# Tableau Cloud Help

Last Updated 2/12/2025

# Contents

# Get Started

Tableau Cloud is a secure, cloud-based solution for authoring, sharing, distributing, and collaborating on content created in Tableau.

## Tableau Cloud Release Notes

Tableau Online is now Tableau Cloud.

This topic describes what’s new in the latest release.

Use the visualization below to explore new features in Tableau Cloud. Click on a feature to bring up the tooltip with a link to detailed documentation for that feature. Explore the filters to refine your search. Download the data to create a customized list.

You can also use the **Search by Feature** dashboard to see a list of new features for a product or version, or explore when a feature was released. The dashboard currently defaults to Tableau Cloud for the latest version of Tableau Cloud.


## Web authoring and interacting with views

For new features and enhancements related to web authoring and interacting with views, see Tableau Desktop and Web Authoring Release Notes. For more topics related to those tasks, see Using Tableau on the Web.

## Features Introduced in Previous Versions of Tableau Cloud

To see the latest Tableau Cloud additions since June 2022, use the Tableau Release Navigator in Tableau Cloud Release Notes.

Browse summaries of features for previously released versions.

All Tableau Cloud Release Notes | All Known Issues

## Added in previous versions

# Added in June 2022

Provision users and groups with Azure Active Directory

Site administrators can now automate user management, provision groups, and assign Tableau Cloud site roles through Azure Active Directory. For more information, see Configure SCIM with Microsoft Entra ID.

Authorize access to Tableau REST API using Tableau connected apps

Using connected apps, you can programmatically authorize access to the REST API on users' behalf using JSON web tokens (JWTs).

For more information, see Access Scopes for Connected Apps.

Enable Explain Data by default per site

Site admins can enable Explain Data by default using site settings and the Explain Data permission. Authors no longer need to set the workbook option **Allow Explain Data to be used in this workbook when viewed online** in the Explain Data Settings dialog box (the workbook setting has been removed). Access to Explain Data in viewing mode is based on site setting, site role, and the Explain Data permission.

For more information, see Control Access to Explain Data.

Adjust the comparison and date range for metrics

You can now edit a metric's configuration to change the comparison, date range, and status indicator. Previously, you could only configure these options when you created a metric. For more information, see Edit a metric's configuration.

Add a Tableau Data Story to your dashboard

You can now create a Data Story in Tableau Cloud and in English only. Data Stories automatically generates narrative insights within your dashboard, saving time and surfacing relevant insights. As you interact with your dashboard, the stories written by Data Stories adjust allowing you to dive deeper into data and identify key insights faster. For more information, see Create a Tableau Data Story (English Only).

Edit published data sources

As of June, you can now edit more types of connections, including Amazon Athena, OData, Databricks, and SharePoint lists. For more information, see Edit a Published Data Source.

Suspend accelerated views automatically

You can now automatically suspend acceleration for views that are consuming unnecessary resources. Set a threshold for the number of times an acceleration task can fail per day, week, or month before the acceleration is automatically suspended. For more information, see View Acceleration.

Understand the ICU 68.2 upgrade

For improved security and better language support, we're upgrading to the current International Components for Unicode (ICU) library, 68.2. This update resolves issues with ordering and better handles new Unicode characters. This update can impact dashboard sorting, filtering, and calculations. If you use string comparisons in calculated fields, confirm that your calculations are still working as expected. For more information, see String Functions.

Tableau Catalog - part of Data Management

**Ask Data Lenses appear in lineage** - The lineage pane now contains lens information. For more information, see Use Lineage for Impact Analysis.

Virtual connections - part of Data Management

**Virtual connections support revision history** - Revision history lets you view the changes to the connection, delete a revision, or restore the connection to a previous version.

**Enhanced filter features for data policy testing** - In the virtual connection editor, when you preview the data with your data policy applied, you can now see the values that are allowed by the policy and the values that are filtered out.

Tableau Bridge support for OAuth

Tableau Bridge now supports OAuth as an authentication method for connections to: Snowflake, Google BigQuery, Google Drive, Salesforce, and OneDrive. Using OAuth provides better security than basic username and password authentication and is easier to manage. For more information, see Publish OAuth enabled private cloud-based data sources.

## Added in May 2022

Admin Insights Job Performance data source

Get more visibility into your site with Admin Insights. You can now connect to the Job Performance data source to see events and runtime information for background jobs on the site. Jobs include extracts refreshes, Bridge refreshes, and flow runs. For more information, see Use Admin Insights to Create Custom Views.

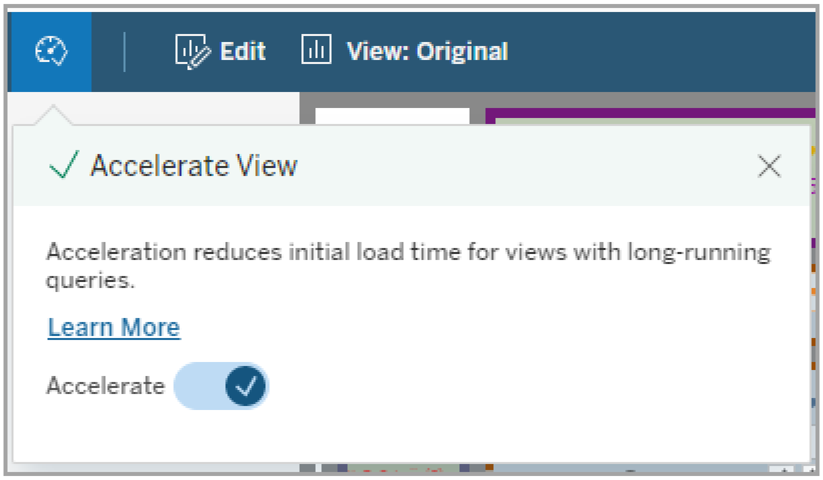
## Added in March 2022

IPv4 address support for Bridge pools

When mapping domains to Bridge pools, site admins can specify IPv4 addresses in the Private Network allowlist to refresh data sources and virtual connections that use IPv4 addresses in their connections. For more information, see IP addresses.

Accelerate load time for your view

Workbook owners, site administrators, and server administrators can now accelerate load time for their views. View Acceleration precomputes long-running queries, so accelerated workbooks load faster. For more information, see View Acceleration.




Customize the View Data window

In a worksheet, you can customize the tabular display of your data in the View Data window. Remove columns from the default view, change the column order, sort columns, or add columns to provide deeper context. You can then download the customized view of the underlying data as a CSV file to share with your team.

> **Note**: When you customize the View Data window, the changes remain only while the View Data window is open.

The new View Data window and customization options are available in Tableau Cloud, Tableau Server, and Tableau Desktop. For more information, see View Underlying Data.

The View Data window and its options are accessible for keyboard navigation and screen readers in Tableau Cloud, Tableau Server, and Tableau Desktop. For more information, see View Data Window in "Keyboard Accessibility for Tableau".

Open the Sheet Description for a workbook on the web

Sheet Description is now available in Tableau Cloud and Tableau Server. While editing a workbook on the web, in the **Worksheet** menu, select **Sheet Description**. Field descriptions are also available on the web. For more information, see Get Details About Fields and Sheets in a Workbook.

Change to Search behavior in Tableau

Beginning with the 2022 Spring release, the Search functionality on the Search Results page in Tableau has changed. Prior to this release, content was indexed to allow “partial token matching.” This meant that you could search for a partial string. For example, if you searched for “super” the results could include content that contained the word “Superstore” in the title, description or columns, even if the word “super” was not present by itself.

As of Spring 2022, indexing is done in a new way that supports both “full token matching” and “fuzzy token matching.” This means that the results you see will be based on complete strings, and will not do partial matches. Fuzzy matching provides partial matching on complete strings. To find "Superstore", you need to search for “superstore” or some variation of that entire string, for example “supertor”, “sperstore”, or “superstores”. Searching on just “super” will not return that match. The goal and benefit of this approach is to reduce noise, limiting the results to content that more closely matches your search string.

Recommendations for taking advantage of this change:

- Use complete words in your query
- Search for words that are present in the title or description of the content

Quick Search

The behavior of Quick Search has not changed, so partial token matching is still supported, but this means that the results in Quick Search will likely not be the same as the results in the Search Results page.

Tableau Catalog - part of Data Management

**Certifications and data quality warnings for virtual connections** - You can now certify and set data quality warnings on virtual connections.

**Virtual connections appear in lineage** - The lineage pane now contains both virtual connection and virtual connection table information. For more information, see Use Lineage for Impact Analysis.

Developer Resources

**Virtual connections in the Metadata API** - Virtual connections and virtual connection tables are now addressable using the Metadata API, and can appear in output when using it. For more information, see Understand the Metadata Model in the Tableau Metadata API Reference.

Virtual connections - part of Data Management

**Salesforce connector supports virtual connections** - You can connect Tableau to your Salesforce data and create virtual connections and data policies that implement row-level security. See About Virtual Connections and Data Policies for details about virtual connections.

**Virtual connections added to space usage view** - Virtual connections are added as an Object Type in the Stats for Space Usage view so administrators can see how much disk space virtual connections use.

## Added in January 2022

Set up OAuth for Salesforce CDP

As a Tableau Cloud site admin, you can set up OAuth for Salesforce CDP. For more information, see  Connect Tableau Cloud Web Authoring to Salesforce Data Cloud.

Update Admin Insights data sources

As a Tableau Cloud site admin, you can now specify how often Admin Insights data sources are updated on your site. For more information, see Manage Admin Insights.

Tableau Cloud sign-in updates

For users added to multiple Tableau Cloud sites, the sign-in process will now prompt users to enter the site URI of the site they are attempting to access. For more information, see Sign In to Tableau Cloud.

Get view load times with Admin Insights

Get more visibility into your Tableau Cloud site with a new Admin Insights data source. You can now connect to Viz Load Times to see load time information for views published on your site. For more information, see Use Admin Insights to Create Custom Views.

## Added in December 2021

Reset MFA verification methods

Site admins can now reset MFA for users who lose all their usual MFA verification methods and are locked out of the site. For more information, see Multi-Factor Authentication and Tableau Cloud.

Support for IdP-initiated SLO

In addition to supporting service provider (SP)-initiated single log out (SLO), Tableau Cloud supports identity provider (IdP)-initiated SLO. For more information about SAML configuration and requirements, see SAML Requirements for Tableau Cloud.

Use Tableau connected apps to enable SSO for embedded content

In early January 2022, as a site admin, you can use Tableau connected apps to create and manage explicit trust relationships between your Tableau Cloud site and custom applications where Tableau content is embedded. With connected apps, you can restrict which content can be embedded and where the content can be embedded, and provide users the ability to access embedded content using single sign on (SSO) without having to integrate with an identity provider (IdP). For more information, see Use Tableau Connected Apps for Application Integration.

Keep more data fresh across multiple private networks

Site admins can now configure multiple Bridge pools to load balance data freshness tasks. Pools can be mapped to domains, giving you the ability to dedicate pools to keeping specific data fresh and maintain security by restricting access to protected domains in your private network. For more information, see Configure the Bridge Client Pool.

Schedule and manage refreshes for file-based data sources directly in Tableau Cloud

Beginning with Bridge version 2021.4.3, refreshes for file-based data sources using Bridge will be integrated with Online schedules. Publishers can schedule and manage refresh schedules for file-based data sources directly from Tableau Cloud. For more information, see Set Up a Bridge Refresh Schedule.

**Note:** Your site admin must have at least one Bridge 2021.4.3 client in a pool mapped to the domain where your file-based data sources are located.

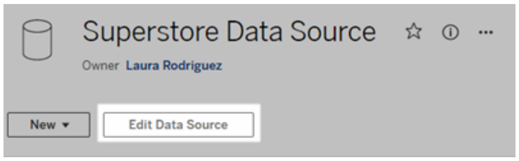
Data freshness support for virtual connections

Keep new virtual connections that connect to private network data fresh using Bridge. Data Management must be enabled for your site to create and use virtual connections. For more information about virtual connections, see About Virtual Connections and Data Policies.

Edit published data sources

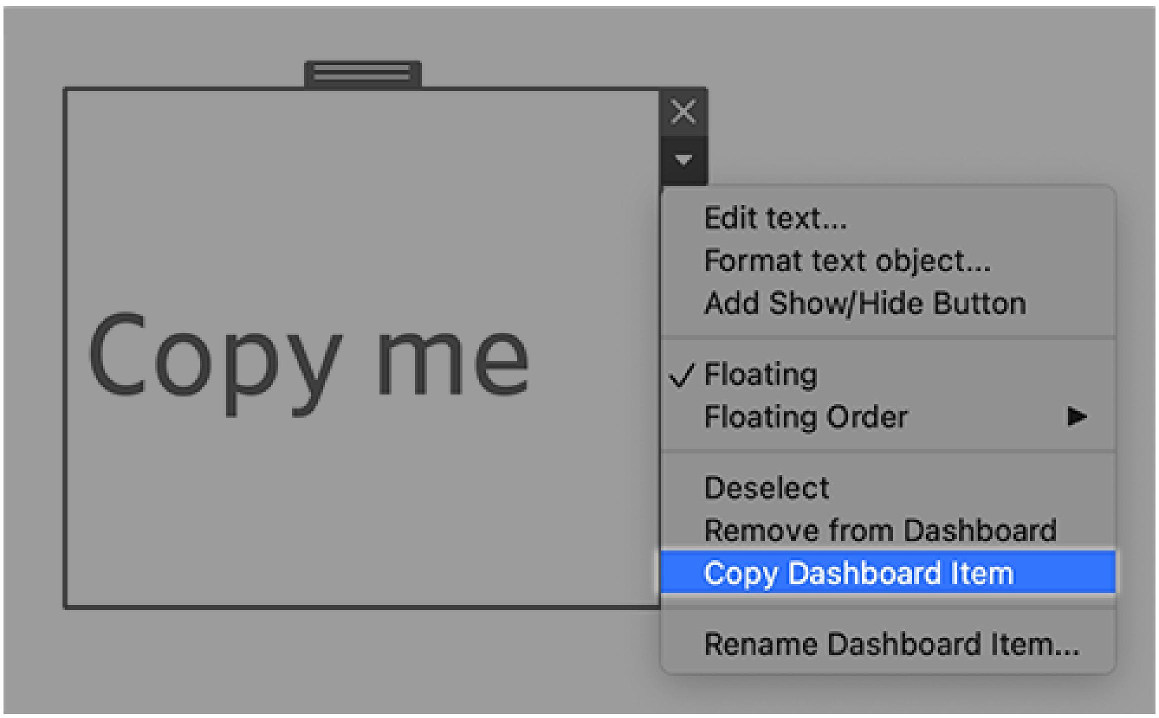
In Tableau Cloud, you can now edit published data sources. Previously, only data sources embedded in workbooks could be edited.

Whether you’re creating a new published data source or editing an existing published data source, you can create joins and edit the schema from the Data Source page. Then use the Scratchpad to test your changes, create folders, organize hierarchies, and rename fields and aliases before publishing your data source—all without ever leaving Tableau. For more information, see Edit a Published Data Source.



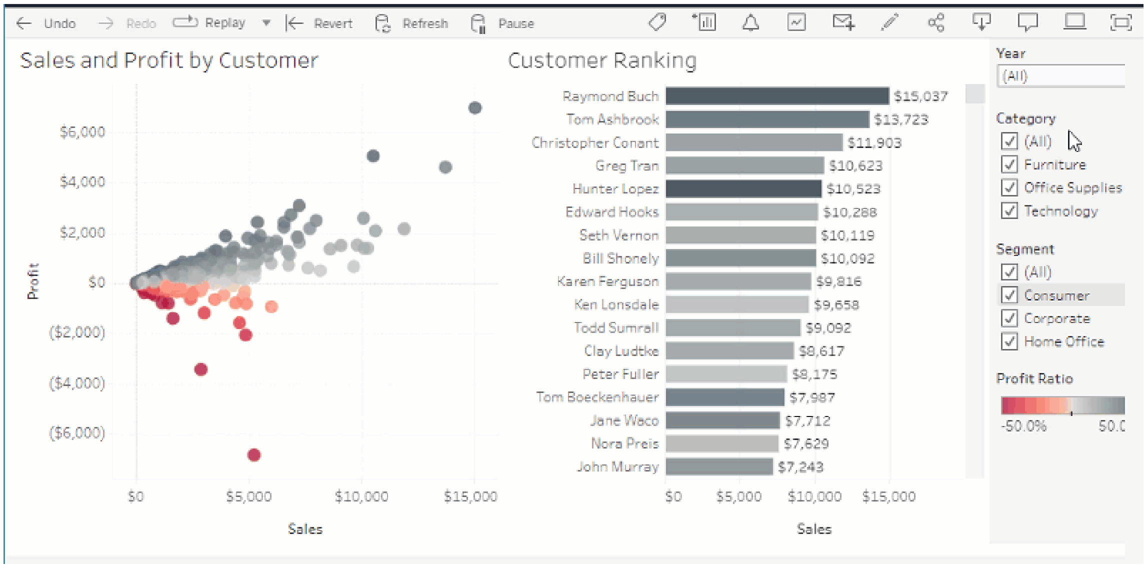

Copy and paste dashboard objects

You can now copy and paste objects either within the current dashboard, or from dashboards in other sheets and files. Note that you can't, however, copy sheets in a dashboard, items that rely on a specific sheet (such as filters), or objects on a device layout. For the complete list of unsupported items and detailed instructions, see Copy objects.




Replay animations in dashboards, stories, and worksheets

You can now replay animations in dashboards, stories, and worksheets wherever you use Tableau. Click the **Replay** button to rewind and replay the most recent animation. You can also choose the speed at which you want to replay the animation: actual speed, 2x speed, or 1/2 speed. Animations help you see how your data is changing in context, so you can make better conclusions about your data. For more information, see Format Animations.




Share Ask Data vizzes with Slack

If your Tableau administrator has configured Slack integration, you can quickly share Ask Data vizzes with anyone who has access to a lens. In the upper right corner of the browser, click the Share icon, then enter specific user names in the text box.


For more information, see Share Ask Data vizzes via email, Slack, or a link.

Use terms previously reserved for analytical functions in Ask Data

Previously, analytical terms found in data source field names and values were ignored by Ask Data. But now it treats terms like "average," "group," "filter," "limit," "sort," and "date" just like any other form of data, letting you analyze data sources without needing to revise their contents.

Query fields with table calculations in Ask Data

Ask Data now lets you query fields with table calculations. Be aware that you cannot include filters, limits, or "year over year difference" comparisons in your query expressions for these calculations.

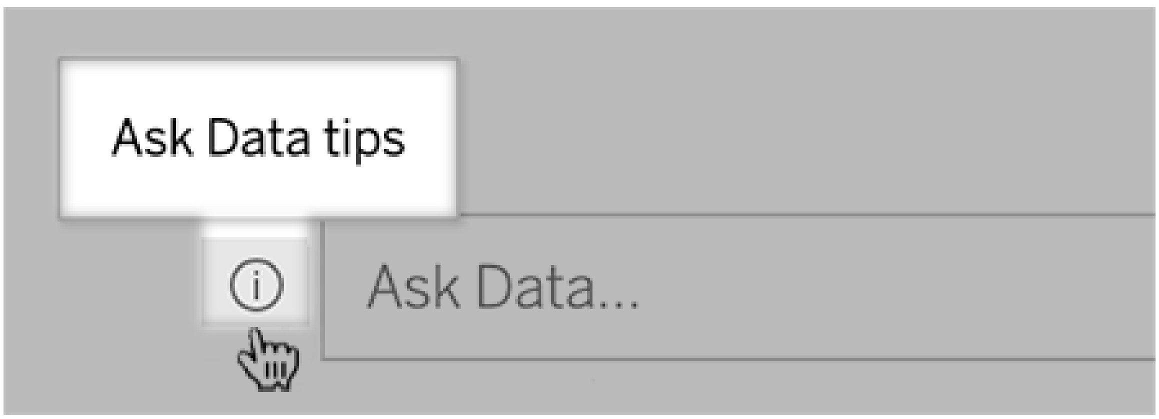
Add Ask Data lenses to Favorites

You can now add Ask Data lenses to your Favorites list for a site, helping you easily return to them.

Provide feedback to Ask Data lens authors

If you have questions about the structure of a lens or how best to use it with Ask Data, you can send feedback directly to the author.

To the left of the query box for Ask Data, click the "i" icon.




Then, at the bottom of the tips dialog, click **Contact the Lens Author**.

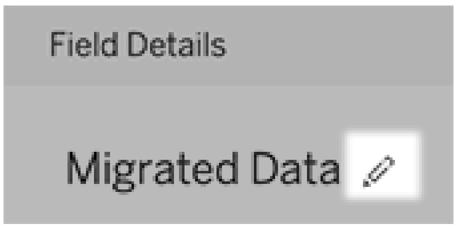
This option is enabled by default, but lens authors can hide it by following the steps in Let users email you questions about a lens.

Rename fields and tables when authoring Ask Data lenses

If field and table names in a data source don't reflect terms your users would recognize, lens authors can now rename these items for each lens.

At left, hover over individual tables or fields, and click the pencil icon:


Then provide a more representative name by clicking the pencil icon to the right.



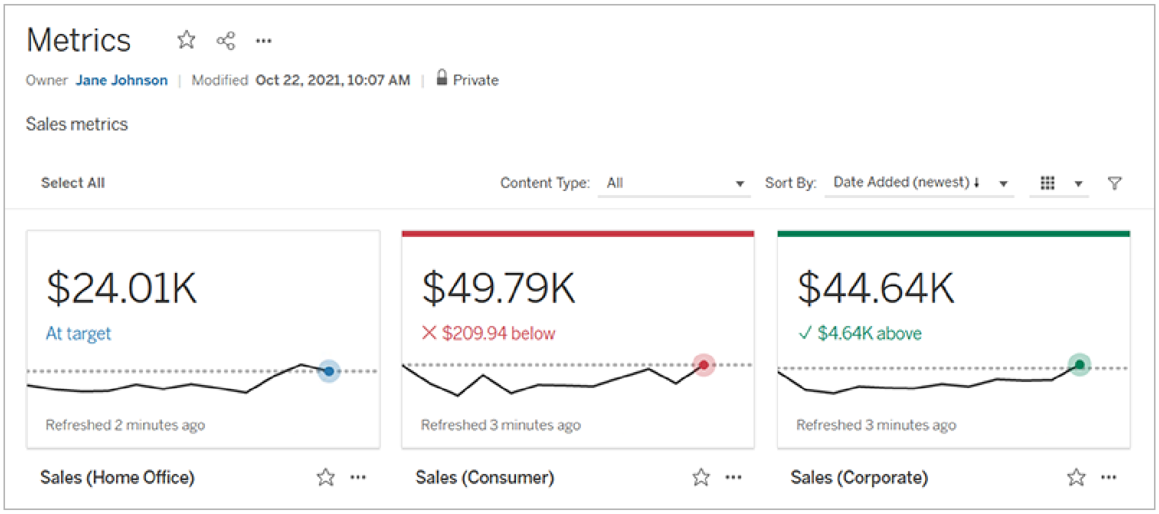

For more information, see Create or configure a lens page on your Tableau site.

Embed metrics into webpages

Include metrics on the webpages and apps where they are relevant by embedding them. To embed a metric, copy the embed code provided on your Tableau site or write your own embed code. An embedded metric follows the same sign in and permission restrictions as the site the metric is embedded from on Tableau Cloud or Tableau Server, so your metric's data is secure. For more information, see Embed Metrics into Webpages.

Configure new comparisons and statuses for metrics

When you create a metric, you can now adjust the date range, configure the historical comparison, and set status indicators. The comparison and status you set are displayed on the metric card, giving users an easy to understand indicator of how the metric is performing compared to a prior point in time or a specific value you've defined. For more information see, Create and Troubleshoot Metrics (Retired).




Salesforce Admin Insights and Nonprofit Cloud

After connecting to Salesforce, you can now publish additional workbooks and data sources for Salesforce Admin Insights and Nonprofit Cloud. The content is customized for your organization and allows you to explore your Salesforce data in Tableau Cloud. For more information, see Create Workbooks with Salesforce Data.

Data Management

Virtual connections and data policies - part of Data Management

Virtual connections and data policies are included in the separately licensed Data Management capabilities for Tableau Cloud. These new data management features enable you to provide a single, centralized connection to a database for your users, as well as define row-level security on the tables in the connection using a data policy. For more information, see About Virtual Connections and Data Policies.

With virtual connections you get Quick Help

As you create and test your new virtual connection, help is just a click away. Delivered in the product, Quick Help shows relevant just-in-time help content based on where you are or what you're doing in the virtual connection editor. Simply click the ? icon on the top right of your screen to open the movable help window.

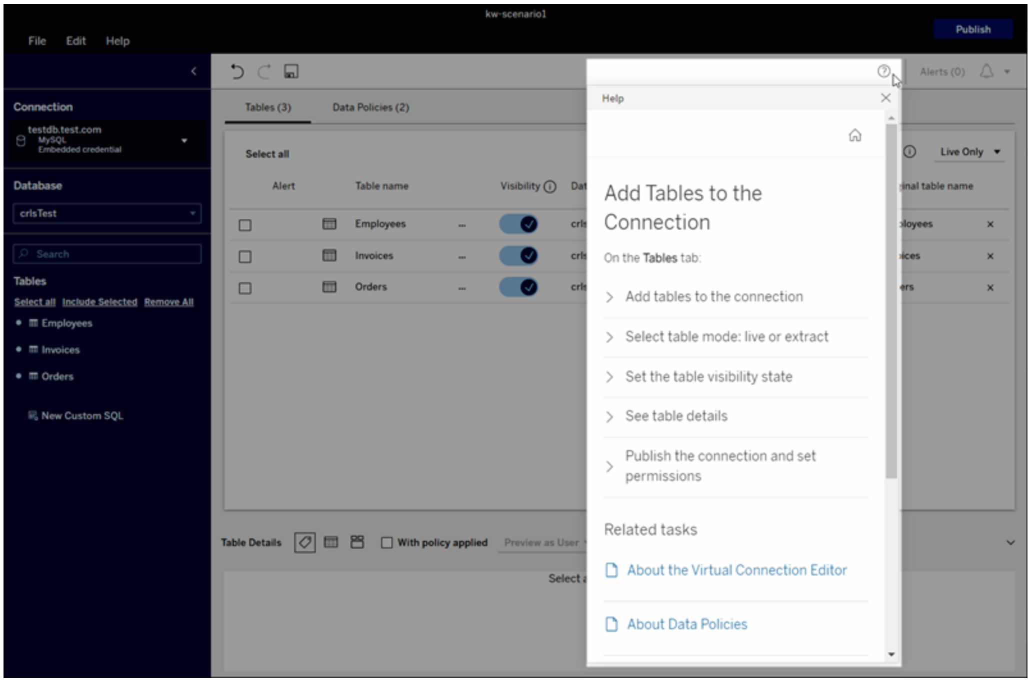



Tableau Catalog - part of Data Management

**Custom SQL information on content lineage pages** - Catalog lineage pages show information that helps users understand more about custom SQL in their content.

- A banner on lineage pages identifies content that uses custom SQL.
- You can review the custom SQL query.
- A warning is shown for custom SQL queries that could result in incomplete lineage.

For more information, see Supported lineage in the Tableau Desktop and Web Authoring Help.

**Tableau Catalog supports the T-SQL dialect in custom SQL queries** - Support for the T-SQL dialect means Tableau Catalog can provide more complete lineage when custom SQL is used. For more information, see Supported queries in the Tableau Desktop and Web Authoring Help.

**Data quality warnings links in email automatically open the Data Details pane** - When you click a data quality warning in a subscription email, the view opens with the **Data Details** pane shown. Also, a new embed parameter, showDataDetails, is available to open the view with the **Data Details** pane shown. For more information, see Parameters for Embed Code in the Tableau Desktop and Web Authoring Help.

**Inherited descriptions appear in the fields list on lineage pages** - When a description for a field exists upstream from the field, it now appears in the fields list on lineage pages with information about where the description is inherited from. For more information, see How field descriptions are inherited in the Tableau Desktop and Web Authoring Help.

**Easily create Prep flows based on external assets** - Now you can use databases and tables as starting points for new flows in Prep web authoring. For more information, see Start a new flow in the Tableau Prep Help.

## Added in September 2021

Share, collaborate, and keep up with your data in Slack

You can now see Tableau notifications in Slack with the Tableau for Slack app, which lets Tableau Cloud site administrators connect with a Slack workspace. Once connected, licensed Tableau users can receive notifications in Slack when they're mentioned in a comment, when teammates share content with them, or when data meets a specified threshold in a data-driven alert. For more information, see Integrate Tableau with a Slack Workspace.

Save workbooks in Personal Space

Creators and Explorers can now edit and save content to Personal Space, a private location for each web author on a Tableau site. Content saved to Personal Space is private to the user and controlled by added resource governance. In Settings, you can enable Personal Space and set user storage limits. Administrators can continue to access and manage all content, including Personal Space content. For more information, see Create and Edit Private Content in Personal Space.

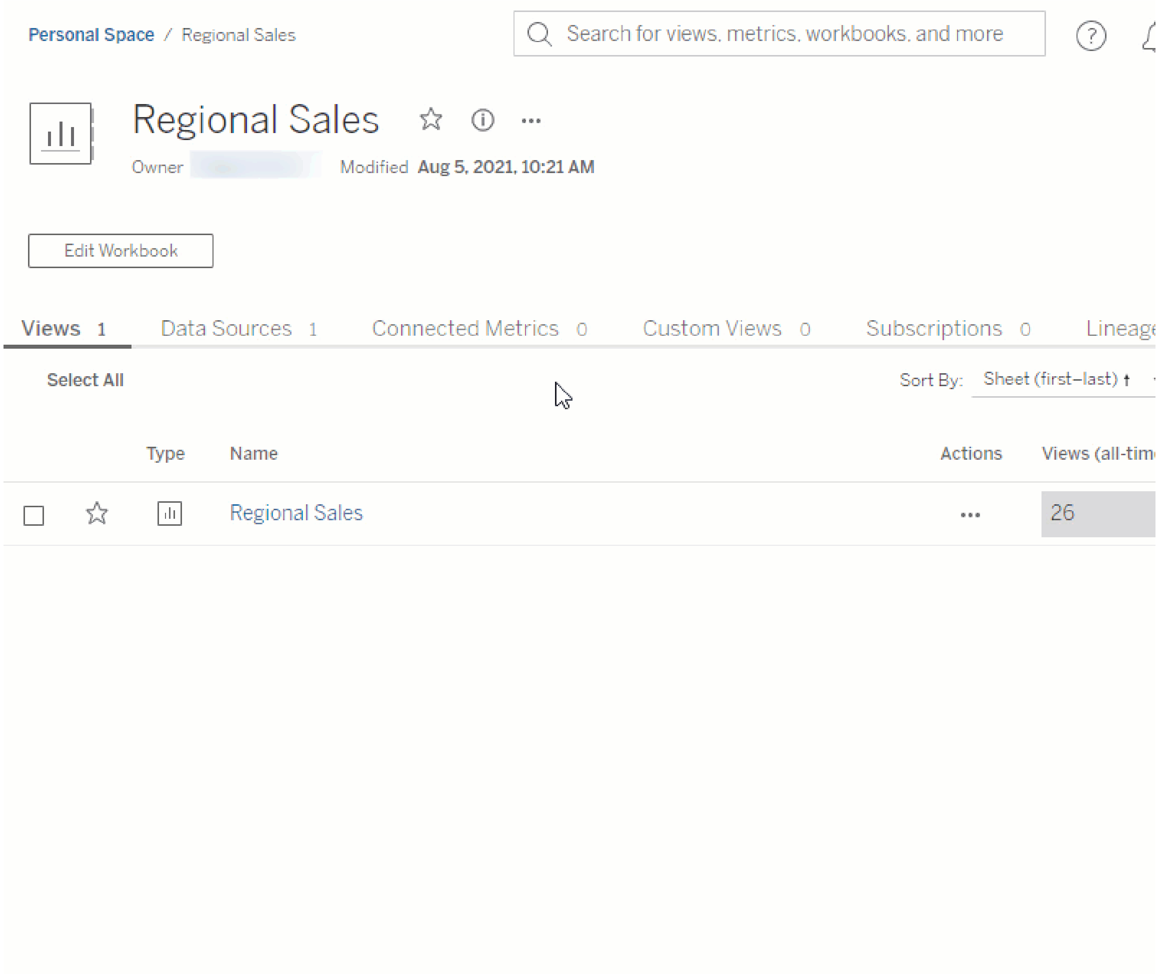
Set your workbook data freshness policy

Strike a balance between performance and data freshness by using workbook data freshness policies. While cached data is great for the performance of live-connection workbooks, seeing stale cached data in a viz can cause confusion and frustration for workbook users. Now with data freshness policies, workbook owners or administrators can choose granular data freshness policies, so the freshest data appears when your business needs it.

From the Workbook Details dialog in Tableau Cloud or Tableau Server, choose **Edit Data Freshness Policy**. Then, choose one of the following:

- **Site default** (12 hours in Tableau Cloud)
- **Always live** (Tableau will always get the latest data.)
- **Ensure data is fresh every**...then, set your interval, such as every 12 hours.
- **Ensure data is fresh at**...then set your days and times, such as Monday, Wednesday, and Friday. at 09:00 AM Pacific time.

Data freshness policies allow you to optimize workbook performance on a schedule that meets the needs of your business. For more information, see Set a Data Freshness Policy for Query Caches and View Acceleration.

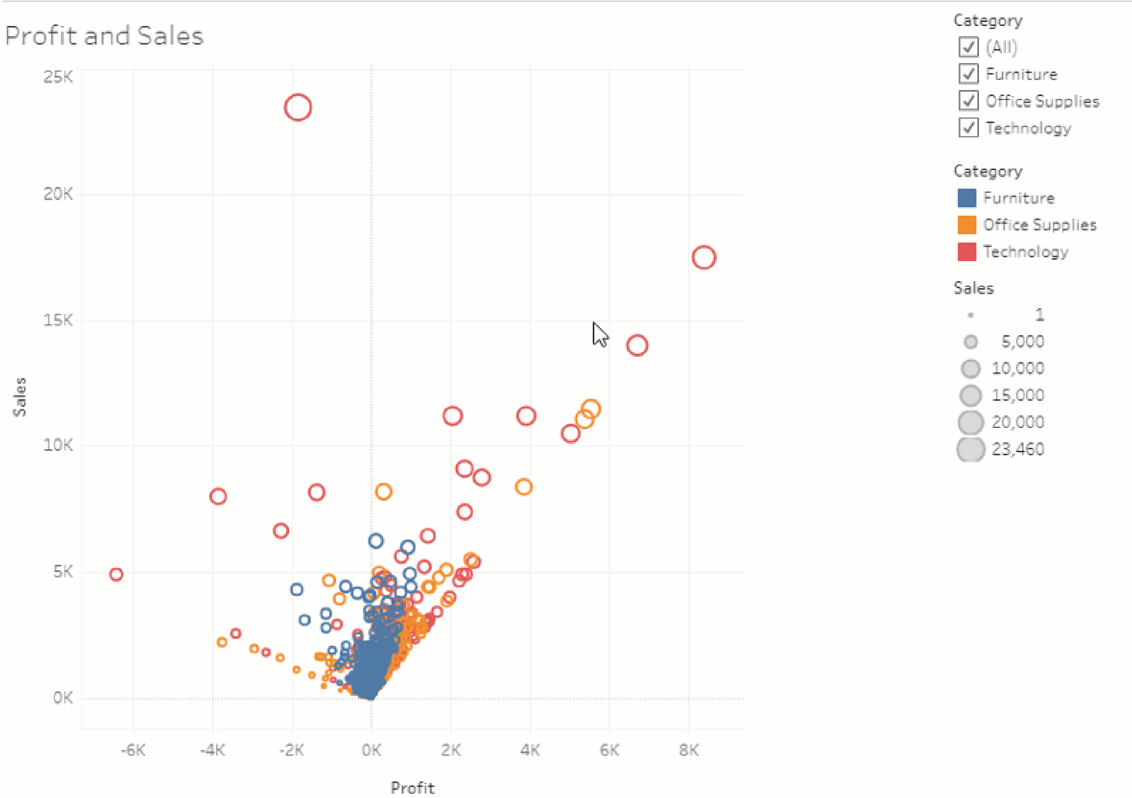



Rename published data sources

In Tableau Cloud and Tableau Server, you can now rename a published data source for which you have **Save** permissions. To rename a published data source, click the **More actions** menu, and choose **Rename**—just like renaming workbooks. You can also rename a published data source using the Update Data Source REST API. When a published data source is renamed, all workbooks that use that data source will use the new name after the next data source refresh is complete. For more information, see Best Practices for Published Data Sources.

Use axes animations to see and understand changes in scale

Axes animations are now available in Tableau Desktop, Tableau Cloud, and Tableau Server. For example, when you filter your viz to include a new data group, you'll see that the scale of the axis changes because a new value was added. Axes animations allow you to see changes of scale in context so you can make better conclusions about your data. For more information, see Format Animations.




Use advanced filtering

From wherever you use Tableau, you can now use advanced filtering that was previously available only in Tableau Desktop. Use Wildcard filtering to filter for strings that match your filter criteria. Or, author Formulas that work with Conditions or Top N filters. For more information, see Filter categorical data (dimensions).

Set new permission capability for metrics

The Create/Refresh Metrics permission capability has been added for workbooks. For more information, see Permission Capabilities and Templates in the Permissions topic.

Prior to 2021.3, the Create/Refresh Metrics capability was controlled by the Download Full Data capability. On workbooks created prior to 2021.3, users who had the Download Full Data capability will have the Create/Refresh Metrics capability.

This new capability provides finer-grained control over your data, allowing you to grant users the ability to create metrics while denying the ability to view or download the full data for the view.

Control access to Explain Data with new site setting and Run Explain Data permission capability

Tableau administrators can now control the availability of Explain Data in site settings. Prior to 2021.3, the ability to enable or disable Explain Data was controlled at the server level only using the tsm configuration set option ExplainDataEnabled.

Authors can now control the availability of Explain Data at the workbook level using the Run Explain Data permission capability. For more information, see Explain Data in the Permissions topic.

> **Note**: To make Explain Data available in viewing mode, a workbook author must also select the option **Allow Explain Data to be used in this workbook when viewed online** in the Explain Data Settings dialog box. For more information, see Control Access to Explain Data.

Limit the number of tags per item

A new setting allows you to limit the number of tags that users can add to Tableau content, such as workbooks and metrics, and external assets, such as databases and tables. This setting ensures that tags don’t pose resource consumption problems. When you lower the tag limit, it prevents new tags from being added above the limit, but it doesn't remove existing tags on items in excess of the limit. For more information, see Site Settings Reference.

Ensure JDBC or ODBC connection customizations are used by Bridge

If a Tableau Datasource Customization (TDC) file is used to customize your generic JDBC or ODBC connections, you can use the steps described in Use .tdc files for generic JDBC or ODBC connections to ensure those customizations are used by Bridge as well.

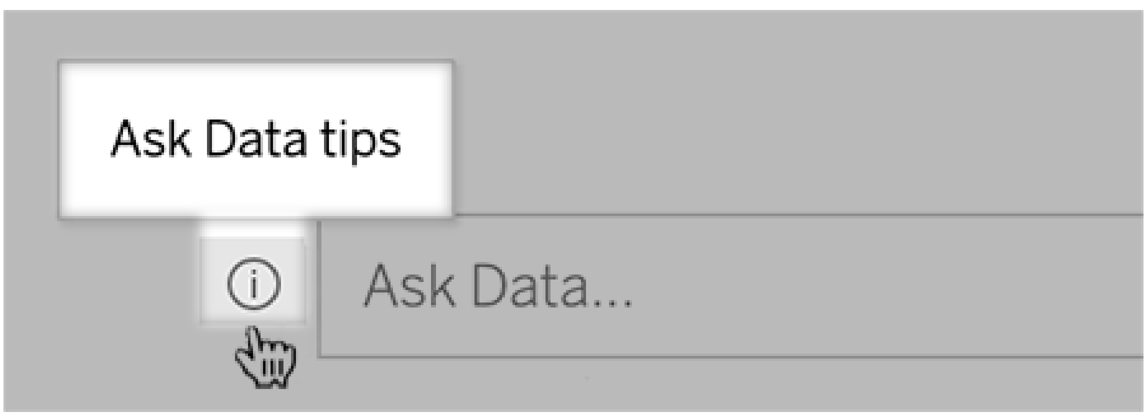
Monitor Bridge refreshes using JSON logs

Create data sources and views to monitor refresh jobs by connecting to a Bridge client's JSON log files. For more information, see Configure the Bridge Client Pool.

Provide feedback to Ask Data lens authors

If you have questions about the structure of a lens or how best to use it with Ask Data, you can send feedback directly to the author.

1. To the left of the query box for Ask Data, click the "i" icon.




3. At the bottom of the tips dialog, click **Contact the Lens Author**.

This option is enabled by default, but lens authors can hide it by following the steps in Let users email you questions about a lens.

Use terms previously reserved for analytical functions in Ask Data

Previously, analytical terms found in data source field names and values were ignored by Ask Data. But now it treats terms like "average," "group," "filter," "limit," "sort," and "date" just like any other form of data, letting you analyze data sources without needing to revise their contents.

Access table calculations in Ask Data

If a published data source contains calculated fields with table calculations that aggregate or sort, Ask Data now indexes and analyzes those just like other fields. (Table calculations that filter or limit data are not supported.)

Use longer field values in Ask Data

Ask Data now indexes field values with lengths of up to 200,000 characters, far above the previous limit of 10,000.

Set up custom OAuth for Dremio

Beginning with version 2021.3, you can set up custom OAuth for Dremio. For more information, see OAuth Connections.

Data Management

Tableau Catalog - part of Data Management

**Inherited descriptions appear in web authoring** - When a description for a field exists upstream from the field, it now appears in web authoring with information about where the description is inherited from. For more information, see Describe fields in a published data source in the Tableau Desktop and Web Authoring Help.

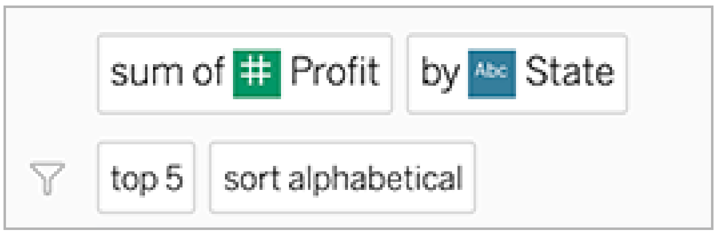
**Assets in personal spaces are indexed** - Tableau Catalog indexes assets in personal spaces, but users who browse through the lineage tool see **Permissions required** instead of information about workbooks in personal spaces.

**Data quality warnings appear in subscription emails** - Subscription emails can include data quality warnings for workbooks or views if their upstream assets have warnings. For more information, see Data quality warnings in subscriptions.

## Added in August 2021

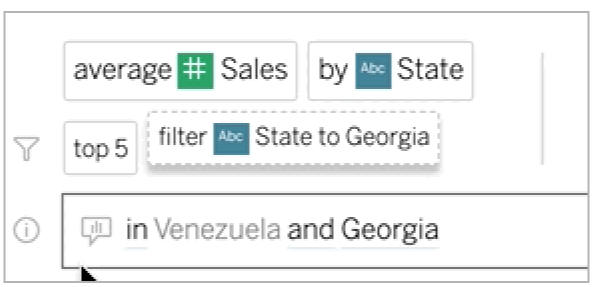
See color-coded data types and simplified phrasing for limiting and sorting in Ask Data

As you create queries in Ask Data, you'll see helpful color-coded icons that identify data types such as numbers, text strings, tables, and so on. Phrasing for limiting filters and sorting has been simplified too, making Ask Data's interpretations of your queries more clear.



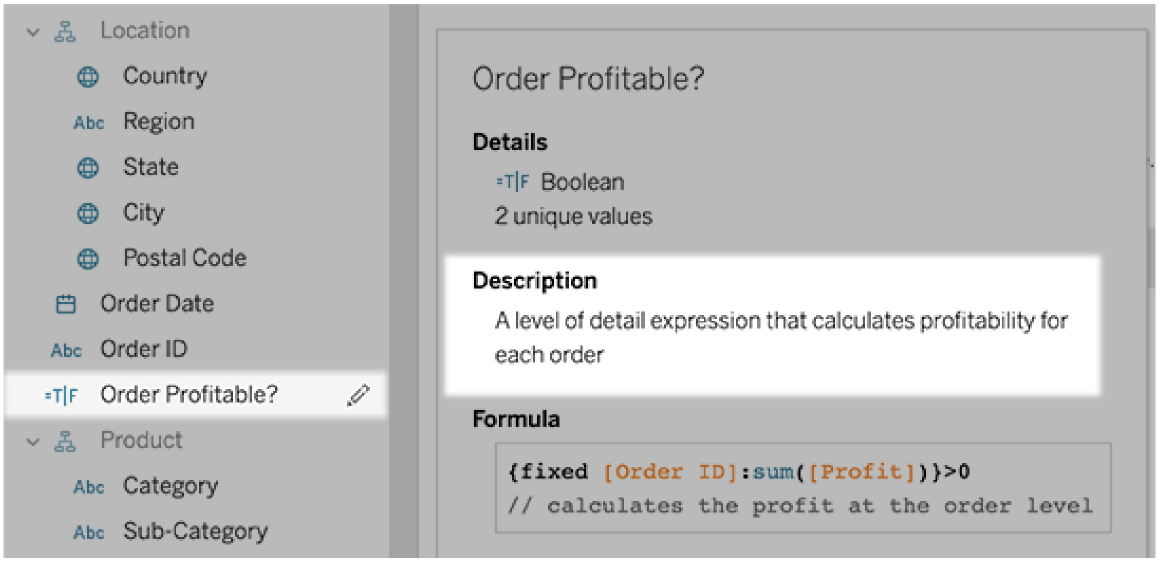

Identify elements used in interpretations for Ask Data

Ask Data has added visual feedback on how your inputs are used in interpretations. Ignored words are grayed out; hovering over remaining words highlights how they're incorporated in the interpretation above.




Edit field descriptions for Ask Data lenses

Lens authors can now customize the description that appears when users hover over a field, better explaining its purpose to the audience of lens users. To change a Description entry, click the pencil icon to the right of a field name.




## Added in June 2021

Tableau with MFA

As the security landscape evolves and threats that can compromise user credentials grow more common, it's important to implement strong security measures to protect your organization and users. If your organization doesn't work directly with an single sign-on (SSO) identity provider (IdP), you can enable multi-factor authentication (MFA) with Tableau authentication to better secure your user sign-in process.

For more information, see one of the following:

- If you're a site admin, see About multi-factor authentication and Tableau Cloud.
- If you're a user, see Register for multi-factor authentication.

Streamlined site settings for Ask Data

Streamlined site settings for Ask Data now disable or enable the feature site-wide for all data sources. If it's enabled site-wide, indexing frequency remains customizable for each data source. For more information, see Disable or Enable Ask Data for a Site.

Organize items in a collection

Collections are like playlists that let users organize content in a way that is meaningful to them. Viewers, Explorers, and Creators can all create and share collections. For more information, see Organize Items in a Collection.

Note that if you participated in the limited preview for collections, the site setting to control public collections no longer exists. Now, permissions for collections are controlled the same way as other types of content. For more information, see Permissions for Collections.

Create workbooks with Salesforce data

You can now integrate Salesforce data into Tableau Cloud to create starter content for users on your site. Once you connect to Salesforce, Tableau publishes ready-to-use workbooks and data sources to help jumpstart analysis into your Sales and Service Clouds. For more information, see Create Workbooks with Salesforce Data.

Configure settings for extracts in web authoring

You can now configure settings for extracts that you create in Web Authoring. Optionally, configure options to tell Tableau how to store, define filters for, and limit the amount of data in your extract. For more information, see Create Extracts on the Web .

Bring Einstein Discovery predictions into your Prep flows on the web

Beginning with version 2021.2, you can bring prediction models built in Einstein Discovery directly into your Prep flows on the web.

> **Note**: You must have a Salesforce license and user account that is configured to access Einstein Discovery to use this feature.

With the power of machine learning and artificial intelligence, you can bulk score your flow data and generate new fields for predicted outcomes at the row level, as well as add top predictors and recommended improvement fields to include data about which fields contributed to the predicted outcome. Add a Prediction step to your flow, sign into Einstein Discovery and choose from deployed models, and apply them to your flow data. Then generate your flow output and use the new data source to analyze the predicted outcomes in Tableau. This feature was first introduced in Tableau Prep Builder in version 2021.1.3. For more information, see Add Einstein Discovery Predictions to your flow in the Tableau Prep help and Create and Interact with Flows on the Web.

Multiple analytics extensions in a site

Beginning with version 2021.2, you can now create multiple analytics extensions connections for each site. This means that organizations with different language or connection requirements can use analytics extensions on the same Tableau Server site, with different workbooks using different connections. For more information on configuring analytics extensions for your site, see Configure Connections with Analytics Extensions. For details on using analytics extensions, see Pass Expressions with Analytics Extensions (Tableau Desktop and Web Authoring Help).

**Note:** As of 2021.2, Einstein Discovery analytics extensions are still limited to one per site.

Share explanations from Explain Data in published dashboards

Explain Data has a reimagined user interface optimized for a broader audience of business users. Authors (Creators or Explorers with editing permissions) can now enable Explain Data for viewers of dashboards and sheets in published workbooks. Viewers can select a mark of interest in the view and run Explain Data to explore their data more deeply than before.

Access to Explain Data in viewing mode is not enabled by default, so authors will need to enable this option. For information on how to enable Explain Data in viewing mode, see Control Access to Explain Data.

For more information on Explain Data, see Discover Insights Faster with Explain Data, Get Started with Explain Data, and Requirements and Considerations for Using Explain Data.

Configure custom OAuth

As a site admin, you can now configure custom OAuth clients for your site to override default OAuth clients. For more information, see Configure custom OAuth.

Keep more data fresh using Bridge

Bridge adds support for the following connectors:

- Alibaba AnalyticsDB for MySQL
- Alibaba Data Lake Analytics
- Databricks
- Denodo
- Impala
- Kyvos

For more information about Bridge connectivity, see Connectivity with Bridge.

Explore new Admin Insights data sources

Get more visibility into your Tableau Cloud site with new Admin Insights data sources. You can now connect to the Groups data source to identify the group membership of users or the Site Content data source for governance information about content items on your site. For more information, see Use Admin Insights to Create Custom Views.

Tableau Catalog - part of Data Management

**Add Field Descriptions** - You can add descriptions for fields in a published data source that then display in the Description column on the data source page Lineage tab. You can also see the description on the Data tab when you build a visualization. For more information, see Describe fields in a published data source in the Tableau Desktop and Web Authoring Help.

**Data Quality Warning Updates**

- **Formatted text support for warning messages** - When you create or edit a data quality warning message, you can format the text with bold, underline, and italics, and include a link or an image. For more information, see Set a Data Quality Warning.
- **Message required for warnings** - When you create a data quality warning, you're now required to enter a message to display to users. (This doesn't apply to warnings

generated when you set Tableau to monitor for extract refresh or flow failures.) For more information, see Set a Data Quality Warning.

**Inherited descriptions appear in Tableau Desktop** - When a description for a field exists upstream from the field, it now appears in Tableau Desktop with information about where the description is inherited from. For more information, see Describe fields in a published data source in the Tableau Desktop and Web Authoring Help.

**Full table name appears** - The table's full name has been added to the table page.

**Filter by tags** - You can now filter databases, files, and tables by tags in the Connect To dialog box.

**Filter by embedded or non-embedded** - On the External Assets page, you can filter databases, files, and tables by asset category: embedded or non-embedded.

Create parameter actions on the web

You can now create parameter actions in both Tableau Cloud and Tableau Server. When you create a parameter action, you customize how data is displayed in your viz. And users can change a parameter value by interacting directly with your viz. For more information, see Parameter Actions.

Create set actions on the web

You can now create set actions in both Tableau Cloud and Tableau Server. Use sets to define a subset of data, and then use set actions to control how members in a set compare to other data in the view. For more information, see Set Actions.

## Added in April 2021

Salesforce Authentication

If your organization uses Salesforce, you can enable Tableau Cloud to use Salesforce accounts for single sign-on with OpenID Connect. When you enable Salesforce authentication, users are directed to the Salesforce sign-in page to enter their credentials, which are stored and managed in Salesforce. Minimal configuration may be required. See Salesforce Authentication.

## Added in March 2021

See new comment and share notifications in redesigned notification center

Users can now see notifications for new comments and shares by selecting the bell icon in the top right corner of their Tableau site. The redesigned notification center also displays updates for flows and extract jobs. With this update, old notifications will continue to be sent by email, but will not appear in the notification center. To continue receiving older notifications via email, navigate to site settings. Under Manage Notifications, select Email for each notification type. For more information, see Tour Your Tableau Site. For settings information, see Site Settings Reference.

Tableau Catalog - part of Data Management

**Automated data quality warning** - You can set Tableau to monitor for extract refresh failures and for flow run failures. When a failure occurs, Tableau generates a data quality warning that displays to users. For more information, see Set a Data Quality Warning.

**Quick search results expanded** - Quick search results now include tags on external assets.

Add Einstein Discovery predictions to Tableau dashboards

With the new Einstein Discovery dashboard extension, as users select marks in a view, they see dynamic updates to predictions and suggestions to improve predicted outcomes. Authors can drag the Extension object onto the dashboard canvas, select Einstein Discovery from the extensions gallery, and then configure the extension in Tableau Cloud. For more information, see Explore Predictions in Tableau with the Einstein Discovery dashboard extension.

For information on required licenses, access, and permissions in Salesforce and Tableau, see Requirements for access.

For an introduction to Einstein Discovery in Tableau, see the Einstein Discovery in Tableau page and demo on tableau.com.

For details on configuration steps required in order to enable the Einstein Discovery dashboard extension, see Configure Einstein Discovery Integration.

## Added in December 2020

Create extracts on the web

Now you can create extracts directly in web authoring, without using Tableau Desktop. For more information, see Create Extracts on the Web . You can extract new workbooks in addition to existing workbooks. Optionally, the extract creation can run in the background and you can be notified when it's completed. This will let you close your authoring session while the extract is being created, which can be helpful with large extracts that might take a long time.

Create and interact with flows on the web

You can now create flows to clean and prepare your data using either Tableau Prep Builder, Tableau Server, or Tableau Cloud. Connect to your data, build a new flow, or edit an existing flow and your work is automatically saved every few seconds as you go.  Create draft flows that are only available to you or publish your flow to make it available for others. Run your individual flows right from the web or run your flows automatically on a schedule using Tableau Prep Conductor if you have Data Management capabilities. For more information, see Create and Interact with Flows on the Web.

Organize items in a collection (limited preview)

Collections are like playlists that let you organize your Tableau content. Create a private collection for personal reference, or make a public collection that can be viewed by other users on your site. For more information, see Organize Items in a Collection.

As a Tableau administrator, you can control whether users can set collections to public by changing the site setting **Allow public collections**.

Collections are available as a limited preview for Tableau Cloud. You won't see collections unless your site is part of the preview. If you're a Tableau administrator who would like to join the preview, sign up here.

Tableau Catalog updates - part of Data Management

Tableau Catalog is included in the separately licensed Data Management capabilities for Tableau Server and Tableau Cloud. For more information, see About Tableau Catalog.

The following features are included in this release:

**Data Quality Warning History admin view** - Site administrators can see how data quality warnings are being used on the site using the pre-built admin view, Data Quality Warning History. For more information see Data Quality Warning History.

**See quality warning details in Tableau Desktop** - Tableau Desktop users can hover over the warning icon on the Data tab to see details about the data quality warnings affecting the data in their workbook. For more information, see Set a Data Quality Warning.

**Metrics appear in lineage and show data quality warnings** - Data quality warnings now appear on metrics affected by a warning. Metrics also appear in the Lineage tool, enabling you to see how a metric might be affected by data changes when performing impact analysis. For more information, see Create and Troubleshoot Metrics (Retired).

Tableau Prep Conductor updates - part of Data Management

Now, Data Management is only needed to schedule and monitor flows with Tableau Prep Conductor. Other flow-related tasks no longer require you to have Data Management. For more information, see Tableau Prep Conductor.

Analytics extensions

Analytics extensions allow you to extend Tableau dynamic calculations in a workbook with languages like R and python, and with other tools and platforms. These settings endpoints enable you to configure analytics extensions on your site in Tableau Cloud. See Configure Connections with Analytics Extensions.

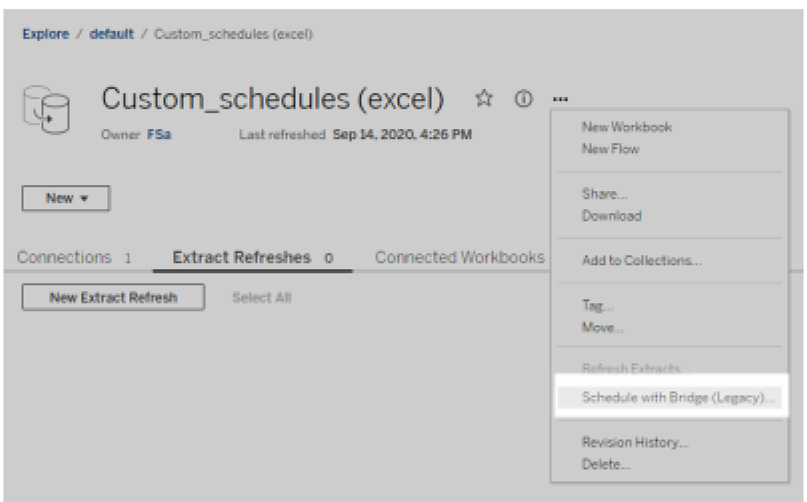
Ask Data Usage and Adoption admin view

You can now see how users engage with Ask Data on a site, using the new Ask Data Usage admin view. The dashboard highlights the top Ask Data users, data sources, and data source owners, along with headline value metrics. For more information, see Ask Data Usage.

## Added in September and October 2020

Bridge (legacy) schedules have moved to a new location

For an extract data source that needs to use a Bridge (legacy) schedule to keep data fresh, you can find and configure a Bridge (legacy) schedule from its new location in the actions menu on the data source page. For more information, see Set Up a Bridge Refresh Schedule.




**Note:** Recommended schedules have not changed location and continue to be integrated with Online refresh schedules. However, Recommended schedules is no longer labeled as "Recommended" to better reflect the integration. All the Bridge-related updates described here have been made to support the new Online scheduling experience.

Custom Extract Refresh schedules

Extract refresh scheduling is now fully customizable and no longer need to be selected from an pre-populated list of schedules. You now have the ability to create and manage customized hourly, daily, weekly, and monthly schedules for the extract refreshes.

For more information, see Schedule Refreshes on Tableau Cloud.

Turn off Web Page objects

To prevent Web Page objects in dashboards from displaying target URLs, deselect **Enable Web Page Objects** in the site settings.

## Added in August 2020

Set the Site Time Zone for Extracts

The default time zone for extract-based data sources in a site is Coordinated Universal Time (UTC). Site administrators can now choose to set a different time zone.

For more information, see Change Time Settings.

Automatically Suspend Extract Refreshes for Inactive Workbooks

To save resources, Tableau can automatically suspend extract refresh tasks for inactive workbooks. This feature applies to full extract refreshes only, not to incremental extract refreshes. This feature only applies to refresh schedules that run weekly or more often.

For more information, see Automatically Suspend Extract Refreshes for Inactive Workbooks and Data Sources.

Manage Licenses for User Groups with Grant Role on Sign In

Administrators can set a minimum site role for user groups and choose **Grant role on sign in** when creating or modifying that user group. Enabling Grant role on sign in reduces manual work to manage licenses, since administrators can designate site role capabilities by group, and provision licenses when a user actually needs it. By waiting to grant licenses until users sign in, administrators can streamline license provisioning, without granting licenses to inactive users. For more information, see Grant License on Sign In.

Tag Stale Content for Archiving

The Stale Content Admin view that was introduced in 2020.2, now has an added functionality that allows you to tag content as stale. You can then choose to archive the tagged content. For more information, see Stale Content.

Tableau Catalog updates - part of Data Management

Tableau Catalog is included in the separately licensed Data Management for Tableau Server and Tableau Cloud. For more information about Tableau Catalog, see About Tableau Catalog.

The following features are included in this release:

**See data quality warnings in Tableau Desktop** - When you open a workbook in Tableau Desktop that has a data quality warning, the warning icon (either a blue circle or a yellow triangle with an exclamation point) appears on the Data tab on the sheet page of the workbook. For more information, see Set a Data Quality Warning

**'Sensitive data' warning type added** - You can use this new warning type to set a data quality warning for sensitive data in your organization. For more information, see Set a Data Quality Warning

**Embedded assets are listed in External Assets** - You can now see embedded assets listed in the External Assets page. For more information, see Use Lineage for Impact Analysis.

**Tag external assets** - Add tags to databases, tables, and columns, which enables you to, among other things, tag tables and columns with personally identifiable information (PII). For more information, see Tag Items in Tableau Desktop and Web Authoring Help.

Web authoring and interaction with views

New features and enhancements related to web authoring and interacting with views on the web are listed in What's New in Tableau for Users and Web Authoring and Tableau Desktop

Feature Comparison. For topics related to web authoring and interacting with views, see Using Tableau on the Web.

## Added in June 2020

Tableau Bridge

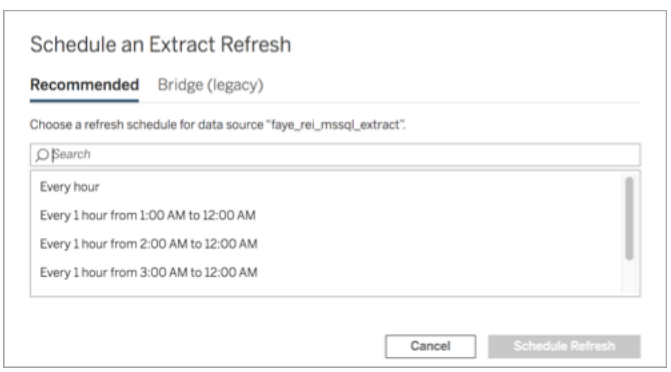
**No Bridge upgrade or installation required – for publishers**

For publishers working exclusively with data sources that connect to on-premises relational data, you no longer need to maintain your current client or upgrade to the latest. As long as you migrate your refresh schedules using Recommended schedules (next bullet), and your admin has installed and set up at least one Bridge 2020.2 client, you're all set. For more information, see Set Up a Bridge Refresh Schedule.

**Integrated refresh schedules**

Refresh schedules for Bridge are now integrated with Tableau Cloud refresh schedules. For publishers, integrated refresh schedules, called **Recommended** schedules, mean:

- You have more control and flexibility to manage your own data sources.
- Your dependence on site admins is reduced for certain data source management tasks like updating connections credentials.




For more information, see Bridge refresh schedules versus Bridge legacy schedules.

**Keep private cloud data fresh**

Use Bridge to keep cloud data, accessible only from inside a private network, fresh. For more information, see Use Bridge for Private Cloud Data.

### Pooling enabled for extract refreshes

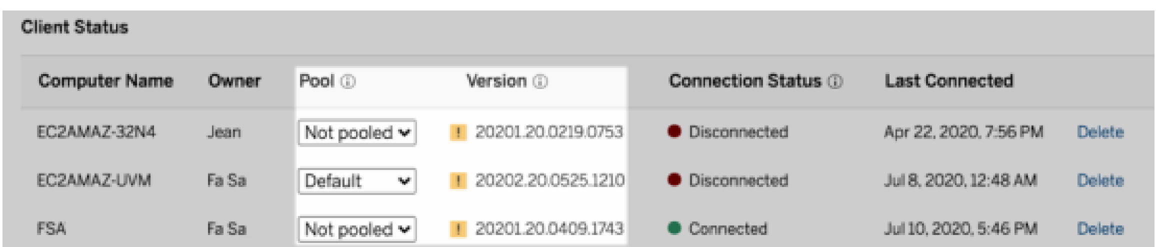
Clients can pool extract refreshes, in addition to live queries, across all 2020.2 clients in the network. For site admins, pooling of extract refreshes means:

- You can focus on providing availability, throughput, and latency.
- You can optimize the composition of your client pool to match the characteristics of your live query and extract refresh workloads.

For more information, see Configure the Bridge Client Pool.

### Updated Settings page

For site admins, the simplified Bridge Settings page allows you to configure which clients to include or exclude from the pool and displays a warning icon to make it easier to know which clients need to be upgraded to the latest version. For more information, see Configure the Bridge Client Pool.


Client Status

| Computer Name | Owner | Pool | Version | Connection Status | Last Connected | |
|---|---|---|---|---|---|---|
| EC2AMAZ-32N4 | Jean | Not pooled | 20201.20.0219.0753 | Disconnected | Apr 22, 2020, 7:56 PM | Delete |
| EC2AMAZ-UVM | Fa Sa | Default | 20202.20.0525.1210 | Disconnected | Jul 8, 2020, 12:48 AM | Delete |
| FSA | Fa Sa | Not pooled | 20201.20.0409.1743 | Connected | Jul 10, 2020, 5:46 PM | Delete |

**Note:** The warning icon shows only when there is a newer client available for download. The warning icon is not an indication that there are issues with the client or related Bridge data sources.

## Added in May 2020

Site Capacity Updates for Extract Refreshes

To improve site performance and ensure a consistent scheduling experience, sites are allocated daily and concurrent extract refresh capacity. For more information, see Tableau Cloud Site Capacity.

Use relationships to combine data for multi-table analysis

Relationships are a new, flexible way to combine data for multi-table analysis in Tableau. Data sources now support multi-table data models in a new logical layer. Tableau recognizes the separate tables in your data source and performs aggregations at the native level of detail for each table.

Creators can combine tables using relationships. Using relationships between logical tables makes it easier to explore and analyze multi-table data at the right level of detail, without having to write specialized calculations to control aggregations like averages and totals.

You do not need to specify join types for relationships; during analysis Tableau automatically selects the appropriate join types based on the fields and context of analysis in the worksheet.

> **Note**: Your workbook must use an embedded data source for you to be able to edit relationships in the Data Source page in web authoring in Tableau Server or Tableau Cloud. You cannot edit the data model of a published data source.

In support of multi-table analysis, several parts of the Tableau interface have changed. The Data Source page (canvas, data grid), View Data window, and the Data pane in the worksheet have all been updated to support a multi-table analysis experience. For more information, see Changes to different parts of the interface.

> **Note**: View Data column order has changed in Tableau 2020.2 and later. This change is required to support relationships and logical tables. For details, see View Data column order changes in Tableau 2020.2 and later.

For more information about relationships and changes to data sources, see these topics:

- What's Changed with Data Sources and Analysis in 2020.2
- Questions about Relationships, the Data Model, and Data Sources in 2020.2
- The Tableau Data Model
- Relate Your Data and Optimize Relationships Using Performance Options
- How Analysis Works for Multi-table Data Sources that Use Relationships
- Troubleshoot Multi-table Analysis
- Walkthrough: Don't Be Scared of Relationships

Also see this Tableau blog post: Relationships, part 1: Introducing new data modeling in Tableau

Create metrics to track data

Metrics help users track changes to their data. Users can create metrics from a view and use them to monitor key numbers like daily sales. For information on how users create metrics, see Create and Troubleshoot Metrics (Retired).

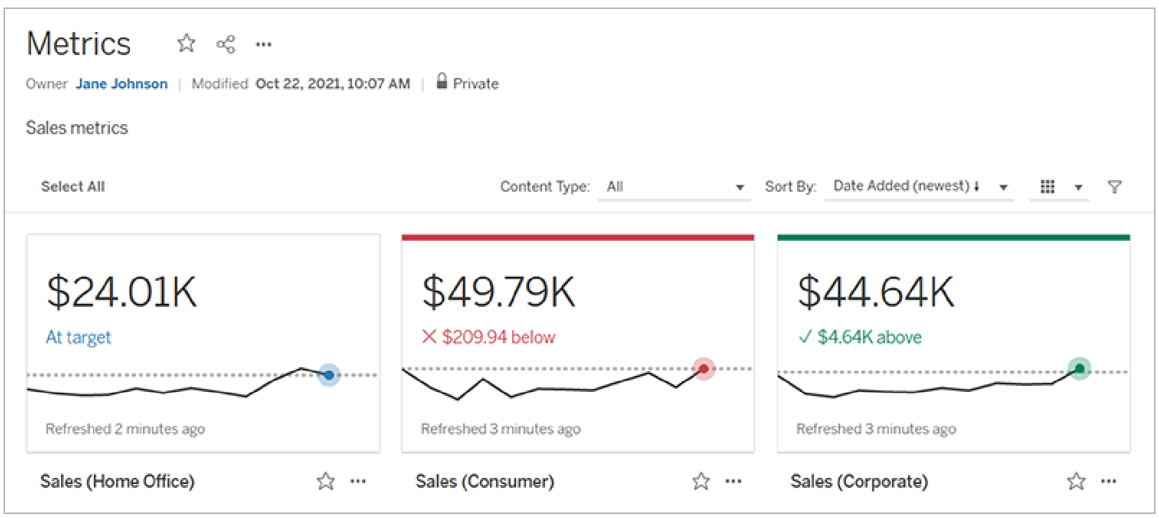
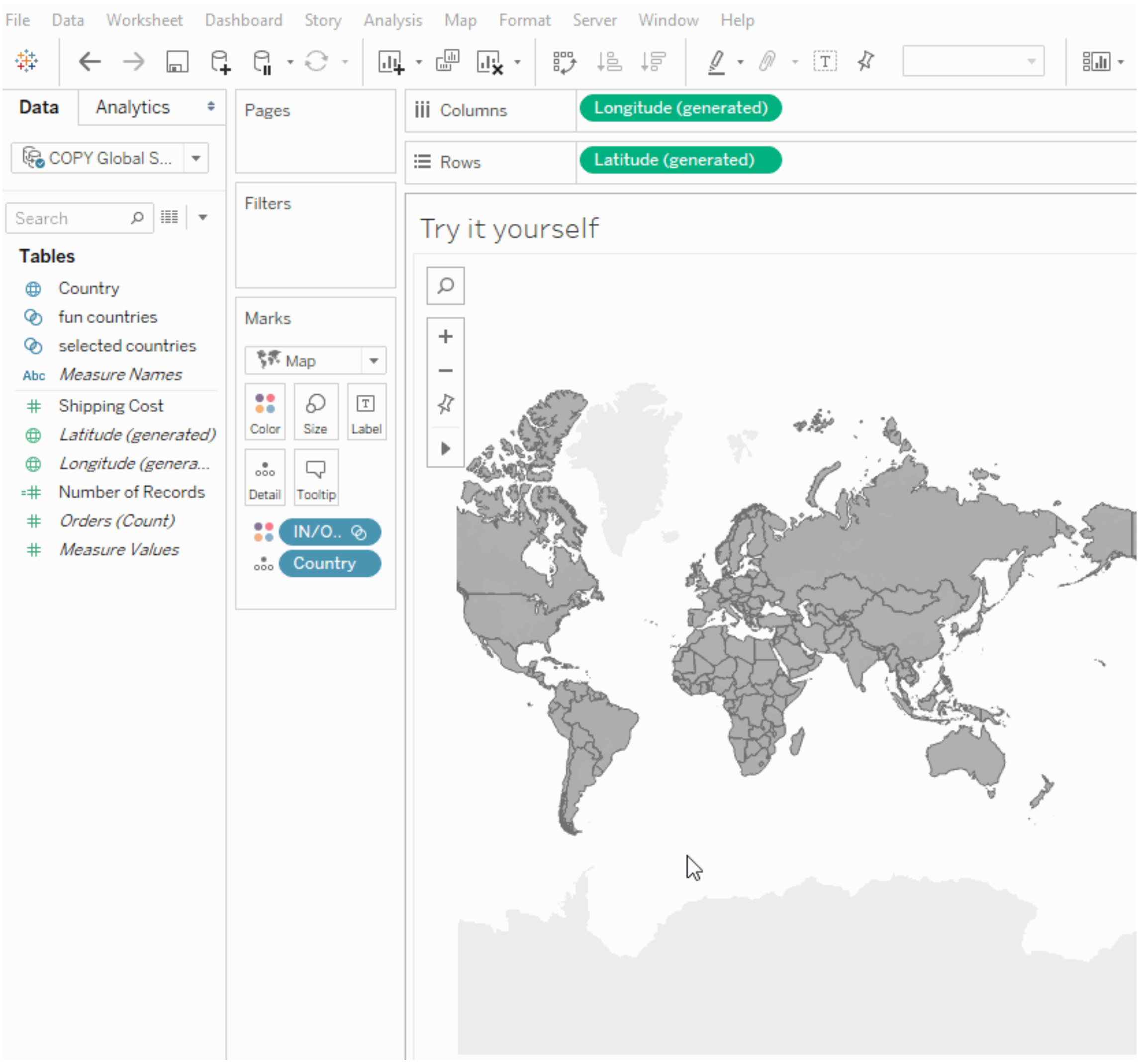



Tableau Cloud administrators can ensure that users are able to create metrics or disable metrics for the site. For more information, see Set Up for Metrics.

Add a Set Control to let users quickly modify the members of a set

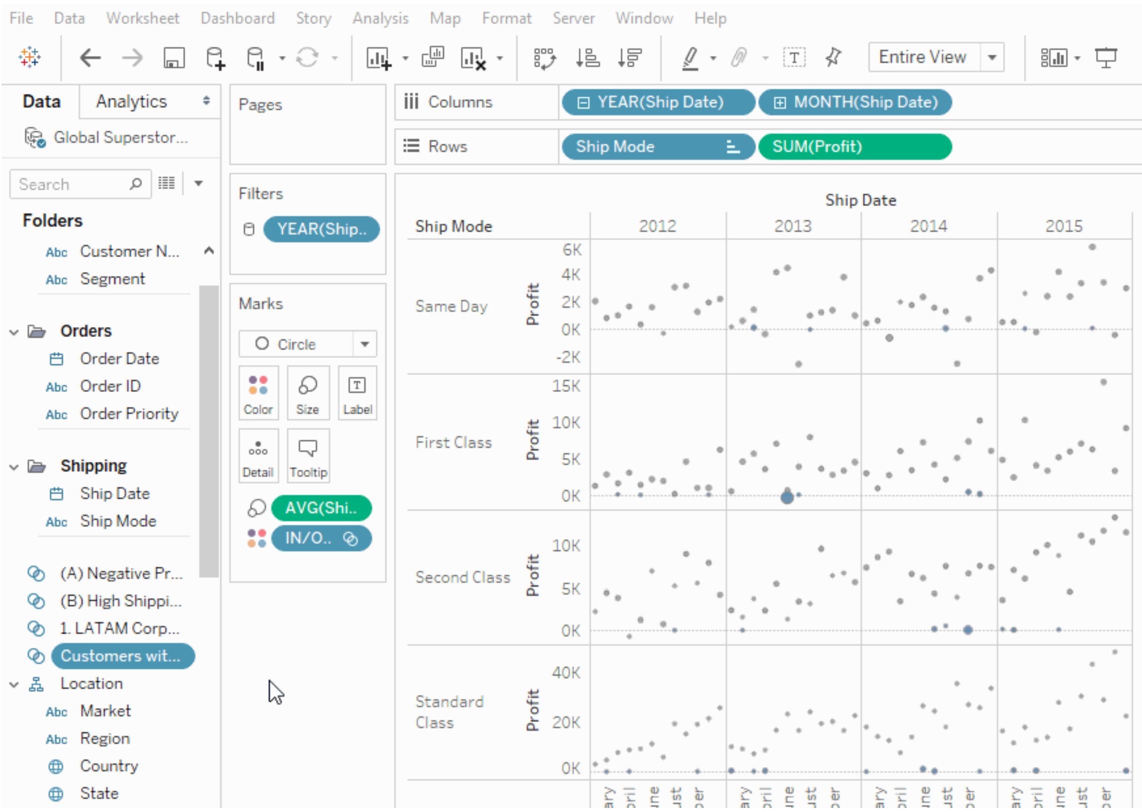
With a Set Control, your audience can select the members of a set without necessitating edit mode. Users can simply add or remove set members by interacting directly with the card in the view. Coupled with Set Actions, you have two powerful, complementary features that make it easy to visualize the set you're interested in.




For more information, see Create Sets, or check out this blog post, Powerful analytics in a user-friendly package with the set control.

Add or remove values from a set by interacting directly with the viz

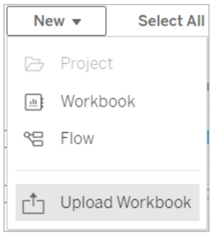
Now, using Set Actions, you and your audience can use the viz itself to incrementally add values to or remove values from a set. Simply interact with the viz and choose which marks to include or exclude. Coupled with the new Set Control feature, you have two powerful ways to gain deeper insights into your data.




For more information, see Set Actions.

Upload and open workbooks with a browser

Users can now upload a Tableau workbook to your Tableau site without publishing through Tableau Desktop, the REST API, or TabCmd. In a Tableau site, users with a Creator or Explorer (can publish) site role can select **New** > **Workbook Upload** to upload a .twb or .twbx file (up to 50 MB) to a project. For more information, see Upload Workbooks to a Tableau Site.




Access Dashboard Starters from Home in Tableau Cloud

Site Administrator Creators can now access Dashboard Starters from the Home page in Tableau Cloud. Use these pre-designed dashboards to quickly visualize data from common business applications like Salesforce or ServiceNow ITSM. For more information, see Use Accelerators to Quickly Visualize Data.

Tableau Catalog updates - part of Data Management

Tableau Catalog is included in separately licensed Data Management capabilities for Tableau Server and Tableau Cloud. For more information about Tableau Catalog, see About Tableau Catalog.

The following features are included in this release:

**Raise the visibility of important warnings** - You can set a data quality warning to be highly visible, so that users of a visualization that's affected by the warning see a notification, and the warning displays in a more prominent yellow color elsewhere in Tableau. For more information, see Set a Data Quality Warning and "Use Data Details to see visualization information" in Explore and Analyze Data in a View in the Tableau Desktop and Web Authoring Help..

**Dashboards appear in the Lineage pane** - When you select the Dashboards item in the lineage, you can see a list of downstream dashboards. For more information, see Use Lineage for Impact Analysis.

**Filter external assets on Certified and data quality warnings** - In addition to using search to narrow down your choices on External Assets, you can now filter databases, files, and tables by Certified and by data quality warnings.

**More filters when connecting** - When you connect to data, you can filter databases and table on connection type.

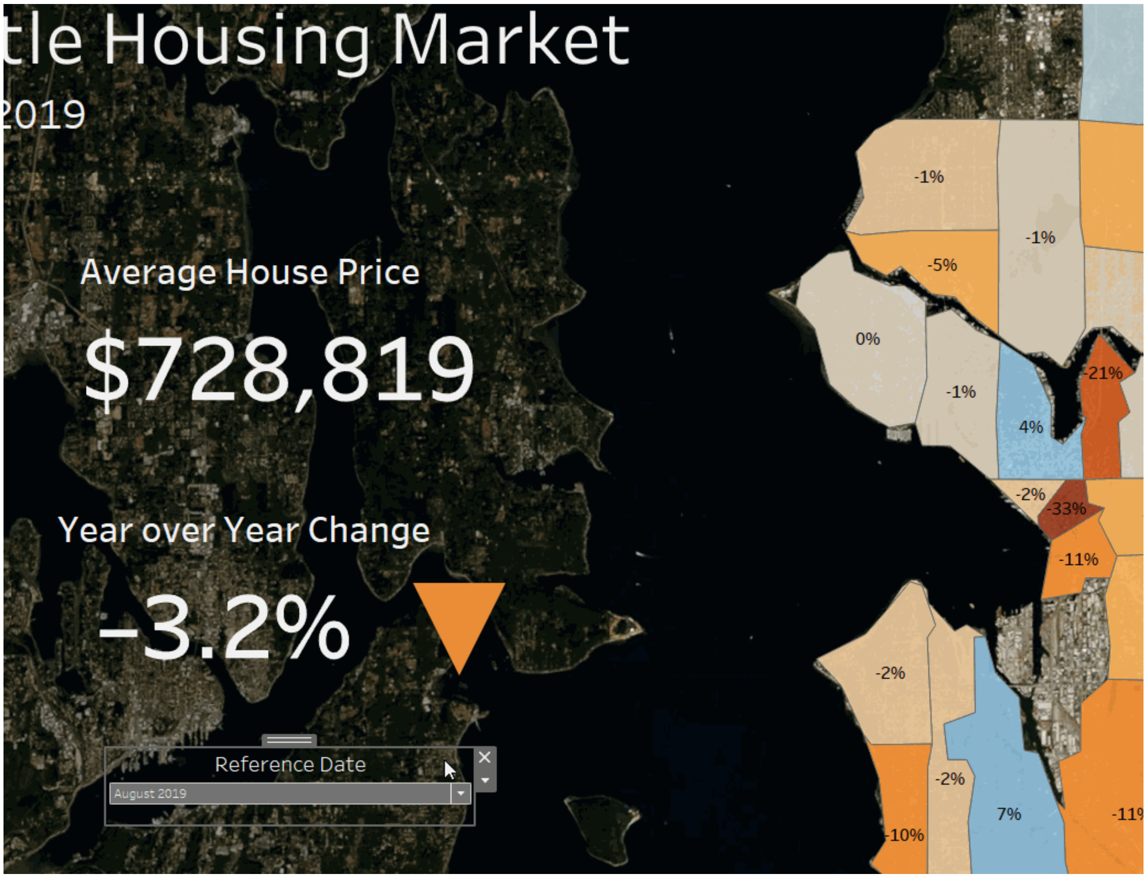
More information on what's new

Other new features and enhancements related to web authoring and interacting with views on the web are listed in What's New in Tableau for Users and Web Authoring and Tableau Desktop Feature Comparison. For topics related to web authoring and interacting with views, see Using Tableau on the Web.

## Added in February 2020

Refresh parameters automatically with dynamic parameters

Now you can set a parameter’s current value to be the result of a single-value, view-independent calculation. In addition, you can refresh a parameter's list of values (or domain) based on a data source column. This means that each time the workbook is opened and Tableau connects to the data source referenced by the parameter, every place in the workbook that references the parameter will use the latest value or domain.




For more information, see Create Parameters.

Automate user provisioning and group synchronization through an external identity provider

You can automate adding or removing users from Tableau Cloud or adding or removing members from groups using your identity provider (IdP). Tableau Cloud IdP user management uses the System for Cross-domain Identity Management (SCIM) standard, which is an open standard for automating the exchange of user identity information. Currently we support SCIM with the following IdPs:

- Okta
- OneLogin

SCIM is used to provision users in cloud applications such as Tableau Cloud. Cloud IdPs centrally manage user identities, including assigning users to applications and groups. The IdP uses the SCIM standard to ensure that "downstream" applications are kept in sync with the provisioning assignments set up with the IdP. Managing users in this way improves security, and can greatly reduce the amount of manual work that Tableau Cloud site administrators need to do to manage site users and group membership.

For more information, see Automate User Provisioning and Group Synchronization through an External Identity Provider.

Support for login-based license management

Login-based license management, helps you manage licensing for users with Creator roles on Tableau Server and Tableau Cloud. Users with Explorer or Viewer roles cannot use this feature. If you’re using Role Based Subscriptions with Tableau Server or Tableau Cloud, you can simplify your license management using login-based license management to eliminate separate Tableau Desktop and Tableau Prep Builder product keys. You only need to manage one or more product keys for on-premises Tableau Server, or in the case of Tableau Cloud, you don’t need to manage any product keys at all.

For more information, see Activate Tableau using Login-based license management.

Updates for Permission Dialog

Set permissions faster with the new permissions dialog. New permission templates and capability groupings match common user scenarios. Editing permission rules is easier than ever with direct editing—double click to enter edit mode. Search for groups and users simultaneously without preselecting your choice. Copy a custom permission rule and paste it for another group or user. And hand off project management to Project Leaders more intuitively with the new setting. For more information on permissions, see Permissions.

Lock nested projects

Regulating permissions is now more flexible. Project permissions can be locked independently for nested projects. Top-level projects can act as organizational containers for projects with different permission models. Non-admins can create new locked projects. For more information, see Lock content permissions.

**Run Now** Setting

This new setting allows Administrators to configure whether to allow or block users from manually running extract refreshes, flows runs, and subscriptions. The Run Now settings are on the General settings page, and by default, is selected to allow users to run jobs manually.

Tableau Catalog updates - part of Data Management

Tableau Catalog is included in the separately licensed Data Management capabilities for Tableau Server and Tableau Cloud. For more information about Tableau Catalog, see About Tableau Catalog.

The following features are included in this release:

**Added connectors** - Connect to more data from external assets. We've added support for the following connectors: Google Big Query, Google Drive, Google Sheets, Box, Dropbox, and OneDrive.

**Create workbooks** - Create a workbook from the External Assets page or from a database or table page for Catalog-supported connections. For more information, see "Tableau Catalog users create workbooks from external assets" in Creators: Get Started with Web Authoring in the Tableau Desktop and Web Authoring Help.

**Filter on Certified and data quality warnings** - Filter data sources, databases, files, and tables by Certified, filter data sources by connections, and filter databases and tables by data quality warnings. For more information, see "Open the Connect to Data page" in Creators: Connect to Data on the Web, or "Connect from Tableau Desktop" in Connect to Data by Using Tableau Server or Tableau Cloud in the Tableau Desktop and Web Authoring Help.

**Enhanced Data Details pane** -

- See a sparkline with the number of times a sheet or dashboard was viewed over the last 12 weeks.
- Easily see that there are Warnings on a view.
- Expand a field to see its metadata, such as a description or calculation.
- When a field in a workbook inherits its description, see where the description comes from.

For more information, see "Use Data Details to see visualization information" in Explore and Analyze Data in a View in the Tableau Desktop and Web Authoring Help.

## Added in October 2019

Web authoring and interaction with views

For a comprehensive list of new features and enhancements related to web authoring and interacting with views on the web, see the features listed under "Prepare, Author, and View Data on the Web" in What's New in Tableau for Users and Web Authoring and Tableau Desktop Feature Comparison. For topics related to web authoring and interacting with views, see Using Tableau on the Web.

Recommendations for views

Tableau Cloud now provides recommendations for views to help users discover relevant content. To learn more about these recommendations, see Discover Recommended Views.

You can control whether recommendations appear on your site, or whether user names appear on recommendation tooltips, by adjusting the options under **Recommendations for Views** on the Settings page.

Table visualization enhancements

Authors can now create wide tables with up to 50 columns. Wide tables with discrete fields can also now be scrolled horizontally. For more details, see Define Table Structure. Also, see this post on 50-column tables from Tableau Public Ambassador Marc Reid on the datavis.blog.

Create extracts on the web

Now you can create extracts in the browser, without using Tableau Desktop. For more information, see Create Extracts on the Web . You can also use the new `createextracts` and `deleteextracts` commands in tabcmd to create or delete extracts for a published workbook or data source. For more information, see tabcmd Commands.

Get view load times with Admin Insights (beta)

Included with the latest version of Admin Insights, is the **Viz Load Time Drilldown** dashboard and the **TS Web Requests** data source. You can use both resources to help users who are authoring views better understand the experience of the users who are consuming those views. For more information, see Explore the pre-built workbook and Use Admin Insights to Create Custom Views.

The dashboard and data source are available to you as in-release beta features *by request*. To join the beta or provide thoughts and ideas about the new Admin Insights content, sign in to the Early Feedback site.

Disable email notifications when Tableau Bridge clients aren't running

If scheduled refreshes appear to be running outside of schedule or if you want to stop notifications you receive about clients not running, you can disable email notifications. For more information, see Change the Bridge Client Settings.

Request access

Users can now request access to see a project, workbook, or view when they don't have viewing permission. When someone requests access to content, Tableau routes an email to the person who controls permissions for that content with information about the request and instructions on making access changes. For information on managing permissions, see Permissions.

Limit visibility of user information

The User Visibility site setting lets administrators manage if users with Viewer and Explorer site roles see other users and groups on the site, which can be important for sites used by multiple clients. When User Visibility is set to **Limited**, Explorers and Viewers cannot see information about other users, including aliases, project ownership, comments, and more. Creators and administrators (including Site Administrator Explorers) can still view user information. By default, User Visibility is set to Full. For more information, see Manage Site User Visibility.

Enable or disable Ask Data for a site

As a site administrator, you can control the availability of Ask Data in the **General** area of site settings. For more information, see Disable or Enable Ask Data for a Site.

Manage Sandboxed Extensions

Tableau now supports Sandboxed extensions, which are a new type of dashboard extension that run in a protected environment hosted by Tableau. Like Network-enabled extensions, Sandboxed extensions are web applications that run in custom dashboard zones and can interact with the rest of the dashboard using the Tableau Extensions API. While Network-enabled extensions have full access to the web, Sandboxed extensions can't share data or make network calls outside of Tableau. Sandboxed extensions provide a new level of security for Tableau users and administrators.

To learn more about controlling extensions, see Manage Dashboard and Viz Extensions in Tableau Cloud. To learn more about extension security and strategies for deployment, see Extension Security in Tableau Server Help.

## Added in September 2019

Support for Italian added

Tableau has added support for Italian. You can now set Tableau to display the user interface in one of eleven languages:

- Chinese (Simplified)
- Chinese (Traditional)
- English (United Kingdom)
- English (United States)
- French
- German
- Italian
- Japanese
- Korean

- Portuguese
- Spanish

For more information, see Change language and locale in the Tableau User Help.

In addition to supporting Italian in all Tableau products, the Help is also available in these languages. To read the help in your preferred language, navigate to the bottom of the Tableau Help page on the Tableau website, and select the language from the footer.

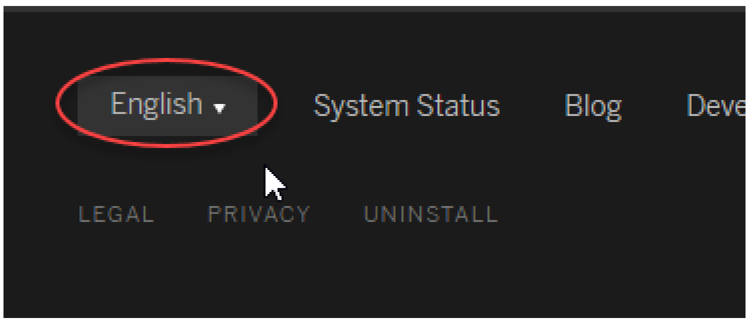



Tableau Data Management

Data Management capabilities are available through a new license that helps customers manage Tableau content and data assets in their Tableau Server or Tableau Cloud environment. Tableau Prep Conductor and Tableau Catalog are included with Data Management. For more information, see About Data Management.

Tableau Prep Conductor—part of the Data Management

Tableau Prep Conductor is included in the separately licensed Data Management capabilities for Tableau Server and Tableau Cloud. Tableau Prep Conductor leverages the scheduling and tracking functionality of Tableau Cloud so you can automate running flows to update the flow output instead of logging into Tableau Prep to manually run individual flows as your data changes. For more information, see Tableau Prep Conductor.

Tableau Catalog features—part of the Data Management

Tableau Catalog is included in the separately licensed Data Management capabilities for Tableau Server and Tableau Cloud, making a variety of features available to you in the data management space. You can use Tableau Catalog to discover data, curate data assets, communicate data quality, perform impact analysis, and trace the lineage of data used in Tableau content. For more information, see About Tableau Catalog.

Tableau Metadata API

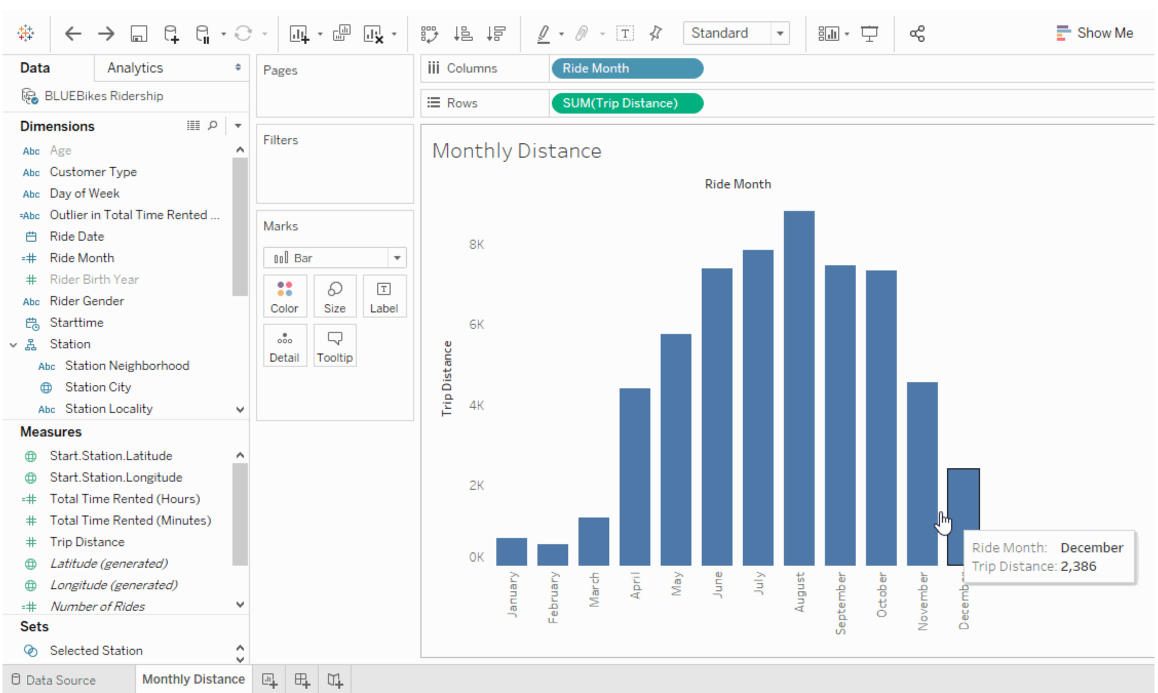
If you're a developer and interested in accessing metadata indexed by or surfaced through Tableau Catalog, see the Tableau Metadata API Help.

Explore and inspect views with Explain Data

Inspect, uncover, and dig deeper into marks in a viz using Explain Data. Explain Data gives you a new window into your data by proposing statistical explanations for a selected mark, including potentially related data from the data source that isn't in the current view.

Creators and Explorers with editing permissions can use Explain Data when editing a view in Desktop, or editing a view on the web in Tableau Cloud or Tableau Server.

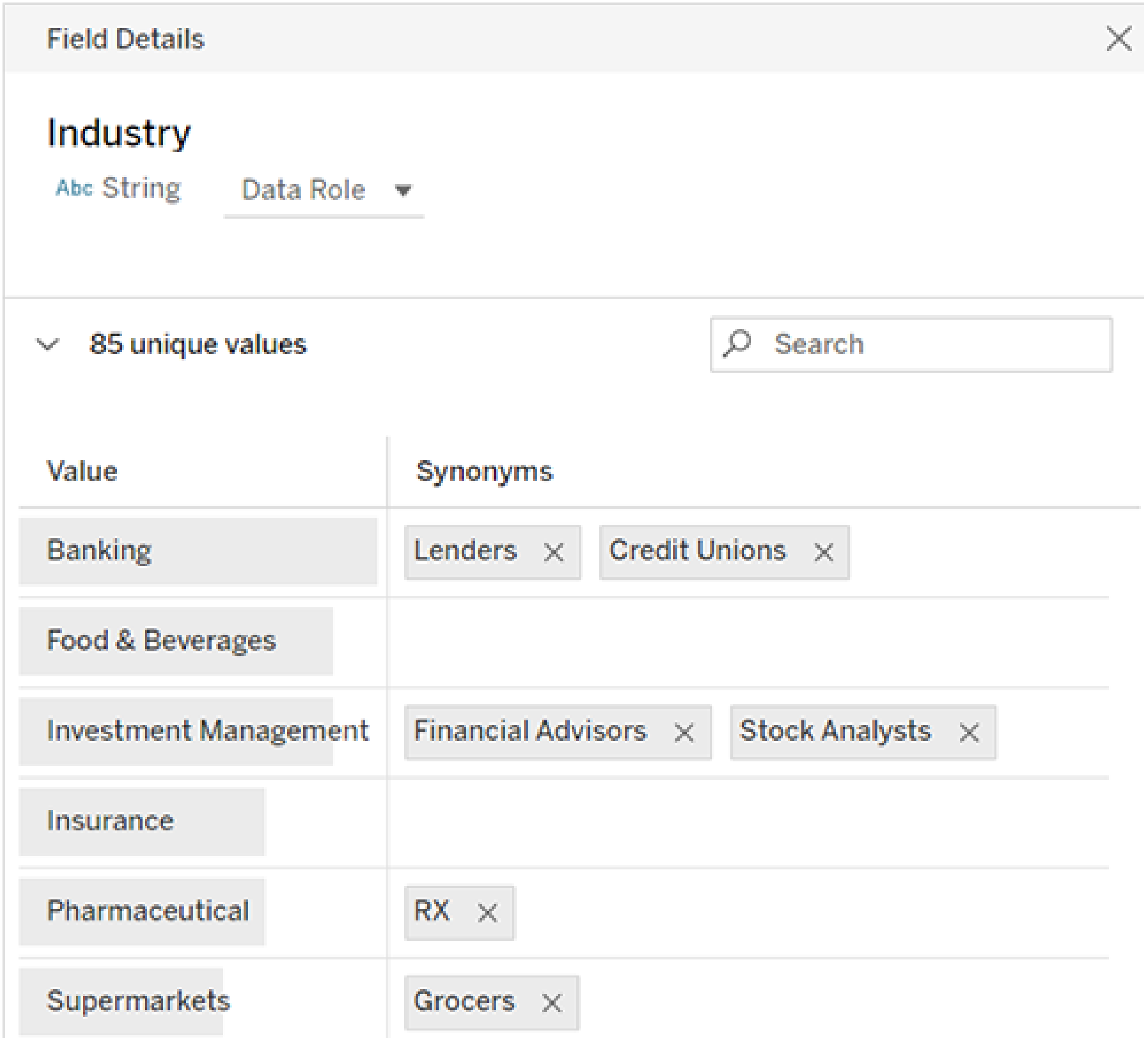
Explanations give you information and visualizations on the data points might be affecting the mark value. You can then open visualizations for further exploration. For more information, see Inspect a View using Explain Data in Tableau User help.



Ask Data improvements

Users can now embed Ask Data into HTML pages, adjust relative date filters, and see top and bottom outliers in context. For more information, see Automatically Build Views with Ask Data in the Tableau User Help.


Data source owners and Tableau administrators can now add synonyms for field values, in addition to field names. For more information, see Optimize Data for Ask Data in the Tableau User Help.




Job Management

Site administrators can now view, monitor, and manage jobs. For more information, see Managing Background Jobs in Tableau Cloud.

## Added in May 2019

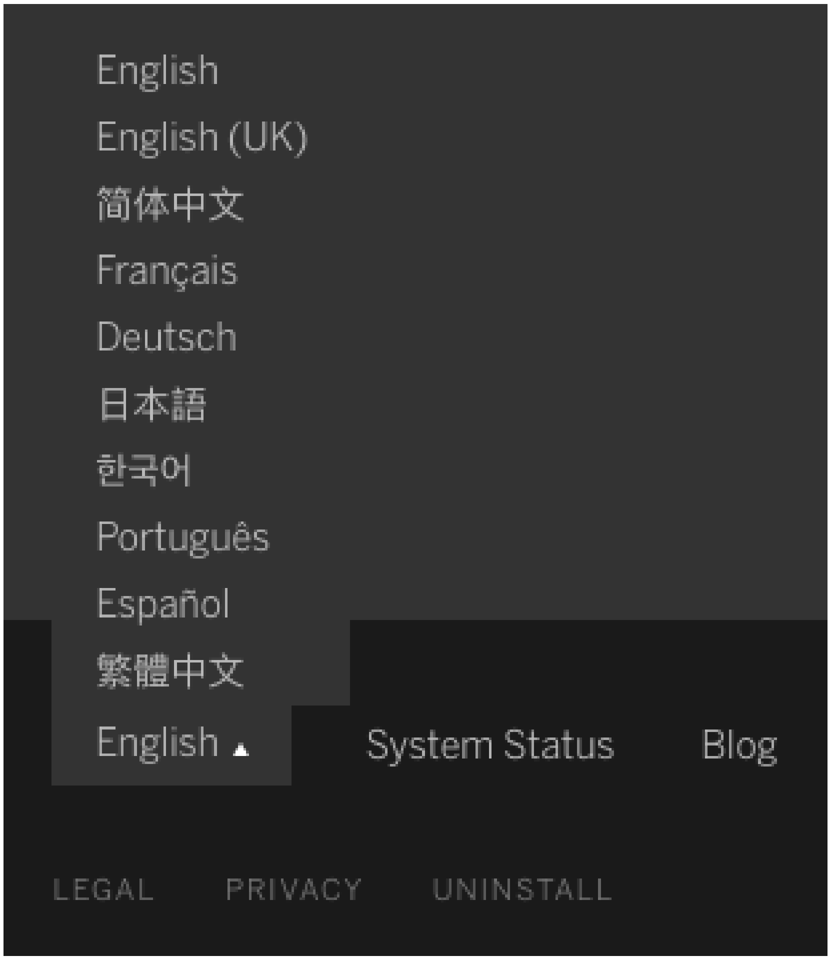
Select from ten different languages for Tableau

Tableau has added support for two new languages, Chinese (Traditional) and English (United Kingdom). You can now set Tableau to display the user interface in one of ten languages:

- Chinese (Simplified)
- Chinese (Traditional)
- English (United Kingdom)
- English (United States)
- French
- German
- Japanese
- Korean
- Portuguese
- Spanish

For more information, see Change language and locale in the Tableau User Help.

In addition to supporting two new languages in all Tableau products, the Help is also available in these languages. To read the help in your preferred language, navigate to the bottom of the Tableau Help page on the Tableau website, and select the language from the footer.




Help Design

A blue **Send feedback** icon is displayed in the bottom right corner of every Help page to make it easier for you to send feedback about the content in a topic. Click the icon to let us know if a topic is helpful to you, and also to comment on what needs improvement.

Use Admin Insights to create custom admin views

Enable the Admin Insights project for your site to create custom admin views about Tableau Cloud adoption, site traffic, license allocation, and more. For more information, see Use Admin Insights to Create Custom Views.

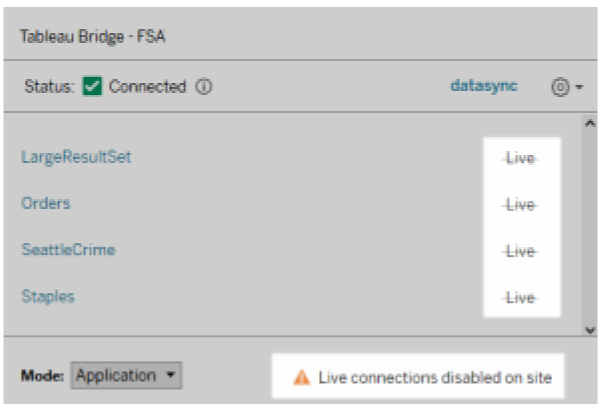
Configure email alerts for incomplete extract refreshes

As an extract data source owner whose scheduled refreshes are performed by Tableau Bridge, you can configure Tableau Cloud to send you email alerts for incomplete refreshes. For more information, see Change the Bridge Client Settings.

Tableau Bridge improvements

Here are some additional improvements made to the Tableau Bridge client and workflow.

- Access Tableau Bridge-related admin views from the client menu.
- Quickly identify whether live queries are supported directly from the client.



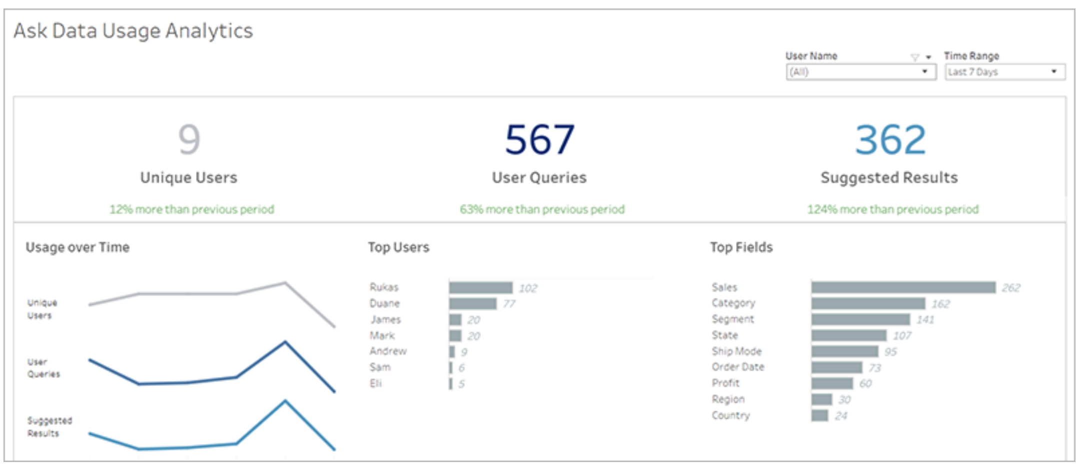

- Receive email alerts when a scheduled refresh cannot start because the client is not running.
  **Note:** After Tableau Cloud's upgrade to 2019.2, some data source owners might see an influx of notifications about Tableau Bridge clients not running. For more information, see Scheduled refreshes appear to be running outside of schedule:.

Ask Data improvements

For users, Ask Data now lets you ask questions in a conversational style, apply simple calculations, and create multiple sheets. For more information, see Automatically Build Views with Ask Data in the Tableau User Help.


For data managers and site administrators:

- Words like "year" and "date" are reserved for analytical functions and should be avoided in field names.
- The ability to add synonyms for field names is now limited to data source owners and Tableau administrators, providing a more consistent experience for users.
- A Usage Analytics dashboard reveals the most popular queries, top users, and other helpful information.

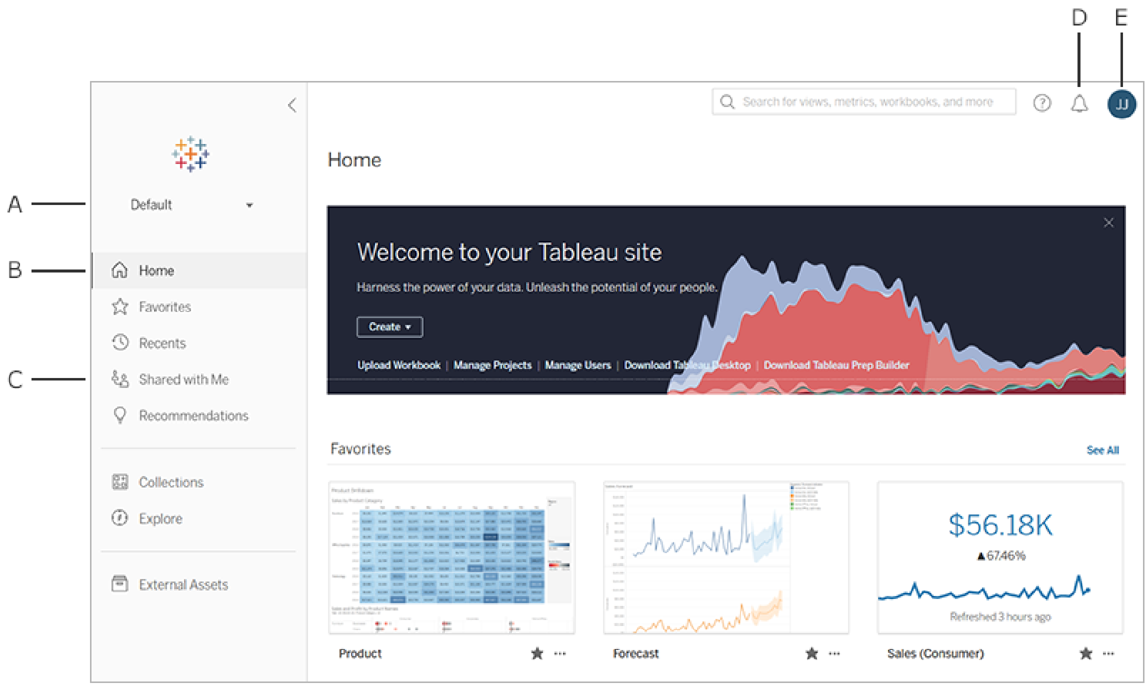



For more information, see Optimize Data for Ask Data in the Tableau User Help.

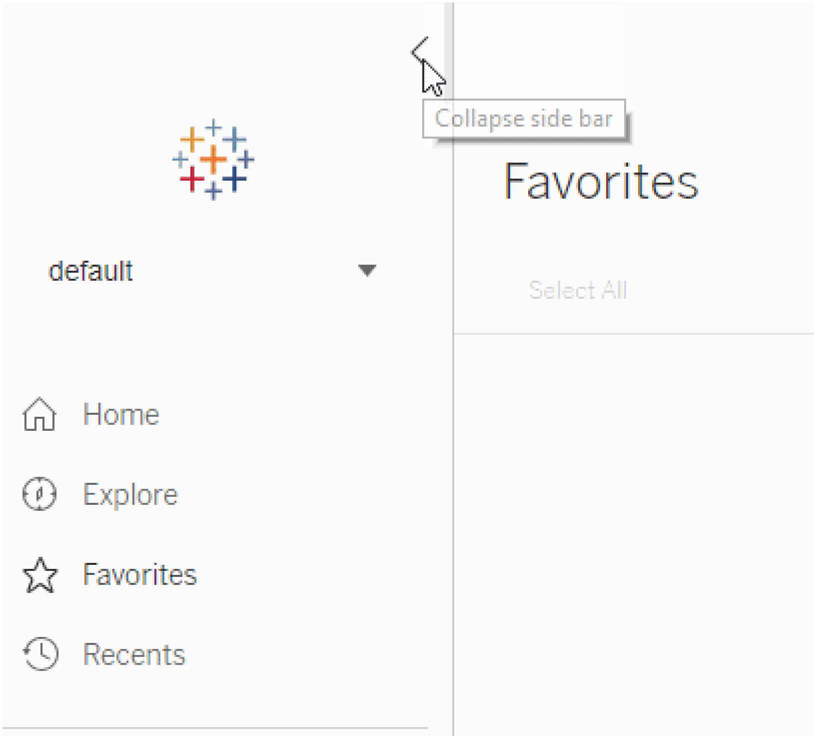
Home page and navigation improvements

For users and administrators, new navigation changes and pages make it easier to get started and locate relevant content:

- Use the new Home page to access recent views, find favorite content, and see what's popular on the site. The welcome banner and actions are tailored by site role to help users get started.




- Dedicated **Favorites** and **Recents** pages give users access to all of their most-important content. Use the sort and filter options on the right side of each page to find relevant content.
- New left navigation panel lets users quickly jump between important pages on the site, including the **Explore** page, where they can see all site content in one place. The panel is responsive to screen sizes and can be collapsed.




- When users are viewing or creating a visualization, the left navigation panel disappears to make more room for analysis. The compact header makes it easy to navigate through project hierarchy, search the site, and access favorites as needed.

To learn more, see Tour Your Tableau Site in the Tableau User Help.

Alert side panel

When users select **Alerts** in any view, a new panel shows alerts that already exist for the viz. To create an alert that is visible for others, select **Make visible to others** when creating the alert. Alerts created prior to 2019.2 are not visible to others, but can be updated to be. To learn more, see Send Data-Driven Alerts from Tableau Cloud or Tableau Server in the Tableau User Help.

Custom views supported for Viewer role

Previously, creating custom views required a Creator or Explorer license, but now Viewers can create them too. For more information, see Use Custom Views in the Tableau User Help.

Set a default site start page

Administrators can set a default start page for everyone on a site. When a site user signs into Tableau Cloud, they will land on the start page set by an administrator. For more information, see Set the Default Start Page for All Users.

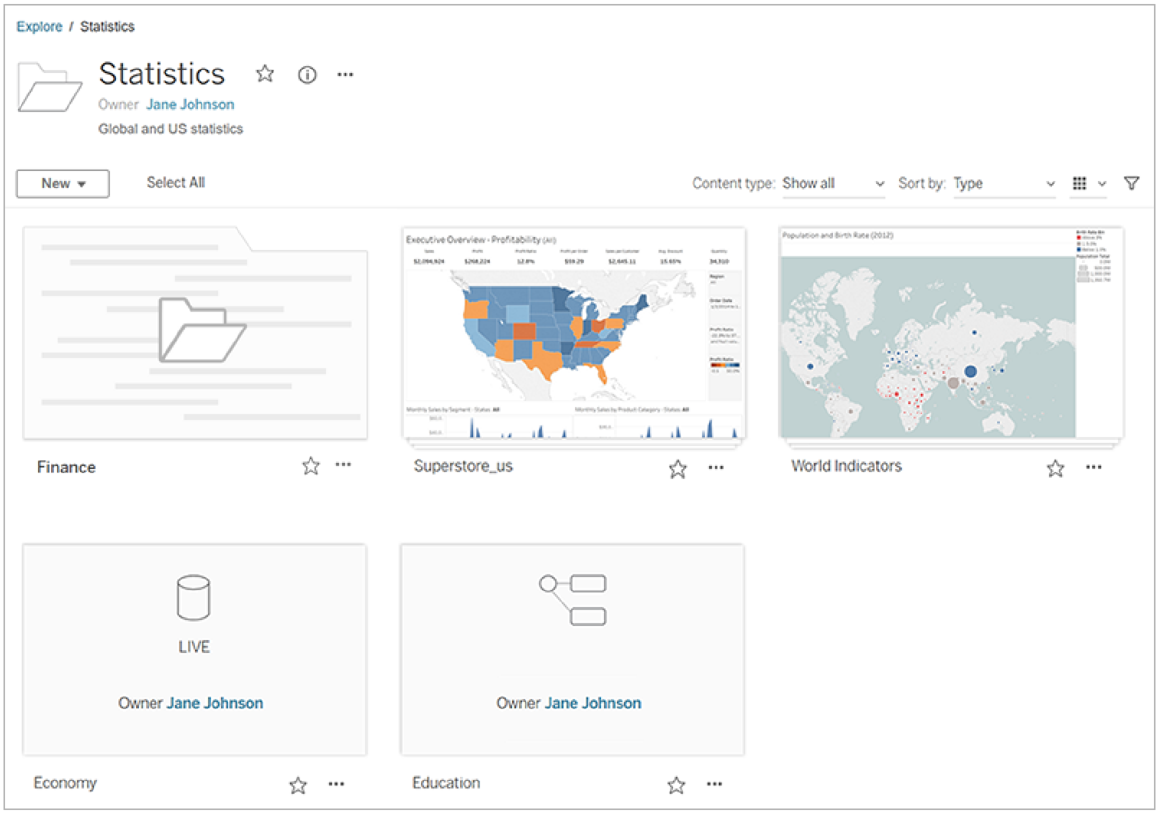
Web authoring improvements

- Add a stored procedure with parameters when creating a data source.
- See the status bar in web authoring to find information about your view, including selected marks compared to total marks, rows and columns, and aggregations. For more information on the status bar, see Status Bar Information in the Tableau User Help.
- Change aggregation of a field using the drop field menu. Right-click+drag (on macOS, left-click+Option+drag) a field on any card or shelf and select an aggregation type. This drops the field onto the card or shelf with the aggregation selected.
- Create, edit, and remove parameters.

## Added in February 2019

Improved content browsing

You have a new way to browse shared content. When you open a project, you will be able to see all the content that project contains—workbooks, views, data sources, flows, and nested projects—in a single grid or list. Locating content is easier, because you no longer need to navigate separate pages for different content types. For more information, see Tour Your Tableau Site.



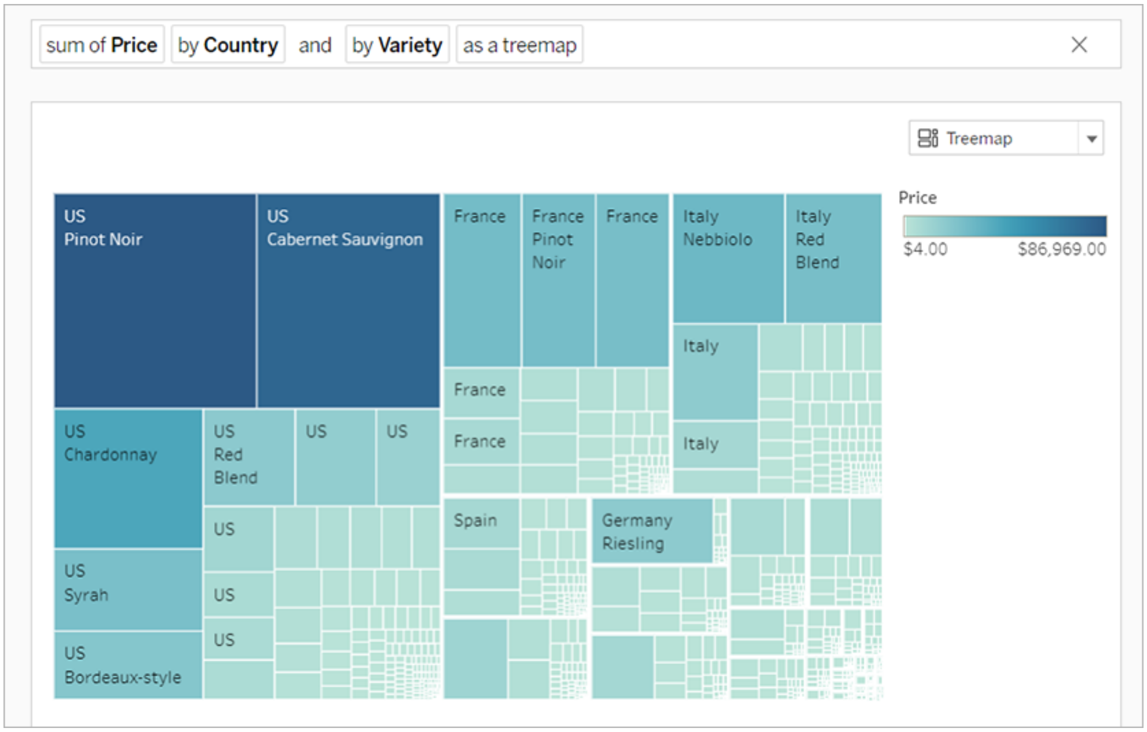

Ask Data to automatically create a viz

Ask Data introduces an entirely new way to interact with your data, letting you type a question and instantly get a response right in Tableau. Answers come in the form of automatic data visualizations, with no need to manually drag-and-drop fields or understand the nuances of your data's structure.

Ask Data lets you ask sophisticated questions naturally, with support for key analytical concepts like time series and spatial analysis, and an understanding of conversational phrases like "last year", "earliest", and "most popular".

Ask Data is available for all user roles with direct access to data sources: Creators, Explorers, and Interactors.

For more information, see Automatically Build Views with Ask Data in Tableau User Help.




Vector tile background maps

Maps created on or published to Tableau Cloud or Tableau Public now use vector tiles for quicker geographic data exploring. Maps now appear sharper and smoother when you pan and zoom, and labels and icons dynamically resize or reshape to fit your view. The new vector tile maps replace the underlying technology that powers Tableau background maps for a smoother and crisper experience. The background cartography for Tableau maps has also been updated.


New cloud connectors for web authoring

Use the Box, Dropbox, Google Drive, Google BigQuery, and OneDrive connectors to connect Tableau Cloud or Tableau Server to your data. For more information, see Creators: Connect to Data on the Web.

Project card images

Project card images will no longer appear on the project card unless they are added as the last item in the project description and encapsulated with **!** (exclamation marks). For more information, see Add a Project Image.

Suspended subscription notifications

When you subscribe to a view or a workbook, you receive an email snapshot of that content at regular intervals. Now, you'll receive an email notification if something caused your subscription to fail, with links to resume or delete the failing alert. For more information, see Create a Subscription to a View or Workbook.

See new demographic data in Tableau Cloud and Tableau Public

Tableau Cloud and Tableau Public have a new, different source of demographic data than Tableau Desktop. If your map uses a demographic data layer in Tableau Desktop, you may notice some slight differences when that map is published to Tableau Cloud or Tableau Public, including the time period and value breaks in a legend. In addition, maps that use the "Block Group" Data Layer option in Tableau Desktop will be automatically updated to "Census Tract" when published to Tableau Cloud or Tableau Public. Six demographic data layers that appear in Tableau Desktop will be absent when maps are published to Tableau Cloud or Tableau Public:

- Population growth projections
- Household growth projections
- Housing units growth projections
- Effective Buying Income (median)
- Year structure built (median)
- Length of Residence (average in years)

Publishing maps from Tableau Desktop to Tableau Server will not result in any discrepancies.

Filter improvements

Use Ctrl-click (control-click on a Mac) to select multiple values in a multi-value filter in the view. The selected values can be non-contiguous and are indicated with a gray highlight. When the values are selected, you can then click any one of their check boxes to clear or choose the values at the same time.

Web authoring enhancements

- New cloud connectors for web authoring: Use the Box, Dropbox, Google Drive, Google BigQuery, and OneDrive connectors to connect Tableau Cloud or Tableau Server to your data.

- Data improvements: Authors connecting to a new data source in Tableau Cloud or Tableau Server can now Run Initial SQL, connect to a custom SQL query, and add a join calculation to resolve mismatches between fields in a join.

- To better distinguish between dashboard items, you can now rename them using the **Item hierarchy** area of the Layout pane or the drop-down menu for each object on the canvas.
- After publishing to the web, click **Preview device layouts** in the browser to see how your designs look on desktop computers, tablets, and phones.

> For related information on new features, also see What's New in Tableau Desktop and Web Authoring Help.

Review and monitor Tableau Bridge extract refresh tasks using admin views

Review and monitor extract refresh tasks performed by Tableau Bridge using admin views. For more information, see Bridge Extracts.

Configure a timeout limit for extract refreshes in Tableau Bridge

To ensure that long running refresh tasks don't prevent other extracts from refreshing, you can enforce a timeout limit for refresh tasks performed by a Tableau Bridge client. For more information, see Change the Bridge Client Settings.

Find the Tableau Bridge client version number on Tableau Cloud

As a site admin, you can check Tableau Cloud for the version numbers of the Tableau Bridge clients associated with your site.

Client Status

| Computer Name | Owner | Mode | Type | Extracts | Status | Version | Last Connected | |
|---|---|---|---|---|---|---|---|---|
| BRIDGE | One | Service | Extract and Live | 0 | Connected | 20182.18.0807.1945 | Dec 14, 2018, 10:43 AM | Delete |
| liu | One | Application | Extract | 0 | Connected | 20191.18.0127.1912 | Dec 14, 2018, 10:45 AM | Delete |
| liu1 | One | Service | Extract | 0 | Connected | 20183.18.1127.1912 | Dec 14, 2018, 10:40 AM | Delete |

**Note:** If the version number for a client is missing, log on to the computer where the client is installed and sign in to Tableau Cloud from the client. If the version number doesn't display after that, consider upgrading to the latest client.

Help Design

Updates have been made to help you navigate our content, including a new right-hand menu to quickly scan and select different topics on a page.

## Added in October 2018

Web authoring enhancements

- Build density maps and charts. Use the density mark to create maps and charts that can help you identify "hot spots" in your data.
- Add image objects to your dashboards. Easily adjust your image, add a target URL, and add alt-text to improve the accessibility of your dashboard.
- Add navigation buttons to dashboards. Buttons can help users navigate to another dashboard, a sheet, or a story. Optionally customize the button with an image of your own, or add guiding tooltip text.
- Make worksheets transparent by setting the worksheet background color to **None**.
- Select **Duplicate as Crosstab** to insert a new worksheet into your workbook and populate the sheet with a cross-tab view of the data from the original worksheet.
- Create, move, and resize point, mark, and area annotations.

For related information on new features, also see What's New in Tableau Desktop and Web Authoring Help.

Product help search, navigation, and layout improvements

Search results within the product help have been expanded to include results for all Tableau products and help articles. Help layout and navigation, such as table of contents placement and breadcrumbs, have been updated to create a more consistent cross-product help experience.

Secure extract data at the row level

Secure your extract data at the row level using existing approaches for implementing row-level security in Tableau. For more information, see Restrict Access at the Data Row Level in the Tableau User Help.

## Added in July 2018

Tableau Cloud migrated to Linux servers. For more information, see Tableau Cloud Pod Migrations on the Tableau website.

Changes to Tableau Help

Search results within the product help have been expanded to include results for all Tableau products and help articles. Help layout and navigation, such as table of contents placement and breadcrumbs, have been updated to create a more consistent cross-product help experience.

Install Tableau Bridge separately from Tableau Desktop

Beginning with the 2018.2 release, you can install Tableau Bridge separately from Tableau Desktop. For more information about Tableau Bridge requirements, compatibility with previous version of Tableau Desktop, and Tableau Bridge client installation, see Install Tableau Bridge.

No auto-restart for Tableau Bridge

The standalone Tableau Bridge client does not use an auto-restart interval to restart itself automatically. For more information about the auto-restart interval required by previous versions of Tableau Bridge, see Tableau Bridge Frequently Asked Questions in the Tableau Knowledge Base.

**Note:** If you upgrade from Tableau Bridge 2018.1 and earlier to Tableau Bridge 2018.2, the auto-restart interval that remains in the configuration file is ignored.

Font support in Tableau Cloud

Tableau Cloud includes the following "web safe" fonts: Arial, Courier New, Georgia, Tableau, Times New Roman, Trebuchet MS, and Verdana.

If a visualization uses a font that is not available on Tableau Cloud, Tableau Cloud displays the visualization using a default system font instead. For more information, see Fonts Not Displaying as Expected After Publishing knowledge base article on the Tableau website.

Validate live connections in Tableau Bridge using Application mode

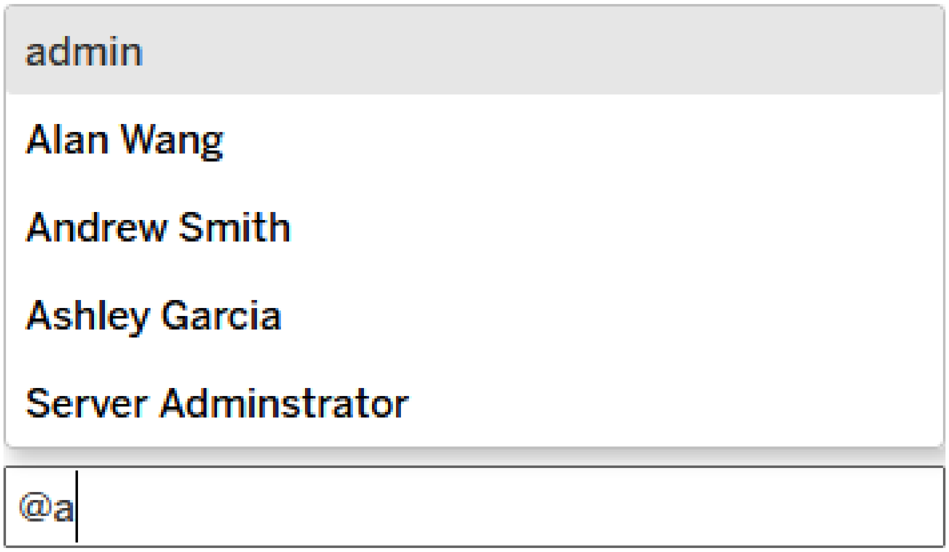
You can now quickly validate live connections in Tableau Bridge using **Application** mode. This means you can also choose to run live queries only when you are logged on to Windows if the site administrator has enabled the option. For more information, see How Tableau Bridge Works.

Manage dashboard extensions in Tableau Cloud

Dashboard extensions are web applications that provide users new ways to interact with data from other applications directly in Tableau. You can control the dashboard extensions that you allow to run in Tableau and can manage the extension's access to data. To learn more about controlling extensions, see Manage Dashboard and Viz Extensions in Tableau Cloud.

Include colleagues on data conversations with @mentions

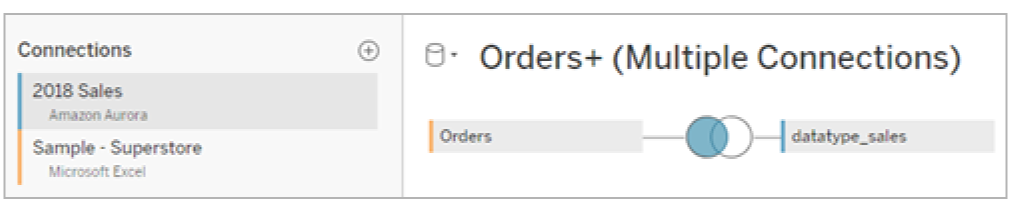
To engage people in a conversation about compelling data you find in a view, @mention them in comments. As you begin to type a name, matching people with Tableau accounts at your organization appear in a list you can choose from. For more information, see Comment on Views in Tableau User Help.




Site administrators can disable @mentions in the General section of site settings.

Web authoring enhancements

- Enhance dashboard functionality by connecting to external applications with dashboard extensions. See Use Dashboard Extensions in Tableau User Help.
- Align dashboard items with a visual grid. See Size and Lay Out Your Dashboard in Tableau User Help.
- Use keyboard shortcuts to quickly create and edit views on the web. See Keyboard Shortcuts in Tableau User Help.
- Create multi-connection data sources and join data from different databases (cross-database joins). See Join Your Data in Tableau User Help.

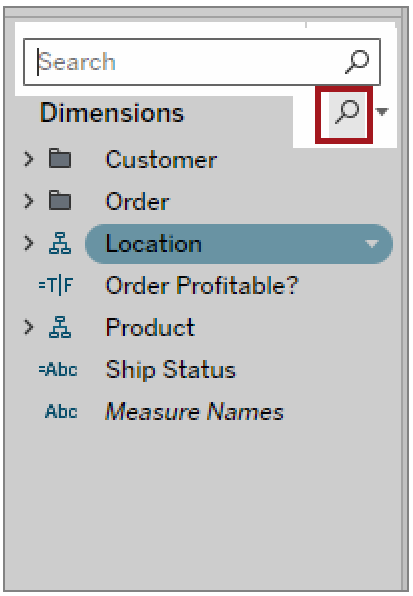


- Union data from the same data connection on the web. See Union Your Data in Tableau User Help.

- When working with file-based data sources, you can pivot data from crosstab format into columnar format. See Pivot Data from Columns to Rows in Tableau User Help.

- Copy selected values in your data grid by pressing Ctrl+C (Windows) or (Command+C) (macOS). Alternatively, to copy selected values in the metadata grid, right-click, and select **Copy**.

- Find fields in the **Data** pane using schema search.

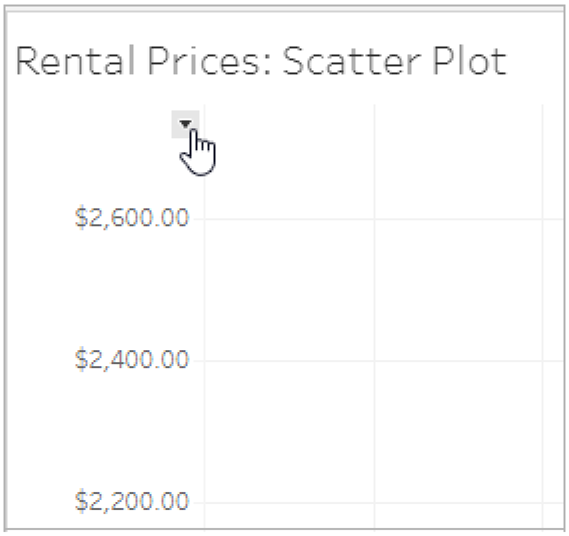


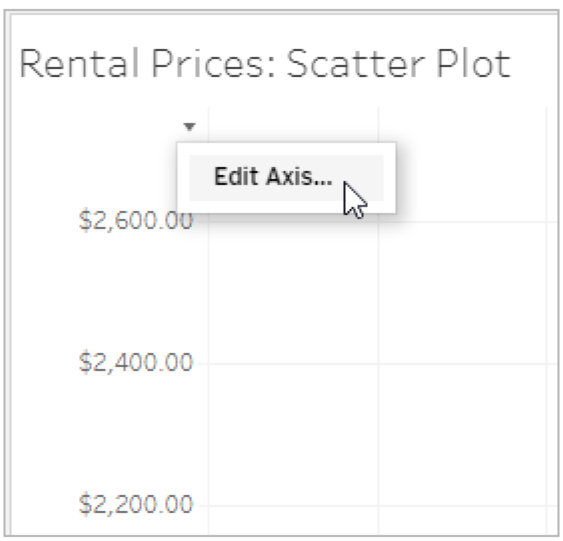

- Better control over sorting. Use nested sort to sort dimension values within the context of each pane. You no longer need to create calculated fields or combine dimensions. For more information, see Sort Data in a Visualization in Tableau User Help.

  Also, you can now access the **Sort** dialog box by right-clicking a dimension field on the Rows or Columns shelves in a view.

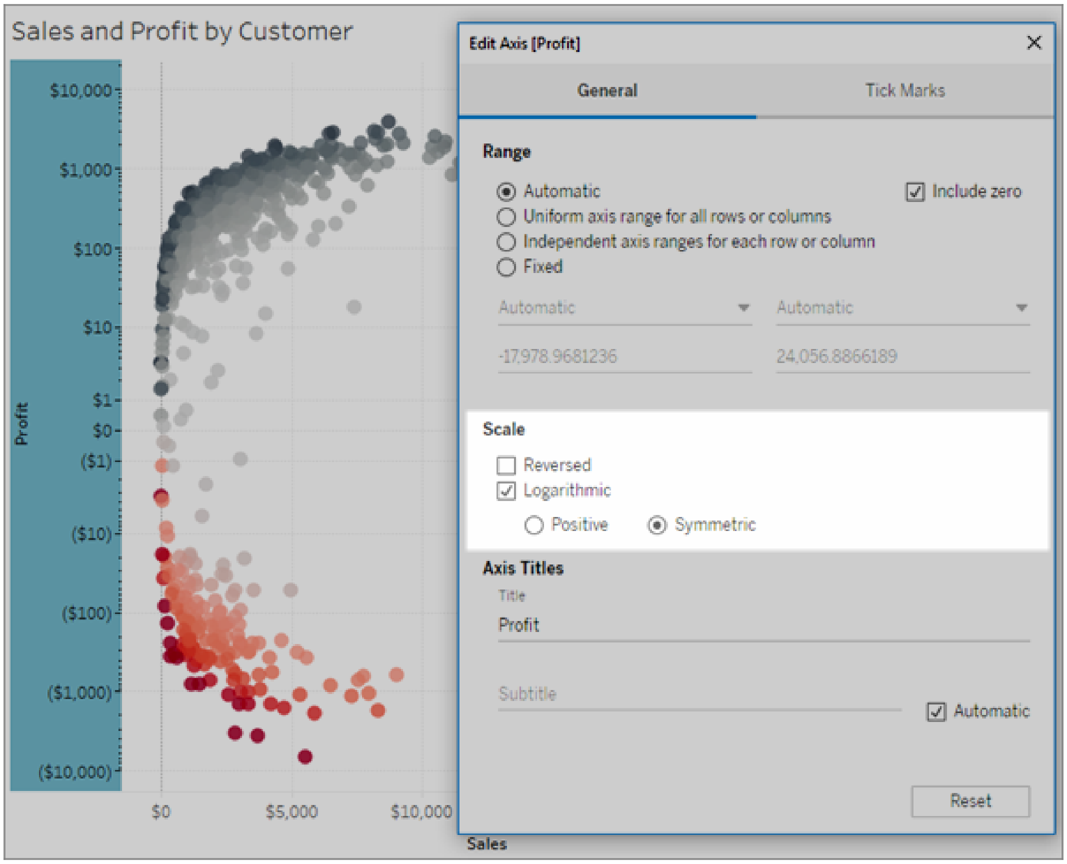
- If you've changed a view (for example, by adjusting filters), you can now create data alerts without first saving a custom view.

- You now have two ways to open the **Edit Axis** dialog box. Hover near the top of the axis (vertical axis) or to the right (horizontal axis) and click the drop-down arrow that appears. Or, double-click the axis.

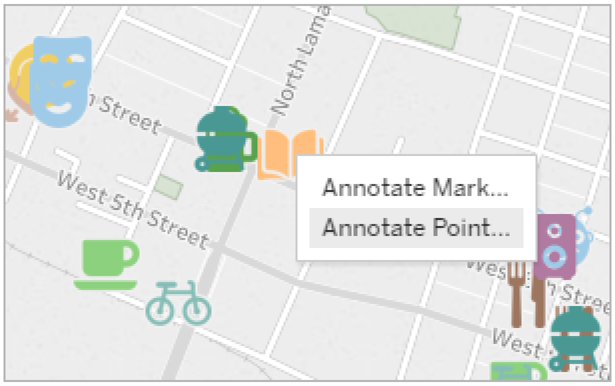


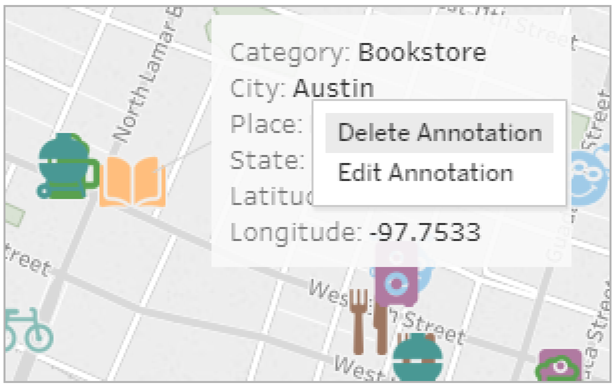




- When you select **Logarithmic** scale for an axis, you now have the option to specify **Symmetric** to display data that contains 0 or negative values on a log scale axis. For details, see Edit Axes in Tableau User Help.




- Create and delete annotations by right-clicking the view (in a worksheet or dashboard), and then selecting point or mark annotation. Right-click the annotation again to edit or remove the annotation.




Materialize calculations in extracts already published to Tableau Cloud

If you need to retroactively materialize calculations in extracts that have already been published to Tableau Cloud, you can use tabcmd to refresh the published extract with the `--addcalculations` option. For more information about materializing calculations in extracts, see Materialize Calculations in Your Extracts in the Tableau User Help. For more information about the tabcmd option, see refreshextracts workbook-name or datasource-name.

## Added in April 2018

New user-based term licenses are now available

Tableau now offers different types of user-based term licenses that grant a range of web authoring and other capabilities at various price points. This gives organizations more flexibility to fit licenses to the data analysis and visualization needs of different users. To learn more, see User-based licenses, or to see the capabilities of each license, see Tableau Pricing.

Quickly analyze cloud-based data with Dashboard Starters

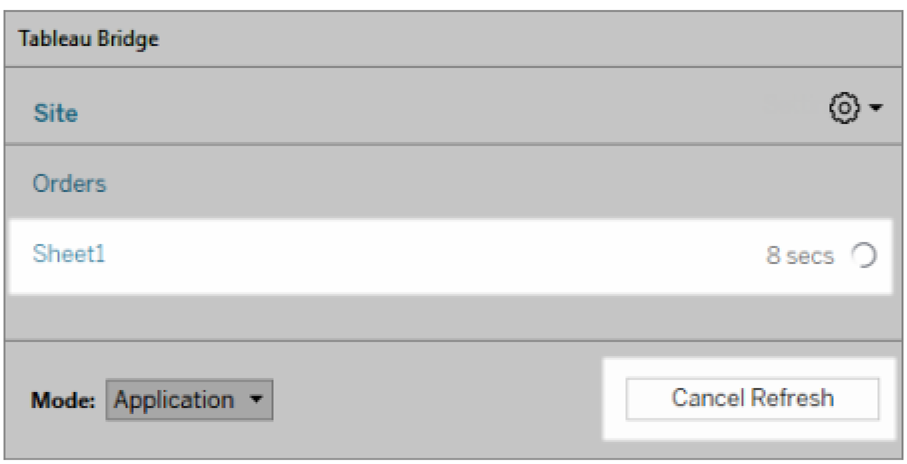
Dashboard Starters help you quickly author and analyze data from cloud-based systems like Salesforce, ServiceNow, Oracle Eloqua, and Marketo. Simply create a new workbook and choose from several beautiful, informative designs that are tailor-made for key business metrics. For more information, see Use Accelerators to Quickly Visualize Data

Configure additional Tableau Bridge clients to load balance live connections

Site administrators can configure additional Tableau Bridge clients on different computers to load balance live queries. For more information, see Allow Publishers to Maintain Live Connections to On-Premises Data.

Cancel a scheduled extract refresh that's in progress using Tableau Bridge

There may be situations where you need to cancel an in-progress extract refresh. You can cancel an in-progress extract refresh if you have configured the extract to refresh on a schedule using Tableau Bridge. For more information, see Create a Schedule for a Tableau Bridge Data Source.



Connect to data on the web

With a Creator user license, you can connect to data directly in your browser. Upload Excel or text-based data sources, connect to data housed in a cloud database or on a server in your enterprise, or connect to published data saved to your site. For more information, see Creators: Connect to data on the web.

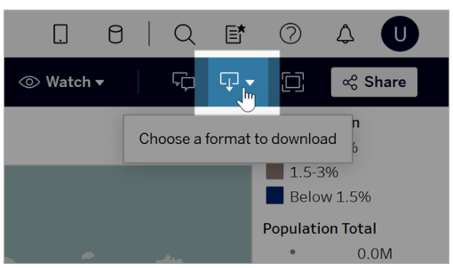
Prepare your data on the web

With a Creator user license, use the Data Sources tab to prepare your data for analysis. Create joins, add new data sources, clean your data using the Data Interpreter, and more. For more information, see Creators: Prepare Data on the Web.

Add an accessible toolbar to an embedded view

Authors can enable an accessible toolbar so that all users can add comments, download the view, or share it with others. For more information, see Publish and embed the view in Author Views for Accessibility.

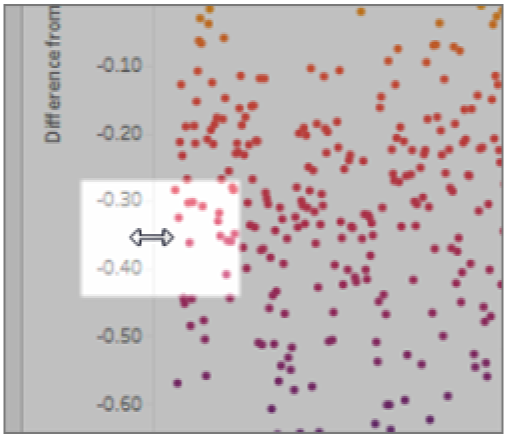
Download your workbook in an earlier version of Tableau

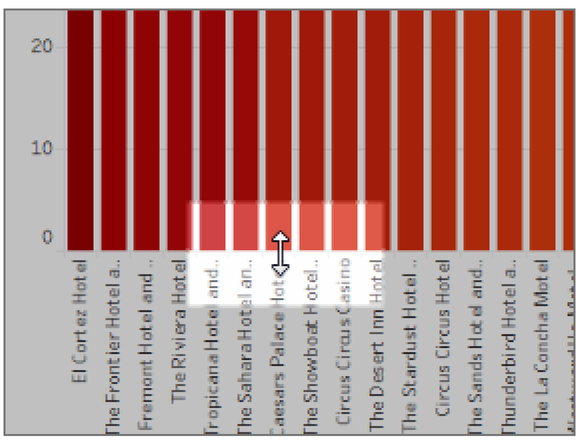



You may need to download your workbook to a different version of Tableau, for example, if the workbook needs to be opened in an earlier version of Tableau Desktop. You have the option of downloading your workbook in its current version, or downgrading it to an earlier version. For more information about version compatibility, see Make Workbooks Compatible Between Versions.

Web Authoring Enhancements

- When editing a view on the web, you can resize the width of row headers and the height of column headers.




- Show Me is now available for dashboards.
- Double-click an annotation to edit its text.
- Hide or show a Viz in Tooltip worksheet. In the target worksheet that is the Viz in Tooltip, click **Hide**. To show the Viz in Tooltip worksheet again, in the source worksheet, click **Unhide All Sheets**.
- Filter hierarchical data in views by using the **All Values in Hierarchy** filter option.

- Change the Line mark type to a step line or a jump line by clicking the Path property in the Marks card.
- Double-click an axis to edit axis settings.

## Added in February 2018

Streamline discussion threads by deleting comments

If a comment is unnecessary or inaccurate, you can quickly delete it. Just click the **X** in the upper-right corner. For more information, see Comment on Views in Tableau User Help.

## Added in January 2018

Tableau Cloud servers were upgraded to version 10.5.

Recommended data sources

Recommended data sources show Tableau Desktop users relevant data sources published to Tableau Server and Tableau Cloud. These recommendations are based on published data sources used by other users in your organization with similar usage behavior as the current user.

To keep the recommendations accurate and up to date, the server checks for the following each day:

- New content - for example, new or updated data sources.
- New usage information - for example, Laura Rodriquez used the Food Catering data source and Henry Wilson used the Monthly Sales data source.

For information on recommended data sources, see Use Certified and Recommended Data Sources and Tables in Tableau User Help.

Nested projects

You can now create project hierarchies when you want to segment content into sub-sections within a larger area. For example, you might create a project for each department. In each of those top-level projects, you can separate content based on how the audience uses it, such as connecting to certified data versus in-progress collaboration. For more information, see the following articles:

- Use Projects to Manage Content Access
- **Navigate projects** in the article Navigate Tableau on the Web

Extracts use the new .hyper format

When you create an extract, it uses the new .hyper format. Extracts in this new format take advantage of the improved data engine, which supports the same analytical and query performance as the data engine before it, but for even larger extracts. Similarly, when you perform an extract task on a .tde extract, the extract is upgraded to a .hyper extract. For more information, see Extract Upgrade to .hyper Format.

Changes to the way values are computed

To improve data source efficiency and scalability, and produce results that are consistent with commercial databases, values in your data source can be computed differently in version 10.5. In some cases, these changes can cause differences with the values and marks in your view between version 10.4 (and earlier) and version 10.5 (and later). This applies to extract data sources, and can apply to multi-connection data sources, data sources that use live connections to file-based data, data sources that connect to Google Sheets data, cloud-based data sources, extract-only data sources, and WDC data sources. For more information, see Changes to values and marks in the view in the Tableau User Help.

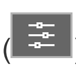
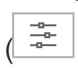
Desktop operating system requirements (64-bit replaces 32-bit)

Starting with version 10.5, Tableau Desktop, Tableau Reader, and Tableau Public (desktop) run only on 64-bit operating systems. Version 10.4 is the last version of Tableau Desktop, Tableau Reader, and Tableau Public to support 32-bit Windows operating systems.

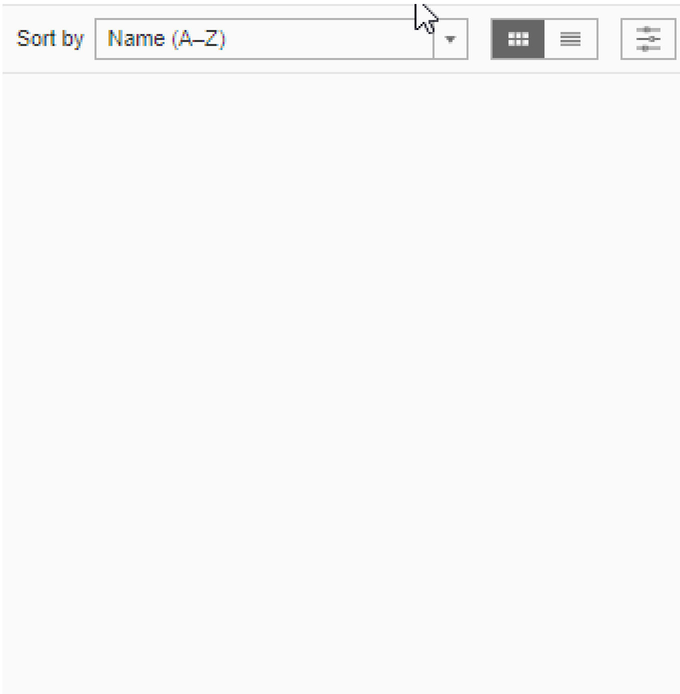
## New in Web Authoring

- Add text objects to dashboards and edit them.
- Edit worksheet and dashboard titles. Double-click the title to open the **Edit Title** dialog box.
- Edit trend lines and view a description of the trend model. To view the trend model, hover over any part of the trend line. To edit a trend line on the web, click a trend line and hold the cursor in place, and then click the **Edit** menu.
- Trend lines now include a Power option.
- Create hierarchies by dragging one dimension onto another in the Data pane.
- Set the default color property for a field.
- For quantitative color legends, advanced settings are available (dates not included).
- Edit axes on the web. To open the Edit Axis dialog box on the web, double-click an axis in the view. Options available from the Edit Axis dialog box include **Synchronize dual axes**, clearing the axis range (**Reset**), and editing tick marks. You can also enable or disable **Dual axis** in a field context menu (right-click a measure field on Rows or Columns shelf).

## Filtered search hidden by default

Filtered search options are now located on the right side of pages, and are hidden by default. The toggle is a dark icon () when the Filters pane is open and a light icon () when the Filters pane is closed. For details on searching, see Search Content.

To use filtered search, click .




# Added in 2017

## Added in September 2017

Tableau Cloud servers were upgraded to version 10.4.

Data-driven alerts

When data reaches important thresholds for your business, data-driven alerts automatically send email notifications to key people users specify. For information on how to create and manage these alerts, see Send Data-Driven Alerts in Tableau User Help.

Data source certification

Certification offers a way to promote data sources through curation. Site administrators and project leaders can certify data sources that meet your organization’s security and compliance standards, or any other standards you define. For more information, see User Certification to Help Users Find Trusted Data.

Tableau Bridge support for live connections

Live query functionality in Tableau Bridge can now be enabled by site administrators without requesting access from Tableau. Use Tableau Bridge to maintain live connections to on-premises relational data, and to perform scheduled extract refreshes. For more information, see Use Tableau Bridge to Expand Data Freshness Options.

Enhanced commenting on views

Commenting has been completely redesigned to inspire conversations about data discoveries. The new Comments pane appears to the right of views, rather than at the bottom, so you can see the discussion and the data at the same time. Profile images automatically appear too, helping you quickly identify other users. To share filtered views with them, add interactive snapshots along with your comments to highlight the data you're describing.

Any comments you add in a desktop browser also appear in Tableau Mobile, and vice versa, so you can easily communicate with colleagues on the go. Comments remain with a view even if you revise the containing workbook (as long as the view name remains the same). For more information, see Comment on Views.

Learn who has seen a view

If you own a view, you can quickly find out who at your organization has seen it. At the top of a main site page, click **Views**. Then hover over the specific view you're interested in, and select **Who Has Seen This View?** from the menu at upper-right.

WCAG-conformant drop-down filters in embedded views

Single Value (drop-down) and Multiple Values (drop-down) filters are now WCAG-conformant when accessed in embedded views. For more information, see Build Data Views for Accessibility and Author Views for Accessibility.

New to Web Authoring

Precise dashboard spacing, with border and background color controls

If you previously used blank objects to refine dashboard layouts, you'll really appreciate the new spacing controls. Padding lets you precisely position items on dashboard, while borders and background colors let you visually highlight them. For more details, see Add padding, borders, and background colors around items.

Turn on the View Toolbar on the web

In prior releases, when authoring on the web, you could only see and use the View Toolbar when working with map views. Now you can turn on the View Toolbar for any view or dashboard in your workbook in web authoring. From the top menu, select **Worksheet** > **Show View Toolbar** and select an option.

Edit groups

Starting with Tableau version 10.4, you can edit groups. To edit a group, in the Data pane, right-click a group field and select **Edit Group**. In the Edit Group dialog box that opens, you can add or remove members from an existing group, as well as create new groups in the group field. You can also choose to Include an Other group. For more information, see Group Your Data.

Create aliases

Starting with Tableau version 10.4, you can create aliases for members in a dimension so that their labels appear differently in the view. To create aliases for a field, in the **Data** pane, right-click a dimension and select **Aliases**. In the Edit Aliases dialog box, under **Value (Alias)**, select a member and enter a new name. For more information, see Create Aliases to Rename Members in the View.

Format lines

When you are authoring on the web, you can quickly change all the lines in your workbook. Select **Format** > **Workbook**, then expand the **Lines** section on the **Format Workbook** and make your selections. For more information, see Format at the Workbook Level.

## Added in July 2017

User-specific time zones for subscription schedules

Subscription schedules were previously limited to one time zone, but now users can choose any time zone. At the top of the browser window, click your name, and select **My Account Settings**. Then, under **Subscription time zone**, select the time zone for schedules you create.

## Added in June 2017

Default task priority for all extract refreshes

To ensure fair distribution of processing for all Tableau Cloud customers, we're removing the ability for site administrators to set task priority for scheduled extract refreshes. All previously set priorities will return to the default value.

## Added in May 2017

Tableau Cloud servers were upgraded to version 10.3.

Tableau Cloud sync client evolves into Tableau Bridge

**Limited release, by request.** The Tableau Online sync client has gained some new functionality and a new name to go with it. Use Tableau Bridge to maintain live connections to on-premises relational data. Bridge also takes on all of the functionality that was provided in the sync client for scheduling extract refreshes. Your existing schedules will continue to run as previously defined in the sync client.

Live query functionality is currently available to site administrators by request only. For more information, see Use Tableau Bridge to Expand Data Freshness Options.

Encrypted SAML assertions from Identity Providers

Tableau Cloud now supports encrypted SAML assertions from Identity Providers. To learn more about configuring SAML single-sign-on, see Enable SAML Authentication on a Site.

Site access for support users

Tableau Cloud administrators can allow approved Tableau support technicians to access their Tableau Cloud site to help troubleshoot a customer support case. To learn more, see Enable Support Access.

Help Redesign

Starting with version 10.3, Tableau Desktop Help is now known as Tableau Help. Tableau Help contains all help topics related to analyzing and consuming data in Tableau Desktop, Tableau Server, and Tableau Cloud. This help is for people who create workbooks or data sources and publish them, and for people who want to see, interact with, and share views in Tableau.

We welcome your feedback on this change, as well as any feedback or ideas you might have on how to make our content better. Please use the feedback bar on the top of any page ("Was this page helpful?") to open the comment field and submit your feedback.

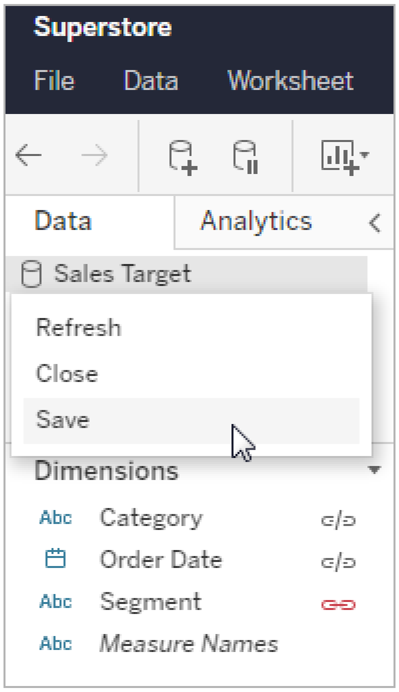
Using Tableau on the Web provides links to the topics that used to be located in Tableau Server and Tableau Cloud help.

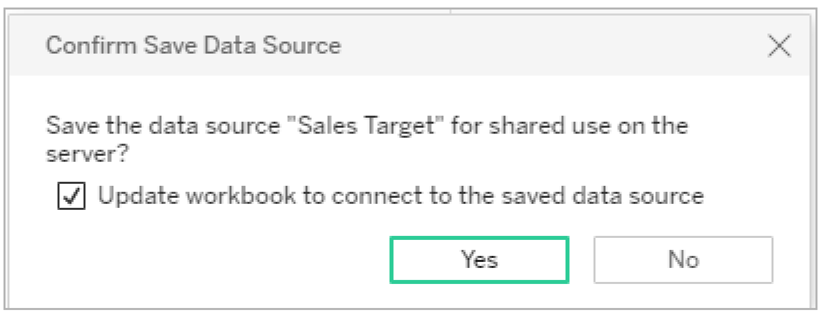
New to Web Authoring

Web authoring topics for Tableau Server and Tableau Cloud are now located in Tableau Help, starting with version 10.3.

Save data source

You now have the option to save a data source that is embedded with a published workbook, as a separate, published data source on Tableau Server and Tableau Cloud that other users can connect to. When you save the data source, you can choose to update the workbook to connect to the newly saved data source.

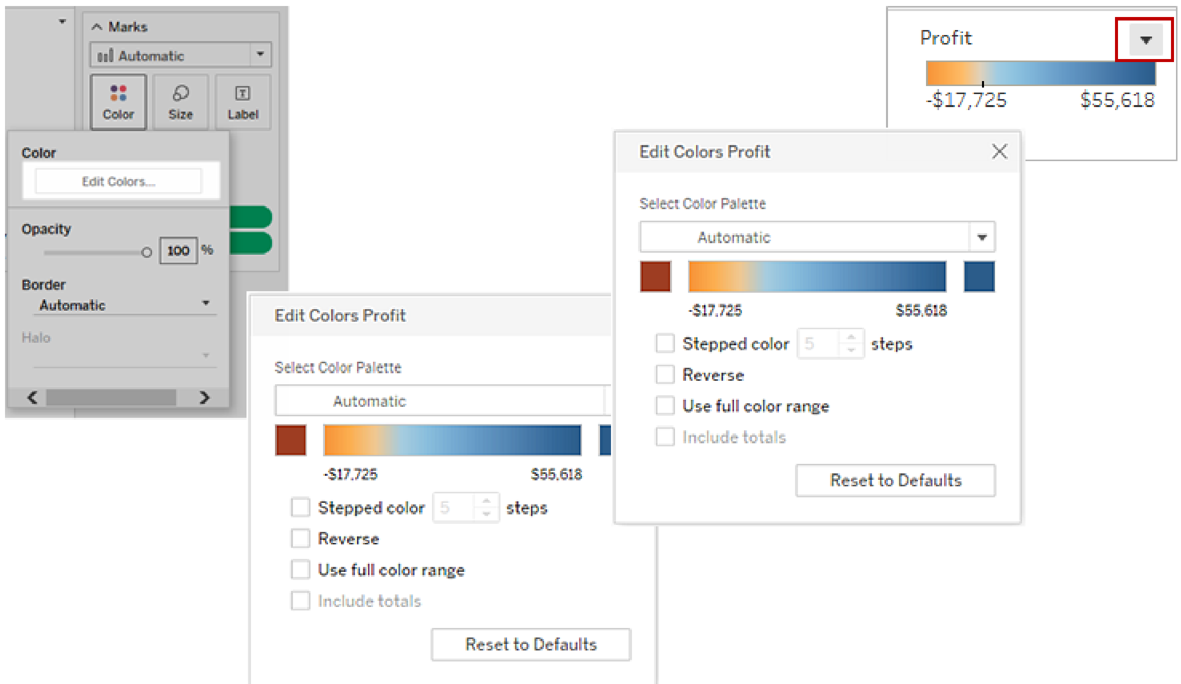


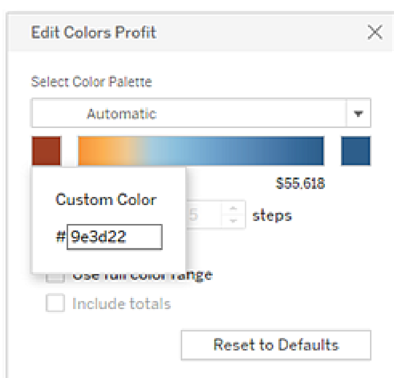

Edit quantitative color legends

You can now edit the color palette for continuous color legends in web authoring. You can open the Edit Colors dialog box from the Marks card or by clicking the drop-down arrow on the legend.

**Marks card:** **Legend:**



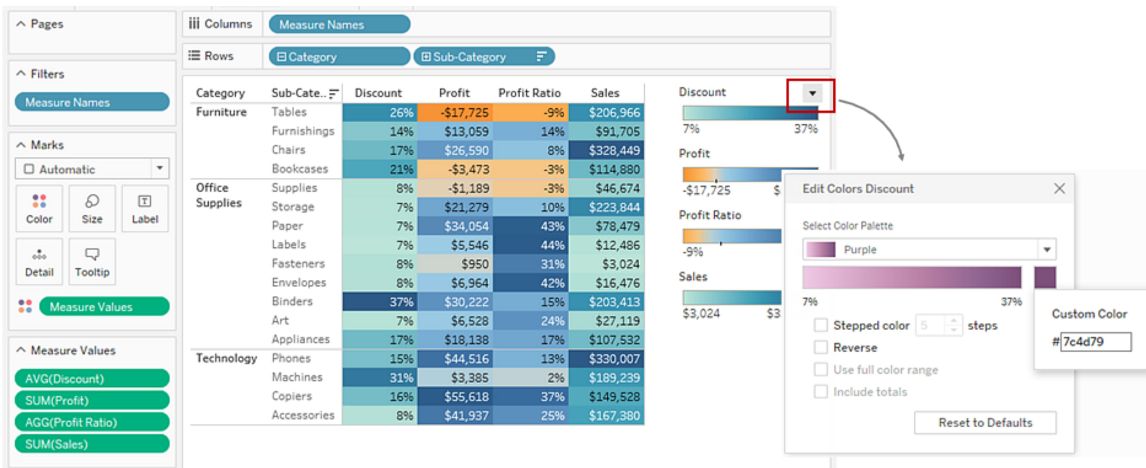

You can also set a custom color for the start and end colors by entering the Hex value.




Edit colors on separated legends

When you create separate color legends for measures in your view, you are no longer restricted to using only the default color palette or the color palette assigned to each color legend when the view was published from Tableau Desktop.

In web authoring mode, you can now select different color palettes for each legend. Click the drop-down arrow on the legend to open the Edit Colors dialog box and then select the color palette. You can also set custom start and end colors using Hex values.




Customize how people interact with your map

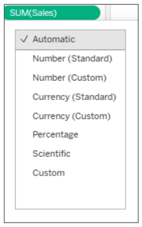
In web authoring mode, you can now customize how your audience interacts with your map view in the following ways using the **Map Options** dialog box:

- Show a map scale
- Hide map search
- Hide the view toolbar
- Turn off pan and zoom

For more information, see Customize How People Interact with your Map.

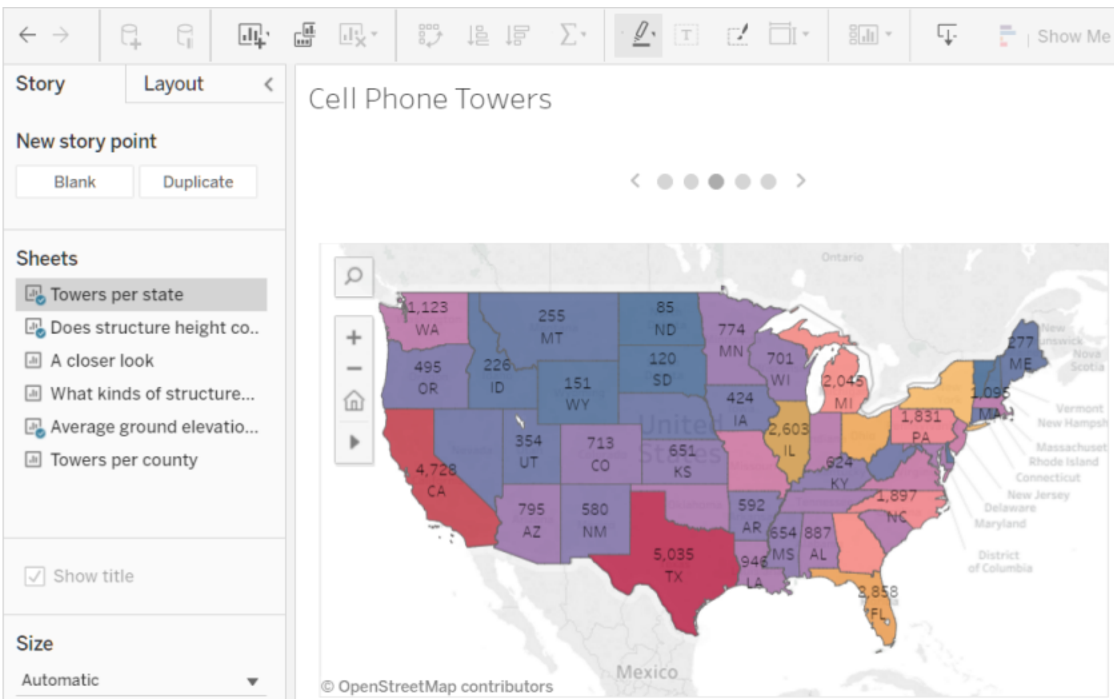
Format numbers on the web

You can now specify basic number formatting for measures in the view on Tableau Server and Tableau Cloud. For more information, see Format Numbers and Null Values on Tableau Server or Tableau Cloud.




Create stories

In web authoring, you can now create a story to tell a data narrative, provide context, demonstrate how decisions relate to outcomes, or to simply make a compelling case. See Create a Story for details.

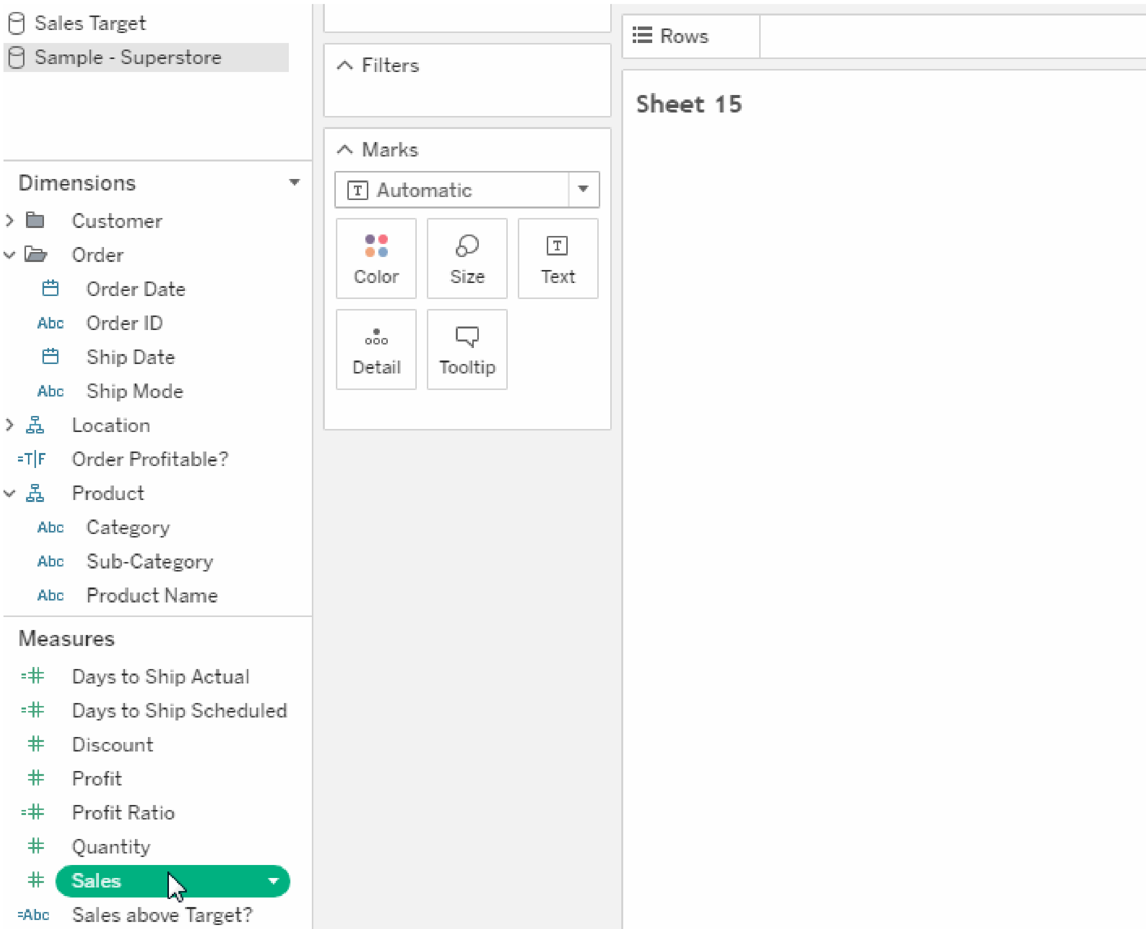



Create and edit bins

Create bins from continuous measures and edit them in Tableau Server and Tableau Cloud, similar to how you do it in Tableau Desktop. For details, see Create Bins from a Continuous Measure.

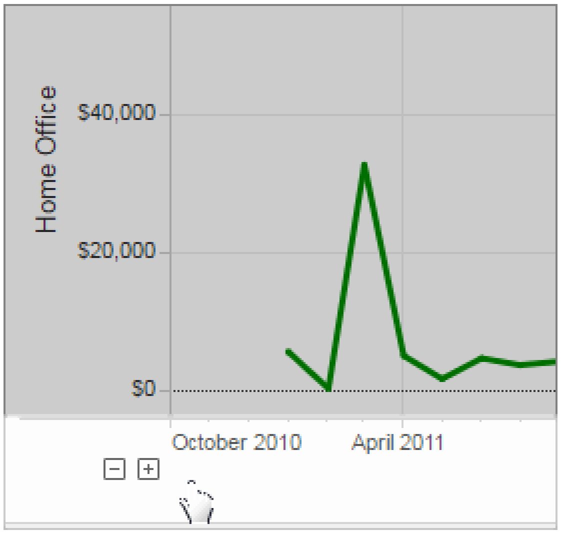
Drag fields to Show Me in the view

Select and drag dimensions and measures of interest to the view area. A "Show Me" view is automatically created. You can then click other Show Me options to try different view types.




Drill up and down a continuous hierarchy in the view

In a view with a continuous hierarchy, hover near the headers on a continuous axis to display the + and - controls. Click to drill down or up.



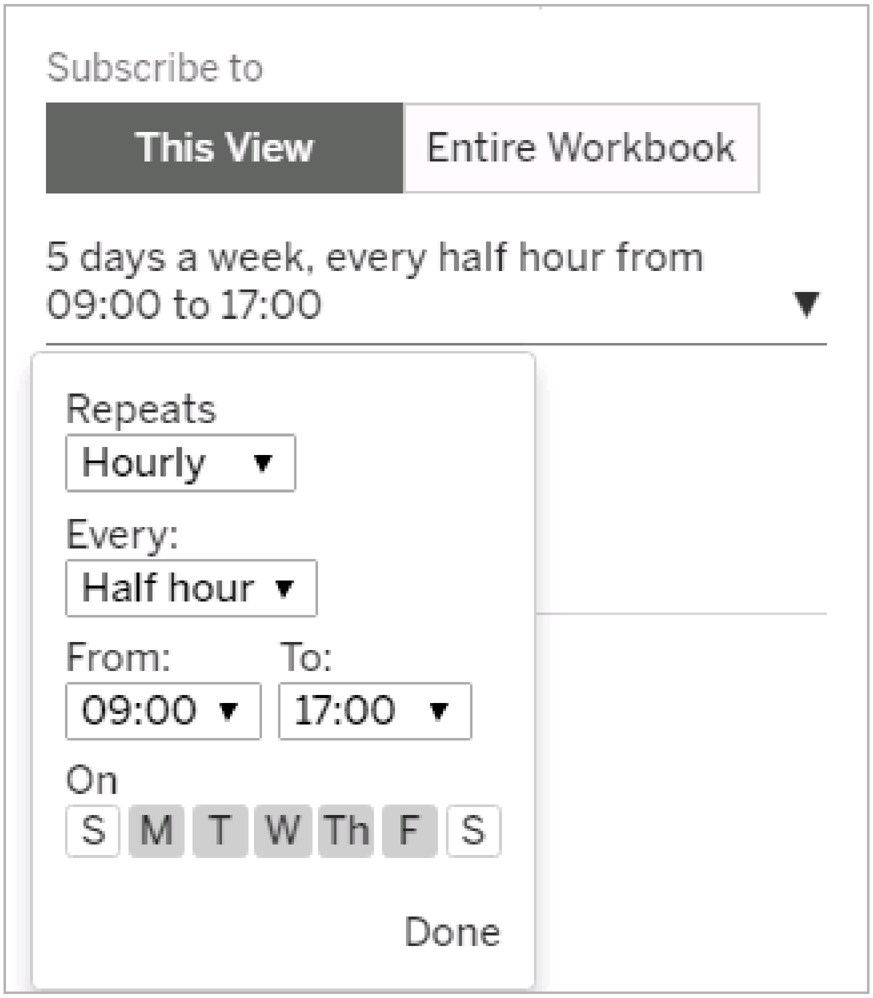

## Added in March 2017

Google authentication

Google authentication gives you the convenience of using your Google ID and password with Tableau Cloud, thus reducing the number of sign-in prompts when accessing Tableau Cloud. Your site administrator can manage these credentials in a central location so that you no longer need to reset multiple passwords. For more information about Google authentication, see Authentication.

Custom schedules for subscriptions

Subscription schedules used to be limited to a set of standard options, but now you can receive emails on whatever schedule works best for you. To learn more, see Subscribe to Views.




### Added in February 2017

Tableau Cloud servers were upgraded to version 10.2.

The following items in What's New in Tableau Server also apply to Tableau Cloud.

- Support for accessibility compliance

  The functionality referred to in this item is for Tableau Desktop authors who want to create accessible views that they publish to Tableau Cloud or Tableau Server.

- Web authoring enhancements

## Added in 2016

### Added in November 2016

Tableau Cloud servers were upgraded to version 10.1.

Web authoring enhancements

- Show or hide headers in a view.
- View read-only device layouts for dashboards.

Full-screen views

To expand a view, click **Full Screen** at the far right of the toolbar. To return to the view to its previous size, press Esc.


Send subscriptions for high-priority alerts

If you've configured a view to contain data only when high-priority information exists, select the new subscription option, **Don't send if view is empty**. For more information, see Subscribe to Views and Manage Your Subscription Settings.

New location for downloading tabcmd

The tabcmd installer is now available from the Tableau Server Releases page on the Tableau website. In this location, you can always find the latest version of tabcmd.

The tabcmd download is on the release notes, under the version number.

The link from the Tableau Cloud Help has changed, too. If you bookmark this link, you can update it at Install tabcmd.

# Sign In to Tableau Cloud

You can sign in to Tableau Cloud from a Tableau *client*. Examples of clients include a web browser, Tableau Desktop, Tableau Bridge, and Tableau Mobile. You can sign in to your site directly, or from a Tableau view embedded in a web page.

This topic discusses how to sign in to a Tableau Cloud site. For information on how to sign in to Tableau Cloud Manager as a cloud administrator, see Sign In to Tableau Cloud Manager.

**Sign-in changes for Tableau with MFA users**
Starting April 2024, after entering your username from the Tableau Cloud sign-in page, the sign-in process redirects you to the Tableau provider sign-in page where you can enter your password. This change will give you a more seamless sign-in experience to other products and services across the Tableau platform. For more information, see For sites with Tableau with MFA.

## Sign-in options and steps

Depending on how your site admin set up your Tableau Cloud site, you will use one of the following ways to sign in (these are also referred to as *authentication* types):

- **Single sign-on**

  Single sign-on (SSO) means that your admin has set up the Tableau Cloud site so that you can use the same username and password (*credentials*) you use for other applications in your company.

  When you use SSO, your credentials are managed outside of Tableau Cloud by a third-party *identity provider* (IdP). When you enter your credentials to sign in to Tableau Cloud, it's the IdP that lets Tableau Cloud know you are an approved user.

- **Tableau with MFA**

  When multi-factor authentication (MFA) is enabled with Tableau authentication (also known as TableauID), you use a combination of your TableauID credentials and a verification method to access Tableau Cloud.

  TableauID credentials are made up of an email address and password that you use for accessing your Tableau Cloud site. These credentials also give you access to other content on the Tableau website such as white papers. You can choose a verification method after you register for MFA. For more information, see Register for multi-factor authentication.

- **Tableau**

  If Tableau hasn't updated your site to require Tableau with MFA yet, you can continue to use Tableau authentication type on a temporary basis.

## How to know which type of credentials your site uses

If your site is set up for single sign-on (SSO) credentials, generally your site admin will notify you, and you use the same user name and password you do for signing in to other programs in your organization.

If your site is not setup for SSO, you sign in to your site using Tableau with MFA. In this case, you receive an email invitation to the site. When you click the link in the email, you can create your password. That email address and password become your TableauID. Then, you are prompted to register at least one verification method to use to confirm your identity each time your sign in.

If you are not sure how the site is set up or which credentials to use, check with your Tableau Cloud site admin.

## To sign in (includes Tableau Cloud URL)

Do one of the following, depending on where you're signing in:

| When signing in from: | Do this: |
|---|---|
| A web browser | Enter the Tableau Cloud URL into the address bar: **https://online.tableau.com** |
| Tableau Desktop, to publish or access content | Select **Server** > **Sign In**, and enter the Tableau Cloud URL: http://online.tableau.com |

| | |
|---|---|
| Tableau Desktop, to sign in to Tableau Bridge | Select **Server** > **Start Tableau Bridge Client**. |
| Tableau Mobile app | Tap **Sign In**, and then tap **Connect to Tableau Cloud**. |

For sites with SSO

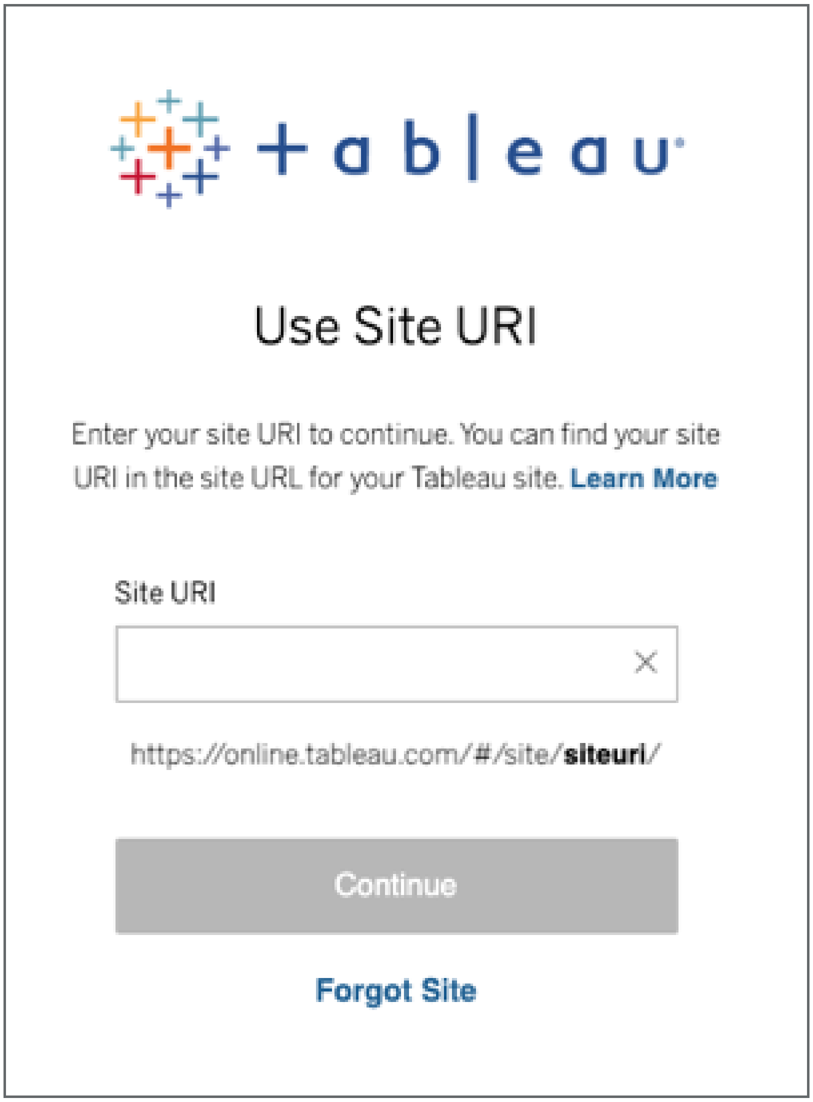
1. On the Tableau Cloud sign-in page, enter your email address and click **Sign In**.

   You are directed to the sign-in form for the identity provider if you've been added to only one site. Enter your user name again and your password. The third-party will authenticate you and direct you back to Tableau Cloud.

2. If you’ve been added to multiple sites with SSO, enter the site *Uniform Resource Identifier (URI)* for the site you want to access, and then click **Continue**.

   As of January 2022, the site URI is required to maintain site privacy. The site URI is the unique identifier for your Tableau Cloud site and appears in the site URL after authenticating. For example, a site name "Company X" may appear in the URL as `https://us-east-1.online.tableau.com/#/site/companyx`. For the site URI, you would enter "companyx".

   To avoid remembering your site URI, you can bookmark site URLs in your browser to quickly redirect and authenticate to that Tableau Cloud site.



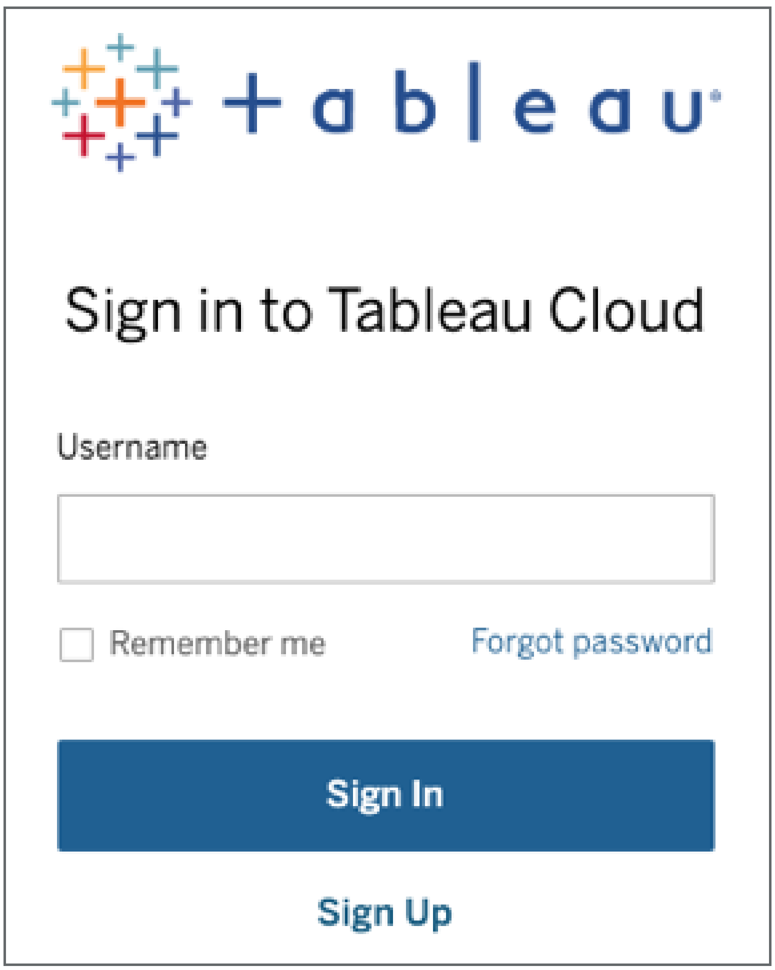

**Note:** If you don’t remember the site URI, click **Forgot URI** and follow instructions to verify your email address. Only one verification code is sent within five minutes, so be sure to check your spam folder if you don't see an email from Tableau. Be careful to enter the code correctly because multiple incorrect attempts can cause the code to expire. After verification, you're redirected to a list of sites associated with your username. You won't need to verify your email address again for 30 days on this client.

For sites with Tableau with MFA

Starting April 2024, after entering your username from the Tableau Cloud sign-in page, the sign-in process redirects you to the Tableau provider sign-in page where you can enter your password. This change will give you a more seamless sign-in experience to other products and services across the Tableau platform.

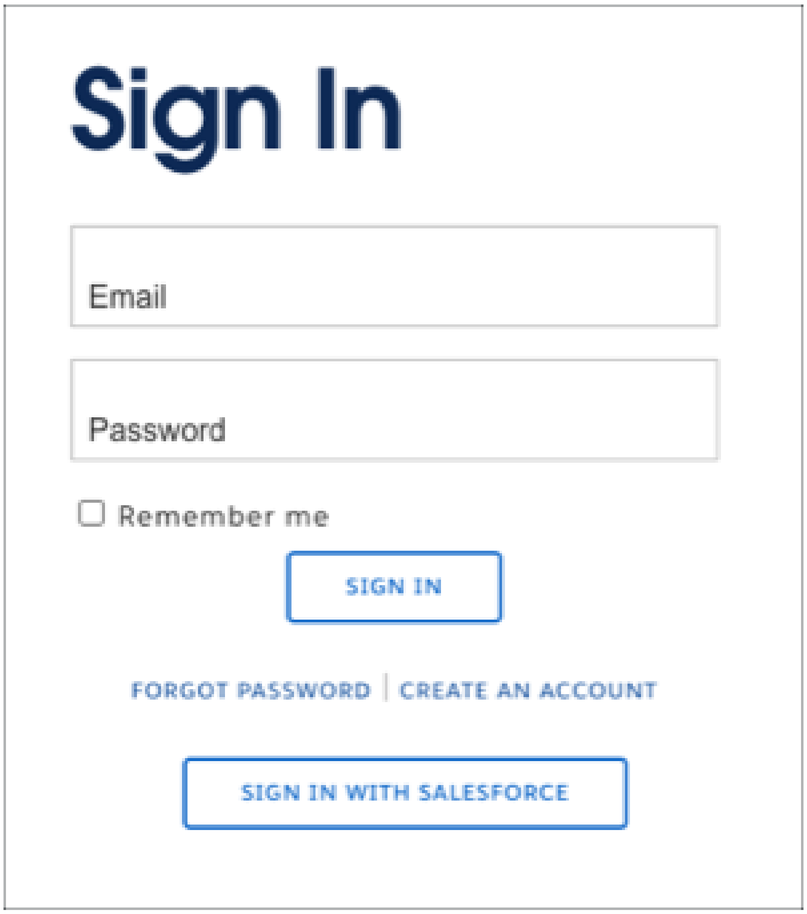
**Note:** If accessing Tableau Cloud behind a firewall or proxy and sign-in problems occur, refer to the Multiple Errors Accessing Tableau Cloud from Behind a Firewall or Proxy knowledge article for more information.

1. On the Tableau Cloud sign-in page, enter your username (email address) and click **Sign In**. You'll be redirected to https://identity.idp.tableau.com/login.



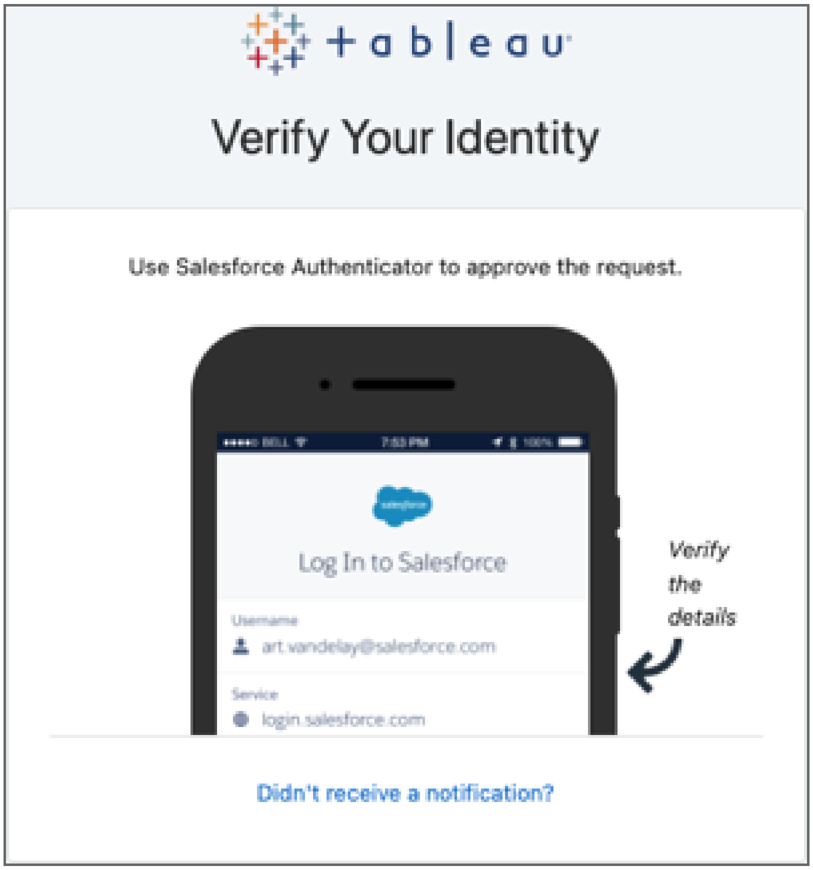
2. On the https://identity.idp.tableau.com/login page, enter your password and click **Sign In** again. You'll be redirected to https://verify.salesforce.com/v1/verify.

   **Note:** You can’t change your username on the https://identity.idp.tableau.com/login page. If you entered the incorrect username or are unable to sign in, go back to the initial Tableau Cloud sign-in page, and try again.

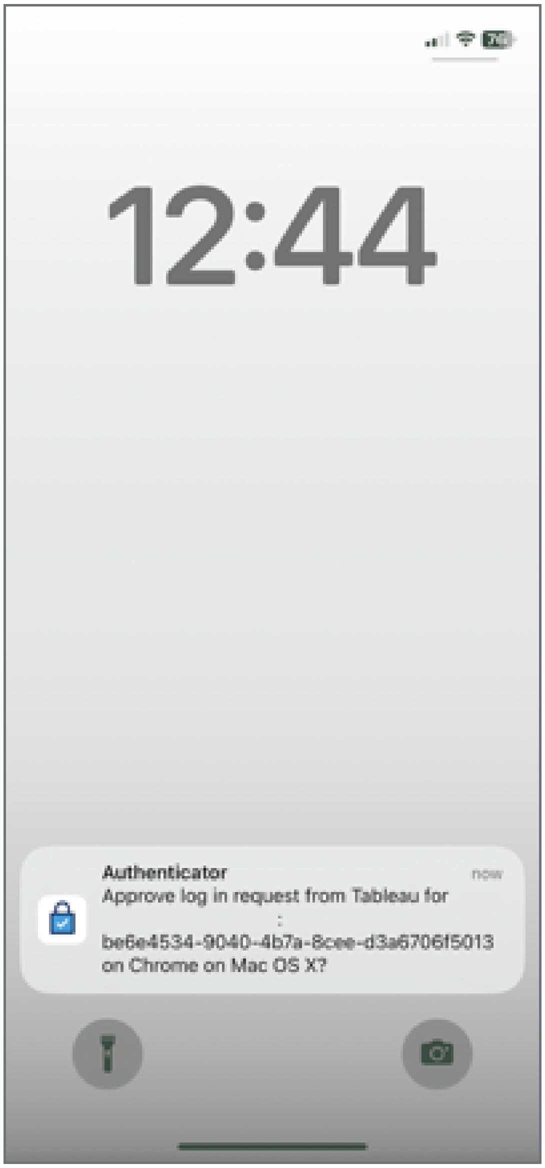



3. Follow the Tableau Cloud prompt to verify your identity using the verification method you chose during the MFA registration process.

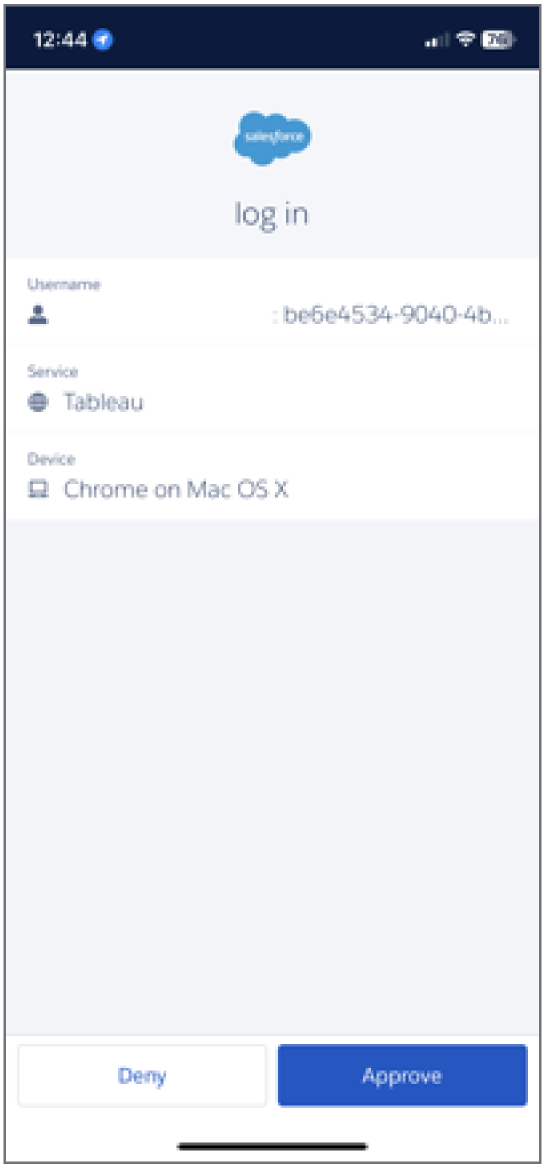
   For example, if you registered the Salesforce Authenticator app as your verification method, you see the following prompt.




a. Respond to the prompt by going to your mobile device and tapping the push notification.



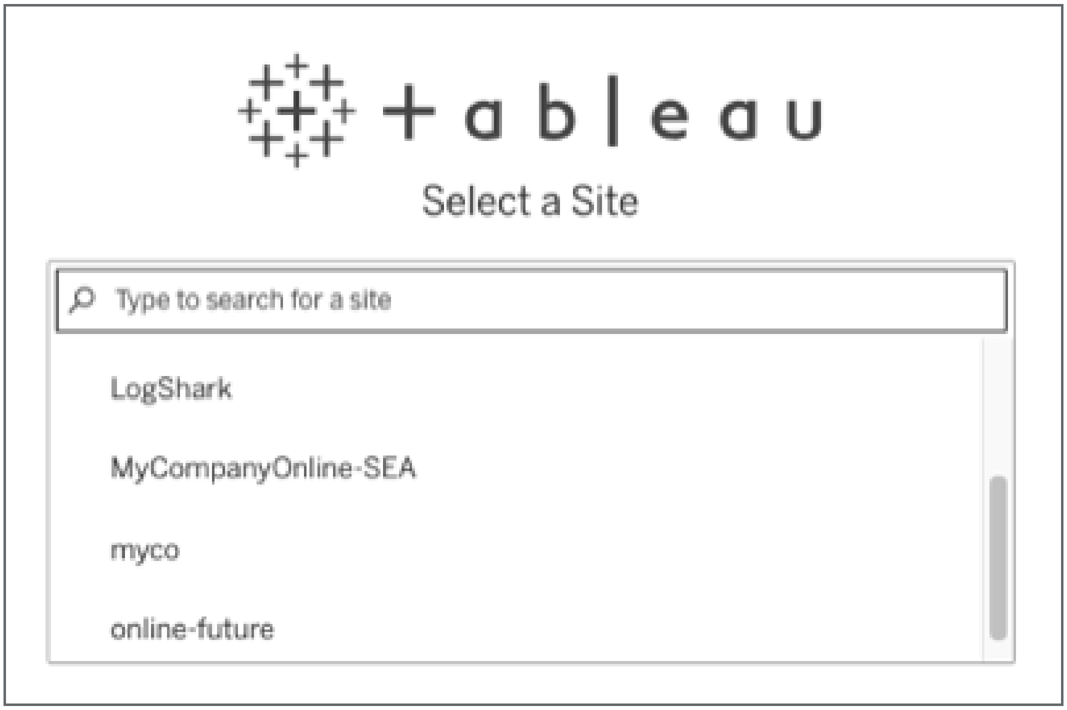

b. Verify the request details are correct and tap **Approve**. After your identity has been verified you are redirected to your Tableau Cloud site.




**Notes:**

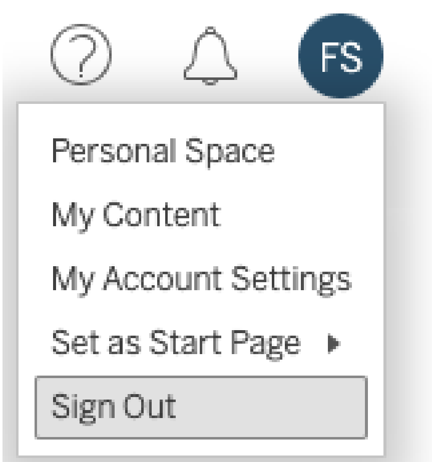
- If you are signing in to Tableau Cloud or registering for MFA for the first time, see Register for multi-factor authentication section.
- If you are signing in to Tableau Cloud when you have registered only one verification method that is either the built-in authenticator, security key, or recovery codes, you are redirected to register an additional backup verification method.

4. If your site admin has added you to multiple Tableau Cloud sites, select a site from the list of available sites that are associated with the credentials you provided.




## To sign out

To sign out, select your display name in the upper-right corner of any page, and then select **Sign Out**.



If your site uses single sign-on, and you do not see a Sign Out link, close the browser tab or window. The Sign Out link does not appear if your site and the identity provider that manages your company's user information are not configured to support single log-out.

## Remember your sign-in credentials

If you want Tableau Cloud to remember your user name, select **Remember me** on the sign-in page. The next time you sign in, Tableau enters your user name. You still need to type your password.

For sites with SSO authentication, Tableau remembers your user name and sets a default site as well. The next time you sign in, Tableau enters your user name and redirects you to the IdP for authentication without prompting for the site's URI.

In both scenarios, the default site will be replaced if:

- You sign in to a different Tableau Cloud site and select **Remember me** again.
- You use deep links, URLs that point to specific sites, to access Tableau Cloud and select **Remember me** when signing in to that site.

To make Tableau forget your user information, remove cookies using your web browser.

### Connected clients

Your site admin has the option to allow direct sign-in from approved Tableau clients. For examples of clients, see this topic's introduction.

After you sign in successfully from a recognized client, Tableau stores your credentials in a secure token that remembers your connection with Tableau Cloud. When this token is in place, you can access your Tableau Cloud site directly, without having to sign in.

### Clearing saved sign-ins

- If you want to disconnect from your site, you can explicitly sign out from the connected client. For example, in Tableau Desktop, select **Server** > **Sign Out**.
- To remove all existing server connections from Tableau Desktop, select **Help** > **Settings and performance** > **Clear saved server sign-ins**.

**Note:** Site admins can disallow secure tokens that store users' connections to the site.

## Sign in to an embedded view in Internet Explorer

When you browse to a web page that has an embedded view, you see a sign-in button in the frame where the view will appear. If you use Internet Explorer (IE), and after entering your credentials, the sign-in button is not replaced with the view, the browser security settings might be blocking access to the view.

IE uses security zones to determine access levels to websites. To display Tableau embedded views in IE, you can add the website you visit and Tableau Cloud addresses to the correct security zone.

### Add web addresses to IE security zones

1. In Internet Explorer, browse to the website that contains the Tableau view.
2. Click the **Tools** button, and then select **Internet Options**.
3. On the **Security** tab, add the website to the appropriate security zone as follows:
    - If the site that contains the Tableau view is internal to your organization, select **Local intranet**, click **Sites**, and click **Advanced**. If the site is not already there, add it to the **Websites** list.

- If the site is external to your organization, select **Trusted sites**, click **Sites**, and add it to the **Websites** list.

4. Add Tableau Cloud:

   Select **Trusted sites**, and in the **Add this website to the zone** box, enter ***.online.tableau.com**.

5. Click **Add**, and then click **Close**.

These steps were taken from the Microsoft Windows page Security zones: adding or removing websites.

**Note:** The link provided will take you away from the Tableau website. Although we make every effort to ensure these links to external websites are accurate, up-to-date, and relevant, Tableau cannot take responsibility for the accuracy or freshness of pages maintained by external providers. Contact the external site for answers to questions regarding its content.

## Register for multi-factor authentication

To help ensure account security, multi-factor authentication (MFA) became a Tableau Cloud requirement beginning February 1, 2022. To meet the requirement MFA with Tableau authentication might have been enabled. If MFA is enabled, you must register at least one verification method to confirm your identity each time you sign in to Tableau Cloud. **Note:** If you're using Tableau Desktop or Tableau Bridge in conjunction with Tableau Cloud, you must be running version 2021.1 and later.

MFA is a secure account authentication method that requires you to prove your identity by providing two or more pieces of verification information, also known as “factors”, when you sign in to Tableau Cloud. The first factor is the username and password you use to sign in to Tableau Cloud (i.e., your TableauID credentials). The additional factor is a code generated by an authenticator app, such as Salesforce Authenticator or a third-party time-based one-time passcode (TOTP) app.

To compare supported verification methods and review usage requirements, see Verification Methods for Multi-Factor Authentication topic in Salesforce Help.

**Important:**

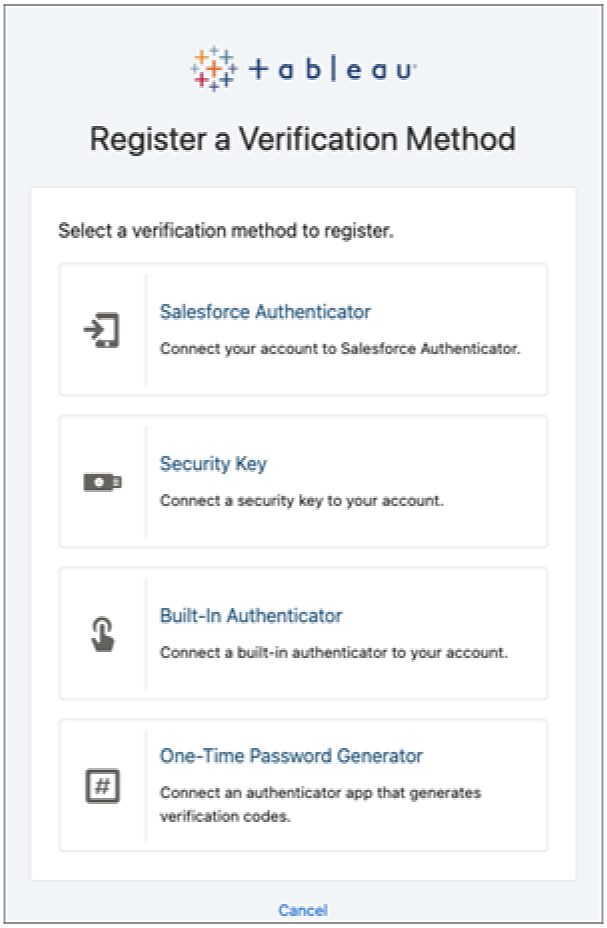
- In most cases, verification methods for Tableau Cloud are mobile authenticator apps that you need to install on a mobile phone.
- Security keys that support WebAuthn or U2F and built-in authenticators **can't** be used when authenticating to Tableau Cloud from **Tableau Desktop**, **Tableau Prep Builder**, **Tableau Bridge**, and **Tableau Content Migration Tool**.
- Recovery Codes option is only available to you after registering your initial set of verification methods.

To register for MFA

1. Sign in to Tableau Cloud with your username and password. You are prompted to register for MFA.

2. Select a verification method.

   For example, click **Salesforce Authenticator**.



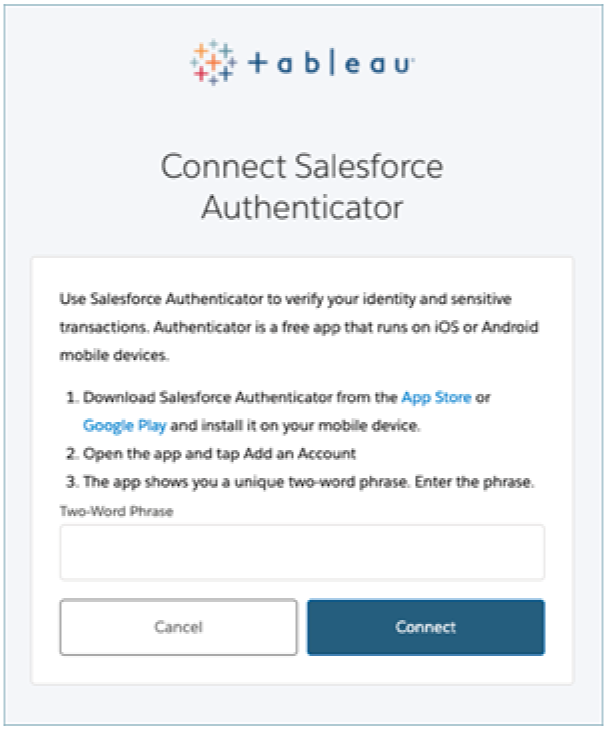

3. Follow the steps in the Tableau Cloud dialog to associate the selected verification method with your Tableau Cloud account.

   For example, if you selected the Salesforce Authenticator app in step 2, you are prompted to do the following:

   a. On an iOS or Android mobile device, download and install the free Salesforce Authenticator app from the App Store or Google Play.

   b. On the mobile device, after the app installation completes, open the app and tap **Add an Account**.

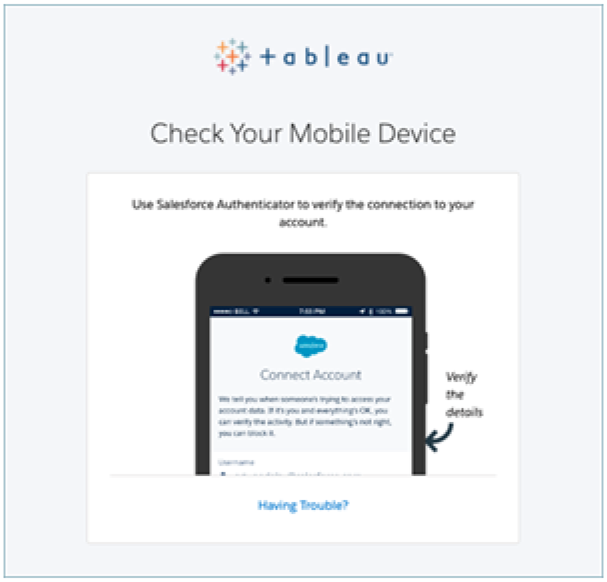
c. In Tableau Cloud, enter the two-word phase from the app in the dialog and click **Connect**.




4. To complete the sign-in process, Tableau Cloud prompts you to approve the request through the authenticator app on the mobile device. By accepting the request, you are verifying your identity. You are then redirected to your site.

   For example, if using the Salesforce Authenticator verification method, do the following:

   a. When Tableau Cloud shows you the following prompt, respond to the push notification on your mobile device.



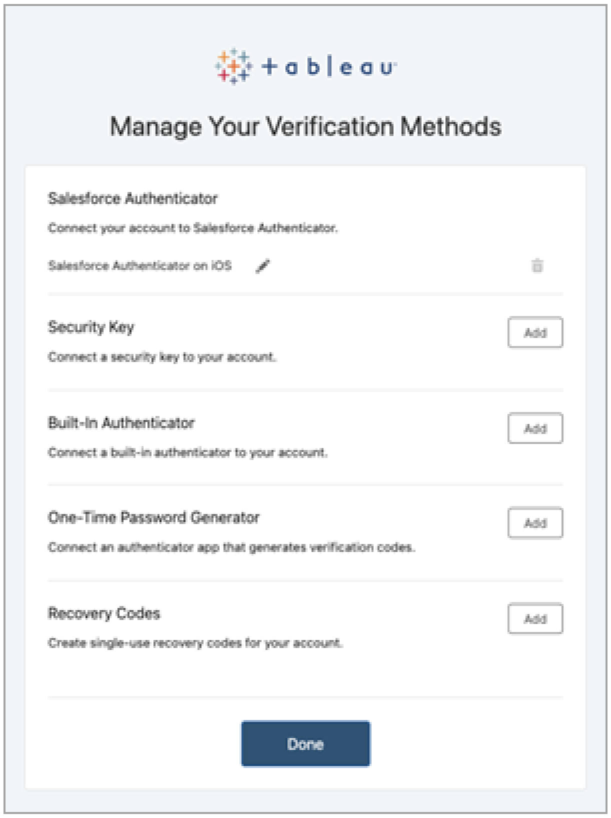

b. In the Salesforce Authenticator app, verify the request details are correct.

c. Tap **Approve**. You are redirected to your site.

## Manage verification methods

After you start using MFA, you can manage verification methods by clicking the **Manage MFA Verification Methods** link in your My Account Settings page in Tableau Cloud.

On this page, you can add or remove additional verification methods, including Recovery Codes. For example, if you get a new mobile phone, delete any verification methods on the old mobile phone. If you're unable to copy your authenticator app configuration by restoring it from a backup to your new mobile phone, you must install and register an authenticator app again. For more information, see Manage Your Account Settings.




## About recovery codes - emergency cases only

To help reduce the risk of a locked-out scenario, we recommend you add **Recovery Codes** as backup after registering for MFA. Recovery codes, to be used in emergency scenarios only, allow you to sign in to Tableau Cloud if you don't have access to your usual MFA verification methods. If you add Recovery Codes option, a list of ten one-time use codes are generated for you that you can use to sign in to Tableau Cloud.

**Important:**

- Because the list of recovery codes are not accessible after you've added the Recover Codes option, immediately copy and store these codes in a safe and secure location so that you can use them in emergency situations.
- Recovery codes should not be used as your primary verification method. Instead, recovery codes should be used in emergency scenarios only when you don’t have access to your usual MFA verification methods.

### Regain site access after being locked out

**Important:** We strongly recommend that you add Recovery Codes option to help avoid being locked out of your site. Recovery codes should be used in emergency scenarios only.

If you lose all your usual MFA verification methods, you must contact your Tableau Cloud site admin and request your MFA verification methods be reset. After your MFA verification methods have been reset, follow the procedure in Register for multi-factor authentication to register for MFA again.

# Understanding License Models

This topic describes the different licensing models and the product keys or subscriptions that may be associated with them. A useful visual of how product keys and subscriptions are represented in Tableau Cloud can be found in the Tableau Customer Portal.

When viewing product keys using the Tableau Customer Portal (Tableau Desktop and Tableau Prep Builder), note the product specific prefixes.

| Product Key Prefix | Description |
|---|---|
| TC | Tableau Creator product key, can be used to activate or deactivate Tableau Desktop and Tableau Prep Builder. |
| TD | Tableau Desktop product key, can be used to activate or deactivate Tableau Desktop only. This is a legacy product key that is no longer sold or provided. |

## Term licensing models

Tableau’s term license model is defined by the metric that permits use of Tableau Cloud. Term licenses are also called subscription licenses. Tableau currently sells access to Tableau Cloud with subscription licenses. In the subscription license model, customers pay a yearly subscription fee. If the subscription expires, the software will stop working.

Subscription licenses are either role-based or core-based subscriptions. A single license key can be purchased with all roles and features and this license is called an Updatable Subscription License (USL). Only one key needs to be activated on Tableau Cloud to represent the entire purchase.

- A *role-based license* allows you to add users based on the available licenses of each role type.
- A *usage-based license* imposes no constraints on the number of Viewer user accounts in Tableau Cloud. Instead, the license is per usage, more specifically analytical impressions. An *Embedded Analytics usage-based license* is one type of usage-based license.

## Role-based license model

Tableau offers role-based term licenses that grant a range of capabilities at various price points. Four types of role-based term licenses are available: Display, Viewer, Explorer, and Creator.

- *Display licenses* let users share and display Tableau content with a broad, internal audience of users who consume dashboards via shared displays with no interaction. There is no separate site role for Display licenses; when using a Display license, administrators create a dedicated login account for each licensed Display location, which is not the same as an individual user's login account, and assign the maximum site role of Viewer.
- *Viewer licenses* let users view and interact with workbooks in Tableau Cloud. Viewer licenses also let users access Tableau Mobile, add comments to workbooks, export visuals in various formats, download workbook summary data, create subscriptions for themselves, and receive data-driven alerts.
- *Explorer licenses* are similar to the user-based licenses available in previous Tableau Cloud releases, and include the capabilities provided with Viewer licenses, and additional capabilities. An Explorer license allows access to workbook authoring capabilities using a web browser, as well as a full set of collaboration features.
- *Creator licenses* permit a wide range of capabilities when using Tableau Cloud, and also grant use of Tableau Desktop and Tableau Prep Builder. A Creator license allows all of the capabilities available under the Explorer license, as well as the following

capabilities when using Tableau Cloud:

- Create and publish new workbooks from a new data source.
- Edit embedded data sources in the Data pane.
- Create and publish new data connections.
- Use login-based license management activation on Tableau Desktop and Tableau Prep Builder.

## Usage-based license model

In a usage-based licensing (UBL) model, Usage Viewers are licensed per usage measured in analytical impressions, while Creators and Explorers are defined per user.

An analytical impression is generated when a Usage Viewer (who must be a viewer outside your organization) accesses one or more embedded analytics within (or related to) your external facing application, or a Pulse metric. For example, when a Viewer is performing these following actions:

- Loading a dashboard.
- Loading a worksheet.
- Downloading or exporting a visualization (dashboard or worksheet) such as an image, PDF, PowerPoint or Tableau workbook via API or the UI.
- Receiving a subscription.
- Successful requests for detail Pulse insights. A successful detail request can happen either from users interacting with the Pulse interface within Tableau or from embedded scenarios where an external application is making requests to the Pulse Insights API.

**Note:** Tableau Pulse will be available for usage-based sites at release, and will begin measuring analytical impressions in June 2024.

Site administrators will receive monthly overview emails updating them on Analytical Impressions consumption so they can track their usage and manage their budget. You can also request usage metrics at any time from your account managers to monitor usage.

## Embedded Analytics

Tableau's Embedded Analytics offering is a limited-use license for Tableau Cloud that's made available to customers who want to embed Tableau Cloud analytics into an external facing solution to provide Tableau content and insights to clients outside of their organization.

> **Note:** Embedded Analytics licenses cannot be used in the same environment as full-use licenses. To change to an Embedded Analytics license, first deactivate your existing full-use licenses and then activate the Embedded Analytics license.

For example, consider an organization that runs a service where they analyze consumer data and generate reports on behavioral patterns regarding different consumer demographics. In this scenario, Tableau Cloud acts in support of a specific proprietary application titled 'Demographics Analyzer' and connects with exported TXT files and a SQL database. The organization makes visualizations available to its clients in a secure portal, where clients log in to manage their account and view the results. End users are uniquely identified by the account they use to access the portal.

To verify the license contact Customer Success.

## License editions

License editions include a suite of features and functionality to which users are entitled. License editions cannot be mixed within a deployment, meaning all users on a deployment must be on the same license edition. Consider the needs of your entire deployment when selecting your license edition.

### Tableau license edition

Tableau license edition is the standard Tableau Cloud edition. It provides Tableau Cloud access for each licensed user, governance, collaboration, data prep, and visual analytics functionality.

### Tableau Enterprise license edition

Enterprise edition is designed for sophisticated business environments on Tableau Cloud . It is ideal for organizations that require advanced administration, security, and data management functionality to scale to more users in more complex data environments and meet Enterprise standards.

For more information and a list of features included with Tableau Enterprise, see About Tableau Enterprise.

### Tableau+ license edition

The Tableau+ edition is available exclusively for Tableau Cloud. It provides a comprehensive package tailored for wall-to-wall adoption of AI-powered, self-service analytics. It encompasses premium features tailored for larger or more complex deployments, premium AI functionality, and the Premier Success offer.

For more information and a list of features included with Tableau+, see About Tableau+.

## Feature licenses

**Important:** As of September 16, 2024, Advanced Management and Data Management are no longer available as independent add-on options. Advanced Management and Data Management capabilities are only available if you previously purchased these, or if you purchase certain license editions - either Tableau Enterprise (for Tableau Server or Tableau Cloud) or Tableau+ (for Tableau Cloud).

Feature licenses are sold differently than other licenses. Features with independent licenses must be licensed for every user in the deployment.

These features are licensed annually, and in the context of licensing, the availability of these features to the user base are “all or none:”

- Data Management
- Advanced Management
- Login-based License Management

**Note:** Updatable subscription licenses include both features and roles in one license. You no longer need to activate multiple licenses and product key(s) for different features and their associated roles.

## Data Management

The Data Management license includes Tableau Catalog and Tableau Prep Conductor. For more information, see About Data Management.

## Advanced Management

Tableau Cloud Advanced Management is licensed on a per deployment basis. For more information on Advanced Management and the capabilities included, see About Tableau Advanced Management on Tableau Cloud.

## Login-based License Management

Login-based license management (LBLM) simplifies licensing for Tableau Desktop and Tableau Prep Builder. Instead of end users needing to activate product keys, Cloud Creators can activate and use Tableau Desktop and Tableau Prep Builder by signing in to the Cloud site (LBLM).

For more information, see Activate Tableau using Login-based License Management.

# Activate Tableau using Login-based License Management

Login-based license management is the preferred license management and activation option for Creator roles within Tableau Cloud, and is enabled by default on your site. Login-based license management allows authorized users to activate and unlock Tableau Desktop and/or Tableau Prep Builder by signing in to Tableau Cloud. Login-based license management eliminates the need to distribute and manage product keys for Tableau Desktop and Tableau Prep Builder.

You only need one Tableau Cloud site to authorize an individual Tableau Desktop or Tableau Prep Builder. You can assign Creator roles to users who use Tableau Desktop, and Tableau Prep Builder for license activation and centralized license management. In addition, login-based license management gives you more visibility into license usage.

You can use administrative views on Tableau Cloud to see the assignment and use of Creator seats in one place. Administrative views provide information about who is using your Creator licenses, and shows the most recent license lease and version of both Tableau Desktop and Tableau Prep Builder, which helps you to monitor your Tableau deployments.

The following Tableau products support login-based license management:

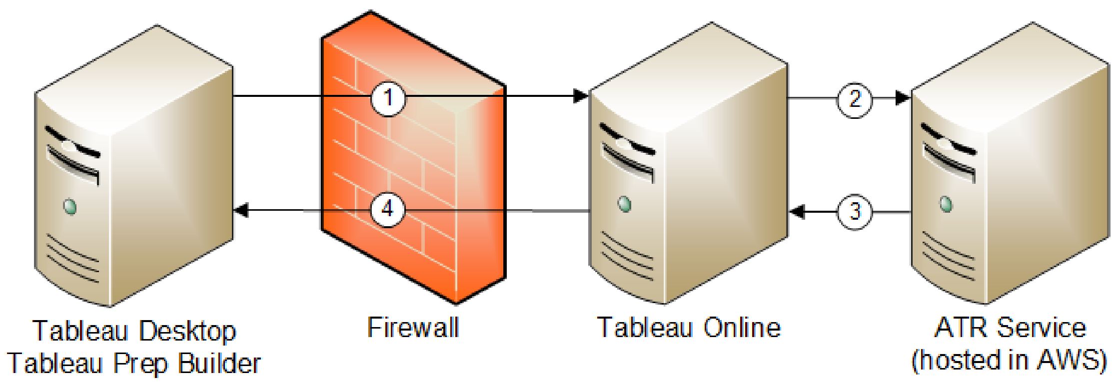
- Tableau Cloud
- Tableau Server 2020.1+
- Tableau Desktop 2020.1+
- Tableau Prep Builder 2020.1.3+

## How login-based license management works

When login-based license management is in use, Tableau Desktop or Tableau Prep Builder periodically contacts Tableau Cloud in order to verify that the user is a Creator and to obtain an authorization to run. Tableau Cloud contacts the Tableau-hosted authorization-to-run (ATR) service to verify that the Tableau Desktop client is allowed activation. The ATR service verifies and manages the license and the length of the authorization window. The diagrams below show the communication process between the client, Tableau Cloud, and the licensing service.

Tableau uses common ports (80 and 443) to make internet requests. In most cases, the computer where Tableau Desktop or Tableau Prep Builder is installed and the network it is running on are already configured to allow the necessary access. For more information about the ports used by Tableau, see Internet Access Requirements.

Login-based license management with Tableau Cloud




1. You install Tableau Desktop or Tableau Prep Builder and select **Activate with your credentials**. You sign into your Tableau Cloud site.

2. Tableau Cloud verifies that you are a Creator. If not, you get an error. If yes, Tableau Cloud communicates with the ATR service.

3. The ATR service returns an ATR lease to Tableau Cloud.

4. Tableau Cloud provides an ATR lease to Tableau Desktop or Tableau Prep Builder to finalize activation.

# Use login-based license management

To use login-based license management, you need to install Tableau Desktop and use it with Tableau Cloud.

## Step 1: Enable login-based license management

Login-based license management is enabled by default for Tableau Cloud and Tableau Desktop starting with version 2020.1. To use login-based license management, you need to install Tableau Desktop and use it with Tableau Cloud. If you're using Tableau Desktop version 2020.1 and later, skip to Step 3: Activate Tableau Desktop.

Versions before 2021.1 do not support login-based license management.

# Change login-based license management settings on Tableau Desktop or Tableau Prep Builder at install

To change login-based license management settings at the command line, you can run the installer .exe file from your computer's command line as an administrator. If you need to extract the .msi files, follow the instructions to Extract and run the Windows (MSI) installer.

To use a duration length other than the default of 14 days/1209600 seconds, include the `ATRREQUESTEDDURATIONSECONDS` switch. For example:

```
tableauDesktop-64bit-2020-1-0.exe /quiet /norestart ACCEPTEULA=1
ATRREQUESTEDDURATIONSECONDS=43200
```

You must run the command from the directory where the .exe file is located or specify a full path to the location of the .exe file on the computer. Do not run the setup program from a shared directory on your network. Instead, download the .exe file to a directory on the computer where you're installing.

The following example shows the Windows installer command that disables login-based license management:

```
tableauDesktop-64bit-2020-1-0.exe /quiet /norestart ACCEPTEULA=1
LBLM=disabled
```

or

```
tableauPrepBuilder-64bit-2020-1-0.exe /quiet /norestart
ACCEPTEULA=1 LBLM=disabled
```

To set the default URL for the Tableau Server you want users to use for activation when using login-based license management, add the `ACTIVATIONSERVER` or `WorkGroupServer` option.

To update the exe:

```
tableauDesktop-64bit-2021-4-0.exe /quiet /norestart ACCEPTEULA=1
ACTIVATIONSERVER=http://<tableau_online_site_url>
```

To update the registry:

```
reg.exe add HKEY_LOCAL_MACHINE\SOFTWARE\Tableau\Tableau 2021.4\Set-
tings /f /v WorkGroupServer /d https://<tableau_server_url>
```

> **Note:** The `ACTIVATIONSERVER` option is only intended for first time activation. If you have previously signed-in to this version of Tableau, you use the WorkGroupServer (Windows) or WorkgroupServer (macOS) option. For example, if you are using Tableau Desktop version 2021.1 on Windows and have previously signed-in successfully, you would use the `WorkGroupServer` option to specify an activation server. On Tableau Desktop on macOS, you would use the `WorkgroupServer` option. On macOS, this option is case sensitive and uses a lowercase "g".

## Change login-based license management settings on Tableau Desktop by editing the registry

If Tableau Desktop is already installed, you can change login-based license management settings by editing the Windows registry.

To turn off login-based license management:

```
reg.exe add HKEY_LOCAL_MACHINE\SOFTWARE\Tableau\ATR /f /v LBLM /d
disabled
```

To make login-based license management the only login option:

```
reg.exe add HKEY_LOCAL_MACHINE\SOFTWARE\Tableau\ATR /f /v LBLM /d
required
```

Or, you can enable, disable, or require login-based license management by editing the registry directly:

1. As an administrator on the computer running Tableau Desktop, make a backup of the registry file before you make any changes to it.
2. Edit the registry, and in `HKEY_LOCAL_MACHINE\SOFTWARE\Tableau`, find the hive named ATR and modify the LBLM value to reflect the desired setting:
   a. Name: LBLM.
   b. Data: enabled, disabled, or required.
3. Restart Tableau so the changes take effect.

## Change login-based license management settings on Tableau Desktop on macOS

To change login-based license management settings on macOS, run the following commands in a terminal window to update the preferences file, and then install or restart Tableau Desktop.

To turn off login-based license management:

```
sudo defaults write /Library/Preferences/com.tableau.ATR LBLM "disabled"
```

To make login-based license management the only login option:

```
sudo defaults write /Library/Preferences/com.tableau.ATR LBLM "required"
```

To set the default URL for the Tableau Server you want user to use for activation when using login-based license management on macOS.

First time activation:

```
sudo defaults write /Library/Preferences/com.tableau.ATR LBLM "required"
```

Subsequent activations:

```
sudo defaults write /Library/Preferences/com.tableau.Tableau-<version> Settings.WorkgroupServer "https://<tableau_server_url>"
```

> **Note:** On Tableau Desktop on macOS, you would use the WorkgroupServer option. On macOS, this option is case sensitive and uses a lowercase "g".

Login-based license management settings

You use the following settings to change login-based license management, set the ATR duration, and set the activation server URL.

| Setting | Value | Description |
|---|---|---|
| `LBLM` | enabled, dis-abled, or required | Set to `enabled` (the default), the licensing screens will present the two options for activation (product key, or credentials).<br><br>Set to `disabled`, login-based license management will not appear on the licensing screens.<br><br>Set to `required`, login-based license management is the only way to activate the Tableau Desktop (when the licensing screen appears, it will offer only the credentials option for activ-ation).<br><br>**Note:** When `LBLM` is set to enabled or required, report-ing is also enabled. |
| `ATRREQUESTEDDURATIONSECONDS` | 1209600 | Sets the authorization to run (ATR) duration (in seconds), which is the length of time that an instance of Tableau Desktop and Tableau Prep Builder is author-ized to run. The default is 1209600 seconds (14 days). Do not use commas as separators in the value. |

| | | |
|---|---|---|
| `ACTIVATIONSERVER` | http://<tableau_online_site_url> | For first time activation, sets the default URL for the Tableau Cloud site you want users to use for activation. |
| `WorkGroupServer` (Windows) `WorkgroupServer` (macOS) | http://<tableau_server_url> | For updates to the Windows registry or macOS plist, sets the default URL for the Tableau Server you want users to use for activation.<br><br>**Note:** On Tableau Desktop on macOS, you would use the WorkgroupServer option. On macOS, this option is case sensitive and uses a lowercase "g". |
| `REPORTINGFREQUENCYSECONDS` | 3600 | Sets the default (in seconds) for how often the login-based license management report is sent to Tableau Server or Tableau Cloud. The minimum setting is 60 seconds, and the default is 3600 seconds (one hour). Change this setting to reduce the load on Tableau Server or to reduce network traffic. No matter what the authorization-to-run (ATR) lease duration is set to, `REPORTINGFREQUENCYSECONDS` sets the time interval that the Tableau Desktop or Tableau |

| | | |
|---|---|---|
| | | Prep Builder client report login-based license management activations back to Tableau Server or Tableau Cloud. |

## Additional configuration for virtual deployments

Tableau Desktop and Tableau Prep Builder periodically contact Tableau Cloud or Tableau Server to verify that Tableau is authorized to run, based on its license. Tableau Cloud or Tableau Server then contacts the ATR service to verify the license and the length of the authorization window.

When configuring a virtual (non-persistent) deployment of Tableau Desktop or Tableau Prep Builder, the duration time should be set to one of the lower values such as 4 or 8 hours in order to avoid an over-use activation error message. After the virtual machine (VM) is returned, the ATR service will handle the activation monitoring.

The following flags should be used on a source image prior to publishing Tableau Desktop to end users. Each end user will be activating the software by logging into Tableau Server or Tableau Cloud with each new VM delivered. No product keys need to be entered if the end user is a Tableau Creator on Tableau Server or Tableau Cloud.

If you are using login-based license management for Tableau Desktop or Tableau Prep Builder on a VM, you may get an error message that your license information has changed whenever you launch a new VM for Tableau Desktop or Tableau Prep Builder. This error forces a restart, which then asks you to register Tableau Desktop again. This error occurs because the ATR service sends a new token that doesn’t match the license cache.

Microsoft Windows

To prevent the error from occurring on Microsoft Windows, you can use the `SYNCHRONOUSLICENSECHECK` and `SILENTLYREGISTERUSER` options with the Windows installer. For example:

```
tableau-setup-std-tableau-2020 SYNCHRONOUSLICENSECHECK="true"
SILENTLYREGISTERUSER="true" ATRREQUESTEDDURATIONSECONDS=14400
```

or

```
tableauDesktop-64bit-2020-1-0.exe /quiet /norestart ACCEPTEULA=1
ATRREQUESTEDDURATIONSECONDS=14400 ACTIVATIONSERVER=http://<tableau_
online_site_url> SYNCHRONOUSLICENSECHECK="true"
SILENTLYREGISTERUSER="true"
```

If Tableau Prep Builder and Tableau Desktop are being delivered on one Virtual Desktop, `ATRREQUESTEDDURATIONSECONDS` only needs to be set during Tableau Desktop installation. However, if you plan to install Tableau Prep Builder as a stand-alone, you'll need to set `ATRREQUESTEDDURATIONSECONDS` during Tableau Prep Builder installation.

Or, you can edit the following registry keys on the source image:

```
Reg key path: HKLM\SOFTWARE\Tableau\<Tableau version>\Settings\
```

```
Reg key (String value, need to set to true to make that feature
enabled)
```

```
SynchronousLicenseCheck
```

```
SilentlyRegisterUser
```

macOS

To prevent the error from occurring on macOS, run the following command to set the `LicenseCache.Desktop` flag to `'false'`.

```
sudo defaults write ~/Library/Preferences/com.tableau.Tableau-<ver-
sion>.plist LicenseCache.Desktop false
```

### (Optional) Step 2: Change the authorization to run (ATR) duration

The login-based license management default settings for the authorization to run (ATR) duration are appropriate for most environments, but you can change these default settings if needed. Login-based license management uses the default authorization to run (ATR) duration of 1209600 seconds (14 days), which is the length of time that an instance of Tableau Desktop and Tableau Prep Builder is authorized to run. This means that after the initial authorization, you could use Tableau without any network connection for 14 days before the activation expired.

The default duration value for login-based license management is not appropriate for delivering a non-persistent VM delivery solution to end users. The ATR duration should be lowered to 4 or 12 hours depending on VM use. When a new VM is delivered to an end user, a new authority to run token will be created. When the VM is returned, this token is also returned and is able to be used on the new VM authorization to run request.

**Note:** Login-based license management uses the following hierarchy when determining ATR duration.

1. **ATR Service** – Establishes the minimum (4 hours/14400 seconds) and maximum (90 days/7776000 seconds) ATR durations applicable to all users/installations. It specifies the default ATR duration (14 days/1209600 seconds) if nothing is specified by Tableau Server or Tableau Desktop.
2. **Tableau Desktop** – Can optionally specify the ATR duration (`ATRREQUESTEDDURATIONSECONDS`) for the computer on which it is installed. If necessary, you can change the default ATR duration (14 days/1209600 seconds) to a setting within the ATR Service minimum (4 hours/14400 seconds) and maximum (90 days/7776000 seconds). This local ATR duration overrides any durations set by the ATR Service or Tableau Server. However, this default ATR duration cannot be more than the maximum ATR duration set on Tableau Server.

## Change the ATR duration on Tableau Desktop by editing the registry

To use a duration length other than the default of 14 days/1209600 seconds, update the `ATRRequestedDurationSeconds` registry setting. For example:

1. As an administrator on the computer running Tableau Desktop, make a backup of the registry file before you make any changes to it.
2. Edit the registry, and in `HKEY_LOCAL_MACHINE\SOFTWARE\Tableau\ATR`, update the ATRRequestedDurationSeconds as follows (0 uses the default setting):

   a. Name: Find the string value named `ATRRequestedDurationSeconds`.

   b. Data: Update the number of seconds the duration should last. For example, add 43200 to set a duration of 12 hours.

3. Restart Tableau so that the changes take effect.

## Change the ATR duration on Tableau Desktop on macOS

To use a duration length other than the default of 14 days/1209600 seconds, include the `ATRRequestedDurationSeconds` preferences setting. For example:

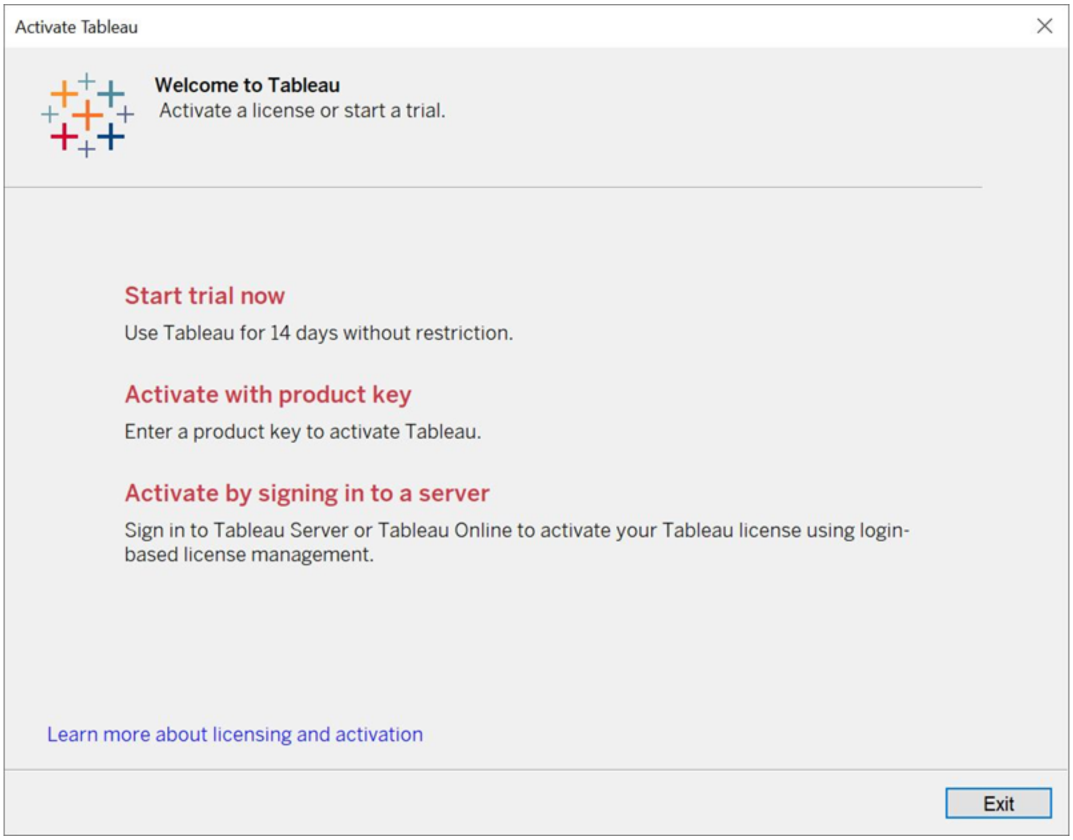
```
sudo defaults write /Library/Preferences/com.tableau.ATR ATRReques-
tedDurationSeconds -string "43200"
```

### Step 3: Activate Tableau Desktop

The 2020.1 and later versions of both Tableau Desktop for Windows or macOS support login-based license management.

1. Run Tableau Desktop setup.

2. The Activate Tableau screen will include the **Activate by signing in to a server** option.




3. Click **Activate by signing in to a server** and then click the Tableau Cloud link.

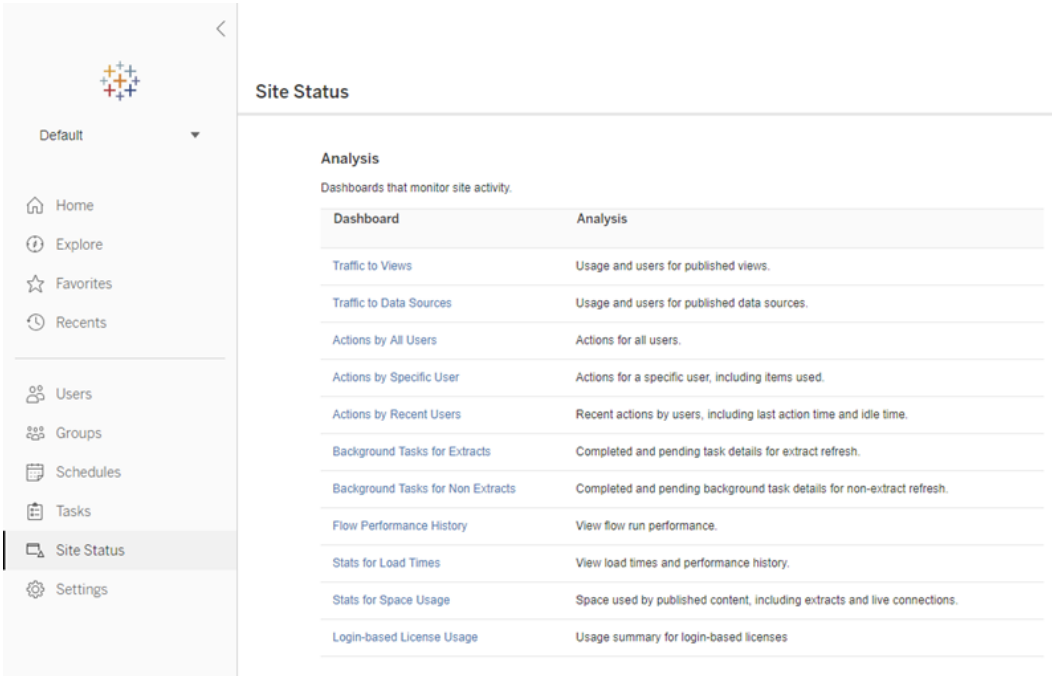
   When prompted, enter valid credentials to sign in to a Tableau Cloud site as a user with a Creator role subscription, and then click **OK**.

## View login-based license usage

You can view login-based license usage for Tableau Cloud or Tableau Server. The report shows users, hosts, user role, product, version, activations, Creator seats in use, Creator seats not in use, and when a Creator seat was last used. You can view data for the past 30 days up to a maximum of 183 days.

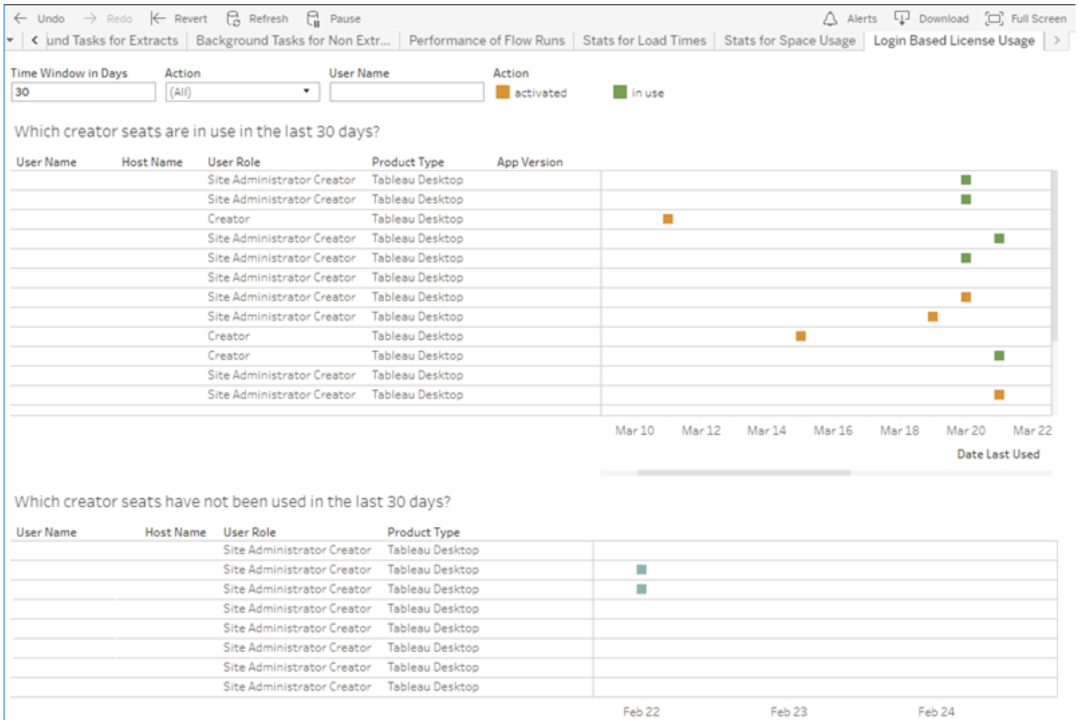
To view the Login-based license management License Usage administrative view:

1. In Tableau Cloud or Tableau Server, in the navigation pane, click **Site Status**.




2. On the Site Status page, click **Login-based License Usage**.

3. Optional. On the report screen, you can change the time window to show when seats were last used, filter on actions, filter on user name, and sort by columns.




## Troubleshooting

You may encounter one of the following error messages while using login-based license management. Use the information below to resolve the issue.

If login-based license management is available as an activation option on Tableau Desktop, but not enabled on your Tableau Cloud site, the following error message may be displayed:

*Login-based license management is not enabled on the server you connected to. Select a different server to connect to, use a product key to activate your license, or start a trial to begin working immediately.*

Contact your administrator and/or Tableau account manager to ensure that your Tableau Cloud site is enabled for login-based license management.

## Login-based license management is not enabled on Tableau Desktop

If login-based license management is not enabled on Tableau Desktop, you will not have the option to activate Tableau using your credentials. Prior to version 2020.1, the ability to use login-based license management on Tableau Desktop is not turned on as a default. Check the Tableau Desktop version to ensure the correct version is being used.

If the login-based license management option has been turned off during installation or with an update, see Step 1: Enable login-based license management.

## Product key expiration date doesn't change after purchasing a year subscription

After purchasing a renewal of Tableau Cloud, it might appear that your Tableau Desktop license is going to expire. This is not the case. In **Manage Product Keys**, the expiration date for new Tableau Cloud subscriptions is not updated until two weeks before the previous Site expiration date.

## You do not have a Creator license

When attempting to activate from Tableau Desktop, the following error message may be displayed:

*You do not have a Creator license. Contact your administrator to obtain one.*

This error is displayed if you have not been assigned a Creator role. If you belong to multiple sites on Tableau Cloud or Tableau Server, you need to sign in to the site where you have the Creator role when using login-based license management. Otherwise you'll get this error.

To verify that the product key you have activated on the server includes Creator licenses, open the TSM web UI and click **Configuration**, and then click **Licensing**.

## You have activated the maximum number of computers

When attempting to activate from Tableau Desktop, the following error message may be displayed:

*You have activated Tableau the maximum number of times allowed under your account. You must wait for the license activation on another computer to expire before you can activate Tableau again.*

This error is displayed when you activated Tableau from multiple computers with the same Creator user credentials and exceeded the maximum number of activations. You must wait until the authorization-to-run (ATR) token expires on one of the existing computers before attempting to activate a new computer. If you are using non-persistent virtual machines (VMs), you can shorten the ATR duration to prevent this error from occurring again.

To shorten the ATR token duration for maximum activation

If you encounter this maximum use error when using a non-persistent virtual deployment, it is possible to shorten the ATR duration to 4 hours (14400) seconds to avoid the error in the future.

The following steps shorten the lease on a computer previously activated with login-based license management that will no longer be used, in order to free up a seat to be activated on a new computer:

1. Open a Command Prompt as an administrator on a Tableau Desktop computer that will no longer be used.
2. Navigate to the Tableau binaries (\bin) directory, using the following command.

   Windows: `cd Program Files\Tableau\Tableau <version>\bin`

   Mac: `cd /Applications/Tableau\ Desktop\ <version>.app/Contents/MacOS`
3. Run the following command to set the duration to 4 hours, in seconds (e.g., 14400).

Windows: `atrdiag.exe -setDuration 14400`

Mac: `sudo ./atrdiag -setDuration 14400`

4. Delete the previous ATR token using the following command:

   Windows: `atrdiag.exe -deleteAllATRs`

   Mac: `./atrdiag -deleteAllATRs`

5. Next, overwrite the existing ATR token. Open Tableau Desktop. Tableau displays the "License has Changed" message. Click **Exit** to automatically close and reopen Tableau Desktop.

6. In the registration dialog box, click **Activate**, and then reactivate Tableau Desktop through Tableau Server using login-based license management, which will overwrite the existing token.

7. Close Tableau Desktop and wait for the ATR duration to elapse (e.g., 4 hours) so that the ATR token expires and frees-up a user seat. Do not open Tableau Desktop before the ATR duration has elapsed. Check to make sure the ATR duration has elapsed. The ATR token TTL End should show a date and time in the future (e.g., 4 hours from now).

   Windows: `atrdiag.exe`

   Mac: `./atrdiag`

8. After the ATR token expires and you can successfully sign in to Tableau Server on a new computer.

To return your computer to an unlicensed state

1. Open a Command Prompt as an administrator.

2. Navigate to the Tableau binaries (\bin) directory, using the following command:

   ```
   cd Program Files\Tableau\Tableau <version>\bin
   ```

3. Run the following command:

   Windows: `atrdiag.exe -deleteAllATRs`

   Mac: `./atrdiag.exe -deleteAllATRs`

> **Note:** This removes only the ATR token from the computer. It does not free-up any of the user seats. The user seat is only freed-up after the deleted ATR token expires.

### Your Tableau credentials are invalid

When attempting to activate from Tableau Desktop, the following error message may be displayed:

*Your Tableau credentials are invalid. Contact your administrator to reset your account.*

This error is displayed when your Tableau license is not recognized. Contact your adminstrator..

### Your computer’s clock is not synchronized to the current time

When attempting to activate from Tableau Desktop, the following error message may be displayed:

*Your computer’s clock is not synchronized to the current time. Synchronize your computer’s clock to the current time and then try to activate Tableau.*

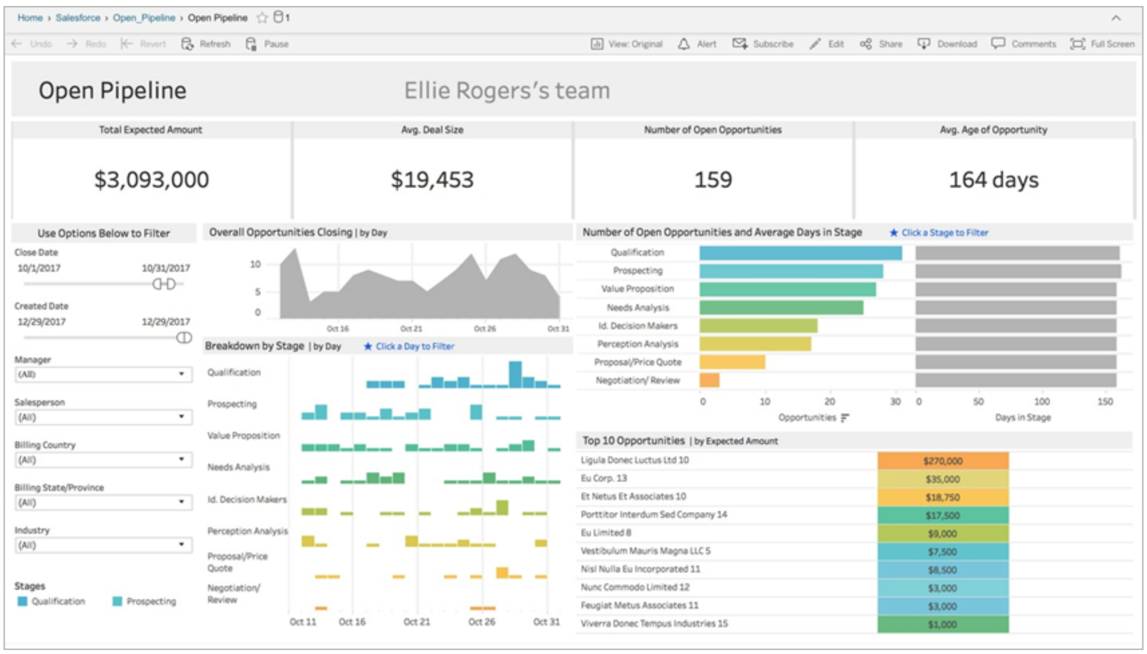
This error is displayed when your computer's clock is not synchronized with the current time. Synchronize your computer’s clock with a time server on the internet or enable automatic time synchronization.

# Create Workbooks with Salesforce Data

You can quickly author and analyze Salesforce data in Tableau. Sign in to Salesforce directly from your Tableau Cloud site and select the clouds you want to explore. Tableau integrates your Salesforce data to create a project with ready-to-use starter workbooks and data sources - choose to explore them on your own or share them with other users on your site.

## What’s included with the Salesforce project

The Salesforce project includes starter workbooks and data sources, all built using your Salesforce data. Use the starter workbooks to quickly answer questions about your Nonprofit, Sales, and Service Clouds, or connect to Salesforce Admin Insights to see usage trends in your organization.




### Nonprofit Cloud

Connect to Nonprofit Cloud to analyze your organization's programs and drive impact.

Includes starter workbooks for: *Nonprofit Case Management - Service Delivery and Staff Capacity*, *Nonprofit Case Management Assessments*, *Nonprofit Case Management Enrollment*, *Nonprofit Case Management Intake*, and *Nonprofit Fundraising Overview*.

### Sales Cloud

Connect to Sales Cloud to visualize your sales funnel and better support your sales team.

Includes starter workbooks for: *Account Tracking*, *Open Pipeline*, *Opportunity Overview*, *Opportunity Tracking*, *Quarterly Sales Results*, *Top Accounts*, and *Marketing Leads*.

### Salesforce Admin Insights

Connect to Salesforce Admin Insights to visualize usage trends and engagement with your organization.

Includes starter workbooks for: *Salesforce Admin Insights*.

### Service Cloud

Connect to Service Cloud to analyze and explore your critical service metrics and cases.

Includes starter workbooks for: *Service Overview* and *Case Tracking*.

## Connect to Salesforce

Connecting to your Salesforce data is simple. Once you sign in and select the Clouds to explore, Tableau creates a new project and publishes workbooks and data sources on your site. When the publishing process is complete, you can edit the resulting workbooks just like any other, quickly customizing them for your needs.

To connect to Salesforce, you must be an administrator with the Site Administrator Creator site role and have API access to your Salesforce instance. API access requires Salesforce Professional Edition or higher. For more information, see Set Users' Site Roles.

1. Sign in to your Tableau Cloud site as an administrator, and select **Settings** > **Integrations**.
2. On the Integrations tab, click **Connect to Salesforce Data** and complete prompts to authorize access to Salesforce.
3. In the Connect to Salesforce dialog window, select the Clouds you want to explore.

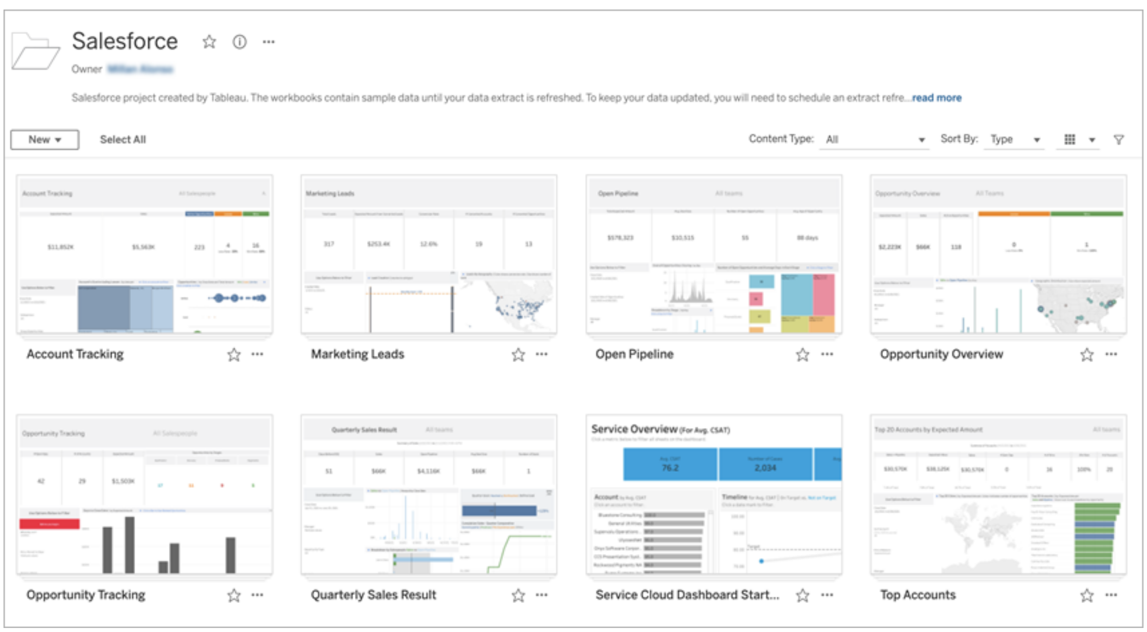
4. Specify a name and initial permissions for the project. You can set permissions for **Only administrators**, or choose to **Inherit permissions from the Default project**. For more information, see Permissions.

5. Review your selections and click **Publish**.

At this point, you've created a new project and published starter workbooks. While Tableau prepares extracts of your Salesforce data, sample data appears in the workbooks so you can explore the layout. You'll receive an email when your Salesforce data is refreshed and added to the workbooks.

> **Note:** Depending on the size of your data source, it may take some time to create extracts. You can view the status of your Salesforce extracts on the Background Tasks for Extracts administrative view.

To see your project and other content you have access to, from the navigation menu, click **Explore**.

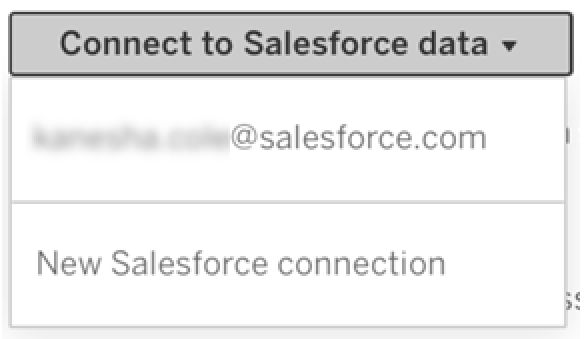


### Use existing Salesforce credentials

If you've already connected to Salesforce, you can use existing credentials to create additional starter workbooks.

From the Integrations tab, click **Connect to Salesforce Data**, and select the Salesforce credentials you want to use from the drop-down menu. Tableau creates a new project every time workbooks publish on your site.

> **Note:** Workbooks will publish on the site with your Salesforce credentials embedded. All users with permission to view the workbook will be able to see data based on these credentials.




## Schedule refreshes to keep data fresh

To make sure you see the latest information when viewing workbooks or connecting to data sources, you'll need to schedule refreshes. By default, the Salesforce data extracts created when publishing starter workbooks will not refresh automatically. For more information about refresh schedules, see Schedule Refreshes on Tableau Cloud.

Follow the steps below to schedule extract refreshes:

1. In Tableau Cloud, navigate to the project containing your Salesforce content.

2. Select the data source you want to refresh, click **Actions**, and choose **Refresh Extracts...**

3. In the Create Extract Refresh dialog window, select the **Refresh Type** and **Refresh Frequency**, and click **Create**.

## Subscriptions

You're automatically subscribed to Salesforce workbooks and will receive notification emails every time the data is refreshed. If you want to update your subscription preferences, see Create a Subscription to a View or Workbook.

## Change permissions for projects, workbooks, and data sources

After connecting to your Salesforce data, you can choose how users interact with the Salesforce project, workbooks, and data sources published on your site. Permissions are a great way to make sure the right users have access to the starter content and enable them to build workbooks of their own. For more information about configuring permissions on your site, see Permissions.

## Create workbooks in Tableau Cloud

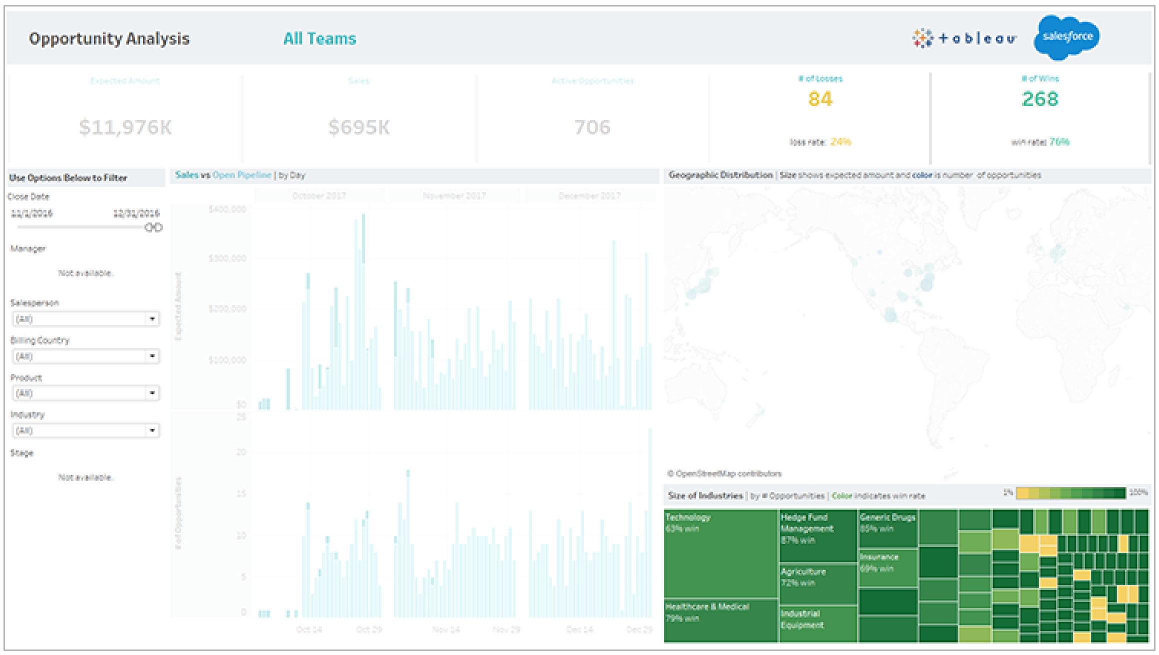
With your Salesforce data sources, you can create new workbooks through web authoring in Tableau Cloud or use Ask Data to query and create visualizations automatically.

- **Web Authoring:** Connect to your data directly in Tableau Cloud to explore and create custom data visualizations of your own. For more information, see Creators: Get Started with Web Authoring in Tableau Desktop help.

- **Ask Data:** Interact with your data by simply typing a question and see automatic data visualizations in response. For more information, see Automatically Build Views with Ask Data in Tableau Desktop help.

## Fix grayed-out views by replacing field names

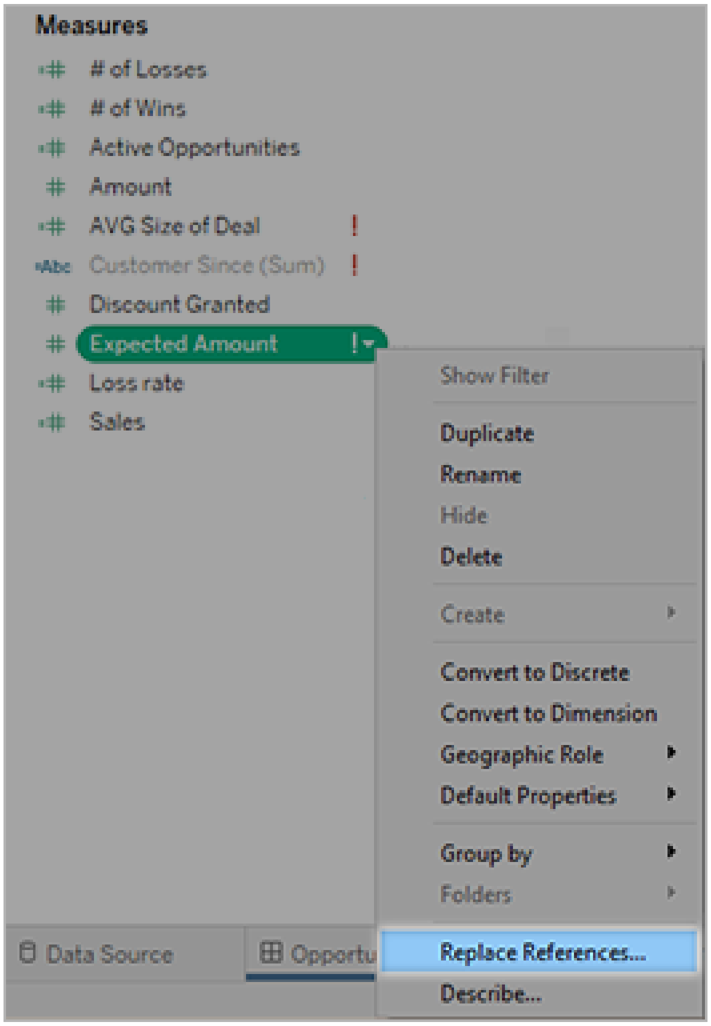
If your organization has customized the data structure of your Salesforce data, you may need to match those changes in the starter workbooks after your data loads in them. For example, if your organization has renamed the Salesforce “Account” field to “Customer”, you'll need to make a corresponding change in workbooks to avoid grayed-out views like this:




To fix grayed-out views:

1. Above the dashboard, click **Edit**.
2. Navigate directly to the grayed-out sheet.
3. In the Data pane at the left, look for red exclamation points (!) next to field names, which indicate that your organization uses different names.

4. Right-click each of those fields, and choose **Replace References**. Then select the correct field name from the list.




# About Tableau+

Tableau+, a license edition of Tableau Cloud, is a comprehensive package tailored for wall-to-wall adoption of self-service analytics in Tableau Cloud. It encompasses premium features tailored for larger or more complex deployments and access to Premier Success. With Tableau+, customers can harness AI-powered visual analytics and insights from their data, wherever it is.

## Tableau+ Licensing

Tableau+ is sold on a per-User basis, with Users differentiated by role - Creators, Explorers, and Viewers. Tableau+ provides a unique package of product capabilities for use by each User, including some features that are sold on a Usage-based model; Data Cloud credits and Einstein Requests. Each Tableau+ Deployment includes a set quantity of Data Cloud credits irrespective of the number of Users, whereas each Tableau+ license role level includes a different volume of Einstein Requests, tailored for the anticipated needs of Users at each role level. Importantly, none of these credits are tied to any User individually. When customers purchase Tableau+ for their Tableau Cloud Deployment, the full quantity of Data Cloud credits and Einstein Requests for all Tableau+ subscriptions are provisioned up-front at subscription start for the quoted term and are available for use by all Tableau+ Users in the Deployment.

For information about these license models, see Understanding License Models.

## Tableau+ Feature Table

The following table lists the features that are included with the Tableau+ license edition. Feature availability below is for Creator. There are differences in available functionality between Creator, Explorer, and Viewer.

For information about configuring Tableau+ features, see Getting Started with Tableau+.

| Feature | Description |
|---|---|
| Tableau Authoring | Use Tableau Desktop or Tableau web authoring on Tableau Cloud to create, collaborate, and share insights about your data. Tableau provides you a way to identify and solve problems, or highlight key findings in a visual and easily understandable way. |
| Tableau Prep | Tableau Prep is a data preparation tool for cleaning, shaping, and combining data for analysis. |
| eLearning | Role-based training Tableau Learning Paths provide a clear track to proficiency with the most up-to-date Tableau training |

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| | content. Assessments help you evaluate where you are in your learning path and give you confidence in your new skills. Accelerate the onboarding process for new employees and help more experienced users get the most out of Tableau capabilities. |
| Tableau Pulse | Tableau Pulse provides insights about your data as a digest sent to subscribed members of an organization. These digests of Pulse insights can surface trends, outliers, and other changes, keeping you up to date on the data relevant to your work.<br><br>For information about setting Pulse up, see Set Up Your Site for Tableau Pulse |
| Tableau Agent in Tableau in Prep<br><br>Tableau Agent in Tableau in Catalog | Tableau Agent is an intelligent assistant that accelerates time to insight in Tableau Prep and Catalog.<br><br>For information about configuring your Tableau Cloud site for AI in Tableau, see Turn On AI in Tableau for Your Site. |
| Tableau Agent in Tableau Cloud Web Authoring | Tableau Agent in Tableau Cloud web authoring is an intelligent assistant that accelerates time to insight with automated data analysis.<br><br>For information about enabling Tableau Agent in Tableau Cloud web authoring, see Turn On AI in Tableau for Your Site. |
| Einstein Requests | Einstein Requests give customers access to generative AI capabilities within Salesforce products, including Tableau Cloud.<br><br>For those that do not have a Salesforce org at the Enterprise edition level or higher, one will be provided as part of Tableau+. |

| | |
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| Data Connect | Data Connect allows seamless access to data across on-premises and private cloud environments in Tableau Cloud without significant increases in IT overhead.<br><br>One Data Connect Node is included with Tableau+. |
| Data Management | Data Management is a collection of features and functionality that helps customers manage Tableau content and data assets in their Tableau Cloud environment.<br><br>One Resource Block Node is included. |
| Advanced Management | Advanced Management is a collection of features designed to provide enhanced security, manageability, and scalability capabilities for Tableau Cloud. |
| Use Tableau Cloud Manager | Tableau Cloud Manager (TCM) provides administrators with a centralized management interface for overseeing their organization's Tableau Cloud sites. With TCM, cloud administrators can create and edit sites, manage users, and monitor license consumption across multiple sites in their tenant, all from a single location.<br><br>Cloud administrators can manage up to 50 sites with a Tableau+ license. |
| Data Cloud | Salesforce Data Cloud makes all Salesforce data natively available in Tableau, allowing you to unify enterprise data, harness the power of metadata, and drive AI results from that data.<br><br>250,000 Data Cloud credits are included with Tableau+. |
| Premier Success | The Premier Success Plan helps you start strong, grow your business, and get more value from Salesforce with expert guidance and expedited support. |

# Getting Started with Tableau+

Tableau+, a license edition of Tableau Cloud, is a comprehensive package tailored for wall-to-wall adoption of self-service analytics in Tableau Cloud. It encompasses premium features tailored for larger or more complex deployments and access to Premier Success. With Tableau+, customers can harness AI-powered visual analytics and insights from their data, wherever it is. Tableau+ includes some features that require configuration, and this topic describes what you need to do for each of them. Some are unique to Tableau+ while others are shared with other editions of Tableau Cloud. A few require configuration in Salesforce.

Initial steps depend on what type of customer you are:

- New Tableau customers

  As a new Tableau Cloud customer you should get familiar with Tableau Cloud before you explore the unique features of Tableau+. See Get Started and About Tableau+ to begin, then follow the configuration steps below.

- Existing Tableau Cloud customers

  For existing Tableau Cloud customers who upgrade to Tableau+, there is little to do regarding “migrating.” Your existing sites remain (there’s no need to “migrate” them), but unique Tableau+ features some configuration.

## Configure Tableau Cloud and Salesforce for Tableau+ features

These Tableau+ features require configuration before you can use them:

- **Tableau Pulse**: Set Up Your Site for Tableau Pulse (Note: Be sure to enable Tableau Pulse summaries of key metrics, which is described in the same topic, here: Turn on Tableau AI.

- **Tableau Agent** in Prep, Catalog, and Web authoring: Turn On AI in Tableau for Your Site to enable Tableau Agent. This requires configuration on each site and in a

Salesforce org that has Einstein generative AI configured. It also requires a Data Cloud instance. A Cloud instance is provided to Tableau+ customers who do not have one.

- Einstein Request Credits: This gives customers access to generative AI capabilities within Salesforce products, including Tableau Cloud.

  For those that do not have an Enterprise edition level or higher Salesforce org, one will be provided as part of Tableau+.

- **Data Cloud** Configure Data Cloud by setting up an admin user and turning Data Cloud on: Set up a Data Cloud Admin User.

The following features are not unique to Tableau+ but provide additional important functionality in your Tableau Cloud instance:

- Data Connect for Private Network Data for access to private network data (includes one node).
- **Data Management**: About Data Management (comes with one resource block. For more information, see Resource Blocks).
- **Advanced Management**: About Tableau Advanced Management on Tableau Cloud
- **Tableau Cloud Manager**: Manage multiple Tableau Cloud sites using TCM. Tableau+ customers get up to 50 sites. For details about using TCM, see Use Tableau Cloud Manager.
- Premier Success: Get maximum value from Tableau with expert guidance and expedited support.
- eLearning: Learn Tableau on your own schedule using self-paced online courses.

# About Tableau Enterprise

Tableau Enterprise is our advanced software package to help you explore and manage data faster with Tableau Cloud. It also makes it easier to purchase the capabilities needed by organizations that require advanced data and deployment management options. It includes Tableau role-based licenses, Data Management, Advanced Management, and eLearning for Creators and Explorers.

## Tableau Enterprise Licensing

Tableau Enterprise is sold on a per-User role-based licensing model, including Creators, Explorers, and Viewers. This model is structured around the specific roles within an organization, each requiring different levels of functionality. With Tableau Enterprise, each role-based license includes Data Management, Advanced Management, and eLearning for Creators and Explorers.

## Tableau Enterprise Feature Table

The following table lists the features that are included with the Tableau Enterprise license edition. Feature availability below is noted for Creator. There are differences in available functionality between Creator, Explorer, and Viewer.

| Feature | Description |
|---|---|
| Tableau Authoring | Use Tableau Desktop or Tableau web authoring on Tableau Cloud to create, collaborate, and share insights about your data. Tableau provides you a way to identify and solve problems, or highlight key findings in a visual and easily understandable way. |
| Tableau Prep | Tableau Prep is a data preparation tool for cleaning, shaping, and combining data for analysis. |
| eLearning | Role-based training Tableau Learning Paths provide a clear track to proficiency with the most up-to-date Tableau training content. Assessments help you evaluate |

| | |
|---|---|
| | where you are in your learning path and give you confidence in your new skills. Accelerate the onboarding process for new employees and help more experienced users get the most out of Tableau capabilities. |
| About Tableau Pulse<br><br>(Tableau Cloud only) | Tableau Pulse provides insights about your data as a digest sent to subscribed members of an organization. These digests of Pulse insights can surface trends, outliers, and other changes, keeping you up to date on the data relevant to your work.<br><br>For information about setting Pulse up, see Set Up Your Site for Tableau Pulse |
| About Data Management | Data Management is a collection of features and capabilities that helps customers manage Tableau content and data assets in their Tableau Cloud environment.<br><br>One Resource Block Node is included with Tableau Enterprise. |
| About Tableau Advanced Management on Tableau Cloud | Advanced Management is a collection of features and capabilities designed to provide enhanced security, manageability, and scalability for Tableau Cloud. |
| Use Tableau Cloud Manager | Tableau Cloud Manager (TCM) provides administrators with a centralized management interface for overseeing their organization's Tableau Cloud sites. With TCM, cloud administrators can create and edit sites, manage users, and monitor |

| | |
|---|---|
| | license consumption across multiple sites in their tenant, all from a single location.<br><br>Cloud administrators can manage up to 10 sites with an Enterprise license. |
| About Data Connect | Data Connect allows seamless access to data across on-premises and private cloud environments in Tableau Cloudwithout significant increases in IT overhead.<br><br>Not included by default in Tableau Enterprise, but available for purchase separately. |

# Use Tableau Cloud Manager

Tableau Cloud Manager (TCM) provides administrators with a centralized management interface for overseeing their organization's Tableau Cloud sites. With TCM, cloud administrators can create and edit sites, manage users, and monitor license consumption across multiple sites, all from a single location. Any changes made within TCM are applied at the top level, or tenant, and then shared across all associated sites, ensuring streamlined administration and governance.

For information about Tableau Cloud Manager REST API capabilities, see Tableau Cloud Manager REST API.

Cloud administrators are the only users with access to Tableau Cloud Manager, a role assigned explicitly within TCM. While most cloud administrators typically access a single TCM tenant, your organization's structure may permit access to multiple tenants.

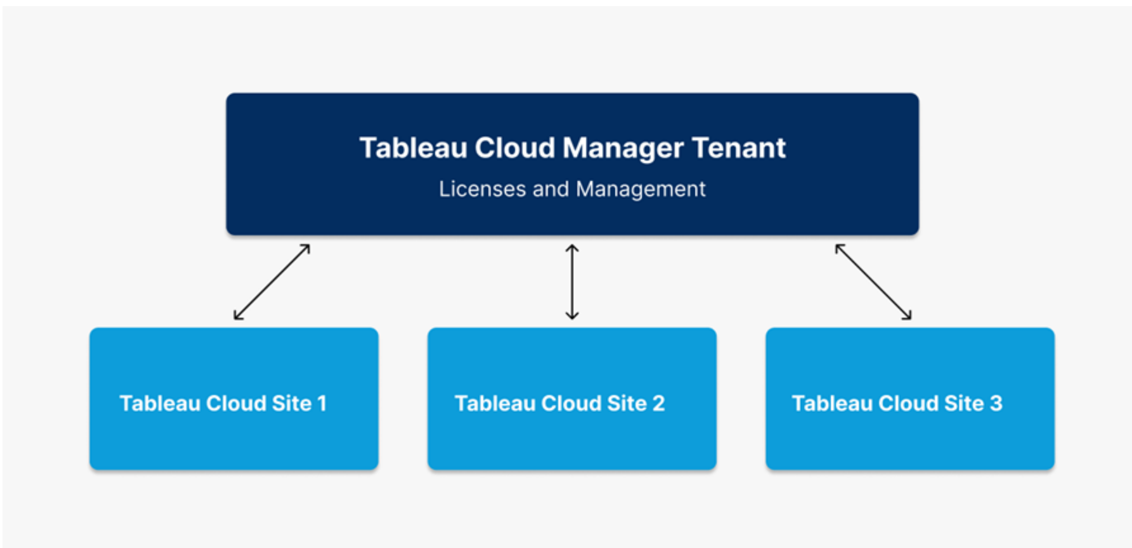
Now that we've discussed the capabilities of TCM, let's explore the concepts it manages within Tableau Cloud.

## Understanding tenant and site administration in Tableau Cloud

Before you jump into Tableau Cloud Manager (TCM), it's important to learn the concepts of tenant and site to understand the administrative structure of Tableau Cloud.

**Tenant:** A tenant in Tableau Cloud is the top-level administrative layer that encompasses your organization's Tableau Cloud deployment. Think of a tenant as the container that holds all your sites, users, and licenses. Cloud administrators operate at this level through TCM, ensuring centralized control over Tableau Cloud. Within this structure, TCM acts as a centralized location to configure changes for multiple sites, such as adding or deleting users and license management.

**Site:** A site, by comparison, is under the tenant and can be thought of as a workspace or a dedicated environment for a specific team, department, or project. Each site has its own set of content, users, and permissions, which site administrators manage. While site administrators have control over their individual sites, including managing workbooks, data sources, and user access, they operate within the constraints set at the tenant level. Sites provide a focused area for collaboration and analytics without exposing the administrative functions of the tenant.




In summary, the tenant is the administrative layer that holds all the sites, and a site is a contained environment where teams can work independently. This structure allows for centralized control at the tenant level and flexible management at the site level, enabling organizations to scale their use of Tableau Cloud efficiently and securely.

# Cloud Administrator Role and Tasks

This topic outlines the role of a cloud administrator, highlighting how it differs from the site administrator role, and defines the core responsibilities involved in Tableau Cloud Manager

(TCM).

## How we define the cloud administrator role

The cloud administrator is responsible for overseeing the Tableau Cloud sites in your organization. Unlike the site administrator, who manages specific site settings and content permissions, the cloud administrator operates at the tenant level, handling broader responsibilities such as user management across multiple sites, license monitoring, and site creation. For more information about tenant and site administration in Tableau Cloud, see Understanding tenant and site administration in Tableau Cloud.

### Licensing and access

The role of a cloud administrator is unique compared to traditional site roles. Cloud administrators only have access to Tableau Cloud Manager, and because they don't have site access, they don't consume a Tableau Cloud license. If site access is required, cloud administrators can assign themselves a site role through TCM, thus gaining access to any site within the tenant.

## Key responsibilities of a cloud administrator

The following are the primary responsibilities of cloud administrators in Tableau Cloud Manager:

- **Manage users across sites:** Cloud administrators oversee users across all sites within Tableau Cloud, such as adding or removing users and adjusting site roles at the tenant level.

- **Bulk upload users across sites:** Cloud administrators can import large numbers of users and configure site access using CSV files. Bulk upload is beneficial for managing user access across multiple sites in large-scale deployments.

- **Track overall licenses:** Cloud administrators actively monitor and manage Tableau Cloud licenses by setting site role limits, enabling site administrators to add users up to a specified count.

- **Create sites:** Cloud administrators are responsible for the creation and deletion of sites within Tableau Cloud. They set the initial framework of sites by assigning the name, region, and initial site administrator. After configuring a site, admin responsibility is then passed to site administrators who manage site level operations.

## Tasks outside the cloud administrator's scope

Cloud administrators focus on tenant-level management and don't directly handle the day-to-day management of specific sites. To gain site access and perform tasks such as setting specific site permissions, managing content, and customizing sites in detail, they must also be assigned the site administrator role. For more information about modifying a user's site membership, see Manage users' site membership.

In this topic, we reviewed the differences between the roles of cloud administrator and site administrator. However, in your organization, the same person might cover both roles. In practice, you can divide these responsibilities in the way that works best for your environment.

# Sign In to Tableau Cloud Manager

Cloud administrators can sign in to Tableau Cloud Manager (TCM) from the Tableau Cloud sign-in page. If you have access to more than one resource, such as sites or tenants, you can navigate between them from the site picker menu after authenticating. When you're added as a cloud administrator, you receive an email with a link to access TCM. For more information about adding users, see Manage Users With Tableau Cloud Manager.

## Sign-in options and steps

Depending on how Tableau Cloud Manager (TCM) is set up, you'll use one of the following ways to sign in as a cloud administrator (also referred to as *authentication* types):

- **Single sign-on**

  Single sign-on (SSO) means that TCM is set up to use the same username and password (credentials) you use for other applications in your company.

  With SSO, your credentials are managed outside of Tableau by a third-party identity provider (IdP). When you sign in to TCM, it's the IdP that lets Tableau know you're an approved user. TCM supports authentication through Google and Salesforce.

- **Tableau with MFA**

  When multi-factor authentication (MFA) is enabled with Tableau authentication (also known as TableauID), you use a combination of your Tableau with MFA credentials and a verification method to access TCM.

  TableauID credentials are made up of an email address and password that you use for accessing TCM. These credentials also give you access to other content on the Tableau website such as white papers. You can choose a verification method after you register for MFA. For more information, see Register for multi-factor authentication.

## How to know which type of credentials TCM uses

If Tableau Cloud Manager (TCM) is set up for single sign-on (SSO) credentials, a cloud administrator notifies you, and you use the same username and password you do for signing in to other applications in your organization.

If TCM isn't set up for SSO, you can sign in using Tableau with MFA. In this case, you receive an email invitation to TCM. When you click the link in the email, you can create your password. That email address and password become your TableauID. Then, you're prompted to register at least one verification method to confirm your identity each time you sign in.

## Sign in to Tableau Cloud Manager

Do one of the following depending on the authentication type:

For SSO

1. On the Tableau Cloud sign-in page, enter your email address and click **Sign In**.
2. Enter the Uniform Resource Identifier (URI) for the Tableau Cloud Manager (TCM) you want to access, and then click **Continue**. You're directed to the sign-in form for the identity provider to complete authentication.

   The URI is a unique identifier for TCM and appears in the URL after authenticating. For example, https://**cloudmanageruri**.cloudmanager.tableau.com. To quickly redirect and authenticate to TCM, bookmark the URL.

   > **Note:** If you don't remember the Cloud Manager URI, click **Forgot URI** and follow the instructions to verify your email address. Only one verification code can be issued within a five-minute period. If you don't see the email, check your spam folder for a message from Tableau. It's important to enter the code correctly, as multiple incorrect attempts cause the code to expire. After verification, you're redirected to a list that displays the TCM and sites associated with your username. You don't need to verify your email address again for 30 days on this client.

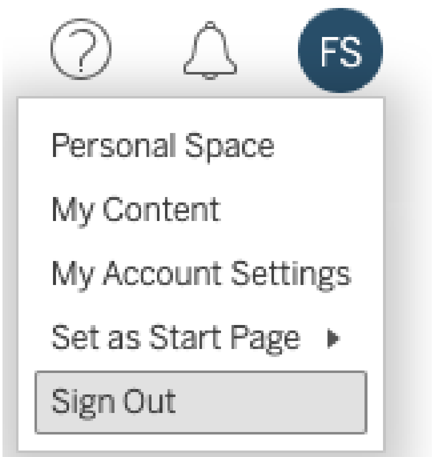
For Tableau with MFA

1. On the Tableau Cloud sign-in page, enter your email address and password, and then click **Sign In**.
2. Enter the Uniform Resource Identifier (URI) for the Tableau Cloud Manager (TCM) you want to access, and then click **Continue**.
3. Enter your password and click **Sign In** again.
4. To complete the sign-in process, follow the Tableau Cloud prompt to verify your identity using the method you chose during MFA registration.

- If you're signing in to TCM or registering for MFA for the first time, see Register for multi-factor authentication.
- If you've only registered one verification method (built-in authenticator, security key, or recovery codes) when signing in to TCM, you're prompted to register an additional backup verification method.

### Sign out

To sign out, select your display name in the upper-right corner of any page, and then select **Sign Out**.




If Tableau Cloud Manager (TCM) uses single sign-on and you don't see an option to sign out, close the browser tab or window. The sign-out link doesn't appear if TCM and the identity provider managing your company's user information aren't configured to support single log-out.

## Remember your sign-in credentials

If you want Tableau Cloud to remember your username, select **Remember me** on the sign-in page. This will populate your username the next time you sign in, but you'll still need to enter your password.

For SSO authentication, Tableau remembers your username and sets a default Tableau Cloud Manager (TCM). When you sign in again, your username is populated, and you're redirected to the IdP for authentication without being prompted for the Cloud Manager URI.

In both scenarios, the default TCM is replaced if:

- You sign in to a different TCM and select **Remember me** again.
- You use deep links, URLs that point to specific pages, to access Tableau Cloud and select **Remember me** when signing in to that TCM.

To have Tableau Cloud forget your user information, clear your web browser's cookies.

## Register for multi-factor authentication

To help ensure account security, multi-factor authentication (MFA) is a required security measure for all Tableau Cloud accounts. With MFA enabled, you must register at least one verification method for identity confirmation each time you sign in to Tableau Cloud Manager.

MFA is a secure account authentication method that requires you to prove your identity by providing two or more pieces of verification information, also known as “factors”, when you sign in to Tableau Cloud. The first factor is the username and password you use to sign in to Tableau Cloud (that is, your TableauID credentials). The additional factor is a code generated by an authenticator app, such as Salesforce Authenticator or a third-party time-based one-time passcode (TOTP) app.

To compare supported verification methods and review usage requirements, see Verification Methods for Multi-Factor Authentication in Salesforce Help.

**Important:**

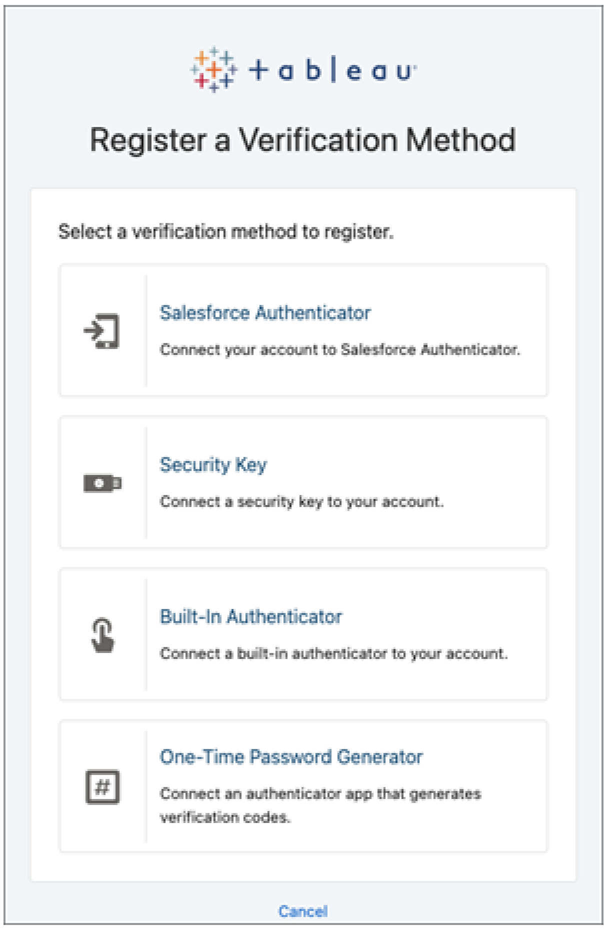
- In most cases, verification methods for Tableau Cloud are mobile authenticator apps that you must install on a mobile phone.
- Recovery Codes option is only available to you after registering your initial set of verification methods.

To register for MFA:

1. Sign in to Tableau Cloud Manager with your username and password. You're prompted to register for MFA.

2. Select a verification method.

   For example, click **Salesforce Authenticator**.



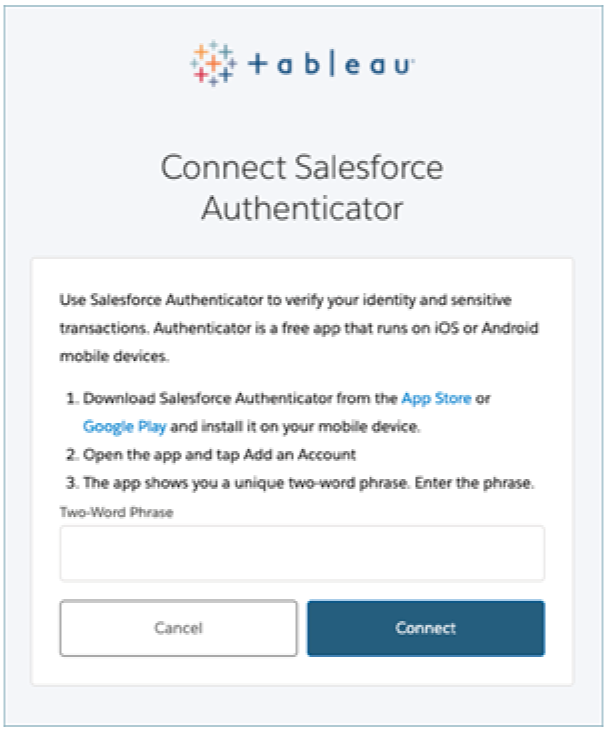

3. Follow the steps in the dialog to associate the selected verification method with your Tableau Cloud account.

   For example, if you selected the Salesforce Authenticator app in step 2, you're prompted to do the following:

a. On an iOS or Android mobile device, download and install the free Salesforce Authenticator app from the App Store or Google Play.

b. On the mobile device, after the app installation completes, open the app and tap **Add an Account**.

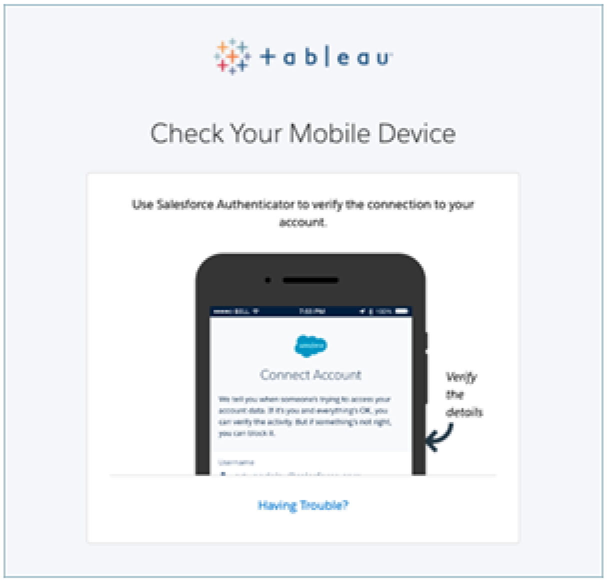
c. In Tableau Cloud, enter the two-word phrase from the app in the dialog and click **Connect**.




4. To complete the sign-in process, Tableau Cloud prompts you to approve the request through the authenticator app on the mobile device. By accepting the request, you're verifying your identity. You're then redirected to Tableau Cloud Manager.

   For example, if using the Salesforce Authenticator verification method, do the following:

a. When Tableau Cloud shows you the following prompt, respond to the push notification on your mobile device.




b. In the Salesforce Authenticator app, verify the request details are correct.

c. Tap **Approve**. You’re redirected to Tableau Cloud Manager.

# Tableau Cloud Manager Authentication

Authentication refers to the options for how cloud administrators can sign in to Tableau Cloud Manager (TCM), and how they access it after signing in the first time. Authentication verifies a user’s identity.

TCM supports multiple authentication types, which you can configure on the **Settings** page. The configuration steps discussed in this topic are limited to TCM, with site administrators configuring site authentication separately.

## Authentication requirements

Regardless of the authentication type you configure, multi-factor authentication (MFA) is the default and mandatory authentication method when accessing TCM. MFA ensures that users provide an additional verification method beyond their primary credentials, significantly enhancing sign-in security and protecting your organization's data.

### Implementing MFA

Multi-factor authentication (MFA) is a multi-step login process that requires users to provide more than just a password to access their accounts. MFA can be implemented in one of two ways:

- **Single sign-on (SSO) and MFA (recommended method):** To satisfy the MFA requirement, enable MFA with your Google or Salesforce identity provider (IdP).
- **Tableau with MFA (alternative method):** If you don't work directly with an SSO IdP, you can instead enable a combination of 1) Tableau with MFA credentials, which are stored with Tableau, and 2) an additional verification method before cloud administrators access TCM. We also recommend that users set up recovery codes as a backup verification method for emergency cases only. For more information, see Multi-Factor Authentication and Tableau Cloud.

## Supported authentication types

Tableau Cloud Manager (TCM) supports the following authentication types:

- **SSO:** If you enable external authentication on TCM, you can select which users you want to sign in using external credentials, and which to use Tableau credentials. You can allow Tableau with MFA and one external provider on TCM, but each user must be set to use one or the other type. You can configure user authentication options on the Users page. For more information, see Manage Users With Tableau Cloud Manager.
    - **Google:** If your organization uses Google applications, you can enable TCM to use Google accounts for single sign-on (SSO) with MFA using OpenID Connect (OIDC). When you enable Google authentication, users are directed to the Google sign-in page to enter their credentials, which are stored with Google.

- **Salesforce:** If your organization uses Salesforce, you can enable TCM to use Salesforce accounts for single sign-on (SSO) with MFA using OpenID Connect (OIDC). When you enable Salesforce authentication, users are directed to the Salesforce sign-in page to enter their credentials, which are stored and managed in Salesforce

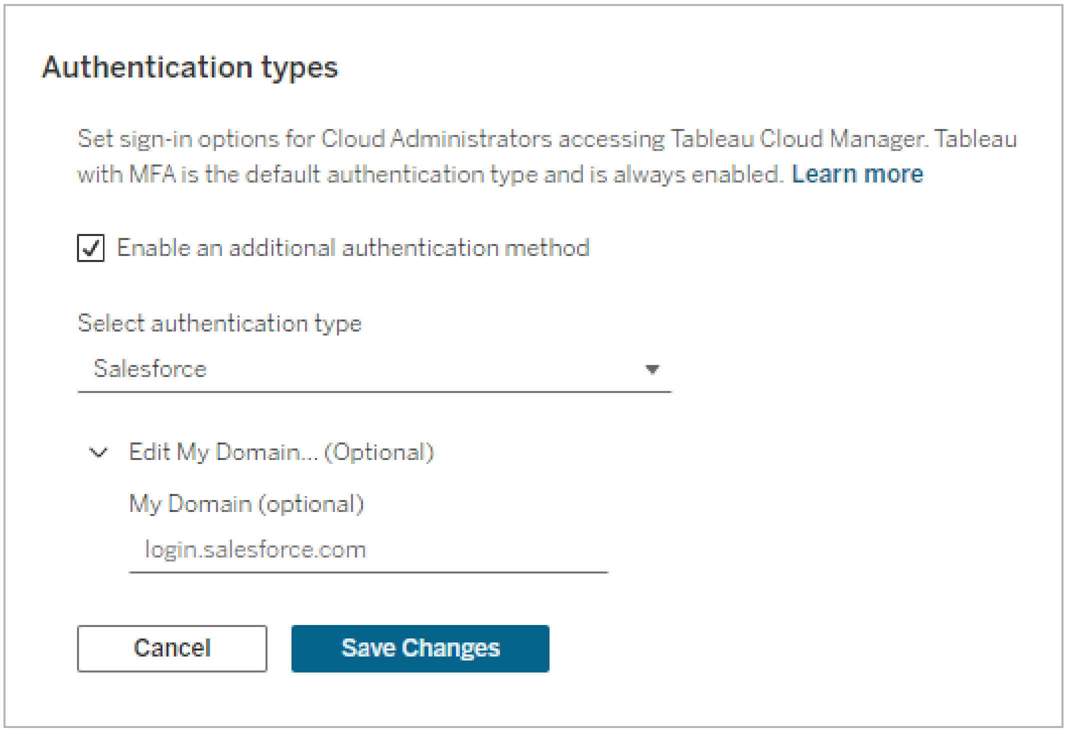
- **Tableau with MFA:** The built-in and default authentication type. It requires users to provide their Tableau ID (username and password stored with TCM) and an MFA verification method, such as an authenticator app or security key, to confirm a user's identity. For more information about supported MFA methods, see Multi-Factor Authentication and Tableau Cloud.

**Important:** In addition to the authentication requirements described above, we recommend that you dedicate a cloud administrator account that is configured for **Tableau with MFA** authentication. If you encounter an issue, a dedicated **Tableau with MFA** account helps ensure that you have access to TCM.

## Step 1: Configure authentication for Tableau Cloud Manager

To configure authentication in Tableau Cloud Manager (TCM), follow these steps:

1. Sign in to Tableau Cloud Manager as a cloud administrator.
2. Navigate to the **Settings** page.
3. Under **Authentication types**, select **Enable an additional authentication method**.
4. From the dropdown menu, select your preferred authentication type.




5. Click **Save Changes**.

## Step 2: Assign authentication to cloud administrators

After configuring TCM authentication, you can assign the authentication method to cloud administrators on the Users page. For more information about changing other user details, see Manage Users With Tableau Cloud Manager.

To assign authentication, follow these steps:

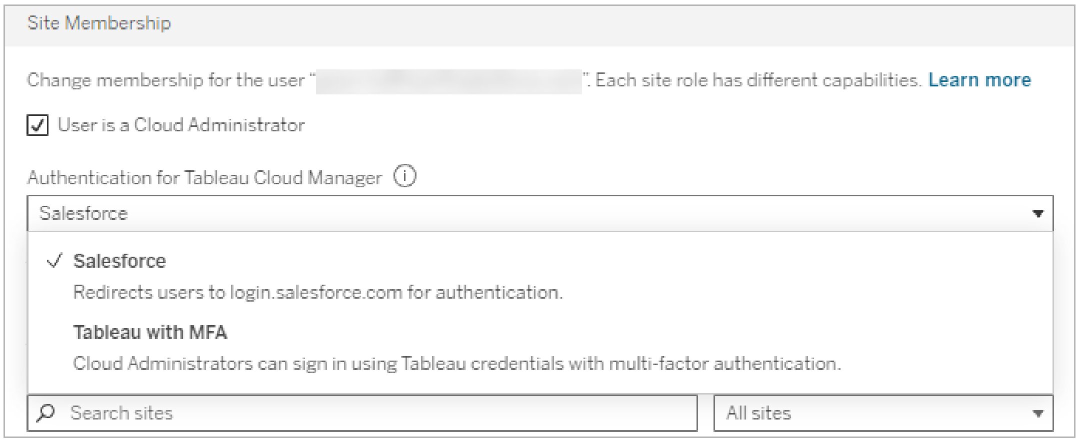
1. Sign in to Tableau Cloud Manager as a cloud administrator.

2. Navigate to the **Users** page and select the users to modify.

> **Note:** You can select up to 50 users at a time. To modify more than 50 users, import a CSV file containing the desired changes. For more information about modifying users in bulk, see Bulk import users.

3. Select **Actions** > **Site Membership**.

4. Select an authentication method from the Authentication for Tableau Cloud Manager dropdown menu.




5. Click **Save**.

## Configure authentication for Tableau Cloud sites

Site authentication is configurable only by site administrators directly at the site level. If you're a cloud administrator, you must also have site administrator privileges to change authentication settings.

To modify site authentication, follow these steps:

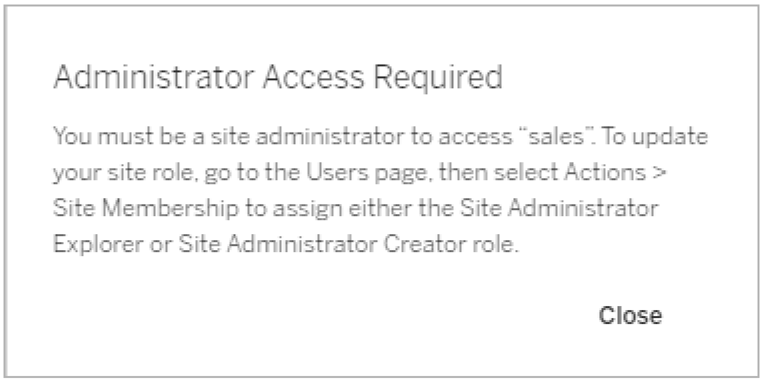
1. Sign in to Tableau Cloud Manager as a cloud administrator.

2. Navigate to the **Sites** page.

3. Click the ellipsis icon (**...**) next to the site you want to modify.

4. From the **Actions** menu, select **Authentication Type** to redirect to the site's authentication settings. For more information about configuring site authentication as a site administrator, see Authentication.

If you're not a site administrator, a dialog is displayed with instructions on how to assign the necessary role. You must be a site administrator with the Site Administrator Explorer or Site Administrator Creator role to proceed with configuring site authentication.




### Assign user authentication for site users

As a cloud administrator, you can't directly configure site authentication settings. However, if multiple authentication methods are set up on the site, you can modify a user's authentication to a site on the Users page of Tableau Cloud Manager. For more information, see Manage users' site membership.

# Personal Access Tokens for Tableau Cloud Manager

Personal access tokens (PATs) provide you with the ability to create long-lived authentication tokens. PATs enable you to sign in to the Tableau Cloud Manager REST API without requiring hard-coded credentials (username and password) or interactive sign-in. For more information, see Tableau Cloud Manager REST API.

**Note:** Tableau Cloud Manager PATs can’t be used to sign in to the Tableau REST API, which is used to manage and change Tableau Cloud site resources.

We recommend creating PATs for automated scripts and tasks that are created with the Tableau Cloud Manager REST API:

- **Improve security:** PATs reduce risk in the event credentials are compromised. Instead of using a username and password, users can reduce the impact of credential compromise by using a personal access token for automated tasks. If a PAT gets compromised or is used in automation that’s failing or posing a risk, you can revoke the PAT instead of rotating or revoking the user's credentials.

- **Manage automation:** A PAT can be created for each script or task that is run. This allows you to silo and review automation tasks across your organization. Additionally, by using PATs, password resets, or metadata changes (username, email, etc.) on user accounts don’t disrupt automation as it does when credentials are hard-coded into the scripts.

**Notes:**

- PATs are required to make a Tableau Cloud Manager REST API sign-in request to Tableau Cloud Manager (TCM) with multi-factor authentication (MFA) enabled with Tableau authentication.

- PATs aren’t used for generic client access to TCM.

- PATs are automatically revoked when the TCM authentication method changes.

## Understand personal access tokens

When a personal access token (PAT) is created, it’s hashed then stored in the repository. After the PAT is hashed and stored, the PAT secret is shown one time to the user and then no longer accessible after they dismiss the dialog. Therefore, users are instructed to copy the PAT to a safe place and handle it like a password.

When the PAT is used at run-time, Tableau Cloud Manager (TCM) compares the PAT presented by the user to the hashed value stored in the repository. If a match is made, then an authenticated session is started. In the context of authorization, the TCM session that is authenticated with a PAT has the same access and privileges as the PAT owner.

### About PAT expiration

Personal access tokens (PATs) expire if not used after 15 consecutive days or based on the token expiration value selected when creating the PAT, whichever comes first.

After PATs expire, they're unable to be used for authentication and removed from the cloud administrator's **My Account Settings** page.

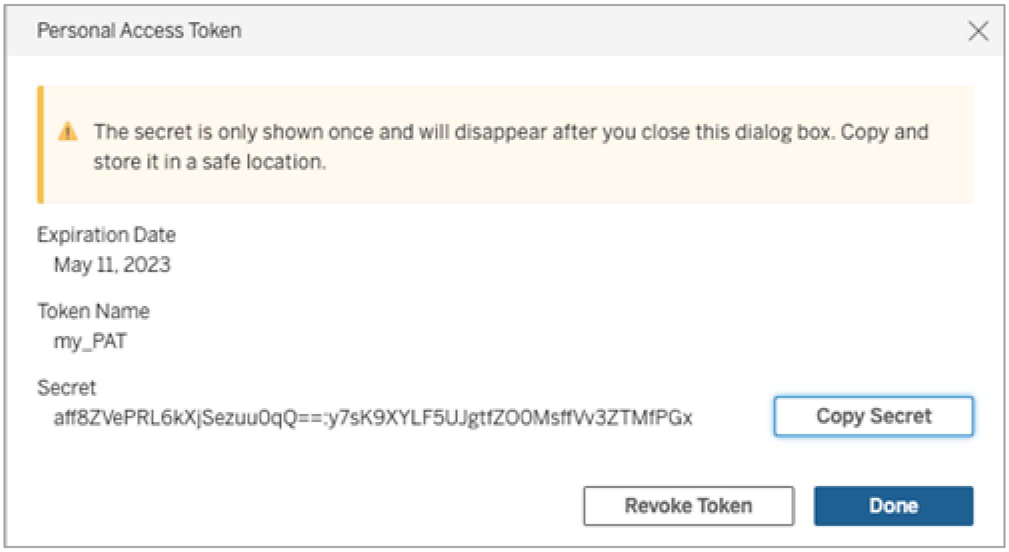
## Tasks for managing cloud administrator's personal access tokens

### Create a PAT

This procedure requires you to copy a secret to a file. The secret is the string that you include in your automation scripts and will be used to authenticate to Tableau Cloud Manager (TCM). Handle the secret as you would a password: protect the secret and don’t share it with others.

To create a PAT, follow these steps:

1. Sign in to Tableau Cloud Manager as a cloud administrator.
2. At the top of a page, click your profile image or initials, and then select **My Account Settings**.
3. Under **Personal Access Tokens**, click **Create Token**.
4. Enter a descriptive name for your token in the **Token Name** field.
5. Select the token expiration date and click **Create Token**.
6. In the Personal Access Token dialog box, click **Copy Secret**.




7. Paste the secret to a file and store the file in a safe location.

8. When finished, click **Done**.

**Note:** A user can have up to 104 PATs.

## Revoke a PAT

Cloud administrators can revoke their PAT on their My Account Settings page using the following steps:

1. Sign in to Tableau Cloud Manager as a cloud administrator.

2. At the top of a page, click your profile image or initials, and then select **My Account Settings**.

3. Under the **Personal Access Tokens** section, identify the PAT that you want to revoke and then click **Revoke Token**.

4. In the Delete dialog, click **Delete**.

# Add, Delete, or Activate Sites

In Tableau Cloud Manager (TCM), the sites you manage correspond to the Tableau Cloud sites within your organization. By default, a tenant contains up to 3 sites, but this capacity increases with different license types – up to 10 sites with an Enterprise license and a maximum of 50 with a Tableau+ license.

> **Note:** Multi-Site Pilot Program customers aren't eligible to manage multiple sites using Tableau Cloud Manager. For more information about feature availability, contact your Tableau account representative.

The **Sites** page contains data for each site in your tenant, including site location, user count, and storage usage. TCM allows you to manage sites and users, but doesn't extend to the governance of content and site settings. These capabilities are reserved for users with the site administrator role, who have the necessary access and permissions at the site level.

This topic walks you through the steps to add new sites and modify existing ones in TCM.

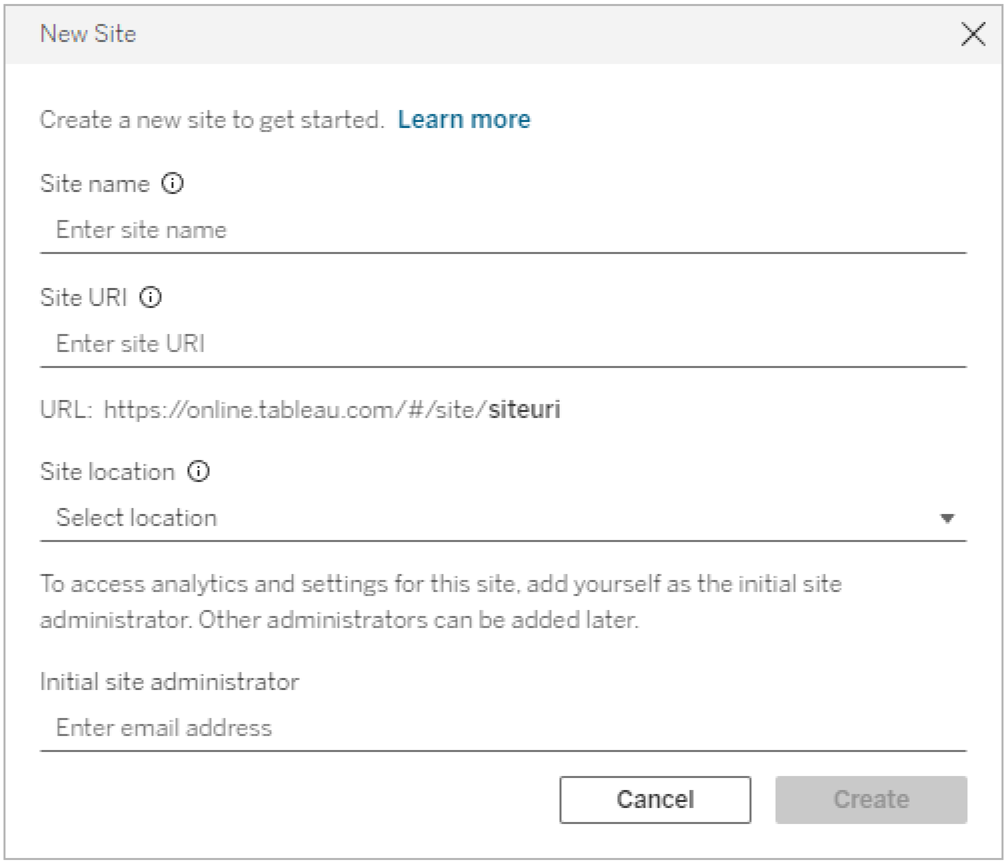
## Add sites

As a cloud administrator, you can expand your organization's capabilities within Tableau Cloud by adding new sites. Tableau recommends creating sites when you must manage a unique set of users and their content separately from others. Consider creating a site for the following scenarios:

- **Environment Separation:** To differentiate between development, testing, and production environments.
- **Project Isolation:** For projects that require confidentiality or are independent of existing projects.
- **Regional Requirements:** When expanding to new regions or to comply with specific data residency and privacy laws.

To add a site, follow these steps:

1. Sign in to Tableau Cloud Manager as a cloud administrator.
2. On the **Sites** page, click **New Site**.
3. Complete the fields in the New Site dialog:




   a. **Site name:** A name for the Tableau Cloud site. The site name can be the name of your organization or for a specific team, such as Sales or Marketing. Providing a descriptive name allows users to quickly understand the intended purpose of the site.

b. **Site URI:** The uniform resource identifier (URI) that users enter to sign in to the site.

c. **Site location:** The region or pod where the Tableau Cloud site is hosted. We suggest selecting the closest location to your user base.

d. **Initial site administrator:** Email address of the initial site administrator. To access analytics and settings for the site, add yourself as the initial site administrator. Other site administrators can be added later.

4. Review the values and click **Create**.

The initial site administrator receives an email with steps to sign in to the site. For more information, see Sign In to Tableau Cloud.

### Modify site authentication

Site authentication is only configurable by site administrators, directly at the site level. If you're a cloud administrator, you must also have site administrator privileges to change authentication settings. For more information, see Configure authentication for Tableau Cloud sites.

## Delete sites

Deleting a site deactivates it immediately and schedules it for deletion after 30 days. During this time, the site is inaccessible to users, but you can reactivate it at any time within the 30-day period. Before proceeding with deletion, ensure that site administrators have notified content owners to back up all necessary workbooks and data sources. Site deletion is irreversible after the 30-day period, and all published content will be permanently removed.

> **Note:** In the event that you accidentally delete a site, allow up to 24 hours for the operation to complete before attempting to reactivate the site.

To delete a site, follow these steps:

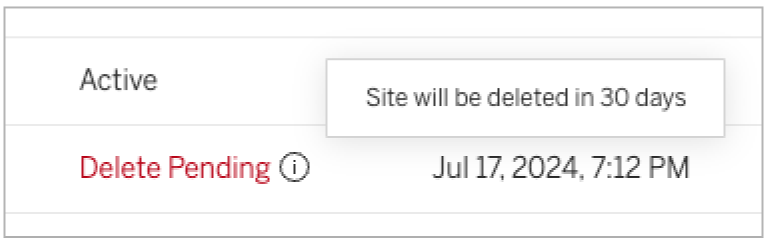
1. Sign in to Tableau Cloud Manager as a cloud administrator.

2. Navigate to the **Sites** page and select the check box next to the site you want to delete.

3. Click the **Actions** menu or ellipsis icon (**...**) and select **Delete**.

4. In the confirmation dialog, click **Delete**. A notification appears, indicating that the site is scheduled for deletion.

After a site is scheduled for deletion, it reflects a "Delete Pending" status and is removed from the Sites page in Cloud Manager upon deletion. To view the remaining days before deletion, hover over the information icon in the **Status** column.




## Activate sites

Cloud administrators can activate a site scheduled for deletion within the 30-day period to prevent permanent removal and ensure continued availability.

To activate a site, follow these steps:

1. Sign in to Tableau Cloud Manager as a cloud administrator.

2. Navigate to the **Sites** page and select the check box next to the site you want to activate.

3. Click the **Actions** menu or ellipsis icon (**...**) and select **Activate**.

4. In the confirmation dialog, click **Activate**.

After a site is activated, it reflects an "Active" status and will be accessible to users again. Activating the site preserves all existing workbooks and data sources without any changes.

## User activation and site roles

When activating a site, users are restored to the roles they held before the site was scheduled for deletion. If there aren’t enough licenses available, such as when other sites consume licenses during the suspended state, users are added until the available license count is exhausted. Any remaining users are unlicensed on the site.

To license the affected users, adjust site role limits across sites. For more information, see Manage Site Role Limits.

# Manage Site Role Limits

In Tableau Cloud Manager (TCM), cloud administrators can set site role limits, which define the maximum number of each license type—Creator, Explorer, or Viewer—that can be consumed by a site. After role limits are created, users on the site automatically consume a license of their assigned role, following the limits set by the cloud administrator.

> **Note:** Cloud administrators only have access to TCM and don't consume a license. To gain site access, you can assign yourself a site role or be assigned one by another cloud admin. For more information, see Manage users’ site membership.

If a user is added to multiple Tableau Cloud sites, they count against the role limit for each individual site. However, for the overall license consumption within TCM, a user only consumes one license. This license corresponds to the max site role they’ve been assigned across all the sites they’re a member of.

Let’s consider the following scenario where a cloud administrator sets site role limits on two sites:

- **Site A:** 3 Creator, 5 Explorer, 10 Viewer licenses
- **Site B:** 2 Creator, 4 Explorer, 6 Viewer licenses

Jane, who works in both sites, is added as a Creator on Site A and an Explorer on Site B. On Site A, Jane is counted as one of the 3 Creators. On Site B, Jane is counted as one of the 4 Explorers

Despite being a member of both sites, Jane only consumes one Creator license in TCM because that is the highest assigned role across sites.

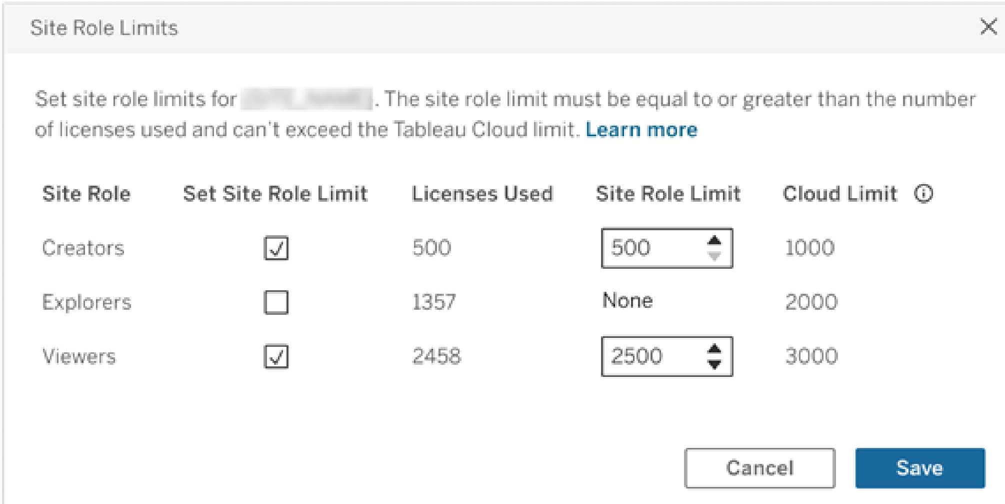
## Create or modify role limits on a site

By default, each site within Tableau Cloud Manager (TCM) uses the *cloud limit*, which is the total number of licenses purchased. When adding users to a site, TCM checks against the cloud limit to ensure that the number of users doesn't exceed the total licenses available.

To manage your organization's Tableau Cloud licenses, cloud administrators can set site role limits. This feature enables control over license allocation across different sites within your tenant.

To set site role limits, follow these steps:

1. Sign in to Tableau Cloud Manager as a cloud administrator.
2. Navigate to the **Sites** page, and select the site you want to modify.
3. Click the **Actions** menu or ellipsis icon (**...**) and select **Site Role Limits**.
4. In the dialog, select **Site Role Limit** for the site role you want to modify, and then enter the desired value.




**Note:** The site role limit must be equal to or greater than the number of licenses used and can't exceed the cloud limit for that site role.

5. Click **Save**.

After setting site role limits, the maximum license count is visible on the **Sites** page of TCM.

| Max creators | Max explorers | Max viewers |
|---|---|---|
| Cloud Limit | Cloud Limit | Cloud Limit |
| 500 | Cloud Limit | 2,500 |
| Cloud Limit | Cloud Limit | Cloud Limit |

At the site level, site administrators can see role limits for their site on the **Users** page.


## When site role limits are met

When a user is added to a site, they automatically consume the license assigned to their site role. However, if the maximum number of licenses for that role (the site role limit) has already been reached, the following occurs:

- If all licenses for a site role are in use, but there are available licenses at a higher role, the user is added to the site and consumes a license for the higher role. For example, if there are no available Explorer licenses, a user added as an Explorer consumes an available Creator license.
- If no higher role licenses are available, the user is added to the site as an Unlicensed user.

Users consuming licenses different from their assigned roles, such as Viewers using Explorer licenses, can affect site role limits. Cloud administrators can address this scenario by unlicensing these users and updating the site role limit as needed. For more information, see Create or modify role limits on a site.

# Manage Users With Tableau Cloud Manager

Everyone who accesses Tableau Cloud—whether to browse, publish, edit content, or perform administrative tasks—must be added as a user. Cloud administrators have the following options for adding users:

- Enter users' email addresses individually
- Import users via a CSV file that you create using the CSV Import File Guidelines

## How users are managed in Tableau Cloud

Within Tableau Cloud, user management is handled through two distinct pages: the Cloud Users page and the Site Users page. The Cloud Users page, accessible only to cloud administrators in Tableau Cloud Manager (TCM), serves as the central place for assigning users to multiple sites and for removing users from Tableau Cloud. Meanwhile, the Site Users page is available to site administrators, allowing them to manage users within their specific sites.

> **Note:** You can only remove a user if the user doesn't own any content (projects, workbooks, views, or data sources). For more information, see Remove users from Tableau Cloud.

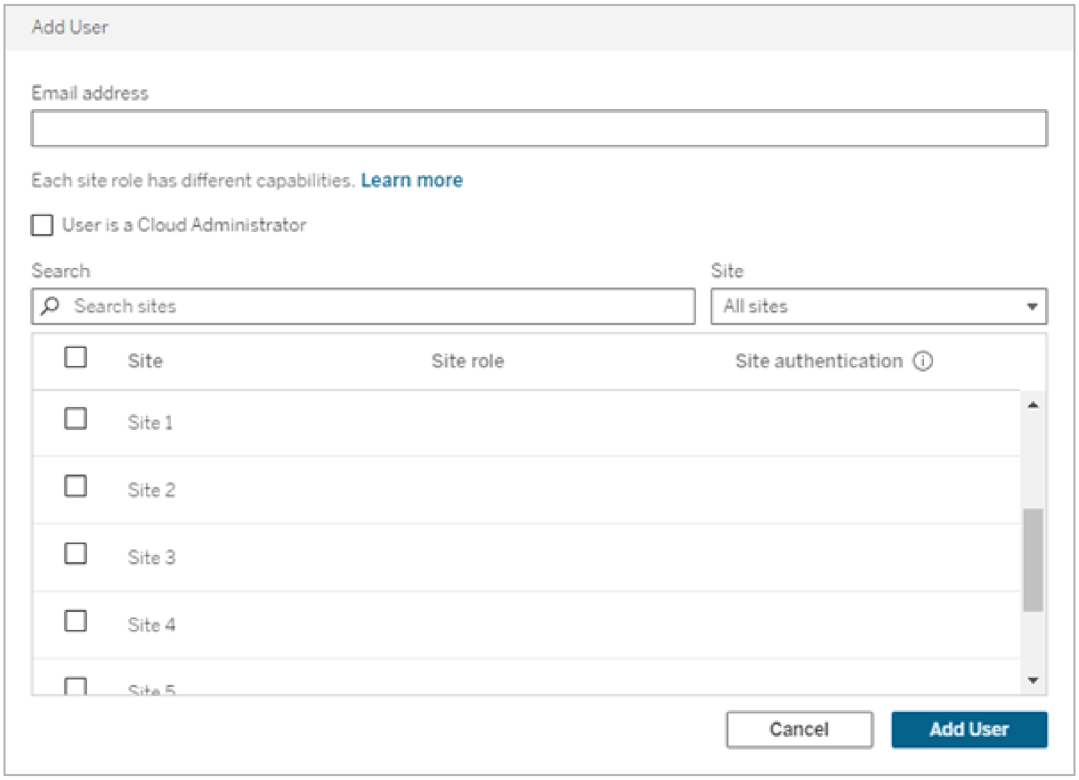
With TCM, users are added at the tenant level and then assigned to the appropriate sites as needed. Adding users through TCM can improve the onboarding process by reducing the administrative burden on site administrators, allowing them to focus more on site-specific management tasks. As a cloud administrator, you can also modify a user's site membership and role at any time. For more information, see Manage users' site membership.

## Add users to Tableau Cloud Manager

You can add users to Tableau Cloud Manager (TCM) individually or in bulk by uploading a CSV file with user information.

### Add a user individually

1. Sign in to Tableau Cloud Manager as a cloud administrator.
2. Navigate to the **Users** page, and select **Add Users** > **Add User by Email**.
3. Complete the fields in the Add User dialog:




a. **Email address:** Email address of the user.

b. **(Optional) User is a Cloud Administrator:** Select whether to add the user as a cloud administrator. By default, cloud administrators authenticate using Tableau with MFA when they sign in to TCM. If an external authentication method is configured, select an alternative authentication type from the dropdown menu.

c. **Site:** Select one or more sites to add the user to.

d. **Site role:** Assign the user a site role on each selected site. For more information about site roles and capabilities, see Set Users' Site Roles.

e. **Site authentication:** Select an authentication method for the user. The default authentication method is Tableau with MFA (multi-factor authentication). If site administrators have configured multiple authentication methods, select an alternative authentication type from the dropdown menu.

4. Click **Add User**. An email is sent to the user with the next steps to sign in to Tableau Cloud.

If a new user's email address is already associated with an account on tableau.com, the user is prompted to sign in using the existing email address and password for that account.

If a new user's email address isn't associated with an account on tableau.com, the user is prompted to provide a first and last name and password.

## Bulk import users

To automate the process of adding users, you can create a CSV file containing user information, and then import the file to Tableau Cloud Manager (TCM). When importing the CSV file, you can specify the users' site membership, site role, and authentication type. The following columns and values are exclusive to TCM:

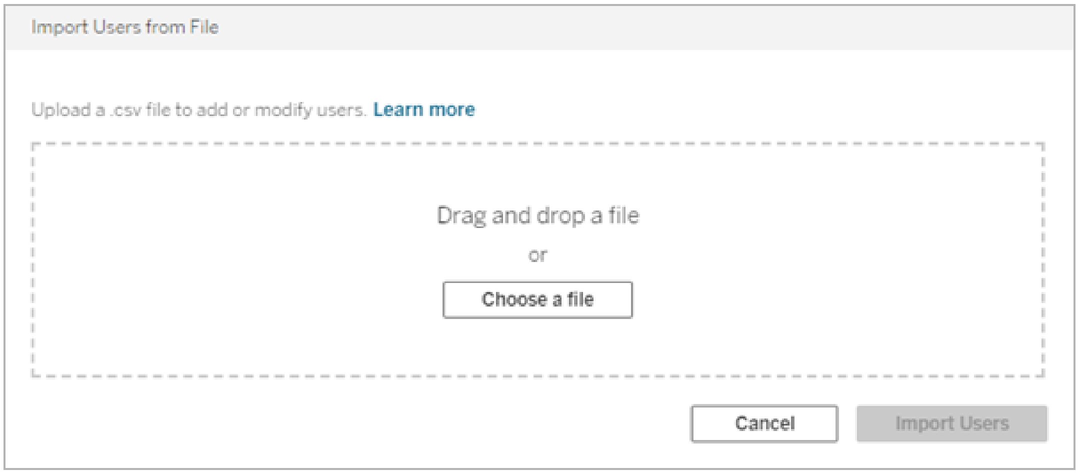
- **Site URI:** The uniform resource identifier for the site. To import a user as a cloud administrator, include the Site URI column and leave it blank.
- **Administrator level:** To add a user as cloud administrator, set the value to `Cloud`.
- **Authentication type:** The user authentication type for accessing a site or TCM.

> **Note:** This section contains the steps for importing, assuming that you have already created the CSV file. If you haven't created the file yet, see CSV Import File Guidelines for a list of file format requirements and import options.

To add or modify users from a CSV file, follow these steps:

1. Sign in to Tableau Cloud Manager as a cloud administrator.
2. Navigate to the **Users** page, and select **Add Users** > **Import Users from File**.

3. To upload a file, drag the CSV file into the dialog, or click **Choose a file**.

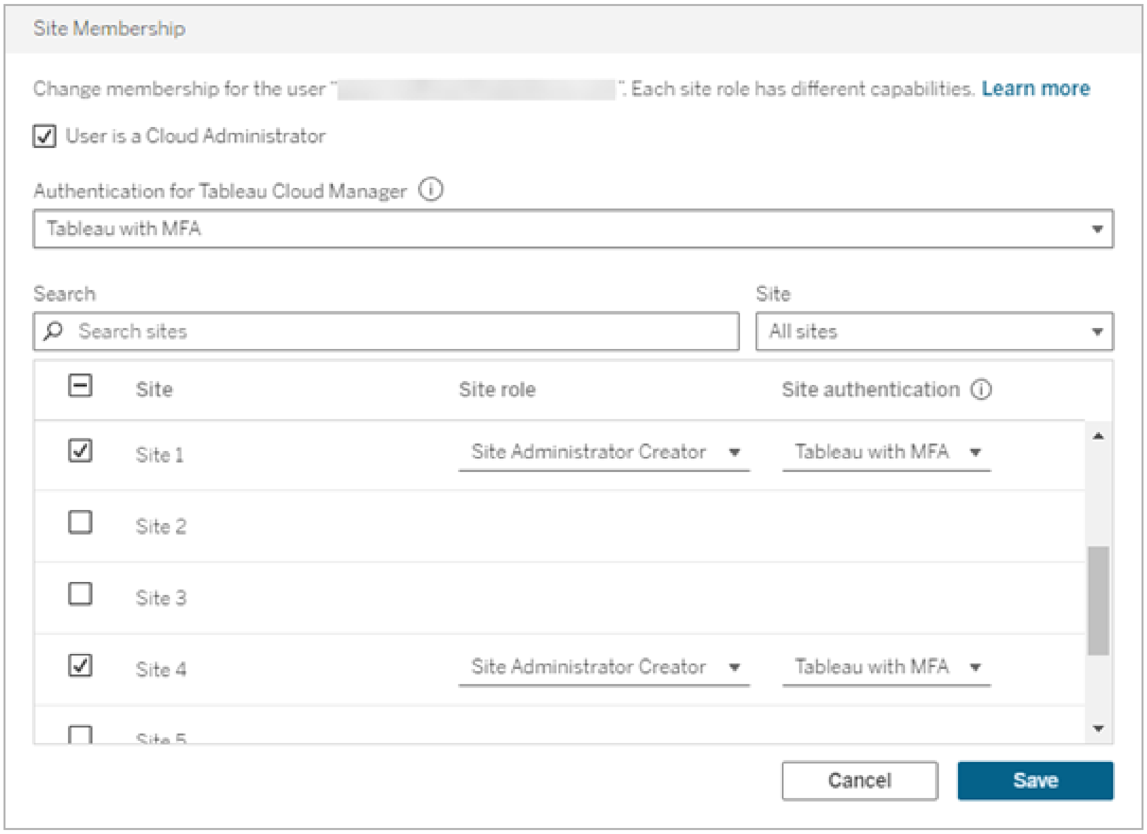



4. Click **Import Users**.

**Important:** Importing a CSV file with different site roles automatically updates existing users to the roles specified, even if they're more restrictive. This change affects all users, including cloud administrators.

## Manage users' site membership

Site membership refers to the sites and roles assigned to each user in a tenant. Cloud administrators can modify a user's site membership at any time, such as granting access to additional sites or changing their designated site role and authentication. All changes to users are performed in the site membership dialog and then shared across sites.



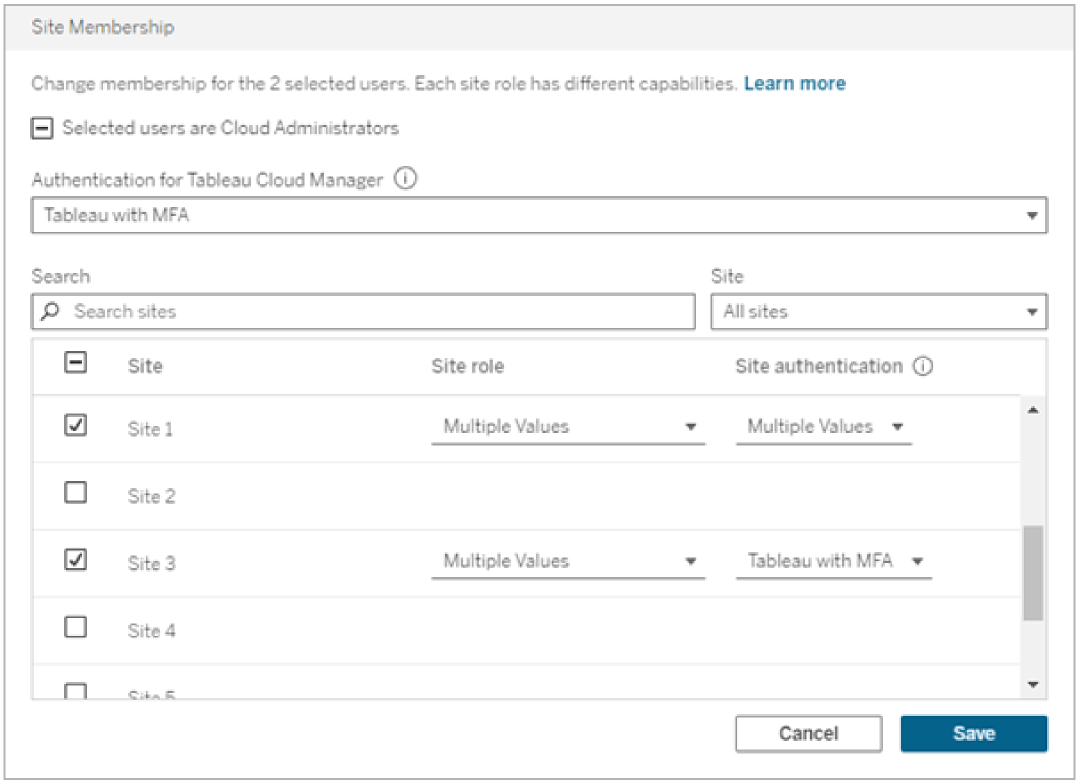

To modify site membership, follow these steps:

1. Sign in to Tableau Cloud Manager as a cloud administrator.
2. Navigate to the **Users** page and select the users to modify.

 > **Note:** You can select up to 50 users at a time. To modify more than 50 users, import a CSV file containing the desired changes. For more information about modifying users in bulk, see Bulk import users.

3. Select **Actions** > **Site Membership**.
4. In the dialog, modify users' site membership, including their site role and authentication method.

When modifying site membership for multiple users, the **Site role** and **Site authentication** dropdown menus display “Multiple Values” when users are assigned different values on the site. Selecting a new value from the list assigns the same value to the selected users.




5. Click **Save**.

## Assign or remove cloud administrator privileges

You can have up to 100 cloud administrators in Tableau Cloud Manager (TCM). To assign or remove the cloud administrator role, select the **User is a Cloud Administrator** checkbox while modifying site membership. When a user is assigned cloud administrator privileges, they gain access to the TCM web interface and Tableau Cloud Manager REST API.

# Remove users from Tableau Cloud

You can remove a user only if the user doesn’t own any content (projects, workbooks, views, or data sources). If you attempt to remove a user who owns content, the user’s site role is set to Unlicensed, but the user isn’t removed from Tableau Cloud Manager.

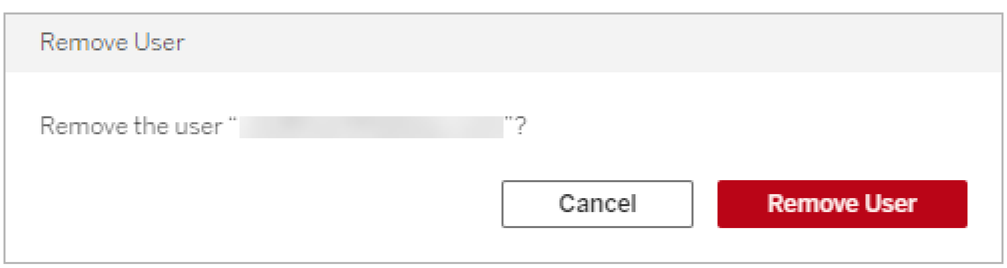
A user who belongs to multiple sites and owns content on any of them is removed from the sites where they don't own content. The user remains a member on sites where they own content, but is demoted to the Unlicensed site role.

To remove a user from Tableau Cloud, follow these steps:

1. Sign in to Tableau Cloud Manager as a cloud administrator.
2. Navigate to the **Users** page, and select one or more users to remove.

   > **Note:** You can select up to 50 users at a time. To modify more than 50 users, import a CSV file containing the desired changes. For more information about modifying users in bulk, see Bulk import users.

3. Select **Actions** > **Remove**.
4. In the confirmation dialog, select **Remove User**.



# Site Administrator Role and Tasks

This topic describes the typical role of the Tableau Cloud site administrator, and how it differs from the related data manager role. It then lists the core tasks that the site administrator completes to set up your Tableau Cloud site. Additional topics in this section provide more information about each of the steps.

# How we define the site administrator role

We define the site administrator as the person who is in charge of creating and maintaining the framework that enables Tableau Desktop users in your organization to publish, share, manage, and connect to data sources and workbooks. For example, a site manager works with site users and their permissions, in contrast to working directly with content that is published to the site.

The Tableau Cloud site administrator is typically part of the IT team at your organization. If your organization doesn't have a formal IT team, the site administrator might be a savvy Tableau Desktop user who takes on this role (the *accidental admin*, so to speak).

## Tasks that are typically outside the site administrator's realm

In this documentation, we make a distinction between the roles of site administrator and data manager, which is the role for the person who creates and publishes data sources to Tableau Cloud. Even so, in your organization, the same person might cover both roles. In practice, you'll divide these responsibilities in the way that works best in your environment. To learn more about the data manager's realm, see Publish Data Sources and Workbooks.

# Steps for setting up your site

The table below shows a loose sequence of steps for setting up a site. You can complete the steps in any order that makes sense for you. At the bottom of this topic you'll find a list of links to more resources for each of the steps.

Before you configure the site, we recommend getting acquainted with the site authentication options, users' site roles, projects, and permissions. Create and document a plan for your projects, groups, and overall permissions strategy. Setting up a test project to experiment with different settings is a good way to iron out these issues. You can change many site settings after your users are working with the site, but try to go in with the intention of minimizing post-production changes.

| | |
|---|---|
| **Upload your logo** | This simple first step helps you get familiar with the environment while you incorporate your organization's branding into your site. Sign in, go to the **Settings** page, and upload your logo where indicated. |
| **Configure site access** | If your organization uses single sign-on, you can configure your site to use Google or SAML authentication. Otherwise, you can use the default Tableau ID authentication, where each user signs in using an email address and password that is unique to Tableau Cloud.<br><br>In addition to the authentication type, you can determine whether to allow users to sign in directly from Tableau *clients* after signing in the first time. This is enabled by default. |
| **Create projects** | Projects help you manage users' access (permissions) to data sources and workbooks that are published to your site. You can set default groups and permissions for all content on the **Default** project, lock the project, and then use it as a template for additional projects you create.<br><br>Projects can also serve as staging environments. |
| **Set up the permissions structure** | In Tableau, permissions work with site roles to make up a user's access to the site and its content. |
| **Add users** | Each user who accesses Tableau Cloud must sign in. |

| | |
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| **Upload your logo** | This simple first step helps you get familiar with the environment while you incorporate your organization's branding into your site. Sign in, go to the **Settings** page, and upload your logo where indicated. |
| | Determine the users you want to be able to sign in to the site. If you enabled Google or SAML authentication, determine which of those users will sign in with their single sign-on credentials, and which will use TableauID credentials.<br><br>Add or import multiple users at a time based on their authentication type. |
| **Get your data to Tableau Cloud** | We recommend that you designate a Tableau Desktop user who will publish vetted data sources to the site (that is, who will serve in the data manager role mentioned earlier). These will be the shared data sources that other Tableau users can connect to.<br><br>As the site administrator, you can centrally manage data source permissions. Other attributes that either you or the data manager can maintain centrally are connection information (credentials, access tokens) and refresh schedules for cloud data sources. For more information, see Keep Data Fresh. |
| **Analyze site usage and performance** | You can monitor usage of published data sources and workbooks, the success of extract refresh tasks, user activity, and so on. |

# Navigate the Admin Areas of the Tableau Web Environment

As an administrator on Tableau Server or Tableau Cloud, you can access admin settings that aren’t available to other users to configure sites, users, projects, and to do other content-related tasks.

## Access based on site role and number of sites

The menus you get when you sign in to Tableau Server or Tableau Cloud depend on the following conditions:

- Whether you’re a site or server administrator.

  Site administrator access is available on Tableau Cloud and Tableau Server. Server administrator access is only on Tableau Server.

- Whether you have access to only one site or to multiple sites.

## Server administrator

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On a **single-site** server, the site selector does not appear, and all other menus are the same.

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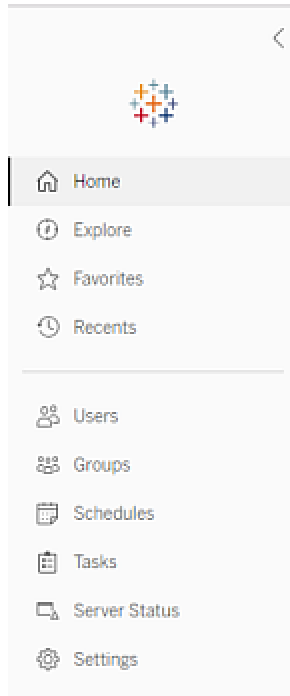


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In a **multi-site** environment, menus along the left enable you to modify a specific site or all sites, and to configure users, groups, schedules, tasks, and server settings.

To access server administrator settings that affect all sites, open the site menu by clicking the arrow next to the current site name, and then select **Manage all sites**.

The **Content** and **Group** tabs go away, and the site menu text changes to **All Sites** to let you know you are managing server-wide settings, and options like **Server Status** reflect the server-wide view.

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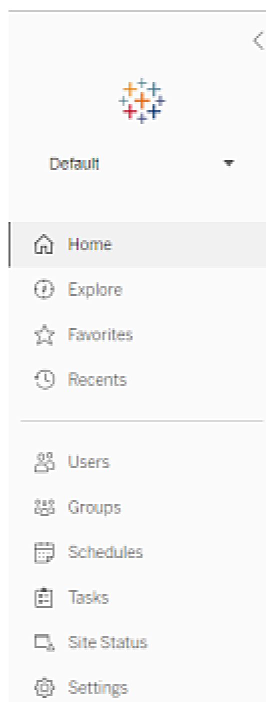


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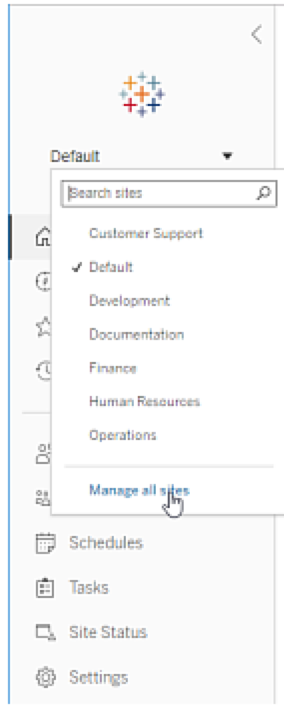
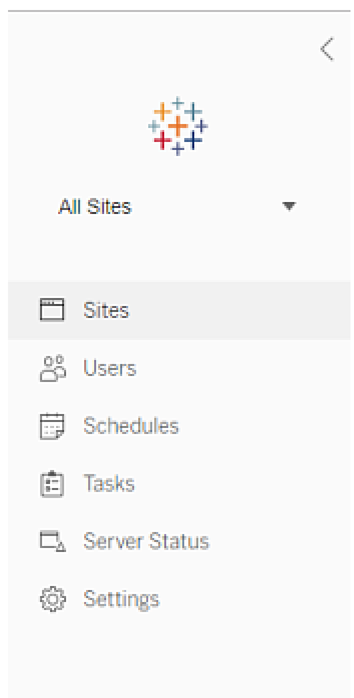
To return to the site administration menus, select **All Sites**, and the select the site you want to manage.



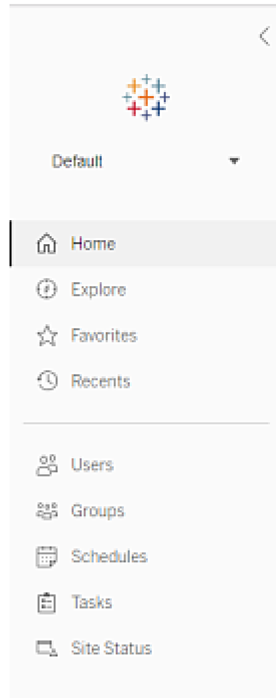



### Site administrator

If you are a site administrator for Tableau Cloud or Tableau Server, and you have access to multiple sites, you'll get menus for selecting which site to manage, and for managing that site's content, users, groups, schedules, and tasks, and for monitoring its status.

The site selector displays the name of the current site. To go to another site, select the site menu, and then select the site name.

If you have access to only one site, the site selector does not appear, but all other menus are the same.




## Server administrator tasks

Server administrators (available with Tableau Server Enterprise only) can do the following:

- Monitor server status and activity.
- Generate log files.
- Add sites and edit site settings. Only server administrators can add sites to the server.
- Add users to the server, and assign users to sites.
- Add and manage site groups.

To manage settings only for a specific site, you must first navigate to the site. Within each site, you can do the following:

- Administer content: Create projects, move content from one project to another, assign permissions, change ownership of a content resource, and so on.
- Manage schedules for extract refreshes and subscriptions.
- Monitor site activity and record workbook performance metrics.
- Manage storage space limits for content published by users.
- Allow web authoring.
- Enable revision history.
- Allow site administrators to add and remove users.
- Set the maximum number of licenses that site can consume for each license type (Creator, Explorer, Viewer).
- Allow users to subscribe to workbooks and views, and allow content owners to subscribe others to workbooks and views.
- Enable offline snapshots for favorites (iOS only).

## Site administrator tasks

A site administrator on Tableau Cloud or Tableau Server can do the following tasks:

- Administer content: Create projects, move content from one project to another, assign permissions, change ownership of a content resource, and so on.
- View, manage, and manually run schedules for extract refreshes and subscriptions.
- Add and manage site users.
- Add and manage site groups.
- Monitor site activity.

# Customize the Site and Content Settings

As a Tableau administrator, you can customize a site for your organization. The settings available to you depend on your site configuration and whether you use Tableau Cloud or Tableau Server. To view and edit site settings, you must be a Site Administrator on Tableau Cloud or Server Administrator on Tableau Server.

Use the topics below to customize your site.

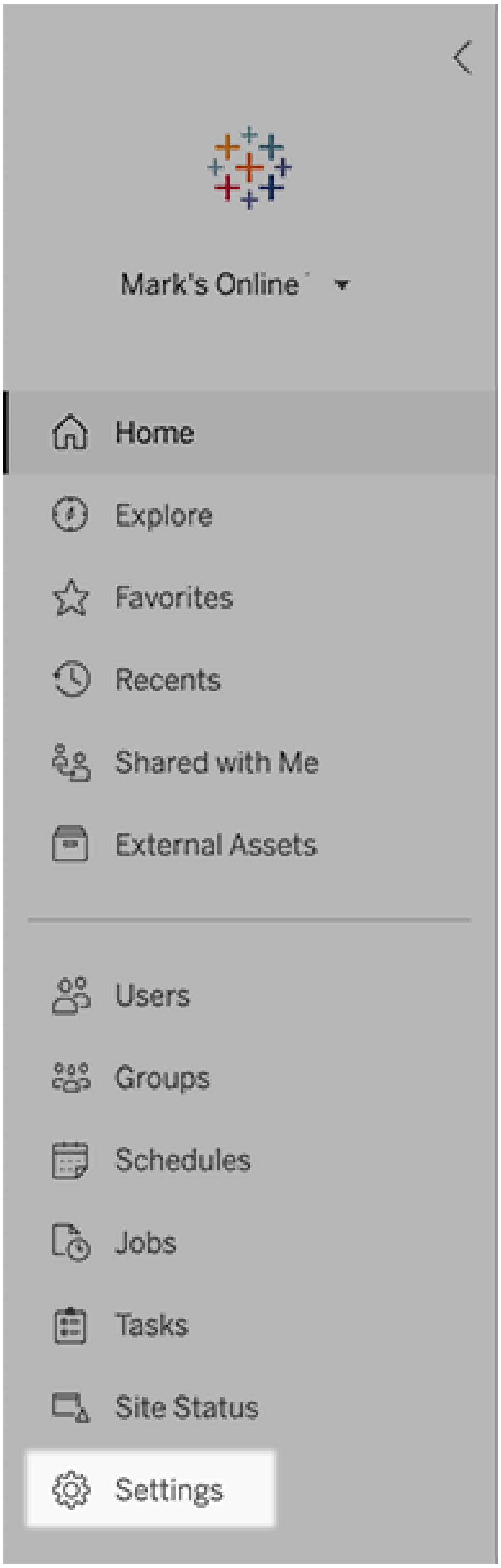
## Site Settings Reference

Customize a site for your organization using the settings below. To view and edit site settings, you must be a Site Administrator on Tableau Cloud or Server Administrator on Tableau Server.

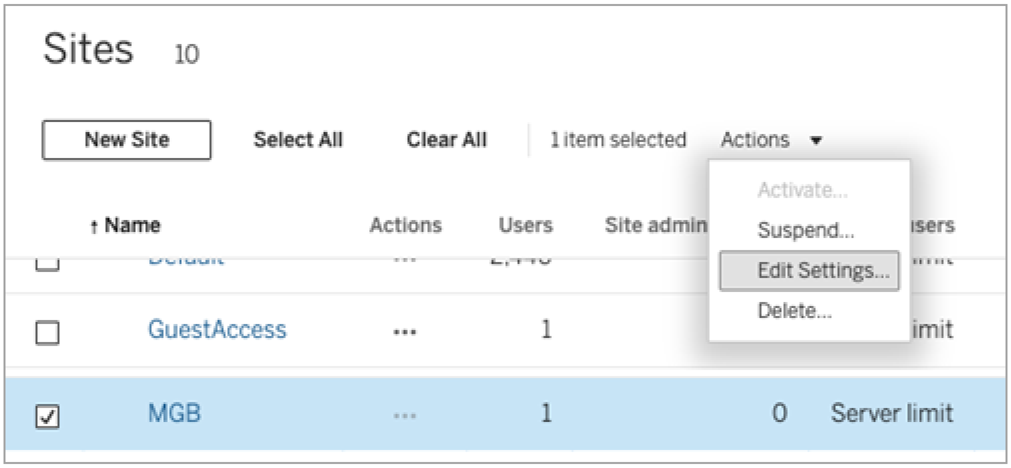
Site settings are displayed differently in Tableau Cloud and Tableau Server. The settings available to you depend on your site configuration and whether you use Tableau Cloud or Tableau Server. To easily find a specific setting below, press Ctrl+F (Windows) or Command+F (macOS) and search for the setting.

### Accessing site settings

- (Tableau Cloud) From the Home page, expand the side pane, and click **Settings** at bottom.


Mark's Online
Home
Explore
Favorites
Recents
Shared with Me
External Assets
Users
Groups
Schedules
Jobs
Tasks
Site Status
Settings

- (Tableau Server) If you're editing an existing site, select it on the Sites page, and then select **Edit Settings**. Or, in a single-site deployment, click **Settings** at the bottom of the side pane.




## General tab

| Setting | Description |
|---|---|
| Site Name and ID (Tableau Server Administrators only) | Specifies the site name seen in the user interface and the ID seen in the site URL. (If you are editing the Default site, you cannot change the ID.)<br><br>You can't change the “#/site” portion of the URL (for example, http://-localhost/#/site/sales). In multi-site server environments, these segments appear in the URL for sites other than the Default site. |
| Storage (Tableau Server Administrators only) | Select either **Server Limit** or **GB**, and for the latter enter the number of gigabytes you want as a limit for storage space for published workbooks, extracts, and other data sources.<br><br>If you set a server limit and the site exceeds it, publishers will be prevented from uploading new content until the site is under the limit again. Server administrators can track where the site is relative to its limit using the Max Storage and Storage Used columns on the Sites page. |

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| Revision History (Tableau Server Administrators only) | Specifies the number of previous versions of workbooks, flows, and data sources that are stored on the server. |
| Tableau Prep Conductor | Controls whether users with appropriate permissions can schedule and monitor flows. Tableau Prep Conductor is part of Data Management. For more information, see Tableau Prep Conductor. |
| Web Authoring | Controls whether browser-based authoring is enabled for the site. When web authoring for workbooks is disabled, users can't create or edit published workbooks from the server web environment but instead must use Tableau Desktop to republish the workbook. When web authoring for flows is disabled, users can't create or edit published flows from the server web environment but instead must use Tableau Prep Builder to re-publish the flow.<br><br>For more information, see Set a Site's Web Authoring Access and Functions in Tableau Cloud Help. |
| Managing Users (Tableau Server Administrators only) | Determines whether only server administrators can add and remove users and change their site roles, or whether site administrators can too.<br><br>If you allow site administrators to manage users, specify how many users they can add to the site by selecting one of the following:<br><br>• Server Limit adds the number of available server seat licenses. For a server with core-based licensing, there is no limit.<br>• Site Limit lets site administrators add users up to a limit you specify.<br>• Site Role Limit lets site administrators add users of each site role up to the license limit you specify for the site.<br><br>For more information, see View Server Licenses. |
| Guest Access | Lets people who lack a Tableau Server account see views that |

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| (Tableau Server Administrators only) | have guest access permissions.<br><br>**Note:** If you use Tableau Server, your administrator can disable Guest Access. |
| Tableau Catalog | Turns off Catalog capabilities when Tableau Server or a Tableau Cloud site is licensed with Data Management. For more information, see Disable Catalog. |
| Workbook Performance after a Scheduled Refresh (Tableau Server Administrators only) | Pre-computes recently viewed workbooks with scheduled refreshes to open them faster. For more information, see Configure Workbook Performance after a Scheduled Refresh. |
| Workbook Performance Metrics (Tableau Server Administrators only) | Lets site users collect metrics on how workbooks perform, such as how quickly they load To initiate recording, users must add a parameter to the workbook's URL. For more information, see Create a Performance Recording. |
| Managed Keychain Clean Up (Tableau Server Administrators only) | Lets site administrators manage saved credential keychains for OAuth connections on the site. For more information, see OAuth Connections. |
| Automatically Suspend Extract Refresh Tasks | To save resources, Tableau can automatically suspend extract refresh tasks for inactive workbooks. This feature applies only to refresh schedules that run weekly or more often. For more information, see Automatically Suspend Extract Refreshes for Inactive Workbooks in Tableau Cloud Help. |
| Linked Tasks<br><br>(Tableau Server and Site Administrators | Lets Server administrators enable users to schedule flow tasks to run one after the other. They can also enable users to trigger the scheduled flow tasks to run using **Run Now**. |

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| only) | This setting can be applied at the server level to include all sites on Tableau Server. The setting can be disabled at the site level to include only specific sites.<br><br>If the setting is turned off after linked tasks are scheduled, any tasks that are running will complete and the scheduled linked tasks are hidden and no longer show on the **Scheduled Tasks** tab.<br><br>For more information, see Schedule Linked Tasks. |
| Email Settings (Tableau Server Administrators only) | Specifies the From address and message footer seen in automatic emails for alerts and subscriptions. |
| Site Invite Notification (Tableau Cloud only) | For sites with single-sign-on authentication, sends an invite email when new users are added to the site. |
| Site Logo (Tableau Cloud only) | Specifies the image that appears with the site name. |
| Start Page | Controls which site page appears when users sign in. By default, the Home page appears, but you can instead open All Projects, All Workbooks, or other pages. For more information, see Set the Default Start Page in Tableau Cloud Help.<br><br>**Note:** If you use Tableau Server, your administrator can override this site setting. |
| Tableau Pulse Deployment | Controls whether Tableau Pulse is available for all users, a group of users, or no users. For more information, see Set Up Your Site for Tableau Pulse. |
| AI in Tableau (Tableau Cloud only) | Controls whether generative AI functionality is enabled for Tableau features. For example, Tableau Pulse can use generative AI to sum- |

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| | marize key metric insights using natural language so they are easier to understand.<br><br>Some generative AI features require Tableau+ and a connection to a Salesforce org with Einstein generative AI set up. For more information about how to turn on AI in Tableau features, see Turn On AI in Tableau for Your Site.<br><br>To learn more about Tableau AI, see AI in Tableau. |
| Personalized Insight Ranking (Tableau Cloud only) | Controls whether users can provide thumbs-up or thumbs-down feedback on individual insights. When this setting is turned on and users provide feedback, that feedback is used by the Tableau Pulse insights platform to further personalize and rank the types of insights it shows to a user.<br><br>This setting is independent of the setting to deploy Tableau Pulse. When Personalized Insight Ranking is turned off, users won't be able to submit thumbs-up or thumbs-down feedback on individual insights. For more information, see "Turn off Personalized Insight Ranking" in Set Up Your Site for Tableau Pulse. |
| User Visibility | Controls what user and group names are visible to other users. For more information, see Manage User Visibility in Tableau Cloud Help. |
| Availability of Ask Data | Controls whether Ask Data lenses are enabled or disabled for data sources. Ask Data lets users query data using conversational language and automatically see visualizations. For more information, see Automatically Build Views with Ask Data in Tableau user Help. |
| Availability of Explain Data | Controls whether site users with the appropriate permissions can run Explain Data and authors can access Explain Data Settings. For more information, see Control Access to Explain Data. To learn more about Explain Data, see Discover Insights Faster with Explain |

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| | Data. |
| Automatic Access to Metadata about Databases and Tables | Automatically grants users certain capabilities to external assets using derived permissions. For more information, see Turn off derived permissions in Tableau Cloud Help. |
| Sensitive Lineage Data | Specifies whether sensitive lineage data should be obfuscated or filtered when users don't have the appropriate permissions to related metadata. For more information, see Sensitive lineage data. |
| Cross-Database Joins | Determines where the join process happens when joining data from multiple sources. For more information, see Combine Tables from Different Databases in Tableau user Help. |
| Extract Encryption at Rest (Tableau Server Administrators only) | Lets you encrypt .hyper extracts while they are stored on Tableau Server. Server administrators can enforce encryption of all extracts on their site or allow users to encrypt all extracts associated with particular published workbooks or data sources. For more information, see Extract Encryption at Rest. |
| Tableau Support Access (Tableau Cloud only) | Allows Tableau Support technicians access to the site to help troubleshoot support cases. By default, this feature is disabled. For more information, see Enable Support Access. |
| Sharing | Allows users to share items directly with other users. When an item is shared, the recipients get a notification and the item is added to their Shared with Me page. If this is not enabled, users can only copy a link to share. For more information, see Share Web Content in Tableau user Help. |
| Comments | Controls whether users can add remarks in a Comments side pane for each view and @mention other Tableau users to notify them via email. For more information, see Comment on Views in Tableau user Help. |
| Data-Driven Alerts | Lets users automatically receive emails when data reaches key thresholds. For more information, see Send Data-Driven Alerts in |

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| | Tableau user Help. |
| Subscriptions | Lets site users subscribe to views and receive regular emails of them. On Tableau Server, these options are available only if you first configure subscription settings. |
| High-Visibility Data Labels in View and Workbook Subscriptions | Controls whether subscriptions include relevant upstream high visibility data quality warnings and sensitivity labels in the email. On Tableau Server, these options are available only if you first turn on and configure subscriptions. For more information on data quality warnings, see Set a Data Quality Warning. For more information on sensitivity labels, see Sensitivity Labels.<br><br>Previously titled **Data Quality Warnings in Subscriptions**.<br><br>**Note:** Data quality warnings and sensitivity labels are a feature of Tableau Catalog, which is part of Data Management. |
| Tagging | Specifies the number of tags that users can add to items. The default limit is 50 tags, and the maximum is 200. For more information, see Use Tags. |
| Recommendations for Views | Controls whether recommendations show on the site and whether the names of users who have looked at recommended items show on recommendation tooltips.<br><br>**Note:** If you use Tableau Server, your administrator can disable Recommendations. |
| Request Access | Lets users send access requests to content or project owners. For more information, see Let Site Users Request Access to Content in Tableau Cloud Help. |

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| Metrics Content Type | Controls whether metrics are available on the site. When you turn metrics on, users can create metrics from views and metrics appear as a content type. When turned off, metrics won't appear on the site or continue to sync. If you turn on metrics again, pre-existing metrics will reappear and resume refreshing. For more information, see "Set Up for Metrics" in Tableau Cloud Help or Tableau Server Help.<br><br>**Retirement of the legacy metrics feature**<br><br>Tableau's legacy metrics feature was retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. In October 2023, Tableau retired the ability to embed legacy metrics in Tableau Cloud and in Tableau Server version 2023.3. With Tableau Pulse, we've developed an improved experience to track metrics and ask questions of your data. For more information, see Create Metrics with Tableau Pulse to learn about the new experience and Create and Troubleshoot Metrics (Retired) for the retired feature. |
| Web Page Objects and Web Images | Controls whether these Web Page and Image objects can display target URLs. For more information, see Security for Web Page objects in Tableau user Help. |
| Personal Space | Allows Creator and Explorer site users to create and save content to a private Personal Space. When Personal Space is turned on, you can set user storage limits. For more information, see Create and Edit Private Content in Personal Space. |
| Collections | Controls whether collections are available on the site. When you turn on collections, users can create collections to organize content and browse collections made available by other users. For more information, see Organize Items in a Collection. |
| Site Time Zone for Extracts | The default time zone for extract-based data sources in a site is Coordinated Universal Time (UTC). Site administrators can set a different time zone. For more information, see Set the Site Time Zone for Extracts in Tableau Server Help or Set the Site Time Zone |

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| | for Extracts in Tableau Cloud Help. |
| Extract Quota Limit Notifications | Sends email alerts to all site administrators when extract refresh jobs are canceled because of extract job capacity issues. |
| Flow Parameters | Enables users to schedule and run flows that include parameters. |
| (Tableau Server and Site Administrators only) | Administrators can also enable flow parameters to accept any value. If this option is enabled, any flow user can enter any value in a parameter, potentially exposing data that the user should not have access to.<br><br>Starting in version 2023.2, administrators can enable system parameters that allow users to apply date or time parameters to flow output names for file and published data source output types. When the flow is run, the start time is automatically added to the flow output name.<br><br>Parameters can be entered in an input step for file name and path, table name, or when using custom SQL queries, in an output step for file name and path and table name, and in any step type for filters or calculated values.<br><br>Flow parameter settings can be applied at the server level to include all sites on Tableau Server. The settings can be disabled at the site level to include only specific sites.<br><br>For more information about using parameters, see Create and Use Parameters in Flows in the Tableau Prep help. |
| Run Now | Controls who can run jobs manually using the Run Now option from the web, Rest API, and Tabcmd. By default, this option is selected to allow users to run jobs manually. Clear the check box if only administrators should be allowed to run jobs manually. |

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| | **Note:** If you use Tableau Server, your administrator can disable this site setting. |
| Manage Notifications | Controls how site users can receive notifications for events such as extract jobs, flow runs, when another user shares content with them or mentions them in a comment. Notifications can be seen in their Tableau site via the notification center, sent by email, or sent to a Slack workspace. When a notification is enabled, users can configure their notification preferences on their Account Settings page.<br><br>**Note:** If you use Tableau Server, your server administrator can disable this site setting. |
| Customize Email Notifications (Tableau Cloud only) | Controls whether email notifications for data-driven alerts and subscriptions to workbooks and views are sent using the Tableau email server or your own SMTP server. When you use your own SMTP server, you can customize the email sender's name as well as the domain used in the sender's email address and the domain for links in the notifications emails. Added for Tableau Cloud in February 2024.<br><br>Separately from the SMTP settings, you can control whether the email notifications sent to users for data-driven alerts and subscriptions include links. These links direct users to your Tableau site to see the content and manage the alert or subscription. A link to unsubscribe is always included in notification emails, regardless of whether this setting is on. Added for Tableau Cloud in June 2023. |
| Flow Subscriptions | Controls whether flow owners can schedule and send emails with flow output data to themselves and others. When you allow flow subscriptions, you can control whether flow output data is included |

| | |
|---|---|
| | in the subscription email and whether flow output files are attached to the email. For more information, see Notify Users of Successful Flow Runs |
| OAuth Clients Registry | For a subset of connectors, you can register a custom OAuth client to override pre-configured OAuth client settings. By registering a custom OAuth client, you enable new and existing connections to use the custom OAuth client instead of the default OAuth client. For more information, see Configure Custom OAuth. |
| Personal Access Tokens (Tableau Cloud only) | Controls whether personal access tokens (PATs) creation is enabled for all users, a group of users, or no users. Also allows PATs expiration period to be customized. Changes to these settings apply only to new PATs. Existing PATs remain valid and unchanged. For more information about PATs, see Personal Access Tokens. |
| View Acceleration | Controls whether Creator and Explorer site users can accelerate the views in their workbooks for faster loading times. When you allow view acceleration, you can set a maximum number of views to be accelerated, and you can choose to automatically suspend acceleration for views that repeatedly fail the acceleration task. For more information, see View Acceleration. |
| Assertions for Group Membership | Enables local group membership to be controlled and managed by your SSO IdP or through a Tableau connected app by dynamically asserting group membership when a user authenticates to Tableau Cloud. Requires additional configuration in the SAML assertion, OIDC assertion, or JSON web token (JWT). For more information, see Dynamic group membership using assertions. |
| Group Sets | Enables the **Group Sets** page and the ability to create group sets. Group sets can be used by certain users (site admins, project owners, and content owners) to apply permission rules that require users to be members of all groups in the group set to access content whose permissions are dependent on the group set. For more |

information, see Work with Group Sets.

## Authentication tab (Tableau Cloud)

| Setting | Description |
|---|---|
| Authentication Types | Specifies how users can sign in to the site, and how they access it after signing in the first time. Authentication verifies a user's identity. For more information, see Authentication. |
| Default Authentication Type for Embedded Views | Specifies how users can sign in to embedded views. By default, Tableau authentication is selected. |
| Control User Access in Authentication Workflows | Enables user attribute functions used in embedded content to accept the passing of user attributes from a JSON Web Token (JWT). The user attributes are passed to Tableau to customize and control the data that can be shown to a user at runtime. For more information, see Embedding API v3 Help. |
| Automatic Provisioning and Group Synchronization (SCIM) | Allows you to manage users on the site through a third-party identity provider (IdP). When enabled, the Base URL and Secret boxes are populated with values to use in the IdP SCIM configuration. For more information, see Automate User Provisioning and Group Synchronization through an External Identity Provider. |
| Connected Clients | Allows Tableau clients such as Tableau Mobile, Tableau Bridge, and others to stay authenticated to the server after a user provides sign-in credentials the first time. When turned off, users are required to sign in explicitly each time they visit Tableau Cloud. For more information, see Access Sites from Connected Clients. |

## Bridge tab (Tableau Cloud)

| Setting | Description |
|---|---|
| Client Not Run- | Sends email alerts to data source owners when a client appears to be |

| | |
|---|---|
| ning Notifications | disconnected from the site. |
| Pooling | Distributes live queries and refresh jobs across all clients in Bridge pools. For more information, see Configure and Manage the Bridge Client Pool. |
| Private Network Allowlist | Add and manage domains that enable dedicated Bridge pool access to private network data on behalf of Tableau Cloud. |

## Extensions tab

| Setting | Description |
|---|---|
| Dashboard and Viz Extensions | Manage and control dashboard and viz extensions. Dashboard extensions are web applications that run in custom dashboard zones and can interact with the rest of the dashboard. Viz extensions are web applications that support new viz types. For more information, see "Manage Dashboard and Viz Extensions" in Tableau Cloud Help or Tableau Server Help. |
| Analytics Extensions | Enables a set of functions that your users can use to pass expressions to analytics extensions for integration with R and Python. For more information, see "Configure Connection with Analytics Extensions" in Tableau Cloud Help or Tableau Server Help. |
| Tableau Prep Extension | When authoring flows on the web, enables users to apply Einstein Discovery-powered models to their flows to bulk score predictions for their data.<br><br>For more information, see Configure Einstein Discovery Integration in the Tableau Server help. |

## Integrations tab

| Setting | Description |
|---|---|
| Slack Connectivity | Displays connections between a Slack workspace and the |

| | |
|---|---|
| | Tableau site. When connected, Tableau site users can see their Tableau notifications in the connected Slack workspace.<br><br>In Tableau Cloud, you can request that the Slack workspace administrator install the Tableau for Slack app, then finalize the connection once installed. For more information, see Integrate Tableau with a Slack Workspace. |
| Analytics Extensions | Enables a set of functions that your users can use to pass expressions to analytics extensions for integration with R and Python. For more information, see "Configure Connection with Analytics Extensions" in Tableau Cloud Help or Tableau Server Help. |
| Publish to Salesforce<br><br>(Beta on Tableau Cloud and Tableau Server) | Allows site users to publish views to a Salesforce app.<br><br>When a view is published to Salesforce, anyone with access to the selected app can see that the content exists. However, only those signed in with existing Tableau permissions can see the view. For more information, see Publish Views to Salesforce (Beta). |

## Connected Apps tab

| Setting | Description |
|---|---|
| Connected Apps | Create and manage Tableau connected apps, or explicit direct trust or OAuth 2.0 trust relationship between your Tableau Cloud site and custom applications and programmatically authorize access to the Tableau REST API on users' behalf using JSON web tokens (JWTs). For more information, see Use Tableau Connected Apps for |

Application Integration in the Tableau Cloud Help.

## Mobile tab

| Setting | Description |
|---|---|
| App Lock | Requires a biometric method or device passcode for users to open this site on Tableau Mobile. For more information, see Enable App Lock for Added Security in the Tableau Mobile Deployment Guide. |
| Offline Previews | Controls whether offline previews are generated for display when users access the site on Tableau Mobile. For more information, see Manage Tableau Mobile Data on Devices in the Tableau Mobile Deployment Guide. |
| **Mobile Security Policies** | Some security policies are enabled automatically and cannot be disabled. Mobile security policies are not available for MAM versions of Tableau Mobile. |
| Jailbreak Detection | Controls whether a Tableau Mobile app user with a device that has been "jailbroken" or "rooted" is allowed to access content on Tableau, and what level of response occurs when a jailbroken or rooted device is detected. For more information, see Tableau Mobile App Security Settings. |
| Malware Detection (Android only) | Controls whether malware detection is enabled for mobile devices, and what level of response occurs when malware is detected. For more information, see Tableau Mobile App Security Settings. |
| Maximum Days Offline Without Policy Refresh | Controls whether there is a maximum number of days a mobile device can be offline and still use the app. For more information, see Tableau Mobile App Security Settings. |
| Prevent Debugging | Controls whether debuggers are prevented on mobile |

| | |
|---|---|
| | devices. For more information, see Tableau Mobile App Security Settings. |
| Screen Sharing and Screenshots (Android only) | Controls whether a Tableau Mobile user is able to take screenshots or use screen sharing while in the app. For more information, see Tableau Mobile App Security Settings. |

# Turn On AI in Tableau for Your Site

**Note**: Einstein Copilot has been renamed Tableau Agent, as the platform expands to accommodate more AI agent functionality. Starting in October 2024, you'll see updates to page sections, field names, and other UI text throughout Tableau Prep, Tableau Catalog, and Tableau Cloud Web Authoring. Help content and Trailhead modules are also being updated to reflect these changes.

AI in Tableau brings trusted Einstein generative AI capabilities to the entire Tableau platform. AI in Tableau can enhance your data analysis by automatically generating calculations for Tableau Prep flows, recommending insightful questions to explore your data, summarizing key metrics, and creating compelling visualizations directly from your data sets.

AI in Tableau is powered by Einstein AI and inherits the Einstein Trust Layer and security controls. To learn more about AI in Tableau, see Tableau AI. For general information about Einstein Generative AI, see About Einstein Generative AI in the Salesforce help.

## Trial Users

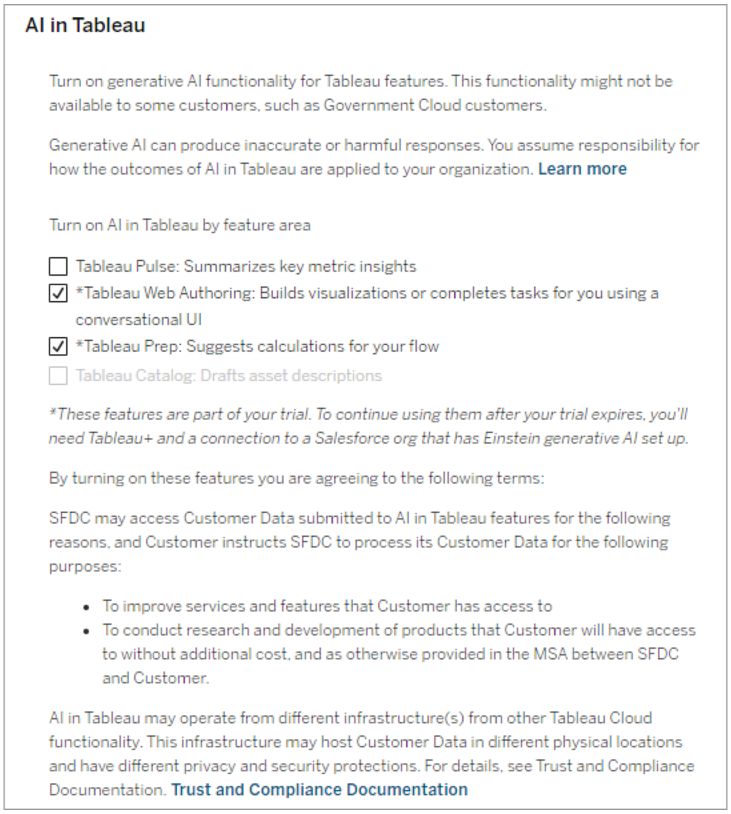
If you'd like to try AI in Tableau, you can sign up for a Tableau Cloud free trial which now includes Tableau Agent features. Simply fill out this form, or contact your Account Executive to get started. Once you sign up, you will receive access to a new Tableau Cloud site. You can't add a trial of Tableau Agent to an existing site.

As a trial user, you can turn on AI features for Tableau Cloud Web Authoring and Tableau Prep. While requests are free with the trial, limits may apply to the number of requests you can make per hour. The following options are not available when using the trial experience:

- Tableau Agent in Tableau Catalog
- Customized data masking
- Audit trail in Data Cloud

To start using AI in Tableau complete the following steps:

1. Sign into your trial Tableau Cloud Site as a site administrator.
2. Select **Settings**.
3. In the **AI in Tableau** section, select the check boxes for the feature areas where you want generative AI turned on.




4. Select from the following options:

   - **Tableau Pulse: Summarizes key metric insights**: Enable users to see their personalized insights summaries and get a quick overview of important changes to their metrics. This option does not require Tableau+ and is available in both trial and production environments. For more information about generative AI in Tableau Pulse, see Tableau AI in Tableau Pulse.

   - **Tableau Web Authoring: Builds visualizations or completes tasks for you using a conversational UI**: Enable users to create visualizations and create and understand calculations with the assistance of Tableau Agent. For more information about Tableau Agent in Tableau Cloud web authoring, see Explore Your Data with Tableau Agent.

  - **Tableau Prep: Suggests calculations for your flow**: Enable users to create calculated fields in Tableau Prep by simply describing the calculation in plain language using Tableau Agent. For more information about Tableau Agent in Tableau Prep, see Create Calculated Fields with Tableau Agent.

5. Navigate to a Tableau Prep flow or Tableau workbook and select the Tableau Agent icon to open the Tableau Agent pane and type a request.

To use AI in Tableau in your production site after your trial expires, you'll need to purchase Tableau+, connect to a Salesforce org that has Einstein generative AI set up, and complete the configuration steps described in this article.

## Configuration prerequisites

To use the generative AI features in Tableau, you must first enable them for your site. Some features require Tableau+ and a Salesforce organization with Einstein generative AI set up before they can be turned on. For example, Tableau Pulse generative AI features don't require Tableau+ or a Salesforce organization. To provide personalized, smart, and contextual metrics and insights for business users in their workflow, simply select the Tableau Pulse check box to turn on this feature.

However, features such as Tableau Cloud web authoring, Tableau Prep, and Tableau Catalog do require Tableau+ and a Salesforce organization with Einstein generative AI set up.

To turn on AI in Tableau for these features, you'll need the following:

- A Tableau Cloud site with Tableau+. For more information about Tableau+, see About Tableau+
- A Salesforce org that has Einstein generative AI set up. When you purchase Tableau+ a Salesforce org is provisioned for you, but you'll need to configure it for Einstein generative AI
- A Data Cloud instance
- The proper permissions and credentials for Tableau and Salesforce

Permissions

To connect your Salesforce Org to your Tableau Site, you'll need user credentials with the following permissions:

- **Tableau**: Tableau Cloud Site Administrator (Explorer or Creator). For more information about setting this site role and its permissions, see Set Users' Site Roles.
- **Salesforce**: Customize Application Profile permission. For more information about this permission, see User capabilities with 'Customize Application' Profile permission in the Salesforce help.

> **Note**: When the Salesforce Org is provisioned for Tableau+ customers, the admin user that is created should already have the Customize Application permission assigned. For more information about this permission, see Custom Permissions, and Grant Permissions on Custom Settings in the Salesforce help.

## Set up Einstein generative AI

To set up Einstein generative AI for your Salesforce org, complete the following steps.

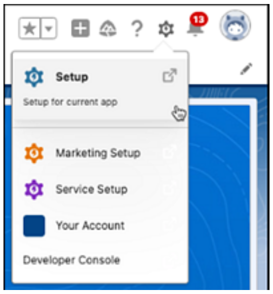
Activate your Salesforce Org

After your purchase is completed, Salesforce will email an invitation to activate your new Salesforce Org. Your activation will provision your Salesforce Org and finalize the creation of your Salesforce Org User.

> **Note**: If you provided an existing Salesforce Org to use during the quoting process, work with your Salesforce Admin to turn on Data Cloud and Einstein generative AI.

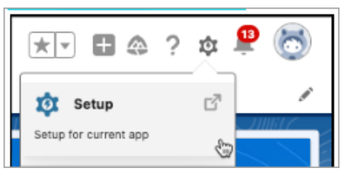
Set up a Data Cloud Admin User

To turn on Data Cloud, you need to have the **Data Cloud Admin** permission set. If you don't see **Data Cloud Setup** in your setup menu, complete the steps in this section. Otherwise, proceed to the next section to turn on Data Cloud.

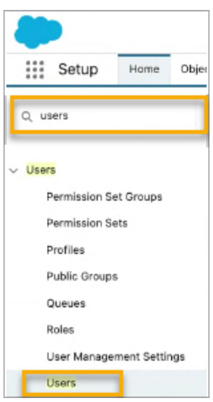



Add the Data Cloud Admin permission set to a user

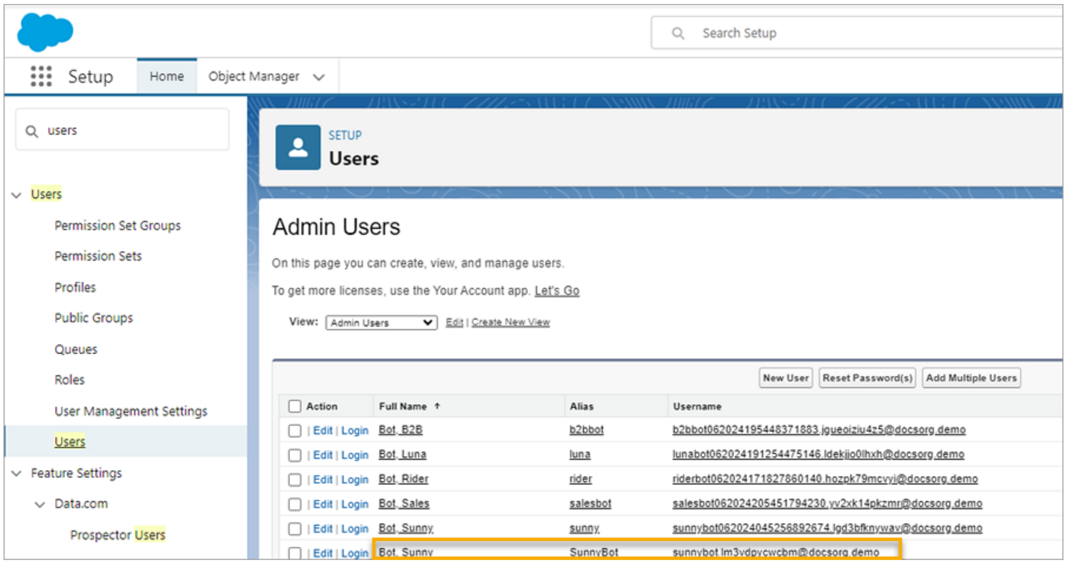
1. In the top right corner, select the **Setup** icon.
2. Select **Setup** from the drop-down menu.



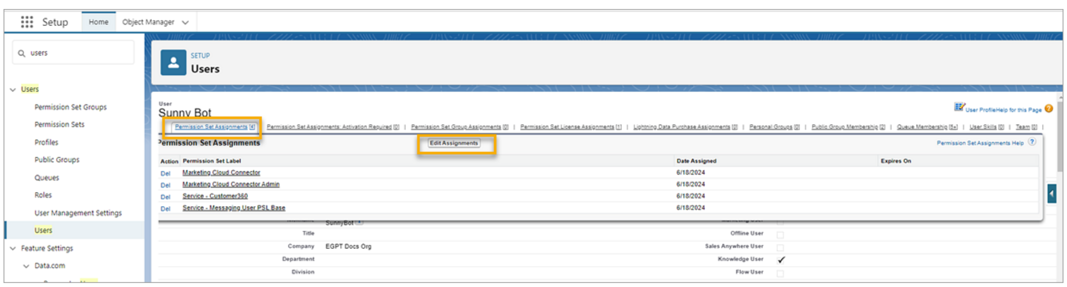

3. In the Quick Find box, type **Users**, then select **Users** from the results.



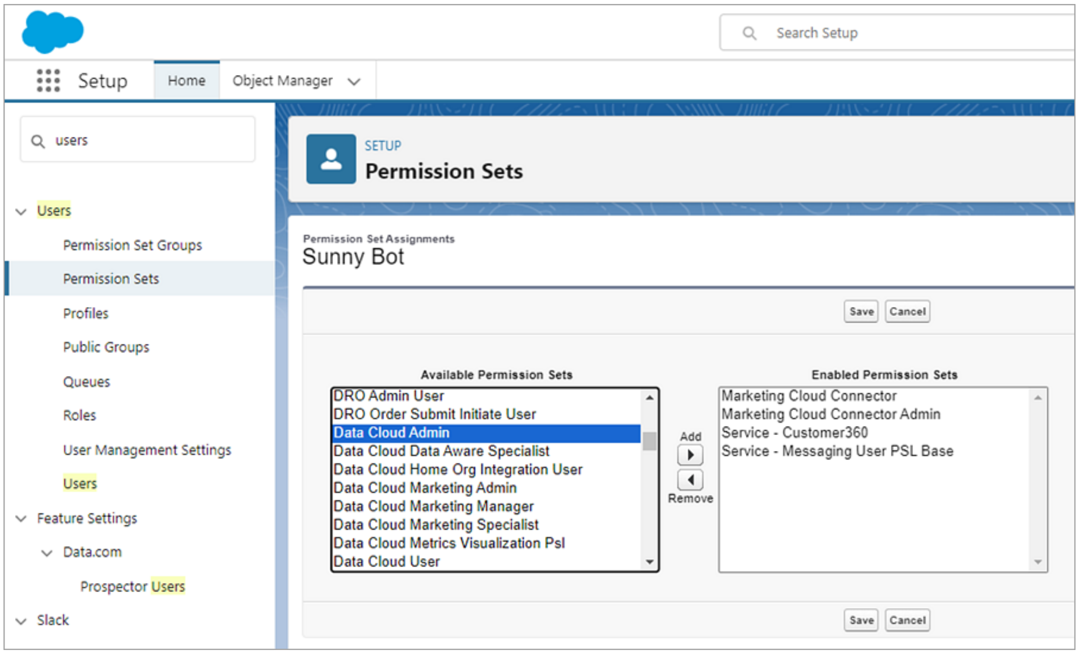

4. On the **Users** page, select the user who should have Data Cloud permissions. Click on the **User name**, **Alias**, or **Username** to open and edit the user profile.



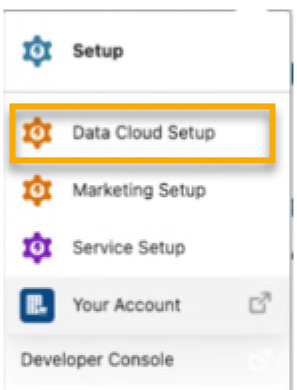
5. To view the permission sets assigned to the user, on the User profile page, hover over **Permission Set assignments**, then select **Edit Assignments**. If the user is already assigned the **Data Cloud Admin** or **Data Cloud Marketing Admin** permission set, it would be shown in the first 5 permission sets.



6. In the **Permission Sets** page, select the **Data Cloud Admin** permission in the **Available Permission Sets** then select the **Add** arrow to add it to the **Enabled Permissions Sets**. Then select **Save**.




You should now see **Data Cloud Setup** in the **Setup** menu.



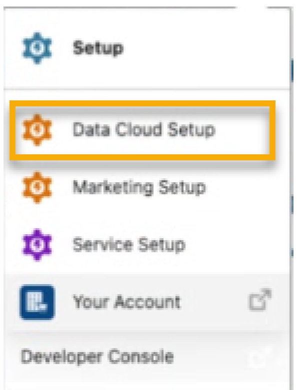

Turn on Data Cloud

Enable Data Cloud in your provisioned Salesforce org. Users must have the **Data Cloud Admin** permission set assigned to enable Data Cloud. For more information about setting up Data Cloud in Salesforce, see Setup and Maintain in the Salesforce help.

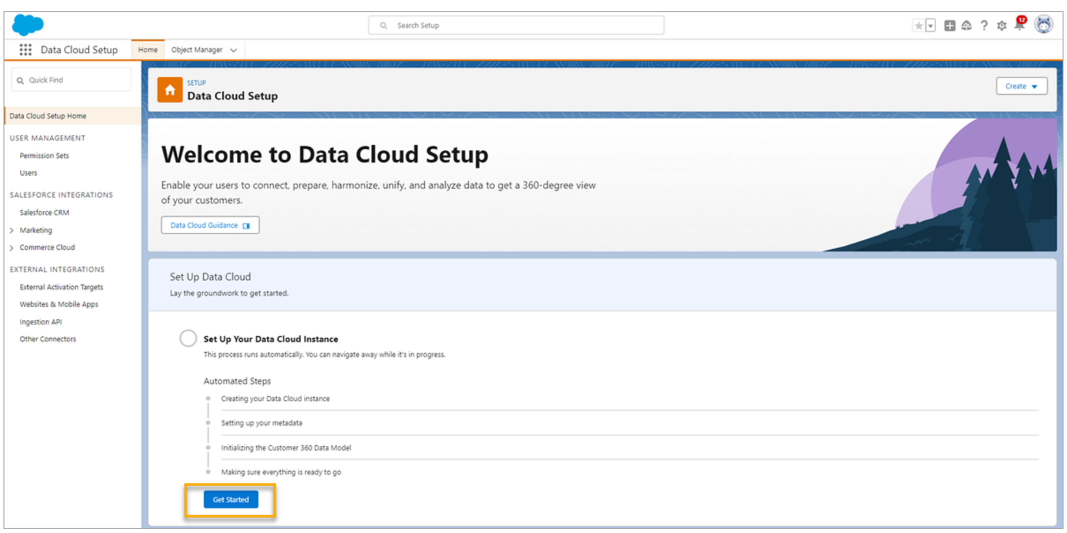
1. Log in to your Salesforce org in Salesforce.

2. In the top right corner, select the **Setup** icon.

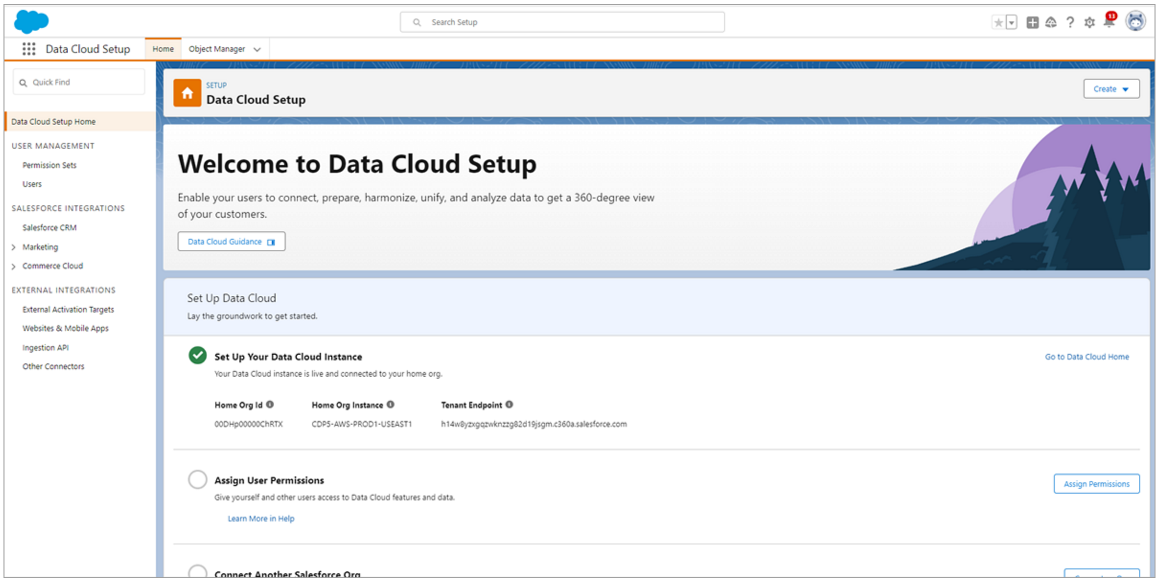
3. Select **Data Cloud Setup** from the drop-down menu. If you don’t see this option, your users might not have Data Cloud permissions set up. If this is the case, follow the steps in Set up a Data Cloud Admin User.




4. On the Data Cloud Setup page, in the bottom left hand corner, select **Get Started** to begin provisioning your org’s Data Cloud.  This may take a few minutes.




The process runs automatically. Once complete your page will look similar to the page below.




Configure your Salesforce org

Set up your Salesforce org to turn on Einstein generative AI. Data Cloud setup must be complete before you can turn on the Einstein Trust Layer, set up data masking and turn on Einstein generative AI data collection and storage.

You'll need to do the following:

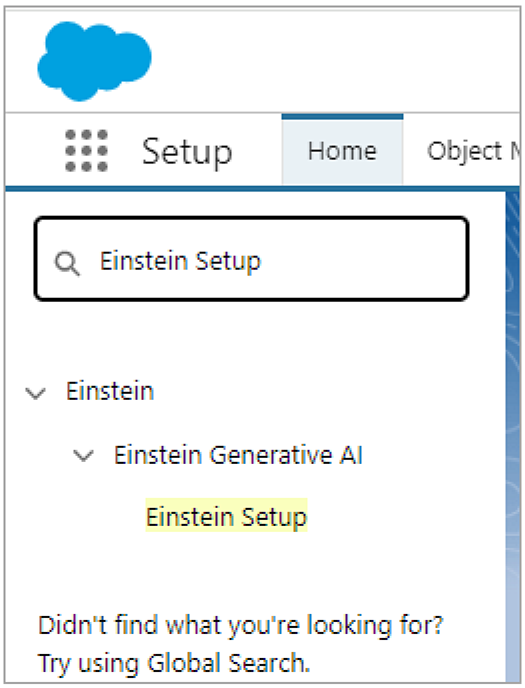
- Turn on Einstein Generative AI to sync Einstein and Data Cloud and use generative AI features.
- Set up Einstein Trust and set up data masking for Personally Identifying Information (PII).
- Turn on Einstein Generative AI data collection and storage to store your Einstein generative AI audit and feedback data in Data Cloud.

For more information, see Set Up Einstein Generative AI in the Salesforce help.

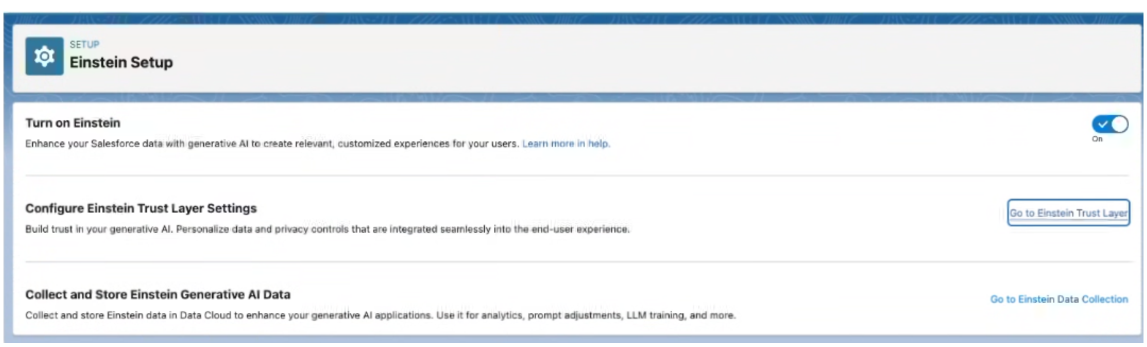
Turn on Einstein

1. In your Salesforce Org, if you aren't already in the **Setup** pages, select the **Setup** icon in the top right corner of the page. The select Setup from the drop-down menu.

2. In the Setup Quick Find box, type **Einstein Setup**, then select **Einstein Setup** from the results.




3. Enable **Turn on Einstein**.

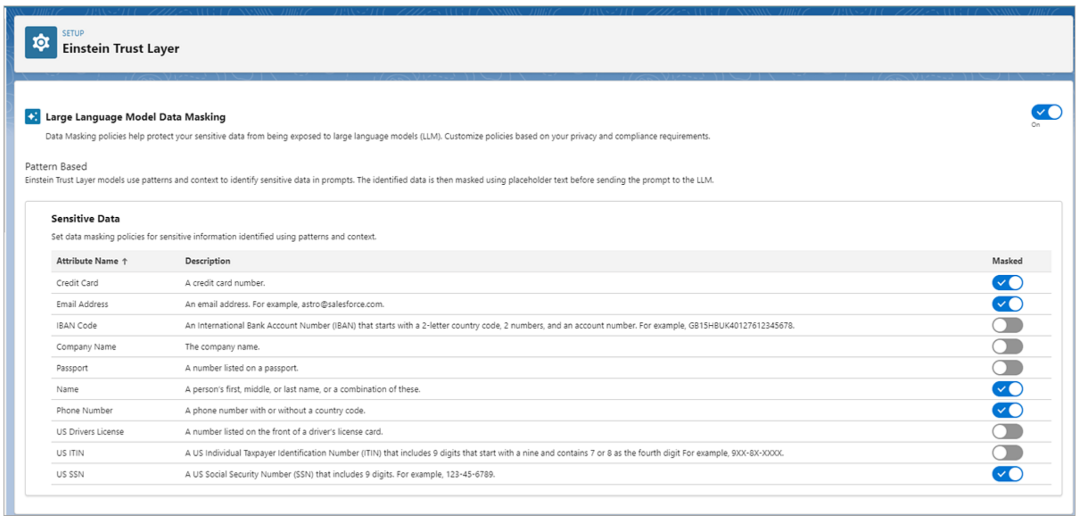


## Turn on the Einstein Trust Layer

Build trust in your generative AI. Use the Einstein Trust Layer to personalize data privacy controls that are integrated into the end-user experience.

> **Note**: Data Cloud setup must be complete before you can turn on the Einstein Trust Layer and configure data masking.

1. In the Einstein Setup page, select **Go to Einstein Trust Layer**.
2. In the **Einstein Trust Layer** page, turn on **Large Language Model Data Masking** and set the masking options for your organization.

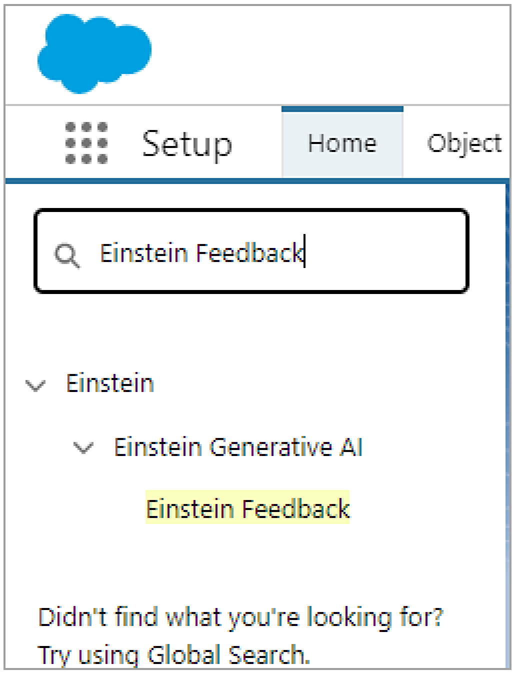



## Turn on Einstein Generative AI data collection and storage

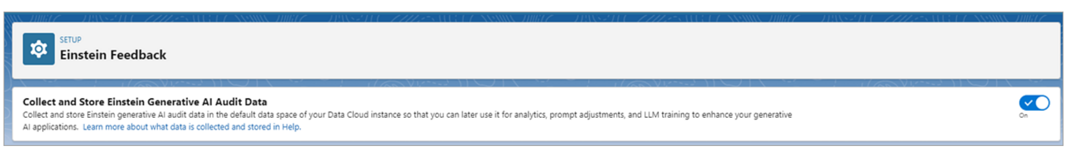
Track the use of generative AI in your Salesforce org and ensure that AI usage complies with your security, privacy, regulatory, and AI governance policies.

> **Note**: Data Cloud setup must be complete before you can turn on Einstein generative AI data collection and storage.

1. In the Setup Quick Find box, type **Einstein Feedback**, then select **Einstein Feedback** from the results.




2. In the Einstein Feedback page, turn on **Collect and Store Einstein Generative AI Audit Data**. It can take a few hours before Einstein Generative AI audit data is available in Data Cloud.

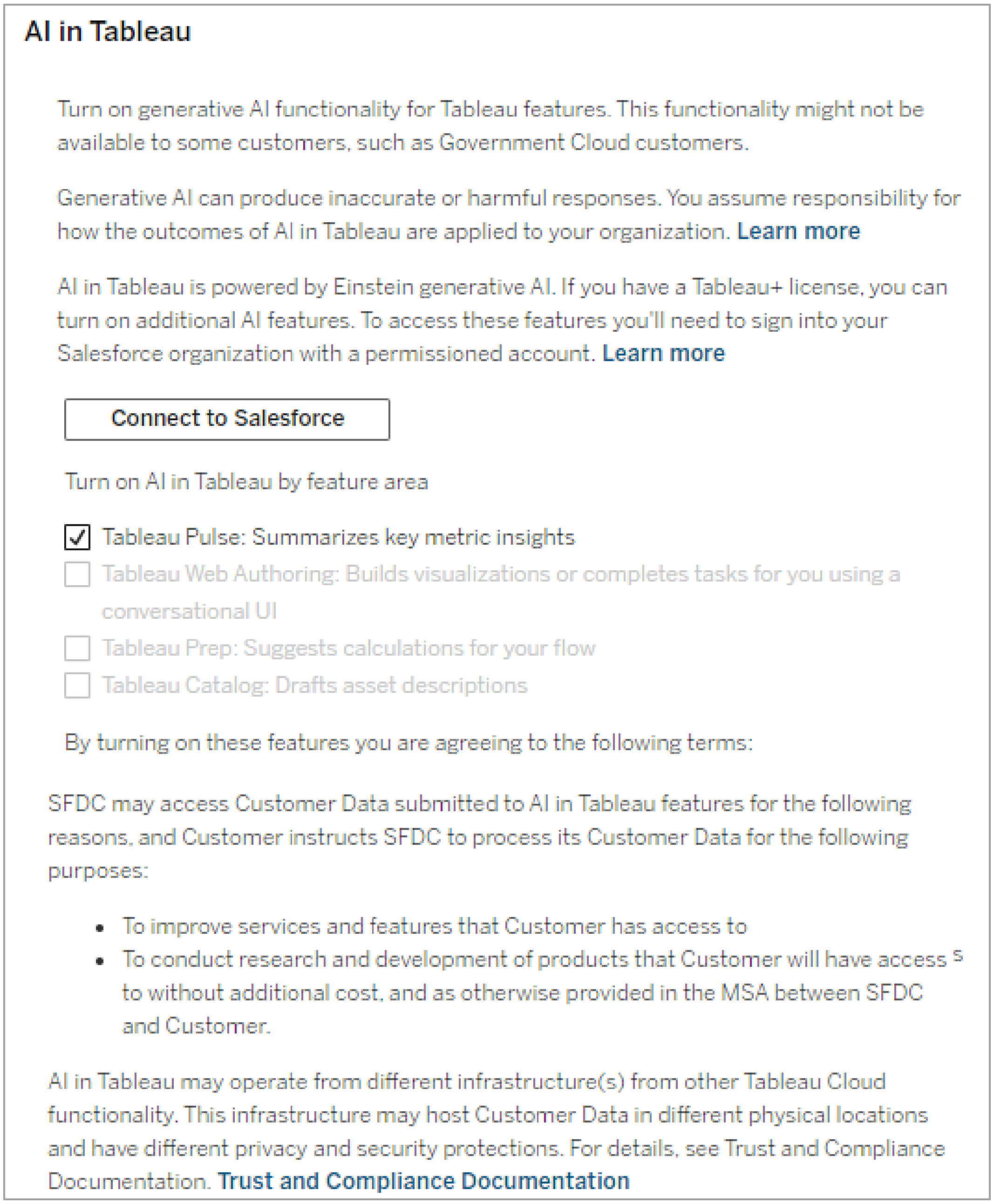



## Configure AI in Tableau

Use this setting to turn on generative AI functionality for specific features in Tableau.

**Note:** This feature uses generative AI, which is built on the Einstein Trust Layer. Your data stays safe and secure through data and privacy controls that are seamlessly integrated into the user experience. For more information, see Einstein Trust Layer.

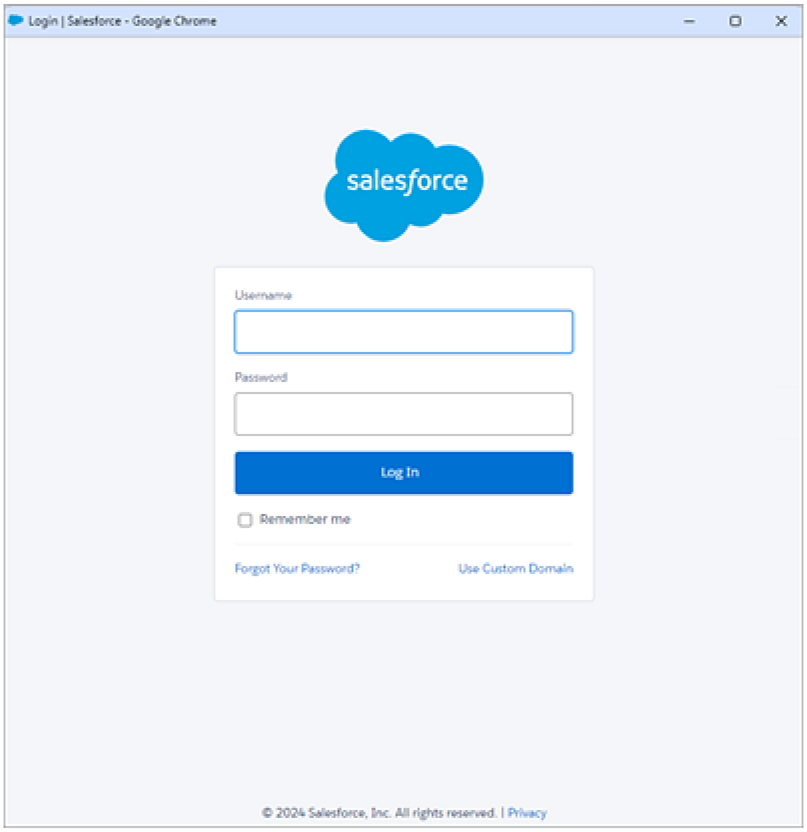
1. Sign in to Tableau Cloud as a site administrator.
2. On the site where you want to turn on generative AI features, select **Settings**.
3. In the **AI in Tableau** section, select the check boxes for the feature areas where you want generative AI turned on.



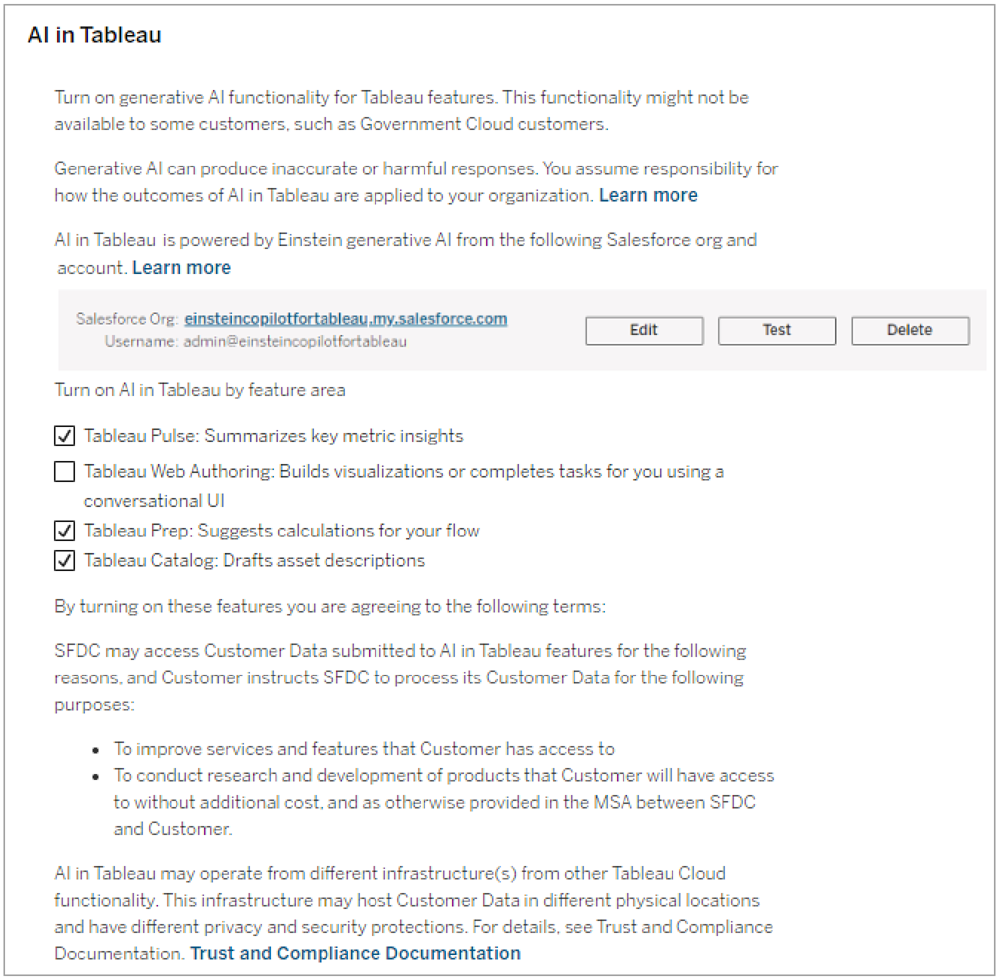

4. Select **Tableau Pulse: Summarizes key metric insights**to enable users to see their personalized insights summaries and get a quick overview of important changes to their metrics. For more information about generative AI in Tableau Pulse, see Tableau AI in Tableau Pulse.

> **Note**: You do not need to log into your Salesforce org to turn on the **Tableau Pulse: Summarizes key metric insights** feature.

5. To turn on AI in Tableau for Tableau Cloud web authoring, Tableau Prep, or Tableau Catalog, you must first log in to your Salesforce org.
   - Select **Connect to Salesforce**.
   - On the **Login|Salesforce** page, enter credentials for your Salesforce org.
     - Your User Id must be assigned the **Customize Application Profile** permission. For more information, see User capabilities with 'Customize Application' Profile permission in the Salesforce help.
     - Your Salesforce org must have Einstein generative AI turned on so that you have access to Einstein generative AI and Einstein Requests credits. For more information about Einstein Requests, see Tableau AI Usage.




- On the **Allow Access** page, select **Allow**.
- After successfully connecting to your Salesforce org, the check boxes for the additional Tableau AI features become enabled. You can also edit, test or delete your connection as needed.




6. Select **Tableau Web Authoring: Builds visualizations or completes tasks for you using a conversational UI** to enable users to create visualizations and create and understand calculations with the assistance of Tableau Agent. For more information about Tableau Agent in Tableau Cloud web authoring, see Explore Your Data with Tableau Agent.

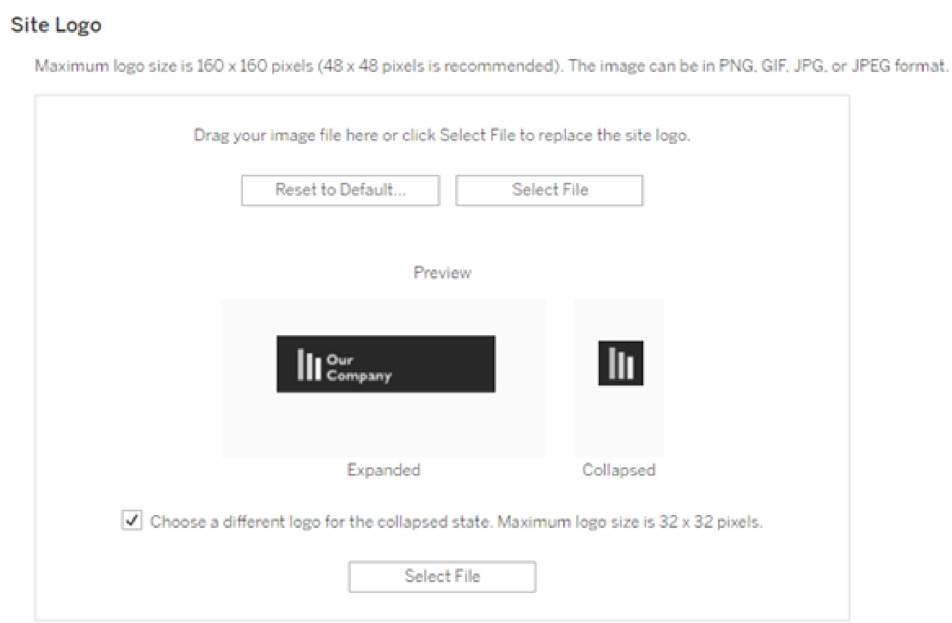
7. Select **Tableau Prep: Suggests calculations for your flow** to enable users to create calculated fields in Tableau Prep by simply describing the calculation in plain language using Tableau Agent. For more information about Tableau Agent in Tableau Prep, see Create Calculated Fields with Tableau Agent.

8. Select **Tableau Catalog: Drafts asset descriptions** to enable users to automatically generate descriptions for data sources, workbooks, and tables. For more information about generative AI in Tableau Catalog, see Manage Web Content.

## Upload a Custom Logo for your Site

To incorporate brand identity into your site header, you can change the Tableau logo to your own logo.

1. Sign in to Tableau Cloud as a site administrator.
2. On the site you want to show your logo, click **Settings**.
3. In the **Site Logo** section, do either of the following:
    - Drag the image file from your computer to the area indicated on the **Settings** page.



- Click **Select File** to open a dialog box where you can browse to and select the image file.

The preview area updates to show how your image will look in the space provided in the header.

4. (Optional) If your logo doesn’t fit quite right in the available space, and you want to make adjustments outside of Tableau before uploading it, you can do either of the following:

   - Click **Reset to Default** to show the original Tableau logo.
   - Click **Revert** to go back to the last saved settings. This is useful if you already have a custom logo in place but want to try a different one.

5. Click **Save**.

Image file tips

- The recommended image size is 48 x 48 pixels, up to 160 x 160 pixels (the maximum).
- Images that have a transparent background and light colors work best against the near-black background of the Tableau Cloud site.

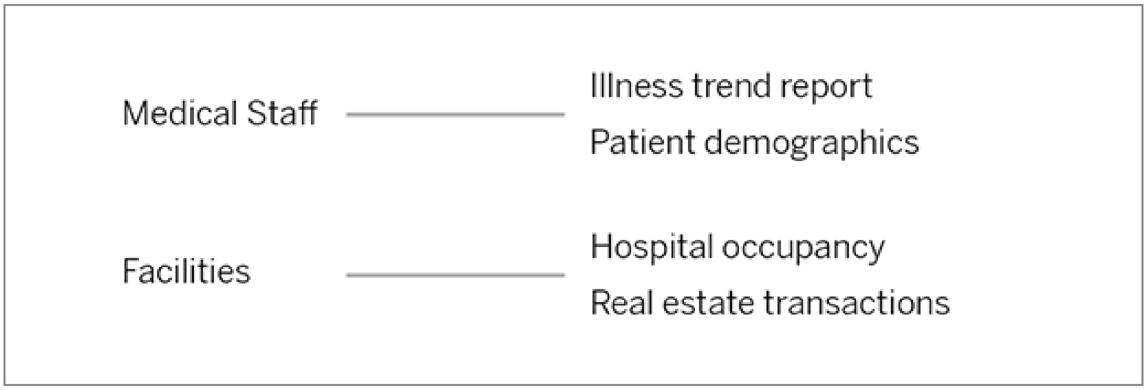
## Dashboard-based Custom Portals

> **Note:** This overview was inspired by the work of Tableau Visionary Mark Jackson. For more details about the process, check out Mark's blog.

The standard Tableau Cloud or Tableau Server interface works great for many organizations, but if you want to create a company-branded experience and don't have API developer skills, consider creating a custom portal based on a Tableau dashboard. A custom portal lets you organize content around specific departments or job roles, and you can even incorporate training that helps people interact with data more fully. As the volume of Tableau content grows, a custom portal guides your users directly to the data they need, while providing ready access to related views and Tableau Cloud search so they can easily explore further.

## Sketch out a portal design

Begin outside of Tableau, on paper or in a wireframing application. Consider the structure of your organization and the number of Tableau views that apply to each group of users. Do you simply need one level of navigation that points immediately to content? Or might you need to start with a main page that provides navigational links for separate groups of users or report types, followed by a second level with related dashboards and views?




After you get buy-in on your design from key stakeholders and data consumers, you're ready to move on to the next phase.

## Gather images for logos and navigation elements

Start thinking about images while refining your initial mockup, and then gather them from libraries of clip-art or approved brand graphics, or create them from scratch in an application like Photoshop or SnagIt. PowerPoint can also be a good source if you plan to create navigation thumbnails of common chart types.

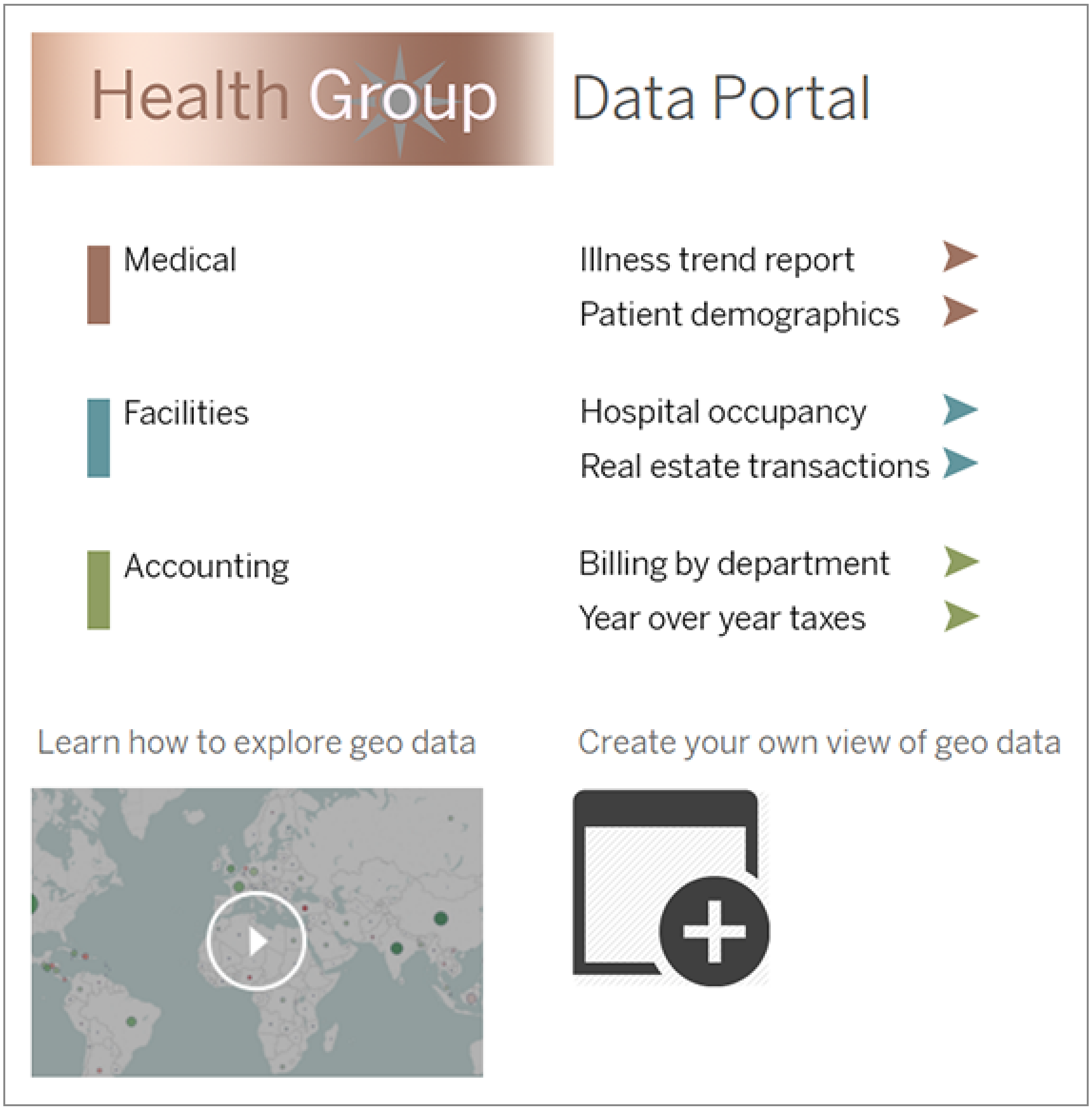
## Lay out text, images, and selected sheets on a dashboard

Create a workbook with a dashboard for the portal, using a tiled layout for more predictable positioning and scaling of elements on different devices. Then start adding Text and Image objects, as well as any sheets for data views you want to highlight right up front in your portal. To refine spacing between these dashboard elements, insert Blank objects and adjust their size. For more information, see Create a Dashboard.

## Link dashboard elements to content

If you have a second level of navigation in your portal, use filter actions to point to a secondary dashboard from the main one. To create links that directly open data views, right-click Image objects and choose Set URL. (In our example below, each colored arrow and accompanying text is an image that links to a view URL.) You can even point to empty views with preloaded data sources, encouraging users to create new Tableau content in the web-authoring workspace.

> **Tip:** To add hyperlinks to text objects, include the full URL (for example, `http://www.tableau.com`).




## Publish, test, and refine your portal

Publish the workbook to your server and distribute the dashboard URL to your users. Portal design, like data analysis itself, is a cyclical process. Now that your portal is out in the wild, start gathering user feedback so you can continuously improve the experience

**Tip:** As a finishing touch, hide the Tableau toolbar to give your portal a custom feel. After the question mark at the end of the dashboard URL, add `:embed=y&:toolbar=n`

## Set the Default Start Page for All Users

In a new site, when users sign in to the Tableau Cloud web authoring environment, they are taken to the Home screen, which displays a role-based welcome banner. Home also displays recent views, favorites, and the site's most-viewed content. As the administrator, you can change users' default landing page at the site level. For example, you can show all workbooks, and when the user signs in, they see the workbooks they have access to.

To set the default start page for all users

1. Display the page or filtered view you want to be the default page users see when they sign in to the site.

2. Select your profile icon in the upper right area of the page.

3. To set the start page for all users on a site, click **Set as Start Page** and **For Users on this Site**.

### User-set start pages and hierarchy

Users can set their own start pages from their profile icon, and can reset their start pages in their account settings (for information, search for “Access Your Profile and Account Settings” in the online Tableau Server Help for your operating system).

If a user sets their own start page, it will override any start page set for the site. The next time that user signs into Tableau Cloud, they will land on the start page that they've set. If neither a user or an administrator has set a start page, users will default to Home.

# Change Time Settings

There are a couple of time-related configurations you might make when working with Tableau Cloud.

## Set the site time zone for extracts

The default time zone for extract-based data sources in a site is Coordinated Universal Time (UTC). Site administrators can set a different time zone.

To set the site time zone for extracts:

1. Sign in to Tableau as an administrator.
2. On the site you want to configure, click `Settings`.
3. In the `Site Time Zone for Extracts` section, select a time zone and then click `Save`.

In calculated fields, functions such as NOW() or TODAY() look at the time zone. For more information about Extracts, see Extract Your Data in the Tableau Desktop help.

The timezone setting, in addition to being used for extract-based data sources, also affects internal extracts. For example, when Tableau connects to file-based data sources like text files, an extract is automatically created internally. Similarly, this happens where Tableau uses an internal extract to integrate data from different sources.

## Synchronize your computer clock with UTC

Timestamps displayed across your Tableau Cloud site is in Coordinated Universal Time (UTC) of the pod that your site is deployed to. To ensure the time on your computer matches the time used by your site, you can synchronize your computer's system clock with UTC using one of the following suggestions:

- If your computer is deployed on Amazon Web Services (AWS), you can synchronize your computer's system clock using Network Time Protocol (NTP) sources as described in the Keeping Time With Amazon Time Sync Service blog post on the AWS website.

- If your computer is deployed outside of AWS, you can synchronize your computer's system clock using one of the National Institute of Standards and Technology (NIST) time servers as described in Set your computer clock via the Internet using tools built into the operating system page on the NIST website.

# Tableau Mobile App Security Settings

Starting in December 2022, you can adjust Tableau Cloud security policies for the Tableau Mobile app. These policies help keep your data secure by checking to see if mobile devices are compromised, and by limiting certain interactions with the Tableau Mobile app.

The policies apply to only the standard version of Tableau Mobile, not the MAM versions of the app. If you have deployed an MAM app, use the specific to Tableau Mobile, in addition to your MAM system's settings, to secure the app.

## Security settings

Configure security settings for Tableau Mobile either on the site settings page for Tableau Cloud or using the REST API. For more information about the REST API, see Mobile Settings Reference in the Tableau REST API Help.

To access the site settings page:

1. Sign into your Tableau Cloud site as administrator.
2. From the navigation pane, select **Settings**.
3. Select the **Mobile** tab.

Starting in December 2022 settings related to mobile device security are available.

These settings include detecting the following conditions:

- **Jailbreak Detection**

  This setting is enabled by default at the **Critical** level and detects whether the app is running on a device that has been jailbroken or rooted.

- **Malware Detection** (Android devices only)

  This setting is enabled by default at the **Critical** level and detects whether the device has malware on it.

- **Maximum Days Offline Without a Policy Refresh**

  This setting is enabled by default at the **Critical** level with a default maximum of 14 days. It determines if the app can be used on a device that has been offline (and thus without a policy refresh) longer than the configured maximum.

- **Prevent Debugging**

  This setting is on by default and cannot be disabled. It detects whether the device has a debugger attached to it.

- **Screen Sharing and Screenshots** (Android devices only)

  This setting is enabled by default and determines whether a Tableau Mobile app user can share screenshots or use screen sharing with the app.

You can change the severity level for the Jailbreak Detection and Malware Detection settings:

- **Warn**: Enforce the policy and if it fails, show a dismissible blocking message.
- **Error**: Enforce the policy and if it fails, show a blocking message until the issue is resolved.
- **Critical**: Enforce the policy and if it fails, show a blocking message and the app decides how to handle the logout/clear session through the providers. This is the default.

# Security in the Cloud

Tableau understands that data is among the most strategic and important assets an organization has. We put the highest priority on maintaining the security and privacy of our customers' data. Tableau enterprise-level security features manage operational security, user security, application security, network security, and data security.

To learn more, see the following resources on Tableau's website (https://www.tableau.com):

- Tableau Cloud Security in the Cloud white paper.
- Tableau Cloud tips: A security checklist for publishing data to the cloud

If you sign in to Tableau Cloud using TableauID credentials, you can use them also to sign in to the Tableau website.

## Operational Security

The Tableau Cloud infrastructure is hosted in a SAS-70 compliant data center that provides numerous controls and safeguards over customer data.

Your data is your own, even when stored in Tableau Cloud. Only your authorized users have access to data or workbooks stored in Tableau Cloud—Tableau employees and other Tableau customers do not.

Tableau does have access to and may monitor metrics that have to do with system utilization, account status, and performance.

## User Security

The only people who have access to your site and content are the users that site administrators or cloud administrators explicitly add. If a user is no longer authorized in your system, simply remove that person's user account to revoke access to Tableau Cloud and your content stored there.

Tableau Cloud enforces an idle user session timeout of 2 hours. This means that users must reauthenticate after not using Tableau Cloud for a period of 2 hours. The idle session timeout value is a system setting that can't be modified.

### Tableau Account

Your Tableau Account provides secure, unified authentication to Tableau's website and services.

Some of the security features of Tableau Accounts are:

- User sign-in is secured by HTTPS.
- Accounts are locked for a period of time after repeated unsuccessful sign-in attempts.
- Accounts are validated by user email to prove identity.
- Passwords are stored using cryptographic protection. Tableau employees and contractor do not have access to plain-text passwords.
- Multi-factor authentication (MFA) can be enabled for accounts that use Tableau authentication (TableauID).

Tableau Cloud site administrators and cloud administrators have the option of using your organization’s identity provider for added control and convenience of users. For more information, see Authentication and Tableau Cloud Manager Authentication.

### Roles and Permissions

A role is a set of permissions that is applied to a project, workbook, view, or data source to manage user interaction. A wide range of specific permissions is available for each asset: view, create, edit, modify, delete, and more.

## Network Security

All communication between users and Tableau Cloud is encrypted using SSL for secure transmission of data. Tableau Cloud supports TLS 1.2 and higher. For more information about TLS support, see the Tableau Community. A variety of encryption techniques ensure security from browser to server tier to repository and back. In addition, Tableau Cloud does not support HTTP/1.0 after the migration to Salesforce's Hyperforce; customers must use HTTP/1.1 or higher for enhanced performance and security. Finally, Tableau has many built-in security mechanisms to help prevent spoofing, hijacking, and SQL injection attacks, and it actively tests and responds to new threats with monthly updates.

## Application Security

The Tableau Cloud environment is hosted in a multi-tenant configuration providing separation of users, data, and metadata across customers.

## Data Security

Tableau Cloud eliminates the need to implement VPNs or tunnels into your corporate environment. Many data sources can be captured as extracts and then refreshed on a regular basis. To use automatic refreshes, you need to embed credentials in the connection information for the data source. For Google and Salesforce.com data sources, you can embed credentials in the form of OAuth 2.0 access tokens.

You can define additional security in your workbooks and data sources by adding user and data source filters. Tableau also provides a User Filter capability that can enable row-level data security using the user name, group, or full name of the current user. User filters allow you to set a filter on your data based on the identity of the person viewing the data. For example, the Western Sales Director could see results for sales in the West but not for other regions. You set user filters when you publish workbooks and data sources from Tableau Desktop.

For information on the alternatives you can use to implement row-level security in Tableau, see an Overview of Row-Level Security Options in Tableau.

### HIPAA Compliance

Tableau Cloud is compliant with the Health Information and Portability Accountability Act (HIPAA) and can be provided in a HIPAA-compliant manner to meet the needs of health care and life sciences users. For more information, review the “Tableau Cloud and HIPAA Security Rule” white paper on the Salesforce Trust | Compliance site.

## Data Location

Tableau Cloud is hosted on Amazon Web Services (AWS). However, starting in August 2024 through March 2025, Tableau Cloud is moving to Salesforce's Hyperforce.

Tableau Cloud is structured so that you can choose the region where your site, and its data, is stored. As a new customer, you can select one of the following regions during the site setup process:

| **Territory** | | **Region** |
|---|---|---|
| Asia | Asia Pacific | Australia |
| | Asia Pacific | Japan |
| | Asia Pacific | Singapore |
| Europe | Europe | Germany<br><br>**Note:**Formerly Ireland prior to the migration to Hyperforce. For more information, see Tableau Cloud Migration to Hyperforce knowledge article. |
| | Europe | UK |
| North America | Canada | Quebec |
| | US-East | Virginia |
| | US-West | Oregon |

If needed, you can migrate your existing site to a different region through the site migration process. Contact your Tableau Sales Account Manager to request this change. For more information, see Tableau Cloud Environment Migrations Using the Content Migration Tool in the knowledge article.

Your site is backed up in the selected region on a regular basis. You can verify your site location by signing in to Tableau Cloud, noting the host name at the beginning of the URL, and then comparing it to the **Site Location** column in Tableau Cloud IP addresses for data provider authorization. For example, URLs that begin with **10ax**, **10ay**, **10az**, **us-west-2b** correspond to the US West - Oregon region. Data corresponding to a site in the US-West Oregon region is stored and backed up in Oregon.

- To request a new site, fill out this web form.
- For more information about the Tableau Cloud maintenance schedule, see Tableau Cloud System Maintenance.

## See also

Keep Data Fresh

OAuth Connections

Permissions

How SAML Authentication Works

User Filtering (Tableau Help)

# Tableau Cloud Site Capacity

Your Tableau Cloud site comes with capacity to support all your users' analytic needs. A site's capacity includes capacity for storage and tasks that need to be performed on the site for extracts, metrics, subscriptions, and flows.

The capacity information discussed in this topic is specific to each site in your Tableau Cloud Manager (TCM) tenant, the top-level administrative layer that manages your organization's Tableau Cloud deployment. Depending on your license type, TCM includes up to 3 sites by default. The number of sites increases with different license types – up to 10 sites with an Enterprise license and a maximum of 50 with a Tableau+ license. For more information about TCM, see Use Tableau Cloud Manager.

Licensing capacity is managed at the tenant level and can be allocated to sites by cloud administrators using site role limits. For more information, see Manage Site Role Limits.

## Summary

The following table summarizes the capacity allowances for your site by feature. You can find more capacity information by the features listed below.

| | Capacity Type | Capacity Allowance |
|---|---|---|
| | | |
| **Storage** | Site | 1 TB<br><br>5 TB with an Advanced Management license. For more information, see Advanced Management capacity. |
| | Individual workbook, published data source, or flow size | 15 GB<br><br>25 GB with an Advanced Management license. See Advanced Management capacity. |
| | | |
| **Extract refreshes** | Daily refreshes | Up to 8 backgrounder hours per Creator license |
| | Concurrent refreshes | Up to 10 jobs*<br><br>Up to 25 jobs* with an Advanced Management license. See Advanced Management capacity. |
| | Individual refresh runtime | 2 hours |
| | | |
| **Metrics** | Daily refreshes | Up to 8 backgrounder hours per Creator license |

| | Capacity Type | Capacity Allowance |
|---|---|---|
| | Concurrent refreshes | Up to 10 jobs |
| | Individual runtime | 2 hours |
| | **Retirement of the legacy metrics feature**<br><br>Tableau's legacy metrics feature was retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. In October 2023, Tableau retired the ability to embed legacy metrics in Tableau Cloud and in Tableau Server version 2023.3. With Tableau Pulse, we've developed an improved experience to track metrics and ask questions of your data. For more information, see Create Metrics with Tableau Pulse to learn about the new experience and Create and Troubleshoot Metrics (Retired) for the retired feature. | |
| | | |
| **Subscriptions** | Concurrent subscriptions | Up to 10 jobs |
| | Individual subscription runtime | 30 minutes |
| | Individual email size | 2 MB |
| | | |
| **Flows** | Concurrent flows | 1 per Resource Block |
| | Individual flow runtime | See Job runtime capacity. |
| | Flow memory usage size | 19.5 GB |
| | | |

| | Capacity Type | Capacity Allowance |
|---|---|---|
| **Visualizations** | Load time | Up to 5 minutes |
| | Idle timeout | 120 minutes |
| | User request rate | Up to 600 requests per hour per user |
| | Query usage size | 20 GB |
| | | |
| **View Accel-eration** | Accelerated views | Minimum 30 accelerated views per site with an additional 20 views per Creator license. Maximum 750 accelerated views. |
| | Accelerated view refreshes | Up to 12 jobs per day per view |
| | Memory usage size | 20 GB |
| | Individual acceleration runtime | Up to 30 minutes |
| | | |

***Note**: To ensure that system resources are equitably distributed across Tableau Cloud, each site has an upper limit on the number of jobs that can run at any point in time. However, this limit is not a guarantee of capacity. Tableau Cloud allocates system resources to optimize jobs and resources are adjusted to start a job within 15 minutes or less from the scheduled start time.

**Note:** The behavior of the capacity limits specific to each site within Tableau Cloud Manager is subject to change as we evolve our infrastructure.

## Storage capacity

A Tableau Cloud site comes with site and individual content storage capacities.

- **Site storage:** A site comes with 1 TB of storage capacity. Workbooks, published data sources, and flows count toward this storage capacity.

- **Individual workbook, published data source, and flow size:** An individual workbook, data source (live or extract), or flow published to your site can have a maximum size of 15 GB.

  **Note:** If your extract data source exceeds 10 GB in size, we recommend that you consider either using live connection to the database or aggregate the data in the extract to reduce its size. Frequently republishing or refreshing large extracts can be time intensive and usually indicates that more efficient data freshness strategies should be considered.

## Visualization capacity

Each site comes with designated capacity to load and query individual visualizations, also known as views. You can find more information about each capacity type below.

- **Load time:** A site has capacity to spend up to 5 minutes to load a view.

- **Idle timeout:** If the user hasn't interacted with or edited a view for 120 consecutive minutes, the user must reload (for example, refresh the page or click the **Reconnect** button if a banner displays) the view or saved draft to interact with it again.

- **User request rate:** Each user on a site has the capacity to make up to 600 requests per hour to load and refresh views. When this capacity has been reached, the user can't interact with, edit, and save the view. After an hour, the view can be refreshed and new views can be loaded.

  **Note:** If the cumulative number of user requests exceeds the site-level request rate, users can't interact with, edit, and save views.

- **Query usage size:** A site has capacity to use no more than 20 GB of memory to query a view that uses an extract data source. The amount of memory needed to query a view can vary depending on the complexity of the data manipulations that Tableau needs to perform to generate the marks in the view.

**Note:** Only queries against extract data sources count toward query usage capacity. Queries against data sources that use live connections to the underlying data do not. However, queries against data sources that use live connections might be subject to other query usage capacity enforced by underlying databases.

Views that exceed these capacity types might be canceled to ensure enough system resources are available so that other views on the site can load.

Tips for optimizing visualization capacity

Views that exceed visualization capacity can indicate the queries that Tableau must run in order to generate the view might be too complex. In such cases, you can use the following tips to help optimize queries thereby minimizing the time it takes to load views on Tableau Cloud. Most tips require that you edit the data source or workbook and republish to Tableau Cloud for changes to take effect.

For more tips, see the Workbook Performance topic in the Tableau Help.

- **Use data source filters**: When you add a filter on a data source, you reduce the amount of data that needs to be generated in the view. Reducing the amount of data can help minimize load times of views. For more information, see Filter Data from Data Sources in the Tableau Help.

- **Use context filters**: Similar to data source filters, context filters reduce the data in the data source but at the sheet level. Context filters work independently of other filters and can significantly reduce the amount of data that needs to be generated in the view. Reducing the amount of data can help minimize load times of views. For more information, see Improve View Performance with Context Filters in the Tableau Help.

- **Decrease date ranges**: As a rule, dates require more computing power than other types of data like numbers and Booleans. If the view contains date filters, you can reduce the date ranges or the number of dates that need to be generated to help minimize the load times of views.

- **Reduce marks**: Because Tableau must calculate the marks in order to generate the view, the number of marks can impact how quickly the view can load. There are several ways you can reduce marks, including using some of the filters listed above or using sets to filter, custom SQL to aggregate data, and more. For more information, see Reduce the number of marks in the view.

## View Acceleration capacity

Each Tableau site has the following View Acceleration capacity:

- **Accelerated views:** The default number of accelerated views per site is 30. For each additional Creator License, 20 more views can be accelerated. The maximum number of accelerated views is 750.

- **Accelerated refreshes:** Accelerated views are regenerated in alignment with the following four data update events:

  - Data freshness policy: The acceleration timestamp is out of sync with the data freshness policy.
  - Extract refreshes: An extract refresh completes, signaling fresher data.
  - Accelerated view update: An accelerated view is updated by the owner.
  - View opted-in: A view is originally opted in for acceleration.

  Each unique event triggers a pre-computation job to be queued. Backgrounder jobs then pick up and complete the pre-computation, and then store query results as a materialized view. Views that belong to the same workbook are refreshed in one job. To limit resource consumption, the maximum number of pre-computation jobs that can be run is limited to 12 jobs per day. For more information, see Set a Data Freshness Policy.

- **Acceleration memory usage size**: A site has capacity to use no more than 20 GB of memory for pre-computing and fetching the workbook's data in a backgrounder job. The amount of memory needed varies depending on the complexity of the query(ies) that are associated with the view that is being accelerated.

## Job runtime capacity

Job runtime capacity is the period of time that a job, or an instance of a task type, is allowed to run before it's canceled to help protect available system resources. Each site comes with job runtime capacities for the following job types:

- Extract refreshes
- Subscriptions
- Flows
- Metrics
- View Acceleration

Each extract refresh or metrics job type has a maximum runtime of two hours (120 minutes or 7,200 seconds). Subscription or view Acceleration has a maximum runtime of 30 minutes (1,800 seconds).

**Note about flows:** For sites that don’t have Data Management, the maximum runtime for flows jobs for a site is 60 minutes times the number of creator licenses up to a maximum of 24 hours. If your site has large flows workloads, consider purchasing Data Managementto get more capacity. For sites with Data Management, you can run flows for up to 24 hours per day per Resource Block. If you exceed the time limit no new jobs can be started until the next day. Additional capacity for concurrent flow jobs can be purchased. For more information, see Resource Blocks.

**Note about extract refreshes:** If a refresh job reaches its maximum runtime, you see a timeout error. For more information about the error and ways you can modify extracts to keep refresh jobs within the runtime capacity, see Time limit for extract refreshes.

## Concurrent jobs capacity

Concurrent jobs capacity is the number of jobs, or instances of a task type that can run at the same time. Each site comes with concurrent capacities for the following job types:

- Extract refreshes
- Subscriptions

- Flows
- Metrics

You can find more information about the concurrent jobs capacity for each job type below.

- **Extract refreshes:** A site has an upper limit of 10 extracts that it can refresh at any given point in time. Depending on available system resources, the wait time (i.e., the time before a job starts) is adjusted to start a job within 15 minutes or less from the scheduled start time. Jobs that count toward refresh capacity include scheduled refreshes, manual refreshes, extract creation, and command line or API calls that trigger refreshes, including appending data incrementally.

- **Subscriptions:** A site has an upper limit of 10 subscriptions that it can run at any given point in time. Depending on available system resources, the wait time (i.e., the time before a job starts) is adjusted to start a job within 15 minutes or less from the scheduled start time. Jobs that count toward subscriptions capacity include generating emails from subscriptions created through Tableau Cloud directly or API calls that generate the email subscriptions.

- **Flows:** If licensed with Data Management, a site has a default capacity of 1 concurrent flow job per Resource Block. Resource Blocks support flow jobs. If not licensed with Data Management, a site has a default capacity of 1 concurrent flow job, which is the equivalent of having one Resource Block. If there are no Resource Blocks available when a flow job starts, the job goes into a queue to wait for a Resource Block to be available. A flow job might also go into a queue during busy hours even when there are available Resource Blocks to ensure that system resources remain available to support flow jobs across all of Tableau Cloud. Additional capacity for concurrent flow jobs can be purchased. For more information, see Resource Blocks. Each user can have a maximum of 4 active flow web editing sessions at one time. If more sessions are opened, the oldest session will be closed.

- **Metrics:** Each site has the capacity to refresh up to 10 metrics concurrently. For more information about how metrics refresh, see Create and Troubleshoot Metrics (Retired).

**Note:** If a site exhausts its concurrent capacity for a job, other jobs that are in the queue remain in a pending state until one or more jobs have completed.

## Daily jobs capacity

Daily jobs capacity is the number of shared hours each site can spend per Creator license a day to perform all jobs on the site. A server process, called backgrounder, initiates and performs these jobs. A site with more Creator licenses gets more daily jobs (backgrounder) capacity to meet the needs of a larger site population.

Each site comes with daily jobs (backgrounder) capacity to perform both extract refresh and metric refresh jobs.

For example:

| If your site has... | multiplied by the default time | Daily jobs capacity |
|---|---|---|
| 10 Creator licenses | 8 hours | Up to **80 hours/day** |
| 50 Creator licenses | 8 hours | Up to **400 hours/day** |

Daily jobs capacity resets each day at 24:00:00 UTC (coordinated universal time).

### About extract refreshes

Refresh jobs that count toward daily jobs capacity include full and incremental refreshes and extract creation, which can be initiated by scheduled refreshes, manual refreshes, and certain command line or API calls.

**Notes:**

- As long as your site has time remaining in its daily refresh capacity, a refresh job will start.
- Site admins receive email notifications when a site reaches 70%, 90%, and 100% of its daily refresh capacity.
- If a site exhausts its daily refresh capacity, any future extract refreshes are canceled and email notifications are sent to content owners alerting them of the refresh cancellation.

Tips for optimizing extract refreshes capacity

If you're managing an extract-heavy environment, Tableau recommends following some best practices to make the most efficient use of your site capacity.

- **Stop refreshing unused extracts**. One of the best ways to reclaim capacity for your site is to stop automatic refreshes, either through schedules on Tableau Cloud or through scripts of extracts that aren’t being used. For more information about deleting a refresh schedule, see Manage Refresh Tasks.

- **Reduce the frequency of refreshes**. Another method of reclaiming capacity for your site is to reduce the frequency of extract refreshes. For example, instead of refreshing an extract hourly, consider refreshing an extract daily or only during business hours when fresh data is most useful. For more information about changing a refresh schedule, see Manage Refresh Tasks.

- **Use incremental refreshes instead of full refreshes**. To decrease the amount of time an extract takes to refresh, consider performing an incremental refresh of the extract instead of a full refresh. For more information, see Schedule Refreshes on Tableau Cloud.

  **Note:** Changing from a full to an incremental refresh can be done from Tableau Cloud only if the extract was configured for incremental refresh in Tableau Desktop before the extract was published. For more information about incremental refreshes, see Configure an incremental extract refresh in the Tableau User Help.

- **Use live connections instead of extract connections**. For views, dashboards, and workbooks whose data needs to be updated frequently, consider setting up the data source to use a live connection instead of an extract connection.

- **Optimize the data in the extract**. Improving the performance of an extract can also help reduce the amount of time an extract takes to refresh. There are a number of changes you can make to the extract's data to help its overall performance, such as removing unused fields, using filters to remove unused rows, changing date ranges, etc.

### About metric refreshes

Metrics that rely on extract data sources refresh when their extract counterparts refresh and therefore count toward daily job capacity.

**Note:** Metrics that rely on live data sources refresh every 60 minutes and don't count toward daily job capacity.

### Jobs initiated by command line and API calls

In addition to the capacity described above, a site comes with designated capacity for command line and API calls.

- **Initiate extract refresh jobs:** A site comes with designated capacity for tabcmd (refreshextracts), REST API (Run Extract Refresh Task), and Tableau Client (Python) library calls to initiate extract refresh jobs. A site allows 20 total calls per one-hour period.

- **Query or cancel jobs:** A site comes with a designated capacity for REST API (Query Job and Cancel Job), and Tableau Client (Python) library calls that query status information for asynchronous jobs, or cancel pending and in-progress jobs. A site allows 20000 calls per 24-hour period.

- **Initiate publish, update, or refresh jobs:** A site comes with designated capacity for tabcmd (publish), REST API (Publish Workbook, Publish Data Source, Update Workbook, Update Data Source, Update Data Source Now, Tableau Prep flow runs), and Tableau Client (Python) library calls that initiate publish, update, or refresh jobs for workbooks and data sources. A site allows 4000 calls per 24-hour period.

**Note:** If the number of calls exceed the command line or API calls capacity described above, you see one of the following errors: *Unknown 429* or *ApiCallError: 429000: Too Many Requests – Too many requests for <job type> 'api.rest.refresh_extracts'. Please retry after 146 second(s)*.

# Monitor capacity

There are a few tools you can use to help you monitor your site's capacity: Jobs page and Admin views.

## Jobs page

The Jobs page gives you detail about the unique instances of backgrounder tasks, called jobs, within the past 24 hours. You can use the jobs page to monitor extract refreshes, subscriptions, and flow jobs.

1. Sign in to Tableau Cloud using your site admin credentials.
2. In the left navigation pane, click **Jobs**.
3. From the filter drop-down menu, under **Task Type**, select the job type you want to monitor.

For more information on the Jobs page, see Managing Background Jobs in Tableau Cloud topic.

## Admin views

Admin views help you monitor different types activity on your site. You can find more capacity usage information, using admin views, for the features listed below.

- **Storage:** You can monitor your site's storage capacity and check which workbooks, data sources, and flows take up the most space on your site using the Admin Insights "Stats for Space Usage" dashboard. Select **Explore** > **Admin Insights** > **Admin Insights Starter** > **Stats for Space Usage**.

  For more information about Admin Insights, see Use Admin Insights to Create Custom Views.

- **Flows:** You can monitor the performance of flow runs. Select **Site Status** > **Flow Performance History**. Using the dashboard, under **Flow History**, click on a mark to see details about the flows job.

For more information about this admin view, see Administrative Views for Flows.

- **Metrics:** You can monitor your site's metrics jobs by using the "Background Tasks for Non Extracts" admin view. Select **Site Status** > **Background Tasks for Non Extracts**, and then from the **Tasks** filter drop-down, select **Update all metrics on a view** check box.

  For more information about this admin view, see Background Tasks for Non Extracts.

## Advanced Management capacity

With Advanced Management, you get the following capacity increases for your site:

- Storage of 5 terabyte (TB)
- Maximum file size of 25 gigabytes (GB)
- Up to 25 concurrent extract refresh jobs*

For more information about Advanced Management, see About Tableau Advanced Management on Tableau Cloud.

***Note**: To ensure that system resources are equitably distributed across Tableau Cloud, each site has an upper limit on the number of jobs that can run at any point in time. However, this limit is not a guarantee of capacity. Tableau Cloud allocates system resources to optimize jobs and resources are adjusted to start a job within 15 minutes or less from the scheduled start time.

# Tableau Cloud System Maintenance

Tableau Cloud undergoes periodic maintenance to sustain the infrastructure supporting Tableau Cloud services and deliver enhanced features and functionality. As a Tableau Cloud site administrator, you don't have to worry about managing updates to your site. But we recommend reviewing the reserved maintenance schedule to plan for scheduled downtime and to avoid service interruptions.

For more information about releases, see Tableau Cloud release cadence.

# Maintenance communication

Tableau communicates system maintenance through the Salesforce Trust Status page and notification emails to site administrators.

## Salesforce Trust notifications

Salesforce Trust is where all Tableau Cloud status updates are posted. Status updates include system maintenance, as well as reported incidents that might affect the use of Tableau Cloud. You can quickly check the status of your Tableau Cloud instance by visiting the trust page, or by subscribing to Trust to stay informed.

To subscribe to Trust, go to https://status.salesforce.com/products/tableau, and click the **Subscribe to Notifications** button. You can receive updates by email. or notifications whenever Tableau Cloud creates, updates, or resolves an incident. For detailed instructions, see the Salesforce Trust Status Notification Guide.

**Important:** On July 15, 2024, Tableau Trust (https://trust.tableau.com) moved to Salesforce Trust (https://status.salesforce.com/products/tableau). If you were subscribed to Tableau Trust email and RSS notifications before July 15, 2024, both email and RSS notifications were migrated to Salesforce Trust so that you can continue getting status updates for Tableau Cloud. To resubscribe to SMS notifications or for new subscriptions, go to Salesforce Trust to subscribe to Tableau Cloud updates.

## Site Administrator emails

Tableau Cloud users with the Site Administrator role will automatically receive notification emails about their site. Emails include system maintenance and reported incidents that might affect the use of Tableau Cloud.

Notification emails will include the date and time, name of the Tableau Cloud instance, type of maintenance scheduled, impact to users, and estimated time to completion.

## Reserved system maintenance schedule

Tableau has reserved system maintenance windows for sustaining the security, availability, and performance of the infrastructure supporting Tableau Cloud services. The reserved maintenance schedule will help you plan for scheduled downtime and avoid service interruptions to your Tableau Cloud site. While there is a pre-defined window in which maintenance can occur, there migh be months when maintenance is not required.

When maintenance is scheduled, we publish the dates and times of the maintenance windows on the Salesforce Trust page. For maintenance that impacts an entire Tableau Cloud instance, Trust Status notifications are sent to subscribers and site administrators via email. Notifications are sent when the maintenance schedule is posted to Trust Status and 14-days before the maintenance will occur. Trust Status notifications will also be sent at the start and end of each maintenance and 48 hours prior as a reminder.

In the event that we need to reschedule maintenance, the maintenance record will be updated on the Trust Status page, and an email will be sent to Trust Status subscribers.

> **Note:** If priority maintenance is required, Trust Status subscribers and Tableau Cloud site administrators may be notified less than one week in advance.

Whenever possible, and only as maintenance is necessary, Tableau will schedule system maintenance the **first and third weekends of the calendar month** during the windows listed in the table below. Plan the maintenance activities for your organization (software upgrades, integration changes, etc.) outside of the Tableau system maintenance windows for your instances. In extreme circumstances, there may be times when system maintenance is scheduled outside of these windows to maintain system availability, performance, and security of the Tableau Cloud infrastructure.

| **Reserved System Maintenance Windows** | | | | |
|---|---|---|---|---|
| **Region** | **Pod** | **Interval** | **Local Time** | **UTC** |
| United States - | 10AY, 10AZ, | 1st monthly | Saturday, 08:00 - | Saturday, |

| | | | | |
|---|---|---|---|---|
| West | UW2B | weekend<br><br>3rd monthly weekend | 14:00 PST | 16:00 – 22:00 |
| United States - East | prod-useast-a, prod-useast-b, useast-1, prod-useast-c | 1st monthly weekend<br><br>3rd monthly weekend | Sunday, 11:00 - 17:00 EST | Sunday, 16:00 – 22:00 |
| Europe | DUB01, EW1A, prod-uk-a | 1st monthly weekend<br><br>3rd monthly weekend | Saturday, 02:00 - 08:00 CET | Saturday, 01:00 – 07:00 |
| Canada - Quebec | prod-ca-a | 1st monthly weekend<br><br>3rd monthly weekend | Sunday, 11:00 - 17:00 EST | Sunday, 16:00 – 22:00 |
| Asia Pacific - Japan | prod-apnortheast-a | 1st monthly weekend<br><br>3rd monthly weekend | Sunday, 01:00 - 07:00 JST | Saturday, 16:00 – 22:00 |
| Asia Pacific - Australia | prod-apsoutheast-a | 1st monthly weekend<br><br>3rd monthly weekend | Sunday, 03:00 - 09:00 AEST | Saturday, 16:00 – 22:00 |
| Asia Pacific - | prod-apsouth- | 1st monthly | Sunday, 00:00 - | Saturday, |

| | | | | |
|---|---|---|---|---|
| Singapore | east-b | weekend<br><br>3rd monthly weekend | 06:00 SGT | 16:00 – 22:00 |

**Note:** Local maintenance windows use standard time. The local time might change +/- 1 hour seasonally during daylight savings.

## Tableau Cloud release cadence

To ensure our products continue to help people use data to solve problems every day, Tableau is constantly innovating. We ship new features and functionality three times a year (Winter, Spring, Summer).

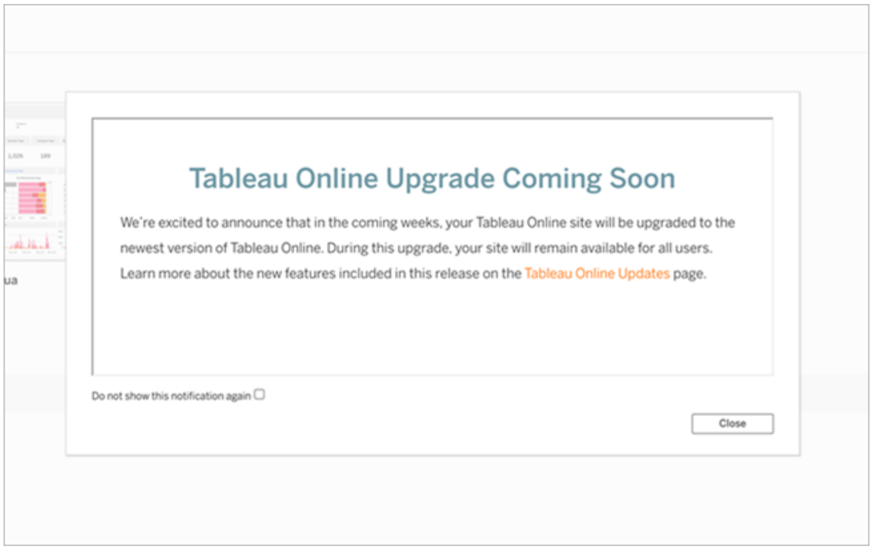
### Release communication

Releases are communicated through in-product notifications to let you know when your site is scheduled to be upgraded, and then again once the upgrade is complete. Sites can be accessed during the upgrade, meaning that all features and functionality are available to users. There's no downtime associated with release upgrades.

### Release schedule

Major releases are rolled out across Tableau Cloud’s worldwide infrastructure over several weeks before upgrading our on-premises software. Because our releases are rolled out worldwide in sequence, exact dates and times are not pre-announced. Instead, in-product notifications are there to inform users and administrators when releases are upcoming.

You'll see an in-product notification approximately two weeks before your site is scheduled to upgrade.




### Learn about new features

For more information about the new features on your site, see Coming Soon. The Coming Soon page offers information about upcoming and in-progress Tableau releases. As a Tableau Cloud customer, you might already have access to the features listed on this page. Broader website updates happen once customers across all of our products can upgrade and take advantage of the new features.

# Authentication

Authentication refers to the options for how users can sign in to their Tableau Cloud site, and how they access it after signing in the first time. Authentication verifies a user's identity.

Tableau Cloud supports multiple authentication types, which you can configure on the **Authentication** page.

This topic is intended for site administrators configuring authentication to a site. For cloud administrators configuring authentication for Tableau Cloud Manager, see Tableau Cloud Manager Authentication.

Regardless of the authentication type you configure for your site, multi-factor authentication (MFA) is required when accessing Tableau Cloud. This contractual requirement went into effect February 1, 2022. For more information, see About multi-factor authentication and Tableau Cloud below.

- **Tableau with MFA:** This is the built-in and default authentication type. It requires users to provide a combination of 1) Tableau credentials (also called TableauID), consisting of a username and password that are stored with Tableau Cloud, and 2) an MFA verification method, such as an authenticator app or security key, to confirm a user's identity. For more information, see Multi-Factor Authentication and Tableau Cloud.
    - **Tableau:** If Tableau hasn't updated your site to require Tableau with MFA yet, you can continue to use this authentication type on a temporary basis. Users enter their TableauID credentials directly on the Tableau Cloud sign-in page.
- **Google:** If your organization uses Google applications, you can enable Tableau Cloud to use Google accounts for single sign-on (SSO) with MFA using OpenID Connect (OIDC). When you enable Google authentication, users are directed to the Google sign-in page to enter their credentials, which are stored by Google.
- **OIDC:** Another way to use SSO is through generic OpenID Connect (OIDC). To do this, you use a third-party identity provider (IdP) with MFA, and configure the site to establish a trust relationship with the IdP. When you enable OIDC, users are directed to the IdP’s sign-in page, where they enter their SSO credentials, already stored with the IdP.
- **Salesforce:** If your organization uses Salesforce, you can enable Tableau Cloud to use Salesforce accounts for single sign-on (SSO) with MFA using OpenID Connect (OIDC). When you enable Salesforce authentication, users are directed to the Salesforce sign-in page to enter their credentials, which are stored and managed in Salesforce. Minimal configuration may be required. For more information, see Salesforce Authentication.

- **SAML:** Another way to use SSO is through Security Assertion Markup Language (SAML). To do this, you use a third-party identity provider (IdP) with MFA, and configure the site to establish a trust relationship with the IdP. When you enable SAML, users are directed to the IdP's sign-in page, where they enter their SSO credentials, already stored with the IdP.

**Notes:**

- Access and management permissions are implemented through site roles. Site roles define which users are admins, and which users are content consumers and publishers on the site. For more information about admins, site roles, groups, Guest User, and user-related administrative tasks, see Manage Users and Groups and Set Users' Site Roles.
- In the context of authentication, it's important to understand that users are not authorized to access external data sources through Tableau Cloud by virtue of having an account. In other words, in the default configuration, Tableau Cloud does not act as a proxy to external data sources. Such access requires additional configuration of the data source on Tableau Cloud or authentication at the data source when a user connects from Tableau Desktop.

## About multi-factor authentication and Tableau Cloud

To get ahead of the rise and constantly evolving security threats that can cripple an organization, MFA authentication became a Tableau Cloud requirement beginning February 1, 2022. MFA is an effective tool for enhancing sign-in security and protecting your organization and its data against security threats. For more information, see the Salesforce Multi-Factor Authentication FAQ in Salesforce Help.

To enhance account security, multi-factor authentication (MFA) is an authentication method that must be used in conjunction with one of the other authentication methods described above. MFA can be implemented in one of two ways:

- **SSO and MFA (recommended method):** To satisfy the MFA requirement, enable MFA with your SSO identity provider (IdP).

- **Tableau with MFA (alternative method):** If you don’t work directly with an SSO IdP, you can instead enable a combination of 1) TableauID credentials, which are stored with Tableau Cloud, and 2) an additional verification method before you and your users can access the site. We also recommend that users set up recovery codes as a backup verification method for emergency cases only. For more information, see Multi-Factor Authentication and Tableau Cloud.

## About Google, OIDC, Salesforce, or SAML configurations

If you enable Google, OIDC, Salesforce, or SAML authentication on your site, you can select which users you want to sign in using external credentials and which to use Tableau credentials (Tableau ID). You can allow Tableau and one or more external providers configured for a site, but each user must be set to use one or the other type. You can configure user authentication options on the **Users** page.

**Important:** In addition to these authentication requirements described above, we recommend that you dedicate a site administrator account that is configured for **Tableau with MFA** authentication. In the event of an issue with SAML or the IdP, a dedicated **Tableau with MFA** account helps ensure that you have access to your site.

Notes about configuring additional authentication methods

Beginning in November 2024 (Tableau 2024.3), you can configure one or more authentication methods for your site.

Each authentication configuration requires a name. Existing configurations that were created before November 2024 will be given a name automatically. For example, if SAML was configured for your site before November 2024, the configuration name is "Initial SAML". Names for existing configurations can't be changed.

The maximum number of configurations that a site can have depends on when the site was created and if SAML or OIDC was configured.

- For sites created before November 2024 upgrade:
  - If you configured SAML only or OIDC only before the November 20204 upgrade, you can create up to 19 configurations.
  - If you configured SAML and then OIDC or OIDC then SAML before the November 2024 upgrade, you can create up to 18 configurations.
- For sites created after the November 2024 upgrade, you can create up to 20 configurations.

**Note:** Configurations can be enabled, disabled, and deleted. However, the SAML configuration associated with SCIM can't be disabled or deleted until the SCIM capability is turned off. For more information about SCIM, see Automate User Provisioning and Group Synchronization through an External Identity Provider.

## Allow direct access from Tableau connected clients

By default, after users provide their credentials to sign in to a site, they can subsequently access the Tableau Cloud site directly from a *connected* Tableau client. To learn more, see Access Sites from Connected Clients.

**Note:** Optionally, you might need to add `*.salesforce.com` if MFA with Tableau authentication is enabled for your site and your environment is using proxies that prevent clients from accessing other necessary services.

## Other authentication scenarios: Embedding and integration

You can put analytics directly in your users' workflows by integrating and embedding Tableau into custom web portals, applications, and customer-facing products. For integration of external applications with Tableau Cloud and embedding Tableau Cloud content, there are additional mechanisms to authenticate users who access Tableau depending on the intended workflow:

- **Embedding with Tableau connected apps:**
    - **Direct trust**—Tableau connected apps enable a seamless and secure authentication experience by facilitating an explicit trust relationship between your Tableau Cloud site and external applications where Tableau content is embedded. The trust relationship provides your users with a single sign-on (SSO) experience without having to integrate with an identity provider. Using connected apps also enables a programmatic way to authorize access to the Tableau REST API using JSON Web Tokens (JWTs). For more information, see Configure Connected Apps with Direct Trust.
    - **OAuth 2.0 trust**— You can register an external authorization server (EAS) with Tableau Cloud to establish a trust relationship between your site and the EAS using the OAuth 2.0 standard protocol. The trust relationship provides your users with a single sign-on experience (SSO), through your IdP, to embedded Tableau content. In addition, registering an EAS enables a programmatic way to authorize access to the Tableau REST API using JSON Web Tokens (JWTs). For more information, see Configure Connected Apps with OAuth 2.0 Trust.
- **Salesforce integration:** Augment your data analysis through machine learning models and comprehensive statistical analysis using Einstein Discovery. For more information, see Configure Einstein Discovery Integration.
- **Slack integration:** Make Tableau notifications available to licensed Tableau users in their Slack workspace. For more information, see Integrate Tableau with a Slack Workspace.

## Multi-Factor Authentication and Tableau Cloud

As part of the broader Salesforce ecosystem, we require you, the site owners, to configure account security mechanisms for you and your users. The way you can enable account security depends on which technologies are available to you in your organization. MFA authentication became a Tableau Cloud requirement beginning February 1, 2022. MFA is an effective tool for enhancing sign-in security and protecting your organization and its data against security threats. For more information, see the Salesforce Multi-Factor Authentication FAQ in Salesforce Help.

To meet the MFA requirement, you can use your single sign-on (SSO) identity provider (IdP). If you don't work directly with an IdP, you can enable MFA for Tableau authentication using the **Tableau with MFA** capability.

**Important:** If you decide to use **Tableau with MFA**, review this topic in its entirety, especially Regain site access after being locked out.

## User accounts and multi-factor authentication

Multi-factor authentication (MFA) is a secure account authentication method that requires users to prove their identity by providing two or more pieces of information (factors) when they sign in to Tableau Cloud. The first factor is the unique information your users know—their usernames and passwords. Other factors are verification methods that users have in their possession, such as an authenticator app, security key, or built-in authenticator.

By enforcing multiple factors when users sign in to Tableau Cloud, MFA makes it more difficult for common threats like phishing attacks and account takeovers to succeed. MFA is an effective tool for enhancing sign-in security and protecting your organization and its data against security threats.

> **Recommended method - SSO with MFA:** If you're currently using your organization's SSO IdP with MFA to enhance your security, continue to do so. If not, to satisfy the MFA requirement, configure your site to use SSO and enable MFA with your SSO IdP. You can configure your site users to authenticate with Google, Salesforce, or SAML provider.
>
> **Alternative method - Tableau with MFA:** If you don't work directly with an SSO IdP, or if you use TableauID, you can satisfy the MFA requirement by enabling MFA with Tableau authentication. This capability enables an additional step of using a verification method before being successfully authenticated to the site.
>
> Tableau with MFA supports the following verification methods:

- Salesforce Authenticator app
- Third-party time-based one-time passcode (TOTP) authenticator apps, including Google Authenticator, Microsoft Authenticator, and Authy
- Security keys that support WebAuthn or U2F, such as Yubico YubiKey or Google Titan Security Key
- Built-in authenticators, including Touch ID, Face ID, and Windows Hello
- Recovery codes (as backup only)

**Important:** Security keys that support WebAuthn or U2F and built-in authenticators can't be used when authenticating to Tableau Cloud from Tableau Desktop, Tableau Prep Builder, Tableau Bridge, and Tableau Content Migration Tool. If one of these verification methods have been registered, you (and your users) can register an additional verification method from your **My Account Settings** page in Tableau Cloud.

To compare supported verification methods and review usage requirements, see Verification Methods for Multi-Factor Authentication topic in Salesforce Help.

## Enable MFA with Tableau authentication

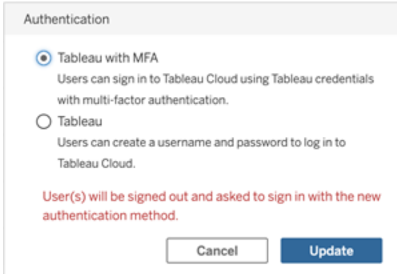
If your organization doesn't work directly with an SSO IdP, you can satisfy the MFA requirement with the default Tableau with MFA authentication. For more information, see About multi-factor authentication and Tableau Cloud.

If Tableau hasn't updated your site to require Tableau with MFA yet, follow these steps to enable MFA. You can also see an overview of this process in the Multi-Factor Authentication Enforcement | Tableau Cloud video on YouTube.

1. Sign in to Tableau Cloud using your site admin credentials and go to the **Users** page.

2. Next to the first user listed, do the following:

   a. Click the Actions menu, select Authentication, and then select **Tableau with MFA**.




b. Click **Update** to save changes.

3. Repeat step 2 for each user listed, including site admins.

After users sign in to Tableau Cloud with their Tableau username and password, they're prompted to choose a supported verification method. For more information about the user process for registering and managing a verification method, see Register for multi-factor authentication.

For an overview of the MFA sign-in experience for Tableau Bridge, tabcmd 2.0, and Tableau REST API, see the Multi-Factor Authentication: Post Enforcement | Tableau Cloud video on YouTube.

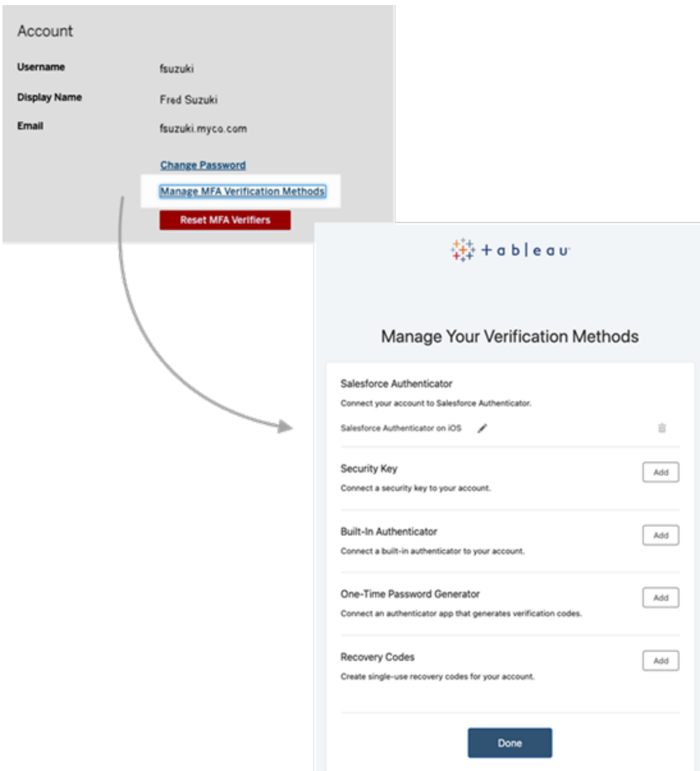
Best practices for site admin accounts

When enabling MFA for your users, we recommended the following best practices for your site admin accounts:

- **Register a minimum of two verification methods:** For each site admin account, register at least two verification methods to reduce the risk of being locked out of the site. For example, after you've registered a primary verification method, we recommend you add the **Recovery Codes** option to generate a set of recovery codes as backup.
- **Designate at least one site admin account to manage users and MFA:** Designate at least one site admin-level account (Site Administrator Creator or Site Administrator Explorer) that has permissions to manage users and MFA settings. This redundancy can help prevent admin access delays if another admin is locked out of the site.

Manage verification methods

You (and your users) can manage verification methods from your **My Account Settings** page. After clicking the **Manage MFA Verification Methods** link, you can add or remove additional verification methods, including adding recovery codes.




About recovery codes - emergency cases only

To help reduce the risk of a locked-out scenario, we recommend you (and your users) add the **Recovery Codes** option as backup after registering for MFA. Recovery codes, to be used in emergency cases only, allow you to sign in to Tableau Cloud if you don't have access to your usual MFA verification methods. If you add the Recovery Codes option, a list of ten one-time use codes are generated that you can use to sign in to Tableau Cloud.

**Important:**

- Because the list of codes isn't accessible after you've added the Recovery Codes option, immediately copy and store these codes in a safe and secure location for use in

emergency situations.
- Recovery codes aren't intended to be a primary verification method and should only be used as **backup only**. Instead, recovery codes are intended for emergency cases only when you don’t have access to your usual MFA verification methods.

Regain site access after being locked out

**Important:** We strongly recommend that you (and your users) register the Recovery Codes option to help avoid being locked out of your site. Recovery codes should be used in emergency cases only.

If you lose all your usual verification methods, contact another site admin to help you regain site access by using the following procedure. You can use this procedure to enable site access for your users as well.

Reset MFA

To enable site access, reset the MFA verification methods from the Users page in Tableau Cloud.

**Important:** For security purposes, a site admin can only reset the MFA verifiers of a user that belongs to a single site. If you don't meet this requirement, contact Tableau Support to file a support case to reset a user's MFA verifiers. For more information, see How To Create a Case on Salesforce Help in the knowledge base.

1. Sign in to Tableau Cloud as a site admin.
2. Navigate to the Users page and select the user who needs to regain access to the site.
3. Click the Actions menu, and select **Reset MFA Verifiers**.
4. On the user's profile page, click the Settings tab, and then click the **Reset MFA Verifiers** button.
   **Note:** To see the **Reset MFA Verifiers** button, the user's authentication method must be set to **Tableau with MFA**.

After the MFA verification methods have been reset, contact the user and request that they follow the procedure described in Register for multi-factor authentication to register for MFA again.

Reset MFA as the only site admin

If you're the only site admin and you lose all your usual verification methods, you must contact your account manager. To regain access to Tableau Cloud, Tableau must manually confirm your identity and then reset the methods of verification. To help ensure a smooth account recovery process, keep the following in mind:

- Tableau might use information from your TableauID profile (on Tableau.com) to validate who you are. Therefore, it’s important to keep your profile information, such as phone number, up to date. For more information about editing your TableauID profile, see the Changing your Name, Title or Email Address in the Tableau Community on the Tableau Community site.
- If you have Premium Support and require assistance on a weekend, you can file a Tableau Support case. For more information, see Submitting a Case from the Webform in the Tableau knowledge base.

For more information, see Tableau Cloud Reset Authenticator for Tableau ID with Multi-Factor Authentication in the Tableau knowledge base.

# Google Authentication

If your organization uses Google, you can enable Tableau Cloud to use Google accounts for single sign-on (SSO) with multi-factor authentication (MFA) using OpenID Connect. Tableau Cloud supports Google authentication as an authentication type. When you enable Google authentication, users are directed to the Google sign-in page to enter their credentials, which are stored and managed by Google.

## Configure authentication type

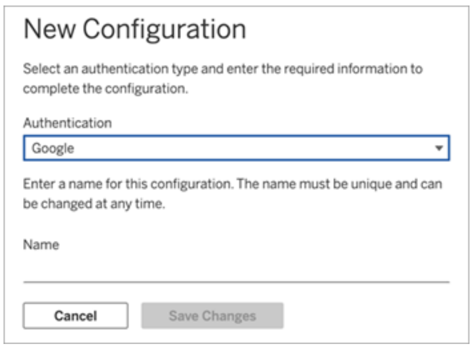
If your organization already uses Google, then set the authentication type to Google in Tableau Cloud.

1. Sign in to Tableau Cloud as a site admin.

2. Select **Settings** > **Authentication**, click the **New Configuration** button, and select **Google** from the Authentication drop-down.

   **Note:** If Google is not on the list of available options, then Google authentication is already enabled for your site.

3. Enter a name for the configuration, and click **Save Changes**.

   **Note:** Configurations created before November 2024 (Tableau 2024.3) can't be renamed.

4. Add new users (or update any previous users) to use Google as their configured authentication type.

   - To add users, see Add Users to a Site.
   - To update a user's authentication method, see Set the User Authentication Type.

## OpenID Connect

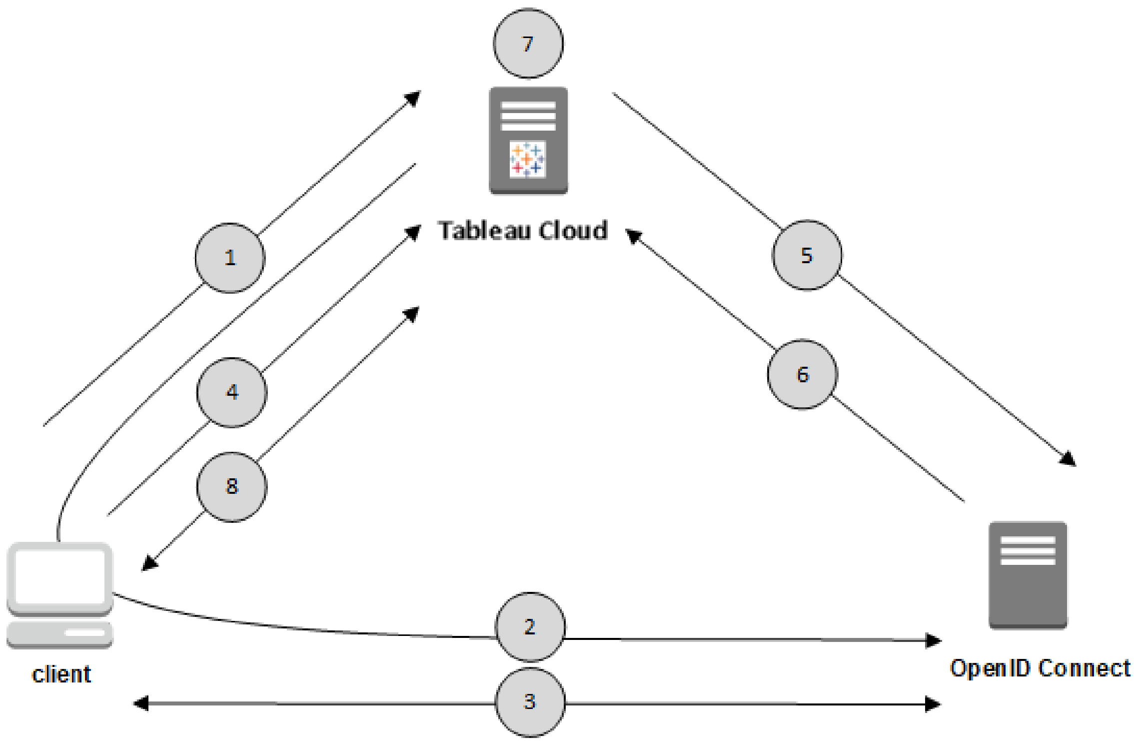
You can configure Tableau Cloud to support OpenID Connect (OIDC) for single sign-in (SSO). OIDC is a standard authentication protocol that lets users sign in to an identity provider (IdP) such as Google or Salesforce. After they've successfully signed in to their IdP, they are automatically signed in to Tableau Cloud.

Configuring OIDC involves several steps. The topics in this section provide general information about using Tableau Cloud with OIDC, and provide a sequence for configuring the IdP and Tableau Cloud.

To configure OIDC using the Tableau REST API, see OpenID Connect Authentication Methods in the Tableau REST API Help.

## Authentication overview

This section describes the OpenID Connect (OIDC) authentication process with Tableau Cloud.




1. A user attempts to log in to Tableau Cloud from a client computer.

2. Tableau Cloud redirects the request for authentication to the IdP gateway.

3. The user is prompted for credentials and successfully authenticates to the IdP. The IdP responds with a redirect URL back to Tableau Cloud. The redirect URL includes an authorization code for the user.

4. The client is redirected to Tableau Cloud and presents the authorization code.

5. Tableau Cloud presents the client's authorization code to the IdP along with its own client credentials. Tableau Cloud is also a client of the IdP. This step is intended to prevent spoofing or man-in-the-middle attacks.

6. The IdP returns an access token and an ID token to Tableau Cloud.

- JSON Web Token (JWT) validation: By default Tableau Cloud performs a validation of the IdP JWT. During discovery, Tableau Cloud retrieves the public keys specified by the `jwks_uri` in the IdP configuration discovery document. Tableau Cloud validates the ID token for expiry and then verifies the JSON web signature (JWS), the issuer (IdP), and the client ID. You can learn more about the JWT process in the OIDC documentation, 10. Signatures and Encryption, and the IETF proposed standard, JSON Web Token. We recommend leaving JWT validation enabled, unless your Idp does not support it.
- The ID token is a set of attribute key-pairs for the user. The key-pairs are called *claims*. Here is an example IdP claim for a user:

```
"sub"                          :
"7gYhRR3HiRRCaRcgvY50ubrtjGQBMJW4rXbpPFp-
g2cptHP62m2sqowM7G1LwjN5"
"email"                        : "alice@example.com",
"email_verified"               : true,
"name"                         : "Alice Adams",
"given_name"                   : "Alice",
"family_name"                  : "Adams",
```

7. Tableau Cloud identifies the user from the IdP claims and completes the authentication request from step 1. Tableau Cloud can be configured to use different claims for this process. See Requirements.

8. Tableau Cloud authorizes the user.

## How Tableau Cloud works with OpenID Connect

OpenID Connect (OIDC) is a flexible protocol that supports many options for the information that's exchanged between a service provider (here, Tableau Cloud) and an IdP. The following list provides details about the Tableau Cloud implementation of OIDC. These details can help you understand what types of information Tableau Cloud sends and expects, and how to configure an IdP.

- Tableau Cloud supports only the OpenID Authorization Code Flow as described in the OpenID Connect final specification in the OpenID Connect documentation.
- Tableau Cloud relies on using discovery or a provider URL to retrieve the IdP metadata.
- Tableau Cloud supports the `client_secret_basic` (default) and `client_secret_post` client authentication, and other parameters specified in the OpenID Connect specification. These can only be configured using the Tableau REST API.

## Dynamic group membership using OIDC assertions

Beginning in June 2024, if OIDC authentication is configured and the capability's setting enabled, you can dynamically control group membership through custom claims included in the JSON Web Token (JWT) sent by the identity provider (IdP).

When configured, during user authentication, the IdP sends the OIDC assertion that contains two custom group membership claims: group (`https://tableau.com/groups`) and group names (for example, "Group1" and "Group2") to assert the user into. Tableau validates the assertion and then enables access to the groups and the content whose permissions are dependent on those groups.

For more information, see Dynamic group membership using assertions.

**Example JWK**

```
"sub"                     :
"7gYhRR3HiRRCaRcgvY50ubrtjGQBMJW4rXbpPFpg2cptHP62m2sqowM7G1LwjN5"
```

```
"email"                      : "alice@example.com",
"email_verified"             : true,
"name"                       : "Alice Adams",
"given_name"                 : "Alice",
"family_name"                : "Adams",
"https://tableau.com/groups": ["Group1", "Group2"]
```

## Configure the Identity Provider for OpenID Connect

This topic provides information about configuring an identity provider (IdP) to use OpenID Connect (OIDC) with Tableau Cloud. This is one step in a multi-step process. The following topics provide information about configuring and using OIDC with Tableau Cloud.

1. OpenID Connect Overview
2. Configure the Identity Provider for OpenID Connect (you are here)
3. Configure Tableau Cloud for OpenID Connect

Configure the IdP

Before you can use OpenID Connect with Tableau Cloud, you must have an account with an identity provider (IdP) and a project or application with the IdP. When you configure Tableau Cloud, you will need to be able to provide the following information:

- Client ID. This is the identifier that the IdP assigned to your application.
- Client secret. This is a token that is used by Tableau to verify the authenticity of the response from the IdP. This value is a secret and should be kept securely.
- Configuration URL. This is the URL at the provider's site that Tableau Cloud should send authentication requests to.

## Redirect URL

Some IdPs will require a redirect URL for Tableau Cloud site.

For example, `https://sso.online.tableau.com/public/oidc/login`.

## Configure Tableau Cloud for OpenID Connect

This topic describes how to configure Tableau Cloud to use OpenID Connect (OIDC) for single-sign on (SSO). This is one step in a multi-step process. The following topics provide information about configuring and using OIDC with Tableau Cloud.

1. OpenID Connect Overview
2. Configure the Identity Provider for OpenID Connect
3. Configure Tableau Cloud for OpenID Connect (you are here)

**Notes:**

- Before you perform the steps described here, you must configure the OpenID identity provider (IdP) as described in Configure the Identity Provider for OpenID Connect.
- Alternatively, you can configure OIDC authentication for Tableau Cloud using the Tableau REST API using the OpenID Connect methods.
- The Tableau REST API and tabcmd do not support OIDC single-sign (SSO). To use tabcmd or the REST API, users must sign in to Tableau Cloud using a TableauID account.

Requirements

Parameters

- **Client ID:** This value is issued by the IdP and specifies an identifier for the registered Tableau Cloud. this enables the IdP to know where the authentication request is coming from.

- **Client secret:** This is a token that is used by Tableau Cloud to verify the authenticity of the response from the IdP. This value should be kept securely.

- **Configuration URL:** This value specifies the URL that the IdP redirects to after the user has authenticated. The URL must include the host and protocol (for example, `https://admin.okta.com/oauth2/default/.well-known/openid-configuration`), but Tableau provides the URL endpoint. Specifies the location of the provider configuration discovery document that contains the OpenID provider metadata.

**Note:** If your IdP does not provide a configuration URL, a URL that ends with `.well-known/openid-configuration`, consider using the OpenID Connect Authentication Methods in the Tableau REST API to configure OIDC.

## Optional parameters

The following optional parameters can be configured using the OpenID Connect Authentication Methods in the Tableau REST API.

- **Prompt:** Prompts the user for re-authentication and consent. By default, user consent is turned on.
- **Custom scope:** Custom scope user-related value to query the IdP.
- **Client authentication:** Token endpoint authentication method. Default value is `'client_secret_basic'`. The value `'client_secret_post'` is supported.
- **Essential ACR values:** List of essential Authentication Context Reference Class values used for authentication.
- **Voluntary ACR values:** List of voluntary Authentication Context Reference Class values used for authentication.

### Claims

To sign in successfully to Tableau Cloud, a given user must be provisioned in OpenID Connect (OIDC) IdP and then mapped to a user account on Tableau Cloud. OIDC uses a method that relies on claims to share user account attributes with other applications. Tableau Cloud relies on the IdP claim to map user accounts from the IdP to those hosted on Tableau Cloud. Claims include user account attributes such as email, given name, etc. To understand how Tableau Cloud maps IdP claims to user accounts, see Authentication overview.

**Note:** Claims are case sensitive.

- **Username:** By default, Tableau Cloud expects the IdP to pass the username claim. Depending on your IdP, you may need to configure Tableau Cloud to use a different IdP claim.

  **Note:** The username in Tableau Cloud is immutable and cannot be updated at any time.

- **Name claim:** You can specify name or given and family name to retrieve DisplayName for the user.

Step 1: Configure OpenID Connect

1. Sign in to Tableau Cloud as a site admin and select **Settings** > **Authentication**.
2. On the Authentication tab, click the **New Configuration** button, select **OpenID Connect (OIDC)**, and enter a name for the configuration.
3. Follow the steps to configure Tableau Cloud for OIDC authentication by doing the following:
    1. In step 1, enter the required information from your IdP, including client ID, client secret, and configuration URL.
    2. In step 2, copy the Tableau Cloud redirect URL that you will paste into your IdP's portal to redirect users after they authenticate.
    3. In step 3, enter the claims to ensure the correct mapping of users' username and display name.
    4. In step 4, optionally enable single logout (SLO) if your IdP supports it.
    5. In step 5, optionally choose how users authenticate when accessing embedded view: in a separate pop-up window or using an inline iFrame.

**Note:** You can select the authentication type for embedded views under the **Default Authentication Type for Embedded Views** section on the Authentication page (below the OIDC configuration steps).

4. When finished, click the **Save Changes** button.

**Note:** When editing OIDC configuration, the client secret is hidden and needs to be reentered before any changes can be saved.

Step 2: Test the configuration

We highly recommend you test the configuration to avoid any locked out scenarios. Testing the configuration helps ensure that you have configured OIDC correctly before changing the authentication type of your users to OIDC. To test the configuration successfully, make sure that there is at least one user who you can sign in as who is already provisioned in the IdP and added to your Tableau Cloud with OIDC authentication type configured.

**Note:** If you're not sure what the claims are, complete the configuration and test the configuration. Testing the configuration will produce a new window with the claim mappings details, including the username and display name claims. Some IdPs may map email address to the Tableau username.

1. On the Authentication tab while OpenID Connect (OIDC) is selected, under step 6, click the **Test Configuration** button. A new window displays with details about the configuration.

2. When finished, complete the OIDC setup by adding users to your site by following the step below.

Step 3: Add users to the OpenID Connect-enabled Tableau site

The steps described in this section are performed on the Tableau Cloud's Users page.

1. After you complete the steps above, return to your Tableau Cloud site.

2. From the left pane, select the **Users** page.

3. Follow the procedure described in Add Users to a Site topic.

Troubleshoot

Use the following topics to troubleshoot OpenID Connect (OIDC) issues in Tableau Cloud.

OIDC protocol is supported by many identity providers. The OIDC protocol is an open and flexible standard, and as such, not all implementations of the standard are identical. Most issues that administrators encounter when configuring Tableau Cloud for OIDC are the result of how different identity providers implement OIDC. If you encounter errors as you set up OIDC with Tableau Cloud, we recommend that you work with your IdP to resolve them.

Signing in from the command line

Even if Tableau Cloud is configured to use OIDC, OIDC authentication isn't used when you sign in to Tableau Cloud using tabcmd, the Tableau REST API, or the Tableau Data Extract command line utility (provided with Tableau Desktop).

Sign-in failed

In some cases, sign-in to Tableau Cloud can fail with the following message:

*Login failure: Identity Provider authentication unsuccessful for user <username_from_IdP>. Failed to find the user in Tableau Cloud.*

This error typically means that there's a mismatch between a username stored in Tableau Cloud and the username provided by the IdP. To resolve this, make sure the username values match. For example, if Jane Smith's username is stored in the IdP as "jsmith@example.com" it must be stored in Tableau Cloud as "jsmith@example.com" as well.

## Salesforce Authentication

If your organization uses Salesforce, you can enable Tableau Cloud to use Salesforce accounts for single sign-on (SSO) with multi-factor authentication (MFA) using OpenID Connect. As of spring 2021, Tableau Cloud supports Salesforce authentication as an authentication type. When you enable Salesforce authentication, users are directed to the Salesforce sign-in page to enter their credentials, which are stored and managed by

Salesforce. This scenario also supports scenarios where Salesforce federates authentication with another IdP.

## Username requirement

The username that is used within your Salesforce Org must match the username field in Tableau Cloud. Both of these usernames are in email format, though they may not be used as email addresses. Verify that that these attributes match. If the do not, configure the Salesforce authentication type, and then see the section below, Mismatched usernames.

## Change and configure authentication type

If your organization already uses Salesforce, then setting the authentication type to Salesforce in Tableau Cloud is a three-step process:

1. In Salesforce, install the Tableau Cloud connected app package in Salesforce. To allow users to sign in to Tableau Cloud from your organization, manage access to your connected app by assigning the appropriate profiles or permission sets. Additionally, set the connected app to Admin pre-approved. See Manage Other Access Settings for a Connected App.

2. In Tableau Cloud, change to Salesforce authentication by doing the following:

    1. In Tableau Cloud, sign in as a site admin.

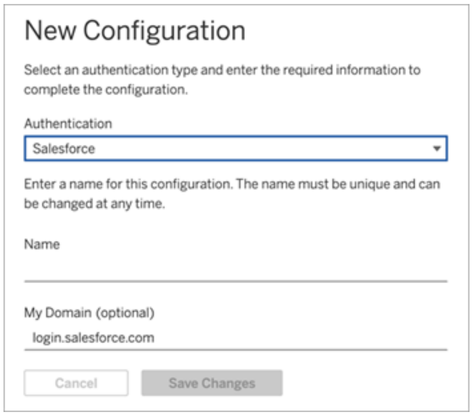
    2. Select **Settings** > **Authentication**, click the **New Configuration** button, and select **Salesforce** from the Authentication drop-down.

    3. Enter a name for the configuration.

        **Note:** Configurations created before November 2024 (Tableau 2024.3) can't be renamed.

    4. (Optional) If you have configured your Salesforce organization to use a custom domain for user sign in, then you will need to configure Tableau Cloud to redirected users to the sign in page. Click **Edit My Domain...** to enter your Salesforce

My Domain. Tableau Cloud will verify the domain and then add it as a sign-in URL.




3. Add new users (or update any previous users) to use Salesforce as their configured authentication type.

    - To add users, see Add Users to a Site.
    - To update a user's authentication method, see Set the User Authentication Type.

## Troubleshooting

### Mismatched usernames

If existing users in Tableau Cloud are using usernames that do not match their corresponding usernames in Salesforce, follow this procedure:

1. Change the existing Tableau Cloud user to an Unlicensed site role to prevent license consumption.
2. Add the new Tableau Cloud user for Salesforce authentication, ensuring the username matches the username in your Salesforce organization.
3. If necessary, migrate previous content owned by the old username in Tableau Cloud to the new user.

Unsuccessful login with OAUTH_APP_BLOCKED in return URL

This issue is surfaced when a user who is configured with Salesforce authentication attempts to sign in and is not redirected. Tableau Cloud will display a message:

*The sign-in was unsuccessful. Try again.*

*If you continue to get this message, capture the status information below, and send it to Customer Support.*

Additionally, return URL in the user's browser includes the following string:

```
/public/oidc/login?error=OAUTH_APP_BLOCKED&error_description=this+app+is+blocked+by+admin&state=...
```

This indicates that the connected application within Salesforce is being blocked by your organization. Some security conscious Salesforce customers block all connected applications and implement API allowlist functionality that will prevent the connected application from working.

To fix this, ensure that the Tableau Cloud - Salesforce User Login via OIDC connected application is installed and has the appropriate user profiles and permission sets applied.
For more information, see:

- Manage Access to a Connected App
- Manage Other Access Settings for a Connected App

Can't edit configuration name

Configurations created before November 2024 (Tableau 2024.3) can't be renamed..

## SAML

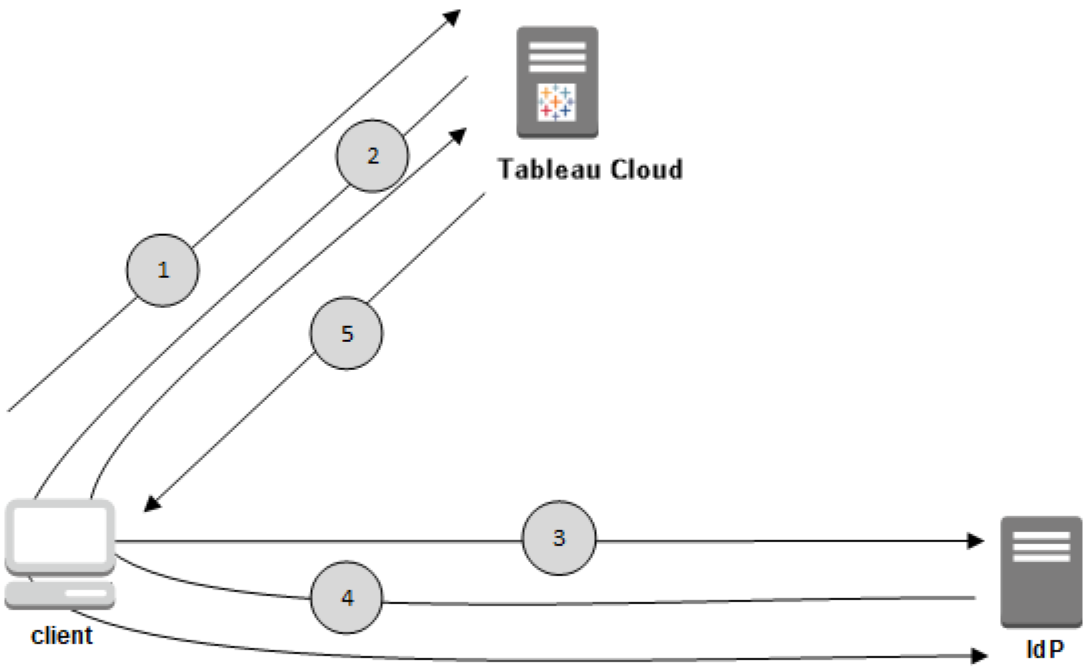
SAML (Security Assertion Markup Language) is an XML standard that allows secure web domains to exchange user authentication and authorization data. You can configure Tableau Cloud to use an external identity provider (IdP) to authenticate users over SAML 2.0. No user credentials are stored with Tableau Cloud, and using SAML enables you to add Tableau to your organization’s single sign-on environment.

User authentication through SAML does not apply to permissions and authorization for Tableau Cloud content, such as data sources and workbooks. It also does not control access to underlying data that workbooks and data sources connect to.

**Note:** Tableau Cloud supports both service provider initiated and IdP initiated SAML in browsers and in the Tableau Mobile app. SAML connections from Tableau Desktop must be service provider initiated.

## Authentication overview

The following image shows the steps to authenticate a user with single sign-on in a typical service provider initiated flow:




1. User navigates to the Tableau Cloud sign-in page or clicks a published workbook URL.

2. Tableau Cloud starts the authentication process by redirecting the client to the configured IdP.

3. The IdP requests the user's username and password from the user. After the user submits valid credentials, the IdP authenticates the user.

4. The IdP returns the successful authentication in the form of a SAML Response to the client. The client passes the SAML Response to Tableau Cloud.

5. Tableau Cloud verifies that the username in the SAML Response matches a licensed user stored in the Tableau Cloud repository. If a match is verified, then Tableau Cloud responds to the client with the requested content.

## SAML Requirements for Tableau Cloud

Before you configure SAML for Tableau Cloud, obtain what you need to meet the requirements.

- Identity provider (IdP) requirements for Tableau configuration
- SAML compatibility notes and requirements
- Using SAML SSO in Tableau client applications
- Effects of changing authentication type on Tableau Bridge
- XML data requirements

Identity provider (IdP) requirements for Tableau configuration

To configure Tableau Cloud for SAML, you need the following:

- **Administrator access to your Tableau Cloud site.** You must have administrator access to the Tableau Cloud site on which you want to enable SAML.

- **List of users who will use SSO to access Tableau Cloud.** You should gather the usernames for the users you want to allow single sign-on (SSO) access to Tableau Cloud.

- **IdP account that supports SAML 2.0.** You need an account with an external identity provider. Some examples are PingFederate, SiteMinder, and Open AM. The IdP must support SAML 2.0. You must have administrator access to that account.

- **SHA256 is used as signing algorithm.** As of May 2020, Tableau Cloud blocks IdP assertions and certificates that are signed with the SHA-1 algorithm.

- **IdP provider that supports import and export of XML metadata.** Although a manually created metadata file might work, Tableau Technical Support cannot assist with generating the file or troubleshooting it.

- **IdP provider that enforces a maximum token age of 24 days or less (2073600 seconds).** If the IdP allows a maximum age of tokens that is a greater length of time than the maximum age setting on Tableau Cloud (2073600 seconds), then Tableau Cloud will not recognize the token as valid. In this scenario, users will receive error messages (*The sign-in was unsuccessful. Try again.*) when attempting to log in to Tableau Cloud.

- **SSO with MFA is enabled.** As of February 2022, multi-factor authentication (MFA) through your SAML SSO identity provider (IdP) is a Tableau Cloud requirement.

  **Important:** In addition to these requirements, we recommend that you dedicate a site administrator account that is always configured for TableauID with MFA. In the event of an issue with SAML or the IdP, a dedicated Tableau with MFA account ensures that you always have access to your site.

SAML compatibility notes and requirements

- **SP or IdP initiated**: Tableau Cloud supports SAML authentication that begins at the identity provider (IdP) or service provider (SP).

- **Single Log Out (SLO)**: Tableau Cloud supports both service provider (SP)-initiated SLO and identity provider (IdP)-initiated SLO.

**Note:** To obtain the SLO URL for your site, download and refer to the metadata XML file your Tableau Cloud site generates. You can find this file by going to **Settings** > **Authentication**. Under the **SAML** authentication type, click the **Configuration (required)** drop-down arrow, and then click the **Export Metadata** button under step 1, method 1.

- **tabcmd and REST API**: To use tabcmd or the REST API, users must sign in to Tableau Cloud using a TableauID account.
- **Encrypted assertions**: Tableau Cloud supports either cleartext or encrypted assertions.
- **Tableau Bridge reconfiguration required**: Tableau Bridge supports SAML authentication, but an authentication change requires reconfiguring the Bridge client. For information, see Effects of changing authentication type on Tableau Bridge.
- **Required signature algorithm**: For all new SAML certificates, Tableau Cloud requires the SHA256 (or greater) signature algorithm.
- **RSA key and ECDSA curve sizes**: The IdP certificate must have either an RSA key strength of 2048 or ECDSA curve size of 256.
- **NameID attribute**: Tableau Cloud requires the NameID attribute in the SAML response.

### Using SAML SSO in Tableau client applications

Tableau Cloud users with SAML credentials can also sign in to their site from Tableau Desktop or the Tableau Mobile app. For best compatibility, we recommend that the Tableau client application version matches that of Tableau Cloud.

Connecting to Tableau Cloud from Tableau Desktop or Tableau Mobile uses a service provider initiated connection.

### Redirecting authenticated users back to Tableau clients

When a user signs in to Tableau Cloud, Tableau Cloud sends a SAML request (`AuthnRequest`) to the IdP, which includes the Tableau application's **RelayState** value. If the user has signed in to Tableau Cloud from a Tableau client such as Tableau Desktop or Tableau Mobile, it's important that the RelayState value is returned within the IdP's SAML response back to Tableau.

When the RelayState value is not returned properly in this scenario, the user is taken to their Tableau Cloud home page in the web browser, rather than being redirected back to the application they signed in from.

Work with your Identity Provider and internal IT team to confirm that this value will be included as part of the IdP's SAML response.

### Effects of changing authentication type on Tableau Bridge

When you change the site's authentication type or modify the IdP, publishers who use Tableau Bridge for scheduled extract refreshes will need to unlink and relink the client, and re-authenticate using the new method or IdP configuration.

For legacy schedules, unlinking the Bridge client removes all data sources, therefore you must set up the refresh schedules again. For online schedules, after relinking the client you must reconfigure the Bridge client pool.

The change in authentication type does not affect Bridge live queries or refreshes that run directly from the Tableau Cloud site (such as for underlying data in the cloud).

We recommend that you alert Bridge users to changes in their site authentication before you make it. Otherwise, they will become aware through authentication errors they get from the Bridge client, or when the client opens with a blank data source area.

### XML data requirements

You configure SAML using XML metadata documents that are generated by Tableau Cloud and by the IdP. During the authentication process, the IdP and Tableau Cloud exchange authentication information using these XML documents. If the XML does not meet the requirements, errors can occur when you configure SAML or when users try to sign in.

**HTTP POST and HTTP REDIRECT:** Tableau Cloud supports HTTP POST and REDIRECT requests for SAML communications. In the SAML metadata XML document that is exported by the IdP, the `Binding` attribute can be set to:

- **HTTP-POST**
- **HTTP-REDIRECT**
- **HTTP-POST-SimpleSign**

**Dynamic group membership using SAML assertions:**

Beginning in June 2024 (Tableau 2024.2), if SAML is configured and the capability's setting enabled, you can dynamically control group membership through custom claims included in the SAML XML response sent by the identity provider (IdP).

When configured, during user authentication, the IdP sends the SAML assertion that contains two custom group membership claims: group (`https://tableau.com/groups`) and group names (for example, "Group1" and "Group2") to assert the user into. Tableau validates the assertion and then enables access to the groups and the content whose permissions are dependent on those groups.

For more information, see Dynamic group membership using assertions.

**Example SAML XML response**

```
<saml2p:Response
  xmlns:saml2p="urn:oasis:names:tc:SAML:2.0:protocol"
    .....
    .....
  <saml2:Assertion
    .....
    .....
    xmlns:saml2="urn:oasis:names:tc:SAML:2.0:assertion"
```

```
    <saml2:AttributeStatement
                xmlns:saml2="urn:oasis:names:tc:SAML:2.0:assertion">
                <saml2:Attribute
                Name="https://tableau.com/groups"
                        NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-form-
at:unspecified">
                        <saml2:AttributeValue
                                xmlns:xs="http://www.w3.org/2001/XMLSchema"
                                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                                xsi:type="xs:string">Group1
                        </saml2:AttributeValue>
                        <saml2:AttributeValue
                                xmlns:xs="http://www.w3.org/2001/XMLSchema"
                                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                                xsi:type="xs:string">Group2
                        </saml2:AttributeValue>
        <saml2:Attribute>
    </saml2:AttributeStatement>
  </saml2:Assertion>
</saml2p:Response>
```

## Enable SAML Authentication on a Site

This topic explains how to enable SAML on the site and select single sign-on users. It also provides steps for switching from SAML to the default Tableau (also known as TableauID) authentication. Before you enable SAML, we recommend that you review the SAML Requirements for Tableau Cloud, including Effects of changing authentication type on Tableau Bridge.

This topic assumes you are familiar with the information in Authentication and How SAML Authentication Works.

IdP-specific configuration information

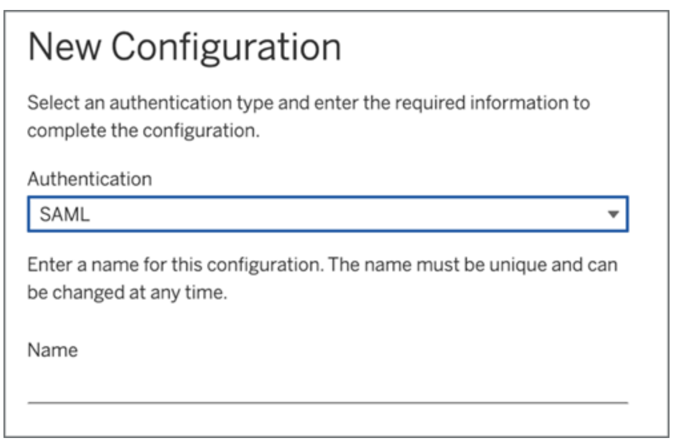
The steps in the sections later in this topic provide basic steps that you can use with your IdP's documentation to configure SAML for your Tableau Cloud site. You can get IdP-specific configuration steps for the following IdPs:

- Configure SAML with Microsoft Entra ID
- Configure SAML with AD FS
- Configure SAML with OneLogin
- Configure SAML with PingOne
- Configure SAML with Okta
- Configure SAML with Salesforce

Enable SAML

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.

2. On the **Authentication** tab, click the **New Configuration** button, select **SAML** from the Authentication drop-down, and then enter a name for the configuration.




   **Note:** Configurations created before November 2024 (Tableau 2024.3) can't be renamed.

SAML configuration steps

This section takes you through the configuration steps that appear on the **Authentication** tab in the Tableau Cloud Settings page.

> **Note:** To complete this process, you will also need the documentation your IdP provides. Look for topics that refer to configuring or defining a service provider for a SAML connection, or adding an application.

## Step 1: Export metadata from IdP

Go to your IdP, sign in to your IdP account, and use the instructions provided by the IdP’s documentation to download your IdP's metadata. The IdP's metadata enables Tableau Cloud to connect to your IdP.

For step 1, the IdP’s documentation will guide you also in how to provide metadata to a service provider. It will instruct you to download a SAML metadata file, or it will display XML code. If it displays XML code, copy and paste the code into a new text file, and save the file with a .xml extension.

## Step 2: Upload metadata to Tableau

In the **New Configuration** page in Tableau Cloud, import the metadata (.xml) file that you downloaded from the IdP or configured manually from the XML it provided.

**Notes:**

- After uploading the IdP metadata, both the **IdP entity ID** and **IdP SSO service URL** fields populate automatically.
- If editing the configuration, you will need to upload the metadata file so Tableau knows

to use the correct IdP entity ID and SSO service URL.
- You can use the **Clear IdP Metadata** button if you need to upload a new metadata file.

## Step 3: Map attributes

Attributes contain authentication, authorization, and other information about a user.

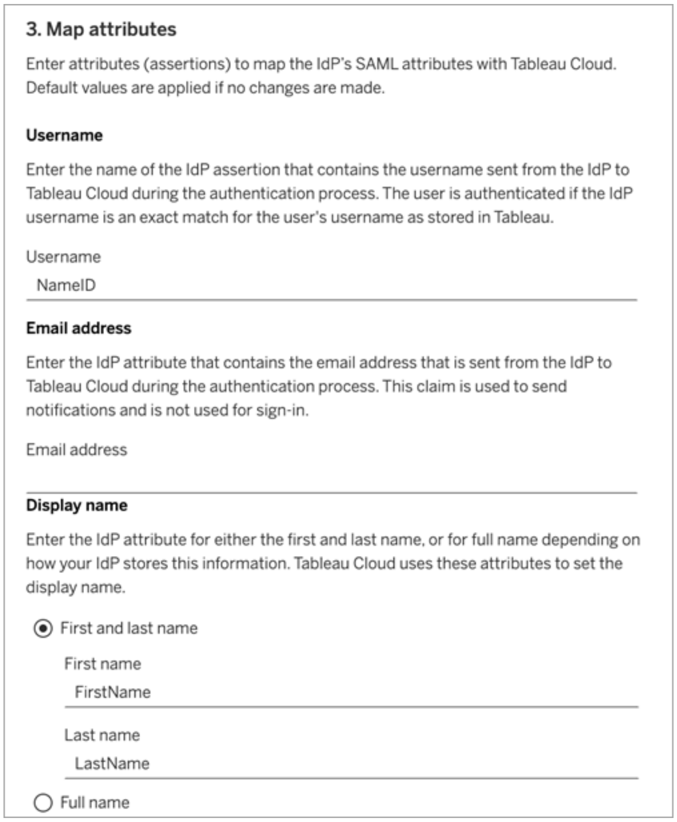
**Note:** Tableau Cloud requires the **NameID** attribute in the SAML response. You can provide other attributes to map user names in Tableau Cloud, but the response message must include the **NameID** attribute.

- **Username:** (Required) Enter the name of the attribute that stores users' usernames (email addresses).

- **Email address:** (Optional) Enter the name of the attribute that contains the email address that the IdP uses during the authentication process to enable users to receive notifications at an email address that is different from the username. The email address attribute is used for notifications purposes only and not used for sign-in.

- **Display name:** (Optional but recommended) Some IdPs use separate attributes for first and last names, and others store the full name in one attribute.

  Select the button that corresponds to the way your IdP stores the names. For example, if the IdP combines first and last name in one attribute, select **Display name**, and then enter the attribute name.




## Step 4: Choose default for embedded views

Select the method by which users sign in to embedded views. The options are to open a separate pop-up window that displays the IdP's sign-in form, or to use an inline frame (iframe).

> **Important:** Because iframes can be vulnerable to *clickjacking* attacks, not all IdPs support signing in through an iframe. With clickjacking, the attacker tries to lure users into clicking or entering content. They do this by displaying the page to attack in a transparent layer over an unrelated page. For Tableau Cloud, an attacker might try to capture user

credentials or to get an authenticated user to change settings. For more information, see Clickjacking on the Open Web Application Security Project website.

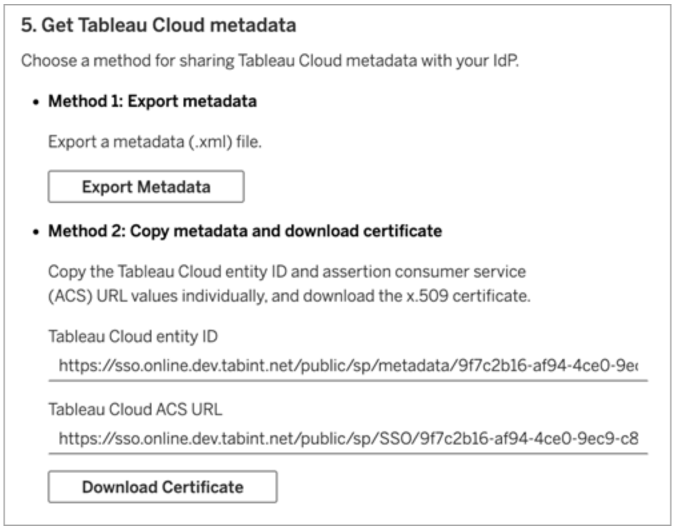
If your IdP doesn’t support signing in through an iframe, select **Authenticate in a separate pop-up window**.

## Step 5: Get Tableau Cloud metadata

To create the SAML connection between Tableau Cloud and your IdP, you need to exchange required metadata between the two services. To get metadata from Tableau Cloud, choose one of the following methods. See the IdP’s SAML configuration documentation to confirm the correct option.

- Select **Export Metadata** button to download an XML file that contains the Tableau Cloud SAML entity ID, Assertion Consumer Service (ACS) URL, and X.509 certificate.
- Select **Download Certificate** if your IdP expects the required information in a different way. For example, if it wants you to enter the Tableau Cloud entity ID, ACS URL, and

X.509 certificate in separate locations.




## Step 6: Configure IdP

For step 6, use the instructions provided by the IdP's documentation to submit the Tableau Cloud metadata.

## Step 7: Test configuration and troubleshoot SAML

We highly recommend that you test the SAML configuration to avoid any locked out scenarios. Testing the configuration helps ensure that you have configured SAML correctly before changing the authentication type of your users to SAML. To test the configuration successfully, make sure that there is at least one user who you can sign in as who is already provisioned in the IdP and added to your Tableau Cloud with SAML authentication type configured.

If you can't successfully sign in to Tableau Cloud, start with the troubleshooting steps suggested on the Authentication page. If those steps do not resolve the issue, see Troubleshoot SAML.

## Manage users

Select existing Tableau Cloud users, or add new users you want to approve for single sign-on.

When you add or import users, you also specify their authentication type. On the Users page, you can change users' authentication type any time after adding them.

## Default authentication type for embedded views

- **Let users to choose their authentication type**

  When this option is selected, only a pop-up window will be supported. In this pop-up window, two sign-in options appear where a view is embedded: a sign-in button that uses single sign-on (SSO) authentication and a link to use Tableau credentials as the alternative.

  > **Tip:** With this option, users need to know which sign-in option to choose. As part of notification you send your users after you add them to the single sign-on site, let them know which type of authentication to use for a variety of sign-in scenarios. For example, embedded views, Tableau Desktop, Tableau Bridge, Tableau Mobile, and so on.

- **Tableau with MFA**

  This option requires users to sign in using Tableau credentials with multi-factor authentication even if SAML is enabled on the site. Signing in with Tableau with MFA requires users to set a verification method to confirm the identity each time the user signs in to Tableau Cloud. For more information, see Multi-Factor Authentication and Tableau Cloud.

- List of authentication configurations

When a specific configuration option is selected, the way users can sign in to embedded views is determined by the setting you configured in step 6 above for the named configuration.

Use Tableau authentication

If a site is configured for SAML, you can change the site settings to require some or all users to sign in using Tableau credentials.

- If you no longer want an identity provider to handle authentication for a site, or require all users to sign in with their Tableau credentials, you can change authentication type at the site level. See Change the site’s authentication type section, below.

- If you want to keep SAML enabled for some users, but require others to use Tableau, you can change authentication type at the user level.

  For more information, see Set the User Authentication Type.

Change the site’s authentication type

Beginning in November 2024 (Tableau 2024.3), you can enable multiple authentication types and methods on a site. To change what authentication you want available on the site, enable or disable the authentication configurations.

1. Sign in to the Tableau Cloud site as a site administrator.

2. Select **Settings** > **Authentication**.

3. Disable or enable authentication configurations for the site by clicking the Actions menu and selecting **Disable** or **Enable**.

After you make the SAML configuration inactive, the metadata and IdP information are preserved so that if you want to enable it again, you do not need to set up the SAML connection with the IdP again.

Update SAML certificate

The certificate used for Tableau site metadata is provided by Tableau and not configurable. To update the certificate for SAML, you must upload a new certificate to your IdP and re-exchange the metadata with Tableau Cloud.

1. Sign in to the site as a site administrator, and select **Settings** > **Authentication**.
2. Under Authentication types, go to the SAML configuration you want to update, and click the Actions menu and select **Edit**.
3. Open a new tab or window, and sign in to your IdP account.
4. Use the instructions provided by the IdP's documentation to upload a new SAML certificate.
5. Download the new XML metadata file to provide to Tableau Cloud.
6. Return to the **Edit Configuration** page in Tableau Cloud, and in step 2, upload the metadata file that you downloaded from the IdP.
7. Scroll down the page and click the **Save and Continue** button.

See also

Access Sites from Connected Clients

## Configure SAML with Microsoft Entra ID

If you've configured Microsoft Entra ID (also known as Microsoft Azure Active Directory (Azure AD)) as your SAML identity provider (IdP), use the information in this topic alongside the Microsoft Entra documentation to add Tableau Cloud to your single sign-on applications.

**Notes:**

- These steps reflect a third-party application and are subject to change without our knowledge. If the steps described here do not match the screens you see in your IdP account, you can use the general SAML configuration steps, along with the IdP's documentation.

- Beginning February 2022, multi-factor authentication (MFA) through your SAML SSO identity provider (IdP) is a Tableau Cloud requirement.
- The configuration steps in the IdP may be in a different order than what you see in Tableau Cloud.

Prerequisites

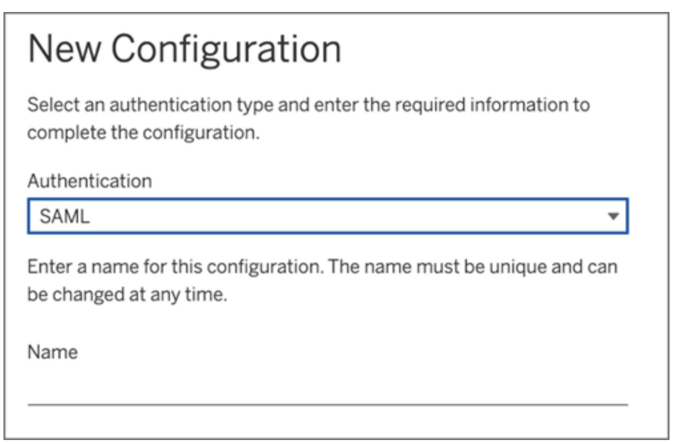
Before you can configure Tableau Cloud and SAML with Entra ID, your environment must have the following:

- Meet the Prerequisites as described in the Tutorial: Microsoft Entra SSO integration with Tableau Cloud documentation
- Create a Microsoft Entra test user as described in the Tutorial: Microsoft Entra SSO integration with Tableau Cloud documentation

Step 1: Get started

In Tableau Cloud, do the following

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.
2. On the **Authentication** tab, click the **New Configuration** button, select **SAML** from the Authentication drop-down, and then enter a name for the configuration.



**Note:** Configurations created before November 2024 (Tableau 2024.3) can't be renamed.

In Entra, do the following:

1. Sign in to the Microsoft Entra admin center as at least a Cloud Application Administrator.
2. Navigate to **Enterprise applications** > **New application**.
3. On the **Browse Microsoft Entra Gallery** page, type "Tableau Cloud" in the search box.
4. Click **Tableau Cloud** from the search results, and in the right panel, optionally change the default name of the application instance and then click **Create**.
   **Notes:**
   - Adding the instance of Tableau Cloud application might take a few moments.
   - When creating an instance of the Tableau Cloud application through the gallery, SAML is the only configuration type supported for integration with Tableau.
5. In the left pane, navigate to **Single sign-on**.
6. On the Select a single sign-on method page, select **SAML**.
7. On the Set up Single Sign-On with SAML page, next to **Basic SAML Configuration**, click **Edit**, and do the following:
   a. In the **Identifier (Entity ID)** text box, enter the following placeholder URL that you will edit again in step 3.2: `https://sso.online.tableau.com/public/sp/metadata?alias=<entityid>`
   b. In the **Reply URL** text box, enter the following placeholder URL that you will edit again in step 3.2: `https://sso.online.tableau.com/public/sp/`
   c. Click **Save**.
8. Next, next to **SAML Signing Certificate**, click **Edit**.

9. Click **Download** to download the **Federation Metadata XML**.

10. Finally, next to **Attributes & Claims**, click **Edit** to prepare for step 2.2, below.

Step 2: Configure SAML in Tableau Cloud

Complete the following procedure after you save the SAML metadata file from Entra, as described in the section above.

1. Back in Tableau Cloud, on the New Configuration page, under **2. Upload metadata to Tableau**, click the **Choose a file** button and navigate to the SAML metadata file you saved from Entra. This automatically fills the IdP entity ID and SSO Service URL values.

2. Under **3. Map attributes** copy the corresponding attribute names (assertions) from the Entra's **Attributes & Claims** section:

   a. For the **Username** field, enter `mail` or `userprincipalname`, or copy the `http://schemas.xmlsoap.org/ws/2005/05/identity/claims/name` URL.

   b. For the remaining optional fields, copy the URL claim names.

3. Under **4. Choose default for embedding views (optional)**, select the experience you want to enable when users access embedded Tableau content.

4. Click the **Save and Continue** button.

5. Go to **5. Get Tableau Cloud metadata** to prepare for step 3.1.

Step 3: Configure Tableau Cloud application in your IdP

1. Back in the Entra, on the Set up Single Sign-On with SAML page, next to **Basic SAML Configuration**, click **Edit**, and do the following:

   a. For **Identifier (Entity ID)**, under Tableau Cloud's **5. Get Tableau Cloud metadata in Tableau Cloud**, copy the **Tableau Cloud entity ID** URL.

b. For **Reply URL**, under Tableau Cloud's **5. Get Tableau Cloud metadata in Tableau Cloud**, copy the **Tableau Cloud ACS URL**.

c. Click **Save**.

Step 4: Test the SAML configuration in Tableau Cloud

In Entra, do the following:

- Assign the Microsoft Entra test user as described in the Tutorial: Microsoft Entra SSO integration with Tableau Cloud documentation.

In Tableau Cloud, do the following:

1. Add that Entra user to Tableau Cloud to test the SAML configuration. To add users in Tableau Cloud, see the Add Users to a Site topic.

2. Under **7. Test configuration**, click the **Test Configuration** button.

   We highly recommend that you test the SAML configuration to avoid any locked out scenarios. Testing the configuration helps ensure that you have configured SAML correctly before changing the authentication type of your users to SAML. To test the configuration successfully, make sure that there is at least one user who you can sign in as who is already provisioned in the IdP and added to your Tableau Cloud with SAML authentication type configured.

Additional notes for SAML support with Microsoft Entra ID

- To avoid enabling SP-initiated single logout (SLO), ensure that the IdP metadata uploaded to Tableau Cloud SAML settings does not contain the SLO endpoint. Alternatively, in the IdP metadata that you upload to Tableau Cloud SAML settings, you can replace the existing “SingleLogoutService” value with "https://sso.online.tableau.com/public/idp/SSO”.

- If using IdP-initiated SSO for your application, do not provide a “Sign On URL” value in the Tableau Cloud application from the gallery in Entra. Providing a value for this field will bypass IdP-initiated SSO.

## Configure SAML with AD FS

You can configure Active Directory Federation Services (AD FS) as a SAML identity provider, and add Tableau Cloud to your supported single sign-on applications. When you integrate AD FS with SAML and Tableau Cloud, your users can sign in to Tableau Cloud using their standard network credentials.

**Notes:**

- These steps reflect a third-party application and are subject to change without our knowledge. If the steps described here do not match the screens you see in your IdP account, you can use the general SAML configuration steps, along with the IdP's documentation.
- Beginning February 2022, multi-factor authentication (MFA) through your SAML SSO identity provider (IdP) is a Tableau Cloud requirement.
- The configuration steps in the IdP may be in a different order than what you see in Tableau Cloud.

### Prerequisites

Before you can configure Tableau Cloud and SAML with AD FS, your environment must have the following:

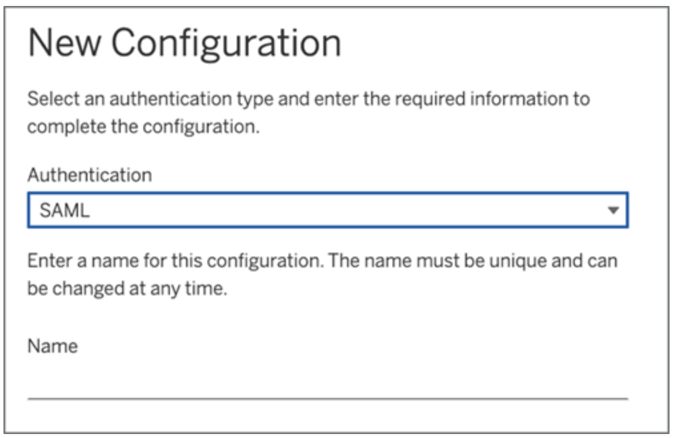
- A server running Microsoft Windows Server 2008 R2 (or later) with AD FS 2.0 (or later) and IIS installed.
- We recommend that you secure your AD FS server (for example, using a reverse proxy). When your AD FS server is accessible from outside your firewall, Tableau Cloud can redirect users to the sign in page hosted by AD FS.
- A site administrator account that uses Tableau with MFA authentication. If SAML single sign-on fails, you can still sign in to Tableau Cloud as a site administrator.

Step 1: Get started

In Tableau Cloud, do the following:

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.

2. On the **Authentication** tab, click the **New Configuration** button, select **SAML** from the Authentication drop-down, and then enter a name for the configuration.




**Note:** Configurations created before November 2024 (Tableau 2024.3) can't be renamed.

In the AD FS, do the following:

The procedure below exports AD FS metadata that you’ll import to Tableau Cloud. You will also make sure the metadata is configured and encoded properly for Tableau Cloud, and verify other AD FS requirements for your SAML configuration.

1. Export AD FS Federation metadata to an XML file, and then download the file from **https://<*adfs server name*>/federationmetadata/2007-06/FederationMetadata.xml**.

2. Open the metadata file in a text editor like Sublime Text or Notepad++, and verify that it is correctly encoded as UTF-8 without BOM.

If the file shows some other encoding type, save it from the text editor with the correct encoding.

3. Verify that AD FS uses forms-based authentication. Sign-ins are performed in a browser window, so you need AD FS to default to this type of authentication.

   Edit **c:\inetpub\adfs\ls\web.config**, search for the tag **,** and move the line so it appears first in the list. Save the file so that IIS can automatically reload it.

   > **Note:** If you don't see the **c:\inetpub\adfs\ls\web.config** file, IIS is not installed and configured on your AD FS server.

4. Configure an additional AD FS relying party identifier. This allows your system to work around any AD FS issues with SAML logout.

   Do one of the following:

   **Windows Server 2008 R2:**

   a. In **AD FS 2.0**, right-click on the relying party you created for Tableau Cloud earlier, and click **Properties**.

   b. On the **Identifiers** tab, in the **Relying party identifier** box, enter **https://<t-ableauservername>/public/sp/metadata** and then click **Add**.

   **Windows Server 2012 R2:**

   a. In **AD FS Management**, in the **Relying Party Trusts** list, right-click on the relying party you created for Tableau Cloud earlier, and click **Properties**.

   b. On the **Identifiers** tab, in the **Relying party identifier** box, enter **https://<t-ableauservername/public/sp/metadata** and then click **Add**.

Step 2: Configure SAML in Tableau Cloud

Complete the following procedure after you save the SAML metadata file from AD FS, as described in the section above.

1. Back in Tableau Cloud, on the New Configuration page, under **2. Upload metadata to Tableau**, click the **Choose a file** button and navigate to the SAML metadata file (FederationMetadata.xml) you exported from AD FS. This automatically fills the IdP entity ID and SSO Service URL values.

2. Skip **3. Map attributes** because you will create a claim rule in AD FS to match the attribute names that Tableau Cloud expects in the section below.

3. Under **4. Choose default for embedding views (optional)**, select the experience you want to enable when users access embedded content.

4. Click the **Save and Continue** button.

5. Under **5. Get Tableau Cloud metadata**, click the **Export Metadata** button and save the Tableau metadata file to your computer.

   By default, the file name is **saml_sp_metadata.xml**.

Step 3. Configure Tableau Cloud application in your IdP

Configuring AD FS to accept Tableau Cloud sign-in requests is a multi-step process, starting with importing the Tableau Cloud metadata file to AD FS.

1. Do one of the following to open the **Add Relying Party Trust Wizard**:

   **Windows Server 2008 R2:**

   a. Select **Start menu**> **to Administrative Tools**> **AD FS 2.0**.

   b. In **AD FS 2.0**, under **Trust Relationships**, right-click the **Relying Party Trusts** folder, and then click **Add Relying Party Trust**.

   **Windows Server 2012 R2:**

   a. Open **Server Manager**, and then on the **Tools** menu, click **AD FS Management**.

   b. In **AD FS Management**, on the **Action** menu, click **Add Relying Party Trust**.

2. In the **Add Relying Party Trust Wizard**, click **Start**.

3. On the **Select Data Source** page, select **Import data about the relying party from a file**, and then click **Browse** to locate your Tableau Cloud metadata file.

   By default, the file name is **saml_sp_metadata.xml**.

4. Click **Next**, and on the **Specify Display Name** page, type a name and description for the relying party trust in the **Display name** and **Notes** boxes.

5. Click Next to skip the **Configure Multi-factor Authentication Now** page.

6. Click Next to skip the **Choose Issuance Authorization Rules** page.

7. Click Next to skip the **Ready to Add Trust** page.

8. On the **Finish** page, select the **Open the Edit Claim Rules dialog for this relying party trust when the wizard closes** check box, and then click **Close**.

Next, you'll work in the **Edit Claim Rules** dialog, to add a rule that makes sure the assertions sent by AD FS match the assertions Tableau Cloud expects. At a minimum, Tableau Cloud needs a username (in email address format). However, including first and last names in addition to email will ensure the user names displayed in Tableau Cloud are the same as those in your AD account.

1. In the **Edit Claim Rules** dialog box, click **Add Rule**.

2. On the **Choose Rule Type** page, for **Claim rule template**, select **Send LDAP Attributes as Claims**, and then click **Next**.

3. On the **Configure Claim Rule** page, for **Claim rule name**, enter a name for the rule that makes sense to you.

4. For **Attribute store**, select **Active Directory**, complete the mapping as shown below, and then click **Finish**.

   The mapping is case sensitive and requires exact spelling, so double-check your entries. The table here shows common attributes and claim mappings. Verify attributes with your specific Active Directory configuration.

   **Note:** Tableau Cloud requires the **NameID** attribute in the SAML response. You can provide other attributes to map user names in Tableau Cloud, but the response message must include the **NameID** attribute.

| LDAP Attribute | Outgoing Claim Type |
|---|---|
| Depending on the version of AD FS:<br><br>User-Principal-Name<br>*or*<br>E-Mail-Addresses | <br><br>email<br>*or*<br>E-Mail Address |
| Given-Name | firstName |
| Surname | lastName |

If you are running AD FS 2016 or later, then you must add a rule to pass through all claim values. If you are running an older version of AD FS, skip to the next procedure to export AD FS metadata.

1. Click **Add Rule**.
2. Under **Claim rule template,** choose **Pass Through or Filter an Incoming Claim.**
3. Under **Claim rule name**, enter Windows.
4. On the **Edit Rule - Windows** pop-up:
   - Under **Incoming claim type**, select **Windows account name**.
   - Select **Pass through all claim values**.
   - Click **OK**.

In Tableau Cloud, do the following:

1. Go back to Tableau Cloud, on the New Configuration page, under **3. Map attributes**, populate the claim values from AD FS in Tableau Cloud.

2. Click the **Save and Continue** button.

Step 4: Test the SAML configuration in Tableau Cloud

1. In Tableau Cloud, add a sample user to both ADFS and Tableau Cloud to test the SAML configuration. To add users in Tableau Cloud, see Add Users to a Site topic.

2. Go back to the New Configuration page, under **7. Test configuration**, click the **Test Configuration** button.

We highly recommend that you test the SAML configuration to avoid any locked out scenarios. Testing the configuration helps ensure that you have configured SAML correctly before changing the authentication type of your users to SAML. To test the configuration successfully, make sure that there is at least one user who you can sign in as who is already provisioned in the IdP and added to your Tableau Cloud with SAML authentication type configured.

Step 5: Add additional users to the SAML-enabled Tableau Cloud site

Use the steps below to add additional users to your site. The procedure described in this section is performed on the Tableau Cloud's **Users** page.

1. After you complete the steps above, from the left pane, navigate to the **Users** page.

2. Follow the procedure described in Add Users to a Site topic. Alternatively, you can add users using a .csv file by following the procedure described in Import Users topic.

Additional requirements and tips for SAML support with AD FS

- After you set up SAML integration between AD FS and Tableau Cloud, you must update Tableau Cloud to reflect particular user changes you make in Active Directory. For example, adding or removing users.

  You can add users automatically or manually:

- **To add users automatically:** Create a script (using PowerShell, Python, or batch file) to push AD changes to Tableau Cloud. The script can use tabcmd or the REST API to interact with Tableau Cloud.
- **To add users manually:** Sign in to the Tableau Cloud web UI, go to the **Users** page, click **Add Users**, and enter users' username or upload a CSV file that contains their information.

> **Note:** If you want to remove a user but keep content assets they own, change the owner of the content before you remove the user. Deleting a user also deletes content they own.

- In Tableau Cloud, a user's username is their unique identifier. As described in the steps for configuring AD FS to accept sign-in requests from Tableau Cloud, users' Tableau Cloud usernames must match the username stored in AD.
- In Step 3. Configure Tableau Cloud application in your IdP, you added a claim rule in AD FS to match the first name, last name, and username attributes between AD FS and Tableau Cloud. Alternatively, you can use step **5. Map attributes** in Tableau Cloud to do the same.

## Configure SAML with OneLogin

If you use OneLogin as your SAML identity provider (IdP), you can use the information in this topic to set up SAML authentication for your Tableau Cloud site.

These steps assume that you have permissions for modifying your organization's OneLogin portal, and you are comfortable reading XML and pasting values into attributes.

**Notes:**

- These steps reflect a third-party application and are subject to change without our knowledge. If the steps described here do not match the screens you see in your IdP account, you can use the general SAML configuration steps, along with the IdP's documentation.

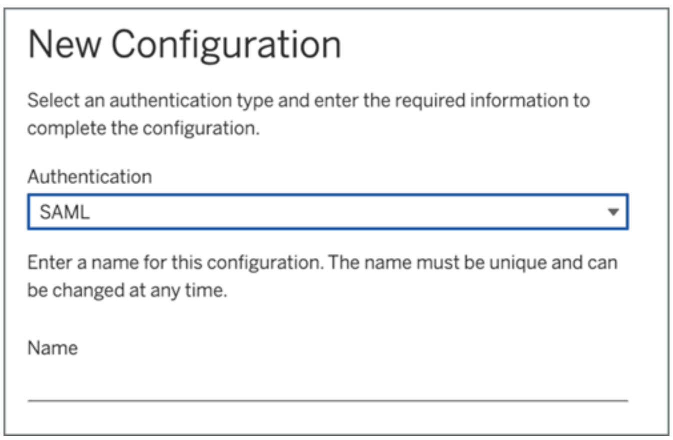
- Beginning February 2022, multi-factor authentication (MFA) through your SAML SSO identity provider (IdP) is a Tableau Cloud requirement.
- The configuration steps in the IdP may be in a different order than what you see in Tableau Cloud.

Step 1: Get started

In Tableau Cloud, do the following:

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.

2. On the **Authentication** tab, click the **New Configuration** button, select **SAML** from the Authentication drop-down, and then enter a name for the configuration.




**Note:** Configurations created before November 2024 (Tableau 2024.3) can't be renamed.

In OneLogin, do the following:

1. Open a new browser tab or window, sign in to your OneLogin admin portal, and then do the following:

2. On the **Applications** page, select **Add Apps**. Search for Tableau, and in the results, select **Tableau Cloud SSO**. In this area you configure the SAML connection.

**Note:** The Tableau Cloud SSO option for OneLogin does not work with Tableau Server.

3. On the **Info** page, set up your portal preferences. If you have more than one Tableau Cloud site, include the site name in the **Display Name** field to help users know which site to select.

4. On the **SSO** page, select and copy the URI shown in the **SLO Endpoint (HTTP)** field.

   **Note:** Although the label indicates HTTP, the URI provided is an **https** address, because the SLO (single logout) endpoint uses SSL/TLS encryption.

5. On the same page, select **More Actions** > **SAML Metadata**, and save the OneLogin metadata file to your computer.

Step 2: Configure SAML in Tableau Cloud

Complete the following steps after you download the SAML metadata file from OneLogin, as described in the section above.

1. Back in Tableau Cloud, on the New Configuration page, under **2. Upload metadata to Tableau**, click the **Choose a file** button and navigate to the SAML metadata file you downloaded from OneLogin.

   **Important:** If you encounter any issues with uploading the OneLogin metadata file, consider using a non-default certificate with OneLogin. To create a new certificate, from the Onelogin admin portal, select **Security** > **Certificates**. If you create a new certificate, ensure the Tableau Cloud application in OneLogin uses this new certificate.

2. Continue to **3. Map attributes** and set the values as follows:

   1. For **Username**, enter Email. This is the email address the users use to sign in to Tableau Cloud.

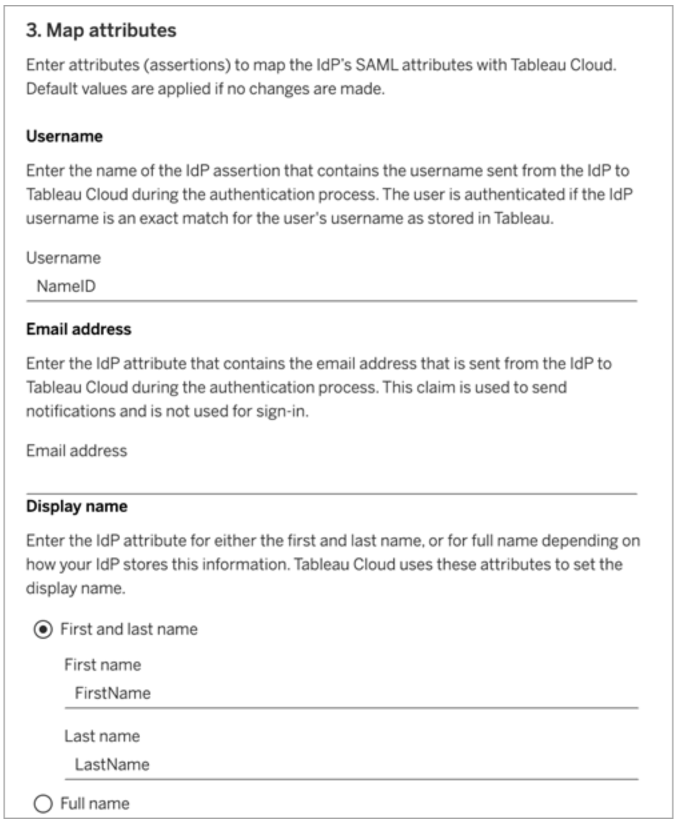
   2. For **Email address**, enter the optional attribute value according to the IdP's documentation. This attribute is the email address where the user should receive

notifications if different from username. This is for notifications purposes only.

3. For **Display name**, select the **First and last name** radio button.

   a. For **First name**, enter FirstName.

   b. For **Last name**, enter LastName.




3. Under **4. Choose default for embedding views (optional)**, select the experience you want to enable when users access embedded content. For more information, see the About enabling iFrame embedding section below.

4. Click the **Save and Continue** button.

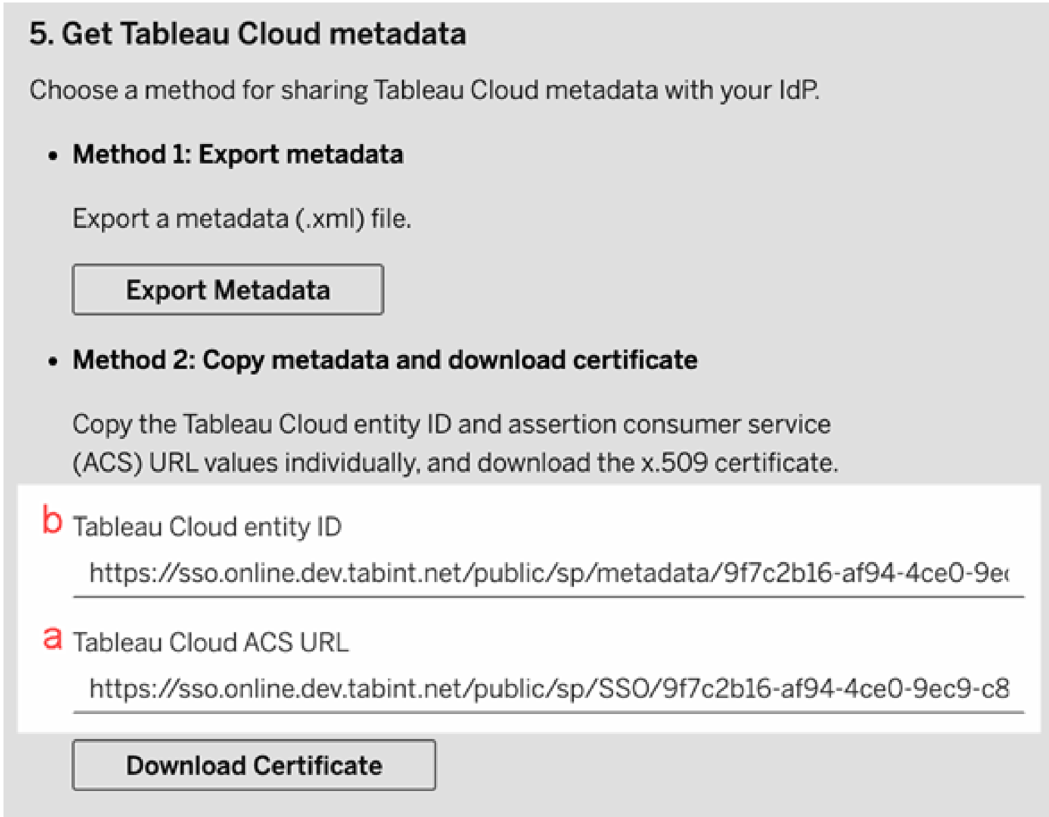
Step 3. Configure Tableau Cloud application in your IdP

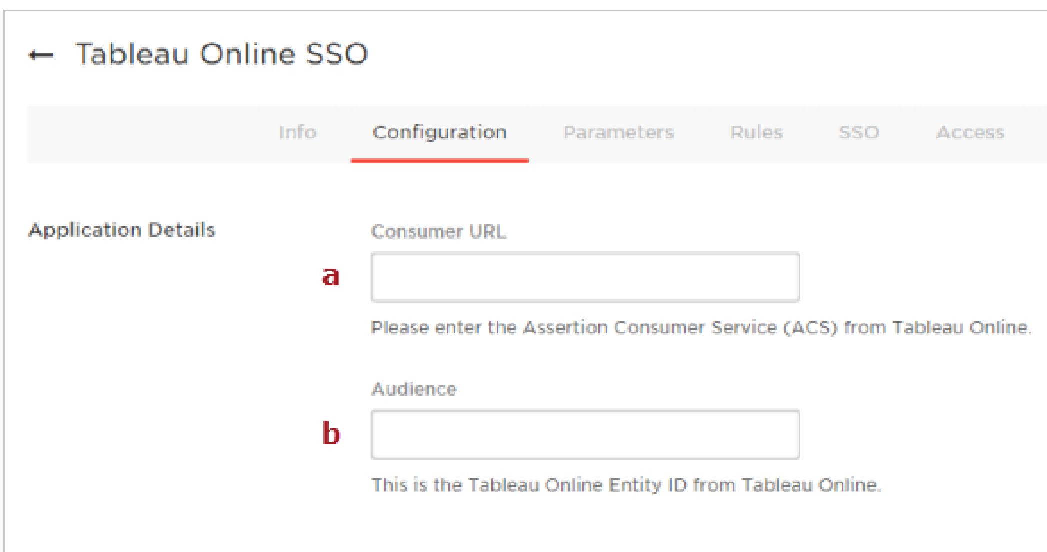
The procedure in this section will use the information from **5. Get Tableau Cloud Metadata**, under **Method 2: Copy metadata and download certificate** on the **New Configuration** page in Tableau Cloud.

1. Back in the OneLogin portal, in the Tableau Cloud application, on the **Configuration** page, do the following:

   a. For **Consumer URL** in the OneLogin portal, paste the **Tableau Cloud ACS URL** value from Tableau Cloud.

   b. For **Audience** in the OneLogin portal, paste the **Tableau Cloud entity ID** value from Tableau Cloud.




2. Navigate to the **SSO** page, select **SHA-256** for the **SAML Signature Algorithm**.

3. Navigate to the **Parameters** and make sure the values appear as follows:

| Tableau Cloud field | Value |
|---|---|
| Username | Email |
| First Name | First Name |
| Last Name | Last Name |

Step 4: Test the SAML configuration in Tableau Cloud

In OneLogin, do the following:

- Add a sample user to OneLogin and assign them to the Tableau Cloud application.

In Tableau Cloud, do the following:

1. Add that OneLogin user to Tableau Cloud to test the SAML configuration. To add users in Tableau Cloud, see the Add Users to a Site topic.

2. Under **7. Test configuration**, click the **Test Configuration** button.

   We highly recommend that you test the SAML configuration to avoid any locked out scenarios. Testing the configuration helps ensure that you have configured SAML correctly before changing the authentication type of your users to SAML. To test the configuration successfully, make sure that there is at least one user who you can sign in as who is already provisioned in the IdP and added to your Tableau Cloud with SAML authentication type configured.

Step 5: Add additional users to the SAML-enabled Tableau Cloud site

Use the steps below to add additional users to your site. The procedure described in this section is performed on the Tableau Cloud's **Users** page.

1. After you complete the steps above, from the left pane, navigate to the **Users** page.

2. Follow the procedure described in Add Users to a Site topic.

About enabling iFrame embedding

When you enable SAML on your site, you need to specify how users sign in to access views embedded in web pages. These steps configure OneLogin to allow your OneLogin dashboard to be embedded into an inline frame (iFrame) on another site. Inline frame embedding may provide a more seamless user experience when signing-on to view embedded visualizations. For example, if a user is already authenticated with your identity provider and iFrame embedding is enabled, the user would seamlessly authenticate with Tableau Cloud when browsing to pages that contain embedded visualizations.

> **Caution:** Inline frames can be vulnerable to a clickjack attack. *Clickjacking* is a type of attack against web pages in which the attacker tries to lure users into clicking or entering content by displaying the page to attack in a transparent layer over an unrelated page. In the context of Tableau Cloud, an attacker might try to use a clickjack attack to capture user credentials or to get an authenticated user to change settings. For more information about clickjack attacks, see Clickjacking on the Open Web Application Security Project website.

1. Open a new browser tab or window, and sign in to your OneLogin admin portal.
2. On the **Settings** menu, click **Account Settings**.
3. On the **Basic** page, in **Framing Protection**, select the **Disable Framing Protection (X-Frame-Options)** check box.

## Configure SAML with PingOne

If you use PingOne as your SAML identity provider (IdP), you can use the information in this topic to set up SAML authentication for your Tableau Cloud site.

**Notes:**

- These steps reflect a third-party application and are subject to change without our knowledge. If the steps described here do not match the screens you see in your IdP account, you can use the general SAML configuration steps, along with the IdP's documentation.

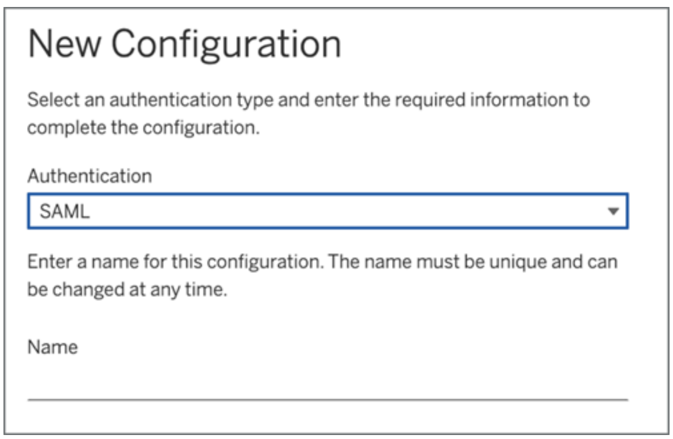
- Beginning February 2022, multi-factor authentication (MFA) through your SAML SSO identity provider (IdP) is a Tableau Cloud requirement.
- The configuration steps in the IdP may be in a different order than what you see in Tableau Cloud.

Step 1: Get started

In Tableau Cloud, do the following:

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.

2. On the **Authentication** tab, click the **New Configuration** button, select **SAML** from the Authentication drop-down, and then enter a name for the configuration.

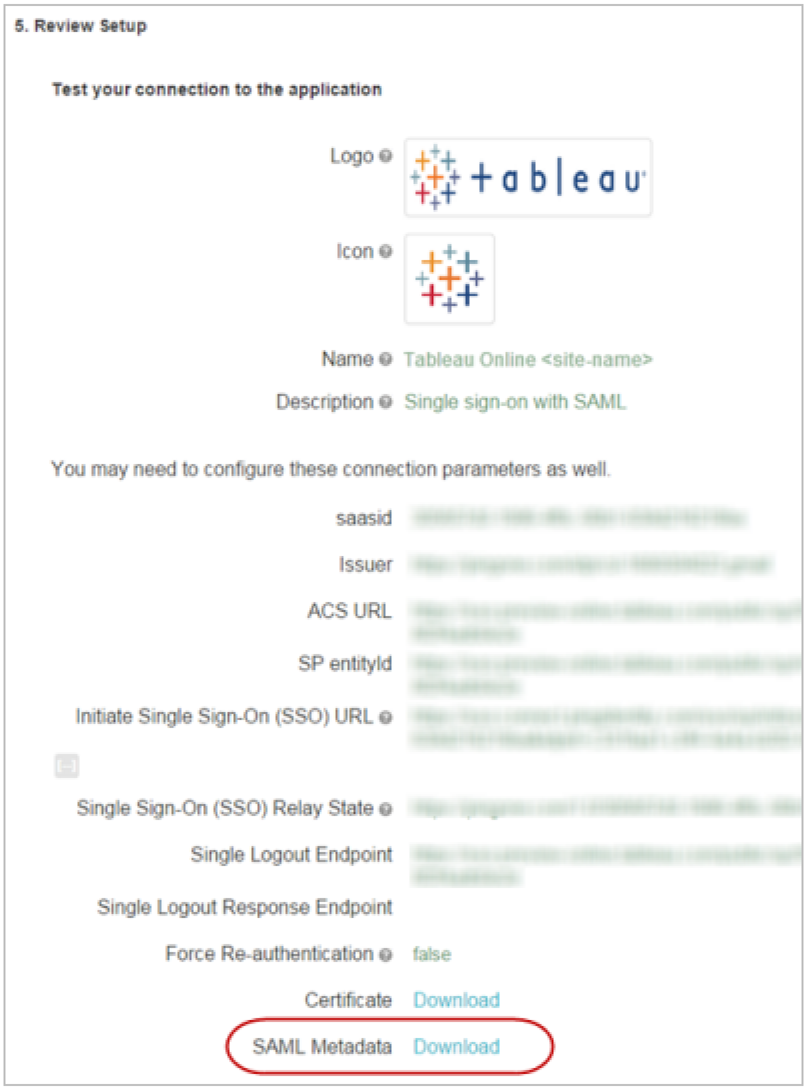
   **Note:** Configurations created before November 2024 (Tableau 2024.3) can't be renamed.

In PingOne, do the following:

1. Open a new browser tab or window, sign in to your PingOne account, and then click the **Applications** tab.

2. In the **Application Catalog** search for and select Tableau Cloud.

3. Click **Setup** button, the **Save & Publish** button, and then click the **Download** link next to **SAML Metadata**, and save the PingOne SAML metadata file to your computer.




Step 2: Configure SAML in Tableau Cloud

Complete the following procedure after you download the SAML metadata file from PingOne, as described in the section above.

1. Back in Tableau Cloud, in the **New Configuration** page, under **2. Upload metadata to Tableau**, click the **Choose a file** button and navigate to the SAML metadata file you

downloaded from your PingOne account.

2. Continue to Step 3: Map attributes , and complete the remaining steps as described.
3. Under **4. Choose default for embedded views**, you can optionally select how users authenticate to embedded views.
4. Click the **Save and Continue** button.
5. Under **5. Get Tableau Cloud metadata**, click the **Export Metadata** button and save the Tableau metadata file to your computer.

   By default, the file name is **saml_sp_metadata.xml**.

Step 3. Configure Tableau Cloud application in your IdP

1. Back in your PingOne account, in the Tableau Cloud application, navigate to **Setup**.
2. On the **1. SSO Instructions** page, click **Continue to Next Step**.
3. On the **2. Configure your connection** page, for **Upload Metadata**, click **Select File**, and upload the Tableau Cloud metadata file you saved from Tableau Cloud.
4. Click **Continue to Next Step**.

When you import the Tableau Cloud metadata as part of the PingOneSAML configuration, the certificate embedded in the metadata is not applied to the IdP application definition. This can cause the following error when people sign out of the SAML site:

*It looks like the signing certificate has not been configured.*

Configure the PingOne certificate

To resolve the sign-out error, you can download the certificate from Tableau Cloud, convert it from DER encoded to Base-64 encoded, and then upload it to PingOne.

The steps for converting the certificate are specific to Windows.

In Tableau Cloud, do the following:

1. Back in Tableau Cloud, make sure **SAML** is selected and you're on the **New Configuration** page.

2. Under **5. Get Tableau Cloud metadata**, for **Method 2: Copy metadata and download certificate**, click the **Download Certificate** button, and save the .cer file to your computer.


On your computer, do the following:

1. Double-click the .cer file you downloaded, and click **Open**.

2. In the **Certificate** dialog box, select the **Details** tab and click **Copy to File**.

3. In the Certificate Export Wizard, do the following:

   a. Click **Next** on the opening screen, and then select **Base-64 encoded X.590 (.CER)**.

   b. Click **Next**, and specify the name and location of the file you are exporting.

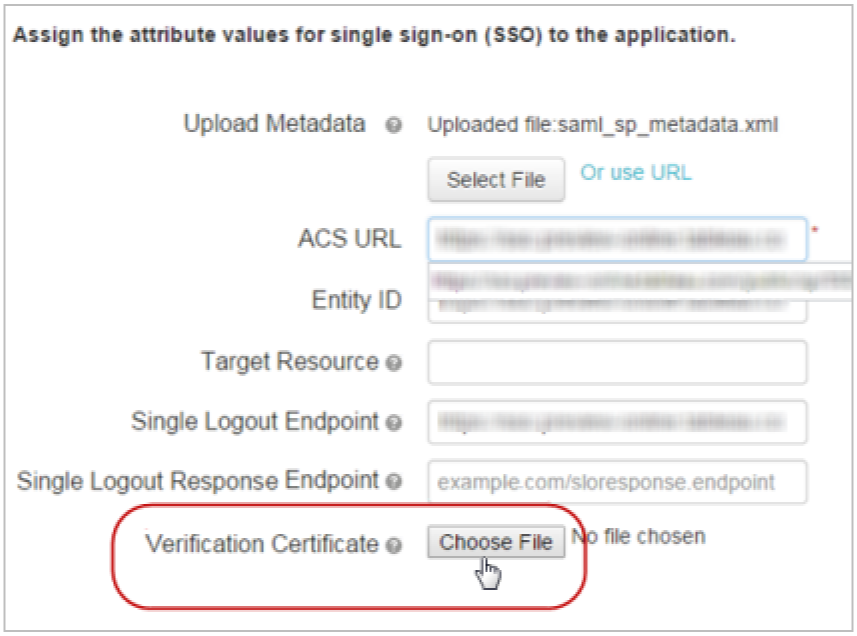
   c. Click **Next**, review the summary information, and then click **Finish**.

In PingOne, do the following:

1. In your PingOne account, return to the application setup pages for Tableau Cloud.

2. In **Step 2. Configure your connection**, for **Verification Certificate**, click **Choose**

**File**, and upload the new .cer file you created.




Step 4: Test the SAML configuration in Tableau Cloud

In PingOne, do the following:

- Add a sample user to PingOne and assign them to the Tableau Cloud application.

In Tableau Cloud, do the following:

1. Add that PingOne user to Tableau Cloud to test the SAML configuration. To add users in Tableau Cloud, see the Add Users to a Site topic.

2. Under **7. Test configuration**, click the **Test Configuration** button.

   We highly recommend that you test the SAML configuration to avoid any locked out scenarios. Testing the configuration helps ensure that you have configured SAML correctly before changing the authentication type of your users to SAML. To test the configuration successfully, make sure that there is at least one user who you can sign in as who is already provisioned in the IdP and added to your Tableau Cloud with SAML authentication type configured.

Step 5: Add additional users to the SAML-enabled Tableau Cloud site

Use the steps below to add additional users to your site. The procedure described in this section is performed on the Tableau Cloud's **Users** page.

1. After you complete the steps above, from the left pane, navigate to the **Users** page.

2. Follow the procedure described in Add Users to a Site topic.

## Configure SAML with Okta

If you use Okta as your SAML identity provider (IdP), you can use the information in this topic to set up SAML authentication for your Tableau Cloud site. You can also use the How to Configure SAML 2.0 for Tableau Cloud topic in the Okta documentation.

Tableau Cloud's SAML integration with Okta supports service provider (SP)-initiated SSO, identity provider (IdP)-initiated SSO, and single logout (SLO).

**Notes:**

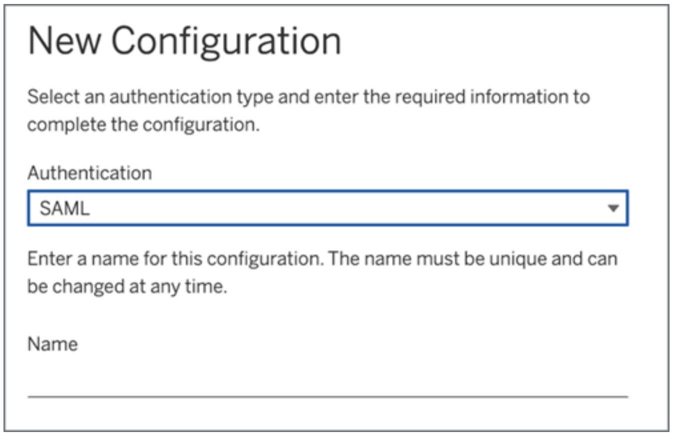
- These steps reflect a third-party application and are subject to change without our knowledge. If the steps described here do not match the screens you see in your IdP account, you can use the general SAML configuration steps, along with the IdP's documentation.
- Beginning February 2022, multi-factor authentication (MFA) through your SAML SSO identity provider (IdP) is a Tableau Cloud requirement.
- The configuration steps in the IdP may be in a different order than what you see in Tableau Cloud.

Step 1: Get started

In Tableau Cloud, do the following:

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.

2. On the **Authentication** tab, click the **New Configuration** button, select **SAML** from the Authentication drop-down, and then enter a name for the configuration.




**Note:** Configurations created before November 2024 (Tableau 2024.3) can't be renamed.

In the Okta administrator console, do the following:

1. Open a new browser tab or window and sign in to your Okta administrator console.
2. From the left pane, select **Applications** > **Applications** and click the **Browse App Catalog** button.
3. Search for and click "Tableau Cloud" and then click the **Add Integration** button. This opens the **General Settings** tab.
4. (Optional) If you have more than one Tableau Cloud site, edit the site name in the **Application label** field to help you differentiate between your Tableau Cloud application instances.
5. Navigate to the **Sign On** tab, click **Edit**, and do the following:
    a. Under **Metadata details**, copy the Metadata URL.
    b. Paste the URL into a new browser and save the results as a file using the default "metadata.xml".

Step 2: Configure SAML in Tableau Cloud

Complete the following procedure after you save the SAML metadata file from Okta, as described in the section above.

1. Back in Tableau Cloud, on the New Configuration page, under **2. Upload metadata to Tableau**, click the **Choose a file** button and navigate to the SAML metadata file you saved from Okta. This automatically fills the IdP entity ID and SSO Service URL values.

2. Map the attribute names (assertions) under **3. Map attributes** to the corresponding attribute names (assertions) in the Okta administrator console's **Tableau Cloud User Profile Mappings** page.

3. Under **4. Choose default for embedding views (optional)**, select the experience you want to enable when users access embedded content. For more information, see the About enabling iFrame embedding section below.

4. Click the **Save and Continue** button.

Step 3. Configure Tableau Cloud application in your IdP

The procedure in this section will use the information from **5. Get Tableau Cloud Metadata**, under **Method 2: Copy metadata and download certificate** on the **New Configuration** page in Tableau Cloud.

1. In the Okta administrator console, click the **Assignments** tab to add your users or groups.

2. When finished, click **Done**.

3. Click the **Sign On** tab and in the Settings section, click **Edit**.

4. (Optional) If you want to enable single logout (SLO), do the following:

a. Select the **Enable Single Logout** check box.

b. Copy the "Single Logout URL" value from the Tableau Cloud metadata file. For example, <md:SingleLogoutService Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST" Location="https://xxxx/public/sp/SLO/xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx"/>. For more information, see the Configure Single Logout Using SAML with Okta in the Tableau Knowledge Base.

c. In the **Advanced Sign-on Settings** text box, enter the value you copied in step b.

d. Next to **Signature Certificate**, click the **Browse** button and navigate to the certificate file you downloaded in the section above.

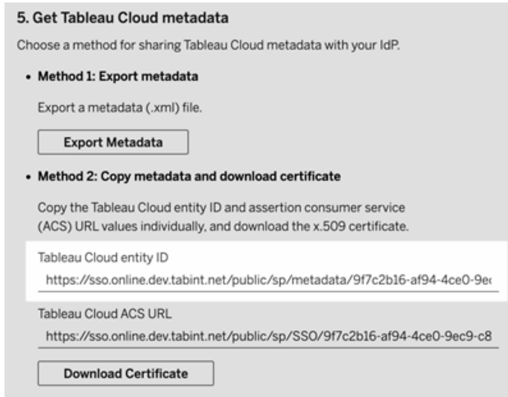
e. Select the file and click the **Upload** button.

f. When finished, click **Save**.

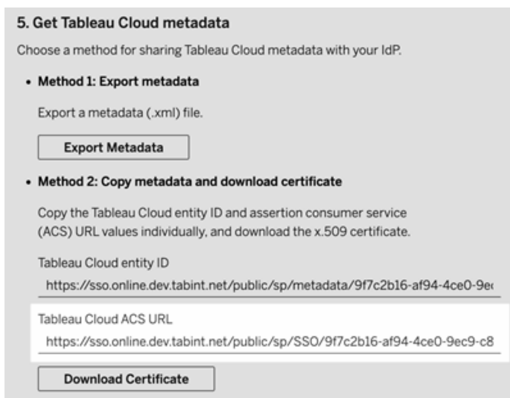
5. Select **Applications** > **Applications**, click the Tableau Cloud application, select the **Sign On** tab, and do the following:

   a. Click **Edit**.

   b. Under Advanced Sign-on Settings, for the **Tableau Cloud entity ID** text box in the Okta administrator console, paste the **Tableau Cloud entity ID** value from Tableau Cloud.




c. For the **Tableau Cloud ACS URL** text box in the Okta administrator console, pate the **Tableau Cloud ACS URL** value from Tableau Cloud.




**Note:** The Tableau Cloud SAML configuration settings appear in a different order than on the Okta settings page. To prevent SAML authentication issues, make sure that the Tableau Cloud entity ID and Tableau Cloud ACS URL are entered into the correct fields in Okta.

6. When finished, click **Save**.

Step 4: Test the SAML configuration in Tableau Cloud

In Okta, do the following:

- Add a sample user to Okta and assign them to the Tableau Cloud application.

In Tableau Cloud, do the following:

1. Add that Okta user to Tableau Cloud to test the SAML configuration. To add users in Tableau Cloud, see the Add Users to a Site topic.

2. On the New Configuration page, under **7. Test Configuration**, click the **Test Configuration** button.

We highly recommend that you test the SAML configuration to avoid any locked out scenarios. Testing the configuration helps ensure that you have configured SAML correctly before changing the authentication type of your users to SAML. To test the configuration successfully, make sure that there is at least one user who you can sign in as who is already provisioned in the IdP and added to your Tableau Cloud with SAML authentication type configured.

**Note:** If the connection fails, consider keeping the `NameID` attribute in Tableau as-is.

Step 5: Add additional users to the SAML-enabled Tableau Cloud site

If you plan to use SCIM to provision your users from Okta, do not manually add your users to Tableau Cloud. For more information, see Configure Configure SCIM with Okta. If you are not using SCIM, then use the steps below to add additional users to your site.

The procedure described in this section is performed on the Tableau Cloud's **Users** page.

1. After you complete the steps above, from the left pane, navigate to the **Users** page.

2. Follow the procedure described in Add Users to a Site topic.

About enabling iFrame embedding

When you enable SAML on your site, you need to specify how users sign in to access views embedded in web pages. These steps configure Okta to allow authentication using an inline frame (iFrame) for embedded visualization. Inline frame embedding may provide a more seamless user experience when signing on to view embedded visualizations. For example, if a user is already authenticated with your identity provider and iFrame embedding is enabled, the user would seamlessly authenticate with Tableau Cloud when browsing to pages that contain embedded visualizations.

> **Caution:** IFrame can be vulnerable to a clickjack attack. *Clickjacking* is a type of attack against web pages in which the attacker tries to lure users into clicking or entering content by displaying the page to attack in a transparent layer over an unrelated page. In the context of Tableau Cloud, an attacker might try to use a clickjack attack to capture user credentials or to get an authenticated user to change settings. For more information about clickjack attacks, see Clickjacking on the Open Web Application Security Project website.

1. Sign in to your Okta administrator console.
2. From the left pane, select **Customizations** > **Other** and navigate to the **IFrame Embedding** section.
3. Click **Edit**, select the **Allow iFrame embedding** check box, and then click **Save**.

## Configure SAML with Salesforce

If you've configured Salesforce as your SAML identity provider (IdP), use the information in this topic alongside the Salesforce documentation to add Tableau Cloud to your single sign-on applications.

**Notes:**

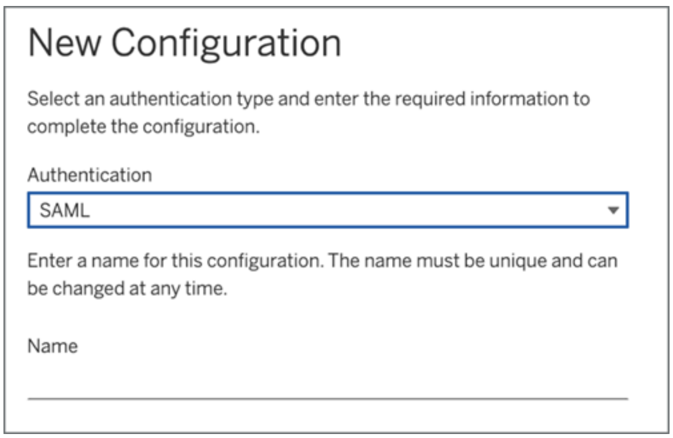
- These steps reflect the Salesforce application and can change without our knowledge. If the steps described here do not match the screens you see in Salesforce, you can use the general SAML configuration steps, along with the Salesforce documentation.
- Beginning February 2022, multi-factor authentication (MFA) with Salesfoce is a Tableau Cloud and Salesforce requirement.
- The configuration steps in the IdP may be in a different order than what you see in Tableau Cloud.

Step 1: Configure SAML in Tableau Cloud

To configure the Salesforce application, you will need to use information in the Tableau Cloud SAML settings.

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.

2. On the **Authentication** tab, click the **New Configuration** button, select **SAML** from the Authentication drop-down, and then enter a name for the configuration.




   **Note:** Configurations created before November 2024 (Tableau 2024.3) can't be renamed.

Step 2: Configure Tableau Cloud application in your IdP

See the Salesforce documentation, Configure SSO from Salesforce to Tableau Cloud.

Step 3: Add users to the SAML-enabled Tableau Cloud site

1. After you complete the Salesforce configuration steps, return to your Tableau Cloud site.

2. Complete the SAML configuration by adding the users you assigned in the Salesforce Application Profile Assignment page to Tableau Cloud by selecting existing Tableau Cloud users, or add new users you want to approve for SAML.

When you add or import users, you also specify their authentication type. On the **Users** page, you can change users' authentication type any time after adding them. For more information, see Add Users to a Site or Import Users.

## Configure SAML for Tableau Viz Lightning Web Component

Tableau provides a Lightning Web Component (LWC) for embedding a Tableau visualization within a Salesforce Lightning page.

This topic describes how to enable a SSO experience for embedded Tableau visualizations in a Salesforce Lightning page. SSO for the Tableau Viz LWC scenario requires SAML configuration. The SAML IdP used for Tableau authentication must be either the Salesforce IdP or same IdP that is used for your Salesforce instance.

In this scenario, Salesforce administrators can drag-and-drop Tableau Viz LWC into the Lightning page to embed a visualization. Any view that is available to them on Tableau Cloud can be displayed in the dashboard by entering the embedded URL to the view.

When single sign-on (SSO) is configured for Tableau Viz LWC on Tableau Cloud, the user experience is seamless: after the user signs into Salesforce, embedded Tableau views will work without further authentication to Tableau Cloud.

When SSO is not configured, then users will need to reauthenticate with Tableau Cloud to view embedded visualizations from Tableau Cloud.

**Note**: Users configured with Salesforce Authentication will need to reauthenticate with Tableau Cloud to view embedded visualizations in Tableau Cloud.

### Requirements

- The SAML IdP used for Tableau authentication must be either the Salesforce IdP or same IdP that is used for your Salesforce instance.
- SAML must be configured on Tableau Cloud. See Enable SAML Authentication on a Site.
- SAML must be configured for Salesforce.

- Install the Tableau Viz Lightning Web Component. See Embed Tableau Views into Salesforce.

Configuring the authentication workflow

You may need to make additional configurations to optimize the sign-in experience for users who access Lightning with embedded Tableau views.

If a seamless authentication user experience is important, then you will need to make some additional configurations. In this context, “seamless” means that users who access the Salesforce Lightning page where Tableau Viz LWC SSO has been enabled, will not be required to perform any action to view the embedded Tableau view. In the seamless scenario, if the user is logged into Salesforce, then embedded Tableau views will be displayed with no additional user action. This scenario is enabled by *in-frame authentication*.

For a seamless user experience you will need to enable in-frame authentication on Tableau Cloud and at your IdP. The sections below describe how to configure in-frame authentication.

On the other hand, there are scenarios where users are interacting with the Lightning page that will require them to click a “Sign in” button to view the embedded Tableau view. This scenario, where a user must take another action to view the embedded Tableau view, is called pop-up authentication.


Pop-up authentication is the default user experience if you do not enable in-frame authentication.

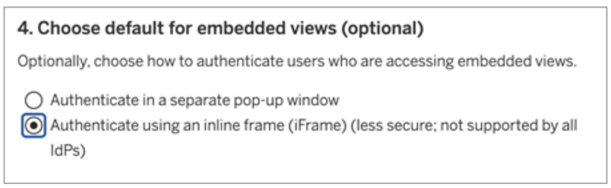
Enable in-frame authentication on Tableau Cloud

Before you enable in-frame authentication on Tableau Cloud, you must have already configured and enabled SAML.

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.

2. On the **Authentication** tab, click the **New Configuration** button, select **SAML** from the Authentication drop-down, and then enter a name for the configuration.

3. Navigate down to **4. Choose default for embedded views (optional)** and select the **Authenticate using an inline frame (iFrame)** radio button.




**Caution:** Inline frames can be vulnerable to a clickjack attack. *Clickjacking* is a type of attack against web pages in which the attacker tries to lure users into clicking or entering content by displaying the page to attack in a transparent layer over an unrelated page. In the context of Tableau Cloud, an attacker might try to use a clickjack attack to capture user credentials or to get an authenticated user to change settings. For more information about clickjack attacks, see Clickjacking on the Open Web Application Security Project website.

Enable in-frame authentication with your SAML IdP

As described above, a seamless authentication user experience with Salesforce Mobile requires IdP support for in-frame authentication. This functionality may also be referred to as “iframe embedding” or “framing protection” at IdPs.

Salesforce safelist domains

In some cases, IdPs only allow enabling in-frame authentication by domain. In those cases, set the following Salesforce wildcard domains when you enable in-frame authentication:

`*.force`

`*.visualforce`

Salesforce IdP

Salesforce IdP supports in-frame authentication by default. You do not need to enable or configure in-frame authentication in the Salesforce configuration. However, you must configure Tableau Cloud for in-frame authentication as described above.

Okta IdP

See *Embed Okta in an iframe*, in the Okta Help Center topic, General customization options.

Ping IdP

See the Ping support topic, How to Disable the "X-Frame-Options=SAMEORIGIN" Header in PingFederate.

OneLogin IdP

See *Framing protection*, in the OneLogin Knowledge Base article, Account Settings for Account Owners.

ADFS and EntraID IdP

Microsoft has blocked all in-frame authentication and it cannot be enabled. Instead, Microsoft only supports pop-up authentication in a second window. As a result, pop up behavior can be blocked by some browsers, which will require users to accept pop ups for the `force.com` and `visualforce.com` sites.

#### Salesforce Mobile App

If your users primarily interact with Lightning on the Salesforce Mobile App, then you should be aware of the following scenarios:

- The Salesforce Mobile App requires that you configure SSO/SAML to view embedded Tableau.
- The Salesforce Mobile App requires in-frame authentication. Pop-up authentication does not work. Instead, users on the Salesforce Mobile App will see the Tableau sign-in button but will not be able to sign to Tableau.
- Mobile App will not work on ADFS and Azure AD IdP.
- Users with Android devices will be required to sign-in to view the embedded Tableau visualization the first time, then SSO will work as expected.

## Troubleshoot SAML

This topic provides information about resolving issues that can occur when you configure SAML authentication.

#### Required assertions and metadata do not map correctly

Most issues occur because metadata that you import from the IdP, or assertion names that you enter, do not match the corresponding IdP attributes. To troubleshoot SAML issues, start by making sure the information shown in Steps 1–5 of the Authentication page matches the IdP's SAML configuration settings.

Tableau Cloud requires the IdP assertion that contains username. In addition to checking steps 2-5, make sure that users' usernames match between Tableau Cloud and the IdP.

#### Identity provider does not display sign-in page

A user provides his or her user name on the Tableau Cloud sign-in page, Tableau Cloud redirects the request to the identity provider (IdP), but the IdP does not return its SAML sign-in page. The IdP can fail to return the sign-in page for any of the following reasons:

- SSO service URL is not valid.

  When you import the IdP metadata, make sure the SSO Service URL field shows the correct URL.

- The IdP does not recognize the authentication request received.

  For example, the Tableau Cloud entity ID may be incorrect. This can occur if SAML configuration settings on the Authentication page have become corrupted or inadvertently changed.

To resolve the issue, repeat Steps 1–2 of the SAML configuration:

1. Sign in to your IdP account and export the IdP metadata

2. Sign in to Tableau Cloud, go to **Settings** > **Authentication** page, next to the authentication configuration, click the Actions menu and select **Edit**.

3. On the **Edit Configuration** page, in step 2, re-import and upload the metadata.

Nothing happens after IdP sign-in

If a user provides incorrect credentials on the IdP's sign-in page, or if the user is not authorized to use SAML, some IdPs will not return control to Tableau Cloud when authentication fails.

In Tableau Cloud, on the **Users** page, you can see whether a user is authorized for SAML authentication.


Full Name field shows users' email addresses

For a SAML site, the Full Name field is populated with the email address if the assertions for first and last name or full name are not provided in step **3. Map attributes** of the SAML settings in the Authentication page.

Unable to authenticate users when using single sign-on

SAML authentication takes place outside Tableau Cloud, so troubleshooting authentication issues can be difficult. However, login attempts are logged by Tableau Cloud. You can create a snapshot of log files and use them to troubleshoot problems.

If a user is having trouble being authenticated on Tableau Cloud, you should examine the log file to ensure that username attribute values returned by the IdP match the usernames of users.

To download the log file:

1. Sign in to Tableau Cloud.
2. Go to **Settings** > **Authentication** page, next to the authentication configuration, click the Actions menu and select **Edit**. Under step **7. Test configuration**, under **Troubleshoot SAML**, click the **Download Log** button.

Signing in through command line utilities

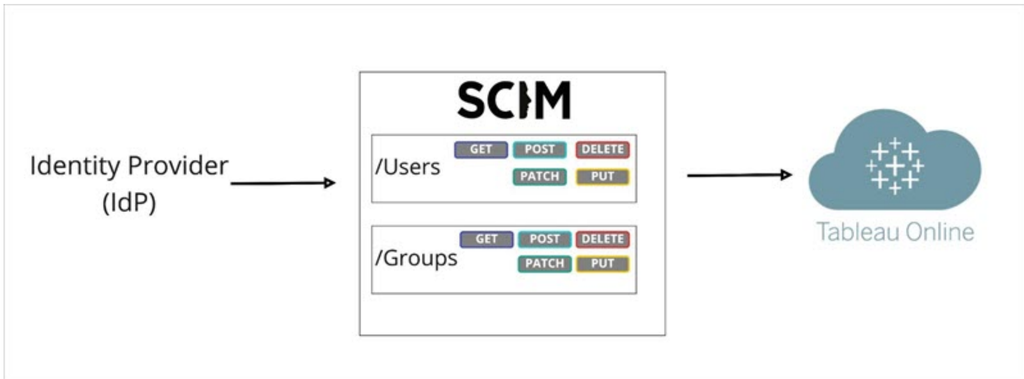
SAML is not used for authentication when you sign in to Tableau Cloud using tabcmd or the Tableau Data Extract command line utility (provided with Tableau Desktop), even if Tableau Cloud is configured to use SAML. These tools require Tableau authentication (also known as TableauID) configured when Tableau Cloud was originally provisioned.

# Automate User Provisioning and Group Synchronization through an External Identity Provider

You can automate adding or removing users from Tableau Cloud or adding or removing members from groups using your Identity Provider (IdP).

Tableau Cloud's user management uses the System for Cross-domain Identity Management (SCIM) standard, an open standard for automating the exchange of user identity information. SCIM allows identity providers (IdPs) to centrally manage user identities, including assigning users to applications and groups. The IdP uses SCIM to ensure that “downstream” applications like Tableau Cloud are kept in sync with the provisioning assignments set up with the

IdP. Managing users in this way improves security and can significantly reduce the manual work that site administrators must do to manage site users and group membership.




In the diagram above, the IdP *pushes* updates to Tableau Cloud and controls how often Tableau Cloud's SCIM endpoints are called to ensure users and groups are appropriately mirrored.

## IdP-specific configuration

The steps later in this topic provide general information that you can use with your IdP's documentation to configure SCIM for your Tableau Cloud site. You can get IdP-specific configuration steps for the following IdPs we support:

- Configure SCIM with Microsoft Entra ID
- Configure SCIM with Okta
- Configure SCIM with OneLogin

## Prerequisites

To enable SCIM integration with your Tableau Cloud site, you'll need the appropriate levels of access:

- Site administrator access to the Tableau Cloud site
- Ability to modify your IdPs configuration settings for Tableau Cloud

Additionally, the SCIM functionality requires that you configure your site to support SAML single sign-on (SSO). If you haven't done this, see Enable SAML Authentication on a Site, and then follow your IdP's documentation to add Tableau Cloud as an application.

## Enable SCIM support with your IdP

Use the following steps to enable SCIM support. To complete this process, you'll also need the documentation your IdP provides. Look for topics that refer to configuring or enabling a service provider for SCIM provisioning.

**Notes:**

- After enabling SCIM, users and their attributes should be managed through the IdP. Changes made within Tableau Cloud directly may result in unexpected behavior and overwritten values.
- Beginning in November 2024 (Tableau 2024.3):
  - You can choose the SAML authentication configuration to associate with SCIM. However, only one SAML authentication configuration can support SCIM on a site.
  - The SCIM capability is no longer site admin-scoped. In other words, all site admins are have the ability to configure and edit SCIM. However, only one SAML authentication configuration can support SCIM on a site.

**To enable SCIM**

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.
2. Do the following:
   a. On the **Authentication** page, under **Automatic Provisioning and Group Synchronization (SCIM)**, select the **Enable SCIM** check box.

This populates the **Base URL** and **Secret** boxes with values you will use in the IdP's SCIM configuration.

> **Important:** The secret token is displayed only immediately after it is generated. If you lose it before you can apply it to your IdP, you can select **Generate New Secret**. In addition, the secret token is tied to the Tableau Cloud user account of the site administrator who enables SCIM support. If that user's site role changes or the user is removed from the site, the secret token becomes invalid, and another site administrator must generate a new secret token and apply it to your IdP.

b. Under **Authentication for SCIM**, select the SAML authentication configuration to associate with SCIM.

**Note:** Only one SAML authentication configuration can support SCIM on a site.

3. Copy the secret token value, and then navigate to your IdP settings. Paste the Tableau Cloud SCIM secret token in the appropriate field.

4. Copy and paste the **Base URL** shown in the Tableau Cloud SCIM settings to the appropriate field in your IdP.

5. Follow your IdP's documentation to provision users and groups after enabling SCIM support.

## Replace a SCIM secret token

When you need to replace your SCIM (system for cross-domain identity management) secret token, follow the steps below:

1. In Tableau Cloud, navigate to **Settings** > **Authorization**.

2. Under Automatic Provisioning and Group Synchronization (SCIM), click **Generate New**

**Secret**.

3. Reconfigure SCIM to use the new secret token.

A site administrator can also revoke a secret token that belongs to another user by deleting that user from Tableau Cloud and then adding them back to the site.

## Configure SCIM with Microsoft Entra ID

You can configure user management through Microsoft Entra ID (also known as Azure Active Directory (AD)), provision groups, and assign Tableau Cloud site roles.

While you complete the following steps, it will help to have the Entra ID documentation at hand. See the tutorial, Configure Tableau Cloud for automatic user provisioning.

> **Note:** If you have already enabled provisioning for your application and would like to update to use the Tableau SCIM 2.0 endpoint, see the Microsoft article Update a Tableau Cloud application. If you are setting up provisioning for a new instance of the Tableau Cloud application, follow the steps below.

Step 1: Perform prerequisites

The SCIM functionality requires that you configure your site to support SAML single sign-on (SSO).

1. Complete the section "Add Tableau Cloud to your Microsoft Entra ID applications" in Configure SAML with Microsoft Entra ID.

2. After adding Tableau Cloud from the Azure Marketplace, remain signed in to both the Entra portal and Tableau Cloud, with the following pages displayed:

   - In Tableau Cloud, the **Settings** > **Authentication** page.
   - In the Entra portal, the **Tableau Cloud** application > **Provisioning** page.

Step 2: Enable SCIM support

Use the following steps to enable SCIM support with Microsoft Entra ID. See also Notes and limitations for SCIM support with Azure Active Directory section below.

**Note:** For the steps in the Entra portal, make sure you're using Tableau Cloud app from the gallery.

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.

2. Do the following:

   a. On the **Authentication** page, under **Automatic Provisioning and Group Synchronization (SCIM)**, select the **Enable SCIM** check box.

      This populates the **Base URL** and **Secret** boxes with values you will use in the IdP's SCIM configuration.

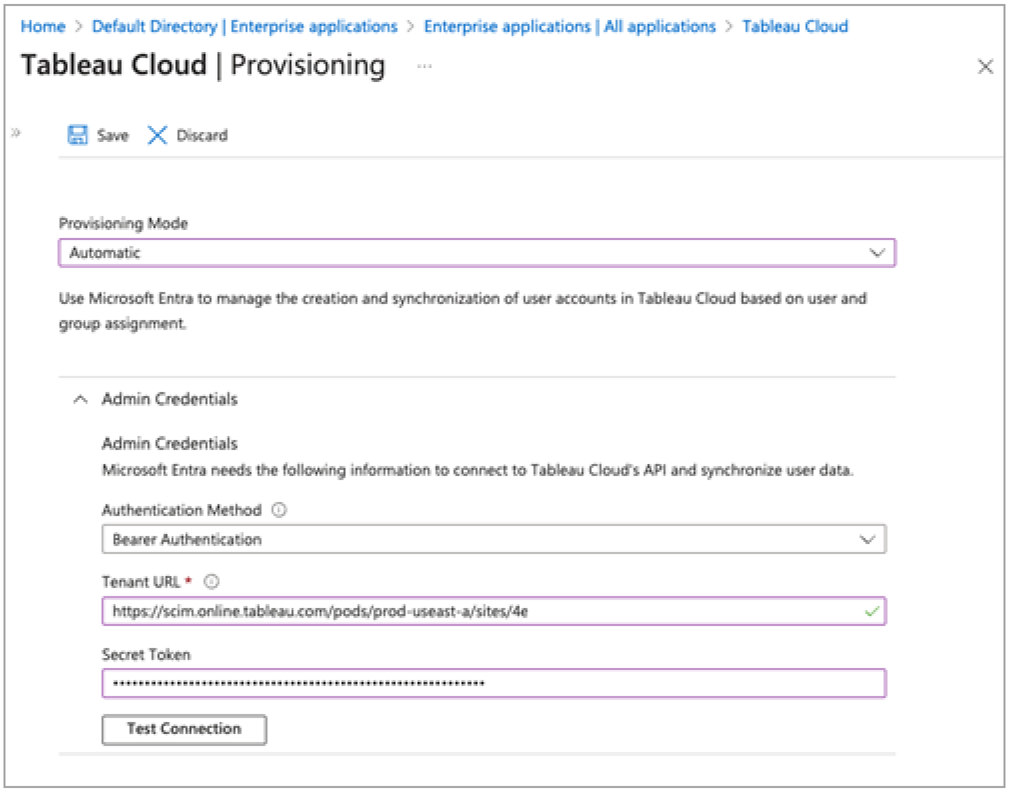
      > **Important:** The secret token is displayed only immediately after it is generated. If you lose it before you can apply it to your IdP, you can select **Generate New Secret**. In addition, the secret token is tied to the Tableau Cloud user account of the site administrator who enables SCIM support. If that user's site role changes or the user is removed from the site, the secret token becomes invalid, and another site administrator must generate a new secret token and apply it to your IdP.

   b. Under **Authentication for SCIM**, select the SAML authentication configuration to associate with SCIM.

      **Note:** Only one SAML authentication configuration can support SCIM on a site.

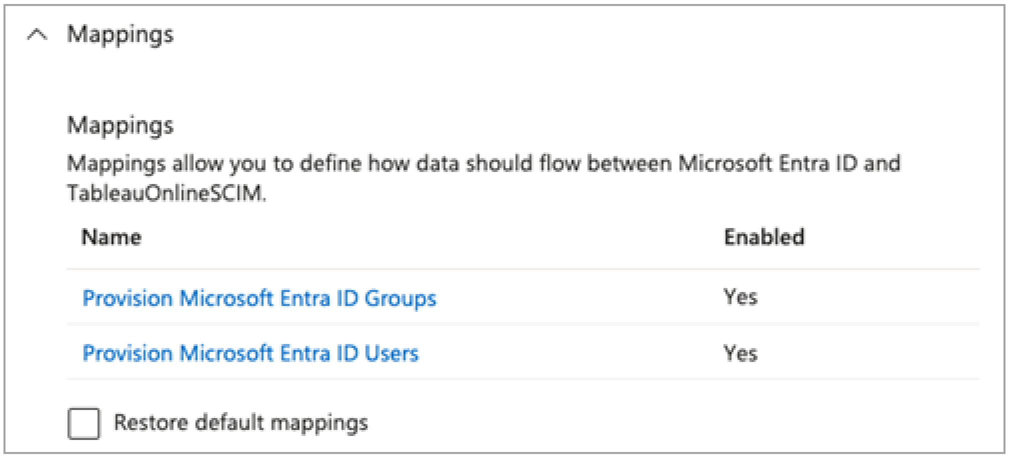
3. Copy the secret token value, and on the **Provisioning** page in your Entra portal, do the following:

- For **Provisioning Mode**, select **Automatic**.
- For **Authentication Method**, select **Bearer Authentication**.
- For **Tenant URL**, copy and paste the **Base URL** shown in the Tableau Cloud SCIM settings.
- For **Secret Token**, paste the Tableau Cloud SCIM secret token you copied earlier.

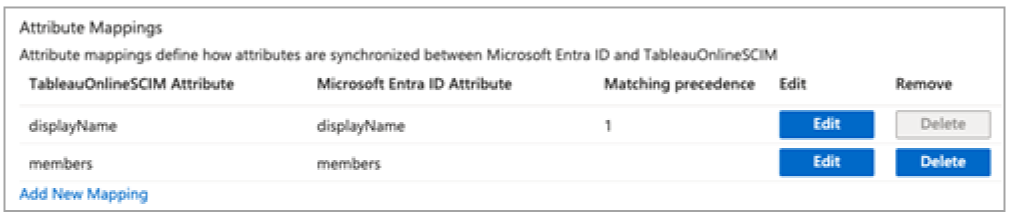



4. Click the **Test Connection** button to verify the credentials are working as expected, and then click **Save**.

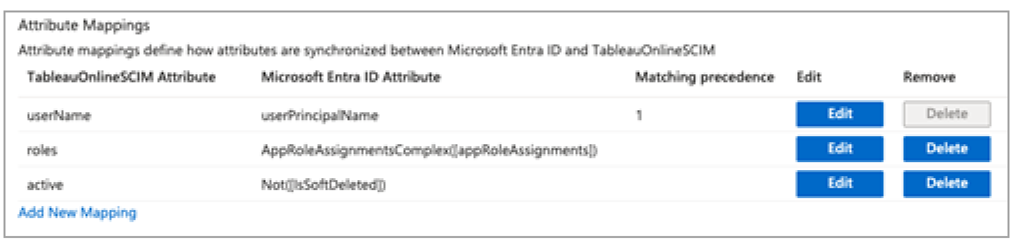
5. In the **Mappings** section, verify that **Provision Microsoft Entra ID Groups** and **Provision Microsoft Entra ID Users** are enabled.




6. Select **Provision Microsoft Entra ID Groups**, and on the **Attribute Mappings** page, review the attributes synchronized from Entra ID to Tableau Cloud. To save any changes, click **Save**.




7. Select **Provision Microsoft Entra ID Users**, and on the **Attribute Mapping** page, review the attributes synchronized from Entra ID to Tableau Cloud. To save any changes, click **Save**.




Step 3: Assign groups to the Tableau Cloud app

Use the following steps to assign groups to the Tableau Cloud gallery app in Microsoft Entra ID.

1. From the application page, select **Enterprise Apps** > **Users and groups**.
2. Click **Add user/group**.
3. On the **Add Assignment** page, select a group and assign one of the following site roles:
   - *Creator*
   - *SiteAdministratorCreator*
   - *Explorer*
   - *SiteAdministratorExplorer*
   - *ExplorerCanPublish*
   - *Viewer*
   - *Unlicensed*

   **Note:** You'll receive an error if you select a role that is not in the above list. For more information about site roles, see Set Users' Site Roles.
4. Click **Assign**.

Create groups for site roles

A user can be a member of multiple groups in Entra ID , but they will only receive the most permissive site role in Tableau Cloud. For example, if a user is a member of two groups with site roles Viewer and Creator, Tableau will assign the Creator site role.

To keep track of role assignments, we recommend creating role-specific groups in Entra ID, such as *"Tableau - Creator"*, *"Tableau - Explorer"*, etc. You can then use the groups to quickly provision new users for the correct role in Tableau Cloud.

Site roles are listed below in order from most permissive to least permissive:

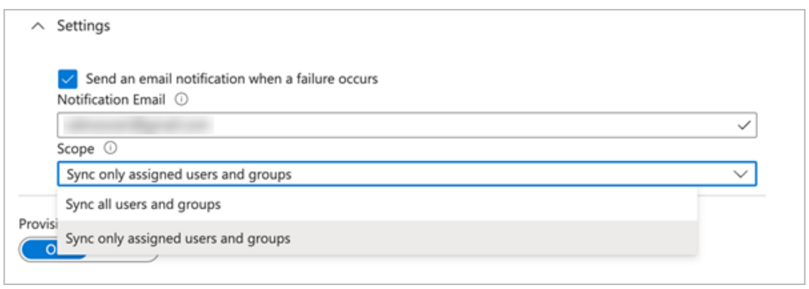
- Site Administrator Creator
- Site Administrator Explorer
- Creator
- Explorer (Can Publish)
- Explorer
- Viewer

**Note:** Users and their attributes should be managed through Entra ID. Changes made within Tableau Cloud directly may result in unexpected behavior and overwritten values.

Step 4: Provision groups

After you have enabled SCIM support and assigned groups to the Tableau Cloud application in Entra ID, the next step is to provision users to your Tableau Cloud site.

1. On the **Provisioning** page, expand the **Settings** section, and define the groups you want to provision to Tableau Cloud in **Scope**.




> **Note:** The Entra ID setting "Sync all users and groups" is not supported with Tableau Cloud.

2. Toggle **Provisioning Status** to **On**.
3. Click **Save**.

Saving starts the initial synchronization of the groups defined in **Scope**. Synchronization occurs approximately every 40 minutes as long as the Entra ID provisioning service runs. To manually provision users outside of the schedule, select **Provision on demand**. For more information about on demand provisioning, see the Microsoft article On-demand provisioning in Microsoft Entra ID.

After provisioning is complete, you should see the groups from Entra ID on the **Site Users** page in Tableau Cloud.

Change user authentication in Tableau Cloud

Provisioned users are assigned the SAML authentication type by default. To change the authentication type for users, use the steps below.

1. In Tableau Cloud, select **Users**.
2. On the **Site Users** page, select the check boxes next to the users you want to assign an authentication type.
3. On the **Actions** menu, select **Authentication**.
4. In the Authentication dialog, select the preferred authentication type for the user.

For more information about the different authentication types in Tableau Cloud, see Authentication.

Notes for SCIM support with Azure Active Directory

- You must add a separate Tableau Cloud app for each site you want to manage using SCIM.
- When deprovisioning a user in the Tableau Cloud application in Azure AD or if a user is deleted from Azure AD entirely, the user is converted to an **Unlicensed** site role in Tableau Cloud. If the user owns any content, you must first reassign ownership of those content assets before you can manually delete the user in Tableau Cloud.

- Beginning in February 2024 (Tableau 2023.3), the use of SCIM with Grant License on Sign In (GLSI) is supported. GLSI requires the following:

  1. Manually enabling the option for a group and selecting the minimum site role for the users who are members of the group *directly* in Tableau Cloud. It is not possible to set a group with the GLSI attribute in Azure AD, but you can set the attribute for the group you have provisioned from Azure AD in Tableau Cloud.
  2. The user must be provisioned as *unlicensed* from the IdP.

## Configure SCIM with Okta

You can configure user management through Okta, provision groups, and assign Tableau Cloud site roles. If you're not yet familiar with Tableau site roles and the capabilities each allows, see Set Users' Site Roles.

Step 1: Perform prerequisites

The SCIM functionality requires that you configure your site to support SAML single sign-on (SSO).

1. Complete the following sections in Configure SAML with Okta:

   - Step 1: Get started
   - Configure SAML with Okta

2. After you finish the steps in these two sections, remain signed in to both the Okta administrator console and Tableau Cloud, with the following pages displayed:

   - In Tableau Cloud, the **Settings** > **Authentication** page.
   - In the Okta administrator console, **Applications** > **Applications** > **Tableau Cloud** > **Provisioning**.

Step 2: Enable SCIM support

Use the following steps to enable SCIM support with Okta. See also the Notes for SCIM support with Okta section below.

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.

2. Do the following:

   a. On the **Authentication** page, under **Automatic Provisioning and Group Synchronization (SCIM)**, select the **Enable SCIM** check box.

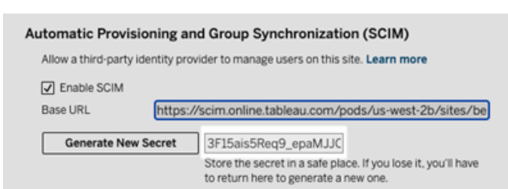
      This populates the **Base URL** and **Secret** boxes with values you will use in the IdP's SCIM configuration.

      > **Important:** The secret token is displayed only immediately after it is generated. If you lose it before you can apply it to your IdP, you can select **Generate New Secret**. In addition, the secret token is tied to the Tableau Cloud user account of the site administrator who enables SCIM support. If that user's site role changes or the user is removed from the site, the secret token becomes invalid, and another site administrator must generate a new secret token and apply it to your IdP.

   b. Under **Authentication for SCIM**, select the SAML authentication configuration to associate with SCIM.

      **Note:** Only one SAML authentication configuration can support SCIM on a site.

3. Copy the secret token value.




4. In the Okta administrator console, do the following:

a. From the left pane, select **Application** > **Application**, click the **Tableau Cloud** app, and then click the **Provisioning** tab.

b. Click **Enable API Integration** button.

c. Select the **Enable API integration** check box and click **Save**.

d. Do the following:

    a. For **API Token**, paste the Tableau Cloud SCIM secret token you copied in the previous step.

    b. For **Base URL**, copy and paste the **Base URL** shown in the Tableau Cloud SCIM settings.

5. Click the **Test API Credentials** button to ensure the configuration was done correctly. If the configuration was done correctly, you see a "Tableau Cloud was verified successfully!" message.

6. When finished, click **Save**.

Step 3: Assign groups to the Tableau app

For user provisioning to Tableau, we recommend you manage users in groups for easier management in Tableau.

In Okta, assign groups to the Tableau app so that the users can be provisioned to Tableau Cloud. More specifically, you need two distinct groups, a group assigned to the Assignment tab and a group assigned to the Push Group tab. The group in the Assignments tab is used to create users in Tableau Cloud. The group in the Push Group tab is used to create the group and manage group membership in Tableau Cloud.

**Notes:**

- Okta requires that you have a group in the Assignments tab and a group for the Push Group tab to prevent a race condition. For more information, see App assignments and Group Push and About Group Pushh in the Okta documentation.

- The steps in this procedure assume you've already created at least two groups. For more information about creating groups in Okta, see Create a group in the Okta documentation.

You can use the procedure below to add a group and assign the group to the Tableau app.

1. From the left pane, select **Application** > **Application**, click the **Tableau Cloud** app, and then click the **Assignments** tab.
2. Click on the **Assign** drop-down and select **Assign to Groups**.
3. Do the following:
    a. Select the relevant group.
    b. Select the site role you would like the users to be provisioned with to Tableau. The options are:
        - Unlicensed
        - Viewer
        - Explorer
        - Explorer (can publish)
        - Creator
        - Site Administrator Explorer
        - Site Administrator Creator
4. When finished, click **Save and Go Back** button.
5. Repeat steps 1-4 in the **Push Group** tab and then click the **Done** button.

Step 4: Enable group provisioning

Okta allows you to push existing groups and their memberships to Tableau Cloud. After a group is pushed, you can manage group membership in Okta to automatically update the corresponding group in Tableau Cloud. Before you follow these steps, we recommend your review Group Push prerequisites and About Group Push in the Okta documentation.

**Important:** After enabling SCIM, users and their attributes should be managed through Okta. Changes made within Tableau Cloud directly may result in unexpected behavior and overwritten values.

The following procedure continues where you left off in the previous section and assume you are signed in to the Okta administrator console.

1. From the left pane, select **Application** > **Application**, click the **Tableau Cloud** app, and then click the **Push Groups** tab.

2. Click the **Push Groups** button and then select one of the following options from the drop-down menu:

   - **Find groups by name:** Select this option to search groups by name.

   - **Find groups by rule:** Select this option to create a search rule that pushes any groups that match the rule.

   You can deactivate group push, unlink pushed groups, or push group membership immediately by clicking **Active** or **Inactive** in the Push Status column. To delete, deactivate, or activate multiple groups, click **Bulk Edit**. For more information, see Enable Group Push in the Okta documentation.

3. (Optional) If pushing multiple groups, click the **Save & Add Another** button, and repeat the previous step.

4. When finished, click **Save**.

SCIM and grant license on sign in

Beginning in February 2024 (Tableau 2023.3), you can use SCIM with Grant License on Sign In (GLSI) with Okta.

Using SCIM with GLSI for Okta requires the following:

1. In Okta, adding users to the groups in Tableau app's Assignment and Push Group tabs.

2. In Tableau Cloud, enabling the GLSI option for the groups and selecting the minimum site role for the users who are members of the groups.

   **Note:** It's not possible to set a group with the GLSI attribute in Okta.

3. Users to be provisioned as "Unlicensed" in Okta.

Enable GLSI

To set up and enable GLSI, see Grant License on Sign In.

Remove SCIM users with GLSI

You must first remove SCIM users from their GLSI-enabled groups in Okta before attempting to deactivate them in Okta. Deactivating users will set the users to the "Unlicensed" role in Tableau Cloud. However, users can't get the "Unlicensed" role in Tableau Cloud until they are no longer a member of any GLSI-enabled groups.

1. In Okta, remove the user from the GLSI-enabled group assigned to the Push Group tab first.

2. In Okta, deprovision the user either by removing them from the GLSI-enabled group assigned to the Assignments tab or deleting the user in Okta. After you do this, the user will be converted to “Unlicensed” in Tableau Cloud. Deprovisioning a user in Okta only causes the user to be converted to “Unlicensed” in Tableau Cloud and does not delete the user.

**Notes:**

- If you want to delete a user in Okta, see Deactivate and delete user accounts in the Okta documentation.
- If you want to delete the SCIM user in Tableau Cloud (see Delete SCIM users, below), you manually delete the user from Tableau Cloud.

If you encounter issues, see the Error "User role was not updated to: Unlicensed (errorCode-e=10079)" When Attempting to Deprovision Users via SCIM knowledge article.

## About Tableau Cloud's "All Users" group

If you've enabled the default "All Users" group with GLSI, you can't deprovision the users in Okta and therefore unable to get the "Unlicensed" role for any of the users that belong to the GLSI-enabled group in Tableau Cloud. To remove SCIM users in the GLSI-enabled "All Users" group, you must manually delete the users from Tableau Cloud.

**Note:** If users have content associated with them, you'll need to reassign content ownership to other users before you can delete the users.

### Delete SCIM users

Deleting SCIM users in Okta will only covert them to the "Unlicensed" role and will not delete them in Tableau Cloud. If you want to delete users, you must manually delete the users in Tableau Cloud.

For more information about deleting users, see "Remove users from a site" in the View, Manage, or Remove Users topic.

### Notes for SCIM support with Okta

- In the Okta user assignment settings, the values for **User Name** and **Primary email** must be identical.

- You must add a separate Tableau Cloud Okta app for each site you want to manage using SCIM.
- If you want to migrate a site, you will need to re-configure SCIM provisioning for the new site.
- When provisioning new users, first name and last name attributes in Okta are not synced to Tableau Cloud. New users must set those fields when they sign in to Tableau Cloud for the first time.
- When a user is unassigned from the Tableau Cloud app in Okta or the user is deactivated or deleted from Okta entirely, the user is converted to an "Unlicensed" site role in Tableau Cloud. If the user owns any content, you must first reassign ownership of those content assets before you can manually delete the user in Tableau Cloud.
- You can set a user’s site role (such as Creator, Explorer, or Viewer) in Okta at either the user or the group level. We recommend assigning the site role at the group level. If the user is assigned a site role directly, it will override any group settings.
- A user can be a member of many groups. Groups can have different site roles. If a user is assigned groups with different site roles, the user will receive the most permissive site role in Tableau Cloud. For example, if you choose Viewer and Creator, Tableau will assign the Creator site role.

  Site roles are listed below in order from most permissive to least permissive:

  - Site Administrator Creator
  - Site Administrator Explorer
  - Creator
  - Explorer (Can Publish)

- Explorer
- Viewer

- You can update the site role attribute for a user in Okta and this change will propagate to Tableau Cloud. Other attributes, such as User Name and Primary email, cannot be updated. To change these attributes, remove the user, change the attribute, and then add the user again.
- Beginning in February 2024 (Tableau 2023.3), the use of SCIM with Grant License on Sign In (GLSI) is supported. For more information, see SCIM and grant license on sign in above.

## Configure SCIM with OneLogin

You can configure user management through OneLogin, provision groups, and assign Tableau Cloud site roles. If you're not yet familiar with Tableau site roles and the capabilities each allows, see Set Users' Site Roles.

As you complete the following steps, it might help also to have the OneLogin documentation at hand. Start with Introduction to User Provisioning in the OneLogin documentation.

Step 1: Perform prerequisites

The SCIM functionality requires that you configure your site to support SAML single sign-on (SSO).

1. Complete the following sections in Configure SAML with OneLogin:
   - Step 1: Get started
   - Configure SAML with OneLogin
2. After you finish the steps in these two sections, remain signed in to both the OneLogin portal and Tableau Cloud, with the following pages displayed:

- In Tableau Cloud, the **Settings** > **Authentication** page.
- In the OneLogin portal, the **Configuration** page.

Step 2: Enable SCIM support

Use the following steps to enable SCIM support with OneLogin. See also Notes and limitations for SCIM support with OneLogin section below.

> **Note:** Remember to click **Save** in the upper right corner of the OneLogin portal after making configuration changes.

1. Sign in to your Tableau Cloud site as a site administrator, and select **Settings** > **Authentication**.
2. Do the following:
   a. On the **Authentication** page, under **Automatic Provisioning and Group Synchronization (SCIM)**, select the **Enable SCIM** check box.

      This populates the **Base URL** and **Secret** boxes with values you will use in the IdP's SCIM configuration.

      > **Important:** The secret token is displayed only immediately after it is generated. If you lose it before you can apply it to your IdP, you can select **Generate New Secret**. In addition, the secret token is tied to the Tableau Cloud user account of the site administrator who enables SCIM support. If that user's site role changes or the user is removed from the site, the secret token becomes invalid, and another site administrator must generate a new secret token and apply it to your IdP.

b. Under **Authentication for SCIM**, select the SAML authentication configuration to associate with SCIM.

   **Note:** Only one SAML authentication configuration can support SCIM on a site.

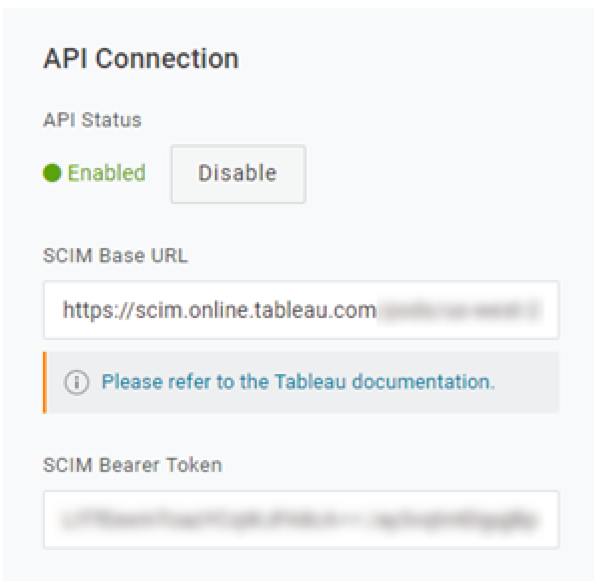
3. Copy the secret token value.

4. In the OneLogin portal, on the **Configuration** page, do the following:

   - For **API Status**, click **Enable**.

   - For **SCIM Bearer Token**, paste the Tableau Cloud SCIM secret token you copied earlier.

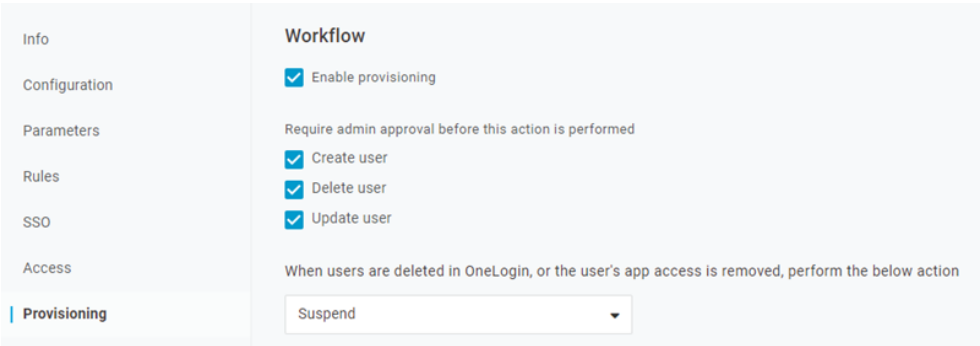
   - For **SCIM Base URL**, copy and paste the **Base URL** shown in the Tableau Cloud SCIM settings.




5. On the **Provisioning** page, do the following:

- Select **Enable provisioning**.

- Select **Suspend** for **When users are deleted in OneLogin, or the user's app access is removed, perform the below action**.




6. Click **Save**.

7. (Optional) On the **Parameters** page, map **SCIM Username** to the **Email** attribute. If you don’t map SCIM Username to an attribute in email address format, you’ll have to manually populate this field for each user as part of the provisioning process.

   An error is displayed when provisioning users if the mapped value doesn’t contain the user email address.

If you want to complete the steps for provisioning users and groups, stay signed in to the OneLogin portal and proceed to the next section.

Step 3: Provision users and groups

OneLogin gives you a number of ways by which you can assign user attributes such as groups or site roles. You can apply them at the Tableau Cloud app level, create mapping rules, or apply them manually to individual users.

Before you begin, it's important to note the OneLogin concept of groups operates differently than the Tableau concept of groups. In OneLogin, groups function as security boundaries to apply specific security policies to users. Because of this, users can only belong to one group at a time.

Additionally, OneLogin uses roles as a container for applications that different user cohorts can access. Once you assign users a role, you grant them access to all the applications included in the role. This is similar to the Tableau concept of groups. Users can have multiple roles in OneLogin, which can be mapped to a target application group, such as Tableau Cloud.

> **Note:** The following steps assume you are signed in to the OneLogin portal and Tableau Cloud app. These steps provide some Tableau-specific information that you can use with the OneLogin documentation for mapping group and site role attributes to users.

Provision a user

Use the following steps to provision individual users to Tableau Cloud through the OneLogin portal.

1. Go to the **Users** tab and select the user you want to provision. This opens the user settings page.
2. From the left navigation menu, select **Applications**.
3. On the **Applications** page, click the plus (+) icon to provision the user for your Tableau Cloud application, and then click **Continue**.
4. Enter the appropriate Tableau Cloud site role for the user in the **Site Role** field. For more information about site roles, see Set Users' Site Roles.
5. Click **Save**.

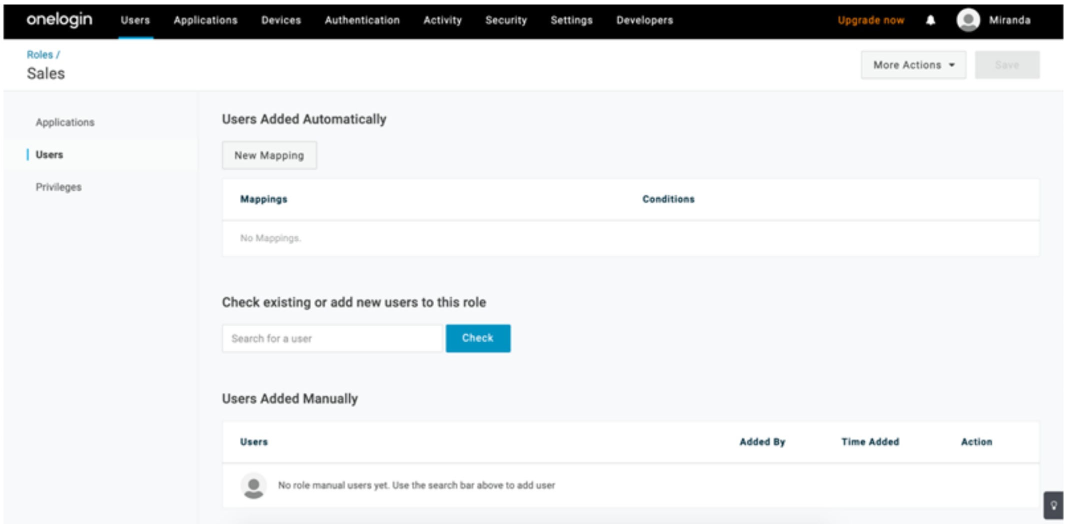
Provision multiple users with OneLogin roles

You can provision multiple users to Tableau Cloud by assigning roles in OneLogin. Users can be added to roles manually or automatically using mappings.

To add users to a role:

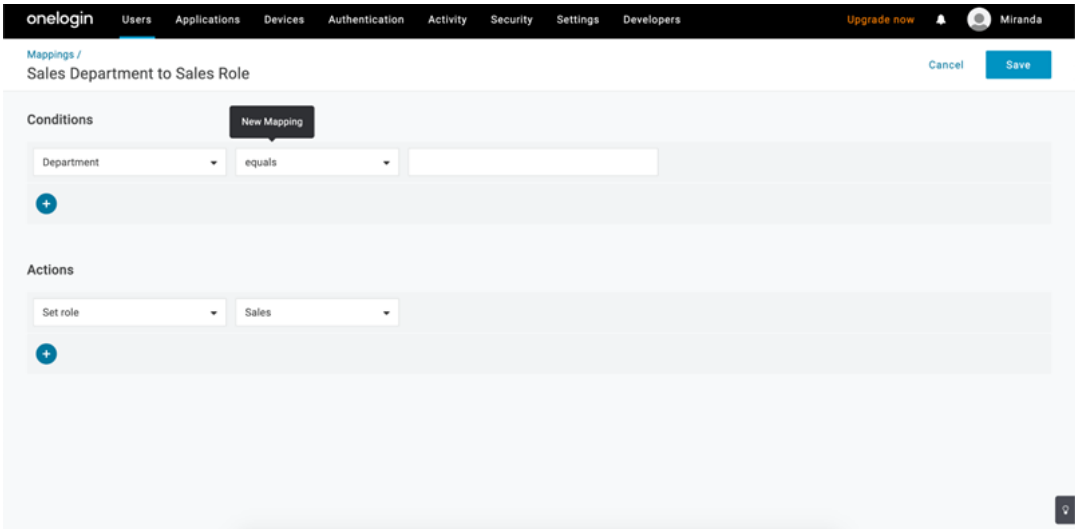
1. Go to **Users** > **Roles**, and select an existing role or create a **New Role**. For more information, see the OneLogin article Roles.

   The following example shows the role “Sales” that we’ll use as a group in Tableau Cloud later on.

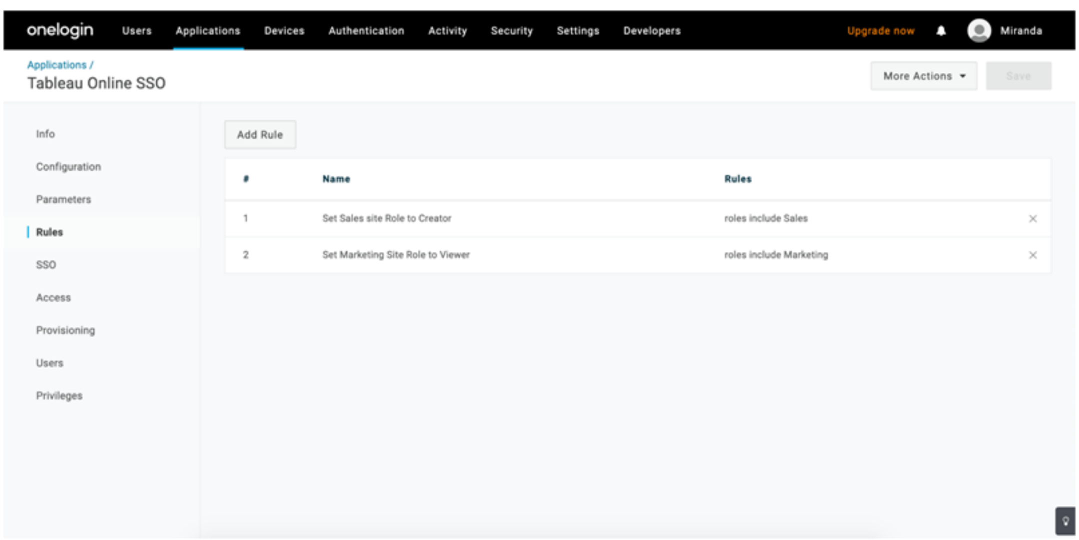
2. On the **Applications** page, assign the role access to the Tableau Cloud application. This should provision the associated users to the application automatically.

3. On the **Users** page, you can add users to a role manually by entering their first and last name, or add a mapping to automatically add users to a role based on specific attributes - such as their Active Directory group, for example.




4. After adding users to roles, we recommend you create rules within the application to assign the appropriate Tableau Cloud site role based on the OneLogin role. For more information, see the OneLogin article Configure Apps.

   In the screenshot below, users with the “Sales” role will be assigned the Creator site role in Tableau Cloud. Likewise, users with the “Marketing” role will be assigned the Viewer site role.

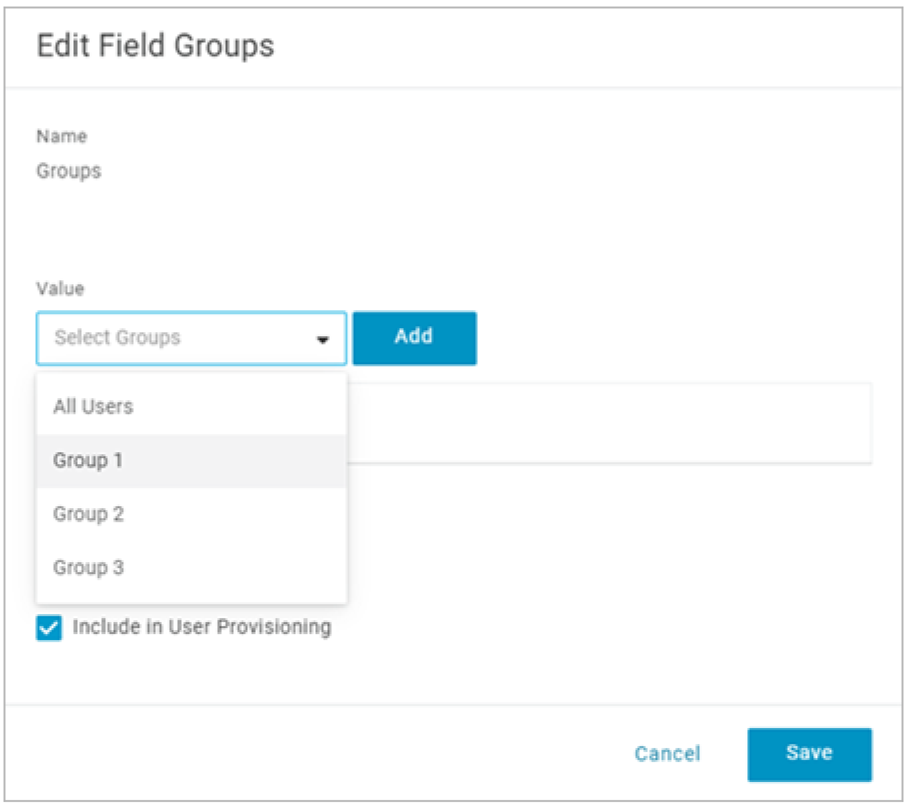


Add users to existing Tableau Cloud groups

Import Tableau Cloud groups into OneLogin and specify the groups you want to be selected by default in the user provisioning dialog.

1. On the **Parameters** page, click **Groups**, and select the **Include in User Provisioning** check box.
2. Go to the **Provisioning** page, and in the **Entitlements** section, click **Refresh**.

   This imports the groups from Tableau Cloud.
3. Go back to the **Parameters** page, and then select the groups that you want to show as selected values in the user provisioning dialog.




4. To change group membership, go to the **Users** page, select a user, and in the **Groups** section, modify the available and selected values.

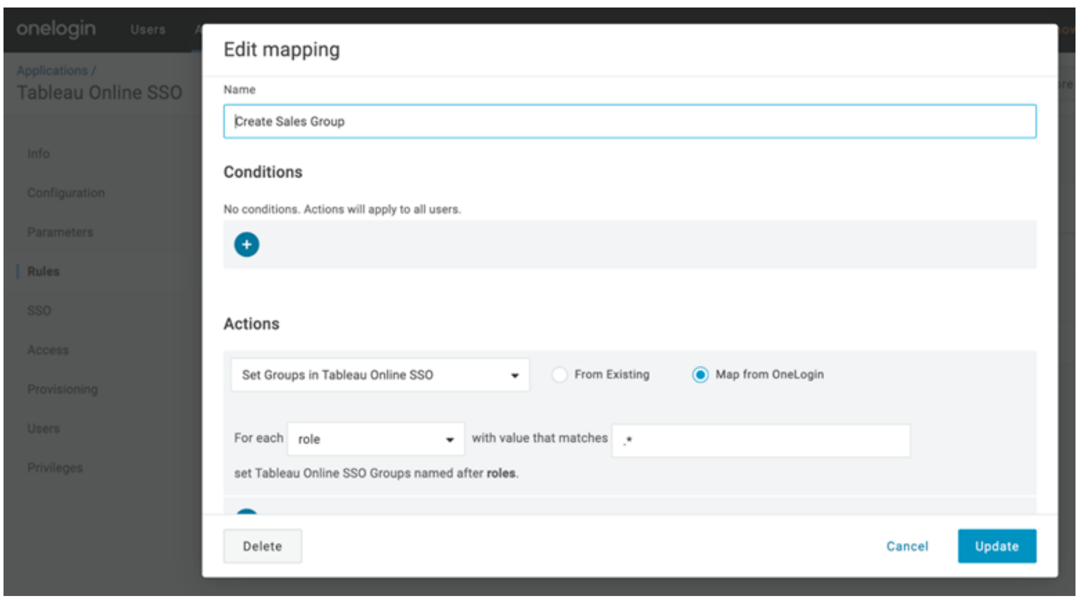
You can also create mappings that put users into groups automatically, based on conditions you define. For more information, see the OneLogin article Mappings.

Create groups in Tableau Cloud from OneLogin

Use the following steps to create Tableau Cloud groups based on attributes in OneLogin mappings. For example, creating a group in Tableau Cloud based on user roles.

1. Go to **Applications**, select the Tableau Cloud application, and then **Rules**.
2. On the **Rules** page, click **Add Rule** to open the edit mapping window.
3. Under **Actions**, select **Set Groups** from the drop-down menu, and then select **Map from OneLogin**.

   The conditions field **with value that matches** uses regular expressions. If you want to create a group in Tableau Cloud that matches the role name in OneLogin, type `.*` in the text field.




Assign Tableau site roles

By default, users are assigned the **Viewer** site role, which occupies a **Viewer** license type.

Whatever method you use in OneLogin to assign site roles, at some point you need to enter the site role name into a text box. For the allowed values you can type, see Valid Tableau site role values below.

**Here are some of the ways you can assign site roles**

For individual users:

1. On the **Users** page, select the user, and then navigate to the **Applications** tab. Select the corresponding Tableau Cloud application.
2. In the user settings, type the site role name in the **Site Role** text box.

For a set of users:

1. On the **Parameters** page, click **Site Role**, and then, for Value, select one of the options for assigning the site role attribute

   For example:

   - If all users have the same site role, select **Macro** and enter the site role name.
   - If the OneLogin user directory contains the site role, select the corresponding attribute.
2. On the **Rules** page, create a rule that maps a role to a particular role in Tableau Cloud.

When you're done assigning the site role, click **Save**.

Valid Tableau site role values

On the **Provisioning** page in your OneLogin portal, the Site Role values you can enter are based on current or legacy license roles.

- **Current license roles** include the following site role values:

  Creator, Explorer, ExplorerCanPublish, ReadOnly, ServerAdministrator, SiteAdministratorExplorer, SiteAdministratorCreator, Unlicensed, or Viewer.

- **Legacy (pre-v2018.1) license types** come with the following site roles:

  Interactor, Publisher, ServerAdministrator, SiteAdministrator, Unlicensed, UnlicensedWithPublish, Viewer, or ViewerWithPublish

To learn the effects of changing user attributes, or how to reset individual user attributes you changed manually, see the OneLogin article Provisioning Attributes: the Effect of Defaults, Rules, and Manual Entry.

Notes and limitations for SCIM support with OneLogin

- You must add a separate Tableau Cloud app for each site you want to manage using SCIM.
- When deprovisioning or removing an existing users from the Tableau Cloud application in OneLogin, the user is converted to an **Unlicensed** site role in Tableau Cloud in case they own any content assets. If the user does own content, you must first reassign ownership of those content assets before you can manually delete the user in Tableau Cloud.
- Use of SCIM with Grant License on Sign In is unsupported and may result in incorrectly provisioned site roles for users or groups.

## Use Tableau Connected Apps for Application Integration

Beginning in early January 2022, Tableau connected apps enable a seamless and secure authentication experience by facilitating an explicit trust relationship between your Tableau Cloud site and external applications where Tableau content is embedded. In June 2022, Tableau connected apps extended its capabilities to support REST API authorization. And as of October 2023, REST API authorization using connected apps is respected by the Tableau Metadata API.

**Note:** Tableau connected apps and Salesforce connected apps are different and offer different functionality. Today, Tableau connected apps are optimized for embedding Tableau views and metrics in external applications and used to authorize access to the Tableau REST API. (In

October 2023, Tableau retired the ability to embed metrics in Tableau Cloud and Tableau Server version 2023.3.).

There are two types of connected apps you can configure: direct trust or OAuth 2.0 trust.

Direct trust

Using *direct trust*, you can:

- Restrict access to which content can be embedded and where that content can be embedded
- Provide users the ability to access embedded content using single sign-on (SSO) without having to integrate with an identity provider (IdP)
- Provide users the ability to authenticate directly from your external application
- Programmatically authorize access to the Tableau REST API and Tableau Metadata API (starting in Tableau Cloud October 2023) on users' behalf using JSON Web Token (JWT)
- Scope Tableau REST API capabilities users or applications can perform
- Enable additional features like:
  - User attribute functions (March 2023)
  - On-demand access (October 2023)
  - Group assertions (June 2024)

For more information about this connected app type, see Configure Connected Apps with Direct Trust.

OAuth 2.0 trust

Using *OAuth 2.0 trust*, you can:

- Restrict access to which content can be embedded and where that content can be embedded

- Provide users the ability to access embedded content using single sign-on (SSO) through your identity provider (IdP)
- Provide access using standard OAuth 2.0 standard protocol
- Programmatically authorize access to Tableau REST API (and the Metadata API starting in Tableau Cloud 2023) on users' behalf
- Scope Tableau REST API capabilities users or applications can perform
- Enable additional features like:
  - User attribute functions (March 2023)
  - On-demand access (October 2023)
  - Group assertions (June 2024)

For more information about this connected app type, see Configure Connected Apps with OAuth 2.0 Trust.

## Configure Connected Apps with Direct Trust

Beginning in early January 2022, Tableau connected apps enable a seamless and secure authentication experience by facilitating an explicit trust relationship between your Tableau Cloud site and external applications.

**Note:** In order for the session token to be valid, the clocks of the external application and the server that hosts the external application must be set to Coordinated Universal Time (UTC). If either clock uses a different standard, the connected app will not be trusted.

### How Tableau connected apps work with direct trust

The trust relationship between your Tableau Cloud site and external application is established and verified through an authentication token in the JSON Web Token (JWT) standard, which uses a shared secret provided by the Tableau connected app and signed by your external application.

Key components of a connected app

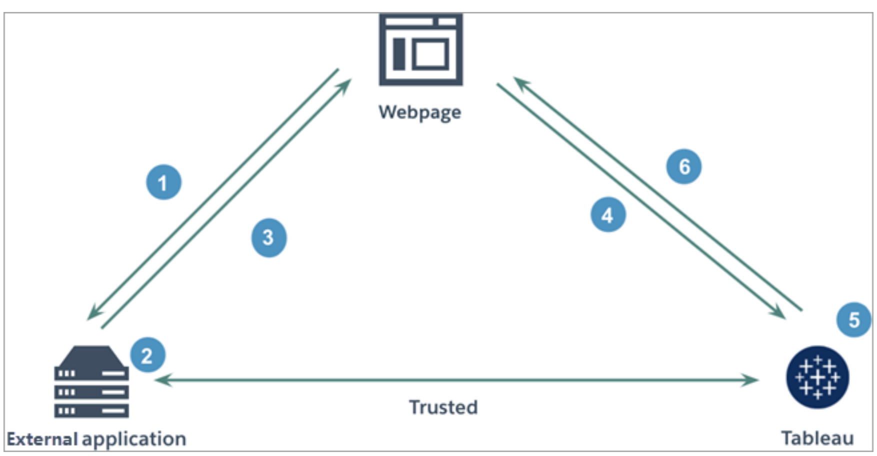
The following components of the connected work together with the JWT in your external application to authenticate users and display embedded content.

- **Secrets:** Secrets are keys shared by Tableau and your external application. They are used in signatures that form the JWT. A secret is required when using connected apps for embedding authentication or REST API authorization. Secrets can be created in a connected app, do not expire, and remain valid until deleted.
- **Domain allowlist (embedding workflows only):** You can specify a list of allowed domains in each connected app. Tableau content embedded through a connected app is only allowed under the specified domains. This helps ensure that content is exposed under the domains that are secured and approved by your business.
- **Access level (embedding workflows only):** You can specify what content can be embedded through a connected app by associating a connected app with one project or all projects. If you specify one project, only the content in the selected project can be embedded through the connected app. If you want to specify multiple projects, you must use the Tableau REST API.

Connected app workflow

## Embedding workflows

The diagram below illustrates how authentication works between your external application (web server and webpage) and Tableau connected app.



1. **User visits the webpage:** When a user visits the embedded content on a webpage, webpage sends a GET request to your external application to retrieve the HTML on that webpage.
2. **External application constructs an authentication token:** The external application constructs a JWT, which contains a secret from the connected app (see Step 3 below for additional JWT requirements) and the scope of user access for the embedded content. The secret is signed by the external application and is used for verification of the trust relationship in a later step.
3. **External application responds with authentication token:** The external application responds to the page with the JWT in the embedded content's URL called by the webpage.
4. **Webpage requests content from Tableau**: With the attempt to load the embedded content, the webpage calls the embedded content's URL, which sends a GET request to Tableau.
5. **Tableau validates the token:** Tableau receives the JWT and verifies the trust relationship with the external application by identifying the connected app and shared secret used in the JWT. Then Tableau creates a session for the user. The session not only respects the embedding scopes defined in the JWT, but also the restrictions specified in the connected app, including the allowed domains and allowed projects.
6. **Tableau returns the content based on the restricted embedding context:** The embedded content only loads when the page is under an allowed domain and the content is published to an allowed project (if applicable). The authenticated user can only interact with the embedded content by the scope defined in the JWT.

Create a connected app

Step 1: Create a connected app

Create a connected app from Tableau Cloud's Settings page.

1. As a site admin, sign in to Tableau Cloud.
2. From the left pane, select **Settings** > **Connected Apps**.
3. Click the New Connected App button drop-down arrow and select **Direct Trust**.

4. In the Create Connected App dialog box, do *one* of following:

   - For *REST API authorization workflows (including Metadata API workflows that use the REST API for authentication)*, in the Connected app name text box, enter a name for the connected app and click the **Create** button.

     **Note:** You can ignore **Access level** and **Domain allowlist** when configuring a connected app for REST API and Metadata API authorization.

   - For *embedding workflows*, do the following:

     i. In the Connected app name text box, enter a name for the connected app.

     ii. From the Applies to drop-down menu, select **All project** or **Only one project** to control which views or metrics can be embedded. If you select the "Only one project" option, select the specific project to scope to. For more information about these two options, see Access level (embedding workflows only).

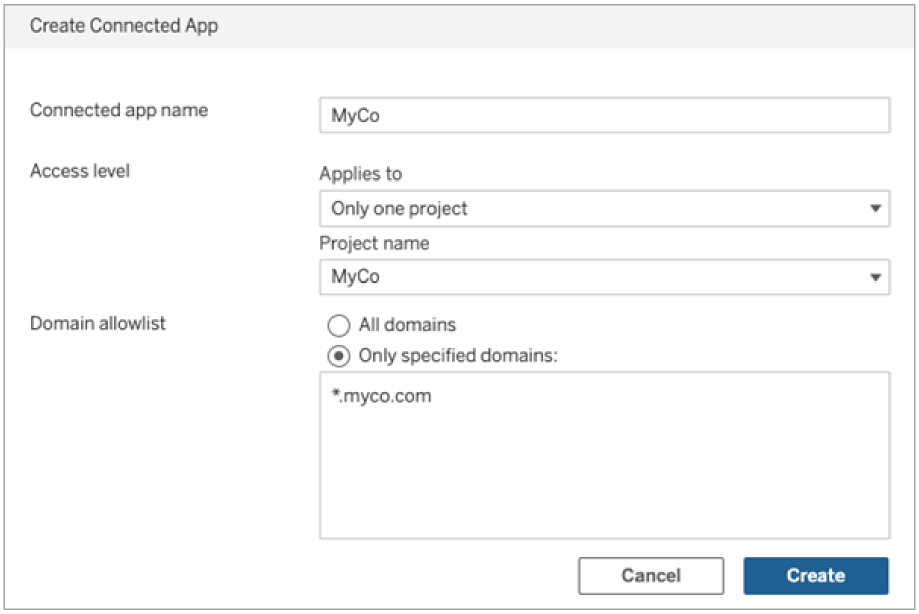
        **Notes:**

        - In October 2023 (Tableau 2023.3), Tableau retired the ability to embed metrics.
        - In February 2024 (Tableau 2024.1), you can specify multiple projects using the Tableau REST API. For more information, see Create Connected App and Update Connected App methods in the REST API Help.

     iii. In the Domain allowlist, specify the domains using the rules described in Domain formatting below to control where views or metrics can be embedded.

        **Important:** We recommend using the domain allowlist as a security best practice to ensure Tableau content is only embedded in locations that you allow.

iv. When finished, click the **Create** button.




5. Next to the connected app's name, click the actions menu and select **Enable**. For security purposes, a connected app is set to disabled by default when created.

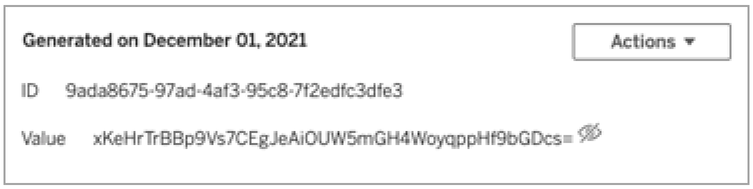

6. Make note of the connected app's ID, also known as the client ID, to use in Step 3 below.

Step 2: Generate a secret

You can generate a total of two secrets for each connected app. The second secret can be used for secret rotation purposes to help protect against issues if a secret is compromised.

1. On the detail page of the connected app you created in Step 1, click the **Generate New Secret** button.

2. Make note of the secret ID and secret value to use in Step 3 below.




Step 3: Configure the JWT

After you've generated a secret, you want to enable your external application to send a valid JWT. JWT is a standard used to securely transfer information between two parties. The JWT is signed by your external application to securely send information to Tableau Cloud. The JWT references the connected app, the user that the session is being generated for, and the level of access the user should have.

A valid JWT includes the following information:

- Connected app ID, also known as the client ID, from Step 1
- Secret ID and secret value generated in Step 2
- Registered claims and header:

| Claim | Name | Description or required value |
|---|---|---|
| `"kid"` | Secret ID | Required (in header). The connected app's secret key identifier. |

| | | |
|---|---|---|
| "iss" | Issuer | Required (in header). Unique issuer URI that identifies the trusted connect app and its signing key. |
| "alg" | Algorithm | Required (in header). JWT signing algorithm. Only HS256 is supported. |
| "sub" | Subject | User name (email address) of the authenticated Tableau Cloud user. |
| "aud" | Audience | Value must be: "tableau". |
| "exp" | Expir-ation Time | A valid JWT must not be expired. The expiration time (in UTC) of the JWT must be within the maximum validity period, which is 10 minutes. |
| "jti" | JWT ID | Required as a claim. The JWT ID claim provides a unique identifier for the JWT and is case sensitive. |
| "scp"<br><br>**Important:** Do not use "scope". | Scope | For *embedding workflows*, supported values include:<br><br>"tableau:views:embed"<br>"tableau:views:embed_authoring"<br>"tableau:metrics:embed" (Retired in October 2023 (Tableau 2023.3))<br>"tableau:ask_ |

| | | |
|---|---|---|
| | | `data:embed`" (Retired in February 2024 (Tableau 2024.1))<br><br>**Notes:**<br><br>• Values must be passed as a list type.<br>• For `tableau-:views:embed` and `tableau-:views:embed_authoring`, the scope respects users' permissions already configured in Tableau Cloud and allows users to interact with the tools in the embedded view if available in the original view.<br>• We recommend the embed code exclude the toolbar parameter. For more information see Known issues (embedding workflows only) below.<br><br>For *REST API authorization workflows*, see REST API methods that support JWT authorization.<br><br>For *Metadata API workflows* |

| | | |
|---|---|---|
| | | *that use the REST API for authentication*, the only supported scope is `tableau:content:read`. |
| `https://tableau.com/oda` | On-demand access - claim (enable capability) | For *embedding workflows* only.<br><br>Value must be "`true`" and one or more Tableau Cloud groups must be specified (see next row). For more information, see the On-demand access (embedding workflows only) section below. |
| `https://tableau.com/groups` | On-demand access - claim (specify group name) | For *embedding workflows* only.<br><br>Value must match the name of one or more groups in Tableau Cloud. For more information, see the On-demand access (embedding workflows only) section below. |
| | | For *embedding workflows* only.<br><br>Value must match the name of one or more groups in Tableau Cloud. For more information, see the Dynamic |

| | | |
|---|---|---|
| | | group membership (embedding workflows only) section below. |
| (User attribute) | (User attribute values) | For *embedding workflows* only.<br><br>You can include user attributes in the JWT. Then when user attribute functions are used in embedded content, Tableau checks the authenticated user's context and determines what data can display at runtime.<br><br>**Notes:**<br><br>• Check the Embedding API v3 Help for *known issues* that might affect your workflow.<br><br>• For the user attribute to work, 1) you must enable the **Control User Access in Authentication Workflows** setting and 2) the content author must create a user attribute function.<br><br>• User attributes are |

| | | |
|---|---|---|
| | | case sensitive. |

## Example JWTs

Here are example JWTs in both Java and Python languages. The Java and Python examples use the nimbus-jose-jwt library and the PyJWT library, respectively.

**Java**

```
import com.nimbusds.jose.*;
import com.nimbusds.jose.crypto.*;
import com.nimbusds.jwt.*;

import java.util.*;

...

String secret = "secretvalue";
        String kid = "connectedAppSecretId";
        String clientId = "connectedAppClientId";
        List<String> scopes = new
ArrayList<>(Arrays.asList("tableau:views:embed"));
        String username = "user@domain.com";
        JWSSigner signer = new MACSigner(secret);
        JWSHeader header = new
JWSHeader.Builder(JWSAlgorithm.HS256).keyID(kid).customParam("iss",
clientId).build();
        JWTClaimsSet claimsSet = new JWTClaimsSet.Builder()
                .issuer(clientId)
                .expirationTime(new Date(new Date().getTime() + 60 * 1000)) //ex-
pires in 1 minute
                .jwtID(UUID.randomUUID().toString())
                .audience("tableau")
                .subject("username")
                .claim("scp", scopes)
                .claim("https://tableau.com/oda", "true")
```

```
                .claim("https://tableau.com/groups", "Contractors", "Team C",
"Group1", "Group2")
                .claim("Region", "East")
                .build();
        SignedJWT signedJWT = new SignedJWT(header, claimsSet);
        signedJWT.sign(signer);
        model.addAttribute("token", signedJWT.serialize());
```

**Python**

```
import jwt

token = jwt.encode(
        {
                "iss": connectedAppClientId,
                "exp": datetime.datetime.utcnow() + datetime.timedelta
(minutes=5),
                "jti": str(uuid.uuid4()),
                "aud": "tableau",
                "sub": user,
                "scp": ["tableau:views:embed", "tableau:metrics:embed"],
                "https://tableau.com/oda":"true",
                "https://tableau.com/groups": ["Contractors", "Team C", "Group1",
"Group2"],
                "Region": "East"
        },
                connectedAppSecretKey,
                algorithm = "HS256",
                headers = {
                'kid': connectedAppSecretId,
                'iss': connectedAppClientId
         }
  )
```

After you've configured the JWT, when the code is run by your external application, it will generate a token.

Step 4: Next steps

## For embedding workflows

After the JWT has been configured, you must add embed code to your external application. Ensure that you include the valid JWT you configured in Step 3 above in the web component that your external application calls.

For more information about embedding Tableau content, see one or both of the following:

- Embed metrics, see Embed Metrics into Webpages topic in the Tableau Help. (In October 2023 (Tableau 2023.3), Tableau retired the ability to embed metrics.)
- Embed Tableau views and metrics using the Tableau Embedding API v3.

**Note:** For users to successfully authenticate when they access embedded content, browsers must be configured to allow third-party cookies.

## For REST API authorization workflows

After the JWT has been configured, you must add the valid JWT to the REST API Sign In request for authorized access. For more information, see Access Scopes for Connected Apps.

## For Metadata API workflows

After the JWT has been configured, you must add the valid JWT to the REST API Sign In request. For more information, see Access Scopes for Connected Apps.

Manage a connected app

The Connected Apps page is where you can manage all the connected apps for your site. You can perform tasks such creating, deleting, and disabling connected apps; and revoking or generating new secrets if existing secrets have been compromised.

1. As a site admin, sign in to Tableau Cloud.

2. From the left pane, select **Settings** > **Connected Apps**.

3. Select the check box next to the connected app you want to manage and do one or more of the following:

    - **Generate a new secret** according to the rotation timeline specified by your organization’s security policies. To generate an additional secret, click on the name of the connected app and then click the **Generate New Secret** button. A connected app can have a maximum of two secrets. Both secrets can be active at the same time, do not expire, and remain valid until deleted.

    - **Review the connected app details** by clicking the name of the connected app to see when the connected app was created, its ID, project and domain scopes, and its secrets.

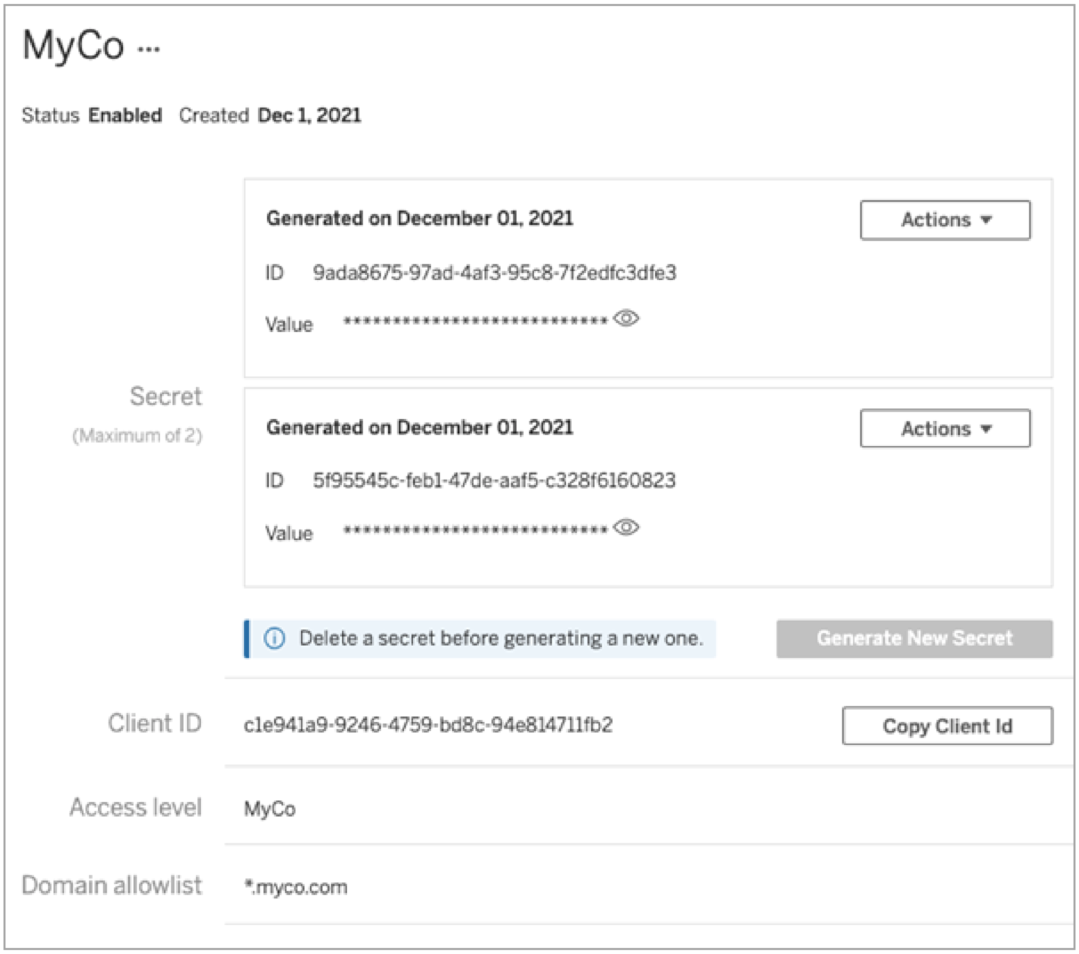
    - **Change the project scope or domain**, in the Actions menu, select **Edit**. Make your changes and click **Update**.

      **Note:** If you change the project or domain scopes and the embedded content doesn’t exist in either the new project or new domain, the embedded view or metric is unable to display and users will see an error when accessing the embedded content.

    - **Delete a secret** by clicking the connected app's name. On the connected app’s page, click **Actions** next to the secret and select **Delete**. In the confirmation dialog box, select **Delete** again.

      **Note:** If the connected app’s secret is being used by an external application, the embedded view or metric is unable to display after the secret is deleted. For more information, see Effects of disabling or deleting a connected app, or deleting a secret below.

    - **Disable a connected app**, in the Actions menu, select **Disable**. If the connected app is being used by an external application, the embedded view or metric is unable to display after the connected app is disabled. For more information, see Effects of disabling or deleting a connected app, or deleting a secret below.




Effects of disabling or deleting a connected app, or deleting a secret

To display embedded content to your user or enable REST API access through a connected app, the connected app must be enabled and its secret generated. If the connect app is being used in your external application and is either disabled or deleted, or its secret deleted or replaced, users will get a 403 error.

To avoid this issue, ensure the connect app is enabled and the JWT is using the correct secret ID and value.

Access level (embedding workflows only)

You can select one of two project types when configuring a connected app's access level. The access level controls which content can be embedded.

- **All projects:** This option enables the content in all projects to be embedded
- **Only one project:** This option enables only the content in the specified project to be embedded. If the specified project contains nested projects, embedding content in those nested projects is not enabled.

**About multiple projects**

Starting in February 2024 (Tableau 2024.1), you can enable the content in multiple projects for a connected app using the Tableau REST API only. To specify which projects, use the "project IDs" in either the Create a Connected App or Update a Connected App methods.

**Note:** When multiple projects are configured for your connected app, Tableau displays **Multiple projects** for the connected app's access level. If you select either **Only one project** or **All projects** and update the connected app, the "Multiple projects" option will no longer be visible. If you need to configure the connected app for multiple projects again, you must use the REST API.

Domain allowlist rules (embedding workflows only)

The connected app’s domain allowlist enables you to restrict access to embedded Tableau content to all domains or some domains; or exclude some domains or block all domains.

**Important:** We recommend using the domain allowlist as a security best practice to ensure Tableau content is only embedded in locations that you allow.

## Domain options

You can select one of two options when configuring a connected app’s domain allowlist:

- **All domains:** As the default option, this option enables unrestricted access to embedded content.

- **Only specific domains:** This option gives you the ability to scope down access to embedded content. If you use this option, follow the formatting rules specified in the following section, Domain formatting.

## Domain formatting

In the domain allowlist text box, you can enter one or more domains using the formatting examples below.

**Note:** Domain formatting rules also apply when using the Connect App methods in the Tableau REST API.

Here are some formatting examples based on common scenarios:

| To specify... | Example | Embedding access |
|---|---|---|
| Range of domains | *.myco.com | Embedded content is accessible from all subdomains under myco.com. |
| All ports | myco.com:* | Embedded content is access from all ports in myco.com. |
| Specific port | myco.com:8080 | Embedded content is accessible from port 8080 in myco.com only. |
| Multiple discrete domains | myco.com<br>events.myco.com<br>ops.myco.com | Embedded content is accessible from all three domains.<br><br>**Note:** When specifying multiple domains, type each domain on a new line or separate domains with a space. For the REST API, domains must be separated by a space. |
| Secure traffic only | https: | Embedded content is securely accessible regardless of domain. |
| Secure traffic to all ports for a range of | https:*myco.com:* | Embedded content is securely accessible from all ports on all subdomains under myco.com. |

| | | |
|---|---|---|
| domains | | |
| No domains | [no domains] | Access to embedded content is blocked. |

On-demand access (embedding workflows only)

Beginning in October 2023, if your site is licensed with Embedded Analytics usage-based model, you can extend access to your embedded Tableau content to more users using on-demand access. With on-demand access, you allow your users to interact with embedded Tableau content authenticated through your connected app without needing to provision those users in your Tableau Cloud site. On-demand access removes the requirement for you to add and manage users in Tableau Cloud to support access to embedded content.

## How on-demand access works

Access to embedded Tableau content using on-demand access is determined by group-level permissions either inherited by (for example, at the project-level) or directly applied to the content. Users like site admins, project owners or leaders, and content owners can assign group-level permissions to content. When users access the embedded content enabled through the on-demand access capability, Tableau validates the JWT contains the correct group membership claims before displaying the content.

## Prerequisites

The following criteria must be true to enable on-demand access for embedded content:

1. Site is licensed with Embedded Analytics usage-based model
2. On-demand access capability is enabled for the group
3. Group permissions are specified for the Tableau content
4. Tableau connected app is created
5. JWT used by the connected app includes the `https://tableau.com/oda` and `https://tableau.com/groups` claims
6. Tableau content is embedded in an external application

When these criteria are met, your users can interact with embedded Tableau content enabled through on-demand access capability.

## Enable on-demand access capability

To enable the on-demand access capability for a group, when creating or editing a group, you must select the **Allow on-demand access** check box. For more information about creating groups, see Create a Group and Add Users to It.

You can also enable this capability using the Tableau REST API. For more information, see the Create Group and Update Group methods in the Tableau REST API Help.

## Capabilities when on-demand access is enabled

Users accessing embedded Tableau content have View capabilities on the content. Users have View capabilities regardless of the selected template or customized capabilities that might be configured for the group (for example, a user with a role of Viewer will never be able to download a data source even if that capability is explicitly granted to them on a specific data source).

## Monitor on-demand access

If you have Tableau Cloud with Advanced Management, you can use Activity Log to monitor on-demand access usage. Events in the Activity Log that capture on-demand access include, but not limited to **access view** and **login**. For more information about these events, see Activity Log Site Event Type Reference.

## Limitations

Because on-demand access workflows enable certain users who access embedded Tableau Content to be anonymous and ephemeral to Tableau Cloud, the following capabilities are not available to users who access embedded content enabled through the on-demand access capability:

- Create custom views
- Share content using the content's share button
- Subscribe to content for email snapshots of information

**Note:** Beginning in February 2024 (Tableau 2024.1), Tableau REST API requests can be made as a user with on-demand access.

Dynamic group membership (embedding workflows only)

Beginning in June 2024 (Tableau 2024.2), if connected apps are configured and the capability's setting is enabled, you can dynamically control group membership through custom claims included in the JWT sent by the external application.

When configured, during user authentication, the external application sends the JWT that contains two custom claims for group membership: group (`https://tableau.com/groups`) and group names (for example, "Group1" and "Group2") to assert the user into. Tableau validates the JWT and then enables access to the groups and the content whose permissions are dependent on those groups.

For more information, see Dynamic group membership using assertions.

Known issues (embedding workflows only)

There are a couple of known issues when using connected apps that will be addressed in a future release.

- **Toolbar features:** When embedded content has the toolbar parameter defined, not all toolbar features will work. To work around this issue, we recommend you hide the toolbar parameter like in the example below.

  ```
  <tableau-viz id='tab-viz' src-
  ='https://online.tableau.com/t/<your_site>/...'
         toolbar='hidden'>
  </tableau-viz>
  ```

- **Published data sources:** Published data sources set to **Prompt User** for database credentials will not display. To work around this issue, if possible, we recommend data source owners embed their database credentials instead.

- **Ask Data objects in embedded dashboards:** Ask Data objects in embedded dashboards will not load. (In February 2024 (Tableau 2024.1), Tableau retired Ask Data.)

- **Metrics and domain allowlists:** Embedded metrics views will display despite access restrictions that might be specified in the connected apps' domain allowlists. **Note:** Metrics data accessed from toolbars of embedded views will work as expected. (In October 2023 (Tableau 2023.3), Tableau retired the ability to embed metrics.)

### Troubleshoot

You can refer to Troubleshoot Connected Apps - Direct Trust for errors that might be associated with the connected app and suggested troubleshooting steps.

## Configure Connected Apps with OAuth 2.0 Trust

As a Tableau Cloud site admin, you can register one or more external authorization servers (EASs) to establish a trust relationship between your Tableau Cloud site and the EAS using the OAuth 2.0 standard protocol.

**Important:**

- Some of the procedures in this topic require configuration with third party software and services. We’ve made a best effort to verify the procedures to enable the EAS feature on Tableau Cloud. However, third-party software and services might change or your organization might differ. If you encounter issues, refer to your third-party documentation for authoritative configuration details and support.
- In order for the session token to be valid, the clocks of the external application and the server that hosts the external application must be set to Coordinated Universal Time (UTC). If either clock uses a different standard, the connected app will not be trusted.

### How Tableau connected apps work with OAuth 2.0 trust

The trust relationship between your Tableau Cloud site and external application is established and verified through an authentication token in the JSON Web Token (JWT) standard.

When embedded Tableau content is loaded in your external application, Authorization Code Flow, OAuth flow is used. After users successfully sign in to the IdP, they are then automatically signed in to Tableau Cloud. Follow the steps described below to register your EAS with  your Tableau Cloud site.

Key components of a connected app

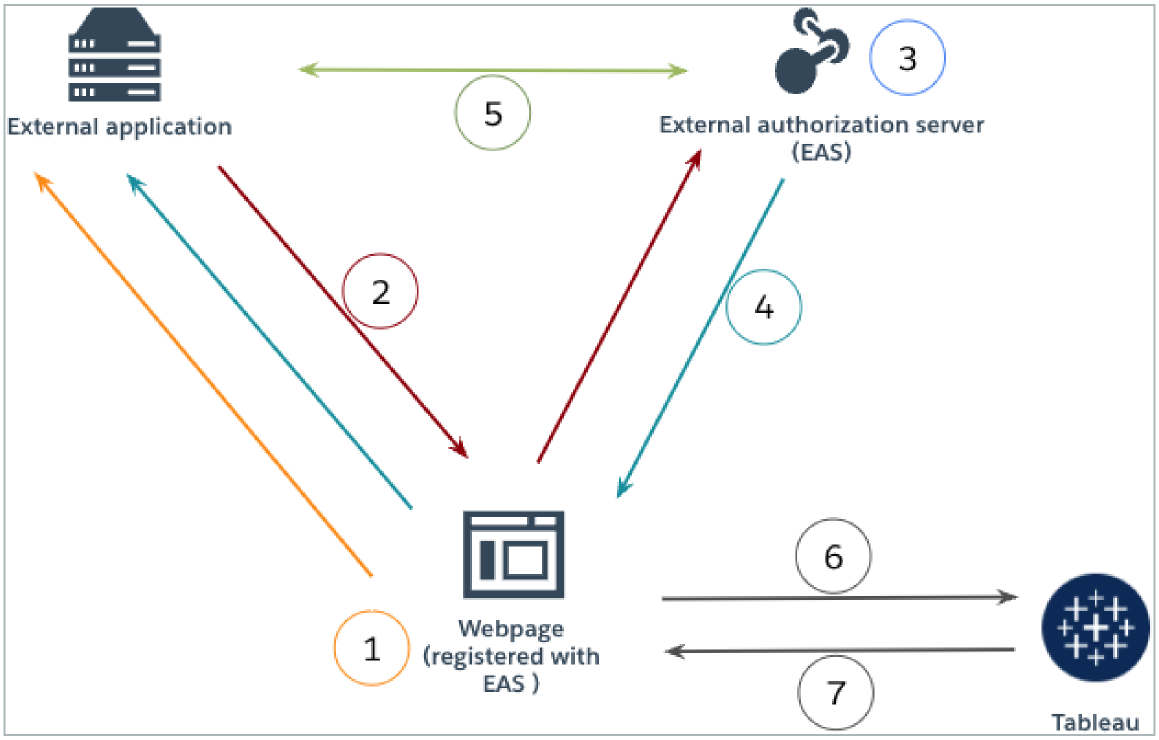
The following components of the connected work together with the JWT in your external application to authenticate users and display embedded content.

- **External authorization server (EAS):** The server, typically your IdP, that functions as the interface between the user and the external application. The server authenticates and authorizes user access to the protected Tableau content.
- **Issuer URL:** The URL that uniquely identifies the EAS instance.

Connected app workflow

## Embedding workflows

The diagram below illustrates how authentication works between your external authorization server (EAS), external application (web server and webpage), and Tableau connected app.




1. **User visits the webpage:** When a user visits the embedded content on a webpage, the webpage sends a GET request to the external application.
2. **External application redirects request to EAS:** External application responds with a webpage that redirects to the external authorization server (EAS).
3. **User authenticates with EAS:** User authenticates and authorizes with the EAS.
4. **EAS responds to webpage with authorization code:** The EAS responds to the page with an authorization code and redirects back to the webpage.
5. **EAS converts authorization code to JWT:** Webpage calls the EAS to convert the authorization code to a JWT, which the webpage puts into the embedded content's URL.
6. **Webpage requests content from Tableau:** Webpage loads the iFrame and sends a GET request to Tableau.

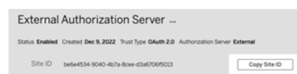
7. **Tableau validates the token:** Tableau validates the JWT in the URL with the signature and responds with the content and respects the embedding scopes defined in the JWT.

Create a connected app

Step 1: Before you begin

To register an EAS with your Tableau Cloud site, you must have an EAS already configured. In addition, the EAS must send a valid JSON Web Token (JWT) that contains the registered claims and header listed in the table below.

| Claim | Name | Description or required value |
|---|---|---|
| `"kid"` | Key ID | Required (in header). A unique key identifier from the identity provider. |
| `"iss"` | Issuer | Required (in header or as a claim). Unique issuer URI, in HTTPS, that identifies the trusted connect app and its signing key. |
| `"alg"` | Algorithm | Required (in header). JWT signing algorithm. Supported algorithm names are listed in the Class JWSAlgorithm page in the javadoc.io documentation. |
| `"sub"` | Subject | User name (email address) of the authenticated Tableau Cloud user. |
| `"aud"` | Audience | Value must be: `"tableau:<site_luid>"` |

| | | |
|---|---|---|
| | | To obtain the site LUID, you can use the Tableau REST API's Sign In method or follow the steps below to copy the site ID. **Note:** You must register an EAS using the procedure described here before you can copy the site ID.<br>1. Select **Settings** > **Connected Apps** and then select the **External Authorization Server** connected app.<br>2. Click the **Copy Site ID** button.<br> |
| `"exp"` | Expiration Time | A valid JWT must not be expired. The expiration time (in UTC) of the JWT must be within the maximum validity period, which is 10 minutes. |
| `"jti"` | JWT ID | The JWT ID claim provides a unique identifier for the JWT and is case sensitive. |
| `"scp"` | Scope | For *embedding workflows*, supported values include:<br>`"tableau:views:embed"` |

| | | |
|---|---|---|
| | | "`tableau:views:embed_authoring`"<br>"`tableau:metrics:embed`" (Retired in October 2023 (Tableau 2023.3))<br>"`tableau:ask_data:embed`"(Retired in February 2024 (Tableau 2024.1))<br><br>**Notes:**<br><br>• Values must be passed as a list type.<br>• For `tableau-:views:embed`, the scope respects users' permissions already configured in Tableau Cloud and allows users to interact with the tools in the embedded view if available in the original view.<br>• We recommend the embed code exclude the toolbar parameter. For more information see Known issues (embedding workflows only) below.<br><br>For *REST API authorization workflows*, see REST API methods that support |

| | | |
|---|---|---|
| | | JWT authorization.<br><br>For *Metadata API workflows that use the REST API for authentication*, the only supported scope is `tableau:content:read`. |
| `https://tableau.com/oda` | On-demand access - claim (enable capability) | For *embedding workflows* only.<br><br>Value must be "`true`" and one or more Tableau Cloud groups must be specified (see next row). For more information, see the On-demand access (embedding workflows only) section below. |
| `https://tableau.com/groups` | On-demand access - claim (specify group name) | For *embedding workflows* only.<br><br>Value must match the name of one or more groups in Tableau Cloud. For more information, see the On-demand access (embedding workflows only) section below. |
| | Dynamic group membership | For *embedding workflows* only.<br><br>Value must match the name of one or more groups in Tableau Cloud. For more information, |

| | | |
|---|---|---|
| | | see the Dynamic group membership (embedding workflows only) section below. |
| (User attributes) | (User attribute values) | For *embedding workflows* only.<br><br>You can include user attributes in the JWT. Then when user attribute functions are used in embedded content, Tableau checks the authenticated user's context and determines what data can display at runtime.<br><br>**Notes:**<br><br>• Check the Embedding API v3 Help for *known issues* that might affect your workflow.<br>• For the user attribute to work, 1) you must enable the **Control User Access in Authentication Workflows** setting and 2) the content author must create a user attribute function.<br>• User attributes are case sensitive. |

**Note:** The JWT claims above are documented in the Registered Claim Names section in the documentation distributed by the Internet Engineering Task Force (IETF) organization.

Step 2: Register your EAS with Tableau Cloud

By registering your EAS with Tableau Cloud, you establish a trust relationship between the EAS and your Tableau Cloud site. This means when users access Tableau content embedded in your external application, they are redirected to authenticate with the IdP. The EAS generates the authentication token, which is passed to Tableau Cloud for verification. After the trust relationship is verified, access to the embedded content is granted users.

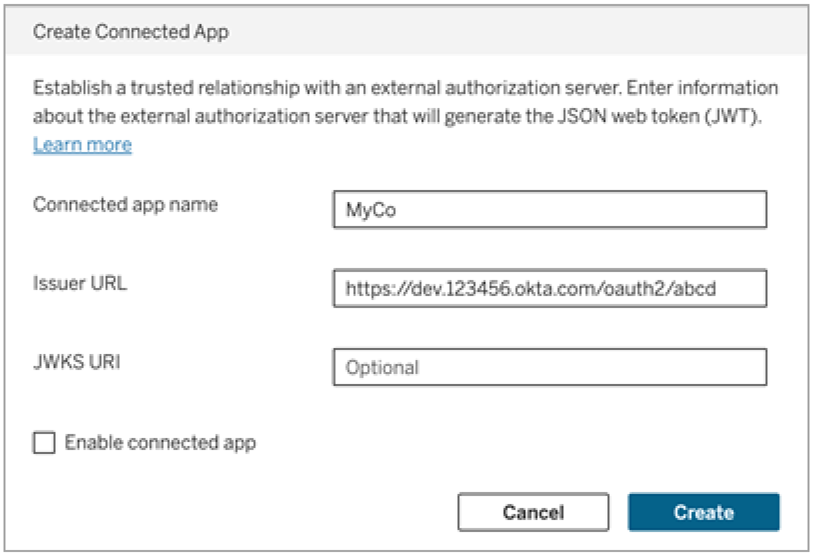
**Note:** Some EAS support the option to display a consent dialog that asks for users' approval for the application to access Tableau content. To ensure the best experience for your users, we recommend you configure your EAS to automatically consent to the external application's request on users' behalf.

## About site-level EAS

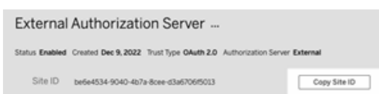
Beginning in Tableau Server 2024.2, you can configure site-level EAS. To register an EAS at the site-level, connected apps must be enabled in Tableau Server Manager (TSM).

1. As a site admin, sign in to Tableau Cloud.
2. From the left pane, select **Settings** > **Connected Apps**.
3. Click the New Connected App button drop-down arrow and select **OAuth 2.0 Trust**.
4. In the Create Connected App dialog box, do the following:
    a. In the **Name** text box, enter a name for the connected app.
    b. In the **Issuer URL** text box, paste the issuer URL of the EAS.
    c. Select the **Enable connected app**. For security purposes, a connected app is set to disabled by default when created.

d. When finished, click the **Create** button.




5. After the connected app is created, copy the connected app's site ID. The site ID is used for the JWT's "aud" (Audience) claim described in Step 1 above.




Step 3: Next steps

## For embedding workflows

After configuring your Tableau Cloud site to use your EAS, you must add embed code to your external application. Ensure that you include the valid JWT generated by your EAS, as described in Step 1, in the web component that your external application calls.

For more information about embedding Tableau content, see one or both of the following:

- Embed metrics, see Embed Metrics into Webpages topic in the Tableau Help. (In October 2023 (Tableau 2023.3), Tableau retired the ability to embed metrics.)
- Embed Tableau views and metrics using the Tableau Embedding API v3.

**Note:** For users to successfully authenticate when they access embedded content, browsers must be configured to allow third-party cookies.

Control where content can be embedded using domain allowlist for embedding

Starting in June 2023 (Tableau 2023.2), you and your users can control whether Tableau content can be embedded without restriction or restricted to certain domains using the Update Embedding Settings for Site method in Tableau REST API.

By default, the `unrestrictedEmbedding` site setting for embedding is set to `true` to allow unrestricted embedding. Alternatively, you and your users can set the setting to `false` and specify the domains where Tableau content in external applications can be embedded using the `allowList` parameter.

For more information, see one or both of the following:

- Update Embedding Settings for Site in the Tableau REST API Help
- Tableau Site Setting for Embedding in the Tableau Embedding API v3 Help.

## For REST API authorization workflows

After the JWT has been configured, you must add the valid JWT to the REST API Sign In request for authorized access. For more information, see Access Scopes for Connected Apps.

## For Metadata API workflows

After the JWT has been configured, you must add the valid JWT to the REST API Sign In request. For more information, see Access Scopes for Connected Apps.

Manage a connected app

On-demand access (embedding workflows only)

Beginning in October 2023, if your site is licensed with Embedded Analytics usage-based model, you can extend access to your embedded Tableau content to more users using on-demand access. With on-demand access, you allow your users to interact with embedded Tableau content authenticated through your connected app without needing to provision those users in your Tableau Cloud site. On-demand access removes the requirement for you to add and manage users in Tableau Cloud to support access to embedded content.

## How on-demand access works

Access to embedded Tableau content using on-demand access is determined by group-level permissions either inherited by (for example, at the project-level) or directly applied to the content. Users like site admins, project owners or leaders, and content owners can assign group-level permissions to content. When users access the embedded content enabled through the on-demand access capability, Tableau validates the JWT contains the correct group membership claims before displaying the content.

## Prerequisites

The following criteria must be true to enable on-demand access for embedded content:

1. Site is licensed with Embedded Analytics usage-based model
2. On-demand access capability is enabled for the group
3. Group permissions are specified for the Tableau content
4. Tableau connected app is created
5. JWT used by the connected app includes the `https://tableau.com/oda` and `https://tableau.com/groups` claims
6. Tableau content is embedded in an external application

When these criteria are met, your users can interact with embedded Tableau content enabled through on-demand access capability.

## Enable on-demand access capability

To enable the on-demand access capability for a group, when creating or editing a group, you must select the **Allow on-demand access** check box. For more information about creating groups, see Create a Group and Add Users to It.

You can also enable this capability using the Tableau REST API. For more information, see the Create Group and Update Group methods in the Tableau REST API Help.

## Capabilities when on-demand access is enabled

Users accessing embedded Tableau content have View capabilities on the content. Users have View capabilities regardless of the selected template or customized capabilities that might be configured for the group (for example, a user with a role of Viewer will never be able to download a data source even if that capability is explicitly granted to them on a specific data source).

## Monitor on-demand access

If you have Tableau Cloud with Advanced Management, you can use Activity Log to monitor on-demand access usage. Events in the Activity Log that capture on-demand access include, but not limited to **access view** and **login**. For more information about these events, see Activity Log Site Event Type Reference.

## Limitations

Because on-demand access workflows enable certain users who access embedded Tableau Content to be anonymous and ephemeral to Tableau Cloud, the following capabilities are not available to users who access embedded content enabled through the on-demand access capability:

- Create custom views
- Share content using the content's share button
- Subscribe to content for email snapshots of information

**Note:** Beginning in February 2024 (Tableau 2024.1), Tableau REST API requests can be made as a user with on-demand access.

Dynamic group membership (embedding workflows only)

Beginning in June 2024 (Tableau 2024.2), if connected apps are configured and the capability’s setting is enabled, you can dynamically control group membership through custom claims included in the JWT sent by the external application.

When configured, during user authentication, the external application sends the JWT that contains two custom claims for group membership: group (`https://tableau.com/groups`) and group names (for example, "Group1" and "Group2") to assert the user into. Tableau validates the JWT and then enables access to the groups and the content whose permissions are dependent on those groups.

For more information, see Dynamic group membership using assertions.

Known issues (embedding workflows only)

There are a couple of known issues when using connected apps that will be addressed in a future release.

- **Toolbar features:** When embedded content has the toolbar parameter defined, not all toolbar features will work. To work around this issue, we recommend you hide the toolbar parameter like in the example below.

```
<tableau-viz id='tab-viz' src-
='https://online.tableau.com/t/<your_site>/...'
       toolbar='hidden'>
</tableau-viz>
```

- **Published data sources:** Published data sources set to **Prompt User** for database credentials will not display. To work around this issue, if possible, we recommend data source owners embed their database credentials instead.

Troubleshoot

When embedded content fails to display in your external application or Tableau REST API authorization fails, you can use a browser's developer tools to inspect and identify error codes that might be associated with the EAS feature enabled on your Tableau Cloud site.

Refer to the table below to review the description of the error code and potential resolution.

| Error code | Summary | Description | Potential resolution or explanation |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 5 | SYSTEM_USER_ NOT_FOUND | Tableau user could not be found | To resolve this issue, verify the '`sub`' (Subject) claim value in the JWT is the user name (email address) of the authenticated Tableau Cloud user. This value is case sensitive. |
| 16 | LOGIN_FAILED | Login failed | This error is typically caused by one of the following claim issues in the JWT:<br>• The '`exp`' (Expiration Time) exceeds the default maximum validity period. To resolve this issue, review registered claims required for a valid JWT and ensure the correct value does not exceed 10 minutes.<br>• The '`sub`' (Subject) is calling an unknown user. To resolve this issue, verify the '`sub`' value is the user name (email address) of the authenticated Tableau Cloud user. |
| 67 | FEATURE_NOT_ ENABLED | On-demand access is not supported | On-demand access is available through licensed Tableau Cloud sites only. |
| 142 | EXTERNAL_ AUTHORIZATION_ | EAS not found | To resolve this issue, verify the correct issuer is being |

| | | | |
|---|---|---|---|
| | SERVER_NOT_ FOUND | | called. |
| 143 | EXTERNAL_ AUTHORIZATION_ SERVER_LIMIT_ EXCEEDED | EAS limit exceeded | The site has reached the maximum allowable number (1) of registered external authorization servers (EAS). |
| 144 | INVALID_ISSUER_ URL | Invalid issuer URL | The issuer URL is not valid or the '`iss`' (Issuer) attribute is missing from the JWT. |
| 149 | EAS_INVALID_ JWKS_URI | Missing JWKS URI | JWKS URI does not exist in the IdP metadata or the JWKS URI is not configured in Tableau. To resolve this issue, configure a valid JWKS URI. |
| 150 | EAS_RETRIEVE_ JWK_SOURCE_ FAILED | Failure in retrieving key-source | To resolve this issue, verify the JWKS URI is configured correctly. |
| 151 | EAS_RETRIEVE_ METADATA_ FAILED | Failure in retrieving metadata from issuerUrl | To resolve this issue, verify the JWKS URI is configured correctly. |
| 10081 | COULD_NOT_ RETRIEVE_IDP_ METADATA | Missing EAS metadata endpoint | To resolve this issue, verify the EAS is configured correctly and the correct issuer is being called. |
| 10082 | AUTHORIZATION_ SERVER_ISSUER_ NOT_SPECIFIED | Missing issuer | To resolve this issue, verify the correct issuer is being called. |
| 10083 | BAD_JWT | JWT header contains issues | The '`kid`' (Secret ID) or '`clientId`' (Issuer) claims are |

| | | | |
|---|---|---|---|
| | | | missing from the JWT header. To resolve this issue, ensure this information is included. |
| 10084 | JWT_PARSE_ERROR | JWT contains issues | To resolve this issue, verify the following:<br>• The '`aud`' (Audience) value referenced in the JWT uses the "tableau" value. This value is case sensitive.<br>• The '`aud`' (Audience) and '`sub`' (Subject) are included in the JWT. |
| 10085 | COULD_NOT_FETCH_JWT_KEYS | JWT could not find keys | Could not find the secret.<br><br>To resolve this issue, verify the correct issuer is being called. |
| 10087 | BLOCKLISTED_JWS_ALGORITHM_USED_TO_SIGN | Issue with the JWT signing algorithm | To resolve the issue, you can remove the signing algorithm. |
| 10088 | RSA_KEY_SIZE_INVALID | Issue with JWT signing requirements | To resolve this issue, verify with the EAS or IdP the JWT is being signed with an RSA key size of 2048. |
| 10091 | JTI_ALREADY_USED | Unique JWT required | The JWT has already been used in the authentication process. To resolve this issue, the EAS or IdP must generate a new JWT. |

| | | | |
|---|---|---|---|
| 10092 | NOT_IN_DOMAIN_ALLOW_LIST | Domain of the embedded content is not specified | To resolve this issue, ensure the `unrestrictedEmbedding` setting is set to `true` or `domainAllowlist` parameter includes the domains where Tableau content is embedded using the Update Embedding Settings for Site method in the Tableau REST API. |
| 10094 | MISSING_REQUIRED_JTI | Missing JWT ID | To resolve this issue, verify the '`jti`' (JWT ID) is included in the JWT. |
| 10095 | EXTERNAL_AUTHZ_SERVER_DISABLED | EAS disabled | The connected app for the EAS registered to the site is disabled. |
| 10096 | JWT_EXPIRATION_EXCEEDS_CONFIGURED_EXPIRATION_PERIOD | | The '`exp`' (Expiration Time) exceeds the default maximum validity period. To resolve this issue, review registered claims required for a valid JWT and ensure the correct value does not exceed 10 minutes. |
| 10097 | SCOPES_MALFORMED | Issues with scopes claim | This error can occur when the '`scp`' (Scope) claim is either missing from the JWT or not passed as a list type. To resolve this issue, verify '`scp`' is included in the JWT and passed as a list type. For troubleshooting help with a JWT, see Debugger on the |

| | | | |
|---|---|---|---|
| | | | auth0 site. |
| 10098 | JWT_UNSIGNED_OR_ENCRYPTED | JWT is unsigned or encrypted | Tableau does not support an unsigned or encrypted JWT. |
| 10099 | SCOPES_MISSING_IN_JWT | Missing scopes claim | The JWT is missing the required '`scp`' (Scope) claim. To resolve this issue, verify '`scp`' is included in the JWT. For troubleshooting help with a JWT, see Debugger on the auth0 site. |
| 10100 | JTI_PERSISTENCE_FAILED | Unexpected JWT ID error | There was an unexpected error with the '`jti`' (JWT ID). To resolve this issue, a new JWT with a new '`jti`' must be generated. |
| 10101 | EPHEMERAL_USER_LOGIN_FAILED_SITE_NOT_UBP_ENABLED | On-demand access is not supported | The site is not licensed with the Embedded Analytics usage-based model that is required to enable on-demand access. For more information, see Understanding License Models. |
| 10102 | EPHEMERAL_USER_NOT_SUPPORTED | On-demand access is not supported when iframe-auth attribute is enabled | This error can occur when the iframe-auth attribute is enabled. To resolve this issue, verify that the Tableau Embedding API version 3.6 or later is being used. |
| 10103 | JWT_MAX_SIZE_EXCEEDED | JWT exceeds maximum size | This error can occur when JWT size exceeds 8000 bytes. To resolve this issue, |

| | | | |
|---|---|---|---|
| | | | make sure that only the necessary claims are being passed to Tableau Cloud. |

## Access Scopes for Connected Apps

Beginning in June 2022, using Tableau connected apps, you can programmatically call and access the Tableau REST API through your custom application on behalf of Tableau Cloud users. Access to the REST API is enabled by a JSON Web Token (JWT) defined as part of the initial Sign In request. The JWT must contain scopes that define the REST API methods that are available to your custom application and its users through the connected app.

Authorize access to the REST API using connected apps to:

- Enhance efficiency—using a JWT as a bearer token enables a simplified impersonation with one request to the Sign In endpoint instead of two requests
- Extend and automate complex Tableau integrations and backend queries—such as dynamic content retrieval and advanced filtering

### Scope actions

Connected apps use scopes that grant access to content or administrative actions through the REST API methods that support JWT authorization (below). A scope is a colon-separated string that starts with the namespace `tableau`, followed by the Tableau resource that access is being granted to, such as `datasources`, and ends with the action that is allowed on the resource, such as `update`.

The action a scope can take include:

- `create`
- `read`
- `run`
- `update`
- `download`
- `delete`

For example, a scope that allows your custom application to call the Update Data Source method looks like:

```
tableau:datasources:update
```

Scope types

The type of scope you use depends on the content or administrative action that you want to enable. Scopes generally fall into one of the following types: content read, individual, wildcard, and cross-category.

- **Content read scope:** The content read scope, `tableau:content:read`, enables supported GET methods for Tableau content. When you use this scope, you enable actions across REST API categories. More specifically, using this scope you enable GET methods for data sources, metrics, views, workbooks, projects, and sites. Starting in Tableau Cloud October 2023, you also specify this scope in a JWT that will be used to create a credentials token for use with the Metadata API.

  **Note:** To enable GET methods for administrative actions, like users and groups, you can use their individual scopes.

- Individual scopes: To enable supported content and administrative actions, you can use their individual scopes. An individual scope is generally associated with a single method and REST API category.

  Examples:

  - To enable publish or update a data source action, you can use the individual `tableau:datasources:create` or `tableau:datasources:update` scope, respectively.
  - For administrative actions like add or remove users, you can use the individual `tableau:users:create` or `tableau:users:delete` scope, respectively.

  **Note:** There are some individual scopes that can enable actions across REST API categories. For example, `tableau:views:download` enables actions in the view data and workbooks REST API categories.

- Wildcard (*) scopes: For certain scopes, you can replace the action with the wildcard character (*) to enable supported actions within a specific REST API category.

  Examples:

  - You can use the `tableau:projects:*` wildcard scope to enable the create, delete, update actions in the projects REST API category.
  - You can use the `tableau:users:*` wildcard scope to enable the get/list, add, delete, update actions in the users REST API category.
  - You can use the `tableau:tasks:*` wildcard scope to enable the get/list, add, delete, update and run actions of extract and subscriptions REST API categories. In addition, this scope enables update data source (if an extract) and update workbook.

- Cross-category scopes: In addition to the content read scope, there are a few additional scopes that, if used, enable supported actions across different REST API categories.

  Examples:

  - If using the `tableau:tasks:run` scope, you enable actions in the data sources and workbooks REST API categories.
  - Again, if using the `tableau:views:download` scope, you enable actions in the view data and workbook REST API categories.
  - If using permissions scopes like `tableau:permissions:update` or `tableau:permissions:delete`, you enable actions in the data sources, workbooks, and projects REST API categories.

Summary of how to authorize REST API access

The following list summarizes the steps to request access to the REST API through a JWT:

1. **Create a connected app** using one of the following methods:
   - Configure Connected Apps with Direct Trust
   - Configure Connected Apps with OAuth 2.0 Trust
2. **Generate a valid JWT**—at runtime your custom application will generate a valid JWT, configured with the scopes you have included
3. **Make a Sign In request**—your custom application will make a Sign In request using the JWT to return a Tableau credentials token and site ID (LUID)

4. **Use the Tableau access token in subsequent requests**—in subsequent REST API calls, use 1) the Tableau credentials token as the `X-Tableau-Auth` header value and 2) the site ID (LUID) in the request URI

Example

For example, suppose you create a connected app using direct trust. Using direct trust, your custom application that calls the REST API generates a valid JWT using the client ID and client secret generated by the connected app.

**Scopes in the JWT**

To successfully authorize access to the REST API, the JWT must also contain the scopes that define the REST API capabilities. For example, to enable various data source-related methods, you might include the following scopes in the JWT:

```
"tableau-
:con-
tent:read","t-
ableau-
:data-
sources:cre-
ate","t-
ableau-
:data-
sources:update","tableau:datasources:download","tableau:tasks:run"
```

Or

```
"tableau:content:read","tableau:datasources:*","tableau:tasks:run"
```

**Note:** Scope values must be passed as a list type.

**Sign In Request URI**

To make a call to the REST API, your custom application must first make a Sign In request to generate a Tableau credentials token.

```
POST https://us-west-2b.online.tableau.com/api/3.16/auth/signin
```

**Request body**

To authorize REST API access using a JWT, the Sign In request body must contain the valid JWT like the example below.

```
<tsRequest>
   <credentials jwt-
="eyJ-
pc3MiOiI4ZTFiNzE3Mi0zOWMzLTRhMzItODg3ZS1mYzJiNDExOWY1NmQiLCJh-
bGciOiJIUzI1NiIsImt-
pZCI6ImIwMTE1YmY5LTNhNGItNGM5MS1iMDA5LWNmMGMxNzBiMWE1NiJ9.eyJh-
dWQiOiJ0YWJsZWF1Ii-
wic3ViI-
joicm1vaGFuQHRhYmxlYXUuY29tIi-
wic2NwIjp-
bInRhYmxlYXU6c2l0ZXM6cmVhZCJdLCJp-
c3MiOiI4ZTFiNzE3Mi0zOWMzLTRhMzItODg3ZS1mYzJiNDExOWY1NmQiLCJleHAiOjE-
2NDg2Njg0Mzk-
sIm-
p0aSI6IjY1ZWFmMmYxLTNmZTgtNDc5Ny1hZmRiLTMyODMzZDVmZGJkYSJ9.mUv2o4gt-
BTrMVLEXY5XTpzDQTGvfE2LGi-3O2vdGfT8">
    <site contentUrl="mycodotcom"/>
   </credentials>
</tsRequest>
```

**Response body**

The Sign In request produces the following response body, which includes the Tableau credentials token.

```
<tsResponse>
   <credentials token="12ab34cd56ef78ab90cd12ef34ab56cd">
    <site id="9a8b7c6d5-e4f3-a2b1-c0d9-e8f7a6b5c4d" contentUrl=""/>
    <user id="9f9e9d9c-8b8a-8f8e-7d7c-7b7a6f6d6e6d" />
   </credentials>
</tsResponse>
```

After the Tableau access token is generated, add the Tableau credentials token to the header of all subsequent REST API requests.

**Header**

`X-Tableau-Auth:12ab34cd56ef78ab90cd12ef34ab56cd`

All subsequent REST API requests using the Tableau access token are then bounded by the scopes in the JWT.

REST API methods that support JWT authorization

The following scopes can be associated with the connected app to define access and methods your custom application can have to the REST API on users' behalf.

**Notes:**

- For other REST API capabilities not listed in the table below, you can use other authorization mechanisms to access the methods. For more information, see Authentication Methods in the Tableau REST API Help.
- Both the Sign In and Sign Out methods are supported by JWT authorization but do not require scopes to use beginning in  June 2023 (Tableau 2023.2).
- For scopes supported by the Embedding API v3, see one of the following:
  - Configure Connected Apps with Direct Trust
  - Configure Connected Apps with OAuth 2.0 Trust

Wildcard (*) scopes

Wildcard scopes use the wildcard character (*) instead of a specific action, to enable multiple supported actions within a specific REST API category. These include:

| Scope | Methods enabled |
|---|---|
| `tableau:datasources:*` | Enables create, update, and update connection data source methods. |
| `tableau:metrics:*` | Enables query, update, and delete metrics actions. |
| `tableau:workbooks:*` | Enables publish, update, download, and preview |

| Scope | Methods enabled |
| --- | --- |
| | image workbook actions. |
| `tableau:groups:*` | Enables create, query, update, and delete groups actions. |
| `tableau:projects:*` | Enables create, delete, and update projects methods. |
| `tableau:users:*` | Enables get/list, add, delete, and update users methods. |
| `tableau:tasks:*`<br><br>**Note:** This scope is also cross-category. | Enables get/list, add, delete, update and run methods for extracts and subscription tasks.<br><br>Enables update methods for data sources for workbooks. |

Cross-category scopes

Cross-category scopes enable multiple supported actions across multiple REST API categories. These include:

| Scope | Methods enabled |
| --- | --- |
| `tableau:content:read` | Enables read/list methods for Tableau content, including data sources, metrics, views, workbooks, projects, and sites. |
| `tableau:tasks:run` | Enables run methods for data sources, workbooks, and extracts. |
| `tableau:views:download` | Enables download methods for view data and workbooks. |
| `tableau:tasks:*`<br><br>**Note:** This scope is also wildcard. | Enables get/list, add, delete, update and run methods for extracts and subscription tasks.<br><br>Enables update methods for data sources for workbooks. |

Individual scopes

| Method | Scope | Description |
|---|---|---|
| (Methods without scopes) | (None) | When no scopes are defined in the JWT, access to the REST API is denied. |
| Sign in | (No scope needed) | Signs you in as a user on Tableau Cloud. |
| Sign out | (No scope needed) | Signs you out of the current session. |
| (Content read scope) | `tableau:content:read` | Enables read/list actions for Tableau content: data sources, metrics, views, workbooks, and projects. |
| Labels | | |
| Delete Label | `tableau:labels:delete` | Deletes a data label by its LUID. |
| Delete Labels | `tableau:labels:delete` | Deletes the data labels on one or more assets. |

| Method | Scope | Description |
| --- | --- | --- |
| Get Label | `tableau:labels:read` | Gets a data label by its LUID. |
| Get Labels | `tableau:labels:read` | Displays information about the data labels on one or more assets. |
| Update Label | `tableau:labels:update` | Updates a label by its LUID. |
| Update Labels | `tableau:labels:update` | Creates or updates labels on one or more assets. |
| Data sources | | |
| (All `tableau-:datasources:` meth-ods) | `tableau:datasources:*` | Enables cre-ate data source, update data source, and update data source con-nection meth-ods. |
| Publish data source | `tableau:datasources:create` | Publish a data source to a site or append |

| Method | Scope | Description |
|---|---|---|
| | | data to an existing published data source. |
| Query data source | `tableau:content:read` | Get information about a published data source. |
| Query data sources | `tableau:content:read` | Get information about all published data source on a site. |
| Query data source connections | `tableau:content:read` | Get server address, port, user name, or password information about a published data source. |
| Update data source | `tableau:datasources:update` | Update owner, project or certification status of the data source. |
| Update data source connection | `tableau:datasources:update` | Update server address, port, user name, or password of the data |

| Method | Scope | Description |
|---|---|---|
| | | source connection. |
| Update data source now | `tableau:tasks:run` | Run extract refresh. |
| Pulse | | |
| Create metric definition | `tableau:insight_definitions:create` | Creates a metric definition. |
| List metric definitions | `tableau:insight_definitions_metrics:read` | Lists the metric definitions configured for a site or, optionally, the details and definition for a specific metric. |
| Delete metric definition | `tableau:insight_definitions:delete` | Deletes a metric definition. |
| Get metric definition | `tableau:insight_definitions_metrics:read` | Gets a metric definition and optionally metrics it contains. |
| Update metric definition | `tableau:insight_definitions:update` | Updates a metric definition. |
| List metrics in definition | `tableau:insight_definitions_metrics:read` | Lists the metrics contained in a metric |

| Method | Scope | Description |
|---|---|---|
| | | definition |
| Batch list metric definitions | `tableau:insight_definitions_metrics:read` | Gets a batch of metric definitions and metrics available on a site. |
| Generate current metric value insight bundle | `tableau:insights:read` | Generates an bundle with the current aggregated value of the metric. |
| Generate detail insight bundle | `tableau:insights:read` | Generates a detail insight bundle. |
| Generate springboard insight bundle | `tableau:insight:read` | Generates a springboard insight bundle. |
| Create metric | `tableau:insight_metrics:create` | Creates a metric. |
| Delete metric | `tableau:insight_metrics:delete` | Deletes a metric. |
| Get metric | `tableau:insight_metrics:read` | Gets the details of the specified metric. |
| Update metric | `tableau:insight_metrics:update` | Updates a metric. |

| Method | Scope | Description |
|---|---|---|
| Batch list metrics | `tableau:insight_metrics:read` | Gets a batch of metrics from a definition, specified in a comma delimited list. |
| Get or create metric | `tableau:insight_metrics:create` | Returns the details of a metric in a definition if it exists, or creates a new metric if it does not. Also returns true if a new metric was created, or `false` if it already existed. |
| Create subscription | `tableau:metric_subscriptions:create` | Creates a subscription to a specified metric for a specified user and/or group. |
| List subscriptions | `tableau:metric_subscriptions:read` | Lists the subscriptions to a specified metric and/or for a specified user. |

| Method | Scope | Description |
| --- | --- | --- |
| Delete subscription | `tableau:metric_subscriptions:delete` | Deletes a specified subscription from a metric. |
| Get subscription | `tableau:metric_subscriptions:read` | Gets a specified subscription to a metric. |
| Update subscription | `tableau:metric_subscriptions:update` | Updates which metric the subscriptions is for, and/or which users and/or groups are subscribed. |
| Batch create subscriptions | `tableau:metric_subscriptions:create` | Creates multiple subscriptions to a metric for specified users and/or groups. |
| Batch get subscriptions | `tableau:metric_subscriptions:read` | Gets a batch of subscriptions to a metric, specified in a comma delimited list of metric LUIDs. |

| Method | Scope | Description |
|---|---|---|
| Batch get subscriber counts | tableau:metric_subscriptions:read | Gets the number of unique users subscribed to a set of metrics specified in a comma separated list of metric LUIDs. |
| Extracts | | |
| (All tableau:tasks: methods) | tableau:tasks:* | Enables create, delete, get, list, run, and update refresh actions for extracts, subscriptions, update data source (for data sources with extracts), and update workbook methods. |
| Create Cloud extract refresh task | tableau:tasks:create | Create an extract refresh for a Tableau Cloud workbook or data source. |

| Method | Scope | Description |
| --- | --- | --- |
| Delete extract refresh task | `tableau:tasks:delete` | Delete an extract refresh tasks for a Tableau Cloud workbook or data source. |
| Get extract refresh task | `tableau:tasks:read` | Get the details of an extract refresh for a Tableau Cloud workbook or data source. |
| List extract refresh tasks in site | `tableau:tasks:read` | List the extract refreshes tasks configured for in a site. |
| Run extract refresh task | `tableau:tasks:run` | Runs an extract refresh task. |
| Update Cloud extract refresh task | `tableau:tasks:update` | Update an extract refresh for a Tableau Cloud workbook or data source. |
| Flows | | |
| Publish flow | `tableau:flows:create` | Publish a flow. |

| Method | Scope | Description |
|---|---|---|
| Metrics<br><br>**Retirement of the legacy metrics feature**<br><br>Tableau's legacy metrics feature was retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. In October 2023, Tableau retired the ability to embed legacy metrics in Tableau Cloud and in Tableau Server version 2023.3. With Tableau Pulse, we've developed an improved experience to track metrics and ask questions of your data. For more information, see Create Metrics with Tableau Pulse to learn about the new experience and Create and Troubleshoot Metrics (Retired) for the retired feature. | | |
| (All `tableau:metrics:` methods) | `tableau:metrics:*` | Enables query, update, and delete metrics actions. |
| (All `tableau:metrics:` methods) | `tableau:metrics:*` | Enables query, update, and delete metrics actions. |
| Get metric | `tableau:content:read` | Get a metric. |
| Delete metric | `tableau:metrics:delete` | Delete a metric. |
| List metrics | `tableau:content:read` | Get list of metrics for a site. |
| Query metrics data | `tableau:metrics:download` | Get underlying data of a metric in comma-sep- |

| Method | Scope | Description |
|---|---|---|
| | | arated value (.csv) format. |
| Update metric | `tableau:metrics:update` | Update owner, project, suspend status, and name of the metric. |
| Subscriptions | | |
| (All `tableau:tasks:` methods) | `tableau:tasks:*` | Enables create, delete, get, list, run, and update refresh actions for extracts, subscriptions, update data source (for data sources with extracts), and update workbook methods. |
| Create subscription | `tableau:tasks:create` | Create a subscription. |
| Delete subscription | `tableau:tasks:delete` | Delete a subscription. |
| Get subscription | `tableau:tasks:read` | Gets the details of a subscription. |

| Method | Scope | Description |
|---|---|---|
| List subscriptions | `tableau:tasks:read` | Lists subscriptions in a site. |
| Update subscription | `tableau:tasks:update` | Updates a subscription. |
| Views | | |
| Delete custom view | `tableau:views:update` | Delete the specified custom view. |
| Get custom view | `tableau:content:read` | Get the details of a specified custom view. |
| Get custom view image | `tableau:views:download` | Download a .png format image file of a specified custom view. |
| Get view | `tableau:content:read` | Get details about a view. |
| Get view by path | `tableau:content:read` | Get details for all views on a site using the specified name. |
| List custom views | `tableau:content:read` | Get a list of custom views on a site. |
| Query view data | `tableau:views:download` | Get a view rendered in |

| Method | Scope | Description |
|---|---|---|
| | | comma-separated value (.csv) format. |
| Query view PDF | `tableau:views:download` | Get a view as a PDF (.pdf) file. |
| Query view image | `tableau:views:download` | Get a view as an image (.png) file. |
| Query views for site | `tableau:content:read` | Get all views for a site. |
| Query views for workbook | `tableau:content:read` | Get all views for the specified workbook. |
| Query view preview image | `tableau:views:download` | Get the thumbnail image (.png) of the view. |
| Update custom view | `tableau:views:update` | Change the owner or name of an existing custom view. |
| Workbooks | | |
| (All `tableau:workbooks:` methods) | `tableau:workbooks:*` | Enables publish, update, download, and preview |

| Method | Scope | Description |
| --- | --- | --- |
| | | image workbook actions. |
| Publish workbook | `tableau:workbooks:create` | Publish a workbook (.twb or .twbx). |
| Get workbook | `tableau:content:read` | Get a specified workbook and its details. |
| Query workbook for site | `tableau:content:read` | Get a list of workbooks published to a site. |
| Query workbook preview image | `tableau:workbooks:download` | Get the thumbnail image (.png) of the workbook. |
| Update workbook | `tableau:workbooks:update` | Modify an existing workbook. |
| Update workbook connection | `tableau:workbooks:update` | Update the connection information. |
| Update workbook now | `tableau:tasks:run` | Initiate a workbook refresh outside of a scheduled task. |

| Method | Scope | Description |
|---|---|---|
| Publish | | |
| Append to file upload | `tableau:file_upload-s:create` | Upload a block of data and append it to the data that is already uploaded - to be used after an upload has been initiated using the "initiate file upload" method. |
| Initiate file upload | `tableau:file_upload-s:create` | Initiate the upload process of a file. |
| Download | | |
| Download data source | `tableau-:datasources:download` | Download the data source (.tdsx). |
| Download view crosstab Excel | `tableau:views:download` | Download an Excel (.xlsx) file containing crosstab data from the view. |
| Download workbook | `tableau:workbooks:download` | Download a workbook (.twb or .twbx). |

| Method | Scope | Description |
|---|---|---|
| Download workbook revision | `tableau:workbooks:download` | Download a specific version of the workbook (.twb or .twbx). |
| Download workbook PDF | `tableau:views:download` | Download a PDF (.pdf) file containing images of the sheets in the workbook. |
| Download workbook PowerPoint | `tableau:views:download` | Download a PowerPoint (.pptx) file containing slides of the sheets in the workbook. |
| Users | | |
| (All `tableau:users` methods) | `tableau:users:*` | Enables add, query, update, and remove users actions. |
| Add user to group | `tableau:groups:update` | Add a user to a group. |
| Add user to site | `tableau:users:create` | Add a user and assign the user to a site. |

| Method | Scope | Description |
|---|---|---|
| Get users in group | `tableau:groups:read` | Get a list of users in a group. |
| Get users on site | `tableau:users:read` | Get all users on a site. |
| Query user on site | `tableau:users:read` | Get a user on a site. |
| Remove users from group | `tableau:groups:update` | Remove a user from a group. |
| Remove user from site | `tableau:users:delete` | Remove the user from a site. |
| Groups | | |
| (All `tableau:groups:` methods) | `tableau:groups:*` | Enables create, query, update, and delete groups actions. |
| Create group | `tableau:groups:create` | Create a group. |
| Delete group | `tableau:groups:delete` | Delete a group. |
| Get groups for user | `tableau:users:read` | Get a list of groups that a user belongs to. |
| Query groups | `tableau:groups:read` | Get a list of |

| Method | Scope | Description |
|---|---|---|
| | | groups on a site. |
| Update group | `tableau:groups:update` | Update a group. |
| Projects | | |
| (All `tableau-:projects:` methods) | `tableau:projects:*` | Enables create, update, and delete projects actions. |
| Create project | `tableau:projects:create` | Create a project. |
| Delete project | `tableau:projects:delete` | Delete a project. |
| Query project | `tableau:content:read` | Get a list of projects. |
| Update project | `tableau:projects:update` | Update the name, description, or project hierarchy of the project. |
| Permissions | | |
| (All `tableau-:permissions:` methods) | `tableau:permissions:*` | Enables add, query, update, delete permissions actions. |
| Add data source permissions | `tableau:permissions:update` | Add permissions to a |

| Method | Scope | Description |
|---|---|---|
| | | data source for a Tableau Server user or group. |
| Add default permissions | `tableau:permissions:update` | Add default permission capabilities to a user or group, for metric, flow, workbook, data source, data role, or lens resources in a project. |
| Add project permissions | `tableau:permissions:update` | Add permissions to a project for a user or group |
| Add view permissions | `tableau:permissions:update` | Add permissions to a view for a user or group. |
| Add workbook permissions | `tableau:permissions:update` | Add permissions to a specified workbook for a user or group. |
| Delete data source permissions | `tableau:permissions:delete` | Delete default permission capabilities of |

| Method | Scope | Description |
|---|---|---|
| | | a user or group, for metric, flow, workbook, data source, data role, or lens resources in a project. |
| Delete default permissions | `tableau:permissions:delete` | Delete default permission capabilities of a user or group, for metric, flow, workbook, data source, data role, or lens resources in a project. |
| Delete project permissions | `tableau:permissions:delete` | Delete the project permission for a user or group. |
| Delete view permissions | `tableau:permissions:delete` | Delete the view permission for a user or group. |
| Delete workbook permissions | `tableau:permissions:delete` | Delete the workbook permission for a user or group. |

| Method | Scope | Description |
|---|---|---|
| Query data source permissions | `tableau:permissions:read` | Get a list of permissions for the data source. |
| Query default permissions | `tableau:permissions:read` | Get default permission capabilities of users and groups for metrics, workbooks, and data sources. |
| Query project permissions | `tableau:permissions:read` | Get a list of permissions for the project. |
| Query view permissions | `tableau:permissions:read` | Get a list of permissions for the view. |
| Query workbook permissions | `tableau:permissions:read` | Get a list of permissions for the workbook. |
| Site | | |
| (All `tableau:sites:` methods) | `tableau:sites:*` | Enables create, query, update, and delete sites actions. |
| Get recently viewed site | `tableau:content:read` | Get views and workbooks |

| Method | Scope | Description |
|---|---|---|
| | | details on the most recently created, updated, or accessed by the signed in user. |
| Query views for site | `tableau:content:read` | List all views on a site. |

Troubleshoot scopes

401001 - signin error

If you encounter error 401001, the **Sign In** response body is appended with one of the following additional connected apps-specific error codes: 16, 10084, or 10085.

For example, in the following response body, "10084” is the connected apps error code you can use to help troubleshoot issues with signing in to Tableau Cloud using a JWT for REST API authorization.

```
<error code="401001">
  "summary": "Signin Error",
  "detail": "Error signing in to Tableau Cloud (10084)"
</error>
```

To help resolve the issue, refer to the description of the applicable error code and its potential causes.

- **16: Could not find user**—this error can occur because the incorrect "`sub`" (user name) was specified
- **10084: Could not parse access token**—this error can occur for the following reasons:

- JWT is invalid or there was an unexpected problem
- Incorrect "`aud`" (audience) was specified
- For direct trust, there was a problem with signing the secret

- **10085: Could not fetch secret to verify signature for client ID**—this error can occur for the following reasons:
  - Incorrect client ID in "`iss`" specified
  - For direct trust, incorrect "`kid`" (secret ID) was specified
  - For OAuth 2.0 trust, unable to fetch keys from the JWKSource

401002 - unauthorized access error

If you encounter error 401002 and have confirmed that you have the appropriate permissions to make the request, ensure the scope included in the JWT is correct and matches the request you're trying to make. For a list of endpoints and supported scopes, see the REST API methods that support JWT authorization section above.

## Troubleshoot Connected Apps - Direct Trust

When embedded content fails to display in your custom application or Tableau REST API authorization fails, you can use a browser's developer tools to inspect and identify error codes that might be associated with the Tableau connected app (direct trust) that's used to display the embedded content.

**Note:** In order for the session token to be valid, the clocks of the external application and the server that hosts the external application must be set to Coordinated Universal Time (UTC). If either clock uses a different standard, the connected app will not be trusted.

Refer to the table below to review the description of the error code and potential resolution.

| Error code | Summary | Description | Potential resolution or explanation |
|---|---|---|---|
| 5 | SYSTEM_USER_NOT_FOUND | Tableau user could not be found | To resolve this issue, verify the '`sub`' (Subject) claim value in the JWT is the user name (email address) of the authenticated |

| | | | |
|---|---|---|---|
| | | | Tableau Cloud user. This value is case sensitive. |
| 16 | LOGIN_FAILED | Login failed | This error is typically caused by one of the following claim issues in the JWT:<br>• The 'exp' (Expiration Time) exceeds the default maximum validity period. To resolve this issue, review registered claims required for a valid JWT and ensure the correct value does not exceed 10 minutes.<br>• The 'sub' (Subject) is calling an unknown user. To resolve this issue, verify the 'sub' value is the user name (email address) of the authenticated Tableau Cloud user. |
| 67 | FEATURE_NOT_ENABLED | On-demand access is not supported | On-demand access is available through licensed Tableau Cloud sites only. |
| 126 | CONNECTED_APP_NOT_FOUND | The connected app could not be found | To resolve this issue, verify the connected app is enabled and the correct client ID (also known as the connect app ID) is referenced in the JWT. |
| 127 | CONNECTED_APP_SECRET_NOT_FOUND | The connected app's secret could not be found | To resolve this issue, verify the correct connected app's secret ID and secret value are referenced in the JWT. |

| | | | |
|---|---|---|---|
| 128 | CONNECTED_APP_SECRET_LIMIT_EXCEEDED | Maximum limit for secrets has been reached | A maximum of two secrets are allowed for a connected app. This error can occur when there's an attempt to create a third secret.<br><br>To resolve this issue, delete a secret from the connected app before creating a new one. |
| 133 | INVALID_CONNECTED_APP_DOMAIN_SAFELIST | Domain allowlist contains one or more invalid characters | This error can occur when the domain allowlist contains one or more invalid characters. |
| 10083 | BAD_JWT | JWT header contains issues | The '`kid`' (Secret ID) or '`clientId`' (Issuer) claims are missing from the JWT header. To resolve this issue, ensure this information is included. |
| 10084 | JWT_PARSE_ERROR | JWT contains issues | To resolve this issue, verify the following:<br><br>• The '`aud`' (Audience) value referenced in the JWT uses the "tableau" value. This value is case sensitive.<br>• The '`aud`' (Audience) and '`sub`' (Subject) are included in the JWT.<br>• Review IssueTime or ensure there's no clock mismatch between the machine hosting the connected app and Tableau Cloud. |

| | | | |
|---|---|---|---|
| 10085 | COULD_NOT_FETCH_JWT_KEYS | JWT could not find keys | Could not find the secret.<br><br>To resolve this issue, verify the correct 'kid' (Secret ID) is used in the JWT header. |
| 10089 | CONNECTED_APP_NOT_FOUND | Could not find connected app | To resolve this issue, ensure the issuer is calling the correct connected app ID (also known as the client ID). |
| 10090 | CONNECTED_APP_DISABLED | Connected app is disabled | The connected app used to verify trust is disabled. To resolve this issue, enable the connected app. |
| 10091 | JTI_ALREADY_USED | Unique JWT required | The JWT has already been used in the authentication process. To resolve this issue, a new JWT must be generated. |
| 10092 | NOT_IN_DOMAIN_ALLOW_LIST | Domain of the embedded content is not specified | To resolve this issue, ensure the `unrestrictedEmbedding` setting is set to `true` or `domainAllowlist` parameter includes the domains where Tableau content is embedded using the Update Embedding Settings for Site method in the Tableau REST API. |
| 10094 | MISSING_REQUIRED_JTI | Missing JWT ID | To resolve this issue, verify the '`jti`' (JWT ID) is included in the JWT. |
| 10096 | JWT_EXPIRATION_EXCEEDS_ | Issue with expiration time | The '`exp`' (Expiration Time) exceeds the default maximum validity period. To resolve this |

| | | | |
|---|---|---|---|
| | CONFIGURED_ EXPIRATION_ PERIOD | | issue, review registered claims required for a valid JWT and ensure the correct value does not exceed 10 minutes. |
| 10097 | SCOPES_ MALFORMED | Issues with scopes claim | This error can occur when the '`scp`' (Scope) claim is either missing from the JWT or not passed as a list type. To resolve this issue, verify '`scp`' is included in the JWT and passed as a list type. For troubleshooting help with a JWT, see Debugger on the auth0 site. |
| 10098 | JWT_UNSIGNED_ OR_ENCRYPTED | JWT is unsigned or encrypted | Tableau does not support an unsigned or encrypted JWT. |
| 10099 | SCOPES_ MISSING_IN_JWT | Missing scopes claim | The JWT is missing the required '`scp`' (scope) claim. To resolve this issue, verify '`scp`' is included in the JWT. For troubleshooting help with a JWT, see Debugger on the auth0 site. |
| 10100 | JTI_ PERSISTENCE_ FAILED | Unexpected JWT ID error | There was an unexpected '`jti`' (JWT ID) error. To resolve this issue, a new JWT with a new '`jti`' must be generated. |
| 10101 | EPHEMERAL_ USER_LOGIN_ FAILED_SITE_ NOT_UBP_ ENABLED | On-demand access is not supported | The site is not licensed with the Embedded Analytics usage-based model that is required to enable on-demand access. For more information, see Understanding License Models. |

| | | | |
|---|---|---|---|
| 10102 | EPHEMERAL_USER_NOT_SUPPORTED | On-demand access is not supported when iframe-auth attribute is enabled | This error can occur when the iframe-auth attribute is enabled. To resolve this issue, verify that the Tableau Embedding API version 3.6 or later is being used. |
| 10103 | JWT_MAX_SIZE_EXCEEDED | JWT exceeds maximum size | This error can occur when JWT size exceeds 8000 bytes. To resolve this issue, make sure that only the necessary claims are being passed to Tableau Cloud. |
| 10105 | ORIGIN_HEADER_NOT_A_VALID_URI | Invalid Origin header | This error can occur because 1) a URL is specified in the domain allowlist and 2) the Origin header does not contain a valid URL. |
| 10106 | ORIGIN_HEADER_NOT_SET | Missing Origin header | This error can occur because 1) a URL is specified in the domain allowlist and 2) the Origin header is not set. |

## Personal Access Tokens

Personal access tokens (PATs) provide you and your Tableau Cloud users the ability to create long-lived authentication tokens. PATs enable you and your users to sign in to Tableau REST API without requiring hard-coded credentials (username and password) or interactive sign-in. For more information about using PATs with Tableau REST API, see Signing In and Out (Authentication) in the Tableau REST API Help.

This topic discusses how to configure and use PATs with Tableau Cloud sites. For information about how to use PATs with Tableau Cloud Manager, see Personal Access Tokens for Tableau Cloud Manager.

We recommend creating PATs for automated scripts and tasks that are created with the Tableau REST API:

- **Improve security:** PATs reduce risk in the event credentials are compromised. Instead of using a user name and password, users can reduce the impact of credential compromise by using a personal access token for automated tasks. If a PAT gets compromised or is used in automation that is failing or posing a risk, you or your users can just revoke the PAT instead of rotating or revoking the user's credentials.

- **Manage automation:** A PAT can be created for each script or task that is run. This allows you and your users to silo and review automation tasks across your organization. Additionally, by using PATs, password resets or metadata changes (username, email, etc.) on user accounts do not disrupt automation as it would when credentials are hard-coded into the scripts.

- **Monitor usage:** If you have Tableau Cloud with Advanced Management, as a site admin, you can review Activity Log to track which users are creating and revoking PATs, which PATs are being used, which PATs are being revoked and the sessions attached to them.

**Notes:**

- You must use a PAT, instead of user name and password, to make a REST API sign in request to Tableau Cloud with multi-factor authentication (MFA) enabled with Tableau authentication.
- PATs are not used for generic client access to Tableau Cloud.
- To use PATs with tabcmd, install the compatible version of tabcmd from https://tableau.github.io/tabcmd/.
- PATs are automatically revoked when a user's authentication method is changed.

## Understand personal access tokens

When a personal access token (PAT) is created, it is hashed then stored in the repository. After the PAT is hashed and stored, the PAT secret is shown once to the user and then no longer accessible after the users dismisses the dialog. Therefore, users are instructed to copy the PAT to a safe place and to handle it as they would a password. When the PAT is used at run-time, Tableau Cloud compares the PAT presented by the user to the hashed value stored in the repository. If a match is made, then an authenticated session is started.

In the context of authorization, the Tableau Cloud session that is authenticated with a PAT has the same access and privileges as the PAT owner.

**Note:** Users can't request concurrent Tableau Cloud sessions with a PAT. Signing in again with the same PAT, whether at the same site or a different site, will terminate the previous session and result in an authentication error.

### About PAT expiration

Personal access tokens (PATs) expire if not used after 15 consecutive days. If PATs are used more frequently than every 15 days, their expiration depends on the PAT's site setting, which is configurable by a site admin.

After PATs expire, they're unable to be used for authentication and removed from the user's **My Account Settings** page.

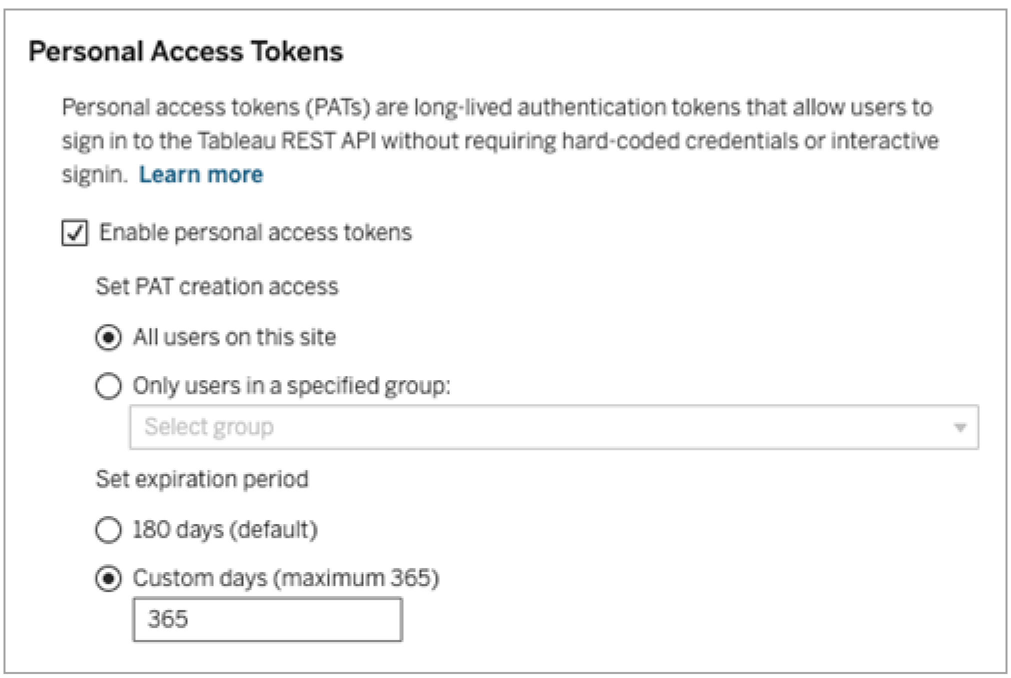
## Site settings for personal access tokens

### Configure PAT creation and expiration

As a site admin, you can configure who can create and use PATs, and when PATs expire. The changes that you make to PATs settings apply only to new PATs. PATs created before setting changes retain the configurations present when they were created and remain valid until they expire.

On sites activated in June 2023 (Tableau 2023.2) and later, creating PATs is disabled by default. On sites activated before June 2023 (Tableau 2023.2), creating personal access tokens (PATs) is enabled for all users by default and have a default expiration of one year.

1. Sign in to Tableau Cloud as a site admin and navigate to the **Settings** page.
2. Under the Personal Access Tokens section, select the **Enable personal access tokens** check box if not already selected, and do *one* of the following tasks:
    - Keep the **Enable personal access tokens** check box selection to enable all users to create PATs.
    - Alternatively, select the **Only users in the specified group** radio button and select a group from the list to limit the access of creating new PATs only to the users that are members of that group.
      **Note:** If you select this option, a group must be selected in order for you to save the setting.
3. Under Set expiration period, do *one* of the following:
    - If not selected already, select the **180 days** radio button.
    - Alternatively, in the **Custom days** text box, enter a valid value, 1 through 365.




4. When finished, click the **Save** button on the top or bottom of the page.

## Tasks for managing users' personal access tokens

### Create a PAT

Site admins can't create PATs for users. Your users must create their own PATs.

Users with accounts on Tableau Cloud can create, manage, and revoke personal access tokens on the **My Account Settings** page. For more information, see Manage Your Account Settings in the Tableau Help.

Note: A user can have up to 104 PATs.

### Monitor PATs usage

If you have Tableau Cloud with Advanced Management, you can use Activity Log to monitor PATs usage. Events in the Activity Log that capture PATs usage include, but not limited to: issue token (issue refresh token), log in with token (login with pat), redeem token (redeem refresh token), and revoke token (revoke refresh token). For more information about these events, see Activity Log Site Event Type Reference.

### Revoke a PAT

As a site admin, you can revoke a user's PAT. A user is also able to revoke their own PAT on their **My Account Settings** page using the procedure described in the Manage Your Account topic in the Tableau User Help.

1. Sign in to Tableau Cloud as a site admin and navigate to the **Users** page.
2. Locate the user whose PAT you want to revoke. For more information about navigating Server Admin pages and locating users, see View, Manage, or Remove Users.
3. Click the user's name to open their profile page.
4. On the user's profile page, click the **Settings** tab.

   **Note:** A site admin can only access the Settings tab and see a user's PAT if they are a site admin on all the sites that the user belongs to.

5. Under the **Personal Access Tokens** section, identify the PAT that you want to revoke and then click the **Revoke Token** button.

6. In the Delete dialog, click the **Delete** button.

# Access Sites from Connected Clients

By default, Tableau Cloud allows users to access their sites directly from a Tableau *client*. It allows this access after the user provides credentials the first time they sign-in from the client. A client in this case is a Tableau application or service that can exchange information with Tableau Cloud. Examples of Tableau clients include Tableau Desktop, Tableau Prep Builder, Tableau Bridge, and Tableau Mobile.

Tableau Cloud establishes a *connected client* by creating a secure refresh token that uniquely identifies a user when the user signs in from the client.

Connected client requirement for Tableau Bridge

The default *connected client* option must remain enabled for the site to allow Tableau Bridge clients to run unattended and, if enabled, support multi-factor authentication with Tableau authentication. If connected clients are disabled for the site, Bridge can only support Tableau user name and password authentication.

**Note:** If multi-factor authentication (MFA) is enabled with Tableau authentication, Bridge clients must be running Tableau Bridge version 2021.1 and later. For more information about Tableau with MFA, see About multi-factor authentication and Tableau Cloud.

## About refresh token expiration

The connected client sessions are managed by refresh tokens. A refresh token is generated after a successful sign-in to Tableau Cloud from the connected client. If the refresh token has not been used in 14 days, then it expires. After the refresh token has expired, a new sign-in to Tableau Cloud from the connected client is required.

If a refresh token is being used regularly, their expiration period depends on when a site was activated. Refresh tokens generated on sites activated in June 2023 (Tableau 2023.2) or later expire after 180 days. Refresh tokens generated on all other sites expire after one year.

After a refresh token has expired, the user must sign in from the connected client to reestablish an authenticated connection to Tableau Cloud.

## Opt out of allowing connected clients

Site admins can turn off this functionality, to require users to sign in explicitly each time they visit Tableau Cloud.

Opting out of allowing connected clients is recommended if SAML is enabled on your site, and you want to ensure that users do not have access to Tableau Cloud when they are removed from the IdP's SAML directory.

1. Sign in to Tableau Cloud with your site admin credentials.
2. Select **Settings**, and then select the **Authentication** tab.
3. Under **Connected clients**, clear the **Let clients automatically connect to this Tableau Cloud site** check box.

If you opt out of connected clients, keep the following points in mind:

- Some clients provide a Remember Me check box, which users can select to remember their user name. Users always need to provide their password.
- For sites configured for single sign-on using SAML authentication, users have direct access to the site after they sign in the first time. They can do this if they do not sign out explicitly by selecting the Sign Out link.

## Remove a user's connected clients

Site admins can remove connected clients (refresh tokens) associated with a particular user, for example, if the user is no longer a member of the site or is seeing a message about exceeding the maximum number of clients in their account.

1. Select **Users**, and on the Site Users page, select the link on the user's display name.

2. On the user's page, select the **Settings** tab.

3. In the **Connected clients** section, remove the appropriate clients.

Users also can go to their own **My Account Settings** page to remove specific clients.

### Monitor refresh token usage

If you have Tableau Cloud with Advanced Management, you can use Activity Log to monitor refresh token usage. Events in the Activity Log that capture refresh token usage include, but not limited to: issue token, redeem token, and revoke token. For more information about these events, see Activity Log Site Event Type Reference.

### See also

Sign In to Tableau Cloud

OAuth Connections

# Monitor Site Activity

## Find Admin Views

The Site Status page contains an embedded Tableau workbook with various admin views. These views help you to monitor different types of site activity.

- Allows you to access the Admin Insights project, which you can use to build custom admin views about your site.

- Shows you general site activity for Tableau Cloud.

- Shows you general Tableau Bridge activity.

## Navigate to admin views

To see the Admin Insights project or admin views, click **Site Status**. Site administrators can see administrative views for their site.

# Use Admin Insights to Create Custom Views

You can get more visibility into your Tableau Cloud deployment by using Admin Insights.

Admin Insights is a Tableau Cloud-only project that is pre-populated with carefully curated data sources and a pre-built workbook of your site's data. Using the resources available to you through the Admin Insights project, you can create custom views to help answer a range of common questions you might have about your site.

For example:

- What's my Tableau Cloud adoption rate in my organization?
- What are common trends around the site’s deployment?
- What content is popular?
- What are my users doing?
- How should licenses be allocated?

## Connect to Admin Insights data

If you're a site admin or someone who has been granted access to the Admin Insights project, you can access the Admin Insights data sources directly from Tableau Cloud using Web Authoring or through Tableau Desktop.

**From Tableau Cloud**

1. Sign in to Tableau Cloud and navigate to the **Admin Insights** project.
2. Select **Create** > **Workbook** and select one of the data sources to get started.

**From Tableau Desktop**

1. Open Tableau Desktop, under Connect, select **Tableau Server**.

   **Note:** If you're not already signed in to Tableau Cloud, in the Tableau Server Sign In dialog, click the **Tableau Cloud** hyperlink. Enter your Tableau Cloud credentials and then click **Sign In**.

2. In the search box, type the name of the data source you're looking for.
3. Select a data source and click **Connect** to get started with your analysis.

## Start creating custom views

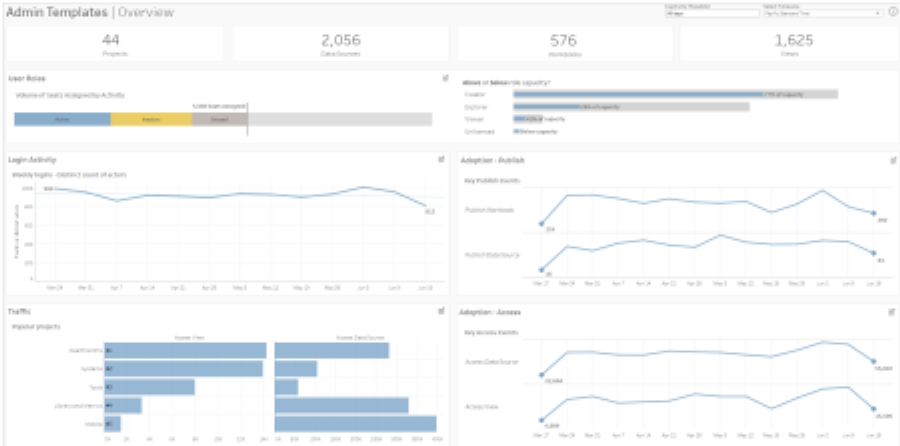
As you think about how you want to approach the analysis of your site and user metrics, consider some of the following questions that organizations commonly ask:

- What are the most popular views or data sources?
- Who are the most active users (i.e., who are the power users)?
- What are the most common tasks performed on the site?
- How many licenses are being used?
- Who hasn't signed in to the site in more than 90 days?

Explore the pre-built workbook

To help you answer the previous questions (and more), go to the pre-built workbook, Admin Insights Starter, to see what kind of insights it can offer. The workbook serves as a template for creating more detailed dashboards and workbooks that address unique questions related to your site or organization.

Starting in October 2024, localized versions of the Admin Insights Starter workbook are available as accelerators on Tableau Exchange.




## User Drilldown

**Focus:** Site activity

**Data source:** TS Users

Use this dashboard to explore high-level site activity by user role.

This dashboard shows you some of the ways you can analyze your site’s log and activity metrics. Although Admin Insights captures up to 90 days of data (365 days with an Advanced Management license), the “Last Publish” and “Last Access” dates can go back to as early as the date the site was created.

**Do more with this dashboard:**

- Change the "Inactivity threshold" (yellow by default) using the parameter control in the upper-right corner.
- Create URL actions that can email users based on their activity type. For example, email users when they haven’t signed in to the site, accessed content, or published content in the last 90 days.
- Create additional views for this dashboard that compares the last 90 days (default) of activity (sign in, access, or publish) to the last 30 days, 60 days, and all days.

## Group Drilldown

**Focus:** Group membership and licensing
**Data source:** Groups, TS Events, TS Users

The dashboard shows you the count of groups and grouped users on the site. Use the filters or click a row or mark in the Group Breakdown worksheet to select a group. After a single group is selected, you can view membership and license details.

The dashboard shows you the following types of information:

- Group membership: How many groups and grouped users are on the site
- License consumption: The percentage of groups using licenses on sign-in
- Site roles and license type: Which users are members of the group and what site role are they assigned

**Do more with this dashboard:** Select a user from the membership worksheet to email all group members.

## Login Activity Drilldown

**Focus:** Sign-in activity
**Connects to:** TS Events (primary), TS Users (secondary)

Use this dashboard to explore trends in sign-in activity.

Using the “Select Events or Distinct Actors” selector on the left, you can see your site’s weekly, daily, and hourly sign-in-related activity. Because there are two data sources behind this dashboard, you can see sign-ins by all users, not just users with recent sign-in activity.

**Do more with this dashboard:** Duplicate the dashboard and keep only the “Login user breakdown.” Then change the filter on the “Last Login Date” to null to see a list of users who have never signed in to the site. You can also email them depending on what kind of action you want users to take.

## Traffic and Adoption Drilldown & Publish Event Drilldown

**Focus:** Content access and usage
**Connects to:** TS Events

The information in the dashboards show you the following types of information:

- View access activity: When a view has been accessed and by whom.
- Data source access activity: When 1) a published data source has been connected to through Web Authoring or Tableau Desktop or 2) a user has viewed or published a workbook that uses the published data source.
- Workbook publish activity: When a workbook has been published and by whom.
- Data source publish activity: When a published data source has been published and by whom.

**Do more with this dashboard:** Using the “Project Name” selector in the upper-right corner, select a project on your site to filter on. This filter affects all sheets in the Admin Insights Starter.

## Stale Content

**Focus:** Content usage and disk space
**Connects to:** Site Content, TS Events

The dashboard shows you the following types of information:

- Disk space usage by activity: Amount of space used by stale content and content considered active - content accessed in the time frame below the stale threshold.
- Space used by item: Amount of space used by content on the site. The x-axis shows the number of days since the content was last viewed, while the y-axis shows the size.

- Space used by stale and unused content: Total amount of space used by stale and unused content. You can use this information to determine which content is the most stale or takes the most space.

**Do more with this dashboard:**

- Use the Inactivity Threshold to determine how long content can go unused before it’s deemed stale. Changing this value filters content items that don't meet the threshold.
- Use the Project Name selector to filter content by project. This filter affects all sheets in the Admin Insights Starter.
- To maintain a clean site, remove content that is no longer in use. If you’re unsure, select an item to email the content owner before deleting it.

## Stats for Space Usage

**Focus:** Content ownership and disk space
**Connects to:** Site Content, TS Events

The dashboard shows you the following types of information:

- Site capacity: Amount of space used in relation to the total site capacity.
- Space usage by project: Amount of space used by top-level projects. Selecting a project filters the other worksheets to show content items, size, and ownership details.
- Space usage by item: Amount of space used by content items, such as workbooks, data sources, flows, and virtual connections.
- Space usage by user: Check how much space content owners are using and identify if any groups or users are exceeding their allotted space.

**Do more with this dashboard:**

- Use the Project Name selector to filter content by project. This filter affects all sheets in the Admin Insights Starter.
- Select an item or user to send an email and clarify how the content is used.

Explore the data sources

You can connect to Admin Insights data sources from Tableau Cloud and Tableau Desktop. Connecting to the data sources directly allows you to explore the data and build dashboards or workbooks specific to your organization. For more information about how to connect, see Connect to Admin Insights data in this topic.

The following table provides an overview of each data source.

| Data source | Description |
| --- | --- |
| TS Events | TS Events functions as a primary audit data source. It contains data about the various events happening on your site, including sign-in, publishing, and accessing views. |
| TS Users | TS Users contains data about your users, such as remaining licenses, site roles, and workbooks owned by a user. It also includes product activation and usage data for Tableau Desktop, Tableau Prep, web authoring, and site role-specific capabilities. |
| Groups | The Groups data source identifies the group membership of users on the site. |
| Site Content | The Site Content data source provides essential governance information about the assets on your site, such as projects, workbooks, flows, and views. It also includes Tableau Pulse information. |
| Viz Load Times | Viz Load Times contains the load time information for views on your site, helping content authors understand the user experience when loading views. |
| Job Performance | Job Performance contains events and runtime information for background jobs on the site, such as extract refreshes and flow runs. It also includes Tableau Bridge refresh data, such as the Bridge client |

| | |
|---|---|
| | name, pooling data, and refresh started and completed times. |
| Permissions | Permissions contains the effective permissions for all users and content on the site. Site administrators can use the data source to identify gaps in permissions security and ensure that only the appropriate users can access content items. |
| Subscriptions | The Subscriptions data source provides details about subscriptions on the site, including the name of the creator and recipient, content item, job status, and schedules. It also includes Tableau Pulse information. |
| Tokens | Tokens contains information about active, unexpired user tokens on the site, including personal access tokens (PATs), refresh tokens, and OAuth tokens. Site administrators can monitor token usage and expiration through the data source, rotating essential tokens as needed. |

## Manage Admin Insights

Admin Insights is a Tableau Cloud-only project that is pre-populated with carefully curated data sources and a pre-built workbook of your site's data. Using the resources available to you through the Admin Insights project, you can create custom views to help answer a range of common questions you might have about your site.

Admin Insights versus Admin views

The Admin Insights project and the pre-built admin views (accessible from Tableau Cloud’s Status page) are both valuable tools for monitoring the health and activity of your Tableau Cloud site. One tool does not replace the other.

To determine which tool to use, consider the following:

| **Admin Insights** | **Admin Views** |
|---|---|
| • Site traffic, adoption, and reach | • General site activity, site performance, and disk space usage |

| Admin Insights | Admin Views |
|---|---|
| • User roles and sign-in activity<br>• Publishing-related activity | • Extract performance<br>• Tableau Bridge traffic and extract-related activity<br>• Troubleshooting |

What's included with the Admin Insights project

The Admin Insights project is comprised of the following:

- **Admin Insights data sources**—TS Events, TS Users, Groups, Site Content, Viz Load Times, Job Performance, Permissions, Subscriptions, and Tokens. You can use these data sources on which to create new data sources if you need to enrich the data with custom calculations or other data from your organization. For more information about the data sources, see Use Admin Insights to Create Custom Views.

- **Admin Insights Starter**—a pre-built workbook that contains dashboards based on the Admin Insights data sources. These dashboards are intended to serve as templates on which to build more dashboards and views that can go more in depth and answer questions that are unique to your site's deployment or organization. For more information about the dashboards, see Explore the pre-built workbook.

- **Tableau System Account**—data sources in the Admin Insights project are updated by the Tableau System Account. While events conducted by this account are not visible in the data sources, the Tableau System Account is listed as the owner of Admin Insights content by default. This account exists to provide Admin Insights data to your Admin Insights project.

About data freshness

The Admin Insights data sources contain up to 90 days of data about your site by default or 365 days with Advanced Management. For more information, see About Tableau Advanced Management on Tableau Cloud. The data sources can be updated daily or weekly. To specify the update frequency for Admin Insights data sources, go to **Settings**, and on the **General** tab, scroll to **Admin Insights Update Frequency**.

Because the Admin Insights Starter is based on these data sources, dashboards in the workbook always show up-to-date information. Periodically, Tableau updates the workbook itself. For more information, see Get updates to the Admin Insights Starter later in this topic.

Share access to Admin Insights

The Admin Insights content is initially visible to site admins only. Consider extending access to other site users in your organization to enable them to build, curate, and gain insight unique to their needs and workflows and ultimately help them manage their content more effectively. For more information about extending project permissions to non-site admins, see Permissions.

Move or rename the Admin Insights Starter

Tableau strongly recommends that you move the pre-built workbook, Admin Insights Starter, to a different project or simply rename it. Doing so helps ensure that your changes are preserved and do not get overwritten by periodic updates Tableau makes to the pre-built workbook.

For more information, see the Get updates to the Admin Insights Starter below.

Get updates to the Admin Insights Starter

Periodically, Tableau makes updates to the Admin Insights Starter. The updates are automatically applied to the **Admin Insights Starter** workbook in the Admin Insights project. The updates are summarized in the Release Notes workbook that is also available in the Admin Insights project. Updates can include new fields or field descriptions, new views, updates to existing views, and more.

To make sure you get the latest updates to the Admin Insights Starter, and none of the changes you make to the workbook are overwritten, follow the steps described below.

**Step 1: Prepare for updates**

In order to preserve the changes you make to your workbook and avoid these changes from being overwritten by Tableau, Tableau recommends that you do one of the following tasks:

- Move the workbook to a different project
- Rename the workbook

To maintain both your changes and Tableau's latest workbook improvements, you'll need to repeat one of the above tasks after each update that Tableau makes.

**Step 2: Check for updates**

As part of its update process, Tableau recreates and then adds the Admin Insights Starter to your Admin Insights project.

If you've moved or renamed the workbook, a *new* "Admin Insights Starter" is added to your Admin Insights project. You can verify the new workbook by its modified date or by its publish date in revision history.

**Step 3: Use Revision History to undo changes (optional)**

If you were unable to move or rename the workbook before Tableau replaced the Admin Insights Starter, or you don't care for the update, you can use revision history to revert the changes. For more information about revision history, see Work with Content Revisions in the Tableau User Help.

**Step 4: Manually make or move your changes to the latest Admin Insights Starter**

To ensure that your changes are reflected in the same workbook as the changes made by Tableau, you'll need to follow the procedure below.

1. In the latest version of the Admin Insights Starter workbook, you do can do one or both of the following:

   - Manually make the changes that you made in your version of the workbook to the latest version of the workbook.
   - Export the sheet from your version of the workbook and save it to the latest version of workbook. For more information about exporting sheets, see Export and import sheets between workbooks in the Tableau User Help.

2. Move or rename the latest workbook again, so that any new updates Tableau makes to the Admin Insights Starter does not overwrite your changes.

Tips for managing Admin Insights

Although the Admin Insights project functions just like any other project on your site, Tableau recommends you consider the following while managing the project:

- **Move the Admin Insights Starter to a different location.** If you plan to make updates to Admin Insights Starter, Tableau recommends that you either 1) move the workbook to a different project or 2) rename the workbook. Doing one of these tasks ensures that your changes are preserved and do not get overwritten by periodic updates that Tableau automatically makes to the workbook. For more information, see Get updates to the Admin Insights Starter.

- **Use caution when moving data sources.** If you move any of the Admin Insights data sources outside of the Admin Insights project, Tableau will be unable to refresh them. The data sources are also periodically updated by Tableau. To ensure the data sources are refreshed and your changes are preserved, keep the TS Events, TS Users, Groups, Site Content, Viz Load Times, Job Performance, Permissions, Subscriptions, and Tokens data sources in the Admin Insights project.

- **Designate other users, including users who are not site admins, to access and create content for the project.** For example, allow a user to create new views based on the TS Events, TS Users, Groups, Site Content, Viz Load Times, Job Performance, Permissions, Subscriptions, and Tokens data sources. For more information about changing project permissions, see Set permissions.

## TS Events Data Source

TS Events functions as a primary audit data source. It contains data about the various events happening on your site, including sign-in, publishing, and accessing views.

Create custom views

If you're a site admin or someone who has been granted access to the Admin Insights project, you can access the Admin Insights data sources directly from Tableau Cloud using Web

Authoring or through Tableau Desktop to build custom views. For more information about connecting to Admin Insights data sources, see Use Admin Insights to Create Custom Views.

Example: What are the most popular views?

Use the following steps to create a view that displays the most popular views on the site.

1. Connect to the TS Events data source.

2. From the **Data** pane, drag **Item Name** to the **Rows** shelf and **Number of Events** to the **Columns** shelf.

3. From the **Data** pane, drag **Item Type** to the **Filters** shelf, and select the **View** checkbox.

Do more with your data

Using Tableau Prep, you can join TS Events with other Admin Insights data sources on the following fields to get more visibility into your site. If you're analyzing data from multiple Tableau Cloud sites, you must also join on "Site LUID = Site LUID".

- Join TS Events to TS Users on "Actor User ID = User ID"

- Join TS Events to Site Content on "Item ID = Item ID" and "Item Type = Item Type"

For more information, see Aggregate, Join, or Union Data in Tableau Prep Help.

Data schema

The following table lists the fields included in the TS Events data source. Each row of data correlates with a single event that occurs on the Tableau Cloud site.

| Folder | Field Name | Type | Description |
|---|---|---|---|
| Who Acted | Actor License Role | String | The license role for the user who initiated the event; one of Creator, Explorer or Viewer. |
| | Actor Site Role | String | The site role for the user who ini- |

| | | | |
|---|---|---|---|
| | | | tiated the event |
| | Actor User Id | Number | The user id of the user who initiated the event. |
| | Actor User Name | String | The email address of the user who initiated the event |
| | Target User Id | Number | The user ID of the user who was the target of the event. |
| What Was Acted Upon | Historical Item Name | String | The name of the Data Source or Workbook the event was performed against, at the time that the event was performed. |
| | Historical Item Repository Url | String | A unique, url-style path to the Data Source, Workbook, or View that the event was performed against.<br><br>This value preserves the historical path of an item during the time the event was performed. |
| | Historical Project Name | String | The name of the Project within which the event took place, as it was named at the time of the event. |
| | Item Id | Number | The Id of the Data Source, Workbook or View the event was performed against. |
| | Item LUID | String | The LUID of the data source, workbook, or view the events was performed against. |

| | | | |
|---|---|---|---|
| | Item Type | String | If the event was performed against content, the value is Data Source, Workbook, or View. Item Type will be NULL if the event wasn’t performed against content. |
| | Item Name | String | Display name of the item included in the subscription.<br><br>The current name of the Data Source or Workbook the event was performed against. |
| | Item Owner Email | String | Email address of the item owner.<br><br>The email of the user who currently owns the View, Datasource or Workbook the event was performed against. |
| | Item Owner Id | Number | The Id of the user who currently owns the View, Datasource or Workbook the event was performed against. |
| | Item Repository Url | String | A unique, url-style path to the Data Source, Workbook or View that the event was performed against.<br><br>This value describes the CURRENT path an item is available at. It will be NULL if the event was not performed against one of the three items listed above, or if |

| | | | |
|---|---|---|---|
| | | | the item has since been deleted. |
| | Project Name | String | The current name of the Project the event took place in, if it was performed against content. |
| | Site Luid | String | The Luid of the Site on which the event took place |
| | Site Name | String | The name of the Site on which the event took place |
| | Workbook Name | String | The name of the Workbook the event was performed against, at the time that the event was performed. |
| What Action Was Taken | Event Date | Date-time | The date and time that the event in question took place, in UTC. |
| | Event Date (local) | Date-time | The date and time that the event in question took place, adjusted by the Timezone parameter you've set.<br><br>**Note:** For older data, a simple adjustment like this will not be accurate if your timezone uses Daylight Savings. |
| | Event Id | Number | Unique identifier for the event. |
| | Event Name | String | The name of the specific event that occurred. |
| | Event Type | String | Events are grouped together into action types, such as Create, |

| | | | |
|---|---|---|---|
| | | | Access, Update and Delete. |
| - | Admin Insights Published At | Date-time | Date and time the Admin Insights data source was last published in UTC |
| | Count of Distinct Actors | Calculated field | Measure representing the count of unique actors (users initiating the events). |
| | Number of Events | Calculated field | Measure representing the total number of events |

## TS Users Data Source

TS Users contains data about your users, such as remaining licenses, site roles, and workbooks owned by a user. Starting May 2023, TS Users includes product activation and usage data for Tableau Desktop, Tableau Prep, web authoring, and site role-specific capabilities.

If a user's site role is changed to unlicensed, their information remains in the TS Users data source. However, when a user is removed from the site, their information is also removed from TS Users within 36 hours.

Create custom views

If you're a site admin or someone who has been granted access to the Admin Insights project, you can access the Admin Insights data sources directly from Tableau Cloud using Web Authoring or through Tableau Desktop to build custom views. For more information about connecting to Admin Insights data sources, see Use Admin Insights to Create Custom Views.

Example: How many licenses are being used?

Use the following steps to create a view that displays the number of licenses used.

1. Connect to the TS Users data source.
2. From the **Data** pane, drag **Measure Names** to the **Rows** shelf and **Measure Values** to the **Columns** shelf.
3. Right-click the **Measure Names** field in the **Rows** shelf and select **Show Filter**.
4. Click the Measure Names filter dropdown menu, and select **Customize** > **Show Apply Button**.
5. In the filter, select the **Total Allowed Licenses** and **Total Occupied Licenses** checkboxes, and then click **Apply**.

Do more with your data

Using Tableau Prep, you can join TS Users with other Admin Insights data sources on the following fields to get more visibility into your site. If you're analyzing data from multiple Tableau Cloud sites, you must also join on "Site LUID = Site LUID".

- Join TS Users to Groups on “User LUID = User LUID”
- Join TS Users to TS Events on “User ID = Actor User Id”
- Join TS Users to Site Content on “User Email = Owner Email” or “User Email = Item Parent Project Owner Email”

For more information, see Aggregate, Join, or Union Data in Tableau Prep Help.

Data schema

The following table lists the fields included in the TS Users data source. Each row of data corresponds to a unique user on the Tableau Cloud site.

| Folder | Field Name | Type | Description |
|---|---|---|---|
| License Utilization | Allowed Creators | Number | Total number of allowed Creator licenses |
| | Allowed | Number | Total number of purchased |

| | | | |
|---|---|---|---|
| | Explorers | | Explorer licenses |
| | Allowed Viewers | Number | Total number of purchased Viewer licenses |
| | Occupied Creator Licenses | Calculated field | Number of occupied Creator licenses |
| | Occupied Explorer Licenses | Calculated field | Number of occupied Explorer licenses |
| | Occupied Viewer Licenses | Calculated field | Number of occupied Viewer licenses |
| | Total Allowed Licenses | Number | Total number of allowed licenses |
| | Total Occupied Licenses | Calculated field | Total number of occupied licenses |
| | Total Remaining Licenses | Calculated field | Total number of remaining licenses |
| Site | Site Luid | String | LUID of the site associated with the user. Primarily useful for referencing sites in the Tableau Server API. |
| | Site Name | String | Name of the Tableau Cloud site |
| | Site Version | String | The version of Tableau Server running on the Tableau Cloud pod that hosts your site |
| Traffic to Content - Historical | Total Traffic - Data Sources | Number | Total number of times the user's data sources were accessed |
| | Total Traffic - Views | Number | Total number of times the user's views were accessed |

| | | | |
|---|---|---|---|
| | Unique Visitors - Data Sources | Number | Number of unique users who accessed the user's data sources |
| | Unique Visitors - Views | Number | Number of unique users who accessed the user's views |
| User | User Creation Date | Date-time | Date and time the user's account was created in UTC |
| | User Email | String | Email address associated with the user's account |
| | User Friendly Name | String | User friendly name associated with the user's account |
| | User ID | Number | Internal ID of the user |
| | User License Type | String | User-based license associated with the user: Viewer, Explorer, or Creator. |
| | User LUID | String | LUID of the user. Primarily useful for referencing users in the Tableau Server API |
| | User Name | String | User name associated with the user's account. |
| | User Site Role | String | Site role of the user. Determines the maximum level of access a user can have on the site. |
| User Activity - Historical | Access Events - Data Sources | Number | Number of times the user accessed a published data source. |
| | Access Events - Views | Number | Number of times the user accessed a view. |

| | | | |
|---|---|---|---|
| | Publish Events - Data Sources | Number | Number of times the user published a data source. |
| | Publish Events - Workbooks | Number | Number of times the user published a workbook. |
| User Activity - Most Recent Event | Data Source - Last Access Date | Date-time | Date and time the user last accessed a published data source in UTC |
| | Data Source - Last Publish Date | Date-time | Date and time the user last published a published data source in UTC |
| | Last Login Date | Date-time | Date and time the user last logged in, in UTC. |
| | Tableau Desktop - Last Access Date | Date-time | Date and time the user last connected to Tableau Cloud from Tableau Desktop in UTC. |
| | Tableau Desktop - Last Access Date (Local) | Date-time | Date and time the user last connected to Tableau Cloud from Tableau Desktop, adjusted by the Timezone parameter. |
| | Tableau Desktop - Last Product Version | String | The version of Tableau Desktop that was last used to connect. |
| | Tableau Prep - Last Access Date | Date-time | Date and time the user last connected to Tableau Cloud from Tableau Prep in UTC. |
| | Tableau Prep - Last Access Date (Local) | Date-time | Date and time the user last connected to Tableau Cloud from Tableau Prep, adjusted by the Timezone parameter. |

| | | | |
|---|---|---|---|
| | Tableau Prep - Last Product Version | String | The version of Tableau Prep that was last used to connect |
| | View - Last Access Date | Date-time | Date and time the user last accessed a view, in UTC. |
| | Web Authoring - Last Access Date | Date-time | Date and time the user last accessed the web authoring environment in UTC. |
| | Web Authoring - Last Access Date (Local) | Date-time | Date and time the user last accessed the web authoring environment, adjusted by the Timezone parameter. |
| | Web Authoring - Last Publish Date | Date-time | Date and time the user last published a workbook, in UTC |
| User Content | Certified Data Sources | Number | Number of certified data sources the user owns. |
| | Data Sources | Number | Number of published data sources the user owns |
| | Projects | Number | Number of projects the user owns. |
| | Size of Data Sources (MB) | Number | The combined size of all published data sources owned by the user, in megabytes. |
| | Size of Workbooks (MB) | Number | Combined size of all workbooks owned by the user, in megabytes. |
| | Views | Number | Number of views the user owns. |
| | Workbooks | Number | Number of workbooks the user owns. |

| | | | |
|---|---|---|---|
| User Metrics | Days Since Last Login | Number | Number of days since the user last logged in. |
| | User Account Age | Number | Number of days since the user's account was created |
| - | Admin Insights Published At | Date-time | Date and time the Admin Insights data source was last published in UTC |

## Groups Data Source

The Groups data source identifies group membership of users on the site. There’s one row of data for each unique combination of group and user pairing. Groups without members, and users not in a group, are included as a row of data with null values represented as "NULL".

Create custom views

If you're a site admin or someone who has been granted access to the Admin Insights project, you can access the Admin Insights data sources directly from Tableau Cloud using Web Authoring or through Tableau Desktop to build custom views. For more information about connecting to Admin Insights data sources, see Use Admin Insights to Create Custom Views.

Example: Which users are in a given group?

Use the following steps to create a view that displays the users in a group.

1. Connect to the Groups data source.
2. From the **Data** pane, drag **Group Name** to the **Rows** shelf.
3. (Optional) In the view, select the groups you want to explore, and then select **Keep Only**.

4. From the **Data** pane, drag **User Email** to the **Rows** shelf, placing it to the right of the **Group Name** field.

Do more with your data

Using Tableau Prep, you can join Groups with other Admin Insights data sources on the following fields to get more visibility into your site. If you're analyzing data from multiple Tableau Cloud sites, you must also join on "Site LUID = Site LUID".

- Join Groups to TS Users on "User LUID = User LUID"

For more information, see Aggregate, Join, or Union Data in Tableau Prep Help.

Data schema

The following table lists the fields included in the Groups data source. Each row of data corresponds to a unique combination of group and user pairing.

| Folder | Field Name | Type | Description |
|---|---|---|---|
| Group | Group Is Licensed On Site | Boolean | Whether or not Grant License on Sign In is enabled |
| | Group LUID | String | LUID of the group associated with the user. Primarily useful for referencing a group in the REST API. |
| | Group Minimum Site Role | String | Minimum site role associated with the group. Will be null if Grant License on Sign In is not enabled. |
| | Group Name | String | Name of the group |
| Site | Site LUID | String | LUID of the site associated with the user. Primarily useful for referencing a site in the REST API. |
| | Site Name | String | Name of the site associated with the |

| | | | |
|---|---|---|---|
| | | | user |
| User | User Email | String | Email address associated with the user’s account |
| | User LUID | String | LUID of the user. Primarily useful for referencing users in the REST API |
| - | Admin Insights Published At | Date-time | Date and time the Admin Insights data source was last published in UTC |
| | Count of Distinct Groups | Number | Distinct count of groups on the site |
| | Count of Distinct Users | Number | Distinct count of users on the site |

## Site Content Data Source

The Site Content data source provides essential governance information about the projects, data sources, flows, workbooks, and views on a site. The data provided about a content item may be unique to its item type. Item types with unique fields are in folders with titles that correspond to their Item Type.

Starting in December 2023, the Site Content data source includes Tableau Pulse information for your site. You can find the fields dedicated to Tableau Pulse within the "Metric" folder while creating views.

**Note:** Users that connect to the Site Content data source see data about all content items on the site, regardless of the permissions set for each item. Keep this in mind if you plan to distribute to non-administrative users.

## Create custom views

If you're a site admin or someone who has been granted access to the Admin Insights project, you can access the Admin Insights data sources directly from Tableau Cloud using Web Authoring or through Tableau Desktop to build custom views. For more information about connecting to Admin Insights data sources, see Use Admin Insights to Create Custom Views.

### Example: What percent of site published data sources are certified?

Use the following steps to create a view that displays the percentage of certified published data sources on the site.

1. Connect to the Site Content data source.
2. From the **Data** pane, drag **Migrated Data (Count)** to the **Columns** shelf.
3. From the **Data** pane, drag **Data Source Content Type** to the **Filters** shelf, clear the **All** checkbox, and select the **Published** checkbox.
4. From the **Data** pane, drag **Data Source Certified** to Color on the **Marks** card.
5. Right-click the **CNT (Migrated Data)** field in the **Columns** shelf and select **Quick Table Calculation** > **Percent of Total**.

## Do more with your data

Using Tableau Prep, you can join Site Content with other Admin Insights data sources on the following fields to get more visibility into your site. If you're analyzing data from multiple Tableau Cloud sites, you must also join on "Site LUID = Site LUID".

- Join Site Content to TS Events on “Item ID = Item ID” and “Item Type = Item Type”
- Join Site Content to TS Users on “Owner Email = User Email” or “Owner Email = Item Parent Project Owner Email"

For more information, see Aggregate, Join, or Union Data in Tableau Prep Help.

Data schema

The following table lists the fields included in the Site Content data source. Each row of data corresponds to a unique content item, with Item LUID as the unique identifier for content in a Tableau Cloud site.

| Folder | Field Name | Type | Description |
|---|---|---|---|
| Data Source | Data Source Content Type | String | Indicates if the Data Source is Published or Embedded. Will be NULL for any Items that are not Data Sources. |
| | Data Source Database Type | String | Type of database connection (i.e. mysql, postgres, sqlproxy, etc.). Will be NULL for any Items that are not Data Sources. |
| | Data Source Is Certified | Boolean | Whether or not the Data Source is a Certified Data Source. Will be NULL for any Items that are not Data Sources. |
| Dates | Created At | Date-time | Date and time the item was created, in UTC. |
| | Created At (Local) | Date-time | Date and time the item was created, adjusted by the Timezone parameter. |
| | Extracts Incremented At | Date-time | Date and time the data source was incrementally refreshed, in UTC. For incremental refreshes only. |
| | Extracts Incremented At (Local) | Date-time | Date and time the data source was incrementally refreshed, adjusted by the Timezone parameter. |
| | Extracts | Date-time | Date and time the data source was |

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|---|---|---|---|
| | Refreshed At | | last refreshed, in UTC. For full extract refreshes only. |
| | Extracts Refreshed At (Local) | Date-time | Date and time the data source was last refreshed, adjusted by the Timezone parameter. |
| | First Published At | Date-time | Date and time the item was first published, in UTC. |
| | First Published At (Local) | Date-time | Date and time the item was first published, adjusted by the Timezone parameter you've set. |
| | Last Accessed At | Date-time | Date and time the item was last accessed, either by accessing a View or connecting to a Data Source, in UTC. |
| | Last Accessed At (Local) | Date-time | Date and time the item was last accessed, either by accessing a View or connecting to a Data Source, adjusted by the Timezone parameter you've set. |
| | Last Published At | Date-time | Date and time the item was last published, in UTC. |
| | Last Published At (Local) | Date-time | Date and time the item was last published, adjusted by the Timezone parameter you've set. |
| | Updated At | Date-time | Date and time the item was last updated, in UTC. |
| | Updated At (Local) | Date-time | Date and time the item was last updated, adjusted by the Timezone parameter you've set. |

| | | | |
|---|---|---|---|
| Hyperlinks | Item Hyperlink | String | Full URL of the item on the site. (Useful for creating hyperlinks to the item). |
| | Site Hyperlink | String | The root URL of the Tableau Cloud site |
| Item | Description | String | The text description of the item. Will be NULL for View items. |
| | Has Incremental Extract | Boolean | Whether or not it is possible to perform an incremental extract for this Workbook or Data Source. |
| | Has Refresh Scheduled | Boolean | Whether or not the Workbook or Data Source has extracts being refreshed on a schedule. |
| | Has Refreshable Extract | Boolean | Whether or not refreshable extracts are available for the Workbook or Data Source.<br><br>(For example: .hyper files published via REST API are not refreshable from Tableau Cloud, so those extracts would be labeled False) |
| | Is Data Extract | Boolean | Whether or not the Workbook or Data Source contains an Extract. |
| | Item ID | Number | The ID of the item. The ID is unique within each Item Type and Site. |
| | Item LUID | String | The LUID of the item. The LUID is unique within each item type and site. Primarily used to reference content via the REST API. |

| | | | |
|---|---|---|---|
| | Item Name | String | Display name of the item |
| | Item Parent Project ID | Number | Item ID of the parent project that contains the item, such as a workbook or data source The Item ID of this item's Parent Project. (Ex: The Item ID of the Project a Workbook resides in.) |
| | Item Parent Project Level | String | The Project Level of this item's Parent Project. (Ex: The Project Level of the Project a Workbook resides in.) |
| | Item Parent Project Name | String | The name of the item’s parent project. For example, the item name of the project a workbook resides in. |
| | Item Parent Project Owner Email | String | The email address of the parent project owner |
| | Item Revision | Number | The revision number of the item |
| | Item Type | String | The type of item that this content is. Either a Data Source, Flow, Project, View or Workbook. |
| | Owner Email | String | Email address of the item owner |
| | Top Parent Project Name | String | The name of the item's top parent project. For example, the item name of the project at project Level 0 of this item's project hierarchy. Will be NULL for top-level projects. |
| - | Size (bytes) | Number | The size of the item in bytes (÷1,000,000,000 for GB) |
| | Size (MB) | Number | The size of the item in MB (÷1,000 for |

| | | | |
|---|---|---|---|
| | | | GB) |
| | Total Size (bytes) | Number | The total size of the item in bytes (÷1,000,000,000 for GB) |
| | Total Size (MB) | Number | The total size of the item in MB (÷1,000 for GB) |
| Metric | Adjustable Filter Options | String | The fields added as adjustable filter options to a metric definition, or the filter options selected on a metric. |
| | Has Definition Filters | String | Whether or not there are definition filters applied. |
| | Metric Definition Aggregation | String | The aggregation for the measure being tracked. |
| | Metric Definition Data Source ID | String | The data source that the metric definition is connected to |
| | Metric Definition ID for Related Metric | String | The definition that the metric is related to |
| | Metric Definition Number Format | String | The format for the metric value |
| | Metric Time Granularity | String | The level of detail that the data is aggregated at |
| Project | Controlled Permissions Enabled | Boolean | The asset permissions setting for projects. When true, project permissions are locked, and assets inherit project permission rules. |

| | | | |
|---|---|---|---|
| | Controlling Permissions Project LUID | String | The LUID of the project that controls permissions for the nested project |
| | Controlling Permissions Project Name | String | The name of the project that controls permissions for the nested project |
| | Nested Projects Permissions Enabled | Boolean | The asset permissions setting for nested projects. When true, nested project permissions are locked, and assets inherit permission rules from the parent project. |
| | Project Level | Number | The level of the project within its hierarchy. The value increments by 1 for each level: 0 = Top-level project, 1 = A project whose parent is a top-level project, 2 = A project whose parent's parent is a top-level project, and so on. The value is NULL for any items that are not projects. |
| Site | Site LUID | String | LUID of the site associated with the user. Primarily used for referencing a site in the REST API. |
| | Site Name | String | The name of the Tableau Cloud site |
| - | Storage Quota (bytes) | Number | The storage capacity of the Tableau Cloud site in bytes. |
| View | View Title | String | The title of the view. The value is NULL for items that are not views. |
| | View Type | String | The type of view. Either a story, dashboard, or sheet. The value is NULL for items that are not views. |

| | | | |
|---|---|---|---|
| | View Workbook ID | Number | ID of the parent workbook of the view. Primarily used for hyperlinks and the REST API. The value is NULL for items that are not views. |
| | View Workbook Name | String | Display name of the parent workbook of the view. The value is NULL for items that are not views. |
| Workbook | Workbook Shows Sheets As Tabs | Boolean | Whether or not the sheets of the workbook are displayed as tabs. The value isNULL for items that are not workbooks. |
| - | Admin Insights Published At | Date-time | Date and time the Admin Insights data source was last published in UTC |
| | Timezone | String | Specifies the timezone for displaying dates. This field represents an integer value used to determine the number of hours to offset from UTC. It doesn't account for Daylight Saving Time adjustments. |

## Viz Load Times Data Source

Viz Load Times contains the load time information for views on your site to help content authors better understand the user experience when loading views.

Create custom views

If you're a site admin or someone who has been granted access to the Admin Insights project, you can access the Admin Insights data sources directly from Tableau Cloud using Web Authoring or through Tableau Desktop to build custom views. For more information about connecting to Admin Insights data sources, see Use Admin Insights to Create Custom Views.

Example: Which views take the longest to load?

Use the following steps to create a view that displays load times, helping to identify which views take the longest to load.

1. Connect to the Viz Load Times data source.
2. From the **Data** pane, drag **Item Name** to the **Rows** shelf and **Duration** to the **Columns** shelf.
3. From the **Data** pane, drag **Status Code Type** to the **Filters** shelf and select the **Success** checkbox.
4. In the **Columns** shelf, right-click **Dimensions** and select **Measure (Count)** > **Median**.

Do more with your data

Using Tableau Prep, you can join Viz Load Times with other Admin Insights data sources on the following fields to get more visibility into your site. If you're analyzing data from multiple Tableau Cloud sites, you must also join on "Site LUID = Site LUID".

- Join Viz Load Times to TS Events and Site Content on “Item Repository URL = Item Repository URL”
- Join Viz Load Times to TS Events and Site Content on “Item Type = Item Type”

For more information, see Aggregate, Join, or Union Data in Tableau Prep Help.

Data schema

The following table lists the fields included in the Viz Load Times data source. Each row of data corresponds to a request for a content item and the load duration, measured in seconds.

| Folder | Field Name | Type | Description |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Item | Item Hyperlink | String | Full URL of the item on the site |
| | Item Luid | String | LUID of the item (data source or view) that was requested. |
| | Item Name | String | Display name of the item |
| | Item Owner Email | String | Email address of the item owner |
| | Item Repository URL | String | A unique name for the item (data source or view) that the request relates to, derived from the ASCII characters in the name, which can be used in URLs to refer to it. |
| | Item Type | String | The type of item, either a data source or view. |
| Project | Project Name | String | The name of the project that contains the item |
| | Project Owner User Name | String | Email address of the project owner |
| Request | HTTP Request URI | String | The request URI |
| | HTTP User Agent | String | The agent string supplied by the client |
| | Request ID | String | Primary key for the request |
| | Request Time | Date-time | The date and time that the request started, in UTC. |
| | Request Time (local) | Date-time | The date and time that the request started, adjusted by the Timezone parameter. |

| | | | |
|---|---|---|---|
| | Status Code | Number | The status returned to the client |
| | Status Code Type | String | The type of status code. The value 1 = Informational response, 2 = Success, 3 = Redirect, 4 = Client error, and 5 = Server error. |
| Workbook | Workbook Name | String | For views, the name of their parent workbook that contains the item requested. |
| | Workbook Owner User Name | String | For views, the email address of the owner of the parent workbook that contains the item requested. |
| - | Admin Insights Published At | Date-time | Date and time the Admin Insights data source was last published in UTC |
| | Timezone | String | Specifies the timezone for displaying dates. This field represents an integer value used to determine the number of hours to offset from UTC. It doesn't account for Daylight Saving Time adjustments. |

## Job Performance Data Source

Job Performance contains events and runtime information for background jobs on the site, such as extract refreshes and flow runs. Starting May 2023, Job Performance includes Tableau Bridge refresh data, including the Bridge client name, pooling data, and refresh started and completed times.

Create custom views

If you're a site admin or someone who has been granted access to the Admin Insights project, you can access the Admin Insights data sources directly from Tableau Cloud using Web

Authoring or through Tableau Desktop to build custom views. For more information about connecting to Admin Insights data sources, see Use Admin Insights to Create Custom Views.

Example: How many extract refreshes and flow runs occur on the site?

Use the following steps to create a view that displays the total number of extract refreshes and flow runs that occur on the site.

1. Connect to the Job Performance data source.
2. From the **Data** pane, drag **Item Name**, **Item Type**, **Owner Email**, and **Job Type** to the **Rows** shelf.
3. In the **Rows** shelf, right-click **Item Name** and select **Sort**.
4. In the Sort dialog, select **Sort By** > **Field** and **Field Name** > **Job ID**. Close the dialog.
5. From the **Data** pane, drag **Started At (local)** to the **Columns** shelf.
6. In the **Columns** shelf, right-click **Started At (local)** and select **Exact Date**. This converts the dimension to a measure.
7. From the **Data** pane, drag **Job Result** to Color and **Job Execution Duration (Days)** to Size on the **Marks** card.

Example: What is the average job queued duration?

Use the following steps to create a view that displays the average job queued duration.

1. Connect to the Job Performance data source.
2. From the **Data** pane, drag **Started At** to the **Columns** shelf and **Started At (local)** to the **Rows** shelf.
3. In the **Columns** shelf, right-click the **Started At** field and select **Day** from the second set of values (i.e., May 11, 2022). This converts the field to a measure.

4. In the **Rows** shelf, right-click **Started At (local)** and select **More** > **Hour** from the first set of values (i.e., 9).
5. On the **Marks** card, select **Square** from the Shape dropdown menu.
6. From the **Data** pane, drag **Job Queued Duration** to Color on the **Marks** card. Right-click the field and select **Measure** > **Average**.
7. From the **Data** pane, drag **Job ID** to Size on the **Marks** card. Right-click the field and select **Measure** > **Count (Distinct)**.

Do more with your data

Using Tableau Prep, you can join Job Performance with other Admin Insights data sources on the following fields to get more visibility into your site. If you're analyzing data from multiple Tableau Cloud sites, you must also join on "Site LUID = Site LUID".

- Join Job Performance to Site Content on "Item ID = Item ID"

For more information, see Aggregate, Join, or Union Data in Tableau Prep Help.

Data schema

The following table lists the fields included in the Job Performance data source. Each row of data corresponds to a unique background job and the related content item, providing information about job status, duration, and error details.

| Folder | Field Name | Type | Description |
|---|---|---|---|
| Bridge | Agent is Pooled? | String | Indicates whether the Bridge client is part of a pool |
| | Agent Name | String | Name of the Bridge client that performed the refresh |
| | Agent Timezone | String | The timezone of the Bridge client |
| | Agent Version | String | The version of Bridge deployed on the |

| | | | |
|---|---|---|---|
| | | | machine |
| | Bridge Error Message | String | The error message associated with the failed request |
| | Bridge Error Type | String | The type of refresh error |
| | Bridge Initiator User Name | String | The user who initiated the refresh request, either from a scheduled task or manual run |
| | Bridge Job Result | String | The result of the Bridge refresh job. Either Succeeded or Failed. |
| | Pool Name | String | Name of the pool associated with the Bridge client |
| Dates | Bridge Completed At | Date-time | Date and time the Bridge refresh was completed in UTC |
| | Bridge Completed At (Local) | Date-time | Date and time the Bridge refresh was completed, adjusted by the Timezone parameter. Does not account for daylight savings. |
| | Bridge Started At | Date-time | Date and time the Bridge refresh was started in UTC |
| | Bridge Started At (Local) | Date-time | Date and time the Bridge refresh was started, adjusted by the Timezone parameter. Does not account for daylight savings. |
| | Completed At | Date-time | Date and time the job was completed in UTC |
| | Completed At (Local) | Date-time | Date and time the job was completed, adjusted by the Timezone parameter. |

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|---|---|---|---|
| | | | Does not account for daylight savings. |

| | | | |
|---|---|---|---|
| | Created At | Date-time | Date and time the job was created in UTC |
| | Created At (Local) | Date-time | Date and time the job was created, adjusted by the Timezone parameter. Does not account for daylight savings. |
| | Overflow Queued At | Date-time | Date and time the job entered the overflow queue in UTC. Jobs enter the overflow queue when they exceed concurrent capacity for the site. Will be NULL for jobs that weren’t added to the overflow queue. |
| | Overflow Queued At (Local) | Date-time | Date and time the job entered the overflow queue, adjusted by the Timezone parameter. Does not account for daylight savings. |
| | Queued At | Date-time | Date and time the job was queued in UTC. For most jobs, this is the same as the Created At date. For jobs that exceed concurrent capacity on the site, this is when the job was eligible to run. |
| | Queued At (Local) | Date-time | Date and time the job was queued, adjusted by the Timezone parameter. Does not account for daylight savings. |
| | Started At | Date-time | Date and time the job was started in UTC |
| | Started At (Local) | Date-time | Date and time the job was started, adjusted by the Timezone parameter. Does not account for daylight savings. |

| | | | |
|---|---|---|---|
| Hyperlinks | Item Hyperlink | String | Full URL of the item on the site |
| Item | Item ID | String | The ID of the item related to the job. The ID is unique within each Item Type and Site. |
| | Item LUID | String | The LUID of the item. The LUID is unique within each item type and site. Primarily used to reference content via the REST API. |
| | Item Name | String | For data sources, flows, and workbooks, the display name of the item that the job is related to. |
| | Item Type | String | The type of item that the job is related to. Either a data source, flow, workbook, or view. |
| | Owner Email | String | Email address of the item owner |
| | Parent Project Name | String | The Item Name of this item's Parent Project. |
| | Parent Project Owner Email | String | The email address of the owner of the parent project (if any) that the item exists within. |
| Job | Error Message | String | Runtime details associated with the job, such as ID, status, and error messages |
| | Final Job Result | String | The final result of the background job, either Succeeded or Failed |
| | Job ID | String | The ID of the job generated. The ID is unique per Job Type and Site. |
| | Job LUID | String | The LUID of the job. The LUID is |

| | | | |
|---|---|---|---|
| | | | unique with each job type and site. Primarily used to reference content via the REST API. |
| | Job Result | String | The result of the background job, either Succeeded or Failed. |
| | Job Type | String | The type of job. Either an extract refresh, incremental refresh, flow run, subscription, data alert, or metric. |
| | Subscriber Email | String | Email address of the individual receiving the subscription |
| | Subscriber ID | String | User ID of the subscription creator |
| | Subscription Subject | String | The email Subject entered by the user when they subscribed to the workbook or view. |
| | Was Manual Run | Boolean | Whether or not the job was initiated manually by clicking the “Run Now” option on the site. |
| | Was Overflow Queued | Boolean | Whether or not the job exceeded the concurrent capacity. |
| Schedule | Schedule LUID | String | The LUID of the schedule that the background task is associated with |
| | Schedule Name | String | Name of the schedule that the background task is associated with |
| - | Admin Insights Published At | Date-time | Date and time the Admin Insights data source was last published in UTC |
| | Bridge Extract Upload Duration | Number | The amount of time it took for the extract to upload in seconds |

| | | | |
|---|---|---|---|
| | Bridge Refresh Duration | Number | The amount of time elapsed since the refresh was started in seconds |
| | Job Duration | Number | How long it took for the job to run, in seconds. Includes queue time and overflow queue time. |
| | Job Execution Duration | Number | The amount of time running after the job was started, in seconds. |
| | Job Overflow Queued Dur-ation | Number | The amount of time waiting to enter the queue due to concurrent jobs capacity, in seconds. |
| | Job Queued Duration | Number | The amount of time spent in the queue, in seconds. |
| | Timezone | Number | Specifies the timezone for displaying dates. This field represents an integer value used to determine the number of hours to offset from UTC. It doesn't account for Daylight Saving Time adjustments. |

## Permissions Data Source

Permissions contains the effective permissions for all users and content on the site. Admin-istrators can use the data source to identify gaps in permissions security and ensure that only the appropriate users can access content items.

**Note:** Site roles determine the maximum capabilities a user can have. For example, a Viewer can’t web edit, even if they’re allowed in a user or group rule. Based on the order that permissions are evaluated, users may have different capabilities than listed in the data source. For more information, see Effective permissions.

Create custom views

If you're a site admin or someone who has been granted access to the Admin Insights project, you can access the Admin Insights data sources directly from Tableau Cloud using Web Authoring or through Tableau Desktop to build custom views. For more information about connecting to Admin Insights data sources, see Use Admin Insights to Create Custom Views.

Example: Which users and groups have access to content?

Use the following steps to create a view that displays which users and groups have access to content.

1. Connect to the Permissions data source.

2. From the **Data** pane, drag **Item Type**, **Item Name**, **Item Parent Project Name**, and **Controlling Permissions Project Name** to the **Rows** shelf. This creates a hierarchical view of your site content and shows how permissions are determined, for example, if permissions are set at the project level or on individual pieces of content.

3. From the **Data** pane, drag **Grantee Name** and **Grantee Type** to the **Rows** shelf. Adding these dimensions shows the users and groups with access to the content.

4. From the **Data** pane, drag **Capability Type** to the **Rows** shelf. The capabilities for users and groups are displayed.

Do more with your data

Using Tableau Prep, you can join Permissions with other Admin Insights data sources on the following fields to get more visibility into your site. If you're analyzing data from multiple Tableau Cloud sites, you must also join on "Site LUID = Site LUID".

- Join Site Content to Permissions on "Item LUID = Item LUID" (left join)
- Join Permissions to TS Users on "User LUID = User LUID"
- Join Permissions to Groups on "Grantee LUID = Group LUID" (right join)

**Tip:** To streamline analysis, delete the All Users group rule or edit the rule to remove permissions.

For more information, see Aggregate, Join, or Union Data in Tableau Prep Help.

Data schema

The following table lists the fields included in the Permissions data source. Each row of data corresponds to a combination of user, content item, and permission capability.

| Folder | Field Name | Type | Description |
|---|---|---|---|
| Capabilities | Capability Type | String | The ability to perform a given action on the item. Options include view, filter, download, or delete and are unique to the item type. |
| | Permissions Description | String | A description of the permission value. |
| | Permission Value | Number | A numerical representation of the effective permissions for a content asset. Lower values indicate precedence. For example, denying a capability to a group (8) is overridden by allowing that capability to a user in the group (7). |
| Grantees | Grantee LUID | String | The LUID of the grantee. Either the user LUID or Group LUID. Primarily used to reference content via the REST API. |
| | Grantee Name | String | The name of the grantee. Either the user email or group name. |
| | Grantee Type | String | The type of the grantee. Either user or group. |

| | | | |
|---|---|---|---|
| Items | Controlling Permissions Project Name | String | The name of the project that controls permissions for the nested project. |
| | Item Hyperlink | String | Full URL to the item on the site. Useful for creating hyperlinks on a dashboard. |
| | Item LUID | String | The LUID of the item. The LUID is unique within each item type and site. Primarily used to reference content via the REST API. |
| | Item Name | String | Display name of the item. |
| | Item Parent Project Name | String | The name of the item's parent project. |
| | Item Type | String | The type of content item. Such as a data source, prep flow, project, or workbook. |
| | Top Parent Project Name | String | The name of the item's top-level project. |
| Site | Site LUID | String | The LUID of the Tableau Cloud site. Primarily used to reference content via the REST API. |
| | Site Name | String | The name of the Tableau Cloud site. |
| - | Admin Insights Published At | Date-time | Date and time the Admin Insights data source was last published in UTC. |
| | User Email | String | The email address of the user with effective permission. |

| | | | |
|---|---|---|---|
| | User LUID | String | The LUID of the user with effective permission. |
| | User Site Role | String | The site role of the user. |
| | Has Permission? | Calculated field | Tells you if the grantee is allowed access to an item. Does not take into account the Site Administrator capability. Site Administrators will have more permissions than captured by the calculation. |

## Subscriptions Data Source

The Subscriptions data source provides details about subscriptions on the site, including the name of the creator and recipient, content item, job status, and schedules. Site administrators can use this data to improve the viewing experience for users who access content through subscriptions.

Starting in February 2024, the Subscriptions data source includes Tableau Pulse information for your site. The "Subscriber Group Name" and "Subscriber Group LUID" fields have been included in the User folder. These fields display the group name and LUID when a user is following a metric as part of a group.

Create custom views

If you're a site admin or someone who has been granted access to the Admin Insights project, you can access the Admin Insights data sources directly from Tableau Cloud using Web Authoring or through Tableau Desktop to build custom views. For more information about connecting to Admin Insights data sources, see Use Admin Insights to Create Custom Views.

Example: How often do users receive subscriptions?

Use the following steps to create a view that displays how often users receive subscriptions.

1. Connect to the Subscriptions and TS Events data sources.
2. Select **Data** > **Edit Blend Relationships**.
3. In the Blend Relationships dialog, set the primary data source to **Subscriptions**, and select the **Custom** radio button.
4. Click **Add**.
5. In the Add/Edit Field Mapping dialog, map **Subscriber Email** to **Actor User Name**, and click **OK**.
6. Click **OK** to exit the Blend Relationships dialog.
7. From the **Data** pane, drag **Subscriber Email**, **Subject**, and **Last Sent (local)** to the Rows shelf.
8. From the **Data** pane, drag **Number of Events** to the Columns shelf.
9. Verify that **Item LUID**, **Item Type**, and **Actor User Name** are the linking fields in the **Data** pane. If there are broken links, click the icon next to the field name to link the two data sources.
10. From the **Data** pane, drag **Subscription Status** to **Color** on the Marks card.

Example: What are the most popular Pulse metrics?

Use the following steps to create a view that displays the most popular Tableau Pulse metrics.

1. Connect to the Subscriptions data source.
2. From the **Data** pane, drag **Item Type** to the Filter shelf, and then select the **Metric** checkbox in the dialog.
3. Drag **Item LUID** and **Item Name** to the Rows shelf.
4. Drag **CNT(Subscriber User LUID)** to the Columns shelf.
5. From the toolbar, select the **Sort Descending** button to sort the X axis.

> **Note:** The viz displays subscribed users individually. To view users subscribed by group, use the "Subscriber Group Name" and "Subscriber Group LUID" fields.

6. From the menu, click **Analysis** > **Create Calculated Field**.

   a. Name:

      ```
      Is Group Follow
      ```

   b. Calculation:

      ```
      NOT ISNULL(Subscriber Group LUID)
      ```

7. From the **Data** pane, drag **Is Group Follow** to **Color** on the Marks card.

8. Drag **Subscriber Group Name** to **Detail** on the Marks card.

   **Tip:** Understanding which users chose to follow a metric themselves, rather than being added by others, can help identify which metrics are naturally popular.

9. From the menu, click **Analysis** > **Create Calculated Field**.

   a. Name:

      ```
      User Self-Followed
      ```

   b. Calculation:

      ```
      NOT [Is Group Follow] AND [Created By User Email] <> [Sub-
      scriber Email]
      ```

10. From the **Data** pane, drag **User Self-Followed** to **Color** on the Marks card.

Do more with your data

Using Tableau Prep, you can join Subscriptions with other Admin Insights data sources on the following fields to get more visibility into your site. If you're analyzing data from multiple Tableau Cloud sites, you must also join on "Site LUID = Site LUID".

- Join Subscriptions to TS Events on "Subscriber Email = Actor User Name"

For more information, see Aggregate, Join, or Union Data in Tableau Prep Help.

Data schema

The following table lists the fields included in the Subscriptions data source. Each row of data corresponds to a subscription and recipient combination.

| Folder | Field Name | Type | Description |
|---|---|---|---|
| Content | Item LUID | String | The LUID of the item included in the subscription |
| | Item Type | String | The type of item included in the sub-scription, either a workbook or view |
| | Item Name | String | Display name of the item included in the subscription |
| | Item Owner Email | String | Email address of the item owner |
| | Item Hyperlink | String | Full URL of the item on the site |
| Dates | Created At | Date-time | Date and time the subscription was created in UTC |
| | Created At (Local) | Date-time | Date and time the subscription was created, adjusted by the Timezone parameter. |
| | Last Sent | Date-time | Date and time the subscription was last sent in UTC |
| | Last Sent (Local) | Date-time | Date and time the subscription was last sent, adjusted by the Timezone parameter. |
| Subscription | Data Conditions | String | The condition for when subscriptions |

| | | | |
|---|---|---|---|
| | | | are sent, either Always or When data is available |
| | Has Image Attached | Boolean | Indicates whether an image is attached to the subscription email |
| | Has PDF Attached | Boolean | Indicates whether a PDF is attached to the subscription email |
| | Is Extract Refresh Triggered | Boolean | Indicates whether the data extract associated with the subscription has been refreshed |
| | Schedule LUID | String | The LUID of the schedule |
| | Schedule Name | String | Name of the schedule |
| | Subject | String | The subject of the subscription |
| | Subscription LUID | String | The LUID of the subscription |
| | Subscription Status | String | Status of the subscription, either Act-ive or Suspended |
| User | Created By User Email | String | Email address of the user that cre-ated the subscription |
| | Created By User LUID | String | The LUID of the user that created the subscription |
| | Subscriber Email | String | Email address of the user receiving the subscription |
| | Subscriber User LUID | String | The LUID of the user receiving the subscription |
| | Subscriber Group Name | String | If user is following a metric as part of a group, the name of the group. |

| | | | |
|---|---|---|---|
| | Subscriber Group LUID | String | If user is following a metric as part of a group, the LUID of the group. |
| - | Admin Insights Published At | Date-time | Date and time the Admin Insights data source was last published in UTC |
| | Number of Recipients | Number | Distinct count of recipients |
| | Number of Sub-scriptions | Number | Distinct count of subscriptions |
| | Timezone | String | Specifies the timezone for displaying dates. This field represents an integer value used to determine the number of hours to offset from UTC. It doesn't account for Daylight Saving Time adjustments. |

## Tokens Data Source

Tokens contains information about active, unexpired user tokens on the site, including personal access tokens (PATs), refresh tokens, and OAuth tokens. Site administrators can monitor token usage and expiration through the data source, rotating essential tokens as needed.

The following tokens are included in the data source:

- **OAuth Database** - Manage the access tokens used for OAuth connections. The tokens are valid until a Tableau Cloud user deletes it, or the data provider revokes it. For more information, see OAuth Connections.

- **OAuth Client** - Manage refresh tokens used by connected clients, such as Tableau Desktop and Tableau Prep. For more information, see Access Sites from Connected Clients.

- **Personal access tokens (PATs)** - Manage long-lived authentication tokens used to sign in to Tableau Cloud, such as automated scripts and tasks that are created with the Tableau REST API. For more information, see Personal Access Tokens.

At any time, site administrators can quickly revoke a token by unlicensing a user with the undesired token. With the caveat that new tokens have to be created when the user is relicensed. For steps on removing or revoking specific types of tokens, follow the links in the previous section.

Create custom views

If you're a site admin or someone who has been granted access to the Admin Insights project, you can access the Admin Insights data sources directly from Tableau Cloud using Web Authoring or through Tableau Desktop to build custom views. For more information about connecting to Admin Insights data sources, see Use Admin Insights to Create Custom Views.

Example: When were OAuth Database tokens last updated?

Use the following steps to create a view that measures when OAuth database tokens were last update and token rotation compliance within an organization.

1. Connect to the Tokens data source.
2. From the **Data** pane, drag **Token Type** to the Filter shelf. Select the **OAuth Database** checkbox, and click **OK**.
3. Drag **Database Type**, **Database User Name**, and **Last Updated** to the **Rows** shelf.
4. On the **Rows** shelf, right-click **Last Updated** and select **Exact Date** from the context menu. Change the field from continuous to discrete.
5. From the menu, click **Analysis** > **Create Calculated Field**.
    a. Name: Days Since Last Update
    b. Calculation:

```
ROUND(TODAY()-[Last Updated])
```

6. Click **OK**.

7. From the **Data** pane, drag Days Since Last Update to the Rows shelf. Change the field from continuous to discrete.

Example: When do embedded OAuth database tokens expire?

To prevent disruptions such as view load errors and failed extract refreshes, it's important to monitor the expiration of embedded OAuth database tokens. Use the following steps to create a view that identifies tokens nearing expiration, enabling users to refresh their credentials proactively.

> **Note:** Tableau doesn't store expiration times for OAuth database tokens. To obtain this information, contact your database administrator to verify expiration details for each database type.

1. Connect to the Tokens data source.

2. From the **Data** pane, drag **Token Type** to the Filter shelf. Select the **OAuth Database** checkbox, and click **OK**.

3. Drag **Database Type** and **Owner Email** to the Rows shelf.

4. From the menu, click **Analysis** > **Create Calculated Field**. In this example, we use a Snowflake database with a 90-day expiration period.

   a. Name: `Expires At (all tokens)`

   b. Calculation:

   ```
   IF [Token Type] = 'OAuth Database'
   THEN
   IF [Database Type] = 'snowflake'
   THEN DATEADD('day', 90, [Last Updated])
   ```

```
// add conditions for other database types here //
ELSE NULL
END
ELSE [Expires At]
END
```

5. From the menu, click **Analysis** > **Create Calculated Field**.

   a. Name: `Days Until Expiration`

   b. Calculation:

   ```
   DATEDIFF('day', TODAY(), [Expires At (all tokens)])
   ```

6. Drag **Days Until Expiration** to the Rows shelf. Change the field from continuous to discrete.

7. Drag **Days Until Expiration** to the Filters shelf. Select **All Values**, setting the Maximum to 14. This filters tokens expiring in the next 14 days or those already expired. Adjust as needed.

8. Use the resulting values to contact users whose tokens are set to expire soon.

Example: Which users own PATs on the site?

The following example displays the names and site roles of users who own PATs on the site. You can adjust the filter for other token types.

1. Connect to the Tokens and TS Users data sources.

2. Select **Data** > **Edit Blend Relationships**.

3. In the Blend Relationships dialog, set the primary data source to **Tokens**, and select the **Custom** radio button.

4. Click **Add**.

5. In the Add/Edit Field Mapping dialog, map **Owner Email** to **User Email**, and click **OK** > **OK**.

6. From the **Data** pane, drag **Token Type** to the Filter shelf. Select the **PAT** checkbox, and click **OK**.

7. From the **Data** pane, drag **User Name**, **User Site Role**, **Expires At**, and **Last Used At** At to the **Rows** shelf.

8. Verify that **User Email** is the linking field in the **Data** pane. If there is a broken link, click the icon next to the field name to link the two data sources.

9. On the **Rows** shelf, right-click **Expires At** and select **Exact Date** from the context menu. Change the field from continuous to discrete.

10. Repeat step 7 for **Last Used At**.

Do more with your data

Using Tableau Prep, you can join Tokens with other Admin Insights data sources on the following fields to get more visibility into your site. If you're analyzing data from multiple Tableau Cloud sites, you must also join on "Site LUID = Site LUID".

- To see the site role of the token owner, join Tokens to TS Users on “Owner Email” = “User Email”

- To see group membership of the token owner, join Tokens to Groups on “Owner Email” = “User Email”

For more information, see Aggregate, Join, or Union Data in Tableau Prep Help.

Data schema

The following table lists the fields included in the Tokens data source. Each row of data corresponds to a combination of Token ID and Owner Email.

| Folder | Field Name | Type | Description |
|---|---|---|---|
| Database | Asset Key ID | Numeric | ID of the database entry. Applies to |

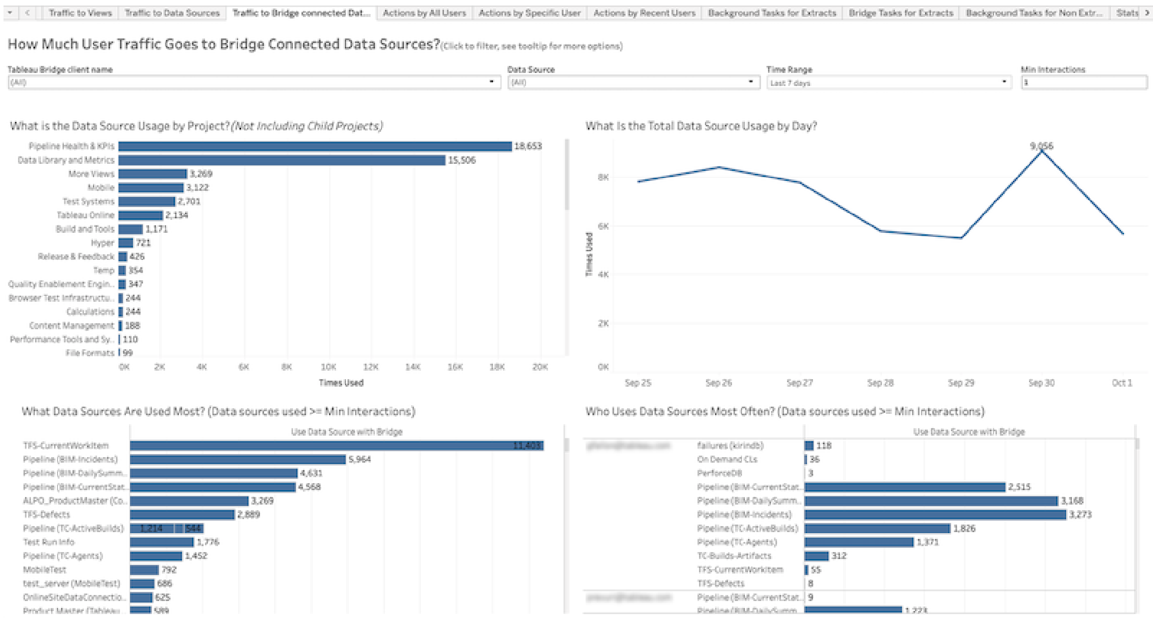
| | | | |
|---|---|---|---|
| | | | OAuth Database tokens. |
| | Database Type | String | The type of database, for example, Salesforce, Snowflake, etc. Applies to OAuth Database tokens. |
| | Database User Name | String | Name of the user connecting to the database. Applies to OAuth Database tokens. |
| | Instance URL | String | The instance URL for the data provider, for example, https://login.salesforce.com. Applies to OAuth Database tokens. |
| | Last Updated | Date-time | Date and time the data source credentials were last changed in UTC. Applies to OAuth Database tokens. |
| Devices | Device ID | String | ID of the connected client associated with the token. Applies to OAuth Client tokens. |
| | Device Name | String | Name of the connected client associated with the token. Applies to OAuth Client tokens. |
| Site | Site LUID | String | The LUID of the Tableau Cloud site. Primarily used to reference content via the REST API. |
| | Site Name | String | Name of the Tableau Cloud site. |
| Token | Expires At | Date-time | Date and time the token expires in UTC. Applies to PAT and OAuth Client tokens. |
| | GUID | String | Unique ID of the token. Applies to PAT and OAuth Client tokens. |

| | | | |
|---|---|---|---|
| | Issued At | Date-time | Date and time the token was issued in UTC. |
| | Last Used At | Date-time | Date and time the token was last used in UTC. Applies to PAT and OAuth Client tokens. |
| | Owner Email | String | Email address of the token owner. |
| | PAT Name | String | Name of the personal access token. Applies to PATs. |
| | Token Identifier | String | Uniquely identifies a row of data using the GUID for PAT and OAuth Client tokens and Asset Key ID for OAuth Database tokens. |
| | Token Type | String | An enumerated value for the token type. Either personal access token (PAT), OAuth Client, or OAuth Database. |
| - | Admin Insights Published At | Date-time | Date and time the Admin Insights data source was last published in UTC. |

## Traffic to Bridge Connected Data Sources

The **Traffic to Bridge Connected Data Sources** admin view gives the site admin the ability to see usage of data sources with live connections. This view can help you determine which data sources are most heavily used and those that are used less often. You can filter the information you see by selecting the Bridge client name, data source, and the time range.

This view gives you a snapshot of Tableau Cloud activity over the past 30 days.




The top of the view shows you how data sources are being used over the **Time Range** you specify (the default is the last 7 days):

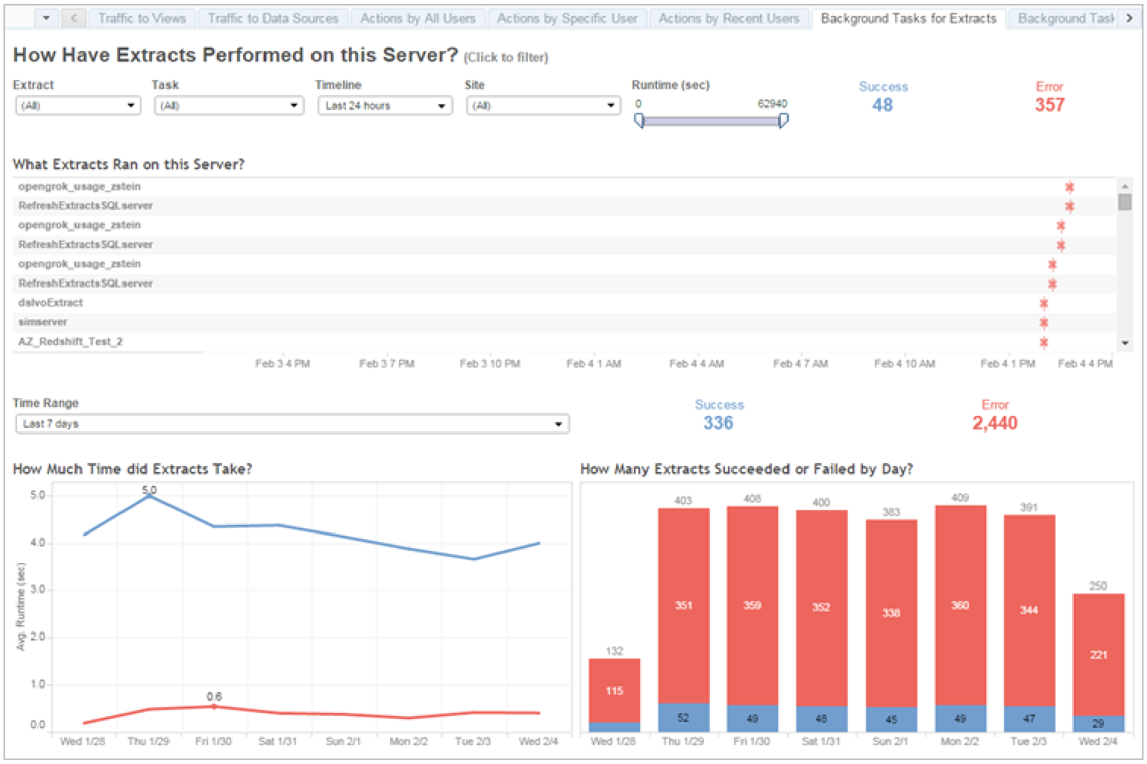
- **What is the Data Source Usage by Project**—this shows total data source usage by project, based on the filters you set. Hover over a mark to see the number of times a data source was used. Select the mark to update the other sections of the view based on your selection.
- **What is the Total Data Source Usage by Day**—this shows total data source usage by day, based on the filters you set. Hover over a point on the line to see the count. Select the point to update the other sections of the view based on your selection.

Two bar graphs at the bottom of the view show results that are filtered by **Min Interactions**. These show you which data sources are most used, and who uses data sources most often. Only those data sources and users with interaction counts greater than or equal to the minimum interactions value are displayed:

- **What Data Sources are Used Most**—this is a list of the most used data sources. Like the other sections of the view, the information is limited by filters and any selection you make.
- **Who Uses Data Sources Most Often**—this shows the users who most often use the data sources. This is impacted by filters and any selection you make.

# Background Tasks for Extracts

The Background Tasks for Extracts view displays extract-specific tasks that run on the server. This view gives you a snapshot of Tableau Cloud activity over the past 30 days.




## Understand this view

To better understand this pre-built admin view, make note of the following:

- The table, "What Extracts Ran on this Server," lists the extracts that ran in the time period specified in **Timeline**.
- You can click **Success** or **Error** to filter the table based on status.
- You can also click a specific task to update the "How Much Time did Extracts Take" graph for the selected task.
- The table, "How Many Extracts Succeeded or Failed," updates for the status (success or failure) of the task, but the count of extracts that succeeded or failed does not change.

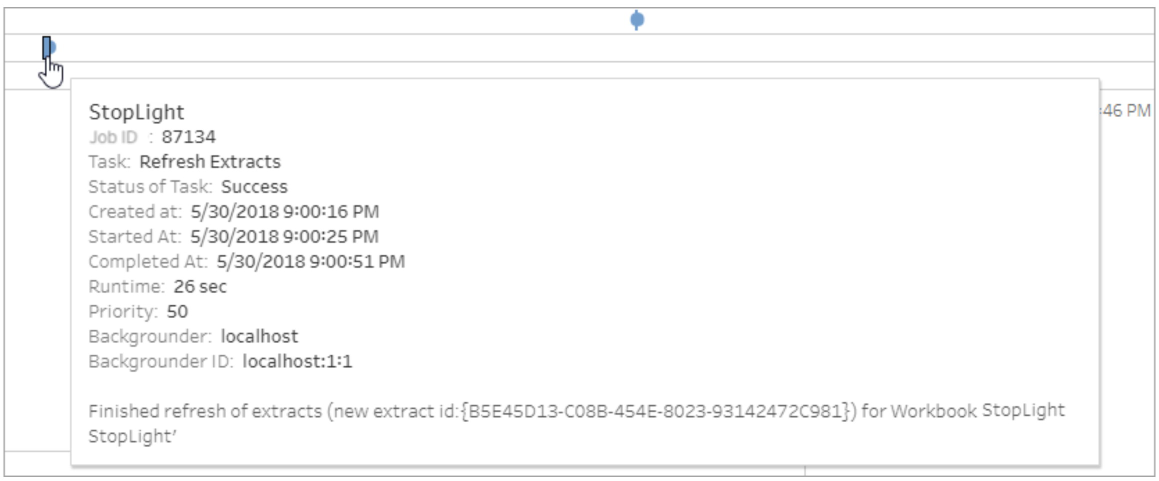
Status

Tasks can have a status of success or error.

| Icon | Description |
|---|---|
|  | **Error**—Server was unable to complete the task. |
|  | **Success**—Server completed the task. |

See details about a task

For details on about the task, use your mouse to hover over the success or error icon.




Errors in task details

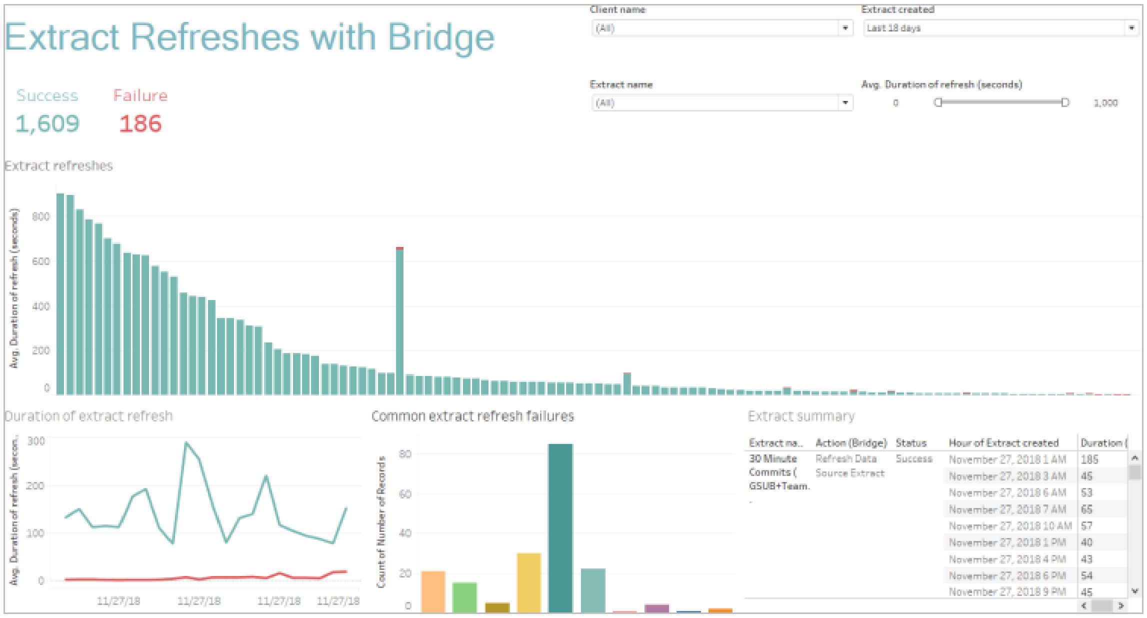
If a refresh task reaches the timeout limit, you might see one of the following errors in the task details:

- *The query time resource limit (7200 seconds) was exceeded.*
- *com.tableau.nativeapi.dll.TableauCancelException: Operation cancelled.*
- *The query time resource limit (8100 seconds) was exceeded.*

For more information about the timeout limit for refresh tasks and suggestions for resolving these errors, see Time limit for extract refreshes.

# Bridge Extracts

The **Bridge Extracts** admin view captures the last 30-days' worth of refresh activity by Tableau Bridge.




This pre-built admin view can help answer the following questions the site admin might have about refreshes performed by one or all of the Bridge clients registered to the site:

- **Error rate:** How often are refreshes succeeding and failing? If refreshes are failing, why?
- **Requests made:** How many refreshes are scheduled?
- **Time-elapsed:** How long are refreshes taking?
- **Saturation:** How busy is each client?

You can filter the view by the client name, when the extract data source was created, the extract data source name, and the duration of the refresh.

Notes about this view

- If you don't see any data in the admin view, verify that you have a Bridge client associated with your site. Alternatively, change the value for the "Extract created" filter in the upper-right corner of the view.

- If you don't see the duration-based data that you expect in the view, clear the "Avg. Duration of refresh (seconds)" filter by clicking the Show All Values () icon.
- In the "Common extract refresh failures" table, hover over each bar to see the error and the error details. If there's more than one data source associated with the error, an asterisk (*) shows instead.
- In some cases, data on the *Bridge Tasks for Extracts* view is missing or incomplete. This is because the view doesn’t include certain jobs, such as canceled or failed jobs. Use *Background Tasks for Extracts* to view extract-specific tasks.

## Background Tasks for Non Extracts

The Background Tasks for Non Extracts view displays tasks that the server runs that are not related to standard Online extract refreshes. For example, Bridge Refresh jobs, edited OAuth connections, subscription notifications, and so on. This view gives you a snapshot of Tableau Cloud activity over the past 30 days.

A table lists the tasks that ran in the time range specified. Click **Success** or **Error** to filter the table based on status. Select a specific task in the **How Many Tasks Succeeded or Failed on this Site** table to update the **What Background Tasks Ran on this Site** graph for the selected task.

Tasks can have a status of success or error. For details about the task, use your mouse to hover over the success or error icon.

| Icon | Description |
|---|---|
| | **Error**—Server was unable to complete the task. |
| | **Success**—Server completed the task. |

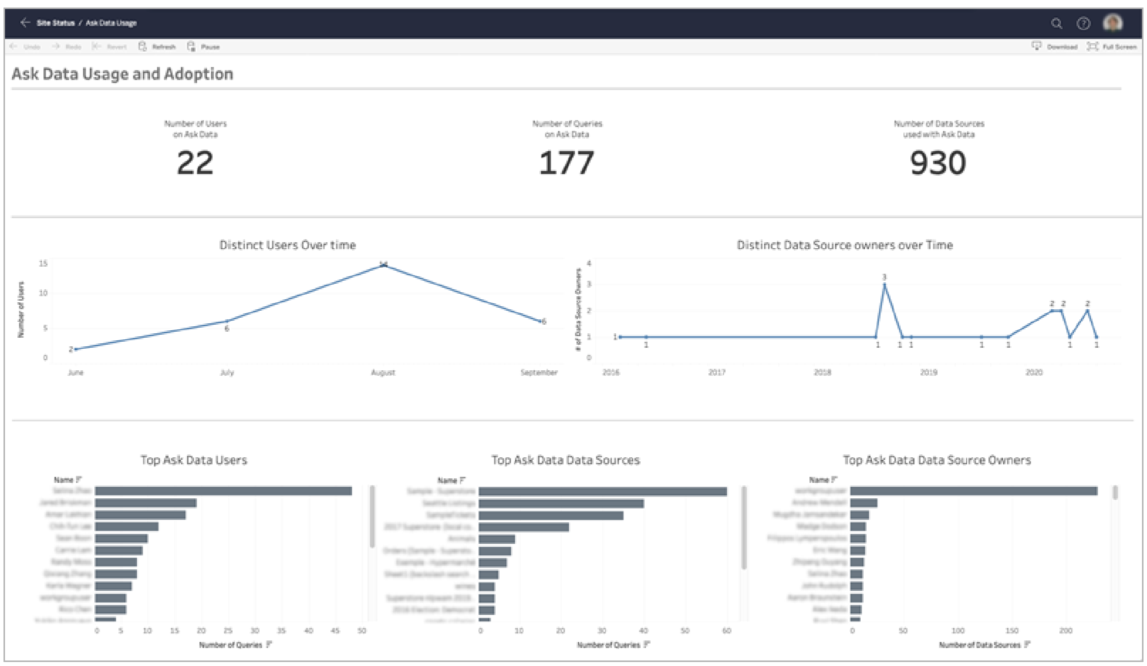
Details that you can see about the task are its ID, status, priority, when it was created, started and completed. You can also see its runtime: the total run time of the background job, which includes the run time of the job plus background job overhead such as initialization and cleanup. You can also see which backgrounder the job is running on.

# Ask Data Usage

**Important changes for Ask Data and Metrics**

Tableau's Ask Data and Metrics features were retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see *How Tableau AI and Tableau Pulse are reimagining the data experience.*

The Ask Data Usage view is a pre-built dashboard that allows site or server admins to see and understand the usage patterns and value of Ask Data for a site. Admins can see the growth of engagement with Ask Data and monitor the results of internal training or roll-outs. The dashboard highlights the top Ask Data users, data sources, and data source owners, along with some headline value metrics.



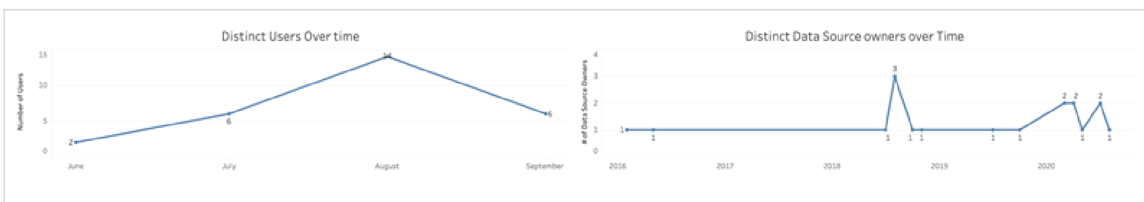

To enable Ask Data, see Disable or Enable Ask Data for a Site.

## Explore the dashboard

The Ask Data Usage view provides information about Ask Data across the entire site. You can use the following metrics to understand user engagement and help drive self-service analytics adoption in your organization.

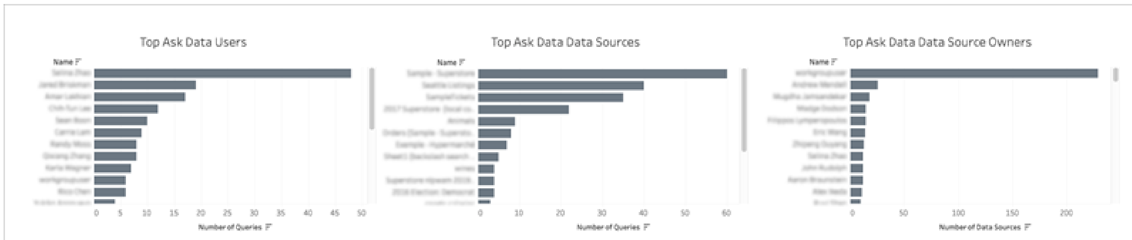

At the top of the dashboard, three headline metrics provide an overview of Ask Data usage on the site.

- **Number of Users on Ask Data** - This shows the total number of Ask Data users on the site.
- **Number of Queries on Ask Data** - This shows the total number of Ask Data queries issued on the site.
- **Number of Data Sources Used with Ask Data** - This shows the total number of data sources used with Ask Data.




In the middle of the dashboard, two line charts show you how Ask Data is used over time.

- **Distinct Users Over Time** - This shows the distinct number of Ask Data users over time.
- **Distinct Data Source Owners Over Time** - This shows the distinct number of data source owners over time.




At the bottom of the dashboard, three bar charts list the top Ask Data users, data sources, and data source owners.

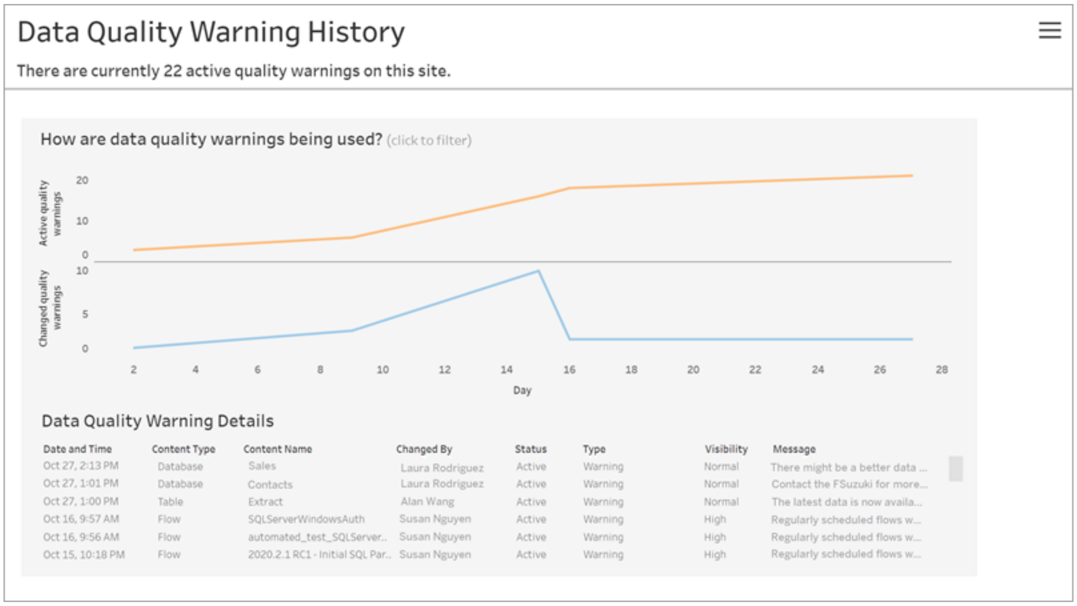
- **Top Ask Data Users** - This lists the top Ask Data users and the total number of queries issued by each user.
- **Top Ask Data Data Sources** - This lists the top Ask Data data sources and the total number of queries issued for each data source.
- **Top Ask Data Data Source Owners** - This lists the top Ask Data data source owners and the total number of data sources owned by each user.

## Data Quality Warning History

When Tableau Catalog is enabled in your environment, site administrators can see how data quality warnings are being used on the site using the pre-built admin view, Data Quality Warning History.

For more information about Tableau Catalog, part of Data Management, see "About Tableau Catalog" in the Tableau Server or Tableau Cloud Help.

From the Site Status page, select the Data Quality Warning History dashboard:




The dashboard shows how many data quality warnings are active over a period of time. It also shows how many warnings have been changed (created, updated, and deleted) over that same time period.

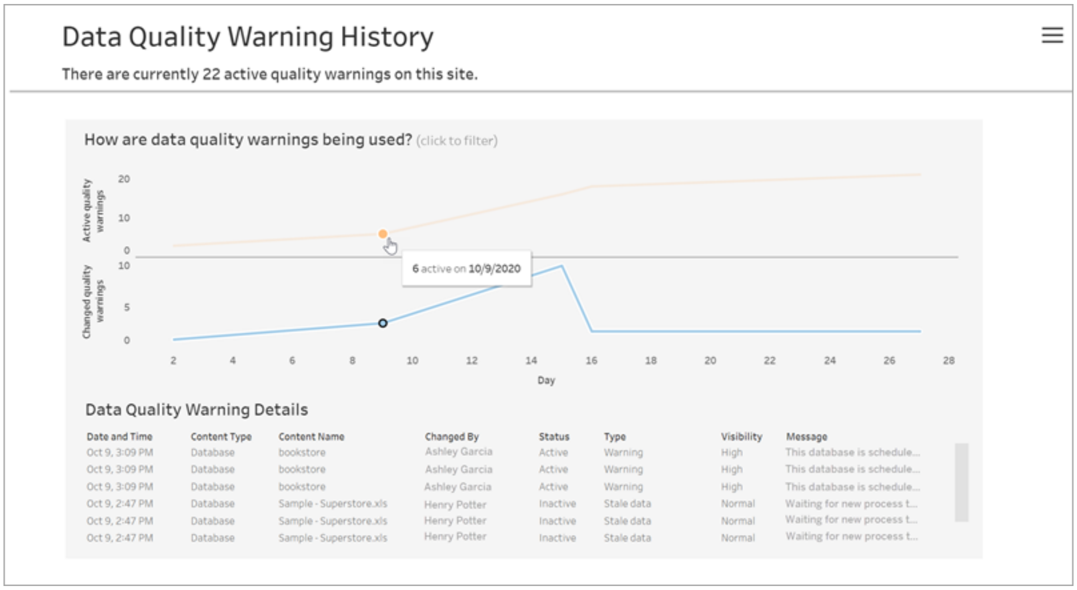
## See warning details

Under the line charts are the details about the data quality warnings, including:

- **Date and Time** - When the warning was created or last changed.
- **Content Type** - The type of asset the warning is set on, such as a database, table, or data source.
- **Content Name** - Name of the asset the warning is set on.
- **Changed By** - Name of the person who created or last changed the warning.
- **Status** - If the warning is active or inactive.
- **Type** - Warning type can be Stale data, Warning, Deprecated, Sensitive data, or Under maintenance.
- **Visibility** - The warning can be configured to have normal (the default) or high visibility.
- **Message** - The message the warning creator wrote to display to users when they see the details of the warning.

## Filter warning history

When you review data quality warning history, you can click a mark on the view to filter the details shown below the view.




The numbers on the Day axis represent the date within the time range. For example, if today is November 18, and you filter for the last 7 days, the Day axis shows 12-18.

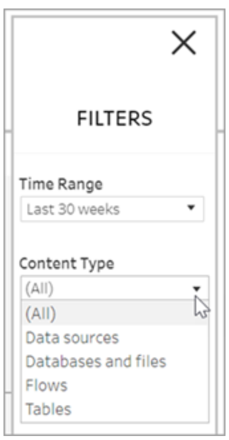
More filters are available when you click the filter icon in the upper right corner: filter by time range and by content type.

Filter by time range

The maximum time range you can configure is the past 30 days.


Filter by content type

You can see all the data quality warnings on your site, or you can filter to see warnings for specific types of assets, like data source or table:




## Who can do this

To set a data quality warning, you must be a server or site administrator.

# Administrative Views for Flows

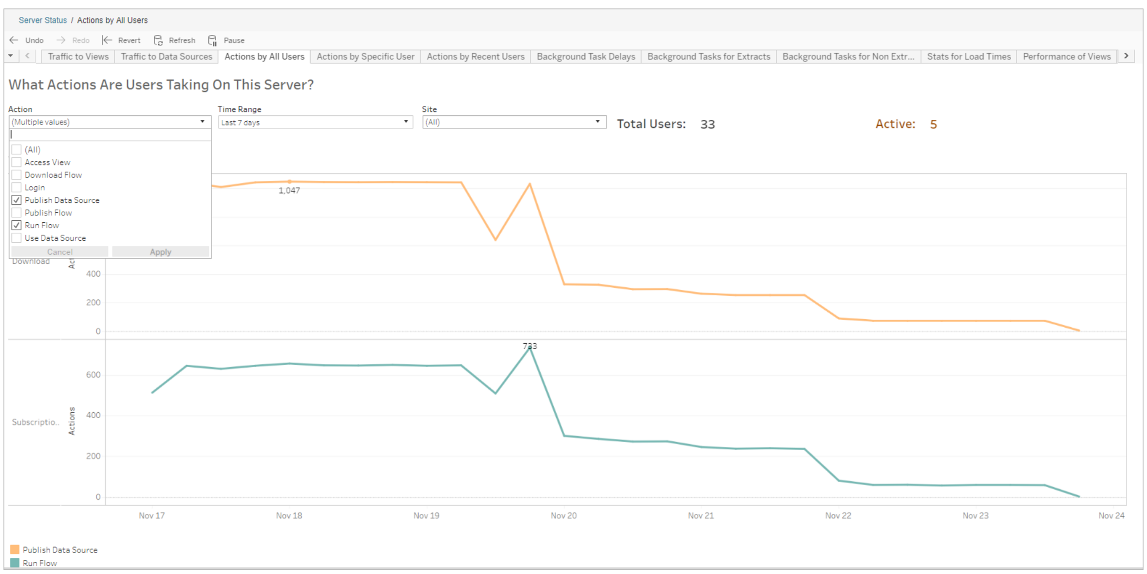
Administrative views can be used to monitor the activities related to flows, performance history, and the disk space used. The **Status** page contains an embedded Tableau workbook with various administrative views that can be used to monitor different types of server or site activity.

## Who can do this?

Tableau Site administrators can view and work with Administrative Views.

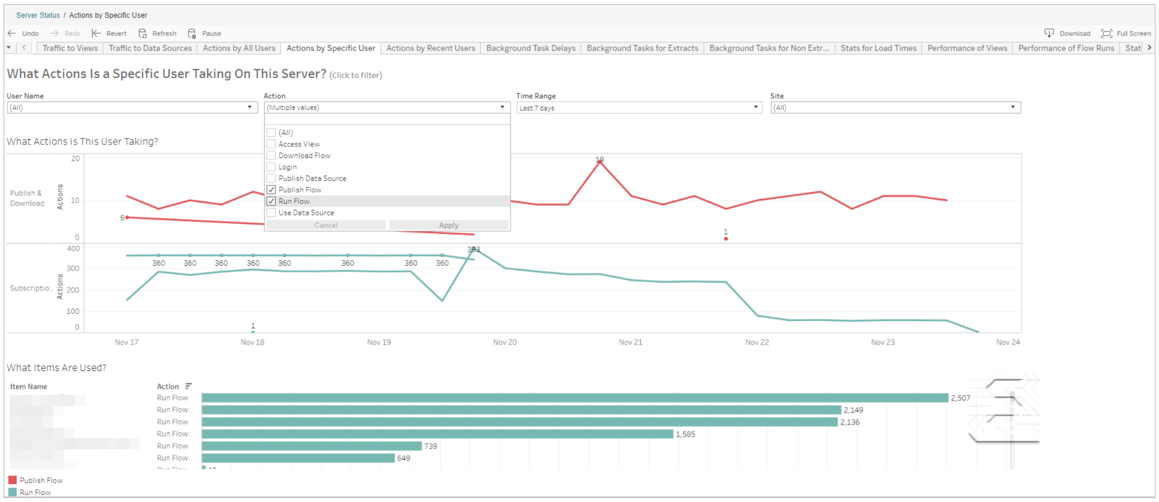
## Action by all users

Use this view to gather insight into how flows are being used. This includes actions like publish, download, and flow runs. You can filter the view by actions, by site, and by time range. The Total Users count shows the number of users who have performed an action. This value is not affected by any filtering. The Active user count shows the number of users who have been active during the selected time period and performed one of the selected actions.




## Action by Specific User

Use this view to gather insights about how an individual user is working with flows. You can filter the view by user name, the type of action, and by time range.




## Action by Recent Users

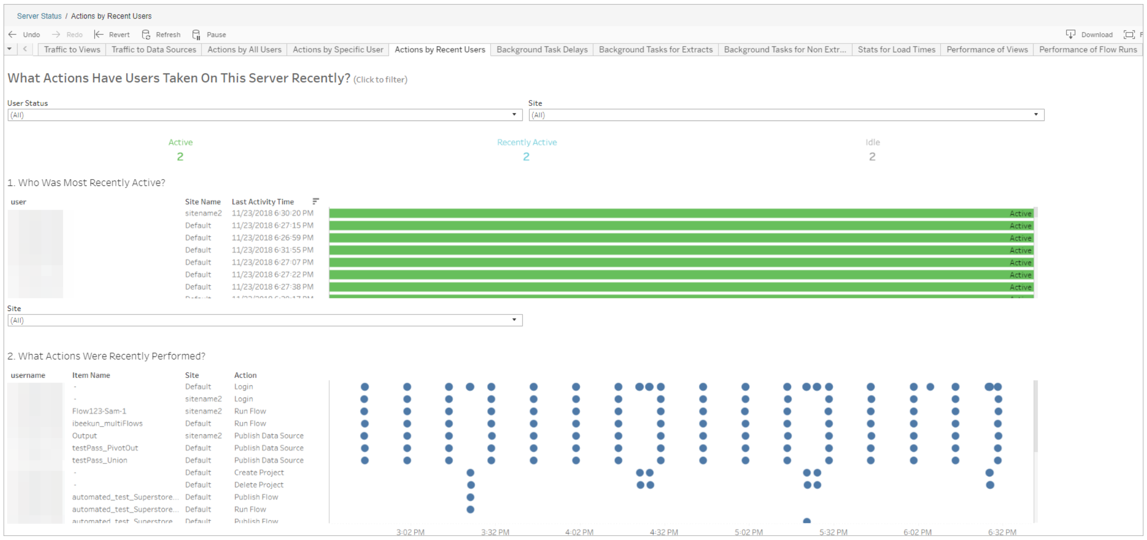
This view shows you which users have been active on Tableau Cloud over the past 24 hours.

This can be useful if you need to do some maintenance activity on the server and want to know which users and how many this will affect, and what they're doing.

The view shows **Active**, **Recently Active**, and **Idle** users that are currently signed in to Tableau Cloud.

For this view, an active user is one who took an action in the last 5 minutes, a recently active user is one who last took an action within 30 minutes, and an idle user is one who last took an action more than 30 minutes ago.

Select a user to see only the actions that user performed recently. Hover over an action to see details of the action.




## Backgrounder Task Delays

This view shows the delay for extract refresh tasks, subscription, and flow tasks—that is, the amount of time between when they are scheduled to run and when they actually run. You can use the view to help identify places you can improve server performance by distributing your task schedules and optimizing tasks.

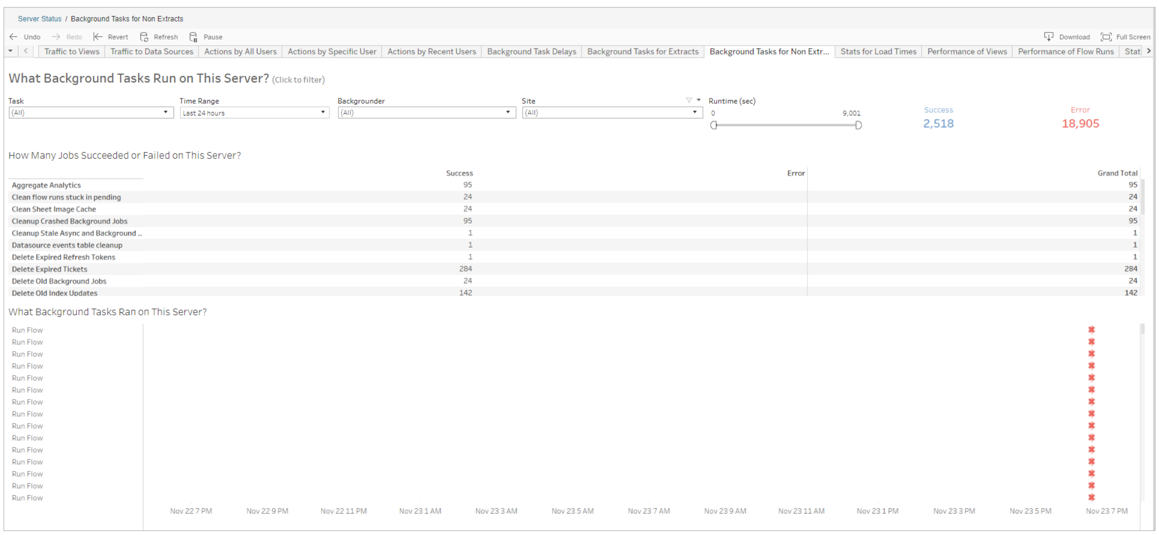

Possible reasons for the delays and ways to reduce the delays include the following:

- Many tasks are scheduled for the same time.

  In the example view, tasks that show long delays are clustered at the same time every day, which creates spikes in the wait time. You can set the Timeline filter to a single day to view task delays by hour and identify the hours of the day when many tasks are scheduled at the same time. One solution is to distribute the tasks to off-peak hours to reduce load on the server.

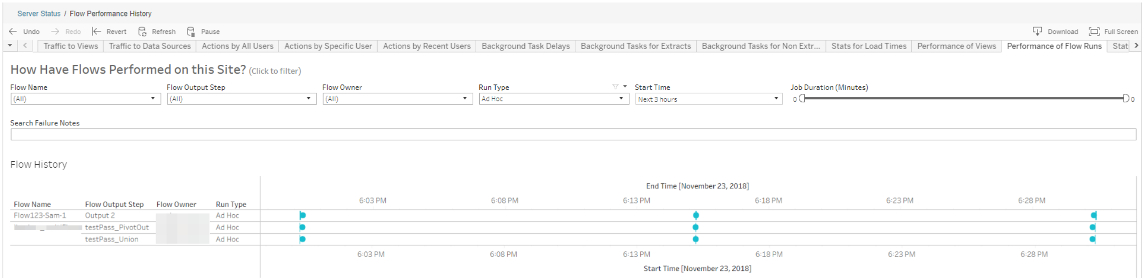
## Background Tasks for Non Extracts

Background Tasks are created to run flows (scheduled and ad hoc). You can use this view to see how many flow tasks succeeded or failed on this site. For details on a task, hover over its icon.




## Performance of Flow Runs

Use this view to see the performance history for all the flows on a site. You can filter by Flow Name, Output Step Name, Flow Owner, Run Type (Scheduled or Ad Hoc), and the time the flow runs were started.



Questions you can answer using this view include:

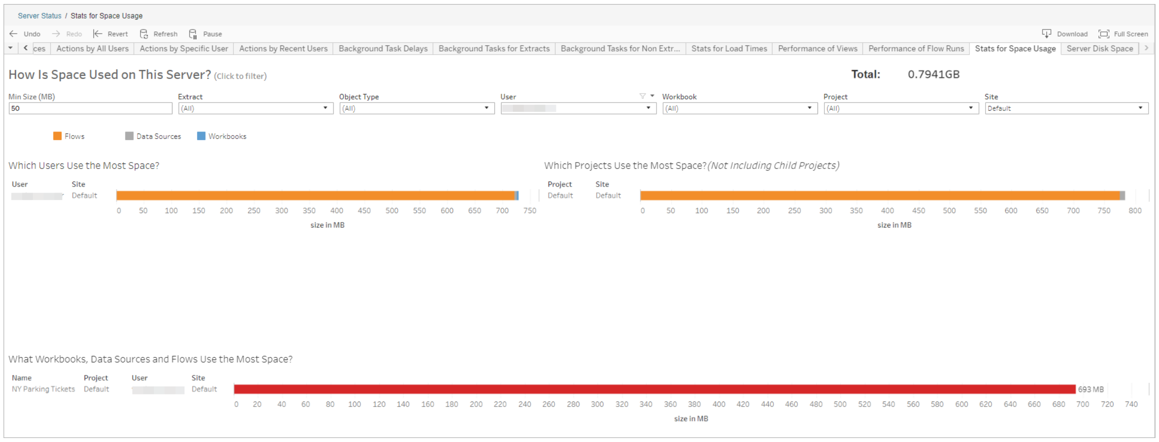
- **What flow tasks are currently scheduled?** – To do this, use the Start Time filter and select the time frame you want to look at. For example, to see flow tasks that are scheduled in the next 3 hours, select **Hours** -> **Next** -> and enter **3**.
- **What is the duration of flow tasks?** - To answer this, click on a mark in the view to see details, including the task duration.
- **How many flows were run ad hoc, and how many were scheduled runs?** - To answer this, use the **Run Type** filter and select **Ad hoc** or **Scheduled**.

This view can also show you the following information:

- Flows with the highest run frequency have the most marks.
- To see flows that are currently running at the same time, hover over a mark that shows “**In Progress**” or “**Pending and select** “**Keep Only**” to filter all flow runs that are currently running.
- To see flows that are running at the same time during a specific time range, select a range for the **Start Time** filter. For example, select “**Next three hours**” to see which flows will be running in the next three hours.

## Stats for Space Usage

Use this view to identify which flow outputs are taking up the most disk space on the server. Disk space usage is displayed by user, project, and by the size of flow output and is rounded down to the nearest number.



Use the Min Size filter to control which flow outputs are displayed, based on the amount of space they take up. Use the object type filter for flows.

- **What Users Use the Most Space** – This section shows the users who own flows (when filtered for flows) that are taking up the most space. Click a user name to filter the next two graphs for that user.

- **What Projects Use the Most Space** – This section shows the projects with flows (when filtered for flows) that are using the most space.

- **What Workbooks, Data Source and Flows Use the Most Space** – This section shows the flows (when filtered for flows) that take up the most space.

## Who can do this

- **Tableau Site Administrators**:
  - Set up email notifications at the site level
  - View errors
  - Resume suspended tasks
  - View alerts
- **Flow owners, project leaders and any user who is granted permissions to view the flow**:
  - View errors
  - Resume suspended tasks
  - View alerts (Flow owners)

# Notify Owners When Extract Refreshes Fail

A scheduled extract refresh can fail to complete for a variety of reasons, such as outdated embedded credentials or file path. For scheduled refreshes that run directly from Tableau Cloud, after a refresh has failed five consecutive times, Tableau Cloud suspends the schedule until a site admin or the data source owner takes an action to address the cause.

A site admin can enable Tableau Cloud to send email to the owner of a data source when its scheduled extract refresh does not complete successfully. The data source owner can then opt out individually in their account settings.

The email contains the following information:

- Extract or workbook name.
- The date and time of the last successful refresh. Or, if the last refresh was longer than 14 days ago, the email shows “not in the last *N* days.”
- The number of consecutive times the refresh has failed.
- A suggested action to take to address the cause of the failure, such as updating embedded credentials or a file path, and a link to Tableau Cloud to take the action.

When receiving email about data sources refreshed by Tableau Bridge, there will be some differences. For more information, see Differences for Tableau Bridge refreshes later in this topic.

## Enable refresh failure emails

As a site admin, you have the ability to enable (or disable) refresh failure emails for your site using the procedure below. If you opt in, each user can potentially opt out from receiving refresh failure emails from his or her individual account.

1. Sign in to Tableau Cloud as a site admin and click **Settings**.
2. Under **Manage Notifications** , select or clear the check boxes to allow or disable notifications for all of your site users.

### Differences for Tableau Bridge refreshes

For data sources that are refreshed through Tableau Bridge, notifications will vary. For more information, see Manage Email Alerts for Bridge.

# Manage Users and Groups

You can add users to your Tableau Cloud site and set their site roles, which determines each user's level of access. To make it easier to manage multiple users, you can organize users into groups.

## Add Users to a Site

Everyone who needs to access Tableau Cloud—whether to browse, publish, edit content or administer the site—must be added as a user. Administrators have the following options for adding users:

- Enter users' email addresses individually.
- Import Users via a CSV file that you create using the CSV Import File Guidelines.

This topic is intended for site administrators and discusses how to add users at the site level. For cloud administrators adding users to Tableau Cloud Manager, see Manage Users With Tableau Cloud Manager.

Add users

1. When you're signed in to the Tableau Cloud site, select **Users**.
2. On the **Users** page, click **Add Users**, and then click **Add Users by Email**.


3. Select the authentication method that you want imported users to sign in to Tableau Cloud with. If no authentication is configured on the site, imported users will be assigned Tableau with MFA authentication method.

   **Notes:**

   - You can go to the **Users** page to change users' authentication type any time after you add them.
   - To work with Tableau Cloud by way of tabcmd, the Tableau Data Extract Utility, or the Tableau APIs, users must authenticate with a TableauID account.

4. In the **Enter email addresses** box, enter the users' email addresses. If you add more than one user, separate each address with a semicolon.

   For example, *tdavis@example.com; jjohnson@example.com; hwilson@example.com*

5. Select a site role from the drop-down list, to assign that site role to all users you're adding.

   For site role definitions, see Set Users' Site Roles.

6. Click **Add Users**.

After adding users

- If a new user's email address is already associated with an account on tableau.com, the user is prompted to sign in using the existing email address and password for that account.

- If a new user's email address is not already associated with an account on tableau.com, the user is prompted to provide a first and last name and password.
- Until the user provides these values, their entry in the Tableau Cloud user list shows the email address preceded by a period.

  For example: `.snguyen@example.com`
- After the user signs in, the entry is updated to show the full name.

  For example: `Susan Nguyen`

## Set Users' Site Roles

When you add users to a site on Tableau Cloud, independent of their license type, you must apply a *site role* to them. The site role signifies the maximum level of access a user can have on the site. Along with content permissions, the site role determines who can publish, interact with or only view published content, or who can manage the site's users and administer the site itself.

### How user licenses, site roles, and content permissions work together

The intersection of a user's license type, site role, and content permissions determines the level of access a user has on the Tableau site.

1. The license type is associated with the user. The site role you want to assign to the user determines the license type they require.

   If a user is a member of multiple Tableau Cloud sites, they must have a license for every site they belong to.
2. The site role is also set at the user level. If a user is a member of multiple Tableau Cloud sites, they will have independent site roles. For example, the same user can have the Site Administrator Creator site role on one site and the Viewer site role on another site.

   The site role defines the maximum capabilities the user can have.

3. Whether the site role's maximum capabilities are available to the user depends on the permissions set on the content resources (projects, data sources, workbooks).

For example, let's say that a user has the following access on a site:

- Creator license
- Explorer site role
- Save permission capability on a project

In this scenario, the license allows connecting to and creating new data sources in the web editing environment or Tableau Desktop, and a permission rule allows them to save in a project. However, their site role prevents them from being able to save, so their effective permissions don't include the save capability. Therefore, the user can't publish content to the site.

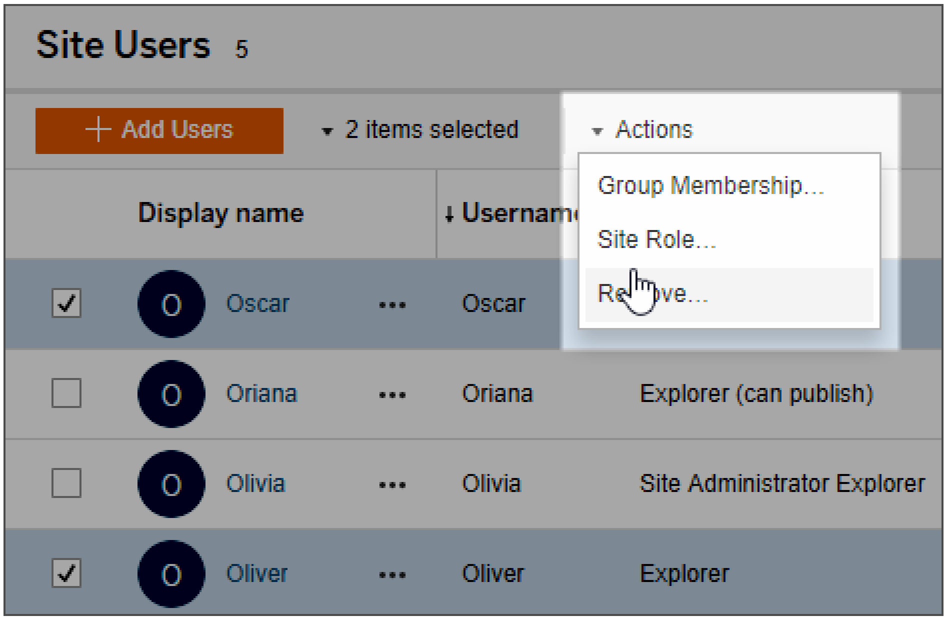
Even if a user has a creator license and a creator site role, if they don't have the save capability on at least one project, they can't publish anything to the site.

For more information, see Permissions.

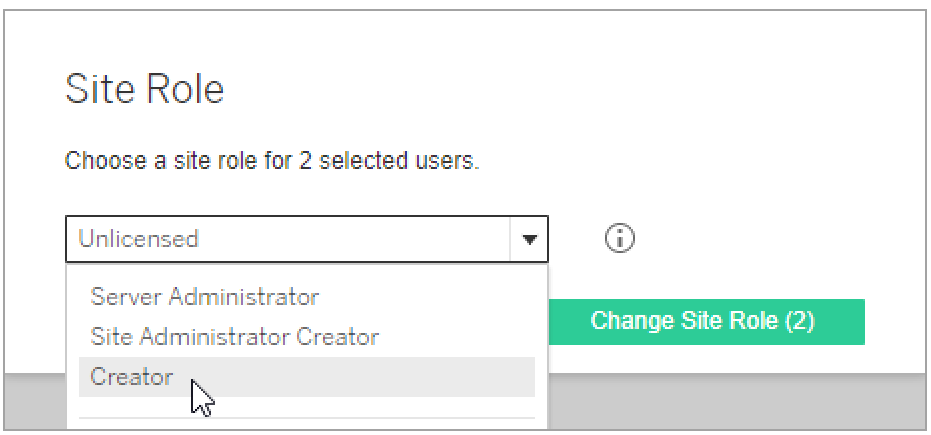
## Change a user's site role

1. Sign in to the site as a site administrator, and go to the **Users** area.

2. Select the users, and then select **Actions** > **Site Role**.




3. Select the new site role, and then click **Change Site Role**.




You can hover the pointer over the information icon to display a matrix that shows the maximum level of general capabilities each site role allows. For more information, continue to General capabilities allowed with each site role.

## General capabilities allowed with each site role

**Note:** This information focuses on *site* roles and is more generalized. For a list of common specific tasks available per *license* role, see the matrix on the For Teams & Organizations tab on the Tableau pricing page.

Tableau site roles

| Site role name | Maximum capabilities this site role allows |
| --- | --- |
| **Tenant roles that don't use a license** | |
| —Users with this role have access to Tableau Cloud Manager. | |
| Cloud Administrator | Available on Tableau Cloud Manager only; not assignable on Tableau Cloud sites.<br><br>This role is the highest level of administration within Tableau Cloud, enabling the creation of sites, management of users, and allocation of licenses across your organization at the tenant level.<br><br>Cloud administrators don’t consume licenses and only have access to Tableau Cloud Manager. To gain site access, cloud administrators can assign themselves a site role through Tableau Cloud Manager, thereby gaining access to any site within the tenant. For more information, see Use Tableau Cloud Manager. |
| **Site roles that use a Creator license** | |
| —Users with these site roles have access to Tableau clients such as Tableau Prep, Tableau Desktop, Tableau Bridge, and Tableau Mobile. | |

| Site role name | Maximum capabilities this site role allows |
|---|---|
| Site Administrator Creator | This is the highest level of access for a Tableau Cloud site.<br><br>Unrestricted access to content as described above, but at the site level. Connect to Tableau or external data in the browser, Tableau Desktop, or Tableau Prep; create new data sources; build and publish content.<br><br>On Tableau Server, server administrators can determine whether or not to allow site administrators to manage users and assign site roles and site membership. By default, on Tableau Server, and always on Tableau Cloud, site administrators are allowed these capabilities. |
| Creator | This is similar to the former Publisher site role, but allows new features. This site role offers non-administrators the maximum level of *content* access.<br><br>Connect to Tableau or external data in the browser, build and publish flows, data sources and workbooks, have access to Dashboard Starters, and use interaction features on published views. Can also connect to data from Tableau Prep or Tableau Desktop, publish (upload/save) and download flows, workbooks and data sources. |
| **Site roles that use an Explorer license** | |
| —Users with these site roles can access the server from the browser or Tableau Mobile. | |
| Site Administrator Explorer | Same access to site and user configuration as Site Administrator Creator, but can't connect to external data or virtual connections from the web editing environment.<br><br>Can connect to Tableau published data sources to create |

| Site role name | Maximum capabilities this site role allows |
| --- | --- |
| | new workbooks, and edit and save existing workbooks. Can't publish Tableau Prep flows. |
| Explorer (can publish) | Can publish workbooks from the web using existing data sources, browse and interact with published views, and use all interaction features.<br><br>In the web editing environment, can edit and save existing workbooks. Can't save new standalone data sources from data connections embedded in workbooks, and can't connect to external data or virtual connections, or create new data sources. Can't publish Tableau Prep flows. |
| Explorer | Can browse and interact with published views. Can subscribe to content, create data driven alerts, connect to Tableau published data sources and open workbooks in the web authoring environment for ad-hoc queries, but they can't save their work. Can't connect to a virtual connection. Can't publish Tableau Prep flows. |
| **Site roles that use a Viewer license** | |
| Viewer | Can see published views others have created and use most interaction features. Can subscribe to views and download as images or summary data. Can't connect to data, create, edit, or publish content, or set data alerts.<br><br>For a list of specific capabilities, see the **Viewer** column in the matrix on the Tableau pricing page.<br><br>**Note:** Although the Viewer site role existed in previous versions, the new Viewer site role has additional capabilities. |

| Site role name | Maximum capabilities this site role allows |
|---|---|
| **Other site roles** | |
| Unlicensed | Unlicensed users can't sign in to Tableau Server or Tableau Cloud. Users are assigned the Unlicensed role in the following circumstances:<br>• You import users from a CSV file and their license level is set to unlicensed.<br>• The number of available licenses is reached at the time you add or import users.<br>• You remove a user who owns content on the site. The user will still own the content but not be able to do anything with it. |

## Who can publish content

The following site roles allow the specified level of publishing access.

- **Site Administrator Creator**; and **Creator** allow full connecting and publishing access.

  This includes connecting to data and publishing new flows, new workbooks and new data sources from Tableau Desktop and the web editing environment. The site roles also allow editing and saving existing published workbooks, or publishing updates to existing data sources.

- **Explorer (Can Publish)** and **Site Administrator Explorer** have limited publishing capabilities, as described in General capabilities allowed with each site role.

- **Explorer**, **Viewer**, **Read Only**, and **Unlicensed** don't allow publishing.

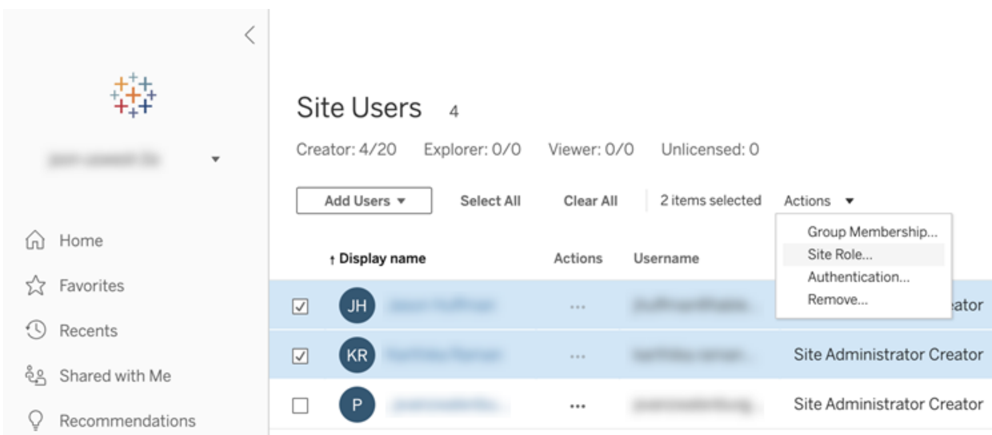
# View, Manage, or Remove Users

Administrators can manage a site's users such as adding and removing users, setting the groups they're members of, setting their site roles, and so on.

## View and manage users on a site

Sign in to a site as an administrator, and then select **Users**. On this page you can do any of the following to manage users:

- Set group membership, set site role, or remove the user from the site. If you've configured the site for SAML single sign-on, you can set the selected users' authentication type.




- Select a user name to see details about them, such as content they own, views they subscribe to, and their account settings.

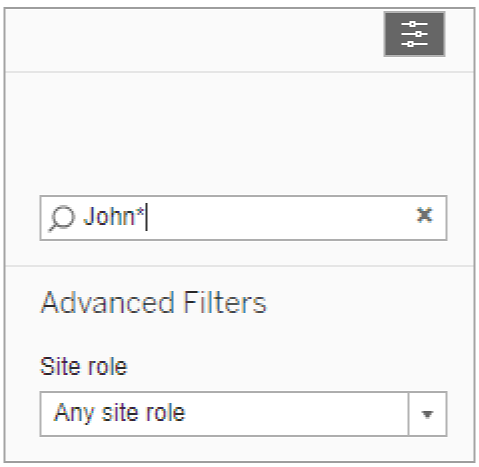
## Search for users (or groups)

To search for a specific user (or group), use the filter toggle in the upper right to display the search box and site role filter. Then use the search box or filters to find the users (or group) you want. The search operation checks the display name and user name attributes.

The search box supports the wildcard (*) character. For example, searching for `John*` will return all names that start with *John*.

In addition, you can do the following:

- Use the wildcard character (*) with a special character to search for names that contain special characters. For example, `sync-*` or `*sync-*`.
- Use the wildcard character (*) with AND or OR conditions when filtering users. For example, searching for `*aw* AND John*` returns all users whose names contain *aw* and whose names start with *John*.
- When searching for names with diacritics, names must be entered with exact diacritics to return relevant results. For example, to search for *José*, enter `José`. Searching for `Jose` will not return results.



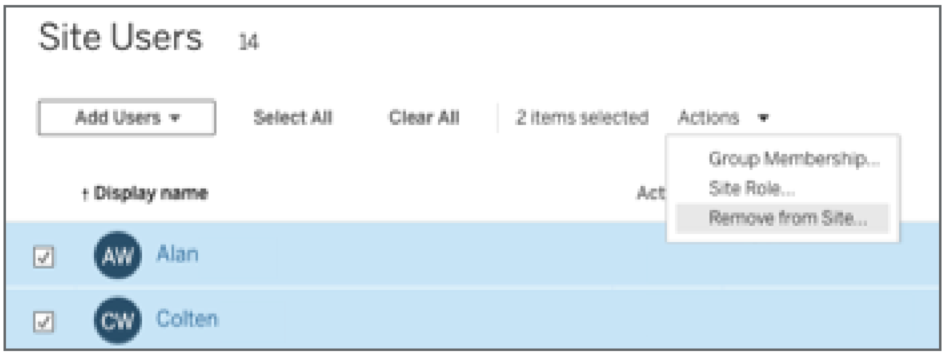

## Remove users from a site

You can remove a user only if the user does not own any content (projects, workbooks, views, data sources, collections, or data alerts for example). If you attempt to remove a user who owns content, the user site role will be set to **Unlicensed**, but the user will not be removed.

If the default All Users group has enabled Grant site role on sign in, that user's content must be reassigned to another user or removed before they can be unlicensed or removed. For more information on Grant role on sign in, see Removing users affected by Grant role on sign in. For more information on changing content ownership, see Manage Content Ownership

**Note:** On Tableau Server, when an administrator removes a user from a site (and the user belongs only to that one site), the user is also deleted from the server.

1. Sign in to a site as an administrator, and go to the **Users** area. Select one or more users to remove, and then select **Actions** > **Remove from Site**.




2. Click **Remove Users** button in the confirmation dialog.

## Set the User Authentication Type

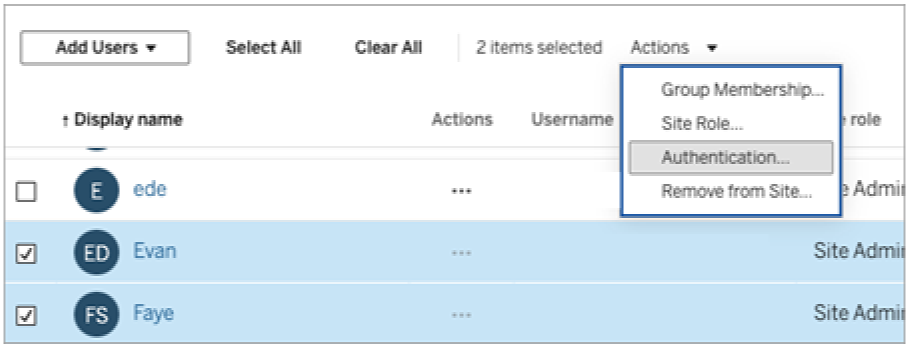
On a Google, OIDC, Salesforce, or SAML-enabled site, administrators can specify users' authentication method. For example, which users can access Tableau Cloud using their single sign-on (SSO) credentials.

You can assign authentication method at the time you add users to Tableau Cloud, as well as any time afterward.

1. When you're signed in to the Tableau Cloud site, select **Users**.

2. On the **Site Users** page, select the check boxes next to the users you want to assign an authentication type.

3. On the **Actions** menu, select **Authentication**.




4. In the Authentication dialog box, select the authentication method or **Tableau with MFA**.

## Notes

- If the authentication for the site changes, you'll see a warning symbol in the Authentication column on the Users page when a user is assigned that authentication method. Starting in November 2024 (Tableau 2024.3), if a user is assigned to an authentication method whose configuration is deleted, you'll see "Undefined" in the Authentication column for that user.

- If you change users' authentication from Tableau with MFA to Google, the next time they sign in, they will be directed to your identity provider's site to provide their credentials.

- If users were signing in using their external IdP credentials, and you change their authentication type to Tableau with MFA, if they do not have existing Tableau credentials, they will receive email from Tableau with instructions for creating new Tableau credentials.

- Tableau recommends that you dedicate a site administrator account that is always configured for Tableau with MFA authentication. In the event of an issue with your IdP, a dedicated Tableau account ensures that you always have access to your site.

- See Multi-Factor Authentication and Tableau Cloud for more information about the **Tableau with MFA** authentication option.

# Import Users

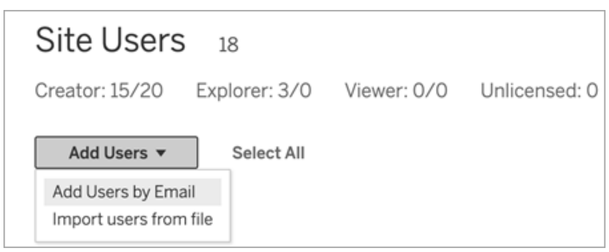
To automate the process of adding users to a site, you can create a CSV file that contains user information, and then import the file. When you import the CSV file, you also specify the users’ authentication type.

This topic is intended for site administrators and discusses how to import users to a particular site. For information on how to import users at the tenant level in Tableau Cloud Manager as a cloud administrator, see Manage Users With Tableau Cloud Manager.

**Note:** This topic contains the steps for importing, assuming that you have already created the CSV file. If you have not created the file yet, see CSV Import File Guidelines for a list of file format requirements and import options.

## Add users from a CSV file

1. When you’re signed in to the Tableau Cloud site, select **Users**.
2. Click **Add Users**, and then click **Import Users from File**.

   The options you have in the Import Users dialog box depend on how users sign in to the site.
3. If you haven't already created or enabled an authentication configuration on the site, skip to the next step.

If you've created or enabled an authentication configuration on the site, you can select one authentication method for the new users.

- Select the authentication method if you have created and enabled Google, OIDC, SAML, or Salesforce authentication and want the imported users to sign in to Tableau Cloud through that external identity provider (IdP).
- Select **Tableau with MFA** if you want these users to have the default username (email address) and password authentication.

4. For **File name**, click **Browse**, navigate to the CSV file, and click **Open**.
5. To see account-specific information, select **View Details**.

   To continue, click **Import Users**, and then click **Exit** in the final dialog box.

   If a user already exists in the Tableau Cloud site, and the import file defines a different site role for them, they will get the new site role as defined in the CSV file, even if it is more restrictive than their current site role. This includes existing site administrators.

# CSV Import File Guidelines

You can automate adding users by creating a comma-separated values (CSV) file with user information and then importing the file. You can include attributes in the CSV file, such as license level and the publishing access, to apply to the users at the same time you import them.

To import users, you can use the site administration page or the `tabcmd` utility. Using `tabcmd` provides an option for assigning a site role to all users in the CSV file. For information, see Import Users or createsiteusers filename.csv.

## CSV file format requirements

When you create the CSV file for importing users, make sure that the file meets the following formatting requirements:

- The file does not include column headings. Tableau Cloud assumes that every line in the file represents a user.
- The file is in UTF-8 format, and includes the byte-order mark (BOM).
- Character encodings such as BIG-5 have been converted to UTF-8. You can do this by opening the file in a text editor and using the **Save As** command.
- If a user name includes an @ character that represents anything other than a domain separator, you need to refer to the symbol using the hexadecimal format: `\0x40`

  For example, `user@fremont@mycompany.com` should be `user-\0x40fremont@mycompany.com`

## Required columns in the CSV file

The following fields are required for each user:

- Username: The user’s email address.
- Password. Tableau Cloud does not use this field, but you need to delimit it in each row to position the subsequent fields correctly.

## Additional CSV column options

For each user, the CSV file can contain the following fields in addition to the required columns. Where indicated, Tableau Cloud does not use the field, but it must be accounted for in the file.

- Site URI (Tableau Cloud Manager only): The uniform resource identifier for the site. To import a user as a cloud administrator, include the Site URI column but leave it blank.
- Display name. Tableau Cloud does not use this field, but you need to delimit it in each row to position the subsequent fields correctly.
- License level. This can be **Creator**, **Explorer**, **Viewer**, or **Unlicensed**.

- Administrator level: The value can be **Cloud**, **Site**, or **None**. Cloud = Cloud administrator, Site = Site administrator, and None = Not an administrator.

  **Note:** The cloud administrator value is only available when importing users to Tableau Cloud Manager. It isn't intended for use with Tableau Cloud sites. For more information, see Manage Users With Tableau Cloud Manager.

- Publishing capability. Acceptable values are **Yes/True/1** or **No/False/0**. If the license level is Creator, the publishing capability must be Yes/True/1.
- Authentication type (Tableau Cloud Manager only): The user authentication type for accessing a site or Tableau Cloud Manager.

CSV file sample entries

Tableau Cloud site

The following example shows a user who will be granted the **Explorer** site role, will not be a site administrator, and will be able to publish to projects on which they have the appropriate content permissions.

```
user1@domain.com,,,Explorer,None,true
```

By changing the administrator-level column, you can import the following user as a site administrator with the Site Administrator Explorer site role.

```
adminuser@domain.com,,,Explorer,Site,true
```

Tableau Cloud Manager

The following example shows a user who is granted the cloud administrator role in Tableau Cloud Manager, and authenticates using Tableau with MFA.

```
cloudadminuser@domain.com,,,,Cloud,,Tableau with MFA
```

By changing the authentication column, you can import the following user with an alternative authentication type if configured in Tableau Cloud Manager settings.

```
cloudadminuser@domain.com,,,,Cloud,,Salesforce
```

Notes

- If the CSV file contains only user name values (email addresses), the users will receive an email invitation to the site. Users can join the site to create their accounts, but the accounts remain unlicensed until an administrator configures the accounts (display name, license level, and so on).
- The password (second value) and display name (third value) fields are not used by Tableau Cloud. Values you do specify for those fields are ignored.

  However, if you want to set the license and publish access for the users, your file still needs to include delimiters for these fields, as shown in the example earlier.
- New users must select a password and a display name when they first sign in to Tableau Cloud. If users already have a Tableau account, such as for the Tableau Community forums, they already have passwords.
- The CSV file does not include a field for setting authentication type (Tableau, Google, or SAML). You specify this in Tableau Cloud when you import the file. The setting applies to all imported users, and you can change authentication type for individual users afterward.

  > **Note:** Alternatively, you can use `tabcmd` to import users and set the authentication type and site role that applies to all users in the CSV file. For information, see createsiteusers filename.csv.

## CSV settings and site roles

The license level, administrator, and publishing settings for a user determine how the user's site role is set during the import process. The following table shows how the settings are converted to site roles.

| CSV settings | Site role |
| --- | --- |
| License level=Unlicensed<br><br>Administrator=Cloud<br><br>Publisher=false | Cloud Administrator. This setting is valid only if you are importing users while signed in to Tableau Cloud Manager (that is, not signed in to a specific site). |
| License level=Creator or Explorer<br><br>Administrator=Site<br><br>Publisher=true | Site Administrator Creator or Site Administrator Explorer. This setting is valid only if you are importing users while signed in to a specific site. |
| License level=Creator<br><br>Administrator=None<br><br>Publisher=true | Creator |
| License level=Explorer<br><br>Administrator=None<br><br>Publisher=true | Explorer (Can Publish) |
| License level=Explorer<br><br>Administrator=None<br><br>Publisher=false | Explorer |
| License level=Viewer<br><br>Administrator=None<br><br>Publisher=false | Viewer |

| CSV settings | Site role |
|---|---|
| License level=Unlicensed<br><br>Administrator=None<br><br>Publisher=false | Unlicensed |

# Manage Site User Visibility

By default, all site users can see aliases, project ownership and comments by other users when permissions allow. The User Visibility setting lets administrators manage if users with Viewer and Explorer site roles see other users and groups on the site, which can be important for sites that are used by multiple clients. To learn more about site roles, see Set Users' Site Roles.

## Limit user visibility

Setting User Visibility to **Limited** impacts certain collaboration tools and hides user information in Tableau Cloud and Tableau Server. Limited User Visibility either disables the feature for Viewers and Explorers (excluding Site Administrator Explorers), or removes user information from other areas. Note that Creators and administrators will still see user information when User Visibility is set to Limited.

To limit user visibility for Explorers and Viewers (excluding Site Administrator Explorers):

- Navigate to the site's **Settings** page
- Select **Limited** in the **User Visibility** setting

The following is a list of site areas impacted when User Visibility is set to Limited. Unless noted that the feature is disabled for all users, only non-administrator Explorers or Viewers are impacted.

| Area | Impact |
|---|---|
| Search | User information not displayed |

| | |
|---|---|
| Content owners | User information not displayed (Explorers and Viewers can't see themselves, but can see their content in My Content) |
| Profile pictures | User information not displayed |
| Subscriptions | User information not displayed |
| Recommendations | Similar users not displayed (all users) |
| Add/Edit Tags | Explorers and Viewers can see tags but cannot delete or modify them |
| "Who has seen this view?" | Disabled |
| Ask Data usage analytics | Disabled |
| Permissions dialogs | Disabled |
| Named sharing | Disabled (all users) |
| Alerts | Disabled (all users)<br>Existing alerts paused |
| Comments | Disabled (all users) |
| Public Custom Views | Disabled (all users)<br>Existing public custom views appear as private |
| Request Access | Disabled (all users) |
| Tableau Desktop | Publishing workbooks disabled from Desktop<br>User information not displayed on user filters |

| | |
|---|---|
| Tableau Pulse | The button to see and manage followers doesn't appear on metrics |
| Tableau Catalog (with Data Management) | User information not displayed |

When User Visibility is set to Limited, Tableau Server REST API and Metdata API calls behave as described in the table above.

Users on a site can interact with views and modify them, such as applying filters. If that user shares their modified view with others, or if the user creates something from that modified view (like a metric or a private custom view), then that user's name appears in the URL. Make sure that the URL for this modified view is only distributed to users who are permitted to see that person's name.

**Note**: If a user is a member of multiple sites, entering an email on the sign in page for Tableau Cloud will return the names of all sites the user is a member of.

Best practices for limiting user visibility

Administrators can also check that user and group information is not visible in these ways:

- Configure permissions to only provide content to appropriate parties. For more information, see Permissions.
    - Limited User Visibility hides user identification information from search, but might return content that the user published, including when searching by owner name, if the person searching has viewing permission to that content.
    - A user publishing a workbook with a duplicate title in the same project might see a warning that a workbook with that title already exists.
- Apply row-level security when necessary.
- Check that metadata within dashboards does not contain user information.
- Check that calculations accessible to users don't contain user metadata (e.g., user filters).

### Restore Full User Visibility

When administrators set User Visibility back to Full, features disabled for all users by Limited User Visibility (such as comments and alerts) remain off. Administrators can re-enable these features through the site's Settings page.

Any previous feature settings are not retained when User Visibility is set to Full, and affected features are not automatically turned on.

## Enable Support Access

Tableau Cloud administrators can allow approved Tableau Support technicians to access their Tableau Cloud site to help troubleshoot a customer support case. By default, this feature is disabled for all sites. Enable the feature to allow support access.

1. In a web browser, sign in to Tableau Cloud as a site administrator and go to the site in which you want to enable support access.
2. From the navigation panel, click **Settings**.
3. Under **Tableau Support Access**, select **Let Tableau Support access your site**.
4. Click **Save**.

When enabled, Tableau Support technicians are assigned the **Support User** role and granted administrator-level access to your site and its content. Tableau Support technicians use this access to gather information to diagnose and reproduce issues. Tableau Support technicians do not make changes to your site unless you authorize them to do so.

Only Tableau Support technicians can be assigned the Support User role. You cannot add this role to new or existing site users. Users assigned the Support User role do not count against the site's user limit. To view users who have the Support User role on the site, click the **Users** tab.

### Disable Support Access

When you disable support access, users with the Support User role who are signed on to the site are automatically signed out. If you do not disable support access, users with the Support

User role will be automatically deleted after 16 days. Any content owned by the Support User will be reassigned to the longest-tenured site administrator.

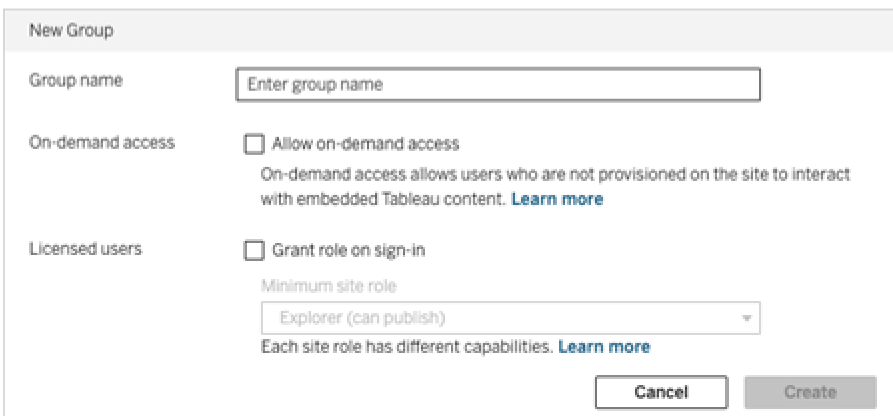
# Create a Group and Add Users to It

As a site admin, you can organize Tableau Cloud users into groups to make it easier to manage multiple users. Groups can also be used by users (such as site admins, project owners, and content owners) to apply permission rules for Tableau content.

Users can belong to multiple groups.

## Create a group

1. On a site, click **Groups**, and then click **New Group**.
2. Type a name for the group.




3. Optionally, do one or both of the following:
   a. If your site is licensed with the Embedded Analytics usage-based model, select the **Allow on-demand access** check box to enable the on-demand access capability for embedding workflows.

For more information, see one of the following: On-demand access using connected apps with direct trust or On-demand access using connected apps with OAuth 2.0 trust.

b. Select **Grant role on sign in** and select a minimum site role for the group. For more information, see Grant License on Sign In.

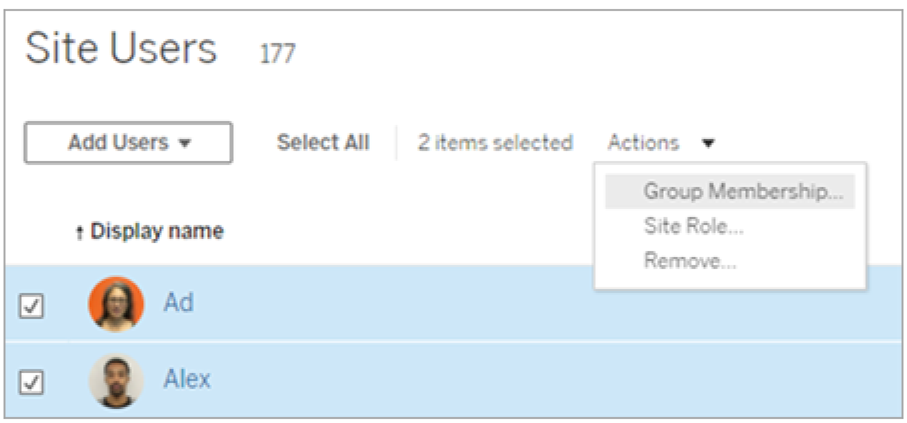
4. Click **Create**.

**Note:** Every user (excluding users with on-demand access) added to a Tableau Cloud site becomes a member of the **All Users** group automatically. The All Users group exists in every site by default. You cannot delete this group, but you can set permissions for it.

## Add users to a group (Users page)

1. On a site, click **Users**.

2. Select the users you want to add to the group, and then select **Actions** > **Group Membership**.

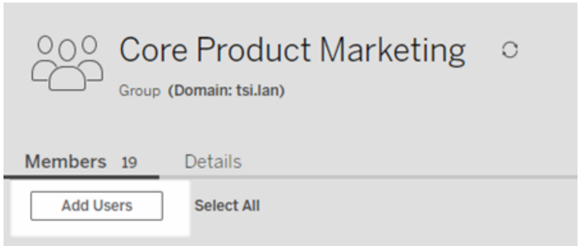



3. Select the groups and then click **Save**.

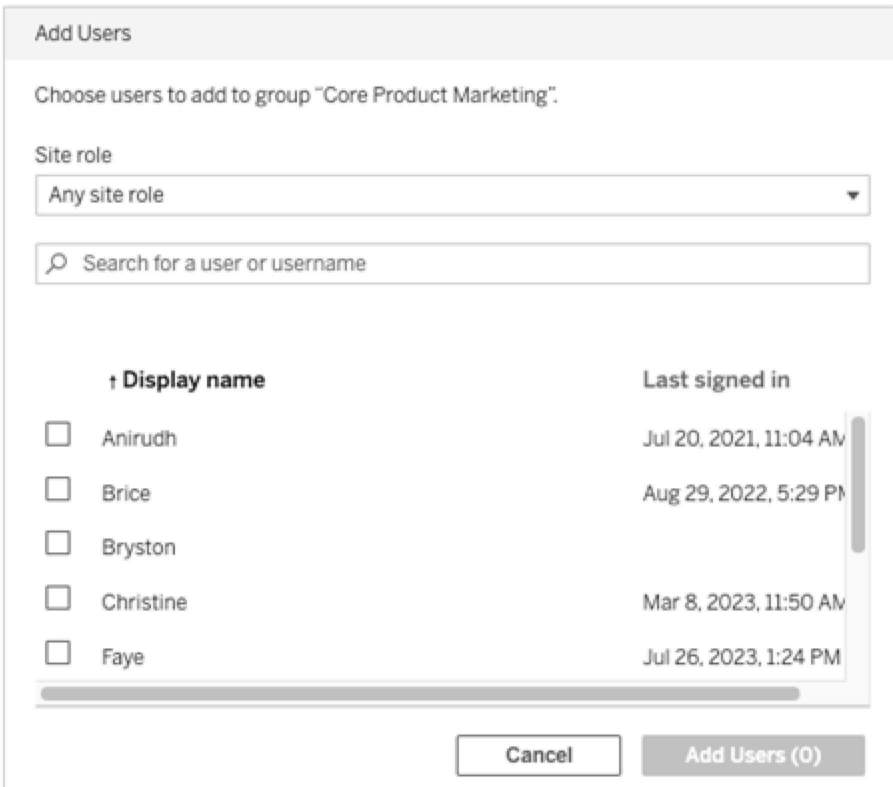
## Add users to a group (Groups page)

1. From the left navigation pane, click **Groups**, and then click the name of the group.

2. On the Group's page, click **Add Users**.




3. Select the users to be added, and then click **Add Users**.




## Dynamic group membership using assertions

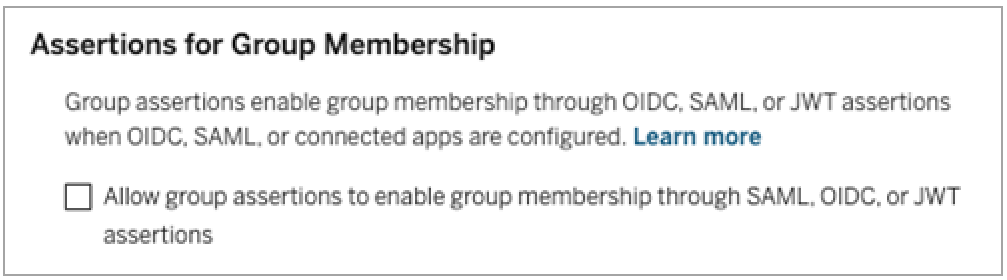
Beginning in June 2024 (Tableau 2024.2), if you have OIDC or SAML authentication configured or use Tableau connected apps for embedding workflows, you can dynamically control group membership through assertions. When configured, at runtime during user authentication, Tableau receives the assertion and then evaluates membership in groups and thus the content whose permissions are dependent on those groups.

The process to dynamically control group membership through assertions requires 1) enabling the setting and 2) ensuring the group membership claims are included in the assertions.

Step 1: Turn on the setting

For security purposes, group membership is only validated in an authentication workflow if the site setting is turned on.

1. Sign in to Tableau Cloud and click Settings > **Authentication**.
2. Under Assertions for Group Membership heading, select the **Allow group assertions to enable group membership through SAML, OIDC, or JWT assertions** check box.




For more information about site settings, see Assertions for Group Membership.

Step 2: Ensure group membership claims are included in the assertion

Two custom group membership claims must be included in the respective OIDC, SAML or JWT assertion to specify group membership. The two custom group membership claims are:

- Group: `https://tableau.com/groups`
- Group names. These names should match local group names in Tableau Cloud exactly.

**Note:** Group sets can't be asserted.

For example assertions, refer to one of the following sections:

- Dynamic group membership using OIDC assertions
- Dynamic group membership using SAML assertions:
- Connected apps - direct trust: Dynamic group membership (embedding workflows only)

- Connected apps - OAuth 2.0 trust: Dynamic group membership (embedding workflows only)

## Grant License on Sign In

Grant license on sign in (Grant role on sign in) lets unlicensed users in specific groups become licensed when they sign into a Tableau site. This streamlines license provisioning for administrators and removes the user's need to request a license before using Tableau.

For more information about site role capabilities and minimum site roles, see Set Users' Site Roles.

For example, imagine that your company has 100 people in the Marketing group, but only 25 members need to access Tableau Cloud. The Tableau Cloud site administrator isn't sure which 25 need Tableau. That administrator can create a Marketing user group with an Explorer minimum site role, select **Grant role on sign in**, and add all 100 Marketing members to the group. Instead of provisioning licenses to the entire group, the 25 Tableau users in Marketing are provisioned Explorer licenses when they sign in to their Tableau Cloud site. Those who don't need Tableau Cloud remain unlicensed unless they sign in.

> **Note**: For more information about benefits and best practices, see Grant Role on Sign In in Tableau Blueprint, Tableau's planning tool for data-driven organizations.

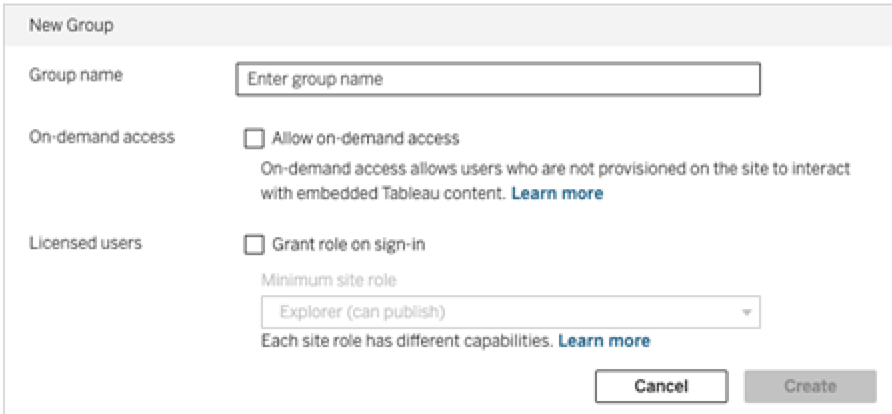
### Activate Grant role on sign in

You can enable Grant role on sign in on new or existing groups. The following steps walk through how to use Grant role on sign in to add new users that are eligible for a license but may not consume one. This may be the case when your company has a lot of eligible users, but limited Tableau licenses.

1. On a site, add a new group:

    a. From the left navigation pane, click **Groups**, and then click **New Group**.

    b. Enter a group name.

    c. Optionally and if your site is licensed with usage-based model, select the **Allow on-demand access** check box.

    For more information, see one of the following: On-demand access using connected apps with direct trust or On-demand access using connected apps with OAuth 2.0 trust.

    d. Select **Grant role on sign in** and select a minimum site role for the group. This setting means licenses and site roles will only be provisioned to group users who sign into this Tableau Cloud site.

    e. Click **Create**.

2. Add users to a site, either by entering users' email addresses individually, or Import Users via a CSV file that you create using the CSV Import File Guidelines.


- Enter email addresses if adding users individually. For information on using Google, OIDC, SAML or Salesforce authentication when adding users, see Add Users to a Site.

  If you add more than one user, separate each address with a semicolon.

  For example, *tdavis@example.com; jjohnson@example.com; hwilson@example.com*

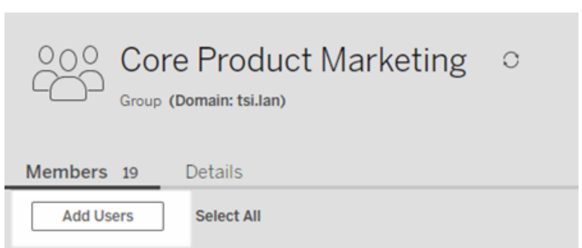
- Set the site role for those users to **Unlicensed**.

- Click **Add Users**.

3. Add those new, unlicensed users to the new group.

   - From the left navigation pane, click **Groups**, and then click the name of the group.

   - On the Group's page, click **Add Users**.




   - Select the users to be added, and then click **Add Users**.

For more information, see Create a Group and Add Users to It.

## Modifying user roles with Grant role on sign in

If a user is part of a group using Grant role on sign in, then that user role can't be set to unlicensed or downgraded to a role lower than the minimum site role set for the group, whether or not they sign in. Administrators can upgrade a user’s site role manually, however.

To downgrade a user’s site role, or unlicense the user from the site, remove the user from the group(s) that have Grant role on sign in enabled.

In accordance with the terms of the End User License Agreement, licenses granted on an Authorized User basis may be permanently reassigned to new users. Users may only be downgraded to a lower site role (including Unlicensed) when they will permanently discontinue access to Server Software at the higher role.

## Removing users affected by Grant role on sign in

You can remove a user from a site only if the user does not own content. If you attempt to remove a user who owns content, the user site role will be set to Unlicensed and removed from all groups, but the user will not be removed from the site. To remove content owners, remove owners from group with Grant site role enabled or reassign content ownership to another user. For more information, see Remove users from a site in the View, Manage, or Remove Users Help topic.

If the default All Users group has Grant site role enabled, users who own content can't be removed from the site or unlicensed. To remove or unlicense these users, reassign content ownership to another user, then remove or unlicense the user.

Tableau REST API can be used to reassign content ownership of a workbook. For more information, see Update Workbook method in the REST API Help. REST API can also be used to remove users from the site and transfer content ownership to another user. For more information, see Remove User from Site method in the REST API Help.

For more information on reassigning content ownership in Tableau Cloud, see Manage Content Ownership.

# Buy More Licenses

You can scale your Tableau Cloud deployment at any time by purchasing additional licenses through the Tableau Webstore.

## What accounts are eligible?

To buy more licenses through the Webstore, you must meet the following requirements:

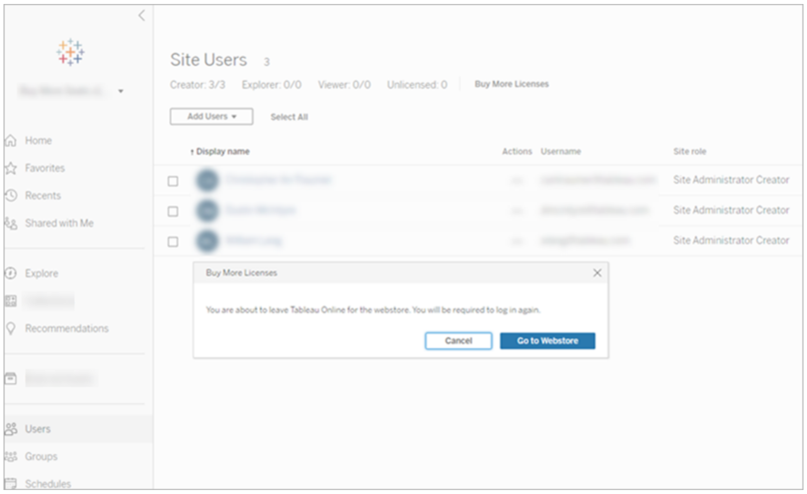
- Customer Portal account administrator
- Not a Government account
- Not licensed with Embedded Analytics

If you are not currently eligible, contact our sales team to complete a transaction.

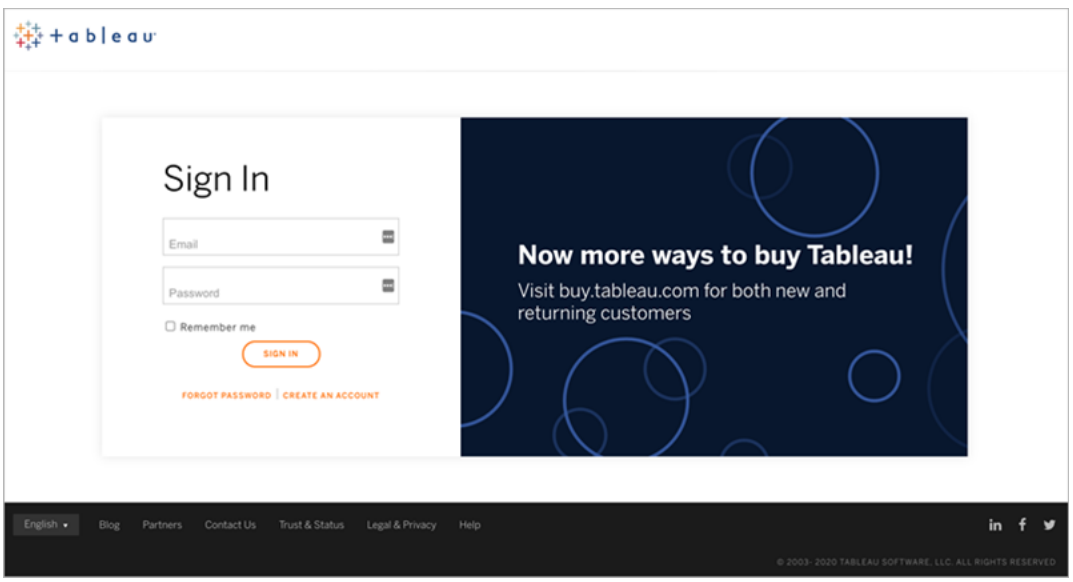
## Access the Tableau Webstore

Complete the following steps to redirect and buy more licenses through the Tableau Webstore:

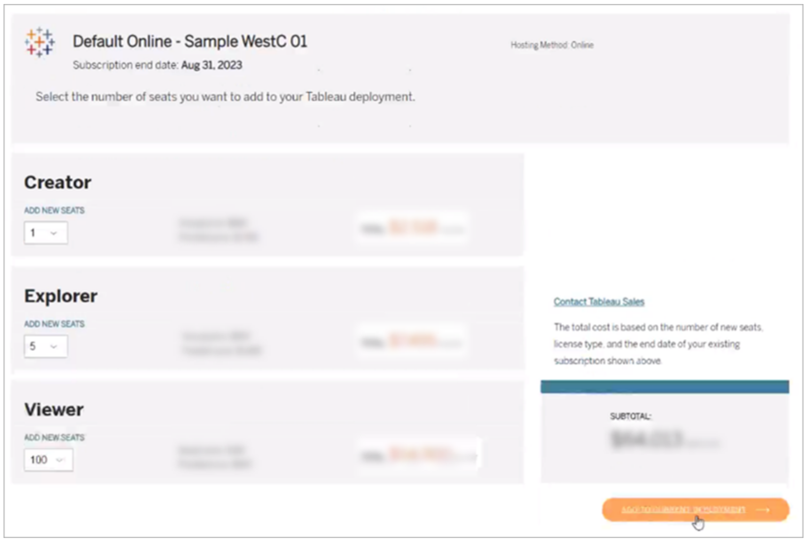
1. Sign in to one of the following locations as an administrator:
   - For site administrators, sign in to a Tableau Cloud site and select **Users**.
   - For cloud administrators, sign in to Tableau Cloud Manager and select **Users**.
2. On the Users page, select **Buy More Licenses**, and then **Go to Webstore**. The Webstore opens in a separate browser tab.




3. Sign in to the Webstore using your Tableau account. If you have previously authenticated with your Tableau account, you aren't prompted to sign in again.




4. On the Webstore, select the number of **Creator**, **Explorer**, and **Viewer** licenses to add to your deployment.




5. Select **Add to Current Deployment** and continue to the **Contact & Billing** and **Summary & Payment** sections.

An order confirmation email is sent shortly after payment. If you don't see an email from Tableau, be sure to check your spam folder. The new licenses are available on the site and Tableau Cloud Manager after the transaction is processed.

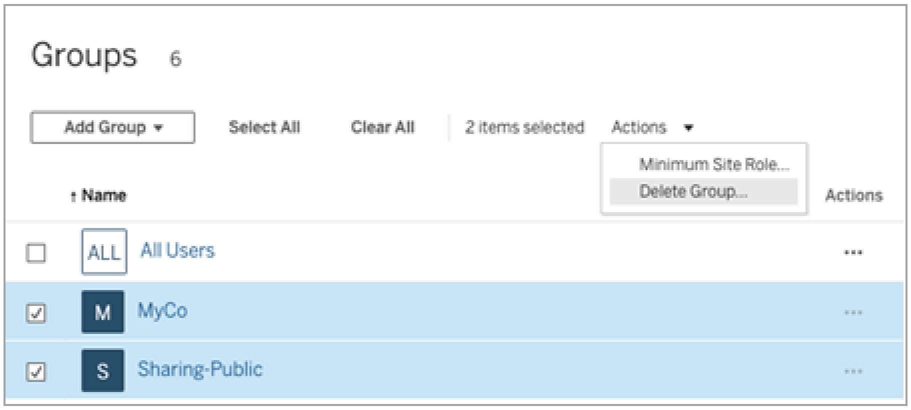
**Note:** If a site role limit is set, cloud administrators must update site role limits in Tableau Cloud Manager to increase the maximum number of licenses for the site. For more information, see Manage Site Role Limits.

## Delete Groups

You can delete any group with the exception of the **All Users** group. When you delete a group, the users are removed from the group but they are not deleted from the site.

1. Sign in to Tableau Cloud as site admin.
2. From the left navigation pane, click **Groups**.
3. On the Groups page, select one or more groups to delete.

4. Select **Actions** > **Delete**.




## Effects of deleting groups

Groups with on-demand access

Beginning in October 2023, some sites can enable the on-demand access capability for groups. When you delete one or more groups with the on-demand access capability enabled, any embedded Tableau content that was accessible to users not provisioned on your site can no longer access the content.

Groups in group sets

Beginning in June 2024 (Tableau 2024.2), groups can be added to group sets. When content permissions are dependent on a group set, content capabilities are evaluated when users belong to all groups in the group set. If a group that belongs to a group set is deleted then it can change user access to Tableau content when content permissions are dependent on the group set.

# Work with Group Sets

Beginning in June 2024 (Tableau 2024.2), you can create a container for your groups using group sets. A group set can contain one or more groups and be used to apply more granular rules for content permissions that are dependent on the group set. When enabling capabilities based on a group set, users in the groups that belong to the group set must be members of all the groups for the capability to be evaluated. In this way, group sets enforce AND logic.

**Benefits of group sets:**

- You can mix and match synchronized groups with local groups in permission rules to enable more dynamic access control scenarios.
- Use AND logic for groups in permission rules, which can simplify access control in some scenarios

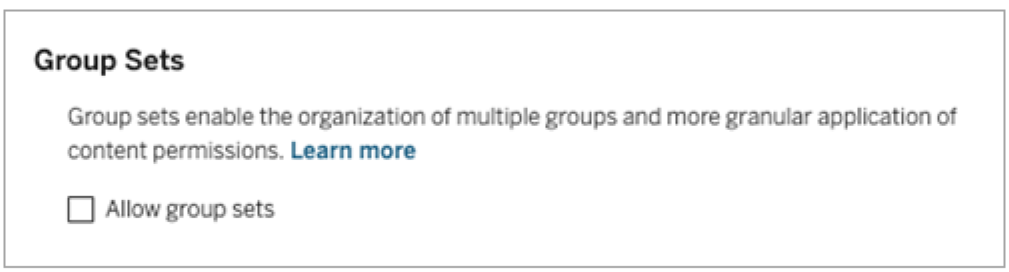
**Notes:**

- Group set permission rules are evaluated after user and group rules. For more information about those rules, see Evaluate permission rules.
- Group sets can only be created by site admins.
- Group sets are not to be used as a group of groups.

## Turn on group sets

Before group sets can be used for permissions, group sets settings must be enabled.

1. Sign in to Tableau Cloud as site admin.
2. Navigate to the **Settings** page.
3. Under the Group Sets section, select the **Allow group sets** check box.

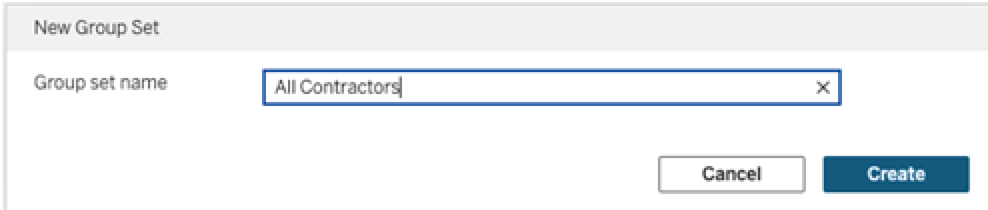



After enabling group sets, a dedicated **Group Sets** page displays in the navigation pane.

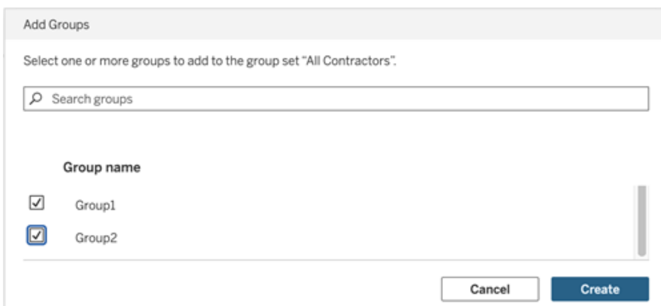
## Create group sets

To create a group set, navigate to the Group Sets page and create a group set as you would a group.

1. Sign in to Tableau Cloud as site admin.
2. Navigate to the Group Sets page and click the **New Group Sets** button.
3. Enter a name for the group set and click **Create**.




4. In the Group Sets table, click the name of the group set you just created and click the **Add Groups** button.
5. From the list of available groups, select the groups you want to add to the group set and click the **Add** button.




## Set permissions on group sets

To use group sets, as a site admin, project leader, or content owner, add or edit the permissions of the content to use the group set.

For example, suppose you are the owner of the "Batters" workbook. To apply permissions based on the group set, do the following:

1. Go to the workbook and select **Permissions** from the actions menu.
2. In the Permissions dialog box, click the **Add Group/User Rule** button, and do the following:
   a. In the text box, enter the group set name, for example "All Contractors."
   b. Select the desired capabilities in the template.

c. Click **Save**.

When permissions are applied using the group set model, you create permissions that affects the users that have membership in *all* groups in the group set.

For example, you might restrict access to different workbook views based on a user's regional group affiliation. Suppose you have users who are, contractors, contractor managers, full time employees, and full time managers accessing these workbook views.

Groups that have default permissions to view the workbook: All, North, South, East, West, Full Time, and Managers.

- For the North Region Detailed view:
  - Permissions are based on group set: North Region
  - Groups in the group set: Full Time, North

  Outcome: Only full time employees and full time managers in the north can see the data in the North Region Detailed view.
- For the All Region Detailed view:
  - Group set is called Managers
  - Groups in the group set: All, Managers

  Outcome: Only contractor managers and full time managers can see the data in the All Region Detailed view.

For more information about permissions, see Configure Projects, Groups, Group Sets, and Permissions for Managed Self-Service.

# Manage Content Access

You can manage who can access content on your site and set the permissions that govern content ownership.

## Set Web Edit, Save, and Download Access on Content

If you're enabling web authoring functionality on your site, you can configure more precisely which users on the site have access to this functionality. Using site roles and permissions rules at the content level, you can grant or deny **Web edit**, **Save**, or **Download** capabilities on projects, workbooks, and data sources.

**Note:** This document strives to use the phrase *Web edit* to specify the name of the capability in permissions rules, and *web authoring* to refer to the general functionality of creating and modifying workbooks on the server. However, you might otherwise see these two phrases used interchangably.

### Why allow users to work on the site directly

As an administrator, your initial thought about allowing people to populate a site with content, seemingly indiscriminately, might be one of skepticism. However, with a few controls, you can limit where this is done, while providing important benefits that centralized content management offers both you and your users.

Web authoring pros and cons

For publishers and business users, some benefits of web authoring include the following:

- It provides analyst teams who work collaboratively with a central location in which to provide input.
- It enables people who do not have Tableau Desktop to connect to data sources and create workbooks.

- It enables people to access content when they are away from their Tableau Desktop computer or VPN, whether on a computer or a hand-held device.
- It can provide a framework for enabling consistency across Tableau reports.(By making template workbooks available on the site, analysts can download or create new workbooks with data connections, branding, and formatting already in place.

For administrators, benefits can include the following:

- Fewer Tableau Desktop deployments to manage and support.
- Fewer computers that need to have database drivers installed.
- Capacity to govern content.
- More accurate monitoring of what people are doing with Tableau.

Some disadvantages to web editing include the following:

- For analysts, web editing functionality is not as extensive as in Tableau Desktop (although it continues to evolve toward that parity).
- For administrators, more people working on the server might mean upgrading systems.
- Without publishing guidelines, content proliferation on the site is expected.
  This can confuse the people who rely on published Tableau dashboards and data sources, degrade server performance and data quality, and potentially affect data security.

## Managing permissions to help users avoid content proliferation

To help users to avoid content proliferation on the site, many Tableau administrators use projects to allow varying levels of access to content. For example, one project can be configured to allow all users to edit and save workbooks; another can allow only approved publishers to save new content.

To get a better idea how this works, see the following resources:

- Configure Projects, Groups, Group Sets, and Permissions for Managed Self-Service
- Governed Self-Service at Scale, a Tableau whitepaper by Rupali Jain.
  To view the PDF, you might need to provide your Tableau website credentials. These are the same ones you use for the community forums or to submit support cases.

### Coordinate edit and save capabilities with site roles for the appropriate level of access

To edit, save, and download workbooks, users must have a site role that allows those actions, along with the capabilities—defined in permissions rules—that grant or deny editing-related access.

Site role access

- When the appropriate permissions are set at the content level, the **Creator** or **Explorer (can publish)** site role allows both **Save** (overwrite) and **Save As/Download**.

  Note that **File > Save** is only available to the workbook owner. When the **Save** permission capability has been granted at the project and workbook level, a non-owner user can overwrite the existing workbook in web authoring by selecting **File > Save As** and using the same workbook name. This overwrites the existing content and they become the owner and gain full access to the content.
- The **Explorer** site role can be granted the **Web Edit** and **Save As/Download** capabilities, but they will not be able to save (neither overwriting existing nor saving changes to a new workbook).

For more information, see Web Editing and Web Authoring.

## Configure Projects, Groups, Group Sets, and Permissions for Managed Self-Service

Publishing to Tableau Cloud and Tableau Server is easy. For some organizations, it might be a little *too* easy. There is value in creating a controlled framework before letting creators publish their own content.

To keep things tidy and to make sure people can find and access the right content, it may be useful to configure your site for managed self-service. This means having guidelines and settings in place to ensure content is organized, discoverable, and secure without having bottlenecks in the publishing process.

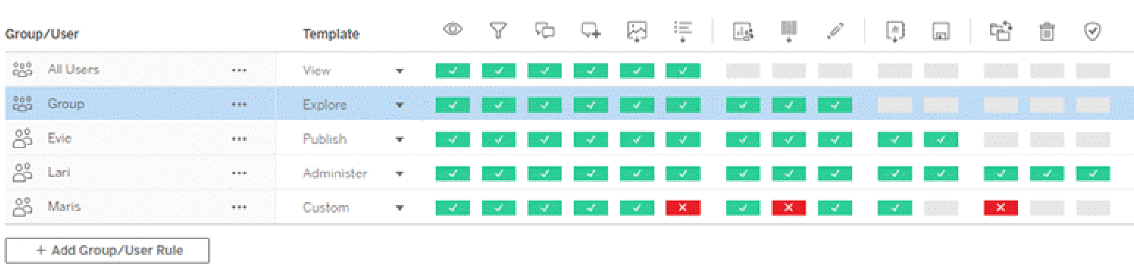
This article lays out a possible path for you as a site administrator to set up your site for managed self-service:

1. Identify the types of groups and projects you'll need
2. Create groups and group sets
3. Remove permissions that will cause ambiguities and establish default permission patterns
4. Create projects
5. Lock project permissions

> **Note:** The information provided here is adapted and simplified from practices of Tableau Visionaries and customers who have shared their experiences.

## Plan your strategy

Permissions in Tableau consist of rules that are applied to content (projects, workbooks, etc.) for a group or user. These permission rules are built by allowing or denying specific capabilities.




Having a comprehensive plan for your projects, groups, and permission rules is useful whether you're starting new or making changes. The details are up to you, but there are two important practices that we recommend for all environments:

- Manage permissions on projects, not individual pieces of content.
- Assign permissions for groups, not individual users.

Setting permissions at the individual user level and on individual content assets becomes unmanageable quickly.

Use a closed permissions model

General models for setting permissions are open or closed. In an open model, users get a high level of access, and you explicitly deny capabilities. In a closed model, users get only the access they need to do their jobs. This is the model security professionals advocate. The examples in this topic follow a closed model.

For more information on how Tableau permissions are evaluated, see Effective permissions.

### Identify the types of projects and groups you'll need

Designing a structure to accommodate content (in projects) and categories of users (as groups) or categories of groups (in group sets) can be the most challenging part of setting up a site, but it makes ongoing management much easier.

**Projects**: Projects function both as a unit for managing permissions and as an organizational and navigational framework. Try to create a project structure that balances how people expect to find content and allows for logical permissioning.

**Groups or group sets**: Before you create groups it can be useful to find common themes in how people interact with content. Try to identify patterns you can use to create groups or group sets and avoid one-off permissions for individual users.

## Example 1: Project and group structure

For example, let's imagine an environment where there is company-wide content that everyone should be able to access, as well as some HR content that needs to be restricted.

Projects include:

- **Acme Corp Conference**. This will include data sources and workbooks for ticket sales, dashboards for content strategy, and project plans for the company conference.
- **Employee Success**. This will include anonymized data sources and workbooks for the internal employee survey

- **Human Resources**. This will include HR data sources and workbooks that should only be available to members of the HR team.

Then, groups should match what people need to do:

- **Core Content Creators**. This group is for users who can publish to top-level projects and have broad access to data sources, but who don’t need to be able to move or otherwise manage content.
- **HR Content Creators.** This group is for users who have access to HR data sources and can publish to the HR project.
- **Business Users.** This group is for users who should be able to access the content created by the Core Content Creators, but shouldn’t even know the HR content exists.
- **HR Users.** This group is for users who should be able to access content in the HR project but don’t have rights to create or publish content.
- **Core Project Leaders.** This group is for users who should be given project leader status on the projects that aren’t HR.

## Example 2: Group and group set structure

Beginning in June 2024 (Tableau 2024.2), you can use group sets to further control the capabilities granted (or denied) to users by enabling permissions at the group set-level. When permissions are set at the group set-level, users must belong to all groups in the group sets to be evaluated.

**Note:** Group set permission rules are evaluated after user and group rules.

For example, suppose you’ve created the groups to match what people need from Example 1 above. You can create the following group set to further lock down HR access:

- **HR Leaders.** This group set consists of HR Content Creators and Core Project Leaders. Only if the users in this group set belong to both groups are they given project leader status, ability to access sensitive HR data sources, and publish to the HR project.

Consider site roles

Remember that permissions are tied to content, not groups or users. This means that you can't give a group **Explore** permissions in a vacuum. Rather, the group can be given **Explore** permissions for a project and its content. Site roles, however, are given to specific users and may define or limit the permissions they can have. For more information on how licenses, site roles, and permissions tie together, see Permissions, Site Roles, and Licenses.

## Create the groups and group sets

While it might be tempting to create the groups and projects as soon as you identify what you need, it's important to do things in a certain order.

**Projects**: Projects shouldn't be created until after the Default project has been properly configured (see the next section). This is because top-level projects use the Default project as a template for their permission rules.

**Groups**: Groups need to be created before they can be used to build permission rules. Users do not need to be added to the groups yet, but they can be. For more information about creating groups, see Create a Group and Add Users to It.

**Group sets:** Groups need to be created before they can be used to build permission rules. Users do not need to be added to the groups yet, but they can be. For more information, see Work with Group Sets.

**Tip**: Creating multiple groups and projects and setting permissions manually can get a little tedious. To automate these processes and make them repeatable for future updates, you can perform these tasks using REST API commands. You can use tabcmd commands for tasks such as adding or deleting a single project or group and adding users, but not for setting permissions.

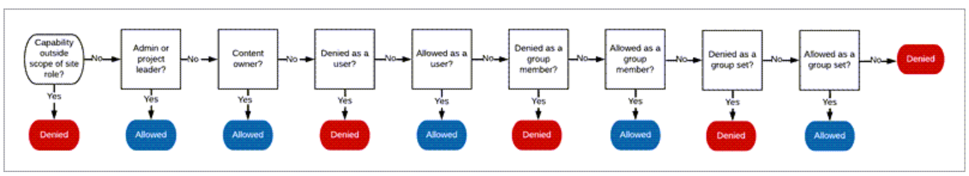
Membership in multiple groups

It’s possible to include the users in the HR Content Creators and HR Users groups in the Business Users group. This would make it easy to assign permissions to Core Content Users versus Business Users for the majority of content. However, in that scenario, the Business Users group couldn’t be denied any capabilities in the Human Resources folder without denying the HR users as well. Instead, the Business Users group would have to be left as unspecified, and the specific HR Content Creators and HR Users groups would be given their applicable capabilities.

This is because Tableau permissions are restrictive. If the Business Users group was denied certain capabilities, that Deny would override the Allow of another permission rule for users in both groups.

Impact of group sets

If assigned permissions are enabled at the group set-level, permissions for every group in the group set must not be specified or not be denied to allow the capability.




When deciding how group membership should be assigned it’s important to understand how permission rules are evaluated. For more information, see Effective Permissions.

## Remove permissions that will cause ambiguities and establish default permission patterns

Every site has an **All Users** group and a **Default** project .

**All Users group**: Any user added to the site becomes a member of the All Users group automatically. To avoid any confusion with permission rules set on multiple groups, it’s best to remove the permissions from the All Users group.

**Default project**: The Default project works as a template for new projects in the site. All new top-level projects will take their permission rules from the Default project. Establishing baseline permission patterns on the Default project means you will have a predictable starting point for new projects. (Note that nested projects inherit the permission rules from their parent project, not the Default project. )

Remove the permission rule for the All Users group on the Default project

1. Select **Explore** to see the top-level projects on the site.
2. On the **Default** project's **Action** (…) menu, select **Permissions**.
3. Next to the **All Users** group name, select **…**, and then select **Delete Rule…**.

This lets you establish permission rules for the groups that you have full control over without any conflicting permissions assigned to All Users. For more information on how multiple rules are evaluated to determine effective permissions, see Effective Permissions.

Create permission rules

Now you can set up the basic permission patterns for the Default project that all new top-level projects will inherit. You may choose to keep the Default project's permission rules empty and build permissions for each new top-level project individually. However, if there are any permission rules that should apply to the majority of projects, it can be helpful to set them on the Default project.

Remember that the permissions dialog for a project contains tabs for each type of content. **You must set permissions for each type of content at the project level** or users will be denied access to that content type. (A capability is only granted to a user if they are expressly allowed it. Leaving a capability as Unspecified will result in it being denied. For more information, see Effective Permissions.)

Tip: Every time you create a permission rule at the project level, make sure you look through all the content type tabs.

Create permission rules as desired:

1. Click **+ Add Group/User Rule** and start typing to search for a group name.
2. For each tab, choose an existing template from the drop-down or create a custom rule by clicking the capabilities.
3. When finished, click Save.

For more information on setting permissions, see Set Permissions.

## Example: Project level permissions for each content type

For our example, the majority of projects should be available to most people. For the default project, we'll use the permission rules templates to give the core content creators publishing rights and everyone else the ability to interact with workbooks and not much else.

| Group | Projects | Workbooks | Data Sources | (Other content) |
|---|---|---|---|---|
| **Core Content Creators** | Publish | Publish | Publish | View |
| **HR Content Creators** | View | Explore | View | None |
| **Business Users** | View | Explore | View | None |
| **HR Users** | View | Explore | View | None |
| **Core Project Leaders** | Set as project leader | n/a | n/a | n/a |

This pattern follows a closed model and limits permissions to basic usage for most content for most users. As new top-level projects are created, these rules are what will be inherited by default, but the permission rules can be modified per project as needed. Remember that the

**Human Resources** project should have these permissions removed and its own pattern established.

## Create projects and adjust permissions

After the Default project is set with your custom permissions templates, you can create the rest of your projects. For each project, you can adjust the default permissions as appropriate.

To create a project

1. Select **Explore** to see the top-level projects on the site.
2. From the **New** dropdown, select **Project**.
3. Name the project and, if desired, give it a description.

It can be useful to establish a naming convention. For example, a basic structure might be <DepartmentPrefix><Team> - <ContentUse>; such as DevOps - Monitoring.

The description appears when you hover over a project thumbnail and on the **Project details** page. A good description can help users know they're in the right place.

4. Adjust permissions as necessary.
    a. Open the new project.
    b. From the Action menu (...), select Permissions
    c. Modify any permission rules as desired. *Remember to check all the content tabs*.

## Lock content permissions

In addition to permission rules, projects have a content permission setting. This setting can be configured in two ways, either **Locked** (recommended) or **Customizable**.

Locking a project is a way of maintaining consistency and ensuring that all content in the project has uniform permissions (per content type). A customizable project permits authorized users set individual permission rules on pieces of content. For more information, see Lock content permissions.

Regardless of the content permission setting, permissions are always enforced on content.

## Possible project structures

Some organizations find it useful to have projects that serve specific purposes. Here are some example projects and their intended uses. Note that these are example templates and you should always test the configuration in your environment.

For information about what capabilities are included with each content type's permission rule templates, see Permission capabilities.

# Examples: permission settings for specific purposes

Workbooks shared for open collaboration on the server

Anyone in the department can publish to the open-collaboration project while their content is in development. Colleagues can collaborate using web editing on the server. Some people call this a sandbox, some call it staging, and so on. On this project you can allow web editing, saving, downloading, and so on.

Here you want not only to enable collaboration, but also to enable people who don't have Tableau Desktop to contribute and provide feedback.

| Group | Projects | Workbooks | Data Sources | (Other content) |
|---|---|---|---|---|
| **Data Stewards** | Publish | Publish | Publish | *TBD* |
| **Analysts** | Publish | Publish | Explore | *TBD* |
| **Business Users** | Publish | Publish | Explore | *TBD* |

Remember that some capabilities in the Publish template (such as Overwrite) may be prevented by a user's site role even if they are allowed that capability.

> **Note**: "*TBD*" indicates these permission rules aren't easily determined by the scenario and can be set however makes sense for a given environment.

Shared reports that cannot be edited

This could be a project that people who create workbooks and data sources (Analysts and Data Stewards) could publish to when they want to make content available to business users for viewing, with confidence that their work cannot be “borrowed” or modified.

For this type of project, you would deny all capabilities that allow editing or getting the data off of the server for reuse. You would allow viewing capabilities.

| Group | Projects | Workbooks | Data Sources | (Other content) |
|---|---|---|---|---|
| **Data Stewards** | Publish | *TBD* | Publish | *TBD* |
| **Analysts** | Publish | Publish | View | *TBD* |
| **Business Users** | View | View | None | None |

Vetted data sources for Analysts to connect to

This would be where Data Stewards publish the data sources that meet all of your data requirements and become the “source of truth” for your organization. Project leaders on this project can certify these data sources, so that they rank higher in search results and are included in recommended data sources.

You would allow authorized Analysts to connect their workbooks to data sources in this project, but not download or edit them. You would deny the view capability to the Business Users group for this project, so those users would not even see this project.

| Group | Projects | Workbooks | Data Sources | (Other content) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| **Data Stewards** | Publish | *TBD* | Publish | *TBD* |
| **Analysts** | View | None | View | None |
| **Business Users** | None | None | None | None |

Inactive content

Another possibility is to segregate workbooks and data sources that the site's administrative views show haven't been used for a period of time. You could give content owners a time limit before their content is removed from the server.

Whether you do this or delete directly from the working projects is up to your organization. In an active environment, don't be afraid to be intentional about removing content that is not being used.

| Group | Projects | Workbooks | Data Sources | (Other content) |
|---|---|---|---|---|
| **Data Stewards** | None | None | None | None |
| **Analysts** | View | View | *TBD* | *TBD* |
| **Business Users** | None | None | None | None |

Source for workbook templates

This is a project that people can download from but not publish or save to, where authorized publishers or project leaders make template workbooks available. Templates that have your organization's approved fonts, colors, images, and even data connections built in can save authors a lot of time and keep your reports looking consistent.

| Group | Projects | Workbooks | Data Sources | (Other content) |
|---|---|---|---|---|
| **Authorized** | Publish | Publish | Publish | *TBD* |

| | | | | |
|---|---|---|---|---|
| **Author** | | | | |
| **Data Stewards** | None | None | None | None |
| **Analysts** | View | *Template*: Explore<br>+<br>*Capability*: Download Workbook/Save a Copy | View | None |
| **Business Users** | None | None | None | None |

## Next steps

Besides projects, groups, and permissions, other data governance themes include:

**User education**

Help *all* of your Tableau users become good data stewards. The most successful Tableau organizations create Tableau user groups, have regular training sessions, and so on.

For a common approach to orienting users to the site, see Dashboard-based Custom Portals.

For publishing and data certification tips, see the following topics:

- Use Certification to Help Users Find Trusted Data
- Prepare for Publishing a Workbook (links to Tableau Help)
- Best Practices for Published Data Sources (links to Tableau Help)

**Optimize extract refresh and subscription activity**

If you use Tableau Server, create policies for extract refresh and subscription schedules, to avoid them dominating the site's resources. The TC customer presentations by Wells Fargo and Sprint address this subject in detail. In addition, see the topics under Performance Tuning.

If you use Tableau Cloud, see the following topics to become familiar with the ways people can refresh extracts:

- Keep Data Fresh
- Use Tableau Bridge to Expand Data Freshness Options

**Monitoring**

Use administrative views to keep an eye on the site's performance and content use.

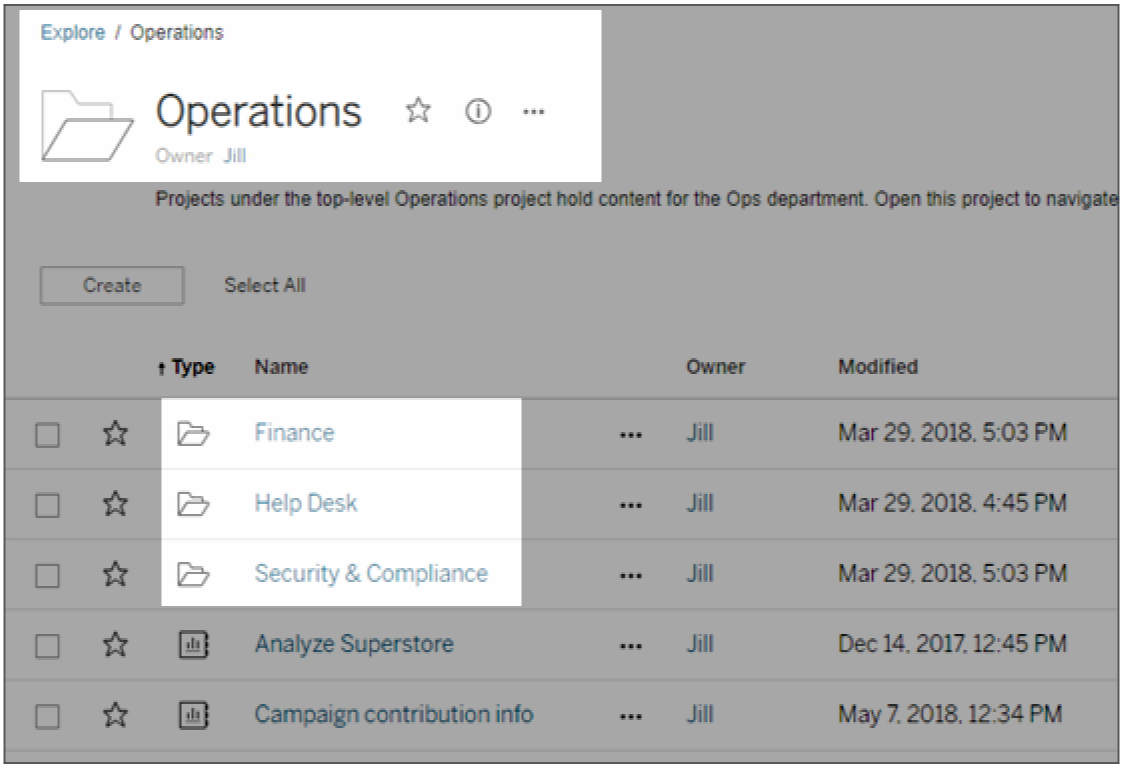
Administrative Views

## Use Projects to Manage Content Access

When Tableau Desktop users publish content to a site on Tableau Cloud, they can select a *project* to publish it to.

Projects can be used for navigation, organization, and access management for assets like workbooks, data sources, lenses, and nested projects. Starting in Tableau Cloud October 2022 / Server 2022.3, if Data Management is licensed and Catalog is enabled, a project can also contain external assets like databases.

The following image shows content within the top-level Operations project in the web authoring environment. The Operations project contains a few nested projects (highlighted) and published workbooks. A project can also contain other asset types.




## Why use projects

Projects help you to create a scalable process for managing access to the content published to Tableau Cloud. Advantages they have include:

- They enable administrators to delegate content management to project leaders who work with the content more closely, without having to give them administrator access to site or server settings.
  - Project leaders can create nested projects under their top-level project, enabling them to maintain their team's content within a single hierarchy.
  - **Note:** Project owners can delete top-level projects they own. Project leaders cannot delete top-level projects.
- They can make the site easier to navigate for self-service users.
  - They segment the Tableau Cloud site into areas that give users access based on how they use the data published to those areas, or on the Tableau user group they work with.

- You can hide projects from groups who don't need to use them, create a distinguishable project-naming scheme, and take advantage of project descriptions to clarify how to use the project.

- They enable you to track permissions effectively.
    - You can create groups based on the level of content access users in the group need, and set default permissions on projects. This enables you to know exactly which capabilities new users get by default, and likewise which capabilities all users get when a new project is created.

When to create project hierarchies (example)

Many organizations have several or more distinct groups of Tableau users, each with its own priorities and leaders. These groups might share some organization-wide content (or even draw from an org-wide pool of data sources), but primarily they use data and reports that are specific to their team. In this or similar scenario, an example for using project hierarchies might look as follows:

1. You, as a site or server administrator, can create top-level projects for each of your distinct Tableau teams.
2. On each top-level project, you assign the Project Leader status to team leads, and change project ownership. Project leaders effectively are the content administrators, so it's important that they understand how permissions work in Tableau, along with Tableau content management best practices.
3. Each project leader can manage their project, creating the structure within the project that works for their team. That is, they can create child projects they need, based on how their team members collaborate and share data and reports.

The benefit to you as the site administrator is that you can focus on system health. The benefit to your Tableau users is that people who know the best practices for working with Tableau and data can manage these things for their teams, without having to submit IT requests to change permissions or add projects.

## Project-level administration

For more information about administering projects, see Manage Permissions with Projects.

## Add Projects and Move Content Into Them

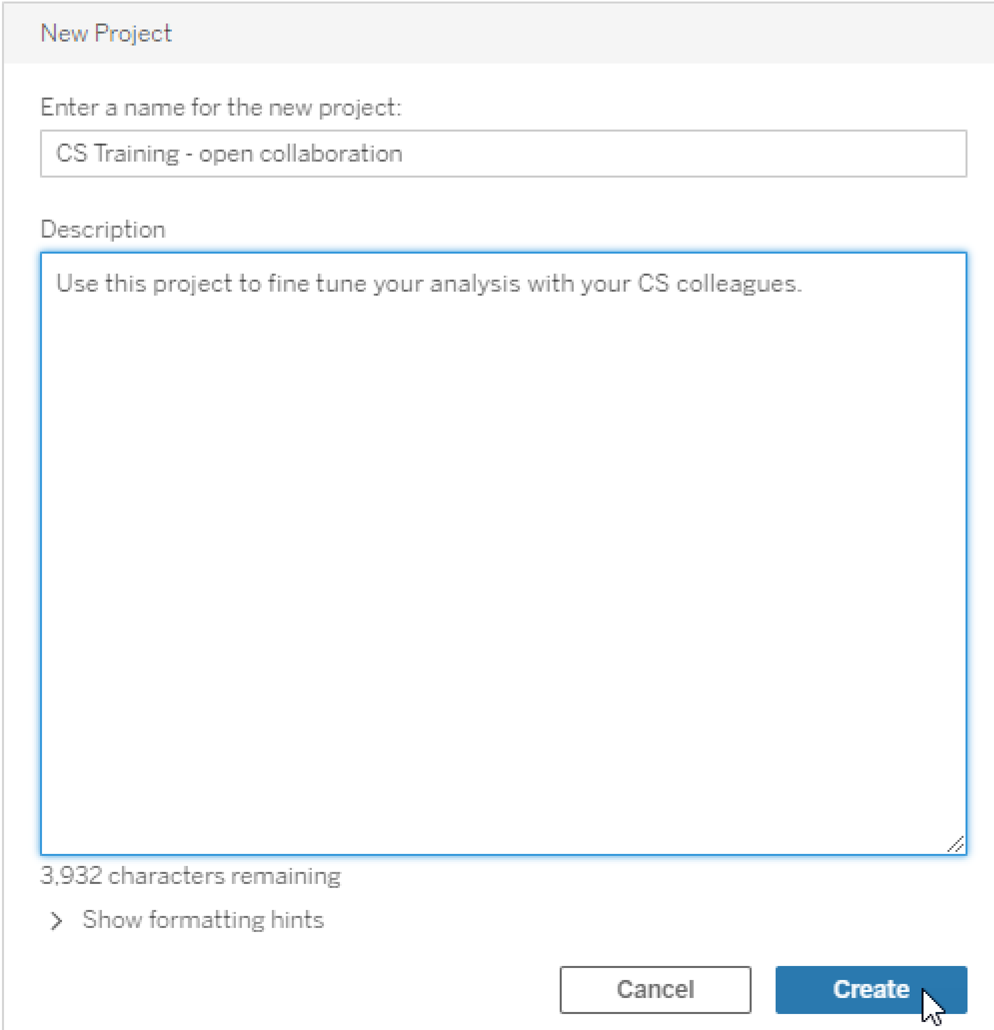
Tableau content (such as workbooks or data sources) must be in a project. Starting in Tableau Server 2022.3 and Tableau Cloud October 2022, if Data Management is licensed and Catalog is enabled, external assets (such as databases and tables) can also be in projects. Server and site administrators can add or remove top-level projects on a site, and move published content from one project to another. Project leaders with appropriate site roles can add or remove child projects and move content between projects on which they have Project Leader access.

This article contains the steps for creating and moving projects. We recommend becoming familiar with the following related content as well:

- To learn about projects and when or why to use them, see Use Projects to Manage Content Access.
- Before you create project hierarchies, become familiar with Permissions.
- To see the specific site roles that allow full Project Leader access, see Project-level administration.

### Add a top-level or child (nested) project

1. While you're signed in to Tableau Cloud as an administrator or project leader, select **Explore**, and then do one of the following:
   - Select **New** > **Project** to create a new top-level project (only administrators can do this).
   - Navigate to and open the project in which you want to create a sub-project, and then select **New** > **Project**. If you're not sure where to find the child project, select **All Projects** from the drop-down menu next to **Explore**, or use the filters in the upper right.
2. Enter a name and description for the project, and then click **Create**.




You can include formatting and hyperlinks in the project description. Select **Show formatting hints** for syntax.

When entering a project description, include a space between capital letters and parentheses to display content inside them, such as "PROJECT (a)". Omitting this space will cause display issues in the project description.

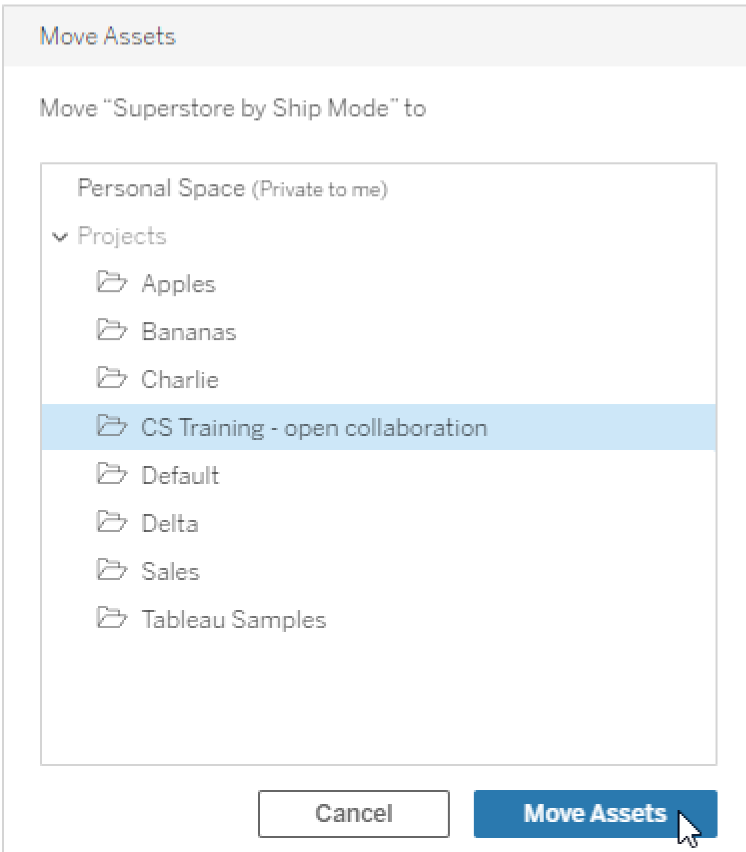
**Note:** To edit a project description later, select it to open it, select the information icon next to its name, and then click **Edit**.

Move an asset to another project

1. In the **Explore** section, find the asset you want to move. You can use the filters in the upper right to search, or you can navigate through the project hierarchy.

2. On the workbook's **Actions**(**...**) menu, select **Move**.

3. Select the new project for the workbook, and then click **Move Content**.




Moving a project includes moving everything in it, including child projects and their assets.

How moving projects affect permissions

When you move a project, Project Leader permissions adapt to the new project environment.

- When the target project hierarchy is **Locked**, previous Project Leader permissions are removed, and new Project Leader permissions are granted according to those set at the top-level of the target hierarchy.
- When the target project hierarchy is **Customizable**, previous implicitly granted Project Leader permissions are removed, explicitly set Project Leader permissions are retained, and new Project Leader permissions are granted according to those set at the top-level of the target hierarchy.

When you move a project and assets, permissions may be impacted. For more information, see Permissions.

Delete a project

When you delete a project, all of the Tableau content in the project is also deleted. If you want to delete a project but not its content, move the content to another project, and then delete the project.

External assets, such as databases and tables, are not deleted, but are moved to the **External Assets Default Project**. (In Tableau Server 2022.3 and earlier, the assets can be found in **External Assets**.)

**Important**

- You cannot undo deleting a project.
- Deleting a project deletes all Tableau content in it, including child projects and their content, but not external assets.
- You cannot delete the **Default** project or the **External Assets Default Project**.

To delete a project:

1. In the **Explore** section, find the project you want to remove. If you're not sure where to find the project, select **All Projects** from the drop-down menu next to **Explore**, or use the filters in the upper right.

2. On the project’s **Actions** (**…**) menu, select **Delete**.

3. Confirm that you want to delete the project.

Requirements for moving assets

Moving an asset is effectively like removing it from one project and publishing it to another. For non-administrators, the permissions needed on the source project are different from those needed on the destination project.

Required site role

To move assets, users must have one of the following site roles:

- Server Administrator (Tableau Server only)
- Site Administrator Creator or Site Administrator Explorer
- Creator or Explorer (can publish)

Users with a Server Administrator or Site Administrator site role do not need any additional capabilities.

Required permissions for the project that users move content *to*

Non-administrators must have the **Publish** permission capability for the destination project.

Required permissions for the project that users move content *from*

Non-administrator users must

- Be the project owner, project leader, or content owner for the original project

  OR

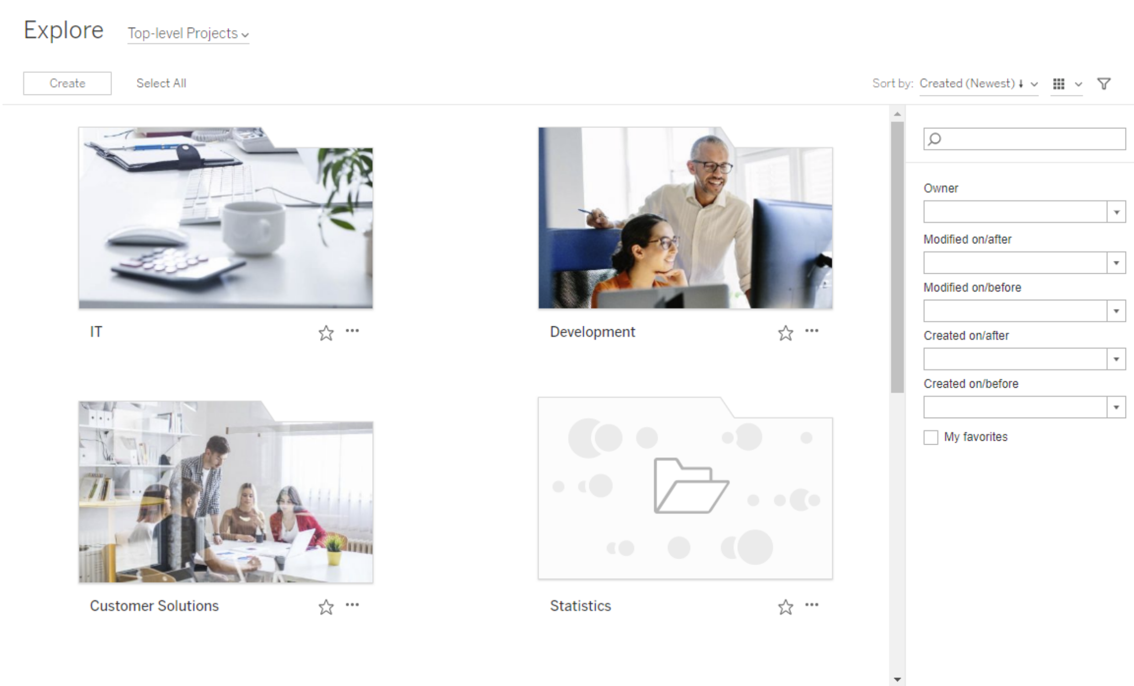
- Have the **Move** permission capability for the content (or, for data sources, be the data source owner). When moving a database with its tables, the user must have the Move capability for both the database *and* its tables.

For more information on moving assets, see Move content.

## Add a Project Image

To help distinguish projects you manage on Tableau Cloud (and help your users find them), you can add an image that appears in the thumbnail. Your image must meet the following requirements:

- The image must be accessible using HTTPS protocol. Shared network directory and related protocols (UNC, SMB, AFP, NFS, etc) are not supported. HTTP protocol for project images is not supported by Google Chrome.
- All users who access the project must have, at a minimum, "read-only" permission on the target image.
- The image must be common internet format: .jpg, png, or gif.

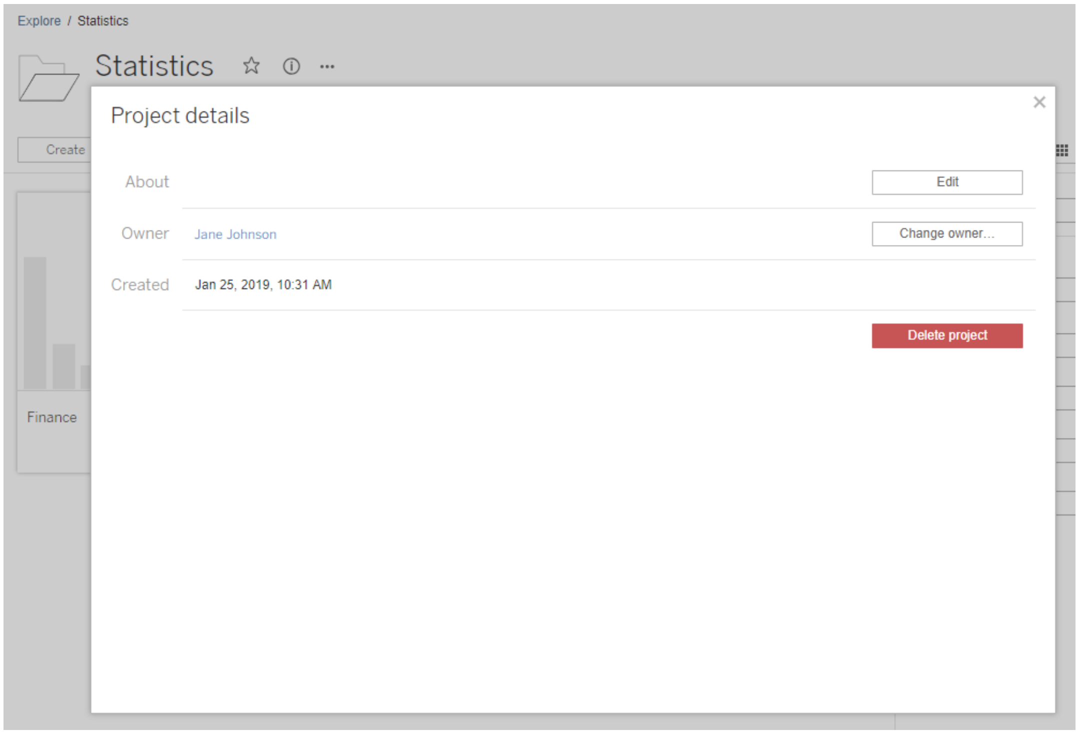



### Set a project image

1. Sign in to a site on Tableau Cloud. In the list of **Top-level Projects** you have access to, select or navigate to the project you want to update. In this example, we'll add an image to the Statistics project folder.

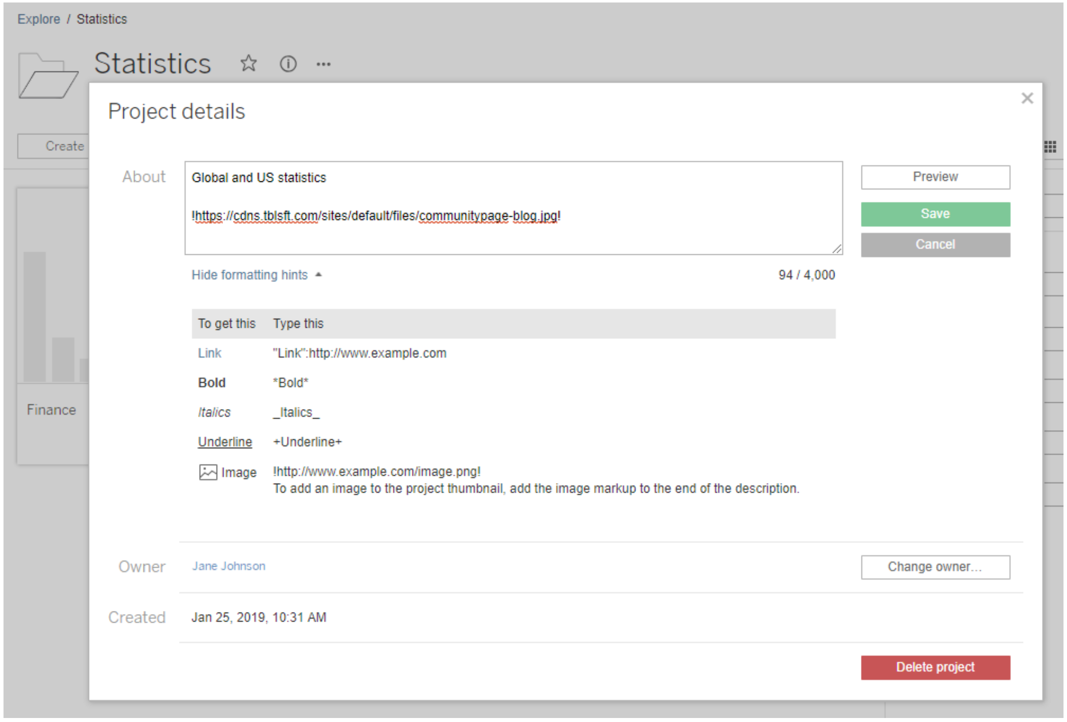
If you're not sure where to find a child project, use the **Explore** drop-down list and select **All Projects**.

2. Click the **Details** icon (i), to open the **Project details** dialog box, and then click **Edit**.




3. In the **About** field, you can enter a description for your project (optional), for example "Global and US statistics." At the end of the project description, add the URL for your image using the following syntax:

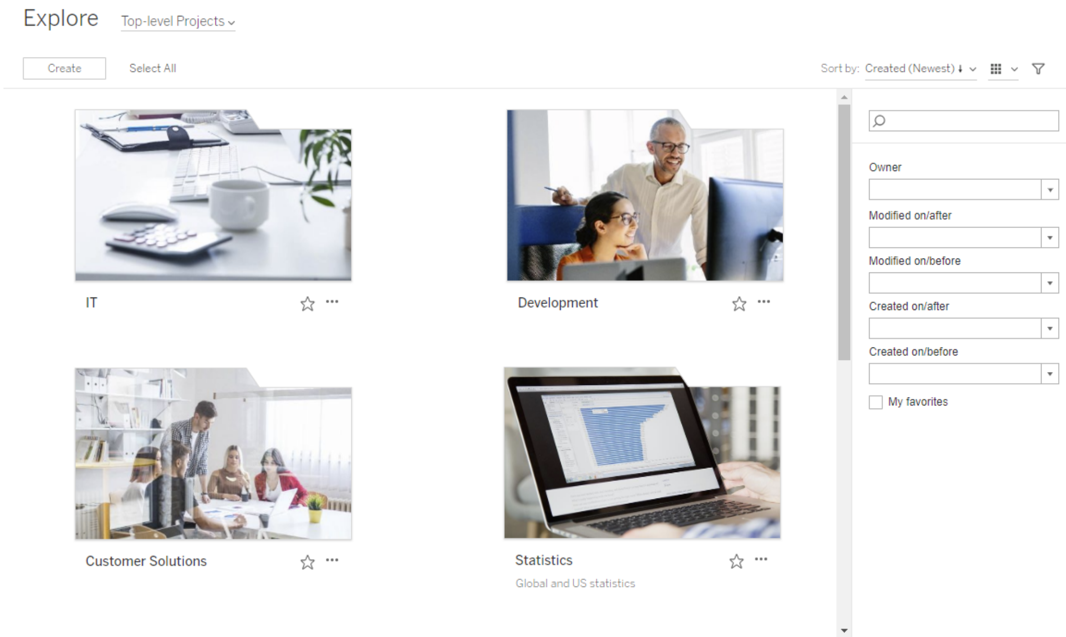
```
!http://www.example.com/image.png!
```




Select **Show formatting hints** to see how you can format description text.

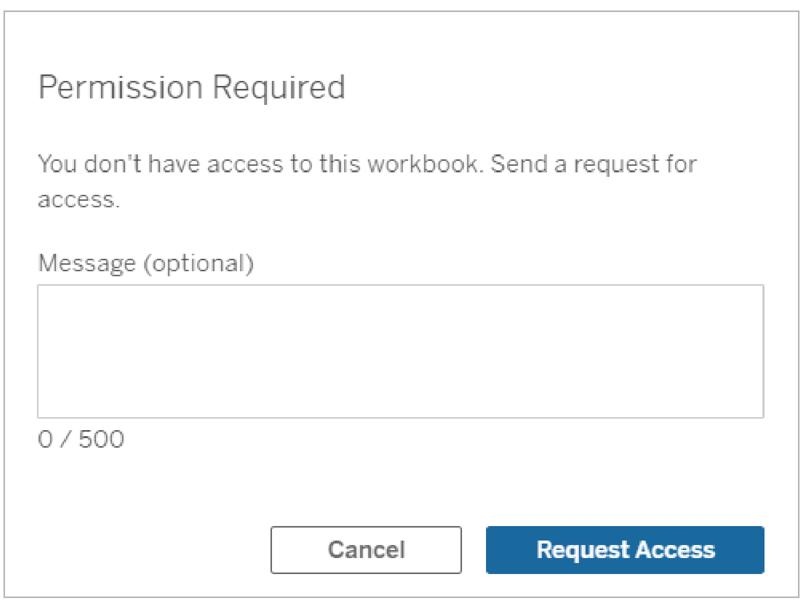
> **Note:** Images embedded in project descriptions cannot be resized or positioned. Recommended size is (300 x 184 pixels). Images that are not 300 x 184 pixels may be stretched, shrunk, or cropped to fit the width of the thumbnail. In addition, they must be added at the end of the project description and be enclosed in **!** (exclamation marks), otherwise they will not be displayed as the thumbnail.

4. Click **Save**.




## Let Site Users Request Access to Content

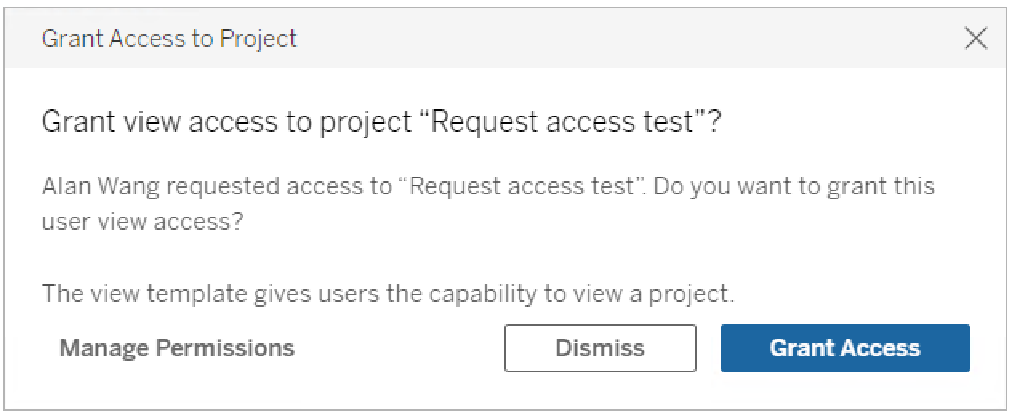
Permissions determine if a user has viewing access to a workbook, view, or other content inside a project. If a user clicks on content or a project they don't have access to, they can send a request for access to the owner who controls permissions for that content.



When someone requests access, the owner who controls permissions for that content (either at the project or workbook level) receives an email with the name and email of the requester, the content or project requested, and a link to grant access to the content. In Tableau Server version 2022.3 and earlier, the owner receives a link to the content to manage permissions instead of a link to directly grant access.

1. On the email notification, select **Grant Access**.

2. On the dialog that appears, to grant the view permissions template, select **Grant Access**. To grant permissions other than the view template, select **Manage Permissions**.




If a user requests access to a workbook and content permissions are locked to the project, then the project owner receives the request. Likewise, if a user requests access to a workbook and project permissions are managed by the workbook owner, then the workbook owner receives the request.

After permission is granted, the owner can email the requester to let them know they have view capability to the project or workbook.

## Default settings

The Request Access setting is enabled by default on a new site. To enable the setting if it's been disabled:

1. Go to the General tab of the Settings page for your site.
2. On the General tab, scroll down to Request Access and select **Let users request access to projects, workbooks, and views**.
3. Click **Save**.

## Configure project permissions

You can control who receives the access request by adjusting the project's content permissions. If content permissions are:

- Locked to the project: the project owner receives the request.
- Managed by the owner: The workbook owner receives the request.

To manage content access using projects, see Use Projects to Manage Content Access and Permissions.

For more information about how permission rules are evaluated, see Permissions: Evaluate permission rules.

## Change project permissions

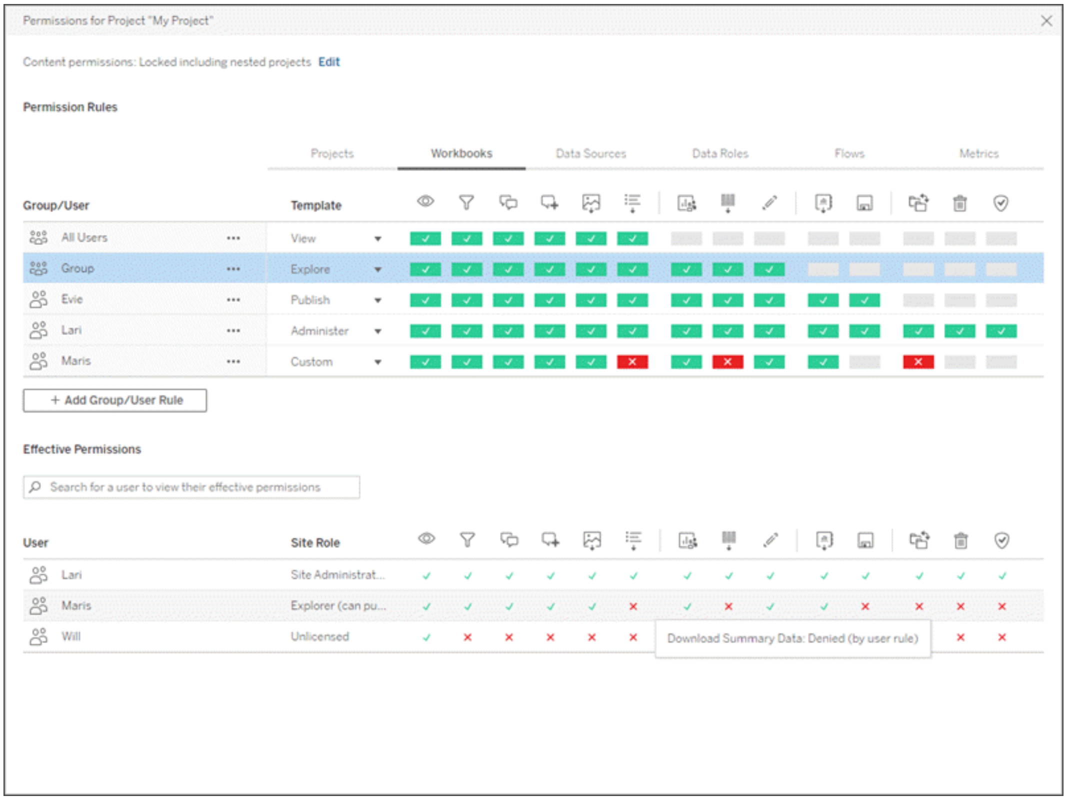
*For administrators and project leaders*

Permissions can be set at the project level for both the project itself and for any content in the project. For example, if workbook permissions are configured at the project level, all workbooks published into that project inherit those default permissions. However, the Creator can choose to change the permissions during publishing, or certain users can change the permissions on published content. To enforce the permissions established at the project level, **Content Permissions** can be locked to the project. For more information, see Lock asset permissions.

To set permissions at the project level:

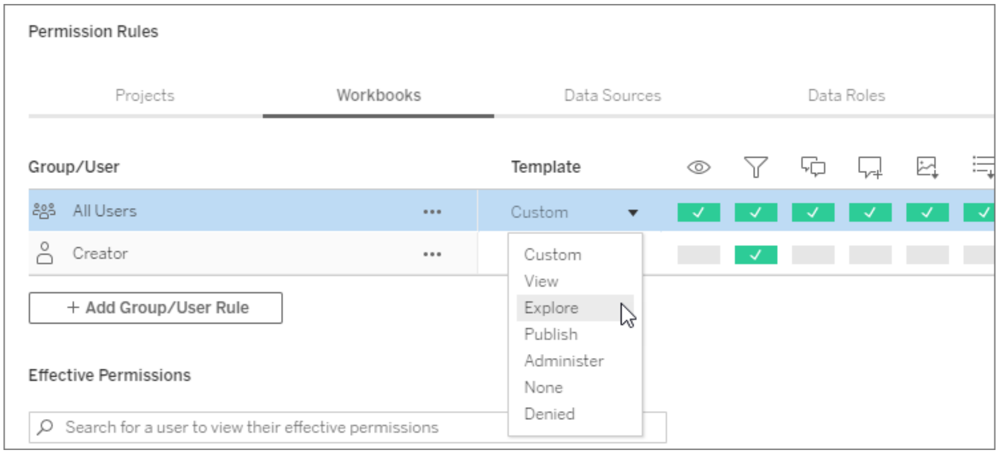
1. Navigate to the project
2. Open the Actions menu (...) and click **Permissions**. The permissions dialog box opens.

This dialog box has two main areas: permission rules at the top and the effective permissions grid below. Use the tabs to navigate between types of content.




With a row selected at the top, the effective permissions grid populates. Use this to verify permissions. Hovering over a capability indicator provides information about why the capability is allowed or denied for that specific user.

3. To modify an existing permission rule, select the rule and click the capability boxes to toggle through allowed/denied/unspecified.
4. To create a new rule,
   a. Select **+ Add Group/User Rule**.
   b. Select a group or user from the drop-down box. This creates a row where you can configure the permission rule.
5. In the row for the permission rule
   a. choose an existing permission role template from the drop-down box for each content type tab.




b. Or create a custom rule by navigating to a content type tab and clicking the capabilities. One click sets the capability to **Allowed**, two clicks sets it to **Denied**, and a third click clears the selection (**Unspecified**).

6. When finished, click **Save**.

## Change content permissions

*For administrators, project leaders, and content owners*

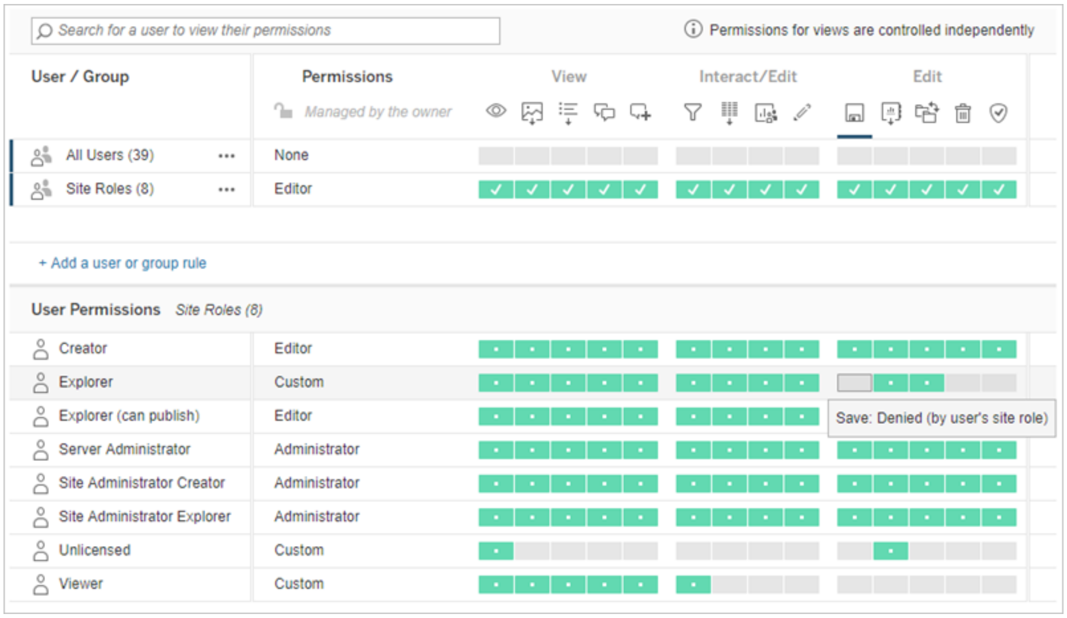
If project permissions are not locked, permissions for individual pieces of content can be modified.

**Warning**: Tableau recommends managing permissions at the project level within the Tableau site. These steps are relevant only for content in projects where permissions are managed by the owner.

Set permissions on content

1. Navigate to the content (workbook, data source, flow, data role)
2. Open the Actions menu (...) and click **Permissions**. The permissions dialog box opens.

   This dialog box has two main areas: permission rules at the top and the effective permissions grid below.




With a row selected at the top, the effective permissions grid populates. Use this to verify permissions. Hovering over a capability square provides information about why the capability is allowed or denied for that specific user.

3. To modify an existing permission rule, open the Actions menu (...) for that row and click **Edit**.
4. To create a new rule,
   a. Select **+ Add a user or group rule**.
   b. If necessary, use the drop-down box on the right to change between groups and users.
   c. Select a group or user from the drop-down box. This creates a row where you can configure the permission rule.
5. In the row for the permission rule, choose an existing permissions role template from the drop-down box or create a custom rule by clicking the capabilities.

   One click sets the capability to **Allowed**, two clicks sets it to **Denied**, and a third click clears the selection (**Unspecified**).
6. When finished, click **Save**.

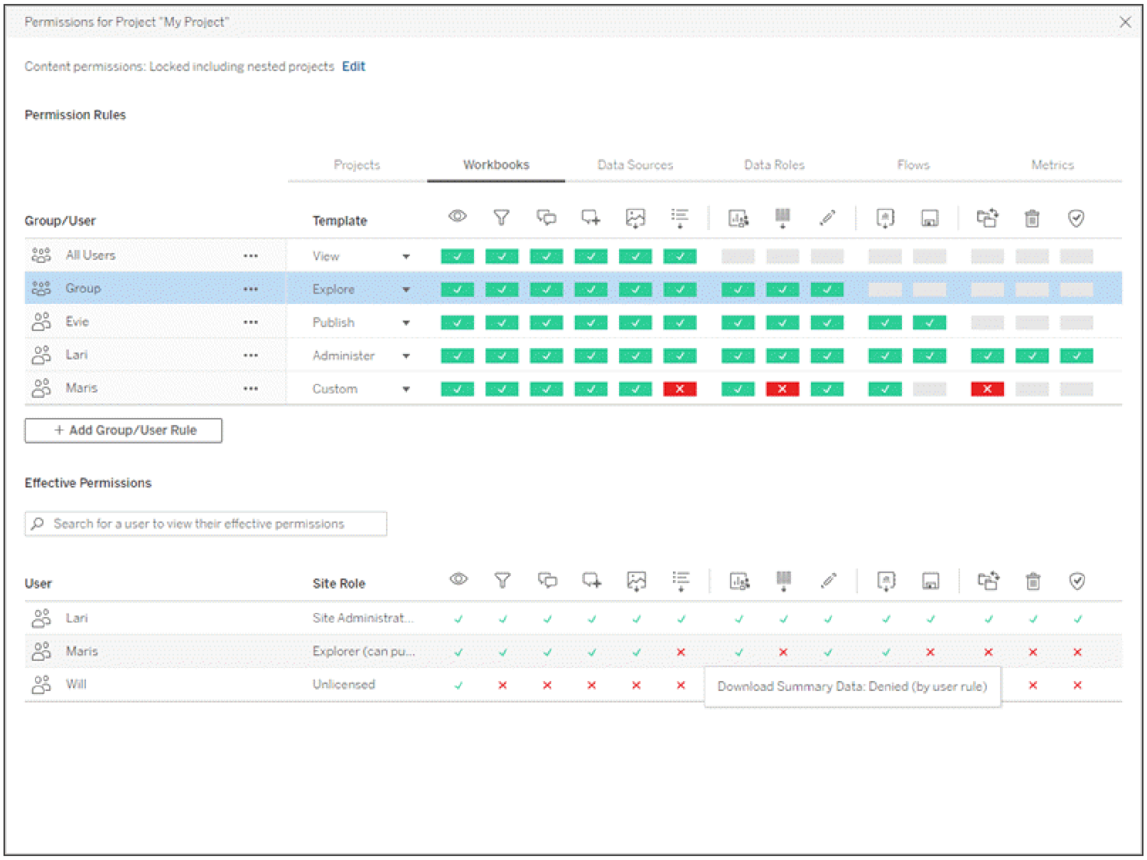
Set permissions on a view

In some situations, it may be valuable to specify permissions on a view independently from the workbook that contains it. To set permissions on a published view, navigate to the view within a published workbook and follow steps above.

**Warning**: While it is possible to set view-level permissions within a workbook, we strongly recommend managing permissions at the project (or workbook) level as much as possible. For views to inherit permissions, the project must be locked or the workbook must be published with **Show Sheets as Tabs**. See Let Site Users Request Access to Content for more information.

## Permissions

Permissions determine how users can interact with content such as workbooks and data sources. Permissions are set in the permission dialog or via the REST API. At the top of the dialog, permission rules configure capabilities for groups or users. Below, the permissions grid displays the effective permissions for users.




There are several interrelated topics that discuss how to think about, set, and manage permissions. The main topics are:

- This topic, which covers the fundamentals, how to set permission rules for projects and other content, and permission considerations for specific scenarios.
- Permission Capabilities and Templates, which covers in detail the various capabilities that are used to build permission rules.
- Manage Permissions with Projects, which covers using projects to manage permissions and how nested and locked projects impact permissions.
- Effective permissions, which covers how permission rules are evaluated and how final permissions are determined.
- Permissions, Site Roles, and Licenses, which covers how permissions interact with site roles and licenses to determine what a user can do on a site.

Additionally, if Data Management is licensed, permissions for external assets have additional considerations. For more information, see Manage Permissions for External Assets.

## Permissions fundamentals

### Projects and groups

Tableau sites use *projects* to organize content and *groups* to organize users. Managing permissions is easier when permission rules are:

- Set at the project level instead of on individual pieces of content.
- Established for groups instead of individuals.

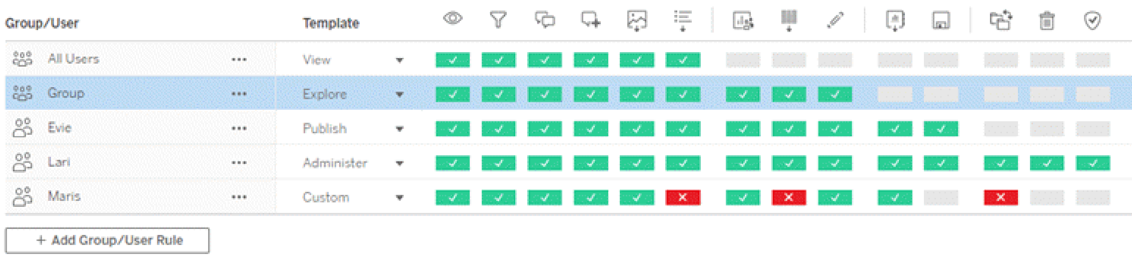
Permissions can only be established for users, groups, projects, or assets that already exist. For more information about creating users and groups, creating projects, and publishing content, see Manage Users and Groups, Use Projects to Manage Content Access , and Publish Data Sources and Workbooks.

### Capabilities and permission rules

Permissions are made up of *capabilities*—the ability to perform actions like view content, web edit, download data sources, or delete content. *Permission rules* establish what capabilities are allowed or denied for a user or group on an asset.

For more information about capabilities and permission rule templates, see Permission Capabilities and Templates.

**Note:** When talking about permissions in general, it’s common to see a phrase like "a user must have the delete *permission*." This is easy to understand in a broad context. However, when working with permissions at a technical level like in this article, it’s more accurate to say "the delete *capability*." In this topic we’ll use the more precise term *capability*, but you should be aware that you might see *permission* in other places.




For a breakdown of the capability icons and their meanings, see Permission Capabilities and Templates.

The interplay between license level, site role, and potentially multiple permission rules factor into the final determination of what a user can or can’t do. For each user this becomes their *effective permissions*. For more information, see Effective permissions.Some tasks such as creating new workbooks from a browser (web authoring) or moving content might require specific configurations of several capabilities rather than being captured in a single capability. For more information, see Permission settings for specific scenarios.

## Set permissions

Permission rules are set differently at the project level, at the content level, or when publishing content from Tableau Desktop.

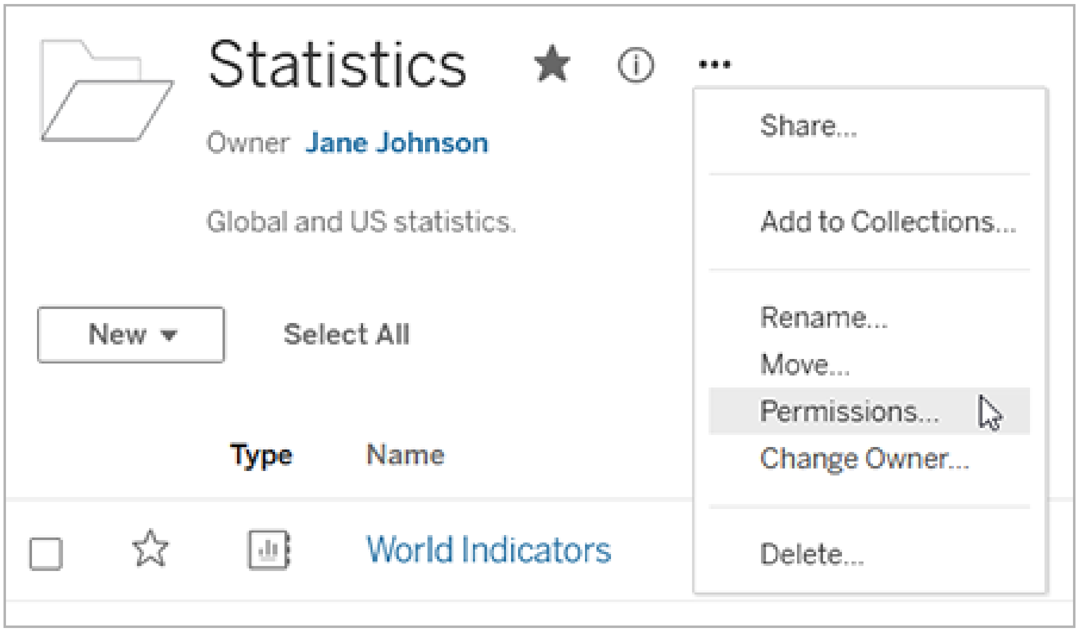
> **Note**: The phrase "project permissions" can have two meanings. There are the permission capabilities for a project itself—View and Publish—that control how a user can interact with a project. There is also the concept of project-level permission rules for other content types. In this article “project-level permissions” means permission rules for workbooks, data sources, and the other assets that are configured in the permission dialog for a project. This is in contrast to “content-level” permission rules that can be set on a specific workbook, data source, etc.

### Project-level permissions

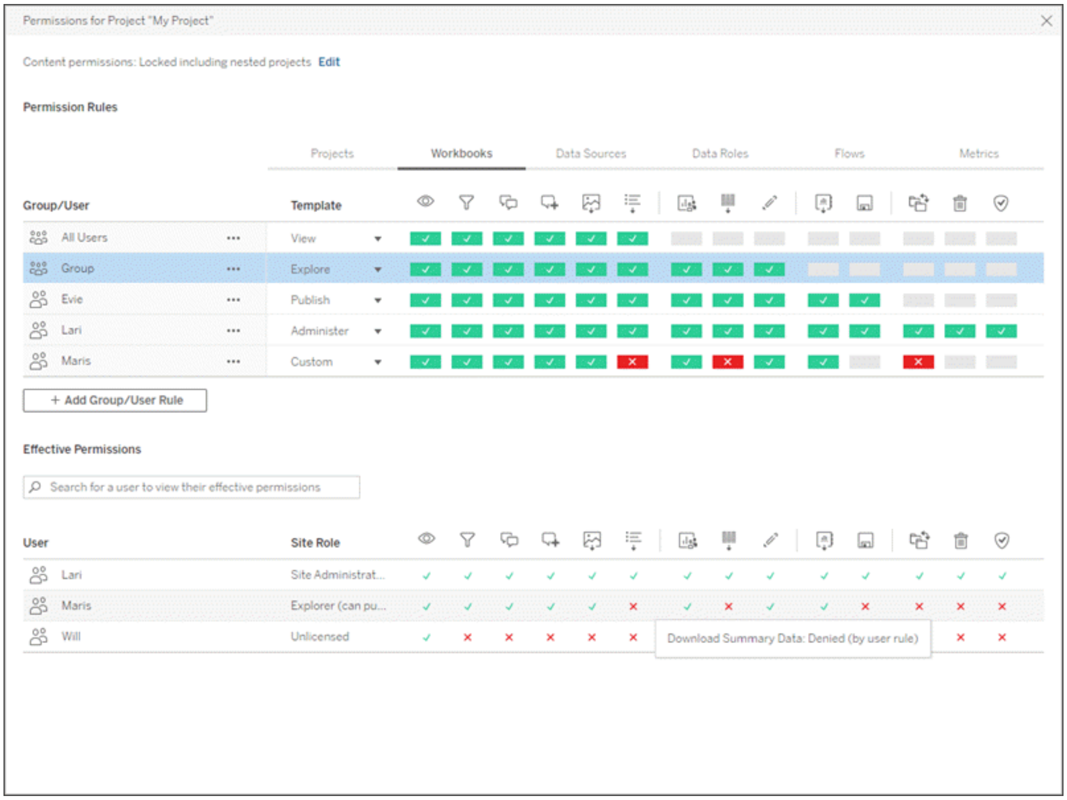
*For administrators, project owners, and project leaders*

To set permissions at the project level:

1. Navigate to the project
2. Open the Actions menu (...) and click **Permissions**.




The permissions dialog opens. This dialog has two main areas: permission rules at the top and the effective permissions grid below. Each content type has a tab. The image below shows the Workbook tab.




With a row selected at the top, the effective permissions grid populates. Use this to verify permissions. Hovering provides information about why the capability is allowed or denied for that specific user.

3. To modify an existing permission rule, select the appropriate tab for that content type and click a capability.
4. To create a rule, click **+ Add Group/User Rule** and start typing to search for a group or user. For each tab, choose an existing template from the dropdown box or create a custom rule by clicking the capabilities.

   One click sets the capability to **Allowed**, two clicks sets it to **Denied**, and a third click clears the selection (**Unspecified**).

5. When finished, click **Save**.
   - If the "None" template is selected, the button will say "Delete Rule".

Set project permissions for all content types

Remember that the permissions dialog for a project contains tabs for each type of content. **You must set permissions for each type of content at the project level or users will be denied access to that content type**. A capability is only granted to a user if they're expressly allowed it. Leaving a capability as Unspecified will result in it being denied.

**Tip**: Every time you create a permission rule at the project level, make sure you look through all the content type tabs.

Configure the asset permissions setting

Permission rules set at the project level act as a default for content saved in that project and any nested projects it contains. Whether those project-level default rules are kept uniform or are able to be edited depends on the **Asset permissions** setting. This setting can be configured in two ways, either **Locked** or **Customizable**. For more information, see Lock asset permissions.

## Content-level permissions

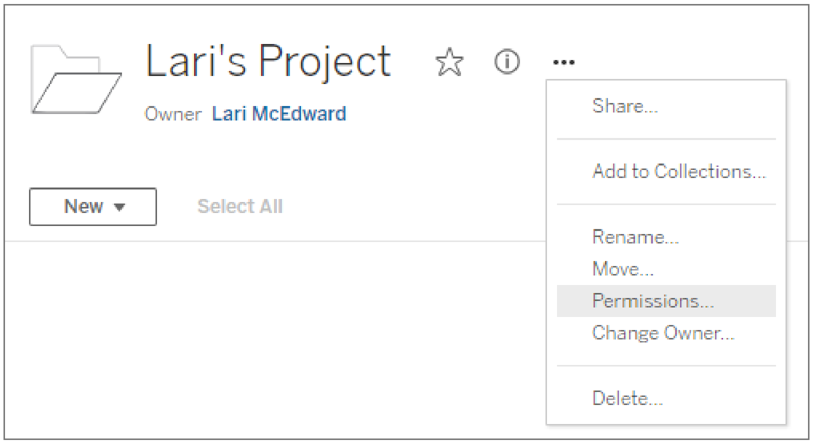
*For administrators, project leaders, and content owners*

If project **Asset permissions** are **Customizable**, permissions for individual assets can be modified. The information below isn't relevant to assets in locked projects. For more information, see Lock asset permissions.

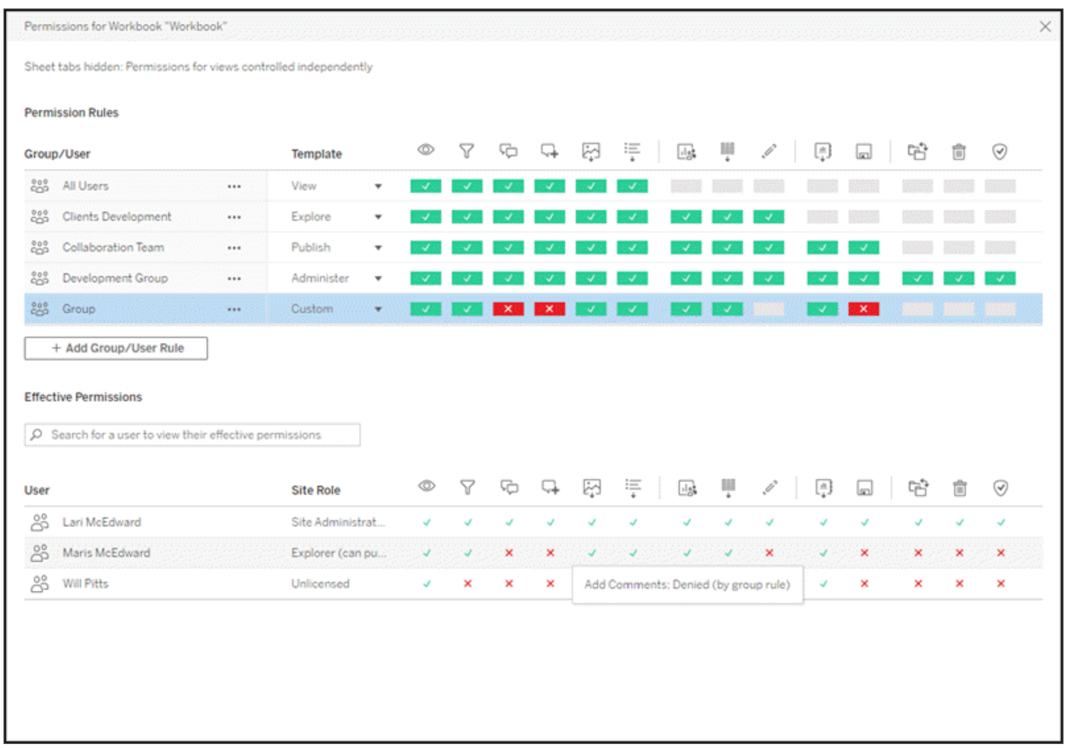
**Tip**: While it is possible to set permissions on individual assets in **Customizable** projects, we recommend managing permissions at the project level.

Set permissions on assets

1. Navigate to the asset (such as a workbook, data source, or flow)
2. Open the Actions menu (...) and click **Permissions**.




The permissions dialog opens. This dialog has two main areas: permission rules at the top and the effective permissions grid below. (Note the lack of tabs across the top—an asset-level permissions dialog has no tabs.)



With a row selected at the top, the effective permissions grid populates. Use this to verify permissions. Hovering over a capability square provides information about why the capability is allowed or denied for that specific user.

3. To modify an existing permission rule, click a capability.
4. To create a rule, click **+ Add Group/User Rule** and start typing to search for a group or user. Choose an existing template from the dropdown or create a custom rule by clicking the capabilities.

   One click sets the capability to **Allowed**, two clicks sets it to **Denied**, and a third click clears the selection (**Unspecified**).

5. When finished, click **Save**.
   - If the "None" template is selected, the button will say "Delete Rule".

Set permissions on a view

**Tip**: While it's possible to set view-level permissions within a workbook, we strongly recommend managing permissions at the project (or, if necessary, workbook) level.

If a workbook is published with **Show Sheets as Tabs** checked, the views in that workbook will inherit all permissions set for the workbook. The permission dialog for a view will be read-only.

In some situations, it may be valuable to specify permissions on a view independently from the workbook that contains it. If the workbook is published with **Show Sheets as Tabs** unchecked (sheet tabs hidden), the views will start with the workbook permissions but will be independent thereafter and can be set independently. Note that this means if the permission rules are modified for the workbook, those changes won't be applied to the views—each view's permissions will need to be managed individually.

See Show or Hide Sheet Tabs for more information.

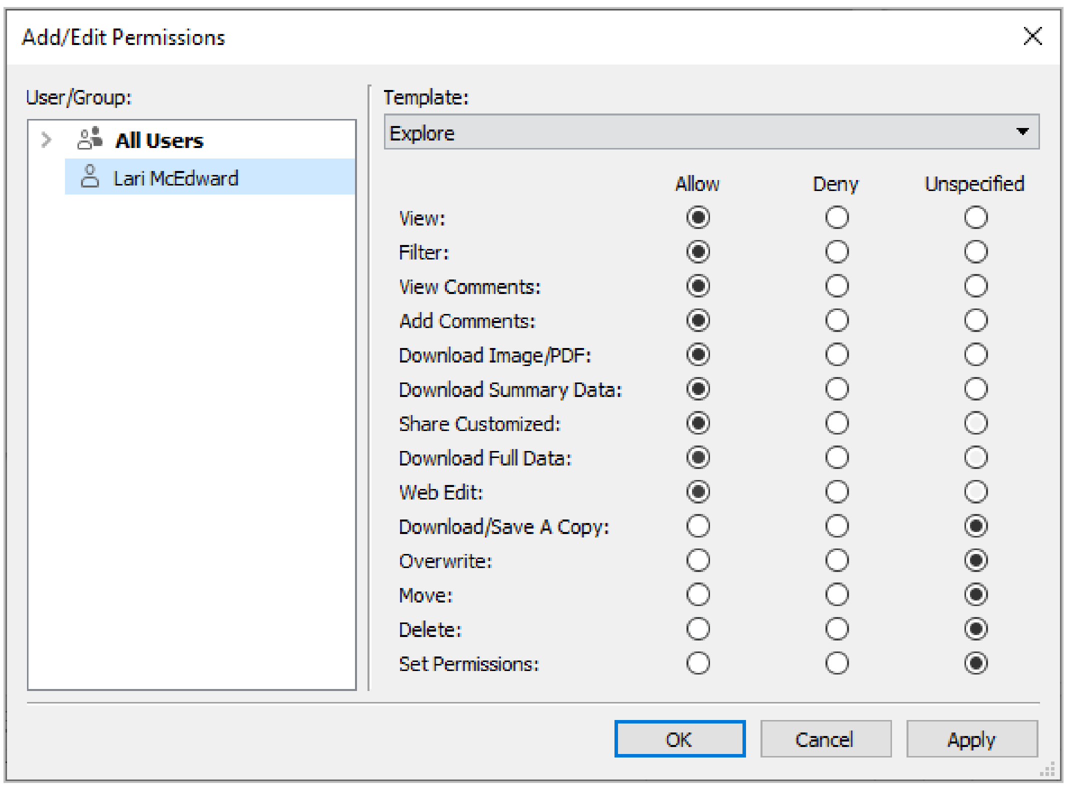
## Set permissions at publish

*For content publishers*

If project **Asset permissions** are **Customizable**, permissions for individual assets can be set when publishing from Tableau Desktop. The information below isn't relevant for content in locked projects. For more information, see Lock asset permissions.

**Tip**: While it's possible to set permissions on individual assets in **Customizable** projects, we recommend managing permissions at the project level.

1. From the publishing dialog , click the Edit link for **Permissions**.
   If the Edit link is unavailable, permissions are locked to the project and can't be modified except by the project owner, project leader, or an administrator.
2. The Add/Edit Permissions dialog shows any existing permission rules. Click **Add** to add a permission rule or **Edit** to modify an existing permission rule
   a. Select the group or user from the left pane. You can expand a group to see which users it contains.
   b. Use the selector at the top of the right pane to choose an existing template, or use the radio buttons to create a custom rule.




Note that effective permissions can't be inspected from the publishing dialog.

3. When finished, click **OK** and resume publishing.

**Note**: Permissions can’t be set while publishing flows from Tableau Prep Builder. To set permissions on a flow, refer to the steps for Project-level permissions or Content-level permissions.

Clean up the All Users group

By default, all users are added to an "All Users" group that has basic permissions for content. To start with a clean slate when building your own permission rules, we recommend that you delete the rule entirely or edit the rule for All Users to remove any permissions (set the permission role template to None). This helps prevent any ambiguity down the road by reducing the number of rules that applies to any given user and therefore making effective permissions easier to understand.

## Permission settings for specific scenarios

Certain actions require combinations of permission capabilities and possibly site roles. The following are some common scenarios and their necessary permission configurations

Saving, publishing, and overwriting

In the context of permissions, saving is essentially publishing. As such, the **Overwrite** and **Save a Copy** capabilities can only be given to users with a site role that allows publishing: Administrator, Creator, or Explorer (can publish). Explorer or Viewer site roles can’t publish, overwrite, or save a copy.

- The **Publish** capability for a project allows a user to publish content into that project.
- The **Overwrite** capability allows a user to save over an existing piece of content. By saving over the content, the user becomes the owner of that content. The Overwrite capability also allows users to edit minor aspects of existing pieces of content, such as the description for a metric or the synonyms for a data role. Editing the existing content in this way doesn't change the owner of the content.

- The **Save a Copy** capability allows a user to save a new copy of the content. This is usually done in conjunction with web authoring and means the user can save their modifications.

It's important to note that users aren't able to Save or Save As a piece of content unless they've the **Publish** capability for at least one project, because all content must be published into a project. Without the **Publish** capability at the project level, the content can't be published.

In web editing, the **Save** option in the File menu only appears to the content owner. If a user who isn't the owner has the **Overwrite** capability (allowing them to save the content), they must use **File > Save As** and name the workbook the exact same name. This prompts a warning that they're about to overwrite the existing content, which they can do. Conversely, a user with only the **Save a Copy** capability trying to use the same name gets an error stating they don't have permission to overwrite the existing content.

If a user who isn't the content owner overwrites content, they become the owner, with all the permissions that entails. The original owner's access to the content is then determined by their permissions as a user rather than the owner.

> **Note**: **Download Workbook/Save a Copy** is a joint capability for workbooks. Explorers can be given this capability but they're only able to download the workbook, not save a copy. Giving the capability to Explorer (can publish), Creator, or Administrator site roles gives them both the ability to download workbooks *and* save a copy.

Web Editing and Web Authoring

Web editing and web authoring allows users to edit or create workbooks directly in the browser.

The permission capability is called *Web Edit* and the site setting is called *Web Authoring*. This section refers to any web-based editing or publishing action as *web authoring*.

To enable this functionality, there are several requirements.

- **User site role**: The user must have the appropriate site role.
  - Viewers can never web edit.
  - Explorers can be given the web edit capability but can’t publish. Essentially, they can use web editing to answer deeper questions based on existing content on the fly, but can’t save their edits.
  - Explorers (can publish) or Site Administrator Explorers can publish, but they can only use data that is already published to the site.
  - Creators, Site Administrator Creators, and Server Administrators can publish and create data sources.
- **Permission capabilities**: The user must have the necessary permission capabilities based on the desired functionality.

Required Permission Capability Settings

| Desired functionality | Minimum Site Role | Web Edit | Download/ Save a Copy | Overwrite *(workbook)* | Publish *(project)* | Connect (*data source*) |
|---|---|---|---|---|---|---|
| Web author without being able to save | *Explorer* | Allow | Deny | Deny | Optional | Allow |
| Web author and save as new content | *Explorer (can publish)* | Allow | Allow | Deny | Allow | Allow |
| Web author and save (overwrite) content | *Explorer (can publish)* | Allow | Allow | Allow | Allow | Allow |
| Web author with new data and save new content | *Creator* | Allow | Optional | Optional | Allow | Optional |

Optional indicates this capability isn't involved in the desired functionality

Data access for published Tableau data sources

Data sources published to a Tableau site can have native authentication as well as permissions within the Tableau environment.

When the data source is published to the Tableau site, the publisher can choose how to Set Credentials for Accessing Your Published Data, which addresses how data source credentials are handled (such as requiring users to log into a database or enter their credentials for Google Sheets). This authentication is controlled by whatever technology holds the data. This can be embedded when the data source is published, or the data source publisher can choose to prompt the user for their credentials to the data source. For more information, see Publish a Data Source.

There are also data source capabilities that allow or deny users the ability to see (**View**) and connect to the published data source (**Connect**) in the context of Tableau. These capabilities are set like any other permissions in Tableau.

When a workbook is published that uses a published data source, the author can control how the Tableau authentication behaves for someone consuming the workbook. The author sets the workbook's access to the published data source, either as **Embed password** (using the author's Connect access to the data source) or **Prompt users** (using the Connect access of the person viewing the workbook), which may require data source authentication as well.

- When the workbook is set to **Embed password**, anyone who looks at the workbook sees the data based on the author's access to the data source.
- If the workbook is set to **Prompt users**, the Tableau-controlled access is checked for the data source. The person consuming the workbook must have the Connect capability for the published data source to see the data. If the published data source is also set to Prompt user, the viewer must also enter their credentials for the data source itself.

| Workbook authentication to the data source | Data source authentication to the data | How data access is evaluated for someone consuming the workbook |
|---|---|---|

| | | |
|---|---|---|
| Embed password | Embed password | User sees the data as if they were the workbook author |
| Embed password | Prompt user | User sees the data as if they were the workbook author. (The author is prompted for data source authentication, not the user.) |
| Prompt user | Embed password | User must have their own **Connect** capability to the published data source |
| Prompt user | Prompt user | User must have their own **Connect** capability to the published data source and are prompted for their credentials to the underlying data |

Note that this applies to consuming a workbook, not web editing. To web edit, the user must have their own Connect capability.

For information on embedding passwords when you publish Tableau content such as a data source or workbook that uses a virtual connection, see Virtual connections in the Tableau Server help.

Move content

To move an item, open its Action menu (...) and click **Move**. Select the new project for the item, then click **Move Assets**. If **Move** is unavailable or there are no available destination projects, verify the appropriate conditions are met:

- Administrators can always move assets and projects to any location.
- Project leaders and project owners can move assets and nested projects among their projects.
  - Note that non-administrators can't move projects to become top-level projects
- Other users can move assets only if all three of the following requirements are met:
  - Creator or Explorer (Can Publish) site role.
  - Publishing rights (**View** and **Publish** capabilities) for the destination project
  - Owner of the content, or—for workbooks and flows—having the **Move** capability.

When moving a database with its tables, the user must have the **Move** capability for both the database *and* its tables.

For information about how permissions are handled when moving content and projects, see Move projects and content.

Metrics

**Retirement of the legacy metrics feature**

Tableau's legacy metrics feature was retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. In October 2023, Tableau retired the ability to embed legacy metrics in Tableau Cloud and in Tableau Server version 2023.3. With Tableau Pulse, we've developed an improved experience to track metrics and ask questions of your data. For more information, see Create Metrics with Tableau Pulse to learn about the new experience and Create and Troubleshoot Metrics (Retired) for the retired feature.

Metrics are created from views in published workbooks. Users can create metrics if they:

- Are a Creator or Explorer (can publish) site role
- Have the **Publish** capability on a project
- Have the **Create/Refresh Metric** capability for the relevant workbook

For more information, see Create and Troubleshoot Metrics (Retired) and Set Up for Metrics.

> **Note:** Prior to 2021.3, the ability to create a metric on a view was controlled by the Download Full Data capability.

Because metrics are independent assets, it's important to note that the permissions for metrics are managed independently from the view they were created from. (This is unlike data-driven alerts and subscriptions, where the content of the alert or subscription can only be seen if the user has the correct permissions for the view itself.)

Although the capabilities for metrics are straightforward, the **View** capability should be considered carefully. It may be possible for a workbook with restricted permissions to be the basis for a metric with more open permissions. To protect sensitive data, you might want to deny metric creation for specific workbooks.

Metrics display data from their owner’s perspective

When you create a metric, you capture your perspective of the data from that view. This means that any users who can access your metric will see the data as it appears to you. If the data in the view is filtered based on your credentials, the data you see might be different from what other users see when they access the same view. Limit the **View** capability for your metric if you're concerned about exposing your perspective of the data.

Explain Data

When Explain Data is available, a user can select a mark in a view and click Run Explain Data in the mark’s Tooltip menu. A combination of settings must be enabled to make Explain Data available in editing mode and viewing mode.

Requirements for authors to run Explain Data or edit Explain Data settings in editing mode:

- Site setting: **Availability of Explain Data** set to **Enable**. Enabled by default.
- Site role: Creator, Explorer (can publish)
- Permissions: **Run Explain Data** capability set to **Allowed**. Unspecified by default. If you open a workbook (Tableau version 2022.1 or earlier) that used this permission in Tableau version 2022.2 or later, you must reset the Run Explain Data capability to Allowed.

**Note:** The **Download Full Data** capability for a Creator or Explorer (can publish) controls whether they see the View Full Data option in Extreme Values explanations. Viewers are always denied the Download Full Data capability. However, all users can see record-level details when the Extreme Values explanation type is enabled in Explain Data settings.

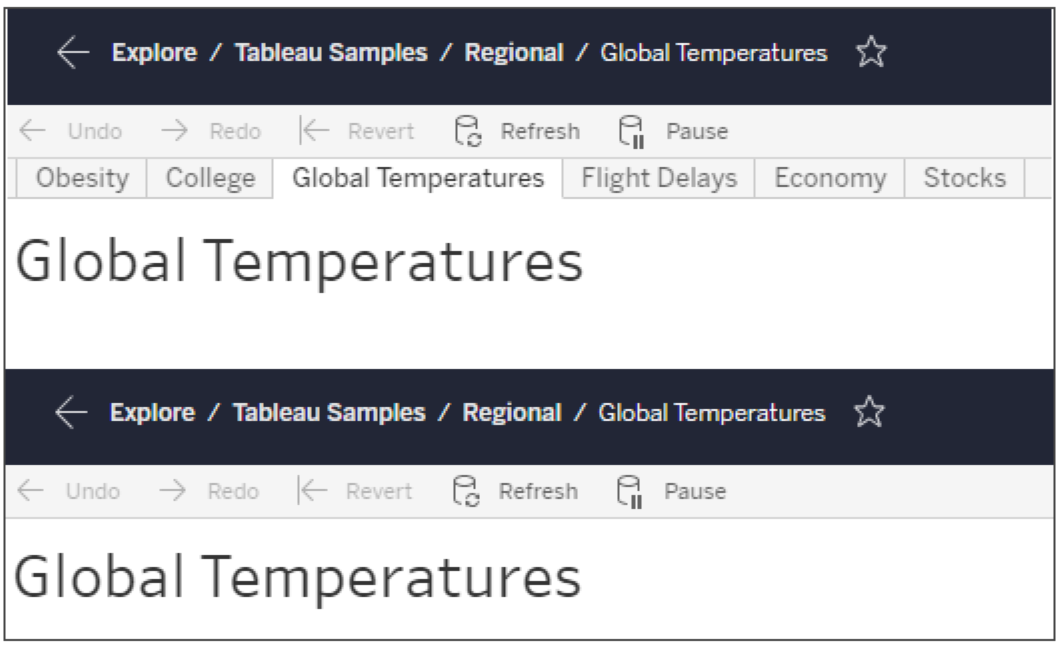
Requirements for all users to run Explain Data in viewing mode:

- Site setting: **Availability of Explain Data** set to **Enable**. Enabled by default.
- Site role: Creator, Explorer, or Viewer
- Permissions: **Run Explain Data** capability set to **Allowed**. Unspecified by default. If you open a workbook (Tableau version 2022.1 or earlier) that used this permission in Tableau version 2022.2 or later, you’ll need to reset the Run Explain Data capability to Allowed.

Show or Hide Sheet Tabs

In the context of published content, sheet tabs (also referred to as tabbed views) is a distinct concept from sheet tabs in Tableau Desktop. Showing and hiding sheet tabs in Tableau Desktop refers to hiding sheets in the authoring environment. For more information, see Manage Sheets in Dashboards and Stories.

Showing and hiding sheet tabs (turning tabbed views on or off) for published content refers to navigation in a published workbook. When sheet tabs are shown, published content has navigational sheet tabs along the top of each view.




This setting also impacts how permissions function and may have security implications (see note).

**Note:** It’s possible to have the **View** capability for a view without the **View** capability for the workbook or project that contain it. Normally if a user lacks the View capability for a project and workbook, they wouldn’t know those assets exist. If they have the View capability for a view, however, a user may be able to see the project and workbook name when looking at the view, such as in the navigational breadcrumb. This is expected and accepted behavior.

Turn off tabbed views to allow independent view permissions

Although it isn't recommended as a general practice, there are times when it can be useful to set permissions on views independently of the workbook that contains them. To do so, three conditions must be met:

1. The workbook must be published—there's no way to set view permissions during publishing.
2. The workbook must be in a customizable project.
3. The workbook can't show sheets as tabs (tabbed views must be hidden).

When a workbook shows sheets as tabs, all views inherit the workbook permissions and any changes to the workbook permissions affect all of its views. **When a workbook in a customizable project doesn't show tabbed views, all views assume the workbook permissions upon publication, but any subsequent changes to the workbook's permission rules *won't be inherited by the views*.**

Changing the configuration of sheets as tabs on a published workbook will also impact the permission model. Show Tabs overrides any existing view-level permissions and reinstate the workbook-level permissions for all views. Hide Tabs breaks the relationship between the workbook and its views.

- To configure sheets as tabs on a published workbook, open the Actions menu (...) for the workbook and select **Tabbed Views**. Choose **Show Tabs** or **Hide Tabs** as desired.
- To configure sheets as tabs during publishing, refer to Show sheets as tabs.
- To set view-level permissions, see Set permissions on assets.

**Important**: In a customizable project, any modifications to the workbook-level permissions won't be applied if navigational sheet tabs are hidden (aka tabbed views are off). Changes to permissions must be made on individual views.

Collections

For information on managing permissions in Collections, refer to Collections.

## Permission Capabilities and Templates

Permissions are made up of capabilities, or the ability to perform a given action on a piece of content, such as view, filter, download, or delete. Each row in the Permission Rules area of the dialog is a *permission rule*. Permission rules are the setting for each capability (allowed, denied, or unspecified) for the group or user in that row. Permission rules have *templates* available that make it easier to assign capabilities quickly. Permission rules can also be copied and pasted.

> **Note**: In the permission dialog for projects, there are tabs for each content type: **Projects**, **Workbooks**, **Data Sources**, **Data Roles**, **Flows**, **Ask Data Lenses**, **Metrics** and—if you have the Data Management—**Virtual Connections**, **Databases**, and **Tables**. (Virtual connections were added in Tableau Server 2021.4 and Tableau Cloud December 2021. Databases and tables were added in Tableau Server 2022.3 and Tableau Cloud October 2022.) When a permission rule is added, the default for all capabilities across all content types is Unspecified. To allow or deny capabilities for each content type, you must go to each tab in turn. In the permission dialog for a specific piece of content, there are no tabs and the permission rules only apply to that piece of content.

Templates

Templates group sets of capabilities that are often assigned together based on common user scenarios, **View**, **Explore**, **Publish**, and **Administer**. When you assign a template, its included capabilities are set to **Allowed**, with the rest left as **Unspecified**. The templates are cumulative, so the Explore template includes everything from the View template plus additional capabilities. All content also has a template for **None** (which sets all capabilities to unspecified) and **Denied** (which sets all capabilities to denied).

Templates are meant to be a starting point and can be adjusted after they are applied. Capabilities can also be granted or denied without using a template at all. In both cases, the template column then shows **Custom**.

#### Copy and paste permissions

If there is a permission rule that needs to be assigned to multiple groups or users, you can copy and paste from one rule to another. You can't copy from or paste onto a rule that involves Project Leader status.

1. Open the action menu (...) for the existing rule you want to copy from and select **Copy Permissions**. This is available only when the rule is not in edit mode.
2. Select an existing rule you want to paste over. You can also create a new rule by clicking **+ Add Group/User Rule** and selecting a group or user.
3. Open the action menu (...) and select **Paste Permissions**.

#### Capabilities

Each content type has specific capabilities:

#### Projects

Projects have only two capabilities and two templates. For more information about project leaders and how to assign them, see Project administration.

### View template

**View** lets a user see the project. If a user hasn't been granted the view capability, the project won't be visible to them. Granting the view capability for a project does not mean a user can see any content in the project, just the existence of the project itself.

### Publish template

**Publish** lets a user publish content to the project from Tableau Desktop or Tableau Prep Builder. The publish capability is also required to move content into the project or save content to the project from web authoring.

## View template

**View** lets a user see the workbook or view. If a user hasn't been granted the view capability, the workbook won't be visible to them.

**Filter** lets a user interact with filters in the view, including keep only and exclude filters. Users lacking this capability won't see filter controls in the view.

**View Comments** lets a user view the comments associated with the views in a workbook.

**Add Comments** lets a user add comments to views in a workbook.

**Download Image/PDF** lets a user download each view as a PNG, PDF, or PowerPoint.

**Download Summary Data** lets a user view the aggregated data in a view, or in the marks they've selected, and download that data (as a CSV).

## Explore template

**Share Customized** lets users add their custom views to the list of "Other Views" visible on a workbook.

- When this capability is denied, users won't see the "Make visible to others" option when they create a custom view. For more information, see Use Custom Views. This capability doesn't impact the ability to share a custom view with the share dialog or by copying the link.

**Download Full Data** lets a user view the underlying data in a view, or in the marks they've selected, and download that data (as a CSV).

**Web Edit** lets a user edit the view in a browser-based authoring environment.

- Note that creating new content in the browser or saving views from the web edit interface requires a specific combination of capabilities. For more information, see Web Editing and Web Authoring.
- The Web Editing feature must also be enabled for the entire site or even users with this capability allowed won't be able to web edit. For more information, see Set a Site's Web Authoring Access.

**Run Explain Data** lets a user run Explain Data on marks in editing and viewing mode.

- Note that for Explain Data to be displayed as an option when a user selects a mark in a workbook, the feature must also be enabled as a site setting. To make Explain Data available in viewing mode, the feature must also be allowed by the author from within a workbook in Explain Data settings. For more information, see Control Access to Explain Data.

## Publish template

**Download Workbook/Save a Copy** lets a user download a packaged workbook (as a TWBX). Lets a user save (publish) a copy from the web edit interface as a new workbook.

**Overwrite** lets a user overwrite (save) the content or asset on the server.

- When allowed, the user can re-publish a workbook, data source, or flow, or save a workbook or flow in web authoring, thereby becoming the owner and gaining access to all permissions. After this change in ownership, the original owner's access to the workbook is determined by their permissions just like any other user.

**Create/Refresh Metrics** lets a user create metrics on the views in a workbook and lets any metrics that a user creates from those views refresh. The legacy Metrics feature was retired in February 2024 for Tableau Cloud and in Tableau Server version 2024.2. For more information, see Create and Troubleshoot Metrics (Retired).

## Administer template

**Move** lets a user move workbooks between projects. For more information, see Move content.

**Delete** lets a user delete the workbook.

**Set Permissions** lets a user create permission rules for the workbook.

Views

In a workbook that is not in a locked project and does not show sheets as tabs for navigation, views (sheets, dashboards, stories) inherit the workbook permissions at publication, but any changes to permission rules must be made on individual views. View capabilities are the same as those for workbooks, except for **Overwrite**, **Download Workbook/Save a Copy**, and **Move** which are only available at the workbook level.

We recommend showing navigational sheet tabs whenever possible so views continue to inherit their permissions from the workbook.

Data Sources

## View template

**View** lets a user see the data source on the server.

**Connect** lets a user connect to a data source in Tableau Desktop, Tableau Prep Builder, Ask Data, or web editing.

- If a workbook author embeds their credentials to a published data source in a published workbook, they are essentially embedding their **Connect** capability. Therefore, users can see the data in the workbook regardless of their own **Connect** capability for that data source. If the workbook author doesn't embed their credentials to the published data source, the user needs their own **Connect** capability to the data source to consume the workbook. For more information, see Data access for published Tableau data sources.

- A user must have the **Connect** capability for a data source to use Ask Data and to create Ask Data lenses. For more information, see Enable Ask Data for Sites and Data Sources.

### Explore template

**Download Data Source** lets a user download the data source from the server (as a TDSX).

### Publish template

**Overwrite** lets a user publish a data source to the server and overwrite the data source on the server.

**API Access** lets a user query the data source with the VizQL Data Service. For more information, see VizQL Data Service.

### Administer template

**Delete** lets a user delete the data source.

**Set Permissions** lets a user create and edit permission rules for the data source.

Other types of assets

| | View template | Explore template | Publish template | Administer template |
|---|---|---|---|---|
| Flows | **View** lets a user view the flow. | **Download flow** lets a user download the flow (as a TFLX). | **Run** lets a user run the flow.<br>**Overwrite** lets a user pub- | **Move** lets a user move assets between projects. For more information, see Move |

| | | | | |
|---|---|---|---|---|
| | | | lish a flow and overwrite the published flow. | content.<br>**Delete** lets a user delete the asset.<br>**Set Permissions** lets a user create permission rules for the asset. |
| Data Roles | **View** lets a user view data roles. | n/a | **Overwrite** lets a user publish data roles, overwrite published data roles, and edit published data roles' synonyms. | |
| Metrics (retired) | **View** lets a user view metrics. | n/a | **Overwrite** lets a user overwrite a metric and edit a metric's details. | |
| Ask Data Lenses | **View** lets a user see the lens. | n/a | **Overwrite** lets a user edit the lens. | |
| Virtual Connections | **View** lets a user see the virtual connection.<br>**Connect*** lets a user connect to data using a virtual connection. | n/a | **Overwrite** lets a user edit the virtual connection. | |

| | | | | |
|---|---|---|---|---|
| Databases | **View** lets a user see the database. | n/a | **Overwrite** lets a user edit the metadata for the database. | |
| Tables | **View** lets a user see the table. | n/a | **Overwrite** lets a user edit the metadata for the table. | |
| Collections | **View** lets a user view collections. | n/a | n/a | n/a |

*By default, virtual connections have a Custom template that sets the View capability to Allowed but not the Connect capability. Be sure to set the Connect capability to Allowed so users can connect using the virtual connection.

## Manage Permissions with Projects

Projects can simplify permission management with features such as nested projects, project visibility, non-admin project leaders, and locking permissions.

**Tip**: How permissions are set at the project level is important, especially for the Default project. When a new top-level project is created, it inherits its default permission rules (for all content types) from the Default project. When a new project is created nested inside another project, the child project inherits its default permission rules from the parent project.

### Project administration

Projects are containers used to organize and manage access to content. By giving non-administrators privileges to manage projects, certain content administration tasks can be handled at the project level.

**Project Leaders**: Projects can have project leaders, users who have been set as a **project leader**. This setting automatically grants a user their maximum capabilities—depending on their site role—for that project and all content in that project. Project leaders with site role of Explorer (can publish) and above have all capabilities. Project leaders are essentially local admins for the project without access to site or server settings.

**Hierarchy**: Only administrators can create top-level projects. Project owners and project leaders can create nested projects inside their projects.

Project owners and leaders have full administrative access to the project and its content, as well as any nested projects it contains. In a hierarchy, project leaders are implicitly given project leader access to all child content. To remove project leader access, you must do so at the level in the hierarchy where the role was explicitly assigned.

**Ownership**: A project can have multiple project leaders, but each project has exactly one owner. By default, a project is owned by the user who created it.

A project’s owner can be changed by the existing owner or an administrator. (Project leaders can't change project ownership, only content ownership). Projects can be owned by users with a site role of Explorer (can publish), Creator, or administrator. Project ownership can be changed even if a project is locked.

**Deleting**: Most content can only exist inside a project. Only administrators can create and delete top-level projects, but project leaders can create or delete nested projects.

Deleting projects also deletes all the Tableau content and nested projects they contain. To delete a project without losing its content, move the content to another project first. Deleting projects can’t be undone.

External assets are handled differently. They don’t have to be in a project. External assets aren’t deleted if their project is deleted and continue to appear in **External Assets**. See External assets that aren’t in projects for more information.

For a deeper dive into project administration, see Use Projects to Manage Content Access and Add Projects and Move Content Into Them.

## Special projects

**Default**: The project named "Default" is a special project. When other top-level projects are created, they use the Default project as a template, and copy all their permissions rules from it (but not the **Asset permissions** setting). The **Default** project can't be deleted, moved, or renamed, but its description can be changed. It has no owner by default, but one can be assigned.

**External Assets Default Project**: In Tableau Cloud and Tableau Server 2023.1 and later, if you have a Data Management license with Catalog enabled, the project named "External Assets Default Project" appears when Catalog needs to move new or existing external assets to it. Catalog puts new external assets and external assets from deleted projects in the **External Assets Default Project**. The project has no permissions rules by default, so server administrators and site administrators are the only users who can see it unless permissions are added. It can't be deleted, moved, or renamed, but its description can be changed. It has no owner by default, but one can be assigned.

## Set a project leader

Project leaders are users who have administrator-like access for a specific project or project hierarchy.

### To assign project leader status to a group or user

1. Open the permission dialog for the appropriate project.
2. Select an existing permission rule, or click **+ Add Group/User Rule** and chose the desired group or user.
3. Open the action menu (...) for that permission rule and select **Set Project Leader...**.

> **Note**: If the action menu includes an option for **Enable "Set Project Leader"**, this needs to be selected before the group or user can be set as a project leader. This option only appears when that group or user was denied the Project Leader capability (prior to 2020.1). That denied capability needs to be removed before they can be set as a project leader.

After a permission rule establishes a project leader, the templates and capabilities can't be edited because all capabilities are allowed for project leaders. If a project leader is established on a project that contains nested projects, they have inherited project leader status on all nested projects and their content.

Project leader status is always applied downward through the entire project hierarchy and can only be removed from the level where it was set. To remove project leader status, follow the same steps but select **Remove as Project Leader** from the action menu. After a group or user has been removed as project leader, that permission rule has all capabilities set to Unspecified. This may mean their access to and capabilities for that project is removed if there’s no other permission rule giving them permissions to the content. To keep their access to the project and its content, they need to have capabilities set like any other group or user.

**Note**: Project leaders can refresh extracts in their projects in most circumstances. They can't refresh extracts if they're only the project leader of a nested project (instead of a top-level project) and the top-level project is *locked (including nested projects)*.

Lock asset permissions

Permission rules set at the project level act as a default for content saved in that project and any nested projects it contains. Whether those project-level default rules are enforced or only preliminary depends on the **Asset permissions** setting. This setting can be configured in two ways, either **Locked** (recommended) or **Customizable**. Locking a project removes the ability for content owners to modify the permission rules on their content. Locking permissions can be applied to nested projects or just to the parent project itself.

- When **Asset permissions** is **Locked** (including nested projects), permission rules set at the project level are enforced for all assets in the project and all nested projects.
- When **Asset permissions** is **Locked** (*not* including nested projects), permission rules set at the project level are enforced for assets in the project. Nested projects can be configured independently with their own permission rules and set as locked or customizable.

- When **Asset permissions** is **Customizable**, permission rules set at the project level are applied to all assets in the project by default. However, permission rules can be modified for individual assets during or after publishing.

> **Note**: Whether permission rules are locked or customizable, the permissions on content are always applied. *Locked* and *customizable* refer only to how project-level permissions are inherited by content in the project and who can change them. Even in a project with customizable permissions, only specific users can modify permissions (content or project owner, project leader, admins, or those with the Set Permission capability).

In a locked project:

- The project permission rules per content type are applied to all assets.
- Only administrators, project owners, and project leaders can modify permissions.
- Content owners lose the Set Permission capability but retain all other capabilities on their content.
- Permissions are predictable for all content in the project.

In a customizable project:

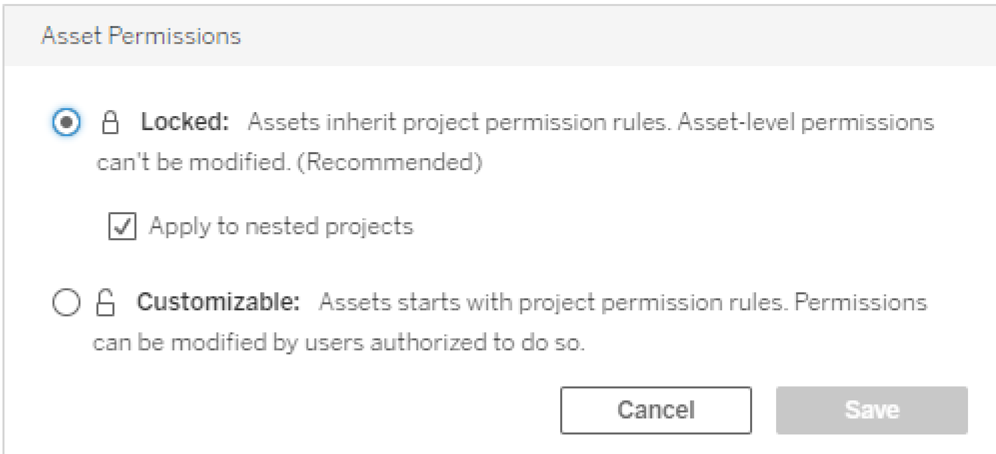
- The project permission rules are applied by default when content is published into the project or nested projects are created, but permissions can be modified during publication or after the content is created.
- Any user with the Set Permissions capability can modify permission rules for that content.
- Content owners have all capabilities on their content.
- Permissions can be different across content in the project.

Set asset permissions (lock a project)

New top-level projects inherit all initial permission rules from the Default project but not the **Asset permissions** setting, which is set to **Customizable**. This can be changed to **Locked** if desired.

To configure **Asset permissions**:

1. You must be logged into the site as an administrator, project owner, or project leader
2. Open the permissions dialog for a project
3. Next to **Asset permissions** in the upper left, click the **Edit** link and select the desired option in the **Asset permissions** dialog




**Note**: If the upper left corner doesn't show an **Edit** link in step 3 above, you may be on the permissions dialog for a (a) nested project or a piece of content in a locked project, in which case the link should bring you to the managing project, (b) piece of content in a customizable project, which won't show anything, or (c) view, which will indicate how the view permissions are tied to the workbook. For more information on the interplay of permissions for views and workbooks, see Show or Hide Sheet Tabs.

Change asset permissions

When the **Asset permissions** setting for a project is changed, the outcome depends on the new setting. Changes to permission rules in a locked hierarchy must be done at the level of the managing project.

| Changing from | Changing to | Outcome |
|---|---|---|
| Locked (including nested pro- | Locked | Doesn't modify existing permission rules. |

| | | |
|---|---|---|
| jects) | | Any nested projects become customizable. |
| | Customizable | Doesn’t modify existing permission rules, though they become customizable.<br><br>Any nested projects become customizable. |
| Locked | Locked (including nested projects) | Overwrites existing custom permission rules for all nested projects and their content. This can’t be undone. |
| | Customizable | Doesn’t modify existing permission rules, though they become customizable.<br><br>Any nested projects retain their content permission settings and permission rules. |
| Customizable | Locked (including nested projects) | Overwrites existing custom permission rules for content in the project, and all nested projects and their content. This can’t be undone. |
| | Locked | Overwrites existing custom permission rules for content in the project. This can’t be undone.<br><br>Any nested projects retain their permission rules and remain customizable. |

Move projects and content

## Move Tableau content and external assets

When *Tableau content* or *external assets* are moved between projects with different permission settings, **Asset permissions** settings determine the logic of how permissions are applied.

- Moving assets into a locked project overrides the existing permission rules and enforce the destination’s permissions.

- **Moving assets into a customizable project maintains the existing permission rules on the asset.**

> **Note**: Prior to Tableau Server 2022.3 and Tableau Cloud June 2022, external assets couldn't be in projects, and permissions on tables were managed through the **Table permissions** setting of the parent database. Beginning with Tableau Server 2022.3 and Tableau Cloud June 2022, external assets can be in projects. If a database or a table is moved into a project, older settings to control table permissions through the database are ignored, and the database or table permissions follow the logic of other assets.

### Move projects

When a *project* is moved into another project, the permissions settings on the item being moved are maintained unless the destination project is scoped to include nested projects. (Project permissions in this case mean the View and Publish capabilities for the project itself.)

- If the destination project is set to **locked (including nested projects)**, the permissions for the project being moved *and its content* are overwritten.
- If the destination project is set to **locked** (not including nested projects), the permissions for the project being moved aren't overwritten. Whether the moved project is locked or customizable is preserved from its original setting.
- If the destination project is set to **customizable**, the permissions for the project being moved aren't overwritten but they're now editable.

  If the project being moved was previously nested under a parent that was *locked (including nested projects)*, when moved, the project takes on the setting of *locked (including nested projects)* and becomes the managing project for any projects it contains. Note: This is the same outcome if a project is moved to become a top-level project.

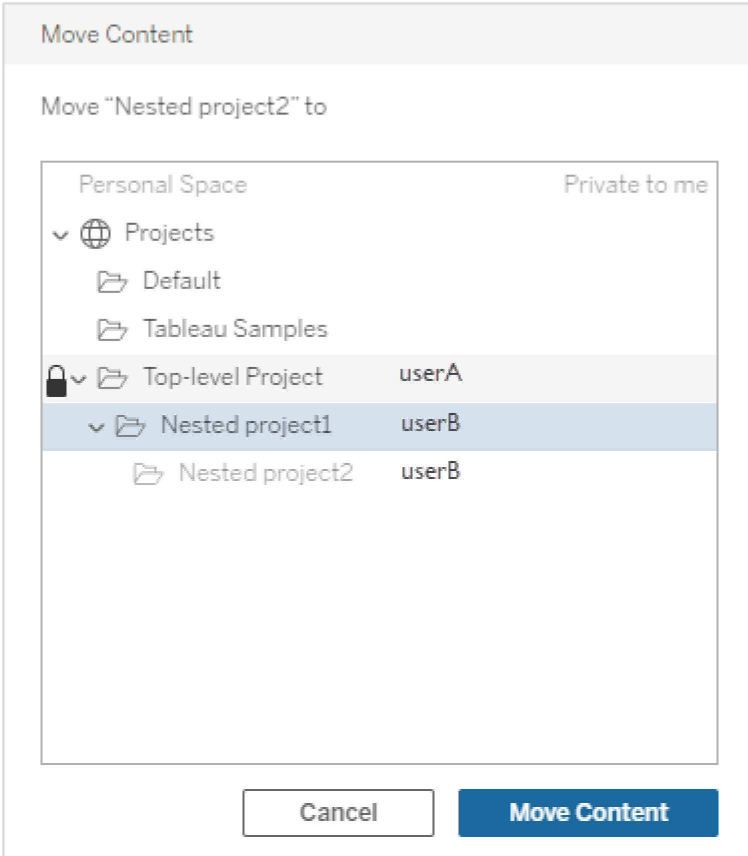
## Use care moving locked nested projects

Moving nested projects inside *locked (including nested projects)* environments can be tricky. A project can be moved into situation that prevents the user from moving it out again.

If a nested project is owned by a different user than the managing project, and the managing project is set to *locked (including nested projects)*, a nested project can wind up unable to be moved by anyone except an admin.

For example, consider a locked (including nested projects) top-level project owned by userA, and two nested projects owned by userB. If userB moves one nested project inside the other, they aren't then able to move it back out—and neither is userA.

- UserB can't move **Nested project2** because they don't have rights to move rights on **Top-level Project** as a destination.
- UserA can't move **Nested project2** because they don't have move rights on it.
- A project leader on **Top-level Project** can't move it even though project leader trickles down to nested projects.
- Only an admin can move **Nested project2** in this setup.




Collections

Unlike projects, which contain content, a collection can be thought of as a list of links to content. Project permissions can be inherited by the content in the project, but permissions for a collection have no effect on the content added to the collection. This means that different users might see different numbers of items in a collection, depending on which items they have permission to view. To make sure that users can see all items in a collection, adjust the permissions for those items individually.

Permissions for a collection can be changed either by using the permissions dialog or by granting access upon sharing a collection, if you're an administrator or the collection owner. For more information, see Manage Collection Permissions.

## Private collections

When a collection is created, it's private by default. A private collection appears on the owner's My Collections page, but it doesn't appear in the list of all collections on a site. Private collections are simply collections with no permission rules added. Unlike other types of content, collections don't have the "All Users" group added by default. When you add permission rules to a collection, it's no longer flagged as private. To return a collection to a private state, remove the permission rules.

Private collections can be viewed by the collection owner as well as by administrators, whose site role gives them effective permissions to view all collections.

## Effective permissions

A permission rule establishes who is impacted (a group set, group, or user) and what Capabilities they are **Allowed**, **Denied**, or **Unspecified**. While it seems straightforward to simply set a permission rule and have that be the whole story, whether a user has a capability may be unclear because of membership in multiple groups and the interplay of site roles and ownership with permission rules.

Multiple factors are evaluated in a specific order, yielding *effective permissions* on a piece of content.

**Tip**: To help keep things as straightforward as possible, we recommend (1) setting permission rules for groups instead of users, (2) managing permissions locked at the project level instead of setting permissions on individual content, and (3) deleting the All User group's permission rule or setting all capabilities to None.

A capability is allowed for a user if and only if the following three conditions are all met:

- The capability is within the scope of their site role.
- They have that capability:
  - based on a specific user scenario (such as being the content owner or a project leader, or they're an administrator site role),
    OR
  - because they have been allowed the capability as a user,
    OR

    - because they are both in a group that has been allowed the capability and no rules deny them the capability as a user or member of another group.
- There is no conflicting permissions settings at another content level that takes precedence.

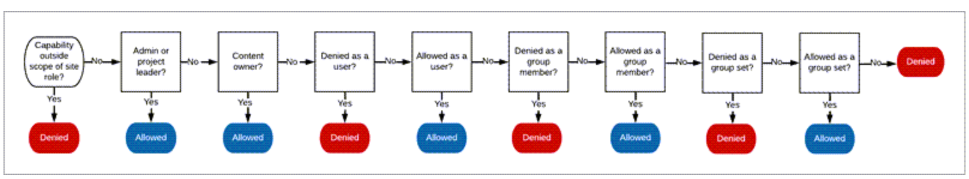
Any other situation denies the user the capability.

Hovering over a capability brings up a tooltip that explains the effective permission. Here are some common examples of why effective permissions—what the user can or can't do in actuality—might appear different than what a given permission rule states:

- A user might have a capability they are denied in a permission rule because their site role includes it (administrators).
- A user might have a capability they are denied in a permission rule because their user scenario allows it (because they own the content or are a project owner or leader).
- A user might lack a capability they are allowed in a permission rule because their site role doesn't allow it.
- A user might lack a capability they are allowed in a permission rule because a conflicting group or user rule denied it.
- A user might lack a capability they are allowed in a permission rule at one level of content (such as a workbook) because another level of content denied it (such as a view).

Evaluate permission rules

Permissions in Tableau are restrictive. Unless a capability is granted to a user, they are denied permission. The following logic evaluates if a capability is allowed or denied for an individual:




1. **Site role:** If a site role doesn't permit a capability, the user is denied. If the user's site role does permit the capability, then specific user scenarios are evaluated.
    - For example, a Viewer site role can't web edit. See General capabilities allowed with each site role for more information on what each site role can do.

2. **Specific user scenarios:**
   - If the user is an admin they have all capabilities on all content.
   - If the user is a project owner or project leader, they have all capabilities on all content in their projects.
   - If the user is the content owner, they have all capabilities* on their content.
   - If these scenarios do not apply to the user, then user rules are evaluated.

   *Exception: Content owners won’t have the **Set Permissions** capability in projects where permissions are locked. Only administrators, project owners, and project leaders can set permission rules in locked projects.

3. **User rules:** If the user is denied a capability, it is denied. If they are allowed a capability, it is allowed. If a capability is unspecified, then group rules are evaluated.
4. **Group rules:** If the user is in *any* group that is denied a capability, it is denied. If the user is in a group that is allowed a capability (and not in any groups that are denied that capability), it is allowed.
   - That is to say, if a user is a member in two groups, and one is allowed a capability and one is denied the same capability, the denial takes precedence for that user and they are denied.
5. **Group set rules:** If a user is a member of a group in a group set, any group in the group set that is denied a capability, is then denied.
6. If none of the above conditions apply, the user is denied that capability. In effect, this means that capabilities left as unspecified will result in denied.

A final effective permission of **Allowed** therefore occurs in three circumstances:

- Allowed by site role (Server Administrator, Site Administrator Creator, Site Administrator Explorer)
- Allowed because the user is the content owner, project owner, or project leader
- Allowed by a group, group set, or user rule (and not denied by a rule of higher precedence)

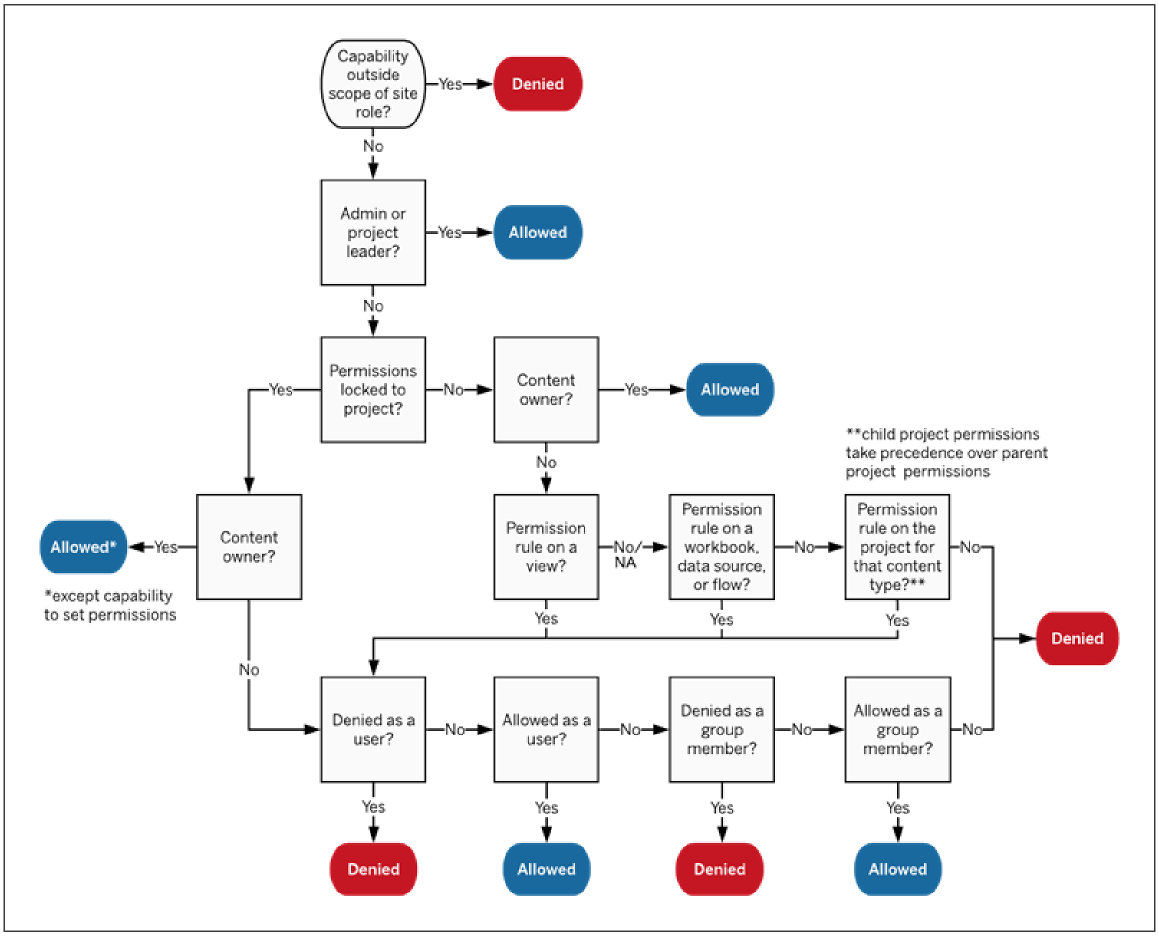
**Denied** occurs in three circumstances:

- Denied by site role
- Denied by a rule (and not allowed by a rule of higher precedence)
- Not granted by any rule

Evaluate permissions set at multiple levels

If **Asset permissions** are set to **Customizable**, it’s possible to configure permission rules in multiple places. There are specific rules that determine what permissions are applied on the content.

- If there are nested projects, permissions set at the child level take precedence over permissions set at the parent level.
- Changes to permissions at the project level are not enforced for existing content.
- If there are permissions set on content (workbook, data source, or flow) during or after publication, these take precedence over rules set at the project level.
- If a workbook doesn’t show navigational sheet tabs, any changes to the workbook-level permissions *won’t* be inherited by the views and any changes to permissions must be done on the view.
- Configuring the workbook to show navigational sheet tabs will override existing view-level permissions and sync them with the workbook-level permissions. See Show or Hide Sheet Tabs.




This image shows how capabilities are evaluated through multiple levels of content.

Permissions on views

In a workbook that is not in a locked project and does not show sheets as tabs for navigation, views (sheets, dashboards, stories) inherit the workbook permissions at publication, but any changes to permission rules must be made on individual views. View capabilities are the same as those for workbooks, except for **Overwrite**, **Download Workbook/Save a Copy**, and **Move** which are only available at the workbook level.

We recommend showing navigational sheet tabs whenever possible so views continue to inherit their permissions from the workbook. For more information, see Show or Hide Sheet Tabs.

Effective permissions and on-demand access

When on-demand access is enabled for a group, you'll see an inline alert. On-demand access indicates that when permissions for Tableau content are dependent on the group, there might be users who are not provisioned on the site that can access the content. Users who might be accessing the content are not provisioned on the site and do not have effective permissions. As a result, these users are not listed in the Effective Permissions area. For more information, see On-demand access using connected apps with direct trust or On-demand access using connected apps with OAuth 2.0 trust.

## Permissions, Site Roles, and Licenses

Adding a user to Tableau Cloud requires an available license. (Users can also be added as unlicensed and configured so they will consume a license only when they first sign in. For more information, see Grant License on Sign In.) For each site the user belongs to they have exactly one site role, restricted by their license. A user has permissions for content on the site, restricted by what their site role allows.

Licenses and site roles apply to users. Permission capabilities apply to content.

**Licenses** are assigned to a user when they are created (or sign in for the first time) on the Tableau Server or Tableau Cloud site. Users are licensed as a **Creator**, **Explorer**, or **Viewer**.

- License levels are consumed based on the maximum *site role* a user can have on that server.
  - Site Administrator Creator and Creator site roles use a Creator license.
  - Site Administrator Explorer, Explorer (can publish), and Explorer site roles use at least an Explorer license.
  - Viewer site role uses at least a Viewer license.
  - An unlicensed user can exist on the site, but they cannot sign in unless they were added with grant site role on sign in.
- For Tableau Cloud, a user consumes a license per site and has only one site role.

**Site roles** are assigned to a user for each site they are a member of.

- Site roles determine the maximum capabilities a user can have in that site. (For example, a user with a site role of Viewer will never be able to download a data source even if that capability is explicitly granted to them on a specific data source.)
- Site roles do not inherently grant any capabilities in and of themselves—with the exception of the administrator site roles. Administrators always have all capabilities applicable to their license level.

**Permissions** consist of *capabilities*, like the ability to save to a project, web edit a workbook, connect to a data source, etc. They apply to group or user on a specific piece of content (project, data source, workbook, view, or flow).

- Permission capabilities are not given to a group or user in a vacuum but rather in the context of content. A user can have different capabilities for different content assets.
- Permissions are evaluated based on the interplay of a user's site role and the permission rules for that user or any groups they are members of.
- Some actions such as web authoring might require combinations of capabilities. For more information, see Permission settings for specific scenarios.

Site roles and their maximum capabilities

These tables indicate what capabilities are available for a site role. There may be other ways for a user with a site role to perform a similar action. For example, although Viewers can't be given the **Share Customized** capability to make their custom views visible to others on the workbook, they can share custom views by copying the view URL. See General capabilities allowed with each site role for more information on what each site role can do.

Projects

| Capability | Creator | Explorer (can publish) | Explorer | Viewer |
|---|---|---|---|---|
| View | ✓ | ✓ | ✓ | ✓ |
| Publish | ✓ | ✓ | ✗ | ✗ |

Workbooks

| Capability | Creator | Explorer (can publish) | Explorer | Viewer |
|---|---|---|---|---|
| View | ✓ | ✓ | ✓ | ✓ |
| Filter | ✓ | ✓ | ✓ | ✓ |
| View Comments | ✓ | ✓ | ✓ | ✓ |
| Add Comments | ✓ | ✓ | ✓ | ✓ |
| Download Image/PDF | ✓ | ✓ | ✓ | ✓ |
| Download Summary Data | ✓ | ✓ | ✓ | ✓ |
| Run Explain Data † | ✓ | ✓ | ✓ | ✓ |
| Share Customized | ✓ | ✓ | ✓ | ✗ |
| Download Full Data | ✓ | ✓ | ✓ | ✗ |
| Web Edit | ✓ | ✓ | ✓ | ✗ |
| Download Workbook/Save a Copy | ✓ | ✓ | ✓ | ✗ |

| | | | | |
|---|---|---|---|---|
| Overwrite | ✓ | ✓ | ✗ | ✗ |
| Create/Re-fresh Metrics ‡ | ✓ | ✓ | ✗ | ✗ |
| Move | ✓ | ✓ | * | ✗ |
| Delete | ✓ | ✓ | ✗ | ✗ |
| Set Per-missions | ✓ | ✓ | ✗ | ✗ |

† Explain Data can be controlled in site settings and in a workbook using the Run Explain Data capability. The availability of Explain Data in viewing mode is controlled in a workbook in the Explain Data Settings dialog box.

‡ Prior to Tableau 2021.3, the Create/Refresh Metrics capability was controlled by the Download Full Data capability.

Data Sources

| Capability | Creator | Explorer (can publish) | Explorer | Viewer |
|---|---|---|---|---|
| View | ✓ | ✓ | ✓ | ✓ |
| Connect | ✓ | ✓ | ✓ | ✓ |
| Download Data Source | ✓ | ✓ | ✓ | ✗ |
| Overwrite | ✓ | ✓ | ✗ | ✗ |
| Delete | ✓ | ✓ | ✗ | ✗ |

| | | | | |
|---|---|---|---|---|
| Set Permissions | ✓ | ✓ | ✗ | ✗ |

Data Roles

| Capability | Creator | Explorer (can publish) | Explorer | Viewer |
|---|---|---|---|---|
| View | ✓ | ✓ | ✓ | ✓ |
| Overwrite | ✓ | ✓ | ✗ | ✗ |
| Move | ✓ | ✓ | * | ✗ |
| Delete | ✓ | ✓ | ✗ | ✗ |
| Set Permissions | ✓ | ✓ | ✗ | ✗ |

Flows

To run flows on a schedule, you must have a Data Management license. For information about configuring flow settings, see Create and Interact with Flows on the Web. Explorer license users can run flows on Tableau Cloud.

| Capability | Creator | Explorer (can publish) | Explorer | Viewer |
|---|---|---|---|---|
| View | ✓ | ✓ | ✓ | ✓ |
| Download Flow | ✓ | ✓ | ✓ | ✗ |
| Web Edit | ✓ | ✗ | ✗ | ✗ |

| | | | | |
|---|---|---|---|---|
| Run Flow | ✓ | ✓ | ✗ | ✗ |
| Overwrite | ✓ | ✗ | ✗ | ✗ |
| Move | ✓ | ✓ | * | ✗ |
| Delete | ✓ | ✓ | ✗ | ✗ |
| Set Per-missions | ✓ | ✓ | ✗ | ✗ |

Ask Data Lenses

| Capability | Creator | Explorer (can publish) | Explorer | Viewer |
|---|---|---|---|---|
| View | ✓ | ✓ | ✓ | ✓ |
| Overwrite | ✓ | ✓ | ✗ | ✗ |
| Move | ✓ | ✓ | * | ✗ |
| Delete | ✓ | ✓ | ✗ | ✗ |
| Set Per-missions | ✓ | ✓ | ✗ | ✗ |

Metrics

**Retirement of the legacy metrics feature**

Tableau's legacy metrics feature was retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. In October 2023, Tableau retired the ability to embed legacy metrics in Tableau Cloud and in Tableau Server version 2023.3. With Tableau Pulse, we've developed an improved experience to track metrics and ask questions of your data. For more information, see Create Metrics with Tableau Pulse to learn about the new experience and Create and Troubleshoot Metrics (Retired) for the retired feature.

| Capability | Creator | Explorer (can publish) | Explorer | Viewer |
|---|---|---|---|---|
| View | ✓ | ✓ | ✓ | ✓ |
| Overwrite | ✓ | ✓ | ✗ | ✗ |
| Move | ✓ | ✓ | * | ✗ |
| Delete | ✓ | ✓ | ✗ | ✗ |
| Set Permissions | ✓ | ✓ | ✗ | ✗ |

Collections

| Capability | Creator | Explorer (can publish) | Explorer | Viewer |
|---|---|---|---|---|
| View | ✓ | ✓ | ✓ | ✓ |

Virtual Connections

Virtual connections require a Data Management license. See About Data Management for details.

| Capability | Creator | Explorer (can publish) | Explorer | Viewer |
|---|---|---|---|---|
| View | ✓ | ✓ | ✓ | ✓ |

| | | | | |
|---|---|---|---|---|
| Connect | ✓ | ** | ** | ** |
| Overwrite | ✓ | ✗ | ✗ | ✗ |
| Move | ✓ | ✓ | * | ✗ |
| Delete | ✓ | ✓ | ✗ | ✗ |
| Set Permissions | ✓ | ✓ | ✗ | ✗ |

* Although the Explorer role can be given the **Move** capability, they can't have the **Publish** capability on a project and therefore there is no place for them to move content to. The **Move** capability should therefore be considered not possible for Explorer site roles.

** Although the Explorer (can publish) role can be given the **Connect** capability for Virtual Connections, the ability to create a new data source of any kind, including Virtual Connections, is only available for users with a Creator site role. Similarly, Explorer and Viewer role users can't access the UI to connect to new or existing data sources. The **Connect** capability should be considered not possible for any role but Creator.

## Quick Start: Permissions

A permission rule is a set of capabilities that defines what access a group or user has to a piece of content, such as a workbook, project, or data source.

To efficiently manage permissions:

- Remove permissions from the **All Users** group before creating more groups
- Configure template permissions on the **Default** project before creating more projects
- Manage permissions for groups, not users
- Manage permissions for projects, not content

Create group permission rules for projects

For details on the following steps, see the main article on permissions. This Quick Start guide is an overview and doesn't capture many important details about permissions and permission management.

1. Add users to groups

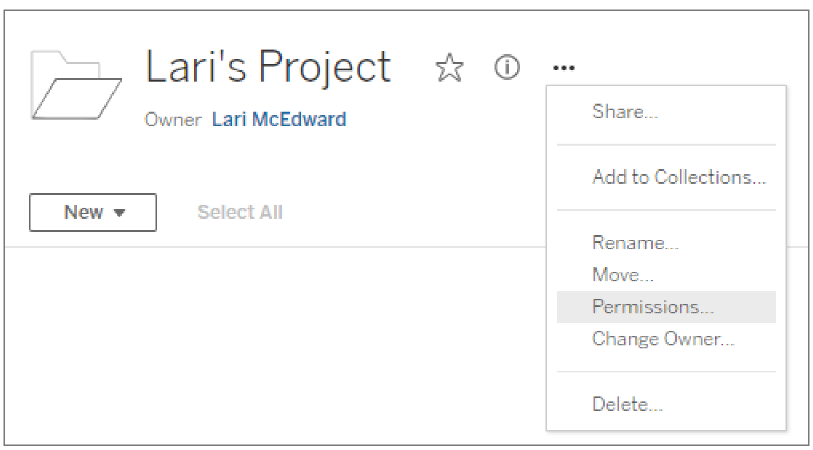
A common way to manage permissions is to use groups for users who should have the same permissions.

1. If necessary, add users to the site.
2. Within a site, select **Groups**.
3. If necessary, create a group using the **Add Group** option.
4. Click a group name to open it, then use the **Add Users** button to add existing users to the group.

2. Access project-level permissions settings

The **Explore** page displays the content on the site. Use the dropdown to display Top-Level Projects or All Projects (to see nested projects as well).

Navigate to the project you want to update, open the **Actions** (**...**) menu, then select **Permissions**.

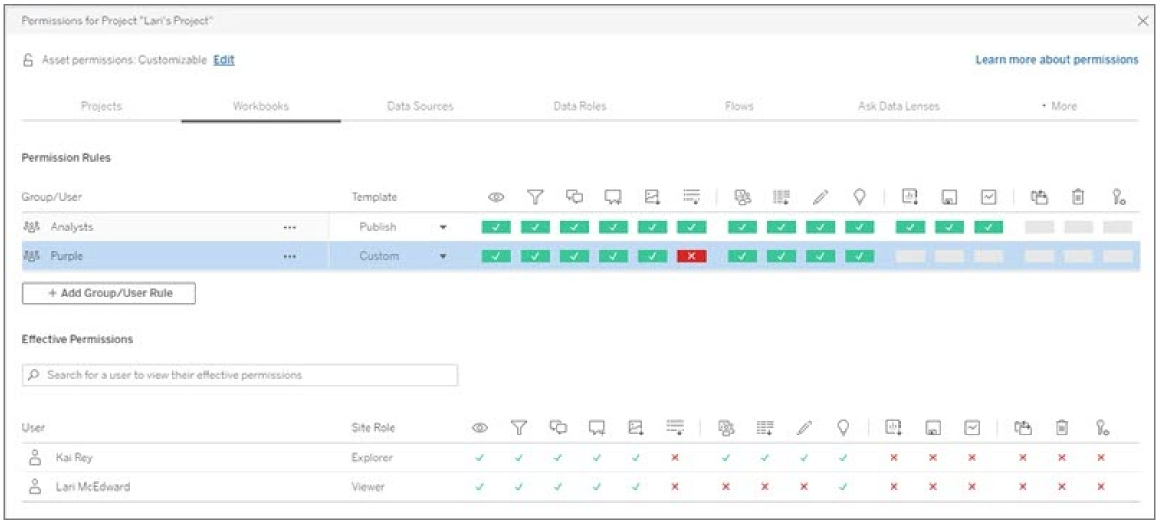



3. Create a permissions rule

Select **+ Add Group/User Rule** to create a new permission rule.

The template drop-down offers a shortcut to apply an initial set of capabilities for the group.

If desired, customize the permission rule by clicking a capability to set it to **Allowed** or **Denied**, or leave it **Unspecified**.




Whether a user can set permissions is based on their site role, content ownership, and how their **Set Permissions** capability is set.

4. View a user's effective permissions

After you save the permissions rule for the group, you can view the effective permissions for each user. Click a group name to see the group's users and their permissions. Hover over a capability box to see a tooltip with details on whether a capability is allowed or denied.

## Site roles

A user's site role determines the maximum permissions allowed for that user.

- Server and site administrators can access all site content and take actions on it.
- Owners always get full access to the content they've published. When the parent project permissions aren't locked, owners can change permissions for their published content.

For more information, see Set Users' Site Roles and Use Projects to Manage Content Access.

## Permission logic

- **Denied** takes precedence over **Allowed**.
- **Unspecified** results in **Denied** if no other permissions are specified.
- Specific user permissions on content take precedence over group permissions on content. In other words, user permissions trump group permissions.

For more information, see Effective permissions.

## Manage Content Ownership

When you publish a data source or workbook on Tableau Cloud or when you create a project, you become its *owner*. A content owner, a project leader with an appropriate site role, or an administrator can change ownership of a content asset. After ownership is reassigned, the original owner has no special connection to the content item, and their ability to access it is determined by their permissions on the project or that specific item.

Who can change or be given ownership, by content type

Whether you can change or be given ownership depends on your permissions and your relationship to the content asset, as described in the following table.

> **Note:** Full project leader access is available only with some site roles. For information, see Project-level administration.

| Content asset type | Who can change ownership | Who can be given ownership |
|---|---|---|
| **Top-level projects** | Server administrator[1]<br><br>Site administrator | Server administrator<br><br>Site administrator (Creator and Explorer)<br><br>Creator<br><br>Explorer (can publish) |
| **Child (nested) projects** | Server administrator<br><br>Site administrator<br><br>Project owner | Any administrator or owner, excluding Explorer and Viewer. |
| **Workbooks and data** | Server administrator | Server administrator |

| | | |
|---|---|---|
| **sources** | Site administrator<br><br>Workbook or data source owner<br><br>Project leader or owner of the project that contains the item | Site administrator<br><br>Creator<br><br>Explorer<br><br>Viewer |
| **Metrics** (The legacy Metrics feature was retired in February 2024 for Tableau Cloud and in Tableau Server version 2024.2. For more information, see Create and Troubleshoot Metrics (Retired).) | Server administrator<br><br>Site administrator<br><br>Metric owner<br><br>Project leader or owner of the project that contains the item | Any administrator or user of the site, excluding Explorer and Viewer. |
| **Ask Data lenses** | Server administrator<br><br>Site administrator<br><br>Lens owner<br><br>Project leader or owner of the project that contains the item | Any administrator or user of the site, excluding Explorer and Viewer. |
| **Flows** | Server administrator<br><br>Site administrator | Server and site administrators can only change the owner to themselves. |

| | | |
|---|---|---|
| **Data Roles** | Server administrator<br>Site administrator<br>Data role owner<br>Project leader or owner of the project that contains the item | Any administrator or user of the site, excluding Explorer and Viewer. |
| **Collections** | Server administrator<br>Site administrator<br>Collection owner | Server administrator<br>Site administrator<br>Creator<br>Explorer<br>Viewer |
| **Virtual Connections**[2] | Server administrator<br>Site administrator<br>Virtual connection owner | Server administrator<br>Site administrator<br>Creator |

[1] The Server Administrator site role applies to Tableau Server only; not Tableau Cloud.

[2] Virtual connections require Data Management. See About Data Management for details. Note that to edit a virtual connection, you must have the database credentials.

Considerations for changing content ownership

- Before you remove a user from Tableau Cloud, make sure they do not own any content assets.

  If the user does own content, you must first reassign ownership of those assets before you can delete the user. Otherwise, their site role is set to **Unlicensed**, but they are not deleted, and only an administrator can take certain actions on that content. Reassign ownership of workbooks or data sources with embedded credentials before you set the user's site role to Unlicensed or delete the user.

- If you change the ownership of a workbook or data source that includes embedded credentials to connect to underlying data, the embedded credentials will be deleted. For flows, embedded credentials are preserved when changing ownership. Connections to published data sources are authenticated using the flow owner and authorized based on their permissions.

  You can update the embedded credentials by editing the connection information on Tableau Cloud. For more information, see Edit Connections on Tableau Cloud. Alternatively, the new owner can download the flow, workbook, or data source and open the item in Tableau Desktop to update the embedded credentials and then re-publish the content.

- If you do not lock permissions to projects, make sure users you give content ownership to know your permissions guidelines, or you account for permissions as you change ownership. In unlocked projects, by default, content owners can set permissions on their content. For more information, see Permissions.
- While it is possible to change the owner of a metric to a user with a site role of Viewer or Explorer, it is not recommended, because doing so will cause the metric refresh to be suspended. A site role of Creator or Explorer (can publish) is required to refresh, overwrite, or delete a metric.

Change the owner of a content resource

1. Sign in to the Tableau Cloud web environment, and from the navigation menu, select **Explore**.

2. Navigate to the content you want to assign to someone else.

   - If you want to reassign multiple of the same type of content, for example, multiple workbooks, select the content type from the drop-down menu.

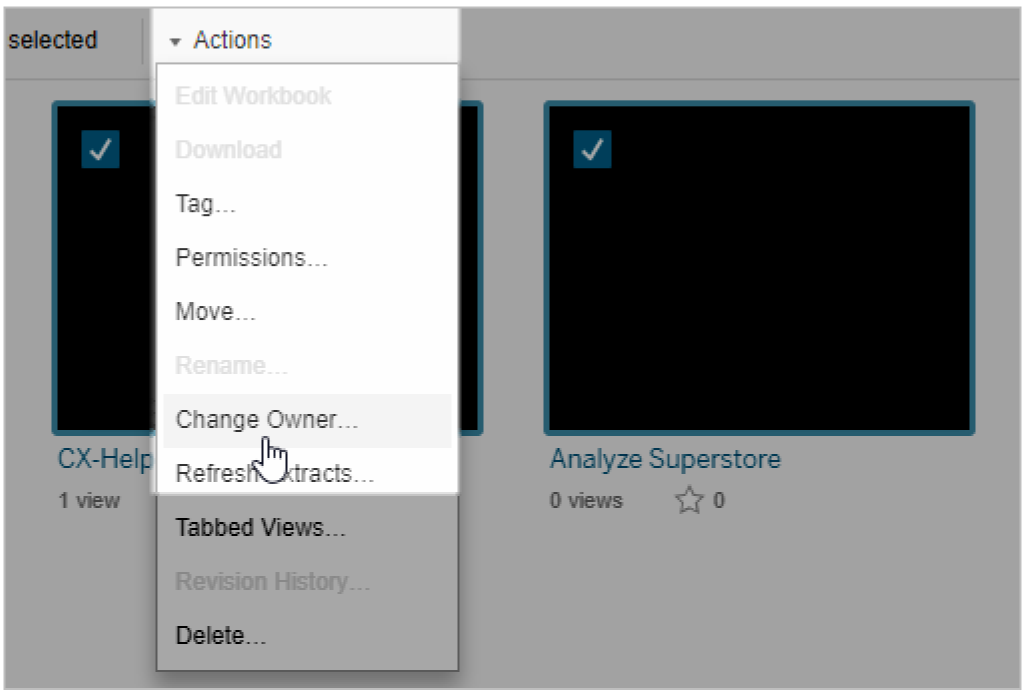
- If you want to reassign multiple items within the same project, navigate to the project.

  If you're not sure where to find a child project, display filters, and select **Show all projects**.

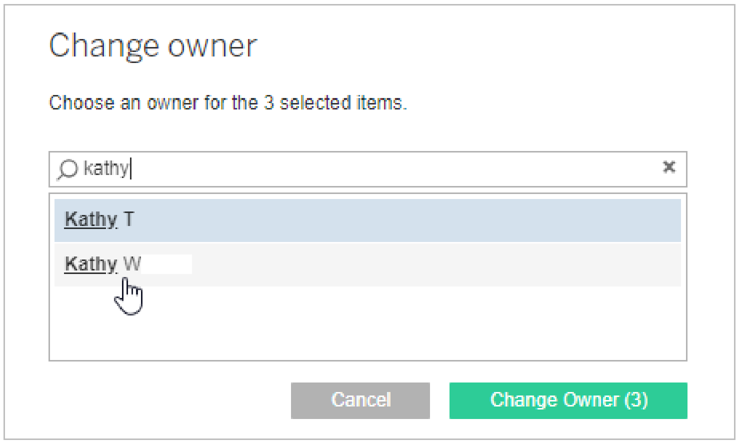
- If you want to reassign multiple content items with the same owner, find the user on the **Users** page.

3. Select the items you want to reassign, and then select **Actions** > **Change Owner**.

   The other menu commands you see will depend on the content type.




4. Type the name of a user or select a user from the list.




5. Click **Change Owner**.

## Manage Permissions for External Assets

Tableau Cloud and Tableau Server provide a space for accessing and managing published content. When Tableau Cloud or Tableau Server is licensed with Data Management, you have access to Tableau Catalog. Tableau Catalog adds a complementary space and a set of features across your site to track and manage metadata and lineage of external assets used by the content published to your site.

Tableau Catalog indexes content and assets

Catalog discovers, tracks, and stores metadata from the content that you publish to Tableau Cloud or Tableau Server.

Catalog indexes metadata for the following:

- **Tableau content:** workbooks, data sources, flows, projects, metrics, virtual connections, virtual connection tables, users, and sites. (The legacy Metrics feature was retired in February 2024 for Tableau Cloud and in Tableau Server version 2024.2. For more information, see Create and Troubleshoot Metrics (Retired).)

- **External assets:** databases and tables associated with Tableau content

Catalog classifies the metadata of any data that comes from outside the Tableau environment as external assets. The data that comes from outside the Tableau environment is stored in many different formats, such as a database server or a local .json file.

Catalog tracks only the metadata of the external data and does not track the underlying data in any form (raw or aggregated).

Catalog metadata includes the following:

- **Lineage information** or the relationship between items. For example, the Sales table has a relationship with both the Superstore data source and the Superstore Sample workbook.
- **Schema information**. Some examples include:
  - Table names, column names, and column types. For example, Table A contains Columns A, B, and C, which are types INT, VARCHAR, and VARCHAR.
  - Database name and server location. For example, Database_1 is a SQL Server database at http://example.net.
  - Data source name, and the names and types of the fields the data source contains. For example, Superstore data source has fields AA, BB, and CC. Field CC is a calculated field that refers back to both field AA and field BB.
- **User curated, added, or managed information**. For example, item descriptions, certifications, user contacts, data quality warnings, and more.

How does Tableau Catalog work?

Tableau Catalog indexes all content published to Tableau Cloud or Tableau Server to track lineage and schema metadata. For example, the metadata comes from workbooks, packaged workbooks, data sources, and the Tableau Server or Tableau Cloud repository.

As part of the indexing process, lineage and schema metadata about external assets (databases, tables, and other objects) used by the published content are also indexed.

**Note:** In addition to accessing Catalog from Tableau Cloud or Tableau Server, indexed metadata can also be accessed from the Tableau Metadata API and Tableau Server REST API. For more information about the Tableau Metadata API or metadata methods in the

REST API, see Tableau Metadata API and Metadata Methods in the Tableau Server REST API, respectively.

Permissions on metadata

Permissions control who is allowed to see and manage external assets and what metadata is shown through lineage.

**Note:** If Tableau Cloud or Tableau Server is not licensed with Data Management, then by default, only admins can see database and table metadata through the Tableau Metadata API. This default can be changed to use "derived permissions," as described below.

Access metadata

The permissions used to access metadata through Catalog (or Metadata API) work similarly to permissions for accessing content through Tableau Cloud or Tableau Server, with some additional considerations for sensitive data that can be exposed through lineage and the capabilities granted on external assets.

## Permissions on Tableau content

Catalog follows the view and manage capabilities that are already in place on existing Tableau content to control the metadata that you can see and manage on Tableau content. For more general information on these capabilities, see Permissions.

## Permissions on external assets using derived permissions

When Tableau Cloud or Tableau Server is licensed with Data Management, by default Catalog uses *derived permissions* to automatically grant you capabilities to external assets in the following scenarios:

For **View** capability:

- If you are the owner of a workbook, data source, or flow, you can see the database and table metadata used *directly* by that workbook, data source, or flow. See Additional notes about lineage.

- If you are a project owner or project leader, you can see all the database and table metadata used by the content published to your project.
- Embedded files use the permissions of the source content (such as the workbook, data source, or flow), rather than the derived permissions of the external asset (the database or table). For example, if you can see a workbook with an embedded file, you can see the embedded file and its metadata used by that workbook.

For both **Overwrite** and **Set Permissions** capabilities:

- If you are the owner of a flow, you can edit and manage permissions for the database and table metadata used by the flow output.

**Note:** In the case of flows, the capabilities mentioned above apply only after the flow has been run successfully at least once under the current owner of the flow.

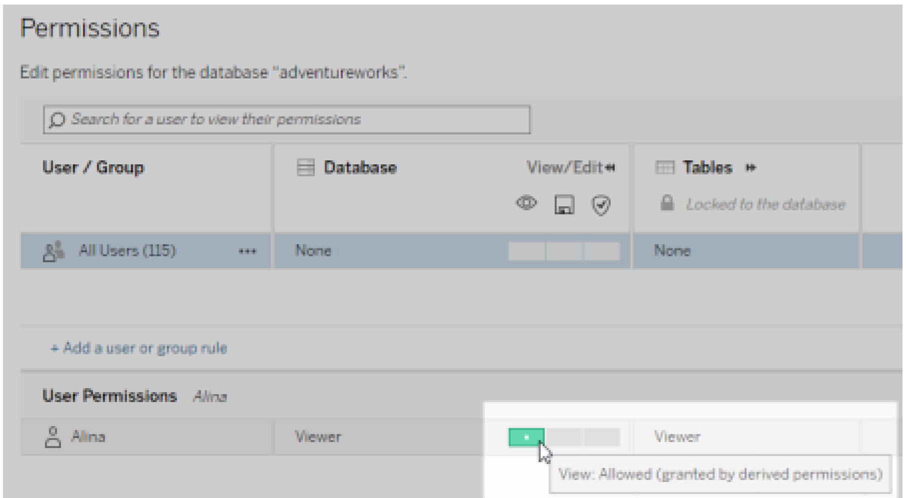
**Check permissions**

As an admin or someone who has been given the capability to set permissions for an asset, you can validate who has derived permissions by following the steps below.

1. Sign in to Tableau Cloud or Tableau Server.
2. From the left navigation pane, click **External Assets**.
3. From the drop-down menu, select **Databases and Files** or **Tables and Objects.**
   **Note:** Local files, like .json or .csv files are grouped as external assets under **Databases**.
4. Select the check box next to the database or table whose permissions you want to modify, and then select **Actions** > **Permissions**.

5. In the Permissions dialog box, click **+ Add Group/User Rule** and start typing to search for a group or user.

6. Validate the permissions by clicking a group name or user name in the permission rules to see the effective permissions below.




**Order of precedence for derived permissions on external assets**

When derived permissions are configured for your Tableau Cloud site or Tableau Server, each user's level of access to external assets depends on the associated Tableau content and the order of precedence of rules Tableau uses for its content.

Tableau follows the rules below, continuing on to the next rule, only if the current rule evaluates to "denied." If any rule evaluates to "allowed," the capability is allowed and Tableau stops evaluating. This rules list is based on the Permissions.

For **View** capability:

1. Admin role
2. License
3. Project leader (Tableau content)
4. Project owner (Tableau content)
5. Content owner (Tableau content)

6. *Derived permissions* (applies only to external assets and the View capability)
    a. Admin role
    b. License
    c. Project leader (external assets)
    d. Project owner (external assets)
    e. Content owner (external assets)
7. Explicit permissions

For **Overwrite** and **Set Permissions** capabilities:

1. Admin role
2. License
3. Project leader (Tableau content)
4. Project owner (Tableau content)
5. Content owner (Tableau content)
6. Explicit permissions (Tableau content)
7. *Derived permissions* (applies only to external assets and the Overwrite and Set Permissions capabilities for flow outputs)
    a. Admin role
    b. License
    c. Project leader (external assets)
    d. Project owner (external assets)
    e. Content owner (external assets)

**Turn off derived permissions**

As an admin, you can turn off the derived permissions default setting for a site in favor of manually granting explicit permissions to databases and tables.

1. Sign in to Tableau Cloud or Tableau Server as an admin.
2. From the left navigation pane, click **Settings**.
3. On the **General** tab, under **Automatic Access to Metadata about Databases and Tables**, clear the **Automatically grant authorized users access to metadata about databases and tables** check box.

**Note:** Data quality warning messages on databases and tables that are visible to users though derived permissions remain visible to those users even when the check box is not selected.

Set permissions on individual external assets

In order to grant additional users permissions to view, edit (overwrite), and manage external assets, an admin can grant those capabilities explicitly on individual databases or tables for users or groups.

Starting with Tableau Server 2022.3 and Tableau Cloud September 2022, you can organize external assets in projects. Permissions inheritance for external assets works the same way as it does for Tableau content, as described in the Permissions topic, and can simplify permissions management.

**Summary of permissions capabilities**

The following table shows the capabilities you can set for external assets:

| Capability | Description | Template |
| --- | --- | --- |
| View | See the database or table asset. | View |
| Overwrite | Add or edit data quality warnings and descriptions of the database or table asset. Prior to version 2020.1, the Overwrite capability was called Save. | Publish |
| Move | Move the database or table asset. | Administer |
| Set Permissions | Grant or deny permissions for the database or table asset. | Administer |

**Set permissions on a database or table**

To set permissions on databases or tables, use the following procedure.

1. Sign in to Tableau Cloud or Tableau Server as an admin or someone who has been granted the "Set Permissions" capability.

2. Find the database or table. You can do this through **Explore** (starting with Tableau Server 2022.3 and Tableau Cloud September 2022) if you know the current location of the database or table, or through **External Assets** to see a list of all databases, tables, and files.

   - **Explore** - From the left navigation pane, click **Explore** and locate the project the database or table is in.

   - **External Assets** - From the left navigation pane, click **External Assets**. From the drop-down menu, select **Databases and Files** or **Tables and Objects** (Note: Local files, like .json or .csv files are grouped as external assets under Databases.)

3. Select the check box next to the database or table whose permissions you want to modify, and then select **Actions** > **Permissions**.

4. In the Permissions dialog box, click **+ Add Group/User Rule** and start typing to search for a group or user.

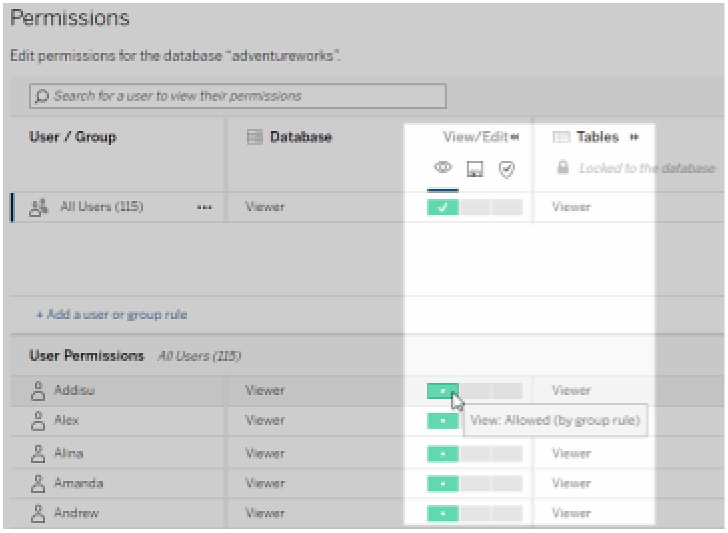
5. Select a permission role template to apply an initial set of capability for the group or user, and then click **Save**. Available templates are: View, Publish, Administer, None, and Denied.

6. To further customize the rule, click a capability in the rule to set it to Allowed or Denied, or leave it unspecified. Click save when you are done.

7. Configure any additional rules you want for other groups or users.

8. Validate the permissions clicking a group name or user name in the permission rules to

see the effective permissions below.




### External assets that are not in projects

There are some scenarios in which an external asset is not in a project:

- External assets that Catalog discovered before the **External Assets Default Project** existed (Tableau Cloud December 2022 / Server 2023.1) will not be in a project unless they've been moved into one since then.
- External assets that had their project deleted before the **External Assets Default Project** existed (Tableau Cloud December 2022 / Server 2023.1) will not be in a project unless they've been moved into one since then.
- In Tableau Server 2022.1 and earlier, external assets cannot be moved to projects at all.

If an external asset is not in a project, permissions for external assets work as they did in Tableau Server 2022.1 and Tableau Cloud June 2022 and earlier. That is, database and table permissions are controlled independently of content in projects, and table permissions can be managed through database permissions. When permissions are set at the database level in this way, those permissions can serve as a template for any newly discovered and indexed child tables of that database. Furthermore, database permissions can also be locked so that the child tables will always use the permissions set at the database level.

Note: You cannot lock (or unlock) permissions to a database if the database is in a project.

To lock (or unlock) permissions to the database, use the following procedure:

1. Sign in to Tableau Cloud or Tableau Server as an admin or someone who has been granted the "Set Permissions" capability.

2. From the left navigation pane, click **External Assets**. By default, the External Assets page shows a list of databases and files.

3. Select the check box next to the database whose permissions you want to lock, select **Actions** > **Permissions**, and then click the Table Permissions **Edit** link .

4. In the Table Permissions in Database dialog box, select **Locked** and click **Save**.

5. To unlock permissions, click **Edit** again, and select **Customized**.

Access lineage information

Catalog (and the Metadata API) can expose relationship and dependencies metadata, also referred to as *lineage*, among the Tableau content and external assets on Tableau Cloud or Tableau Server. Lineage shows three primary things:

- How items relate to each other, either directly or indirectly
- How many of those items relate to each other
- With the appropriate permissions, shows sensitive data about items in the lineage

**Sensitive lineage data**

In some cases, lineage can contain sensitive data, such as data quality warning messages, content or asset names, or related items and metadata.

By default, complete lineage information displays for all users while its sensitive data is blocked from specific users who don't have the appropriate View capabilities. The concept of blocking sensitive data is called obfuscation.

Obfuscation allows all metadata in the lineage to be visible while keeping its sensitive data blocked from specific users who don't have the appropriate View capabilities. This default enables workflows that rely on a complete impact analysis.

If obfuscating sensitive data in the lineage is not enough for your organization, certain parts of the lineage, including its sensitive data, can be filtered.

Filtering omits certain parts of the lineage (and lineage-related areas like data details) for specific users who don't have the appropriate **View** capabilities for its sensitive data. Because filtering omits parts of lineage, it prevents workflows that rely on a complete impact analysis.

To change how sensitive data is handled, do the following:

1. Sign in to Tableau Cloud or Tableau Server as an admin.
2. From the left navigation pane, click **Settings**.
3. On the General tab, under **Sensitive Lineage Information**, select the radio button that best handles lineage information for all users on your Tableau Cloud site or Tableau Server.

**Additional notes about lineage**

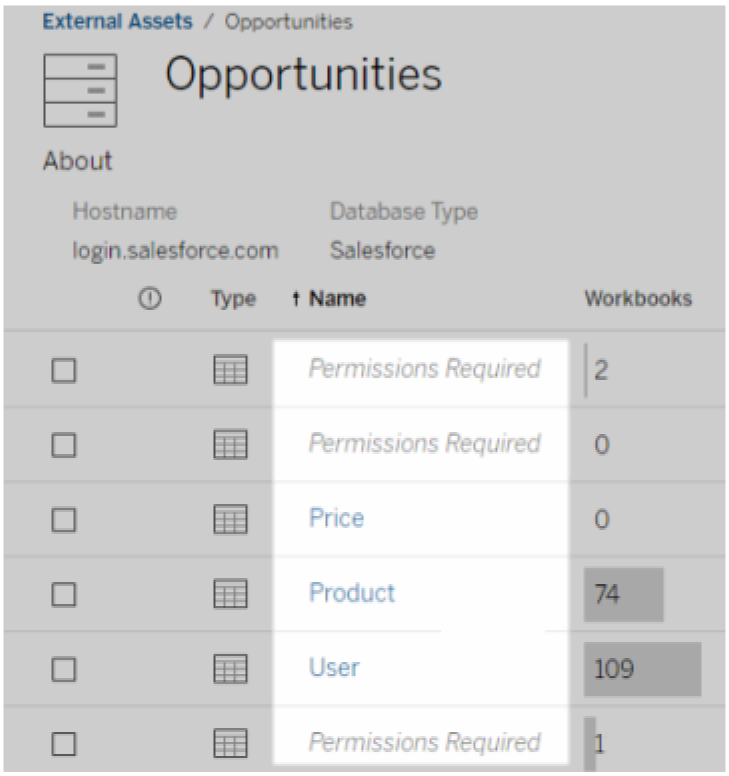
- **If you have the View capability on related assets**, you can see when and what assets and content are related to each other, and their sensitive metadata.

  For example, you can see 1) the names, data quality warnings, and total number of related upstream databases and tables and 2) the combined number of sheets (visible and hidden) in the lineage of the downstream workbook of the asset you are evaluating.

- **If you *don't* have the View capability on related assets**, you can always see when assets relate to each other.

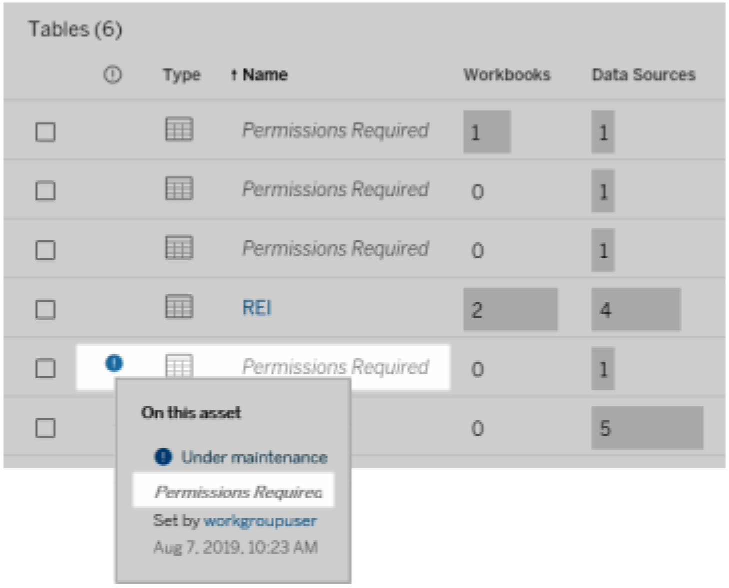
For example, you can see 1) whether related upstream databases and tables exist in the lineage and 2) the total number of databases or total number of tables that are related to the asset you are evaluating.

However, you can't see the metadata associated with those assets when you don't have the view capability for them. When metadata is blocked because of limited permissions, or the asset is in a Personal Space, you see **Permissions Required**.




- **If you *don't* have the View capability on related assets**, you can always see whether the assets are certified.

  However, if you don't have View capability, you can't see sensitive information related to the certification, like the names of the related databases and tables. When metadata is blocked because of limited permissions, or the asset is in a Personal Space, you see **Permissions Required**.




For more information about lineage see Use Lineage for Impact Analysis.

### Additional notes about tags discoverable through lineage data

In addition to Tableau content, external assets can also be tagged. Although tags are always visible, tagged items that you see through lineage data can either be obfuscated (default) or filtered as described earlier in this topic.

When tagged items are obfuscated:

- **If you have the View capability for tagged items**, you can see the tagged items and related tagged items, and all metadata.
- **If you don’t have the View capability for tagged items**:
  - You can see the type of tagged and related tagged items but you can't see sensitive metadata about the items. For example, suppose you use a tag filter to see items with the tag “Noteworthy.” Although you can see that there are database items tagged with "Noteworthy," you can’t see the names of the tagged databases.

- You can see how many related tagged items there are. For example, suppose you do a tag query on “Noteworthy.” Your query returns five tagged databases.

When tagged items are filtered, the tagged and related tagged items you see are limited to only the items that you have the View capability for.

For more information about tags, see Tagged Items in the Tableau User Help.

**Potential mismatch between asset results and content results**

When Catalog shows lineage information, it provides information about Tableau content and external assets. Catalog lineage always shows the true count or result of associated items. However, in other areas of the site, you might see fewer items. This could be because of your **View** capabilities. Outside of Catalog, you see only the content that your permissions allow.

For example, suppose you're looking at the Superstore data source. The lineage for the Superstore data source shows how many upstream underlying tables the data source connects to and how many downstream workbooks rely on the data source. However, because you might not have permissions to see all of those downstream workbooks, the number of related workbooks in the Catalog lineage (actual total) might be greater than the number of workbooks in the **Connected Workbooks** tab (what you have permission to see).

There might be other reasons, unrelated to permissions, why you might see a mismatch between asset counts and content counts. For more information, see Use Lineage for Impact Analysis.

Who can do this

The following information summarizes the types of users who can do the tasks described in this topic.

## Tableau Cloud site or Tableau Server admin

| **Data Management** | **Capability** | **Requirements** |
|---|---|---|
| **Licensed** | See assets and their metadata | None |

| Data Management | Capability | Requirements |
|---|---|---|
| | Edit assets and their metadata | None |
| | Change permission on assets and their metadata | None |
| | Grant users ability to see assets and their metadata | **Default:** When “derived permissions” is on, your users can see metadata on external assets for the content that they own, or for the content that is published to a project that they are a project leader or project owner of.<br><br>**Ad-hoc:** You can configure explicit **View** permissions on a specified external asset. |
| | Grant users ability to edit assets and their metadata | You can configure explicit "write" or **Overwrite** permissions on a specified external asset (if not automatically granted because the user is a flow owner) . |
| | Grant users ability to change permissions on assets and their metadata | You can configure explicit "edit" or **Set Permissions** on a specified external asset (if not automatically granted because the user is a flow owner) . |

| Data Management | Capability | Requirements |
|---|---|---|
| **Not licensed** | See all assets and their metadata | **Applies to Metadata API only** |
| | Edit assets and their metadata | Requires Data Management |
| | Change permission on assets and their metadata | Requires Data Management |
| | Grant users ability to see assets and their metadata | **Applies to Metadata API only:**<br><br>You can turn on derived permissions as described above. If “derived permissions” is on, your users can see metadata on external assets for the content that they own, or for the content that is published to a project that they are a project leader or project owner of. |
| | Grant users ability to edit assets and their metadata | Requires Data Management |
| | Grant users ability to change permissions on assets and their metadata | Requires Data Management |

## User with Creator or Explorer license

| Data Management | Capability | Requirements |
|---|---|---|
| **Licensed** | See assets and their metadata | **Default:** When "derived permissions" is enabled by your Tableau Cloud site admin or Tableau Server admin, you can see metadata on external assets for the content that you own, or for the content that is published to a project that you are a project leader or project owner of.<br><br>**Ad-hoc:** You can see metadata on external assets that you have been granted explicit **View** permissions to. |
| | Edit assets and their metadata | You can edit metadata on an external asset that you have been granted explicit "write" or **Overwrite** permissions to(if not automatically granted because the user is a flow owner). |
| | Change permissions on assets and their metadata | You can change permissions on an external asset that you have been granted explicit "edit" or **Set Permissions** to ((if not automatically granted |

| Data Management | Capability | Requirements |
|---|---|---|
| | | because the user is a flow owner). |
| | Grant other users permissions to see assets and their metadata | You can change permissions on an external asset that you have been granted explicit "edit" or **Set Permissions** to ((if not automatically granted because the user is a flow owner). |
| **Not licensed** | See assets and their metadata | **Applies to Metadata API only:**<br><br>If “derived permissions” is enabled by your Tableau Cloud site admin or Tableau Server admin, you can see metadata on external assets for the content that you own, or for the content that is published to a project that you area project leader or project owner of. |
| | Edit assets and their metadata | Requires Data Management |
| | Change permissions on assets and their metadata | |
| | Grant other users permissions to see assets and their metadata | |

# Enable Tableau Catalog

Tableau Catalog discovers and indexes all of the content on your Tableau Cloud site or Tableau Server, including workbooks, data sources, sheets, metrics, and flows. (The legacy Metrics feature was retired in February 2024 for Tableau Cloud and in Tableau Server version 2024.2. For more information, see Create and Troubleshoot Metrics (Retired).) Indexing is used to gather information about the content, or metadata, about the schema and lineage of the content. Then from the metadata, Catalog identifies all of the databases, files, and tables used by the content on your Tableau Cloud site or Tableau Server.

Catalog is available with the Data Management license. For more information, see About Data Management.

In addition to Catalog, metadata about your content can also be accessed from both the Tableau Metadata API and the Tableau REST API using Metadata Methods.

## Catalog on Tableau Cloud

Catalog is automatically enabled when Tableau Cloud is licensed with the Data Management.

After your Tableau Cloud site has been licensed with the Data Management, the content that already exists on your Tableau Cloud site is immediately indexed. The time it takes to index the content depends on the amount of content you have. After the content is initially indexed, Catalog monitors newly published content and other changes to assets and continues to index in the background.

## Troubleshoot Catalog

You or your users might encounter one of the following issues when using Catalog.

Timeout limit and node limit exceeded messages

To ensure that Catalog tasks that have to return a large number of results don’t take up all system resources, Catalog implements both timeout and node limits.

- **Timeout limit**

  When tasks in Catalog reach the timeout limit, you and your users see the following message:

  "*Showing partial results, Request time limit exceeded. Try again later.*" or TIME_LIMIT_EXCEEDED

- **Node limit**

  When tasks in Catalog reach the node limit, you and your users see the following message:

  NODE_LIMIT_EXCEEDED

# Use Lineage for Impact Analysis

Knowing where your data comes from is key to trusting the data, and knowing who else uses it means you can analyze the impact of changes to data in your environment. The lineage feature in Tableau Catalog helps you do both these things.

When you have a Data Management license and Tableau Catalog enabled, you have access to lineage information for your content. For more information about Tableau Catalog, see "About Tableau Catalog" in the Tableau Server or Tableau Cloud Help.

## Navigate lineage

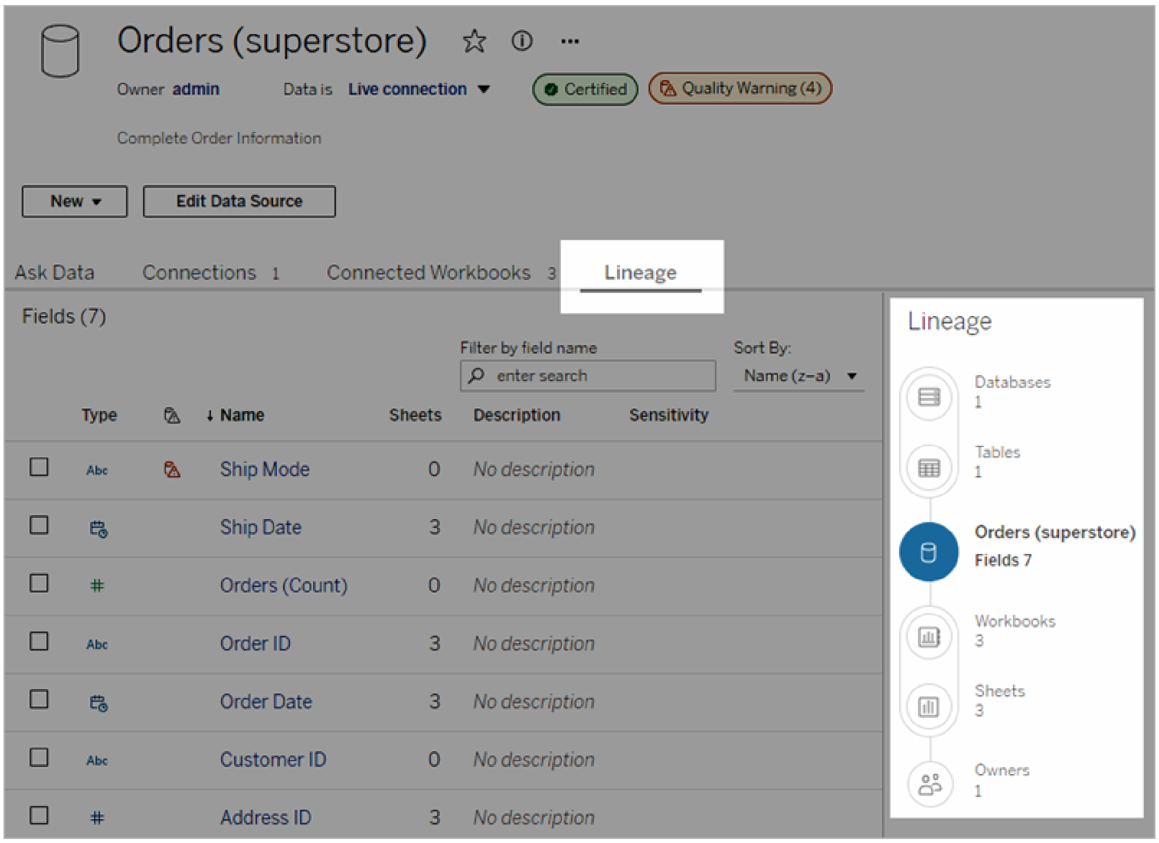
To see the lineage for an asset, first navigate to the asset's page. Your options for this step include:

- Search for the asset and select it.
- Navigate to it from **Explore**.
- If it's an external asset (such as a database or table) that's not in a project, navigate to it through **External Assets**.(This option also works for external assets that *are* in projects.)

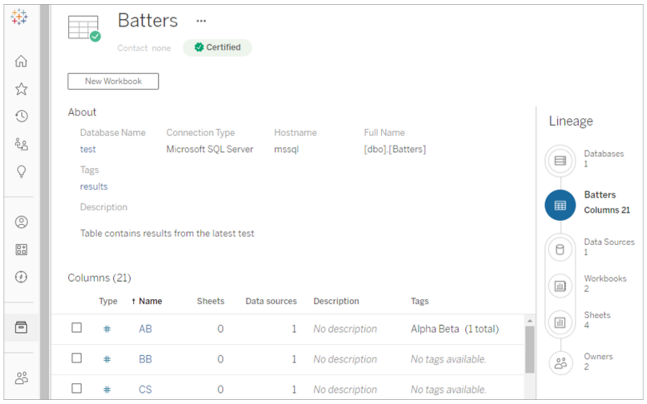
Then select the **Lineage** tab.

If you see a Lineage tab but don't have a license that includes Data Management, clicking on the Lineage tab displays a promotion for Data Management. The promotion can be disabled in your Account Settings.

> **Note**: Lineage data for flows won't show if the flow includes parameter values. For more information about using parameters in flows see Create and Use Parameters in Flows in the Tableau Prep help.



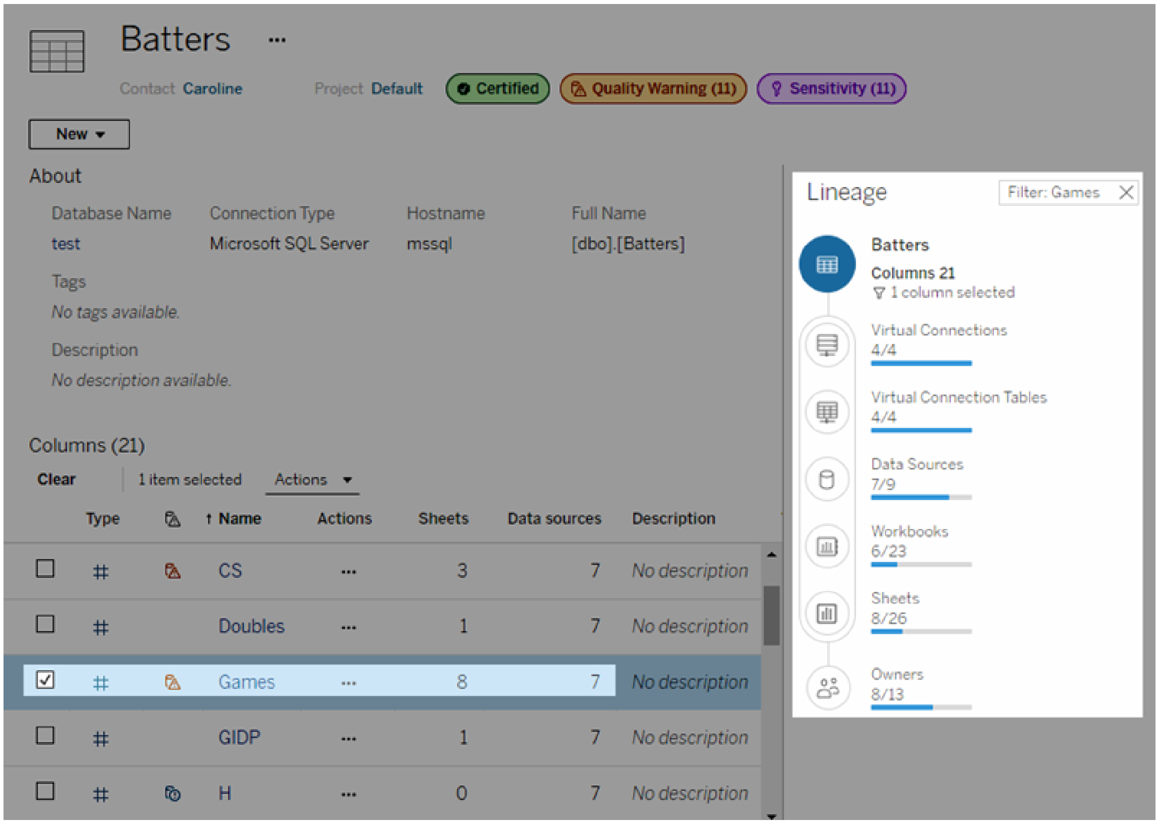

Lineage shows dependencies in relationship to the lineage anchor, which is the asset selected. A lineage anchor can be a database, table, workbook, published data source, virtual connection, virtual connection table, Pulse metric definition, or flow. (In the image above, the anchor is the "Orders (superstore)"data source, and in the image below, the anchor is the "Batters" table.) All the assets below the anchor depend, either directly or indirectly, on the anchor and are called outputs or downstream assets. The assets above the anchor are the assets the anchor is either directly or indirectly dependent on and are called inputs or upstream assets.




Starting in Tableau Cloud June 2024, Pulse metric definitions appear in lineage. (Tableau Pulse is not available on Tableau Server.)

Starting in Tableau Cloud June 2023 and Tableau Server 2023.3, lineage pages for data sources include search and filtering (in the top-right of the fields list) that allow you to quickly find fields of interest or relevance.

When you select a field in a data source or a column in a table, the lineage is filtered to show only downstream assets that depend on the field (or column) or upstream inputs to the field (or column), as in this 'Batters' table example that shows the lineage filtered for the 'Games' column:



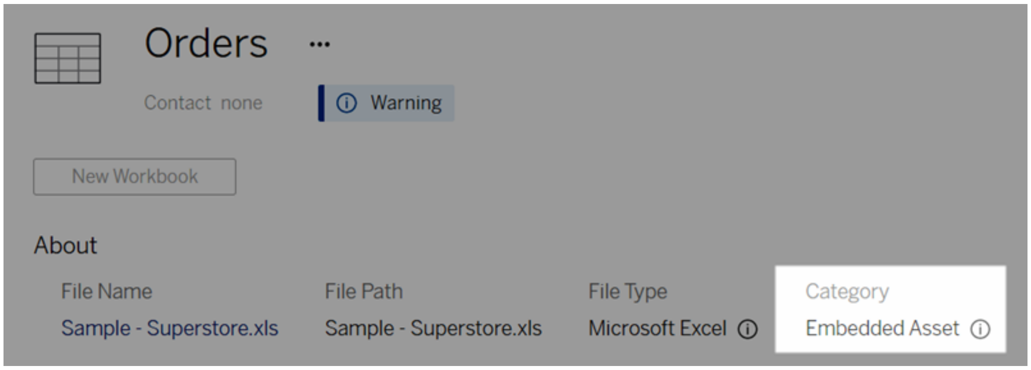

You can select an upstream or downstream asset in the Lineage pane to see its details. For example, when you select Data Sources, the list of data sources that depend on this table appear to the left of the Lineage pane.

From the Lineage pane, you can navigate to any asset related to your initial choice, in this case the table, by following the links that interest you.

## Embedded asset appears in External Assets

Tableau Catalog treats an external asset as ‘embedded’ if the **Include external files** check box is selected when a data source or workbook is published. When an external asset (database, table, or file) is embedded in published Tableau content (workbooks, data sources, and flows), the external asset is used by the content, but is not shareable with other users. That embedded external asset appears in the lineage upstream from its Tableau content and is listed in External Assets.

To see if an external asset is embedded, go to the external asset’s detail page and see if “Embedded Asset” is listed under **Category**.




For information about embedded data, see Publishing data separately or embedded in workbooks in Tableau Desktop and Web Authoring Help.

## Lineage and custom SQL connections

When you view the lineage of a connection that uses custom SQL, keep in mind the following:

- Lineage might not be complete.
- Catalog doesn't support showing column information for tables that it only knows about through custom SQL.
- Field details cards might not contain links to connected columns, or might not show any connected columns at all.
- Column details cards might not contain links to fields that use the column, or might not show any fields at all.

For more information, see Tableau Catalog support for custom SQL in the Tableau Desktop and Web Authoring Help.

## Catalog doesn't support cubes

Cube data sources (also known as multidimensional or OLAP data sources) are not supported by Tableau Catalog. Tableau content (such as a data source, view, or workbook) that relies on cube data does not display any cube metadata or cube lineage in Catalog.

## Mismatch between lineage count and tab count

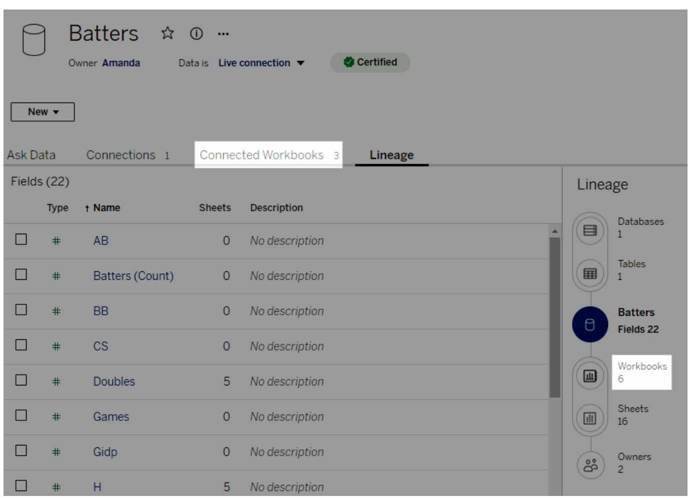
You might notice a mismatch in the count of assets between the Tableau Catalog Lineage tool and the tabs in Tableau Server or Tableau Cloud.

The count mismatch is explained by the fact that each—lineage count vs. tab count—counts assets a different way. For example, at any given point in time, Catalog can count only assets that are indexed, whereas Tableau Server or Tableau Cloud counts any assets that are published. Other reasons for count differences include whether:

- You have "View" permissions for the asset.
- An asset is hidden.
- Any fields are used in a workbook.
- An asset is directly or indirectly connected to.
- An asset is in a Personal Space.

### Workbook count mismatch example

As an example, here's how the tab count vs. the lineage count is determined for workbooks.




Connected Workbooks tab counts workbooks that meet both these criteria:

- Connects to the data source (whether or not any fields are actually used in the workbook).
- The user has permissions to view (whether it's a worksheet, dashboard, or story).

Tableau Catalog Lineage counts workbooks that meet all these criteria:

- Has been indexed by Tableau Catalog.
- Connects to the data source and uses at least one field in the data source.
- Contains worksheets, including dashboards or stories that contain a worksheet, that use at least one field in the data source.

When metadata is blocked because of limited permissions, or the asset is in a Personal Space, Catalog still counts the workbook. But instead of seeing some of the sensitive metadata, you see **Permissions required**. For more information, see Access lineage information.

## Use email to contact owners

At the end of the lineage is Owners. The list of owners includes anyone assigned as the owner or contact for any content downstream from the lineage anchor.

You can email owners to let them know about changes to the data. (To email owners, you must have the 'Overwrite' (Save) capability on the lineage anchor content.)

1. Select **Owners** to see the list of people who are impacted by the data in this lineage.
2. Select the owners you want to send a message to.
3. Click **Send Email** to open the email message box.
4. Enter the Subject and your message in the text box, and click **Send**.

# Data Labels

Data labels are metadata that you can attach to data assets. Data labels help classify data and pass information to users. For example:

- One published data source is more authoritative than other, similarly named ones. The certification data label can help you inform users which data source is recommended.
- A column in a database contains outdated information. A warning data label can help you tell workbook authors and viewers that the data isn't up to date.
- A table of employee income contains sensitive information that shouldn't be shared. A sensitivity data label can inform users that they must take care when using data from the table.

- Some published data sources can be grouped based on the department that published them. A custom label category with custom labels can identify the departments responsible for the data sources.

Note: Data labels are a more recent and extensible way of thinking about ways to classify metadata. Certifications and data quality warnings, which were part of the Data Management license long before the term "data labels" existed, are now considered categories in the broader data label concept, along with the Sensitivity Labels released in Tableau Cloud June 2023 and Tableau Server 2023.3.

A Data Management license is required for all data label operations except for ones related to the certification of published data sources.

## Assets you can label

You can add labels to the following Tableau content and external assets:

- Databases
- Tables
- Columns (except for certification) *(column labels introduced in Tableau Cloud October 2022 / Server 2022.3)*
- Data sources
- Flows
- Virtual connections
- Virtual connection tables

## Label names and categories

Each label has a name and category. The names and categories built-into Tableau are:

| Name | Category |
|---|---|
| Certified | Certification |
| Deprecated | Data Quality Warning |

| | |
|---|---|
| Stale data | Data Quality Warning |
| Under maintenance | Data Quality Warning |
| Warning | Data Quality Warning |
| Extract refresh failed | Data Quality Warning |
| Flow run failed | Data Quality Warning |
| Sensitive data[1] | Sensitivity |

[1] *In Tableau Cloud March 2023 / Server 2023.1 and earlier, the Sensitive data label uses the Data Quality Warning category.*

Starting with Tableau Cloud October 2023 and Tableau Server 2023.3, using the label manager on the Data Labels page or the REST API, an administrator can customize the built-in labels or create new label names and categories. (Using the REST API, Tableau Cloud Administrators have been able to modify some built-in labels and add others in certain categories since June 2023.) For more information, see Manage Data Labels.

# Label categories

A label's category affects where and how the label appears, whether it appears on downstream assets, and which parts are customizable, among other things.

## Certification

In a self-service environment with multiple publishers and numerous assets, it can be difficult to find recommended content. Using certification, you can mark assets as trusted, and the assets display badges in various places across Tableau. For complete information, see Use Certification to Help Users Find Trusted Data.

## Data quality warnings

Identifying problematic data is important for building trust with users. Data quality warnings allow you to mark data assets that have known issues. When you attach a data quality warning to an asset, a warning shows on it and any downstream assets that use it, making data consumers aware of problems with the source data. For example, if you mark a database table as deprecated, users viewing workbooks based on that table may see a warning.

Furthermore, data quality warnings can be set automatically when an extract refresh or flow run fails, and removed again when it succeeds. And using the Data Labels page or the REST API, administrators can create new, customized data quality warning labels, adding nuance and specificity to the warnings that users can choose from. For complete information, see Set a Data Quality Warning

## Sensitivity labels

Some data needs to be handled differently. Using Sensitivity labels, you can relay data sensitivity information to consumers of that data. When you mark an asset as sensitive, users browsing Tableau Cloud see badges on it and any downstream assets that use it. For example, if you mark a table column as sensitive, a user authoring a new workbook based on that table may see a warning. Furthermore, using the **Data Labels** page or the REST API, administrators can create customized sensitivity labels, adding nuance and specificity to the range of classifications that users can choose from when using sensitivity labels.

> Note: Sensitivity labels were introduced in Tableau Cloud June 2023 and Tableau Server 2023.3. Earlier versions of Tableau Cloud and Tableau Server relay data sensitivity through the "Sensitive data" data quality warning instead of using a dedicated sensitivity category.

For complete information, see Sensitivity Labels.

## Custom label categories

Sometimes you need to classify data in a way that isn't covered by certification, data quality warnings, or sensitivity labels. Using custom categories that administrators define, you can use labels to categorize assets in any way that your organization sees fit. For example, an administrator in your organization might create a category called "Department" with labels in it for sales, marketing, and other departments, ready to be applied to assets on your site. For complete information, see Labels with Custom Categories.

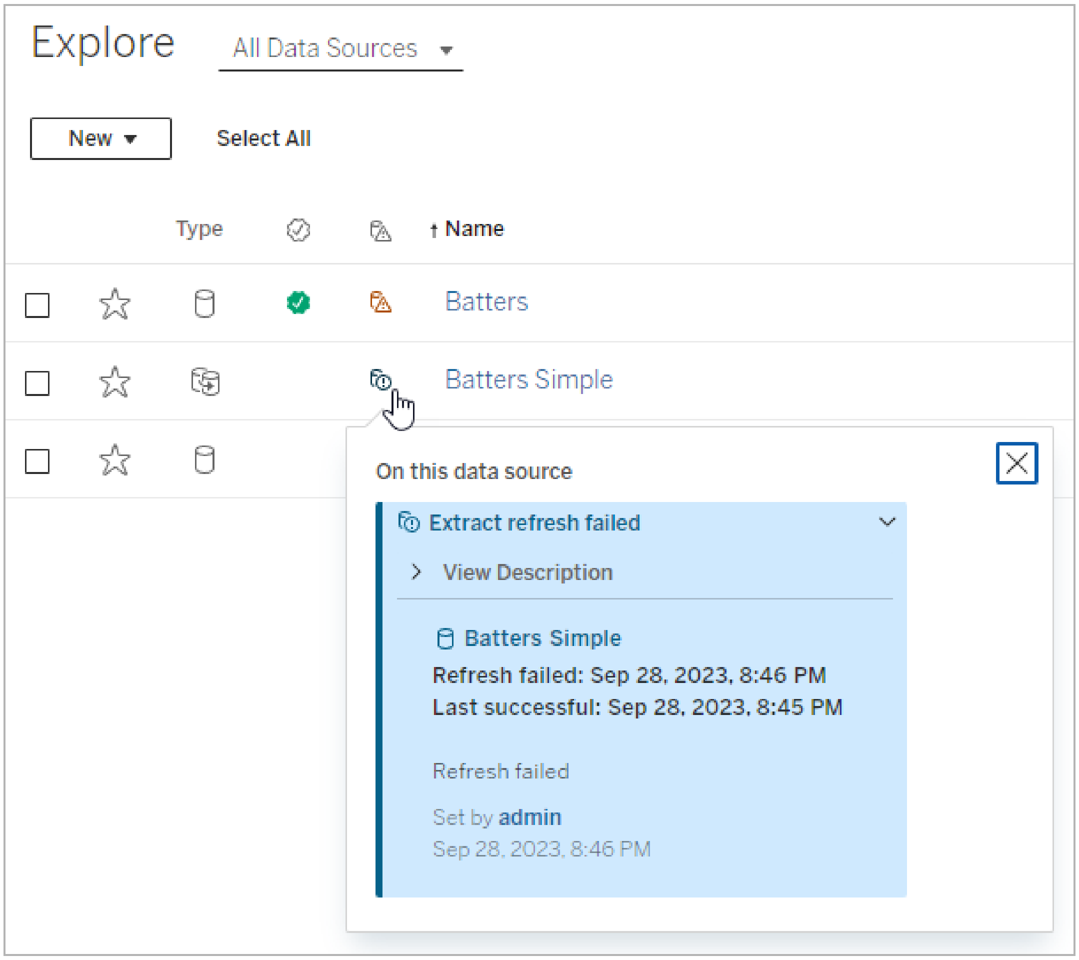
> Note: The ability for administrators to create label names and categories through the label manager was released with Tableau Cloud October 2023 and Tableau Server 2023.3. Tableau Cloud administrators could use the REST API in a more limited way to create custom label names with built-in categories in June 2023.

## Where data labels appear

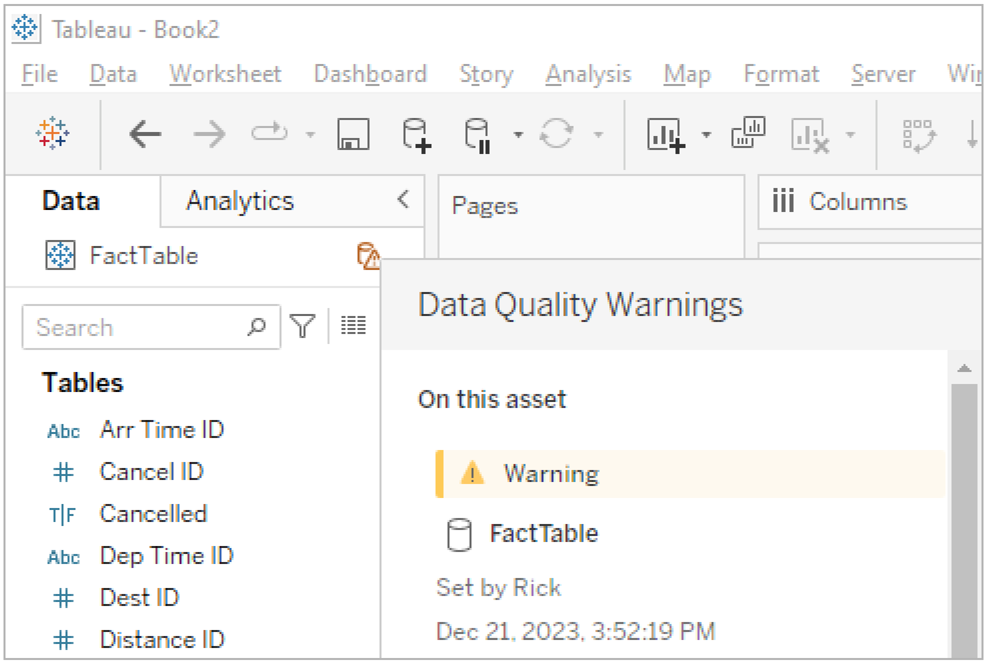
Data labels appear in various places, such as

- the tops of asset pages (workbooks, data sources, tables, and so forth)

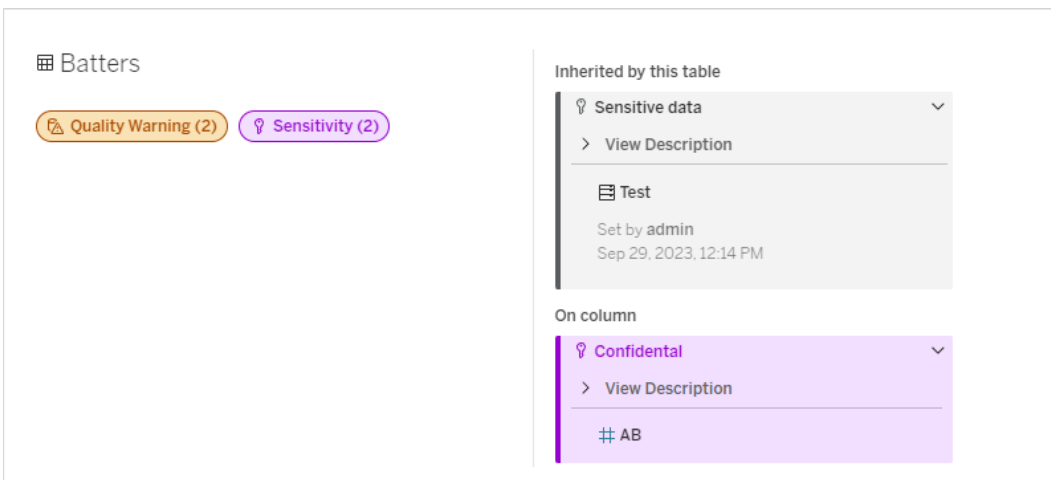
- lists of assets (**Explore** pages, **External Assets** page, and so forth)



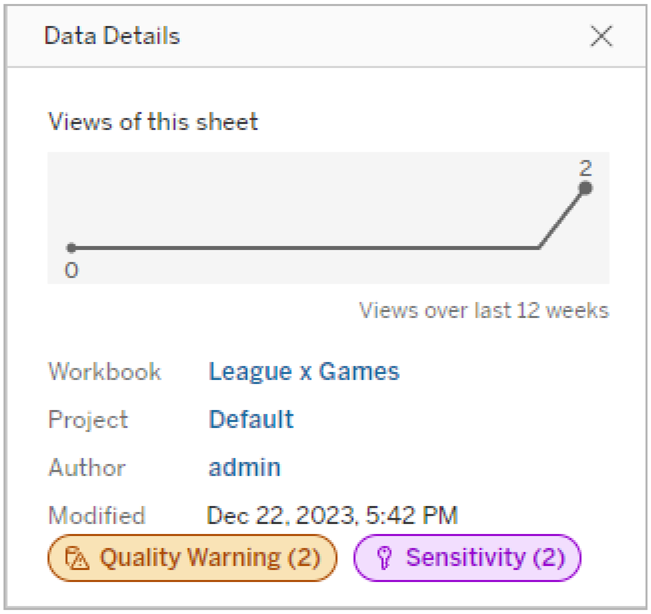
- the Desktop **Data** pane




- the web authoring **Catalog Details** window



- the **Data Details** pane

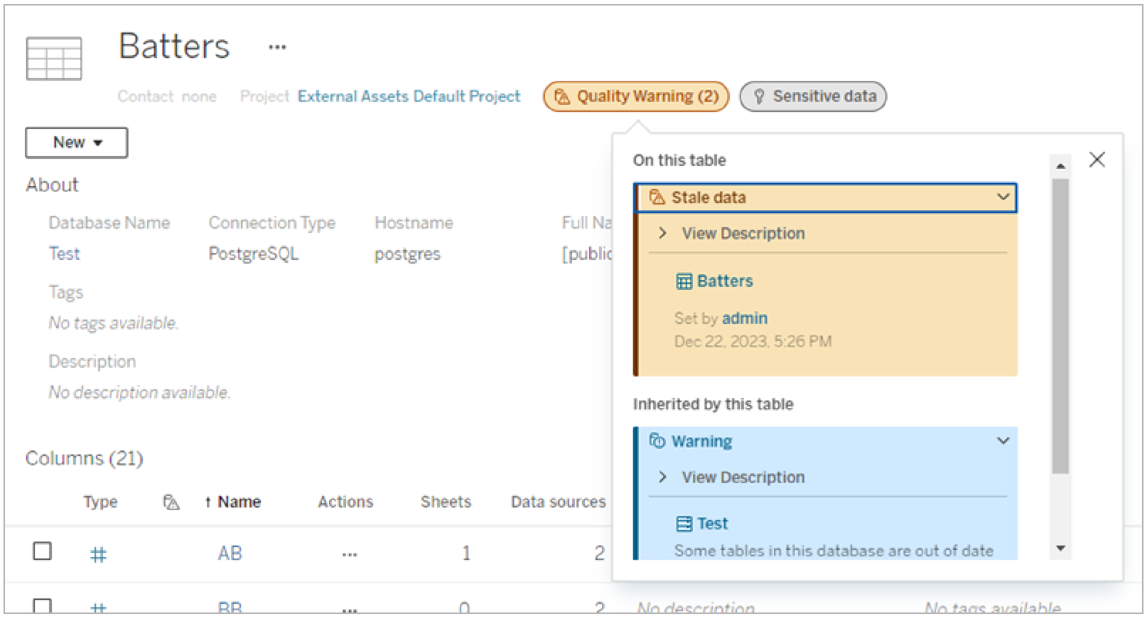



Color indicates the category and visibility level of a label:

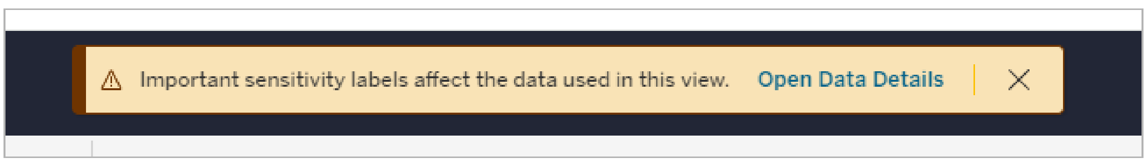
- **Green** indicates the asset is certified
- **Blue** indicates a standard visibility quality warning
- **Yellow** indicates a high visibility quality warning
- **Gray** indicates a standard visibility sensitivity label or label with a custom category
- **Purple** indicates a high visibility sensitivity label

Select a label badge to see details for labels of that category on the asset. In the case of quality warning labels and sensitivity labels, the details will include labels inherited from upstream assets. If you're examining quality warning labels or sensitivity labels on a table, the details will include labels on downstream columns. To go to the related asset's page, select it. Certification labels and custom category labels are not inherited from upstream assets.

There's a single indicator for each label category, no matter how many labels of that category are on the asset or inherited by it. The indicator is colored for high visibility if one or more of the labels it represents are high visibility labels. For example, suppose that a table has a standard visibility quality warning on it, and the table's upstream database has a high visibility quality warning on it. You'll see a yellow **Quality Warning (2)** indicator because the indicator represents two quality warnings, one of which is high visibility.




High visibility quality warnings and high visibility sensitivity labels that affect views and web authoring sessions cause alerts to be shown.

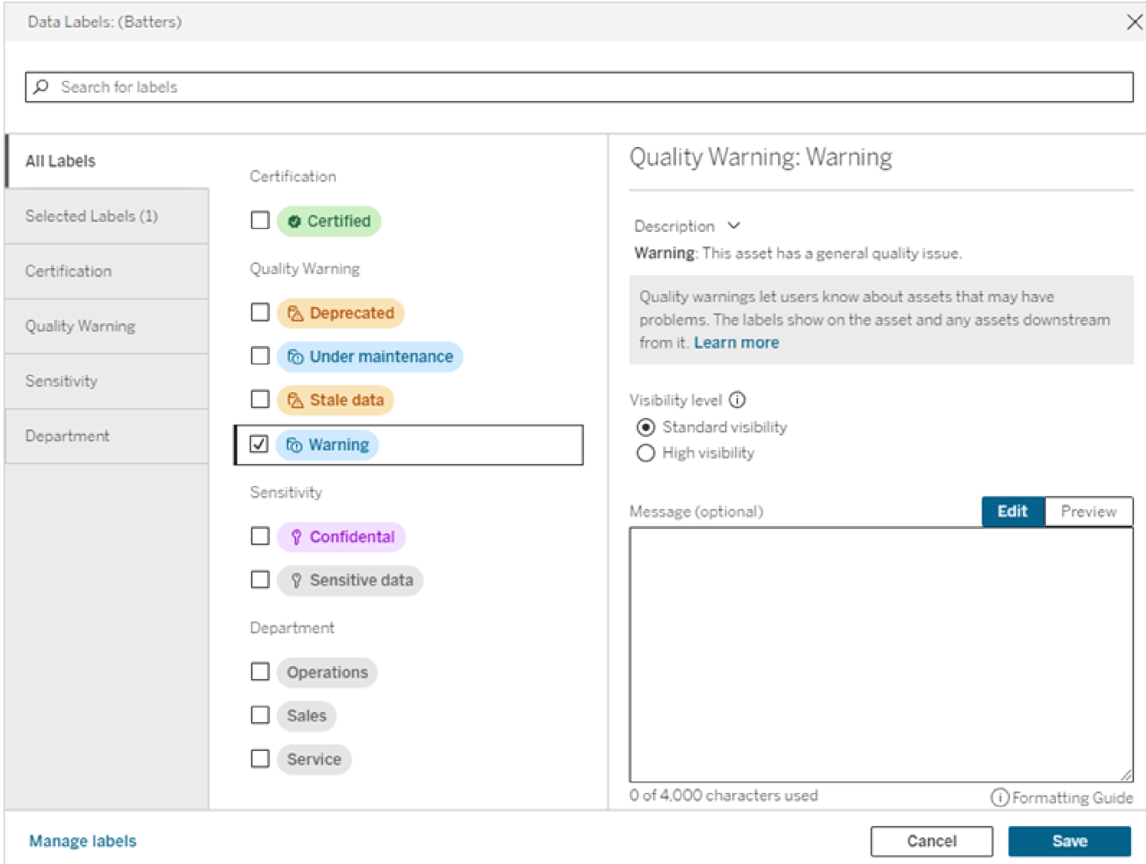



These alerts inform users that the data they're seeing needs to be treated with care. Selecting the Open Data Details link shows more information on the labels affecting the data.

## The Data Labels dialog

Starting in Tableau Cloud February 2024 and Tableau Server 2024.2, you add, remove, and modify data labels on assets using the consolidated **Data Labels** dialog. (Extract refresh monitoring and flow refresh monitoring are still controlled through separate dialogs.)

To open the **Data Labels** dialog for an asset, select the actions (...) menu next to the asset, then select **Data Labels**. Choose **Certification**, **Data Quality Warning**, **Sensitivity Label**, or **All Labels** to open the **Data Labels** dialog with the appropriate tab showing.




The vertical tabs on the dialog's left side correspond to data label categories, except for the **All labels** and **Selected labels** tabs at the top of the list.

- The **All labels** tab lists all the site's data labels across all categories. Each label selected for the asset is checked. This includes data labels that were selected for the asset when the dialog was opened, in addition to any labels that have been selected since then.
- The **Selected labels** tab lists all the data labels that have been selected for the asset. This includes data labels that were selected for the asset when the dialog was opened, in addition to any labels that have been selected since then.
- The other tabs correspond to data label categories. Those tabs list all data labels associated with the category. Each label selected for the asset is checked. This includes data labels that were selected for the asset when the dialog was opened, in addition to any labels that have been selected since then.

The search bar at the top of the dialog returns data labels that match the search term you provide. You can select or deselect any labels you want from the results.

To change the data labels on an asset:

1. Navigate to the label by using the search bar or vertical tabs to find the label.
2. To add a data label to the asset, check the box next to it.
3. Select a visibility level (if applicable) and a message if desired.
4. To remove a data label from an asset, clear the box next to it.
5. Add, remove, or modify more labels for the asset by repeating these steps
6. To commit your changes to the data labels on the asset and close the dialog, click **Save**. Or, if you want to abandon all your changes since the dialog opened, click **Cancel** and confirm you want to abandon the changes.

Note: Selecting the data label instead of the check box next to it will show details about the label without changing the status of the check box. This action is useful for seeing the label description or making changes to the message without changing the status of the label on the asset.

The consolidated Data Labels dialog isn't available in Tableau Server.

For detailed information on the labels in specific categories, see the appropriate topic:

- Use Certification to Help Users Find Trusted Data
- Set a Data Quality Warning
- Sensitivity Labels
- Labels with Custom Categories

## Permissions required to interact with data labels on assets

Permissions required to view, add, update, and delete labels on assets are as follows:

- To view a data label, you must have **read** permissions on the associated asset.
- To add, update, or delete a data label other than a certification label, you must have **write** permission on the associated asset.
- To add, update, or delete a certification label, you must be an administrator, or else you must be a project leader or product owner for the project the asset is in.

- To add, update, or delete a certification label for an external asset *not* in a project, you must have the **change permissions** permission on the associated asset.

## Comparison of data labels and tags

Tableau Cloud and Tableau Server also feature another solution for asset classification: Tags. Data labels and tags differ in significant ways:

| Area | Data Labels | Tags |
|---|---|---|
| Structure and control | Administrators control the range of data labels | No administrative control over the range of tags users add |
| Permissions | Ability to add/update/remove data labels is controlled through asset permissions | Explorers and Creators can tag any assets that they can view |
| Appearance | Data label iconography is easily seen and color-coded by category and visibility level | Tags appear in fewer places than data labels and have no iconography |
| Inheritance | Some data labels (like warnings and sensitivity labels) show on downstream assets | No inheritance |
| Searching/Filtering | Certification and quality warnings can be used as filters in some asset lists | Search results return assets with matching tags, and tags can be used as filters in some asset lists |
| API accessible | Access via REST API and Metadata API is possible | Access via REST API and Metadata API is possible |
| License requirements | Requires a Data Management license (except for the certification of published data sources) | No licensing requirements |

| | | |
|---|---|---|
| Use | Structured categorization focused on providing important information that can influence users' use of data | Open-ended method to categorize assets |

For more information on tags, see Use Tags in the Tableau Desktop and Web Authoring Help.

# Use Certification to Help Users Find Trusted Data

In a self-service environment with multiple publishers, it's common for a project on Tableau Cloud to contain a variety of content that is named similarly, or is based on the same or similar underlying data, or is published without any descriptive information about it. When this is the case, analysts might lack confidence about the data they should use.

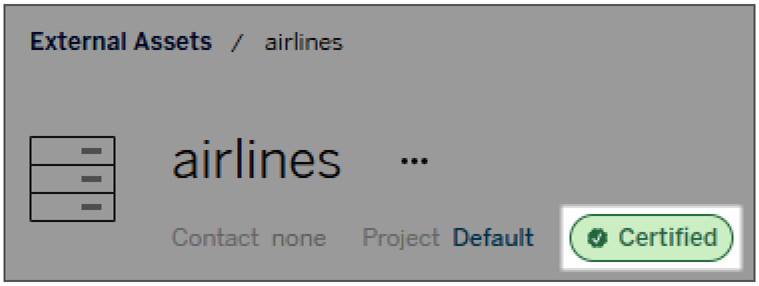
To help your users find the data that's trusted and recommended for their type of analysis, you can *certify* the data that complies with your organization's data standards.

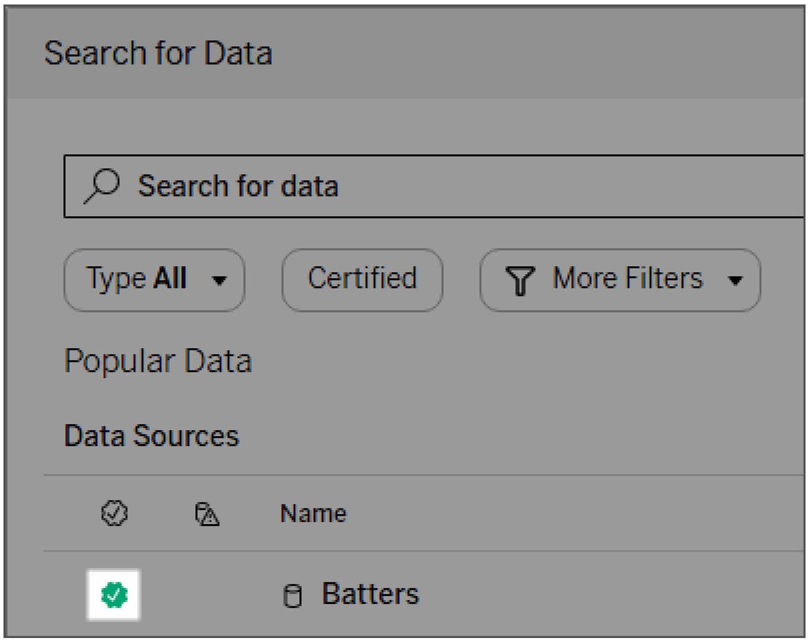
In addition to certifying published data sources, if you have a Data Management license for Tableau Server or Tableau Cloud:

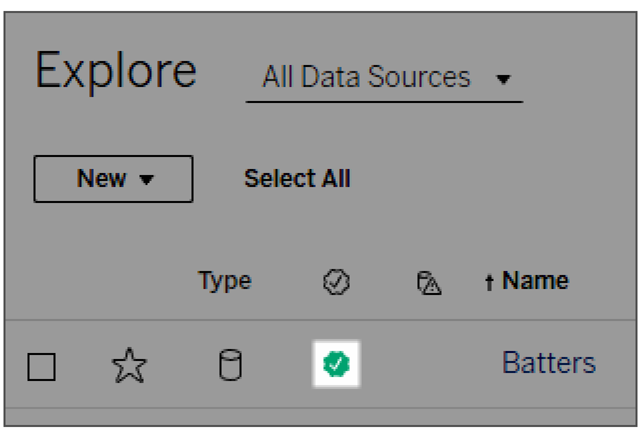
- If Tableau Catalog is enabled, you can certify databases and tables that are associated with your Tableau content. (For more information about Tableau Catalog, see "About Tableau Catalog" in the Tableau Server or Tableau Cloud Help.)
- Starting in Tableau 2022.1, you can certify virtual connections and virtual connection tables.

## How certification helps users find trusted data

When you certify an asset, users see a green badge or green check mark, depending on where the asset is being viewed.

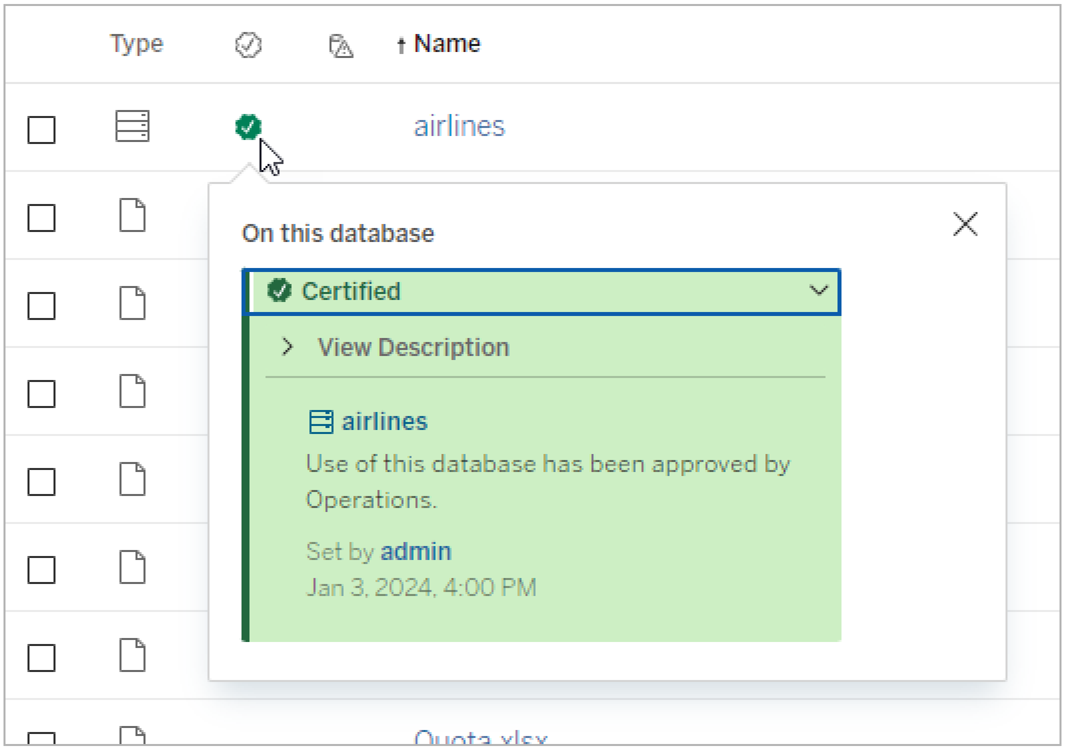



Certified data sources rank higher in search results and are added to recommended data sources.

In addition, you can provide notes about the certification status, which appear when users click the badge, or in a tooltip when they hover over the data source icon in web authoring or Tableau Desktop. The information also shows who certified the data source.




## Create guidelines for selecting data to certify

As with most Tableau functionality, certification is flexible. You can define for your organization the criteria you use to determine when to certify an asset. As you do so, document and share your guidelines. The guidelines can help you, other administrators, and project leaders to be consistent with your certification choices. They can also help users understand what certification means.

Whether you use the same certification criteria across all projects, or define unique criteria for each project, the important thing is to be clear about what certification means in your environment.

## Who can certify data

To certify a data source, you must

- be a Server or Site Administrator, *or*
- have a site role of **Explorer (Can Publish)** or **Creator** *and* be the project owner or have the **Project Leader** capability for the project containing the data you want to certify.

To certify virtual connections and virtual connection tables, you must have a Data Management license in your environment, and you must

- be a Server or Site Administrator, *or*
- have a site role of **Explorer (Can Publish)** or **Creator** *and* be the project owner or have the **Project Leader** capability for the project containing the data you want to certify.

To certify databases or tables, you must have Tableau Catalog enabled in your environment, and you must

- be a Server or Site Administrator, *or*
- have the **Set permissions** capability on the database to certify that database or any tables within that database.

## How to certify data

The data you can certify depends on the permissions you have, and whether you have a Data Management license and Tableau Catalog enabled in your environment.

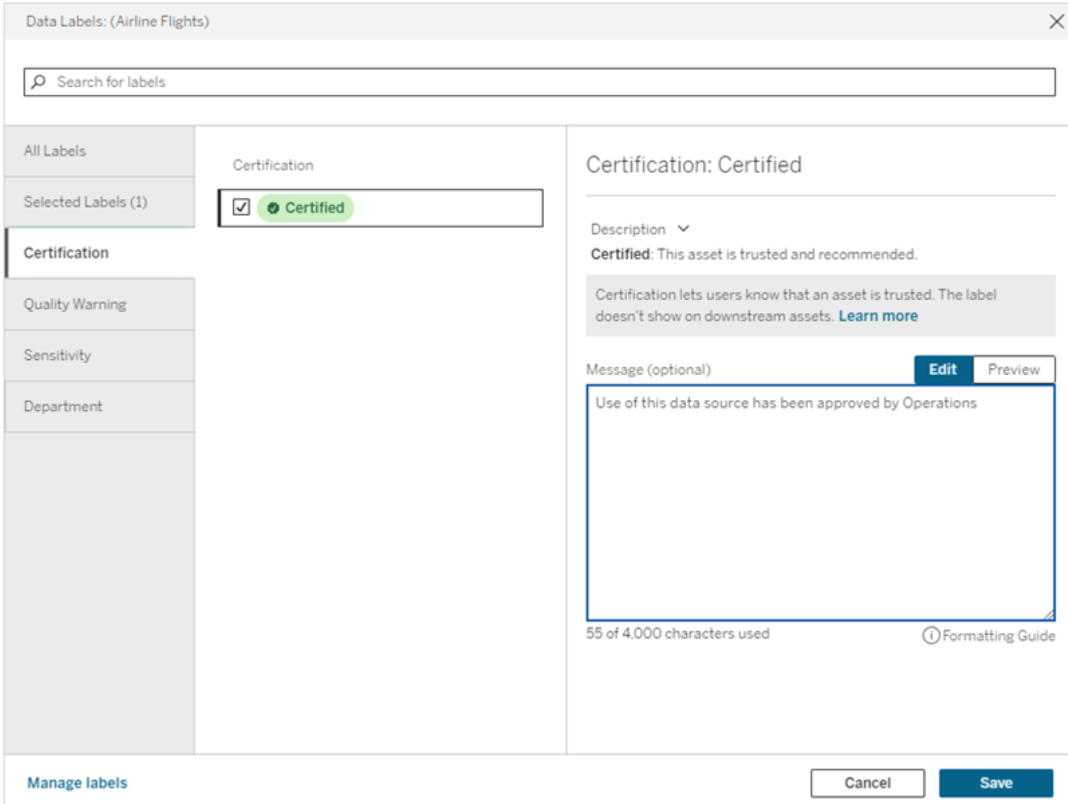
- All users with permissions can certify data sources.
- If you have a Data Management license, users with permissions can also certify virtual connections and virtual connection tables.
- If you have a Data Management license and Tableau Catalog is enabled, users with permissions can also certify databases, tables, and files.

To certify an asset:

> Note: Starting in Tableau Cloud February 2024 and Tableau Server 2024.2, you add and remove certifications using the consolidated Data Labels dialog instead of separate

dialogs for each type of label. For information on the Data Labels dialog, see The Data Labels dialog.

1. Search for or navigate to the asset. The steps to navigate depend on the type of asset you want to certify:
   - Data source or virtual connection - on the **Explore** page, select **All Data Sources** or **All Virtual Connections**.
   - Virtual connection table - on the **Explore** page, select **All Virtual Connections**, and select the virtual connection that contains the virtual connection table you want to certify. Then select the virtual connection table.
   - Database or table - on the **Explore** page, navigate to the database or table. Or on the **External Assets** page, select **Databases and Files** or **Tables and Objects**.
2. On the page, select the More actions menu (...) next to the asset name you want to certify.
3. Select **Data Labels** > **Certification** (or **Edit Certification** in Tableau Server 2023.1 and earlier)
4. Select the **Certified** checkbox. (In earlier versions of Tableau Server, use the switch.)
5. Add a message if desired. The message gives users context for the certification status, intended use for the data, or other helpful information. Information you add to the **Message** section appears in the certification badge or tooltip, mentioned earlier in How certification helps users find trusted data. You can format the text in a message with bold, underline, and italics, and include a link or an image. To see text formatting tips, click the information (i) icon above the **Save** button. (Starting in Tableau Cloud February 2024, the message is optional. Earlier versions of Tableau Cloud and Tableau Server required it.)




6. Select **Save**.

### Customize certification

Beginning with Tableau Cloud June 2023 and Tableau Server 2023.3, using the label manager on the Data Labels page or the REST API, an administrator can change the certification description that users see in the certification dialog. For more information, see Manage Data Labels.

## Set a Data Quality Warning

Data quality warnings are a feature of Tableau Catalog, part of the Data Management offering for Tableau Server and Tableau Cloud. For more information about Tableau Catalog, see "About Tableau Catalog" in the Tableau Server or Tableau Cloud Help.

When Tableau Catalog is enabled in your environment, you can set data quality warnings on data assets so that users of that data are aware of issues. For example, you might want to let users know that a data source has been deprecated, or that a refresh has failed for an extract data source.

You can set data quality warnings on data sources, databases, tables, flows, virtual connections, virtual connection tables, and columns.

Data quality warnings for data sources, databases, tables, and flows were introduced in version 2019.3 for Tableau Cloud and Tableau Server. Data quality warnings for virtual connections and virtual connection tables were added in Tableau Cloud March 2022 and Tableau Server 2022.1, and for columns in Tableau Cloud October 2022 and Tableau Server 2022.3.

## About data quality warnings

There are two kinds of data quality warnings: Quality warnings that you set, and quality warnings that Tableau sets when an extract refresh or flow run fails, also known as monitoring quality warnings.

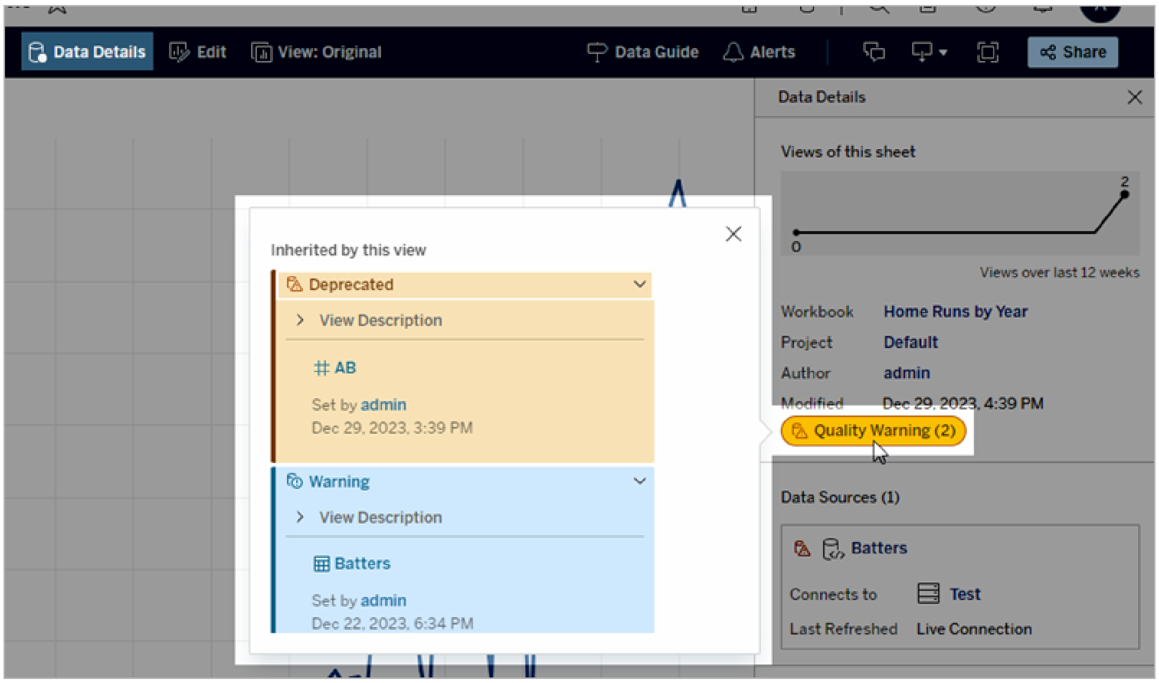
- **Quality warnings that you set**: A quality warning that you set is visible to users until you or another user removes it.
- **Monitoring quality warning**: If you enable a monitoring quality warning for an extract or flow asset, Tableau automatically adds a quality warning to the asset when an extract refresh or flow run fails. Later, if the extract refresh or flow run succeeds, Tableau automatically removes the quality warning.

Starting with Tableau Cloud October 2023 and Tableau Server 2023.3, in addition to setting monitoring warnings at the asset level, you can also turn extract refresh and flow run monitoring on or off for the entire site at once. For information about site-wide monitoring, see Site-wide monitoring for extract refresh and flow run failures.

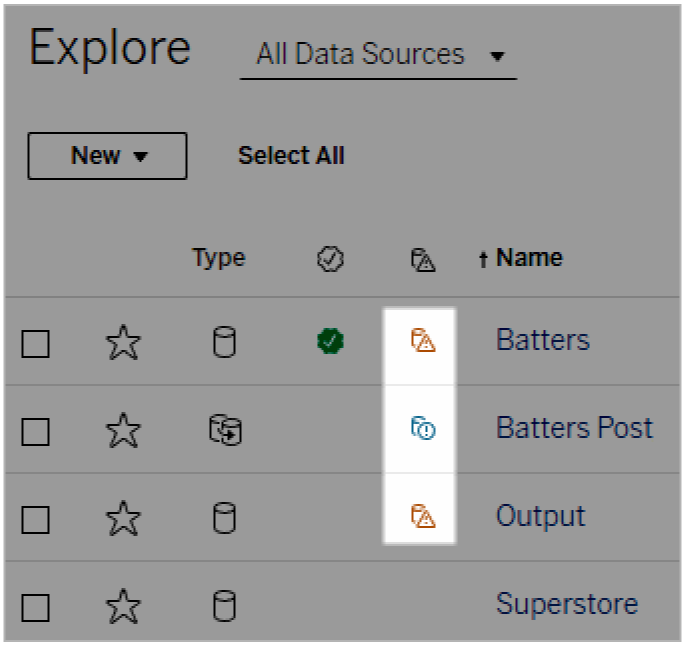
> **Note:** You can enable and modify both kinds of data quality warnings using the REST API. For more information, see the Label and Data Quality Warning Metadata Methods in the Tableau REST API Help.

## Where data quality warnings appear

In Tableau Cloud and Tableau Server, when you set a warning on a data source, flow, database, table, column, virtual connection, or virtual connection table, the warning is visible to users of the asset and any assets downstream from it. For example, a warning set on a table is visible to users looking at a dashboard that depends on that table. The users see a warning icon on the dashboard's Data Details tab and can open the pane to see more information.




Data quality warnings appear when exploring some types of content in a list view:




Note: If you see a data quality warning column, but don't have a license that includes Data Management, selecting the column header displays a promotion for Data Management. The promotion can be turned off in your Account Settings.

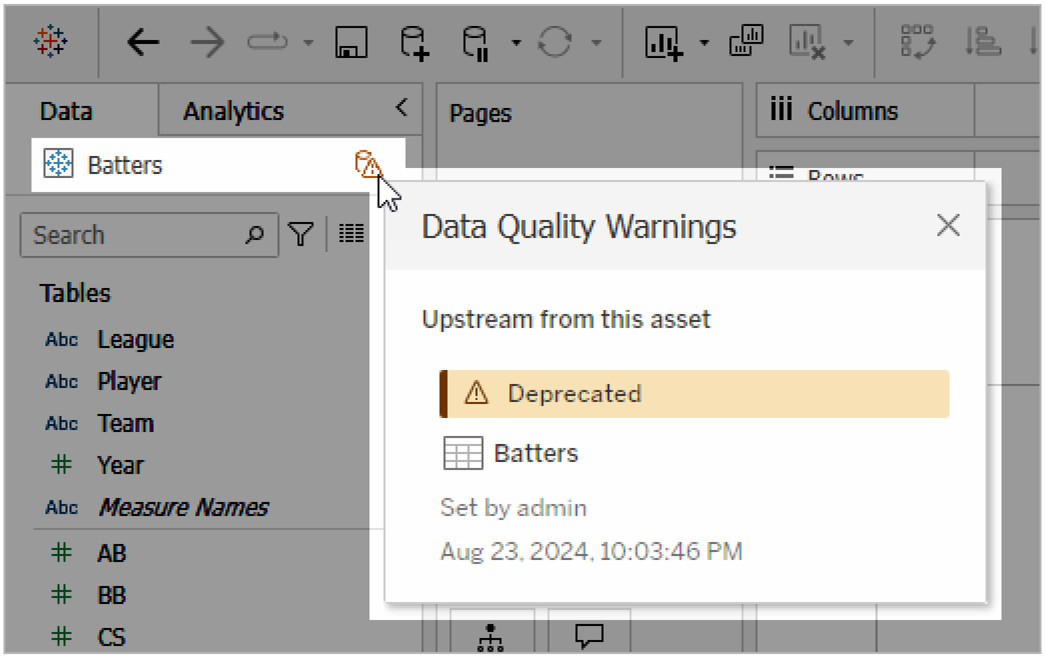
Data quality warnings also appear at the top of asset pages:


In Tableau Desktop, users see an icon next to the data source in the **Data** pane when

- there's a warning on a data source used in the workbook, or
- there's a warning upstream from the data source used in the workbook

Note: Data quality warnings for columns and virtual connections don't appear in Tableau Desktop.

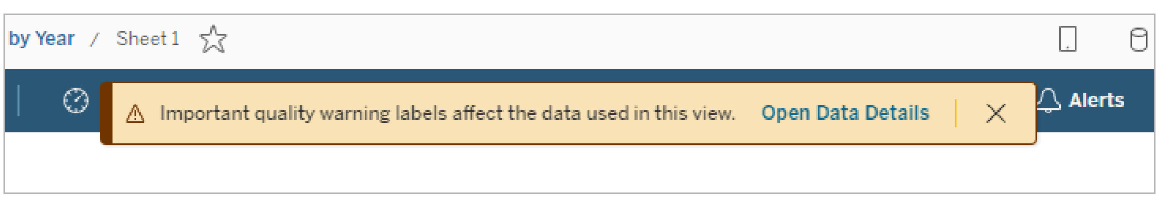
To see the details of the warning, select the warning icon.




In Tableau Cloud web authoring, you can look at all label properties for an object in the data pane (data connection or field) by selecting **Catalog Details** on the data connection or field.

Visibility

Data quality warnings can be classified as high visibility. High visibility quality warnings appear more urgent and appear in more places. For example, a high visibility warning on a data source generates a notification when anyone opens a view that depends on it.



The icon and badge for high visibility quality warnings is yellow or orange, while standard visibility quality warnings are blue.

If more than one quality warning applies to an asset (because the asset has more than one quality warning or is inheriting upstream ones), the badge includes a number, and the color is determined by the highest visibility label. For example, if two quality warnings apply to an asset, one of which is standard visibility and one of which is high visibility, the badge is yellow or orange.


## Data quality warnings in subscriptions

Administrators can turn on data quality warnings in email subscriptions. If this feature is turned on, emails the users receive include high visibility data quality warnings for that view, with links to:

- Relevant views or workbooks with their **Data Details** pane open.
- Relevant upstream assets, such as data sources, tables, or databases.

Administrators can turn on data quality warnings in email subscriptions by selecting the **High-Visibility Data Labels in View and Workbook Subscriptions** option (previously the **Data Quality Warnings in Subscriptions** option) on the Tableau Server or Tableau Cloud site settings page. For more information, see High-Visibility Data Labels in View and Workbook Subscriptions in the Site Settings Reference.

## How to set a quality warning

You can set several different data quality warnings on an asset. Starting with Tableau Cloud June 2023 and Tableau Server 2023.3, an administrator can add to the list of available data quality warnings by customizing data labels.

Starting with Tableau Cloud June 2023 and Tableau Server 2023.3, "Sensitive data" is no longer a data quality warning, but is a sensitivity label instead. For more information, see Sensitivity Labels. In Tableau Server 2023.1 and earlier, "Sensitive data" remains a data quality warning.

The following data quality warnings are built in:

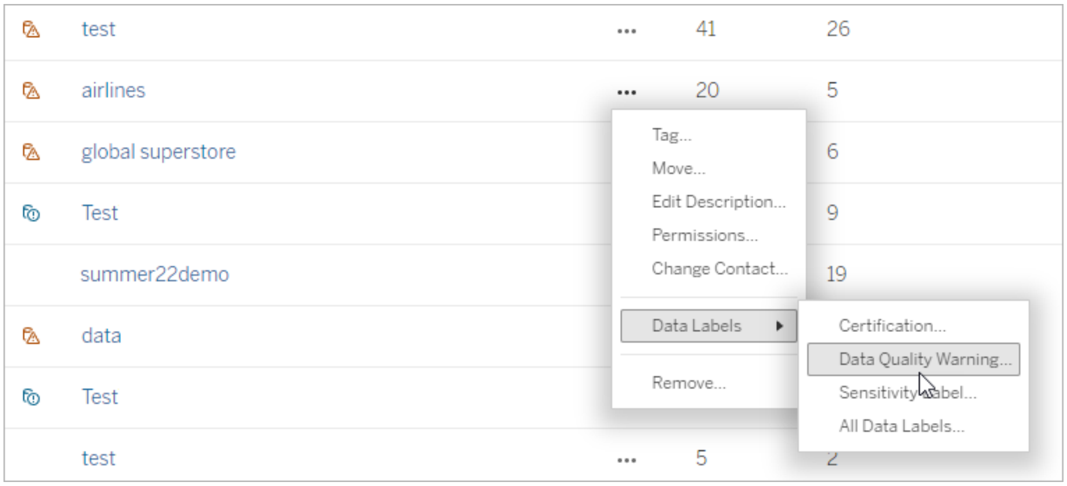
- Warning
- Deprecated
- Stale data
- Under maintenance

To attach a data quality warning to an asset:

Note: Starting with Tableau Cloud February 2024 and Tableau Server 2024.2, you add and remove quality warnings using the consolidated Data Labels dialog instead of separate dialogs for each type of label. For information on the Data Labels dialog, see The Data Labels dialog.

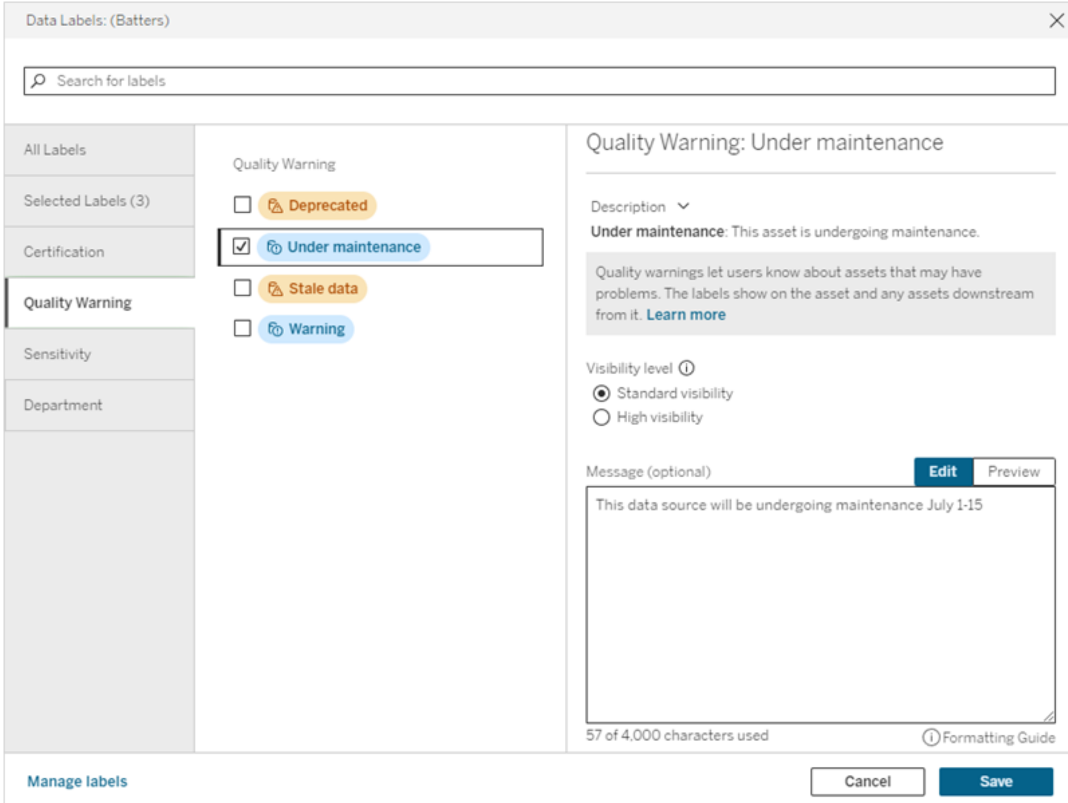
1. Search for or navigate to the asset. The steps to navigate depend on the type of asset you want to add the quality warning to:
   - Data source or virtual connection - on the **Explore** page, select **All Data Sources** or **All Virtual Connections**.
   - Virtual connection table - on the **Explore** page, select **All Virtual Connections**, and select the virtual connection that contains the virtual connection table you want to certify. Then select the virtual connection table.
   - Database or table - on the **Explore** page, navigate to the database or table. Or on the **External Assets** page, select **Databases and Files** or **Tables and Objects**.
   - Column - on the **Explore** page, navigate to the table. Or on the **External Assets** page, select **Tables and Objects** and navigate to the table. Then find the column in the list.
2. Select the actions menu (. . .) next to the asset, and then select **Data Labels** > **Data Quality Warning**. (For columns in Tableau Server 2022.3 and earlier, instead select the

column, and then click the actions dropdown and select **Quality Warning**.)




3. Select the checkbox beside quality warnings you want attached to the asset. Optionally, if you know the name of a quality warning, you can search for it at the top of the dialog, and then select the checkbox beside it. (In Tableau Server 2023.3 and earlier, you can only attach one quality warning to each asset. Use the **Show warning** switch or **Enable warning** checkbox to turn on a quality warning for that asset, then select the desired warning from the dropdown list.)
4. Set the visibility level.
5. If desired, enter a message to display to users. (In Tableau Server 2023.3 and earlier, a message is required.)You can format the text in a message with bold, underline, and italics, and include a link or an image. To see text formatting tips, click the information

(i) icon above the **Save** button.




6. Select **Save**.

## Remove a data quality warning

When a warning no longer applies, you can remove it by navigating to the data asset with the warning.

Note: Starting with Tableau Cloud February 2024 and Tableau Server 2024.2, you add and remove quality warnings using the consolidated Data Labels dialog instead of separate dialogs for each type of label. For information on the Data Labels dialog, see The Data Labels dialog.

1. Select the actions menu (. . .) next to the asset, and then select **Quality Warning**. (For columns in Tableau Server 2022.3 and earlier, instead select the column, and then click the actions dropdown and select **Quality Warning**.)

2. Uncheck the boxes beside quality warnings you want to remove from the asset. (In Tableau Server 2023.3 and earlier, use the **Show warning** switch or **Enable warning** checkbox to turn off a quality warning for that asset.)
3. Turn off the warning.
4. Select **Save**.

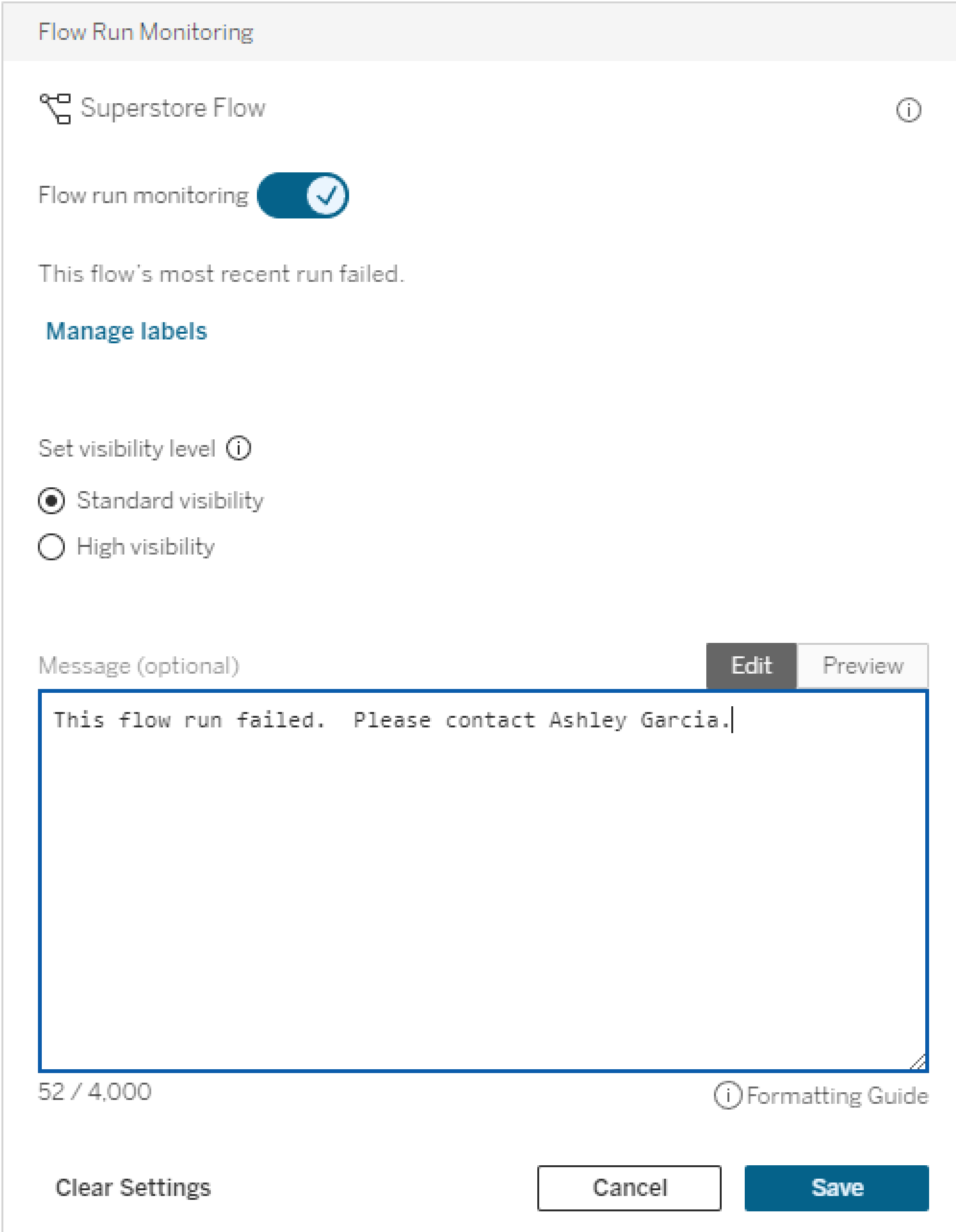
## How to turn on a monitoring quality warning

You can set Tableau to monitor for two events: extract data source refresh failure and flow run failure. When the event occurs, Tableau generates a quality warning that appears in the same places that a manual quality warning appears.

You can turn on monitoring explicitly on the extract or flow, or, starting with Tableau Cloud October 2023 and Tableau Server 2023.3, you can enable site-wide monitoring for all extract refresh and flow run failures. For information on site-wide monitoring, see Site-wide monitoring for extract refresh and flow run failures.

To explicitly monitor for either an extract refresh or flow run failure:

1. Select the actions menu (. . .) next to the extract data source or flow you want to create a warning for, and then select the appropriate option:
   - In Tableau Cloud and Tableau Server 2023.3 and later:
     - **Data Labels** > **Extract Refresh Monitoring**
     - **Data labels** > **Flow Run Monitoring**
   - In Tableau Server 2023.1 and earlier:
     - **Quality Warning** > **Extract Refresh Monitoring**
     - **Quality Warning** > **Flow Run Monitoring**
2. Enable the warning.
3. Set the visibility level. (Older versions of the dialogs have a checkbox for high visibility.)
4. If desired, enter a message for users to see in the warning details if the extract refresh or flow run fails. You can format the text in a message with bold, underline, and italics, and include a link or an image. To see text formatting tips, click the information (i) icon above the **Save** button.
5. Click **Save**.




## How to turn off a monitoring quality warning

To turn off monitoring for either an extract refresh or flow run failure:

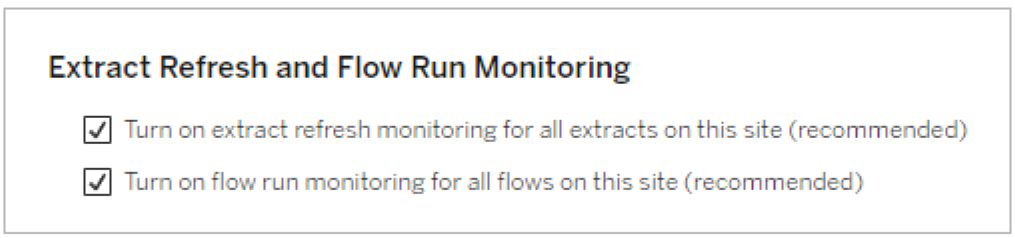
1. Select the actions menu (. . .) next to the extract data source or flow you want to create a warning for, and then select the appropriate option:

- In Tableau Cloud and Tableau Server 2023.3 and later:
  - **Data Labels** > **Extract Refresh Monitoring**
  - **Data labels** > **Flow Run Monitoring**
- In Tableau Server 2023.1 and earlier:
  - **Quality Warning** > **Extract Refresh Monitoring**
  - **Quality Warning** > **Flow Run Monitoring**

2. Turn off the warning.
3. Click **Save**.

## Site-wide monitoring for extract refresh and flow run failures

Starting with Tableau Cloud October 2023 and Tableau Server 2023.3, an administrator can turn on site-wide monitoring to add or remove data quality warnings for extract refresh failures and flow run failures. You can control this feature through the Settings page, under the Extract Refresh and Flow Run Monitoring section:




These settings are turned on by default for all new sites. Sites that existed before the change will have the settings turned off, but an administrator can turn them on.

**Note**: Data quality warning notifications aren't displayed for extract refreshes that use Tableau Bridge.

### Interaction of site-wide monitoring and explicit monitoring

The interaction of explicit monitoring on assets and site-wide monitoring of all assets is as follows:

- If monitoring is explicitly turned on for an asset *and* site-wide monitoring is turned on, explicit settings on the asset take precedence over the site-wide settings. Settings include properties like visibility level and message.

- When you turn off site-wide monitoring:
  - Assets *with* monitoring explicitly turned on aren't changed.
  - Assets *without* monitoring explicitly turned on stop monitoring for extract refresh or flow run failures, and warnings that previously arose from extract refresh or flow run failures on those assets are removed.
  - Catalog ingestion performance might be temporarily reduced as Catalog re-ingests assets that may no longer have warning labels.

Site-wide monitoring was released in Tableau Cloud October 2023 and Tableau Server 2023.3. There's no interaction of explicit monitoring and site-wide monitoring in earlier versions.

### Who can set quality warnings

To set a data quality warning, you must either

- be a server or site administrator, or
- have the **Overwrite** capability for the asset.

### Customize data quality warnings

Starting with Tableau Cloud June 2023 and Tableau Server 2023.3, using the label manager on the Data Labels page or the REST API, an administrator can change the data quality warnings that users see in the data quality warning dialog, or create new ones. For more information, see Manage Data Labels.

## Sensitivity Labels

Some data needs to be handled more carefully. To ensure trust and security, it's important that users know which data that is. Starting in Tableau Cloud June 2023 and Tableau Server 2023.3, if you have a Data Management license, Tableau offers a new category of data label: *Sensitivity labels*. Users can use sensitivity labels to indicate the level of care that should be taken when creating views or sharing information. Furthermore, sensitivity labels can co-exist on the same asset as other labels, such as certification and data quality warnings. And, using the label manager on the **Data Labels** page or the REST API, an administrator can create sensitivity labels to suit the needs of their organization.

Note: In Tableau Cloud March 2023 and Tableau Server 2023.1 and earlier, data sensitivity was expressed using the "sensitive data" data quality warning. With the upgrade to Tableau Cloud June 2023 and Tableau Server 2023.3, "sensitive data" data quality warnings were migrated to sensitivity labels.

Sensitivity labels can be attached to the same types of assets that other data labels can.

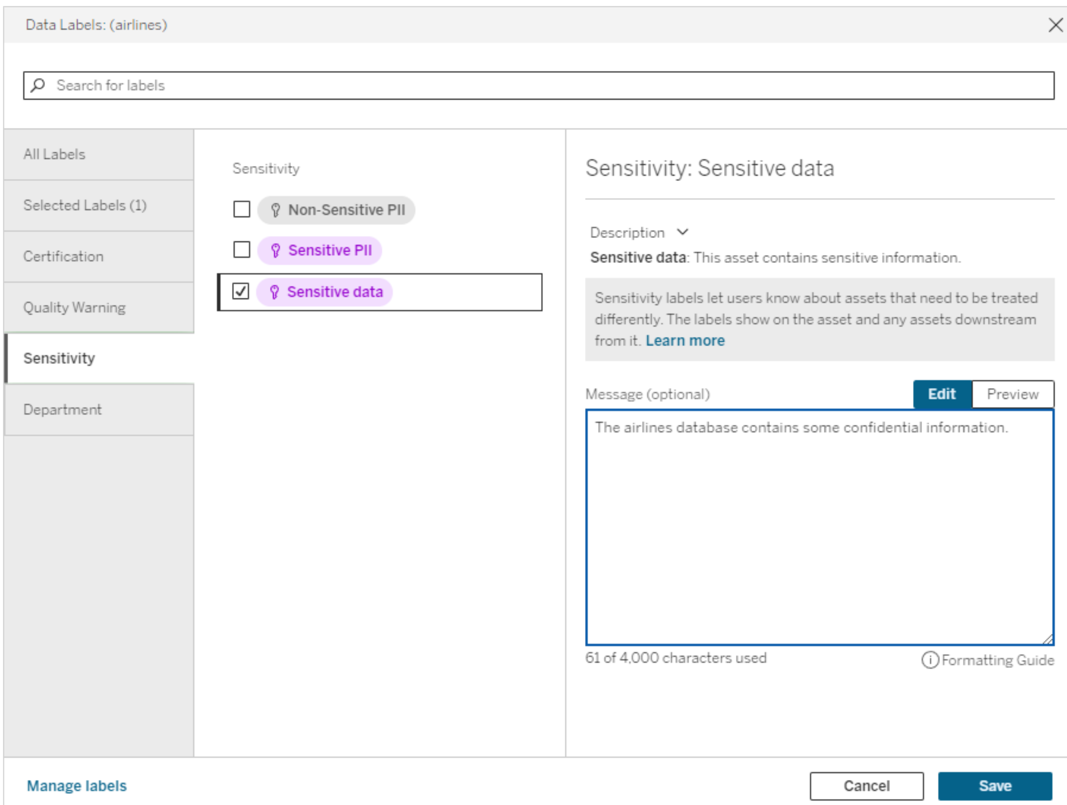
## Attach a sensitivity label to an asset

To attach a sensitivity label to an asset:

Note: Starting with Tableau Cloud February 2024 and Tableau Server 2024.2, you add and remove sensitivity labels using the consolidated Data Labels dialog instead of separate dialogs for each type of label. For information on the Data Labels dialog, see The Data Labels dialog.

1. Search for or navigate to the asset. The steps to navigate depend on the type of asset you want to add the sensitivity label to:
   - Data source or virtual connection - on the **Explore** page, select **All Data Sources** or **All Virtual Connections**.
   - Virtual connection table - on the **Explore** page, select **All Virtual Connections**, and select the virtual connection that contains the virtual connection table you want to certify. Then select the virtual connection table.
   - Database or table - on the **Explore** page, navigate to the database or table. Or on the **External Assets** page, select **Databases and Files** or **Tables and Objects**.
   - Column - on the **Explore** page, navigate to the table. Or on the **External Assets** page, select **Tables and Objects** and navigate to the table. Then find the column in the list.

2. Select the actions menu (. . .) next to the asset, and then select **Data Labels** > **Sensitivity Label**.
3. Select the checkbox beside sensitivity labels you want attached to the asset. Optionally, if you know the name of a sensitivity label, you can search for it at the top of the dialog, and then select the checkbox beside it. (In Tableau Server 2023.3 and earlier, you can only attach one sensitivity label to each asset. Use the **Show label** switch to turn on a sensitivity label for that asset, then select the desired sensitivity label from the dropdown list.)
4. If desired, enter a message to display to users. You can format the text in a message with bold, underline, and italics, and include a link or an image. To see text formatting tips, hover over the information (i) icon above the **Save** button.
5. Select **Save**.




## Remove a sensitivity label from an asset

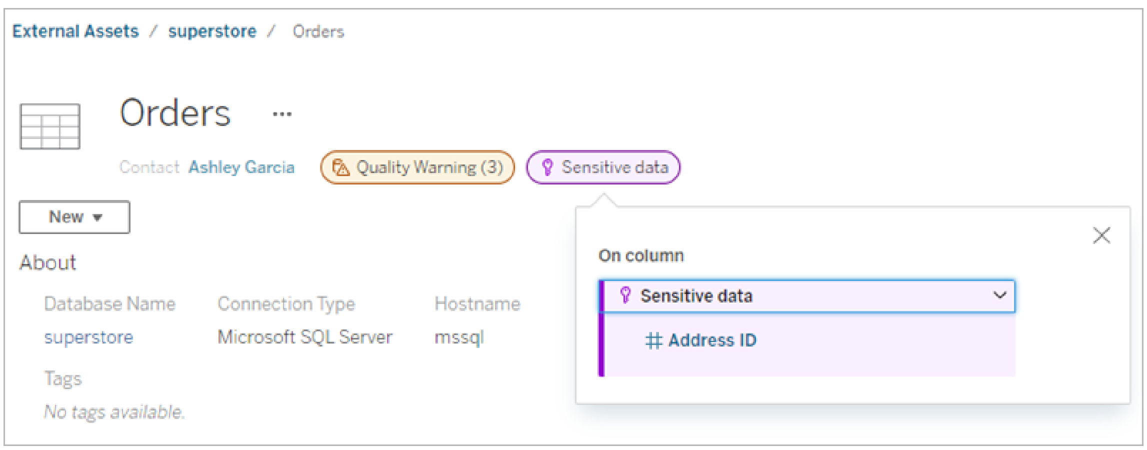
To remove a sensitivity label from an asset:

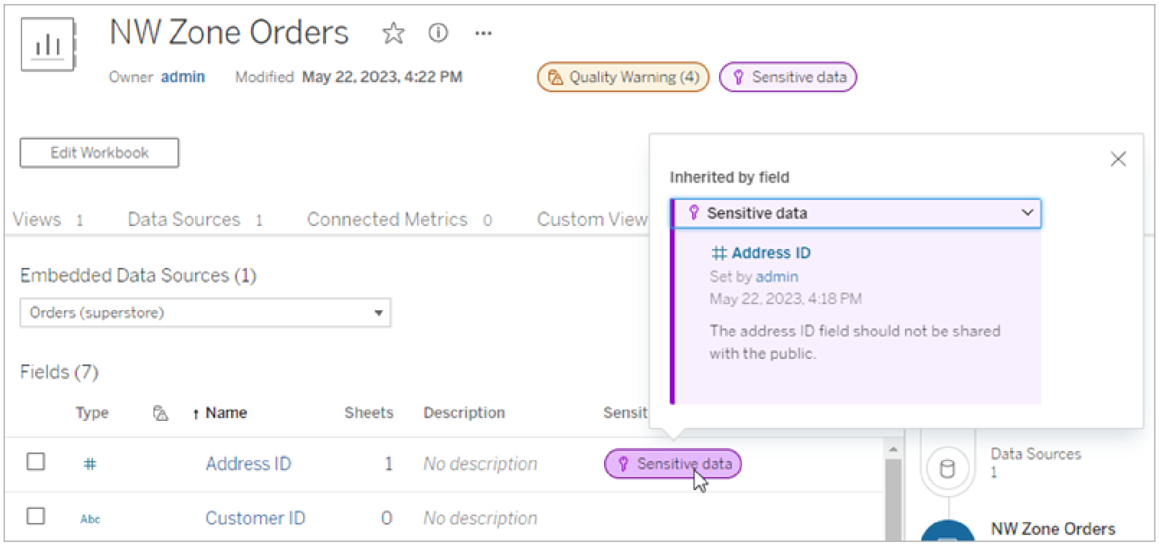
Note: Starting with Tableau Cloud February 2024 and Tableau Server 2024.2, you add and remove sensitivity labels using the consolidated Data Labels dialog instead of separate dialogs for each type of label. For information on the Data Labels dialog, see The Data Labels dialog

1. Select the actions menu (. . .) next to the asset, and then select **Data Labels** > **Sensitivity Label**.
2. Uncheck the boxes beside sensitivity labels you want to remove from the asset. (In Tableau Server 2023.3 and earlier, turn off the label with the **Show label** switch.)
3. Select **Save**.

## Where sensitivity labels appear

Sensitivity labels appear on assets when navigating Tableau Cloud. Like data quality warnings, sensitivity labels appear downstream from the assets on which they're attached. For example, a sensitivity label on a column appears in the columns row of the table page, again at the top of the table page, and on the database page.





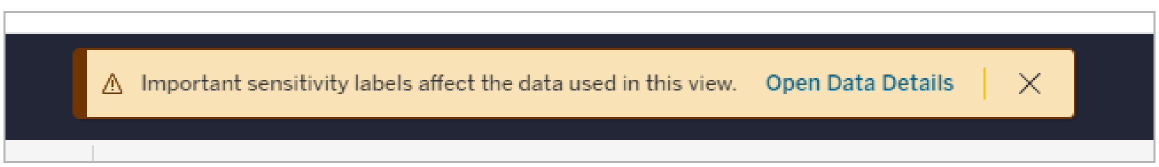

In web authoring, users see an icon next to the data source in the **Data** pane when

- there's a sensitivity label on a data source used in the workbook, or
- there's a warning upstream from the data source used in the workbook

To see the details, hover over the icon with the cursor. Or, in Tableau Cloud web authoring, you can select a data source or a column and then select **Catalog Details** to see all its labels.

Visibility

High visibility sensitivity labels appear more urgent and appear in more places. For example, a high visibility sensitivity label on a table generates a notification when anyone authors a view or opens a published view that depends on it.




The icon and badge for high visibility sensitivity labels is purple, while standard visibility ones are gray. By default, the built-in sensitivity label called "Sensitive data" is high visibility.

If more than one sensitivity label applies to an asset (because the asset has more than one sensitivity label or is inheriting upstream ones), the badge includes a number, and the color is determined by the highest visibility label. For example, if two sensitivity labels apply to an asset, one of which is standard visibility and one of which is high visibility, the badge is purple.


Sensitivity labels in email subscriptions

Administrators can turn on sensitivity labels in email subscriptions so that when users subscribe to a view, the email they get includes high visibility sensitivity labels associated with that view. Emails with high visibility sensitivity labels contain:

- Links to relevant views or workbooks with their **Data Details** pane open.
- Links to relevant upstream assets, such as data sources, tables, or databases.

Administrators can turn on sensitivity labels in email subscriptions by selecting the **High-Visibility Data Labels in View and Workbook Subscriptions** option (previously the **Data Quality Warnings in Subscriptions** option) on the Tableau Server or Tableau Cloud site settings page. For more information, see High-Visibility Data Labels in View and Workbook Subscriptions in the Site Settings Reference.

## Who can set sensitivity labels

To set a sensitivity label, you must either

- be a server or site administrator, or
- have the **Overwrite** capability for the asset.

## Customize sensitivity labels

There's only one built-in sensitivity label: *Sensitive data*. Starting with Tableau Cloud June 2023 and Tableau Server 2023, using the labels manager on the **Data Labels** page or the REST API, an administrator can create sensitivity labels or change the name and description of an existing ones. Typical additions (name and description) might be:

- **Public**: Available to the public to view.
- **Internal**: Restricted to company employees and contractors. This data must not be shared publicly, but it can be shared with customers, partners, and others under a non-disclosure agreement (NDA).
- **Confidential**: Available to an approved group of employees and contractors. This data isn't restricted by law, regulation, or a company master service agreement (MSA). It can be shared with customers, partners, and others under an NDA.
- **Restricted**: Available only to an approved group of employees and contractors. This data is likely restricted by law, regulation, an NDA, or a company MSA.
- **MissionCritical**: Available only to a small group of approved employees and contractors. Third parties who are given access could be subject to heightened contractual requirements. This data is almost always restricted by law, regulation, an NDA, or a company MSA.

For more information, see Manage Data Labels.

## Labels with Custom Categories

Tableau offers several data labels – certification, quality warnings, and sensitivity labels – that cover a wide variety of ways to classify data. Still, there may be times that users need other labels and categories that match other use cases. Starting in Tableau Cloud October 2023 and Tableau Server 2023.3, users can classify assets using labels with custom categories that an administrator has defined. For example, an administrator could create a category called "Department" with labels for the sales, service, and operations departments ready to be applied to assets.

Labels with custom categories require a Data Management license with Tableau Catalog enabled, and can be attached to the same kinds of assets that other data labels can. However, labels with custom categories don't show on downstream assets the way that data quality warnings and sensitivity labels do.

> Note: If you're an administrator who wants to create custom categories and labels, see Manage Data Labels.

## Attach labels with custom categories to an asset

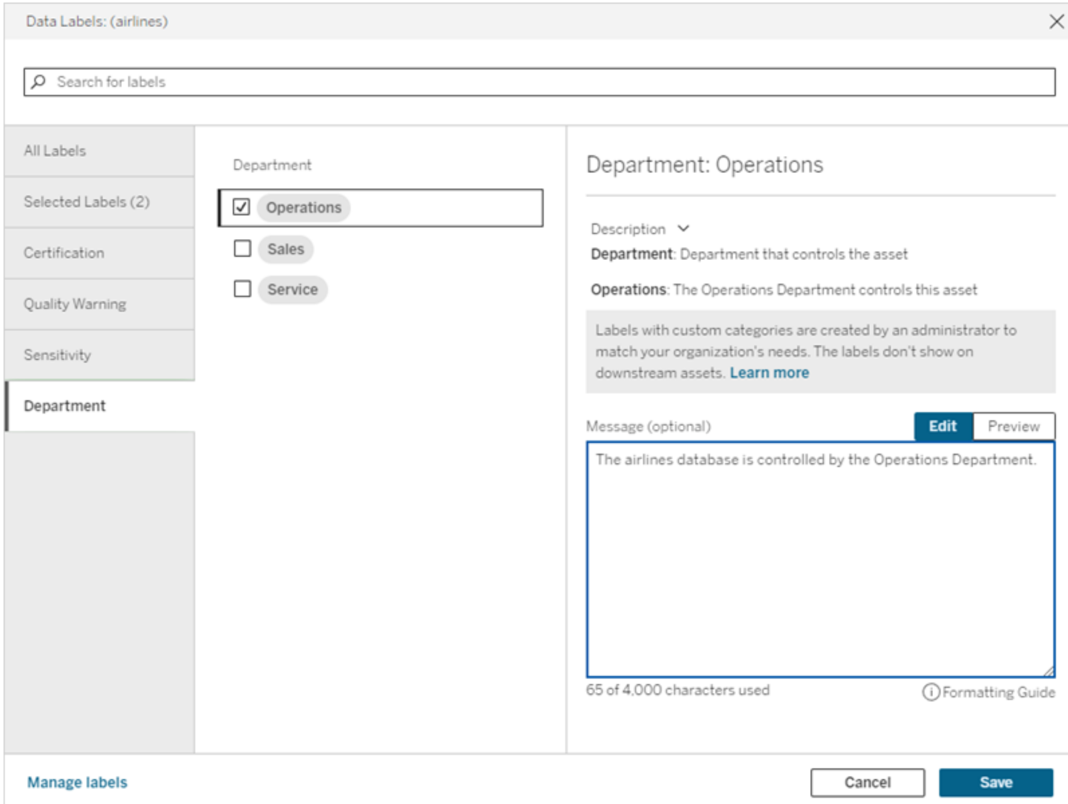
Note: Starting in Tableau Cloud February 2024 and Tableau Server 2024.2, you add and remove labels with custom categories using the consolidated Data Labels dialog instead of separate dialogs for each type of label. For information on the Data Labels dialog, see The Data Labels dialog.

To attach a label with a custom category to an asset:

In Tableau Cloud and Tableau Server 2024.2 and later

1. Search for or navigate to the asset. The steps to navigate depend on the type of asset you want to add the label to:
   - Data source or virtual connection - on the **Explore** page, select **All Data Sources** or **All Virtual Connections**.
   - Virtual connection table - on the **Explore** page, select **All Virtual Connections**, and select the virtual connection that contains the virtual connection table you want to certify. Then select the virtual connection table.
   - Database or table - on the **Explore** page, navigate to the database or table. Or on the **External Assets** page, select **Databases and Files** or **Tables and Objects**.
   - Column - on the **Explore** page, navigate to the table. Or on the **External Assets** page, select **Tables and Objects** and navigate to the table. Then find the column in the list.
2. Select the actions menu (...) next to the asset, and then select **Data Labels** > **All Data Labels**.
3. Select the vertical tab on the left side of the dialog that corresponds to the custom label category. Optionally, if you know the name of a label, you can search for it at the top of the dialog.
4. Select the checkbox beside labels you want attached to the asset.
5. If desired, enter a message to display to users. You can format the text in a message with bold, underline, and italics, and include a link or an image. To see text formatting tips, hover over the information (i) icon above the **Save** button.
6. Repeat steps 3 through 5 for each label you want to add.

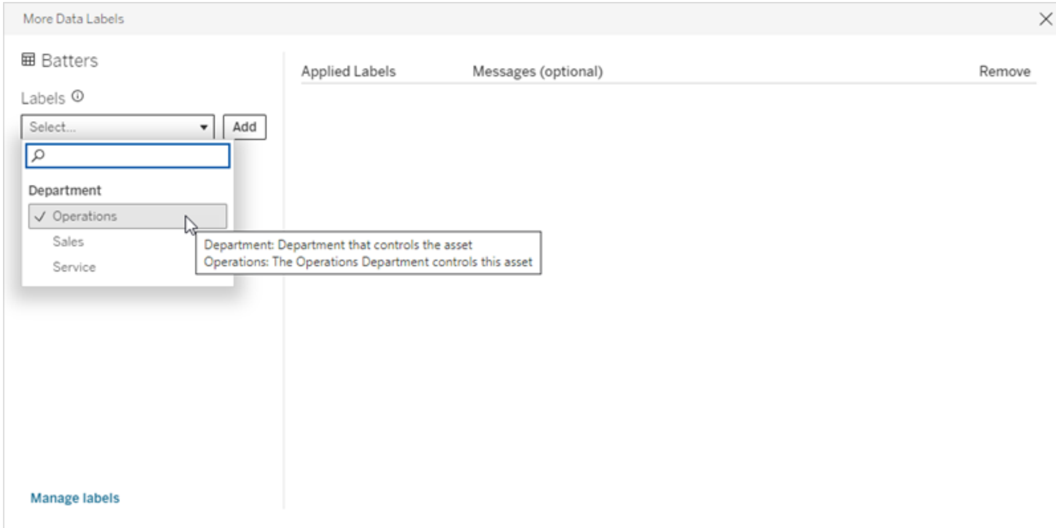
7. Select **Save**.



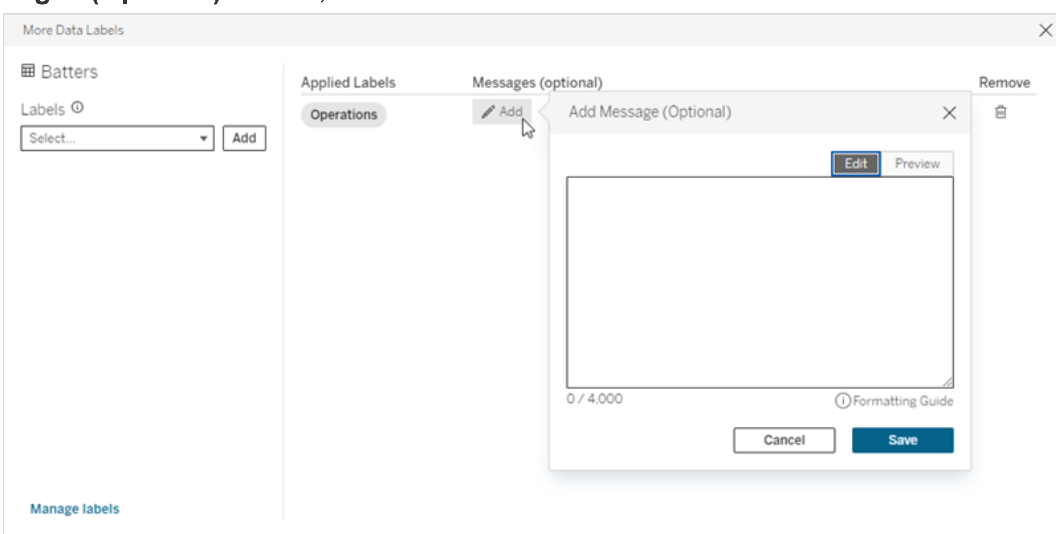

In Tableau Server 2023.3

1. Select the actions menu (...) next to the asset, and then select **Data Labels** > **More Data Labels**.

2. Select the **Labels** dropdown. The label names are arranged by label category, and you can scroll through them.




3. Select the label to attach, then select **Add** next to the **Labels** dropdown. The label appears in the **Applied Labels** list on the right side of the dialog.
4. To add an optional label message on this specific asset, select the pencil in the **Messages (Optional)** column, then select **Save**.




5. Repeat steps 2 through 5 for each label you want to add.
6. When you're finished adding labels, close the dialog. (Select the X in the dialog box's upper right corner or select something outside of the dialog box to close it.)

## Remove labels with custom categories from an asset

Note: Starting in Tableau Cloud February 2024 and Tableau Server 2024.2, you add and remove labels with custom categories using the consolidated Data Labels dialog instead of separate dialogs for each type of label. For information on the Data Labels dialog, see The Data Labels dialog.

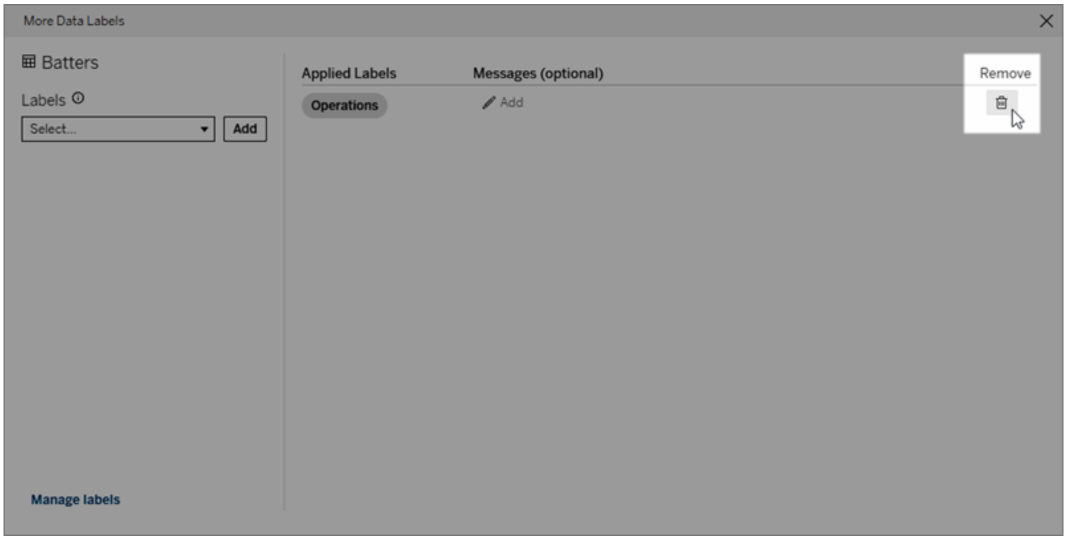
To remove a label with a custom category from an asset:

In Tableau Cloud and Tableau Server 2024.2 and later.

1. Search for or navigate to the asset. The steps to navigate depend on the type of asset you want to add the label to:
   - Data source or virtual connection - on the **Explore** page, select **All Data Sources** or **All Virtual Connections**.
   - Virtual connection table - on the **Explore** page, select **All Virtual Connections**, and select the virtual connection that contains the virtual connection table you want to certify. Then select the virtual connection table.
   - Database or table - on the **Explore** page, navigate to the database or table. Or on the **External Assets** page, select **Databases and Files** or **Tables and Objects**.
   - Column - on the **Explore** page, navigate to the table. Or on the **External Assets** page, select **Tables and Objects** and navigate to the table. Then find the column in the list.
2. Select the actions menu (...) next to the asset, and then select **Data Labels** > **All Data Labels**.
3. Select the vertical tab on the left side of the dialog that corresponds to the custom label category. Optionally, use the **Selected Labels** vertical tab to see all the labels attached to the asset. Or, if you know the name of a label, you can search for it at the top of the dialog.
4. Deselect the checkbox beside labels you want removed from the asset.
5. Repeat steps 3 and 4 for each label you want to remove.
6. Select **Save**.

In Tableau Server 2023.3

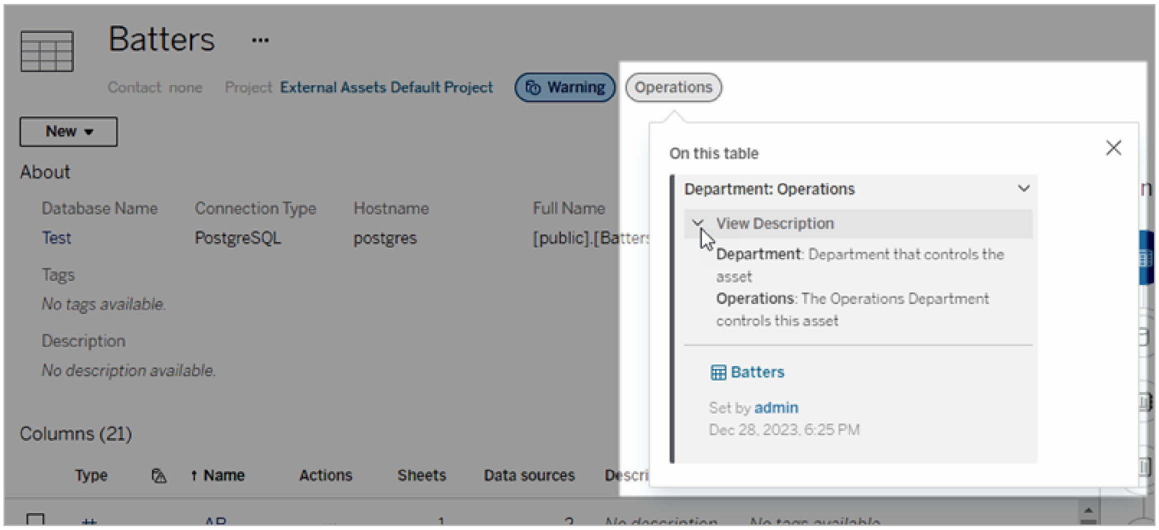
1. Select the actions menu (...) next to the asset, and then select **Data Labels** > **More Data Labels**.
2. In the **Applied Labels** section of the dialog, select the trash icon in the row for the label to remove.




3. Repeat step 2 for each label you want to remove.
4. When you're finished removing labels, close the dialog. (Select the X in the dialog box's upper right corner or select something outside of the dialog box to close it.)

## Where labels with custom categories appear

Custom labels appear on assets when navigating Tableau Cloud and Tableau Server.




In web authoring, you can select a data source or a column and then select **Catalog Details** to see all its labels.

Unlike quality warnings and sensitivity labels, labels with custom categories don't appear downstream from assets they're attached to. For example, suppose your organization has a custom label category named "Department" to which a custom label named "Sales" belongs. If you attach the "Sales" label to a table called "Orders", the label only appears on the "Orders" table and not on workbooks downstream from it.

## Who can add custom category labels

To add a label with a custom category to an asset (or to remove one from an asset), you must either

- be a server or site administrator, or
- have the Overwrite capability for the asset.

## Customize a label with a custom category

For information on how administrators can create or edit custom categories and labels that appear in the **More Data Labels** dialog, see Manage Data Labels.

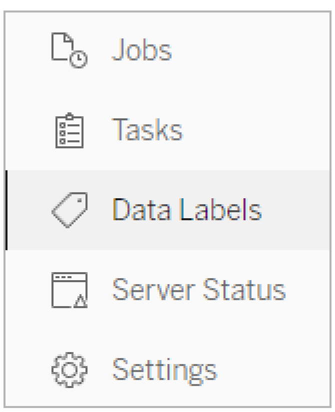
# Manage Data Labels

Starting in Tableau Cloud October 2023 and Tableau Server 2023.3, if you have a Data Management license and are an administrator, you can use the label manager to create or edit label names and label categories. These customizations affect the way that labels appear throughout Tableau when users interact with labels.

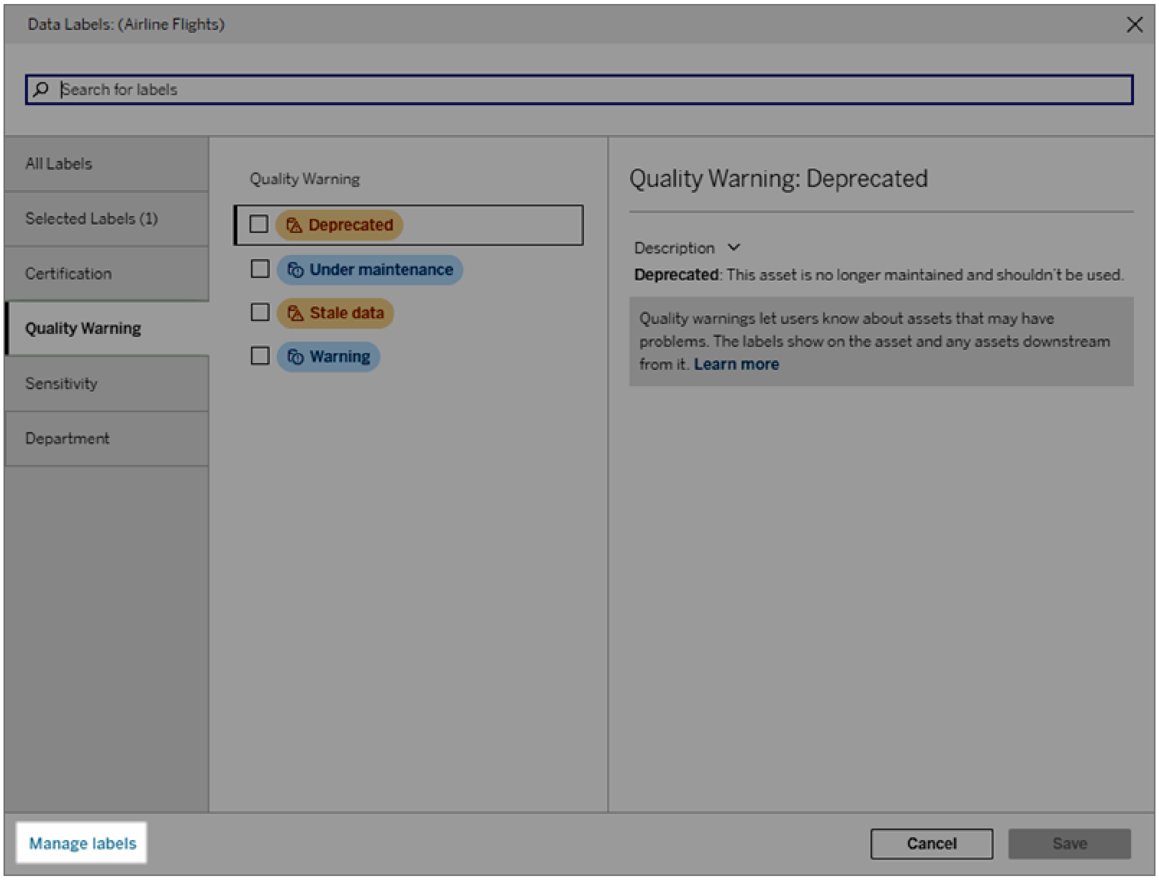
> Note: You can also use the REST API's labelValues methods and labelCategories methods to create and edit labels and label categories. (Tableau Cloud administrators have been able to create and modify label names and descriptions using the labelValues methods since Tableau Cloud June 2023.) For more information, see the Metadata Methods in the REST API Reference.

## Label Manager

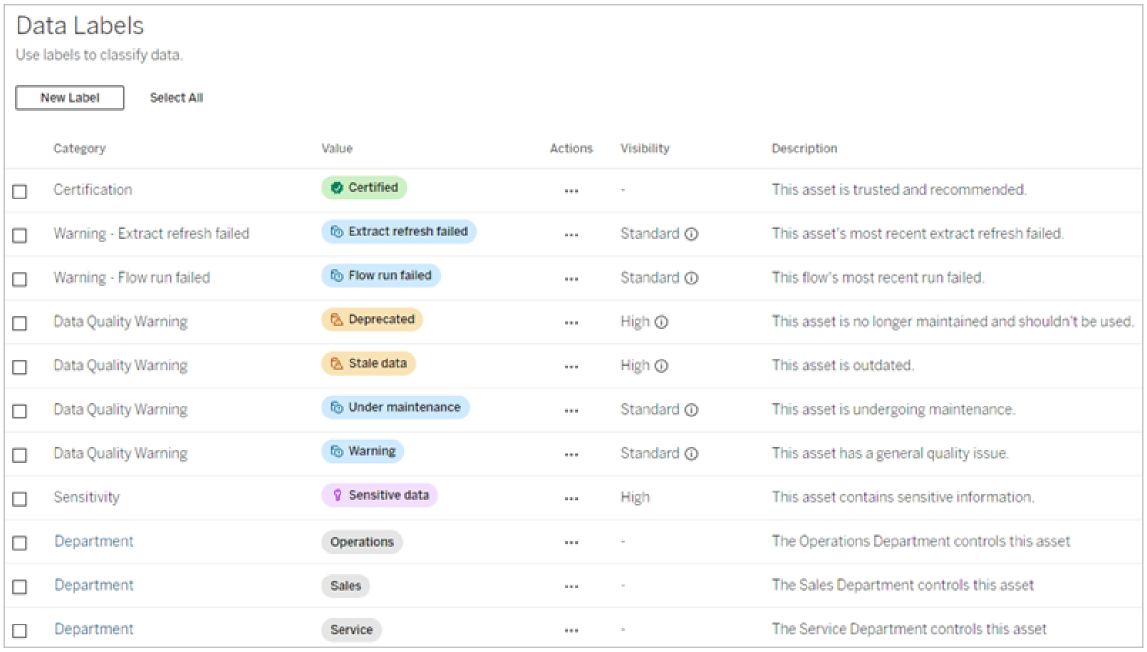
To use the label manager, log in as an administrator and select **Data Labels** from the left navigation pane.




Alternatively, if you're logged in as an administrator and you open the **Data Labels** dialog to label an asset, a **Manage labels** link shows in the lower-left corner. The **Manage labels** link leads to the **Data Labels** page. (In Tableau Server 2023.3 and earlier, the **Manage labels** link shows in the label selection dropdowns of the individual certification, data quality warning, sensitivity label, and custom label dialogs instead.)




The label manager page shows a row for each label, sorted by label category. Each row includes the label category, name (here known as the value), an **Actions** menu (...) to perform actions on that label, visibility, and description.



Data Labels

Use labels to classify data.

New Label Select All

| | Category | Value | Actions | Visibility | Description |
|---|---|---|---|---|---|
| ☐ | Certification | Certified | ... | - | This asset is trusted and recommended. |
| ☐ | Warning - Extract refresh failed | Extract refresh failed | ... | Standard | This asset's most recent extract refresh failed. |
| ☐ | Warning - Flow run failed | Flow run failed | ... | Standard | This flow's most recent run failed. |
| ☐ | Data Quality Warning | Deprecated | ... | High | This asset is no longer maintained and shouldn't be used. |
| ☐ | Data Quality Warning | Stale data | ... | High | This asset is outdated. |
| ☐ | Data Quality Warning | Under maintenance | ... | Standard | This asset is undergoing maintenance. |
| ☐ | Data Quality Warning | Warning | ... | Standard | This asset has a general quality issue. |
| ☐ | Sensitivity | Sensitive data | ... | High | This asset contains sensitive information. |
| ☐ | Department | Operations | ... | - | The Operations Department controls this asset |
| ☐ | Department | Sales | ... | - | The Sales Department controls this asset |
| ☐ | Department | Service | ... | - | The Service Department controls this asset |

Use the label manager to:

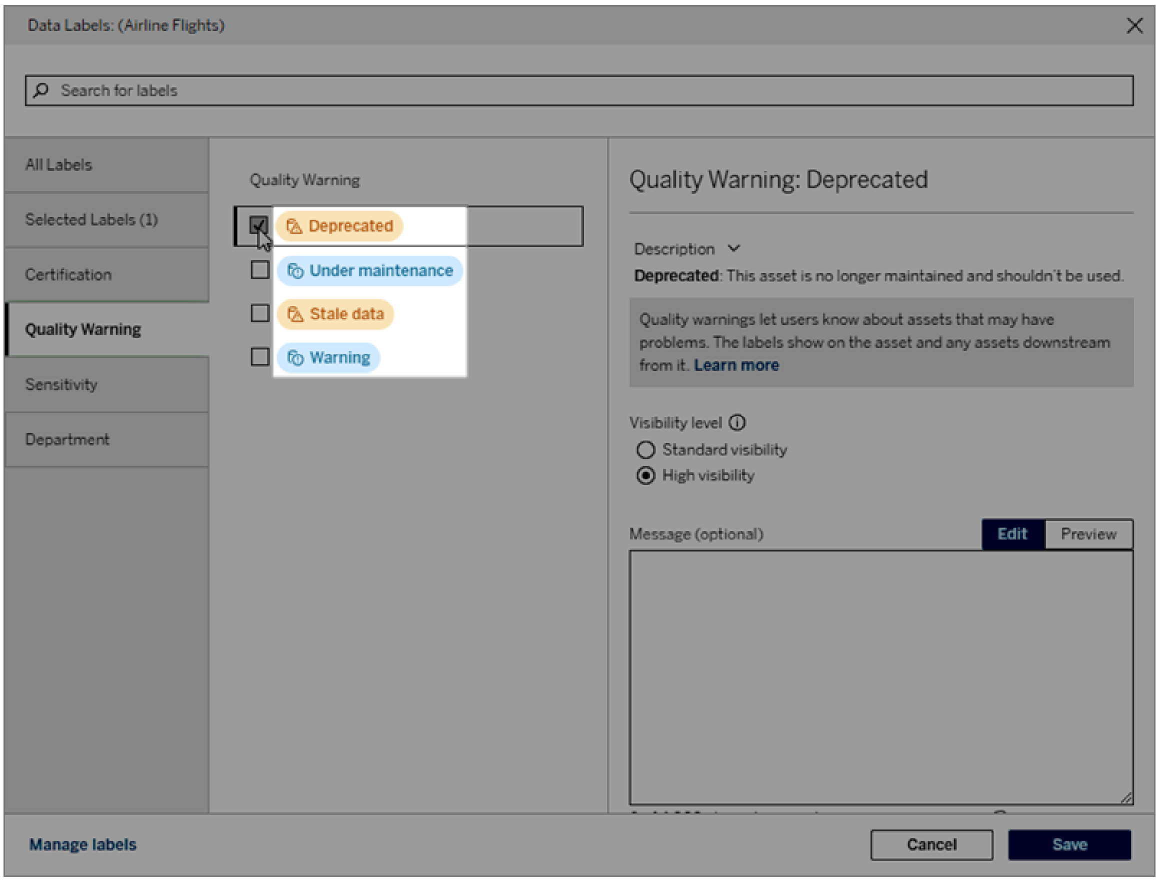
- **Edit built-in labels**
  - Example: You change the name of the built-in "Under maintenance" quality warning to "Maintenance mode".
  - Example: You change the visibility of extract refresh monitoring labels from standard visibility to high visibility so that they show in views.
- **Create new labels for the existing, built-in categories**
  - Example: You add a new sensitivity label called "Confidential".
- **Revert a built-in label to its default name, description, and visibility**
  - Example: You previously changed the "Stale data" quality warning name to "Outdated", and you want to revert it to its default name.
- **Create custom categories**
  - Example: You create a new label category called "Department" with the intention of adding labels for different business units.
- **Create new labels in custom categories**
  - Example: You create new "Sales", "Service", and "Operations" labels for your newly created "Department" category.

## Properties of Data Labels

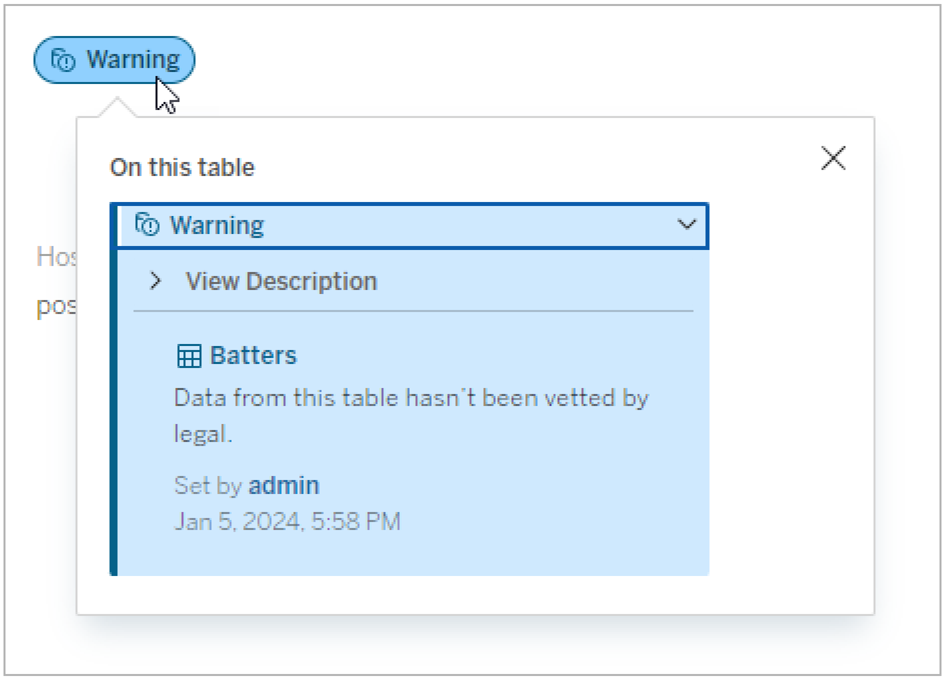
A label has a name, a category, and a description. Labels with a Quality Warning or Sensitivity category also have a visibility level.

Name

The label name is the common name for the label as it appears in various places. For example, here the label name "Deprecated" is selected in the **Quality Warning** tab of the **Data Labels** dialog.




Here the label name "Warning" shows at the top of the "Batters" table page, and again in the label details.

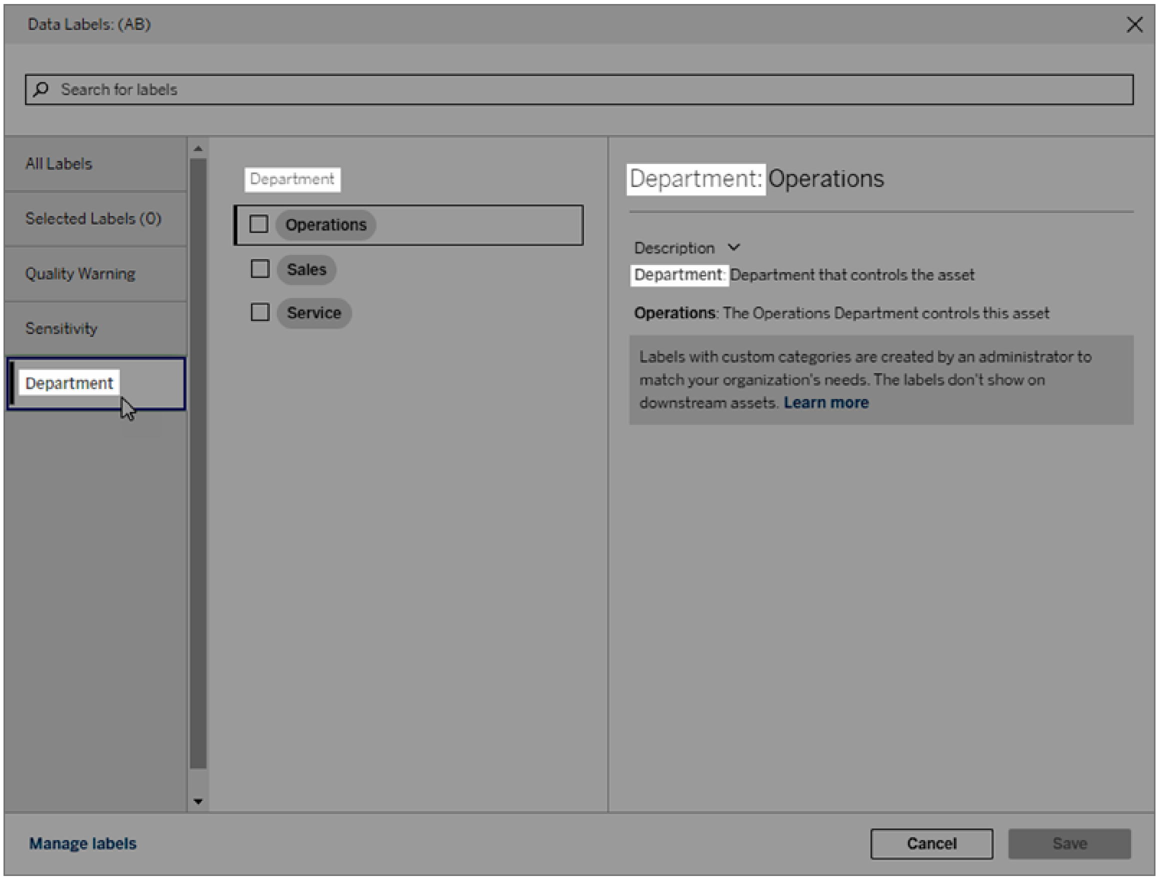



Category

The label category affects where and how the label appears, whether it appears on assets that are downstream from the one it's attached to, and which parts are customizable, among other things. For example, quality warnings and sensitivity labels appear on downstream assets, but other labels with other categories don't. Another example: You can change the description of a certification label, but not the name.

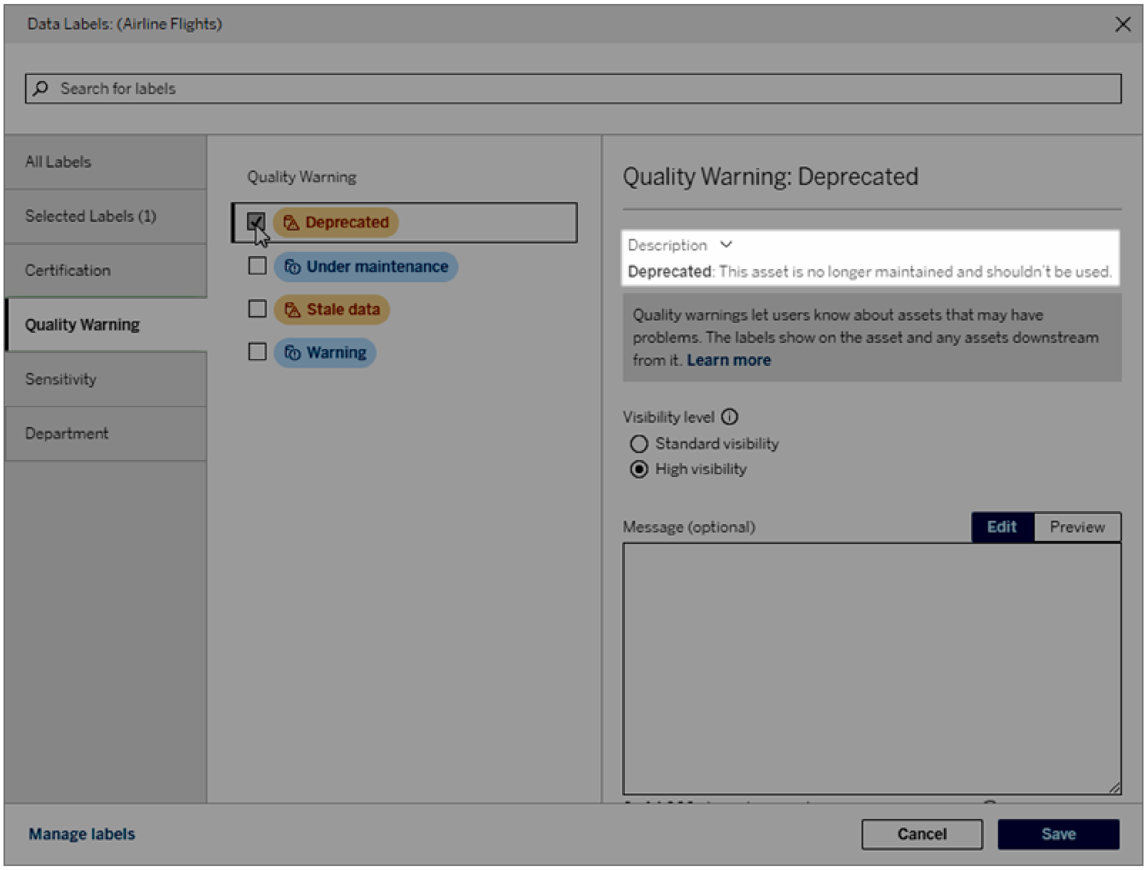
The built-in categories are **certification**, **quality warning**, and **sensitivity**.

For custom categories, users see the category name in the vertical category tabs of the **Data Labels** dialog, among other places. For example, here the category name "Department" appears in the vertical category tabs, the top of the label name list, and other places.




Description

The label description appears in various places, including in the **Data Labels** dialog, and helps the user understand what the label is used for. For example, the label description for this quality warning says "This asset is no longer maintained and shouldn't be used."




Visibility

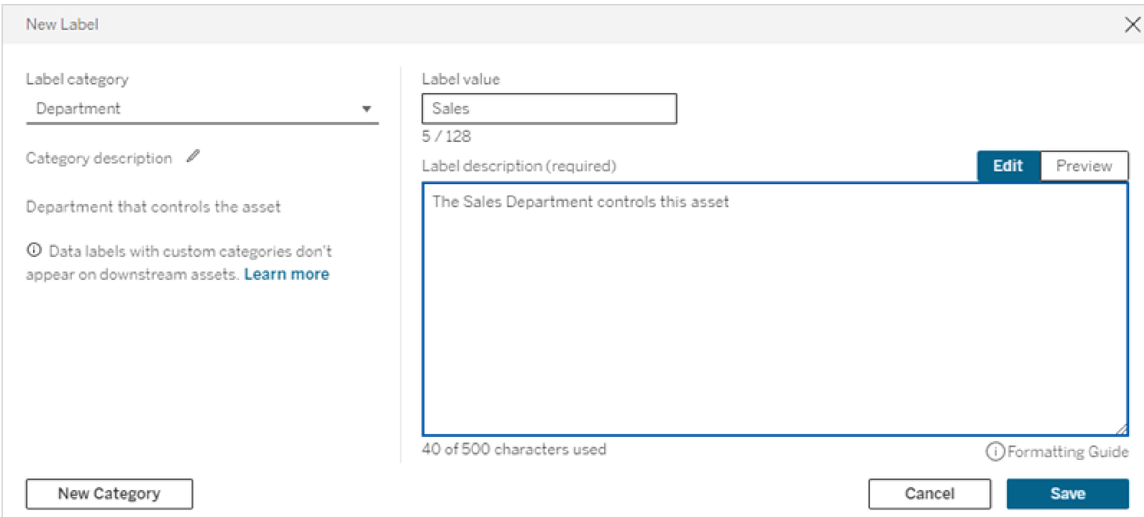
The visibility of a label determines its appearance. High-visibility labels appear in more places and may appear more urgent to the user. You can only set the visibility level on Quality Warning or Sensitivity labels. Furthermore, if a label has a category of Quality Warning, users with permissions can override the default visibility on each asset that they attach a Quality Warning label to. For more information, see the Set a Data Quality Warning and Sensitivity Labels topics.

## Create a data label

To create a label:

1. From the **Data Labels** page, select **New Label**.
2. Select a category from the **Label** category dropdown.
3. Enter the label name in the **Label value** field.

4. Enter the label description in the **Label description** field. You can format the text with bold, underline, and italics, and include a link or an image. To see text formatting tips, hover over the information (i) icon above the **Save** button.
5. If the label has a category of Quality Warning or Sensitivity, set the visibility level. For more information, see Visibility.
6. Select **Save**.




Limitations for creating labels

- You can't create a label in the certification category. The certification category allows only the single, built-in label.
- You can't create new monitoring warnings. However, the extract refresh failure warning and flow run failure warning can be edited in limited ways, as described in the "Edit a label" section.
- The maximum length for a label name is 128 characters in Tableau Cloud and Tableau Server 2024.2 and later. The maximum length for a label name is 24 characters in Tableau Server 2023.3 and earlier.
- The maximum length for a label description is 500 characters.

## Edit a data label

To edit an existing label:

1. From the **Data Labels** page, select the **Actions** (...) menu in the label's row. Or select the row using its checkbox on the left and click the **Actions** dropdown at the top of the

label list.

2. Select **Edit**.
3. (Optional) Change the label name using the **Label value** field.
4. (Optional) Change the label description using the **Label description** field.
5. (Optional) If the label has a category of Quality Warning or Sensitivity, set the visibility level. For more information, see Visibility.
6. Select **Save**.

Limitations for editing labels

- You can't change the category on an existing label.
- The maximum length for a label name is 128 characters in Tableau Cloud and Tableau Server 2024.2 and later. The maximum length for a label name is 24 characters in Tableau Server 2023.3 and earlier.
- The maximum length for a label description is 500 characters.

The different label categories allow different degrees of label editing. The following table lists the editable properties of labels with the given categories:

| Label category | Can edit label category | Can edit label names | Can edit label descriptions | Can edit label visibility |
|---|---|---|---|---|
| Certification | No | No | Yes | N/A |
| Quality Warning | No | Yes[1] | Yes | Yes[2] |
| Sensitivity | No | Yes | Yes | Yes |
| Custom | No | Yes | Yes | N/A |

[1] *You can't edit the label name (label value) of the extract refresh or flow run monitoring warnings.*

[2] *The visibility level you set for quality warnings is the default visibility. Users with permission can override the default visibility when they attach a quality warning to an asset. For more information, see Visibility.*

## Delete a data label

To delete an existing label:

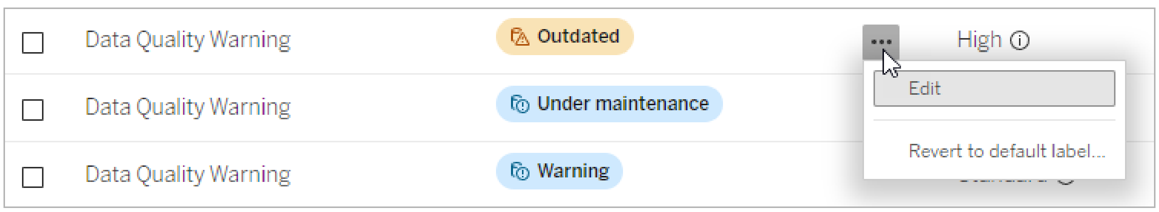
1. From the **Data Labels** page, select the **Actions** (...) menu in the label's row. Or select the row using its checkbox on the left and click the **Actions** dropdown at the top of the label list.
2. Select **Delete**.

Limitations for deleting labels

- You can't delete a built-in label. Built-in labels are the default labels in Tableau Cloud.

## Revert a built-in data label to its defaults

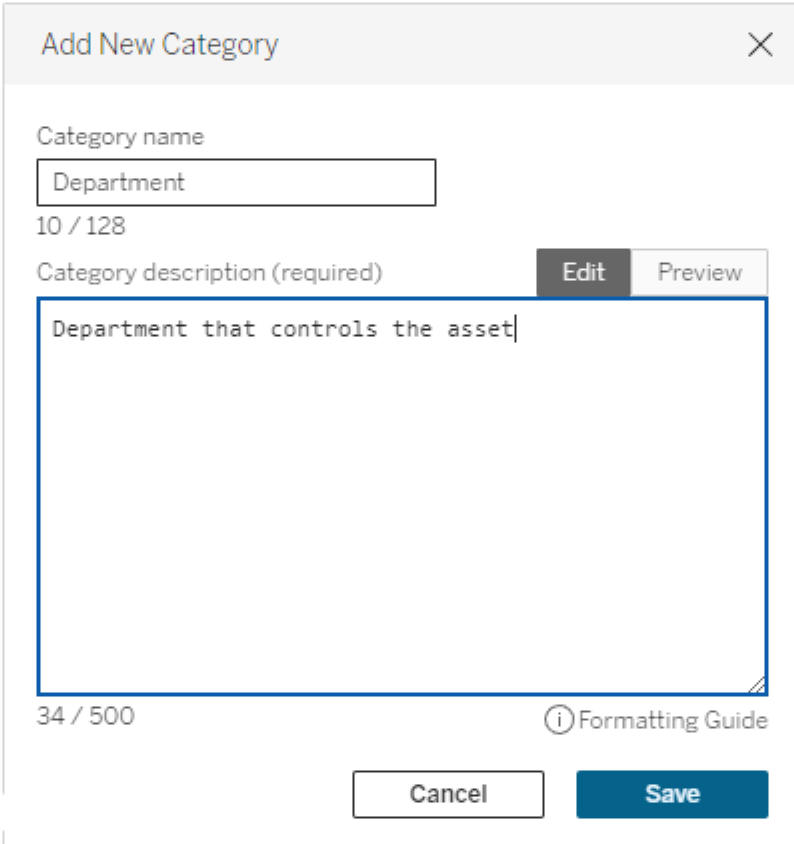
If an administrator previously edited a built-in label, the **Actions** menu for that label contains **Revert to default label**. Reverting a label to its defaults returns the label's name (value), description, and visibility to its built-in defaults.




## Create a data label category

To create a label category:

1. From the **Data Labels** page, select **New Label**.
2. In the **New Label** dialog, select **New Category**.
3. Enter the category name in the **Category name** field.
4. Enter the category description in the **Category description** field. You can format the text with bold, underline, and italics, and include a link or an image. To see text formatting tips, hover over the information (i) icon above the **Save** button.
5. Select **Save**.




Limitations for creating label categories

- The maximum length for a category name is 128 characters in Tableau Cloud and Tableau Server 2024.2 and later. The maximum length for a category name is 24 characters in Tableau Server 2023.3 and earlier.
- The maximum length for a category description is 500 characters.

## Edit a data label category

To edit a label category:

1. From the **Data Labels** page, select the label category, then select the pencil icon. Or from the **New Label** or **Edit Label** dialogs, select the category in the **Label category** dropdown and then select the pencil icon next to **Category description**.
2. (Optional) Change the category name using the **Category name** field.
3. (Optional) Change the category description using the **Category description** field.
4. Select **Save**.

Limitations for editing label categories

- You can't edit a built-in category.
- The maximum length for a category name is 128 characters in Tableau Cloud and Tableau Server 2024.2 and later. The maximum length for a category name is 24 characters in Tableau Server 2023.3 and earlier.
- The maximum length for a category description is 500 characters.

## Delete a data label category

Currently, there isn't a method to delete a label category through the regular Tableau Cloud interface. To delete a category using the REST API, see the Delete Label Category method in the REST API Reference.

## Scenarios for customization

Scenario: Customize a built-in data label

Suppose you decide that the data quality warning called "Warning" could be more specific. As an administrator, you change the label name from the default ("Warning") to something you think is more useful to your organization: "Not approved". The label name "Not approved" now appears in label dialogs when users are selecting labels.

Alternatively, you could change the label description so that the user learns more about the warning in the label dialog. For example: "This asset doesn't meet quality standards required by the marketing department."

Scenario: Create a custom data label

Suppose you want users to have more granular control over classifying the sensitivity of assets. You create two sensitivity labels with the names "Public" and "PII". The custom label names "Public" and "PII" now appear in the label dialog dropdowns and descriptions, alongside the built-in sensitivity label.

Scenario: Create a new data label category and associated data labels

Suppose you need a way to identify the business units that are responsible for assets. You create a label category called "Department". Then you create three labels – "Sales", "Service", and "Operations" – with "Department" as their category. The category "Department" and the three associated labels now appear in the **More Data Labels** dialog for users to attach to assets.

# Manage Dashboard and Viz Extensions in Tableau Cloud

Dashboard extensions are web applications that run in custom dashboard zones and can interact with the rest of the dashboard using the Tableau Extensions API. Dashboard extensions give users the ability to interact with data from other applications directly in Tableau. Like dashboard extensions, viz extensions are web applications that use the Tableau Extensions API and allow developers to create new viz types. Tableau users can access viz extensions through the worksheet Marks card.

> **Note:** You must be a site administrator to add dashboard and viz extensions to the safe list and to control the type of data the extensions can access. The site administrator can also configure whether users on the site see prompts when they add or view extensions. For information about extension security and recommended deployment options, see Extension Security - Best Practices for Deployment.

For information about using dashboard extensions in Tableau, see Use Dashboard Extensions.

For information about using viz extensions, see Add Viz Extensions to Your Worksheet.

> Looking for Tableau Server? See Manage Dashboard Extensions in Tableau Server.

## Before you run extensions on Tableau Cloud

Tableau supports two ways of hosting extensions:

- Network-enabled extensions, which are hosted on web servers located inside or outside of your local network. Network-enabled extensions have full access to the web.
- Sandboxed extensions, which run in a protected environment without access to any other resource or service on the web.

**Note:** Beginning in March 2021.1 Tableau supports integration with Einstein Discovery through the Einstein Discovery Dashboard extension. This is a special extension that has access to data in Salesforce.com and is allowed by default. It is not considered a Network-enabled extension or a Sandboxed extension. For more information on Einstein Discovery integration, see Configure Einstein Discovery Integration.

Sandboxed extensions are hosted by Tableau and employ W3C standards, such as Content Security Policy (CSP), to ensure the extension can't make network calls outside of the hosting Tableau Server. A Sandboxed extension can query data in the dashboard, but it can't send that data anywhere outside of the sandbox. Sandboxed Extensions are supported in Tableau 2019.4 and later. By default, Sandboxed extensions are allowed to run if extensions are enabled for the site.

Network-enabled extensions are web applications and could be running on any computer set up as a web server. This includes local computers, computers in your domain, and third-party web sites. Because Network-enabled extensions could be hosted on third-party sites and could have access to the data in the workbook, you want to only allow the extensions you trust. See Test Network-enabled extensions for security.

For security, you can use the settings for extensions on Tableau Cloud to control and limit the extensions that are allowed to run.

- By default, Sandboxed extensions are allowed to run if extensions are enabled for the site.

- By default, no Network-enabled extensions are allowed unless they've been explicitly added to the safe list.

- By default, only extensions that use the HTTPS protocol are allowed, which guarantees an encrypted channel for sending and receiving data (the only exception is for `http://localhost`).
- If the Network-enabled extension requires full data (access to the underlying data) the extension can't run on Tableau Cloud unless you explicitly add the extension to the safe list and grant the extension access to full data.

## Control extensions and access to data

Site administrators can control whether to enable extensions for the site and whether to allow Sandboxed extensions on the site. The default site settings allow Sandboxed extensions to run on the site, provided the extension is not specifically blocked on the server. The default site settings allow Network-enabled extensions to run that appear on the safe list for the site. Individual Sandboxed extensions can also be added to the safe list, if Sandboxed extensions are not allowed by default.

1. To change these settings for the site, go to **Settings > Extensions**.
2. Under Dashboard and Viz Extensions, configure these options:
    - **Let users run extensions on this site**
    - **Let Sandboxed extensions run unless they are specifically blocked by a server administrator**

Site administrators can add or remove Network-enabled and Sandboxed extensions from the safe list for a site. When you add an extension to the safe list, you can control whether to allow the extension to have access to full data. See Add extensions to the safe list and configure user prompts.

## Identifying the URL of an extension

As a web application, an extension is associated with a URL. You can use this URL to test and verify the extension. You also use the URL to add the extension to the safe list to allow full data access, or to the block list to prohibit any access.

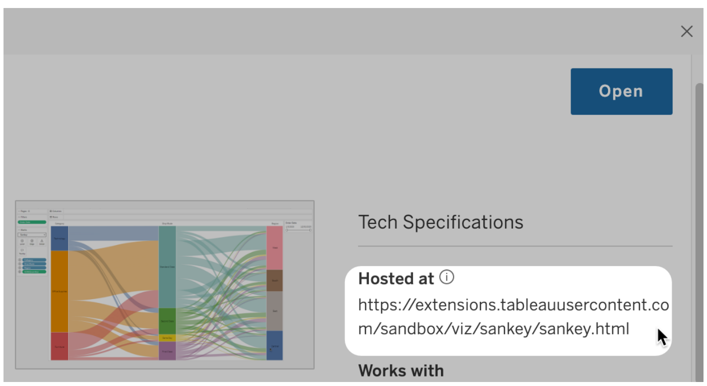
## From the manifest file

If you have the extension manifest file (`.trex`), an XML file that defines properties for the extension, you can find the URL from the `<source-location>` element.

```
<source-location>
    <url>https://www.example.com/myExtension.html</url>
</source-location>
```

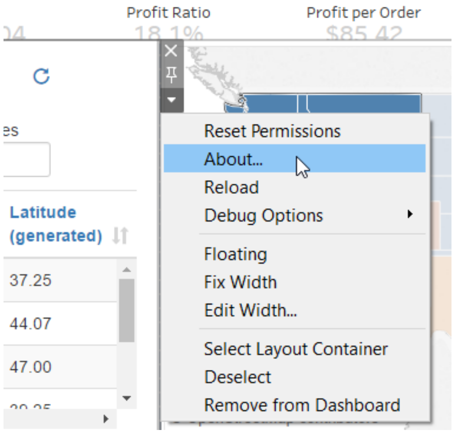
## From Tableau Exchange

If you added or downloaded an extension from the Tableau Exchange, you can find the URL for the extension on the Exchange. Open the tile for the extension, under Tech Specifications, look for the URL under the heading, **Hosted at**.

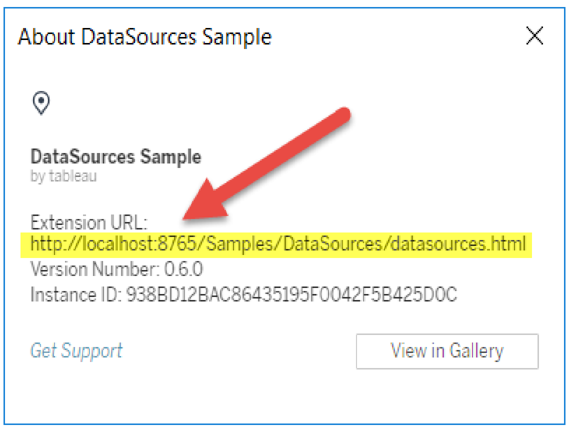



## Identifying a dashboard extension using the About dialog box

If you have added the extension to the dashboard, you can find the URL from the extension properties. From the **More Options** menu, click **About**.




The About dialog box lists the name of the extension, the author, the web site of the author, and the URL of the extension.




## Add extensions to the safe list and configure user prompts

To ensure that users can use Network-enabled extensions that are trusted, you can add them to the safe list for the site. You can also add Sandboxed extensions to the safe list, if Sandboxed extensions aren't enabled by default on the site.

On the safe list, you can control whether to grant the extension full data access. By default, when you add an extension to the safe list, the extension only has access to the summary (or aggregated) data. You can also control whether users see a prompt asking them to allow the extension access to data. You might want to add an extension to the safe list (for example, a

Sandboxed extension) so that you can configure whether users see the prompts. When you hide the prompt from users, the extension can run immediately.

1. Go to **Settings > Extensions**.

2. Under **Enable Specific Extensions**, add the URL of the extension. See Identifying the URL of an extension.

   **Tip:** You can use a period and asterisk (`.*`) as a wildcard in the URL to allow all extensions in a certain domain or location. For example, to allow all extensions in the domain under example.com that use port 8080, you would add the URL: `https://example.com:8080/.*`. For more information, see Using regular expressions in the safe list URL.

3. Choose to **Allow** or **Deny** the extension **Full Data Access**.

   Full data access is access to the underlying data in the view, not just the summary or aggregated data. Full data access also includes information about the data sources, such as the names of the connection, fields, and tables. Usually, if you are adding an extension you want to use to the safe list, you also want to allow the extension to have access to full data, if the extension requires it. Before adding extensions to the safe list, be sure to Test Network-enabled extensions for security.

4. Choose to **Show** or **Hide** the **User Prompts**.

   Users see the prompts by default when they are adding a dashboard extension to a dashboard, or a viz extension to a worksheet, or when they are interacting with a view that has an extension. The prompt tells users details about the extension and whether the extension has access to full data. The prompt gives users the ability to allow or deny the extension from running. You can hide this prompt from users, allowing the extension to run immediately.

## Using regular expressions in the safe list URL

In general, when you add an extension to the safe list, you should use the specific URL of the extension. However, there are times when you might want to allow multiple extensions that are hosted from the same domain and location. In this case it is convenient to use a wildcard in the URL. The extension settings support the use of regular expressions.

| Regular expression | Description |
|---|---|
| . | A period (.) is a wildcard you can use to match any character. If you need to specify a period (.) in the URL instead of a wildcard, you can escape the character with a backslash (\.). |
| * | An asterisk (*) is a quantifier that specifies one or more instances of the previous character. |

Use care if you use wildcards so that you don't make the safe list too permissive, and inadvertently allow access to extensions that should not have access.

The following table shows some examples of using regular expressions in the URL. Note that these examples do not show the protocol and the full URL of the extension. Only extensions that use the HTTPS protocol are allowed (with the exception of http://localhost).

| To specify... | Example | Specifies |
|---|---|---|
| Range of domains | .*\.example.com | All subdomains under example.com. |
| All ports | example.com:.* | Extensions are allowed access from all ports on example.com. |
| All extensions under domain, port, and path | example.com:8080/xyz/.* | All extensions under the domain example.com that use port 8080 and are located in zyz, are allowed access. |
| All ports for a range of domains | .*\.example.com:.* | Allows access to extensions on all ports on all subdomains under example.com. |

| | | |
|---|---|---|
| All extensions under a domain and path that match the pattern | example.com/t.c/.* | Allows access to extensions running on example.com under folders that match the pattern t.c. For example, tic, tac, toc. |

## Test Network-enabled extensions for security

Dashboard and viz extensions are web applications that interact with data in Tableau using the Extensions API. Network-enabled extensions could be hosted on web servers inside or outside of your domain, and can make network calls and have access to resources on the Internet. Because of the potential vulnerabilities, such as cross-site scripting, you should test and vet Network-enabled extensions before they are used in Tableau Desktop, and before you allow the extensions on Tableau Cloud.

### Examine the source files

Dashboard and viz extensions are web applications and include various HTML, CSS, and JavaScript files, and an XML manifest file (*.trex) that defines the properties in the extension. In many cases, the code for a extension is publicly available on GitHub and can be examined there or downloaded. In the manifest file (`*.trex`), you can find the source location, or URL indicated where the extension is hosted, the name of the author, and the web site of the author or company to contact for support. The `<source-location>` element specifies in the URL, the `<author>` element, specifies the name of the organization and the web site to contact for support (`website="SUPPORT_URL"`). The web site is the **Get Support** link user see in the **About** dialog box for the extension.

Many extensions reference external JavaScript libraries, such as the jQuery library or API libraries for third parties. Validate that the URL for external libraries points to a trusted location for the library. For example, if the connector references the jQuery library, make sure that the library is on a site that is considered standard and safe.

All extensions are required to use the HTTPS protocol (`https://`) for hosting their extensions. You should examine the source files for the extension to ensure that any reference to external libraries is also using HTTPS or is hosted on the same web site as the extension. The one exception to the requirement of HTTPS is if the extension is hosted on the same computer as Tableau (`http://localhost`).

To the extent possible, make sure you understand what the code is doing. In particular, try to understand how the code is constructing requests to external sites, and what information is being sent in the request. In particular, check if any user-supplied data is validated to prevent cross-site scripting.

## Understand data access

The Tableau Extensions API provides methods that can access the names of the active tables and fields in the data source, the summary descriptions of the data source connections, and the underlying data in a worksheet. If an extension uses any of these methods in a view, the extension developer must declare that the extension requires full data permission in the manifest file (`.trex`). The declaration looks like the following.

```
<permissions>
   <permission>full data</permission>
</permissions>
```

Tableau uses this declaration to provide a prompt to users at run time that gives them the option of allowing this access. If the extension uses any one of these methods, without declaring full-data permission in the manifest file, the extension loads but the method calls fail.

For information about how an extension accesses data from the dashboard, and the JavaScript methods used, see Accessing Underlying Data in the Tableau Extensions API. To get a better understanding about what the extension can find out about the data, you can use the DataSources sample dashboard extension (available from the Tableau Extensions API GitHub repository) to see what data is exposed when the `getDataSourcesAsync()` method is called.

### Test the extension in an isolated environment

If possible, test the extension in an environment that is isolated from your production environment and from user computers. For example, add a dashboard or viz extension to a safe list on a test computer or virtual machine that's running a version of Tableau Cloud that is not used for production.

### Monitor traffic created by the dashboard extension

When you test a Network-enabled extension, use a tool like Fiddler, Charles HTTP proxy, or Wireshark to examine the requests and responses that the extension makes. Make sure that you understand what content the extension is requesting. Examine the traffic to be sure that the extension is not reading data or code that is not directly related to the purpose of the extension.

# Configure Connections with Analytics Extensions

Analytics extensions allow you to extend Tableau dynamic calculations in a workbook with languages like R and Python, with Einstein Discovery, and with other tools and platforms. These settings endpoints enable you to configure analytics extensions on your site in Tableau Cloud. For more information, see Analytics Extensions API.

For more information about user scenarios and configuring analytics connections in Tableau Desktop or for web authoring, see Pass Expressions with Analytics Extensions, in the *Tableau Desktop and Web Authoring Help*.

> **Note:** Beginning in June 2021, you can create multiple analytics extensions connections for a site, including multiple connection for the same type of extension (you are presently limited to a single Einstein Discovery analytics extension for each site). For details, see Tableau Cloud Release Notes.

This topic describes how to configure sites on Tableau Cloud with analytics extensions.

## Security requirements and configuration

For increased security, Tableau Cloud requires an encrypted channel and authenticated access to the external services used for analytics extensions.

### Certificate

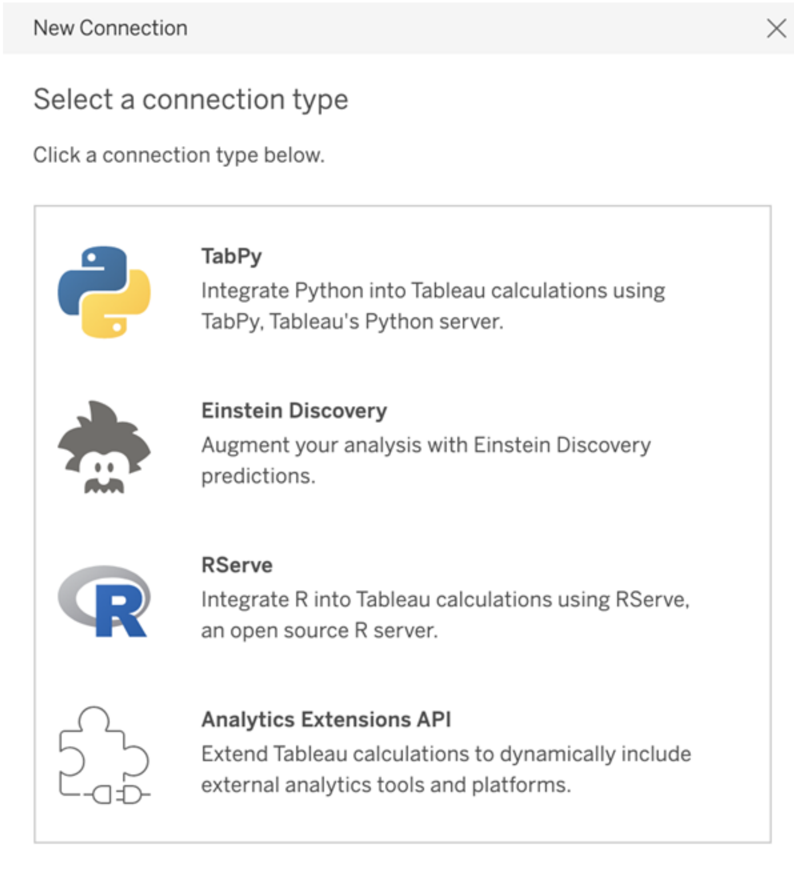
The server running the external service for analytics extensions must be configured with a valid TLS/SSL certificate from a trusted 3rd party certificate authority (CA). Tableau Cloud will not establish a connection with external servers that are configured with a self-signed certificate, a certificate from a private PKI, or a certificate that is not trusted by an established 3rd party CA.

### Safelist firewall configuration

Many organizations deploy a firewall that requires safelist exceptions for known hosts outside the network. In this scenario, you will need to specify two Tableau Cloud IP addresses as exceptions. The Tableau Cloud IP addresses used for connections to analytics extensions servers are `44.224.205.196` and `44.230.200.109`.

## Configure analytics extensions settings

1. Sign in to Tableau Cloud as a site administrator.
2. Click **Settings**.
3. On the Settings page, click the **Extensions** tab and then scroll to **Analytics Extensions**.
4. Select **Enable analytics extensions for site**.
5. Click **Create new connection**.
6. In the **New Connection** dialog, click the connection type you want to add, then enter the configuration settings for your analytics service:



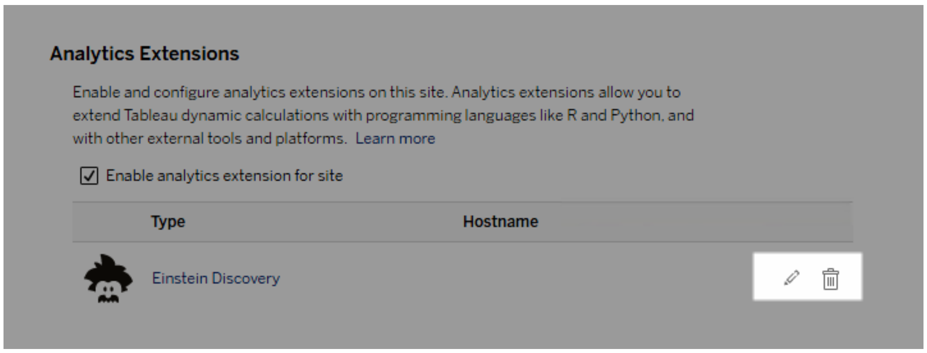

1. The options you need to configure depend on the connection type you choose:
   - For an Einstein Discovery connection, click **Enable**.
   - For TabPy, RServer, and Analytics Extensions API connections, enter the following information:
     - **Connection Name**: Specify the server type you are connecting to. RSERVE supports connections to R using the RServe package. TABPY supports connections to Python using TabPy, or to other analytics extensions.
     - **Require SSL**: Select this option to encrypt the connection to the analytics service. If you specify a `HTTPS` URL in the **Hostname** field, then you must select this option.
     - **Hostname**: Specify the computer name or URL where the analytics service is running. This field is case sensitive.
     - **Port**: Specify the port for the service.

- **Sign in with a username and password**: Select this option to specify user name and password that is used to authenticate to the analytics service.

7. Click **Save**.

### Edit or delete an analytics extension connection

To edit or delete a configuration, navigate to **Analytics Extensions** on the **Extensions** tab of your site.




Click the **Edit** or **Delete** icon and follow the prompts to change the configuration.

## Script errors

Tableau cannot verify that workbooks that use an analytics extension will render properly on Tableau Cloud. There might be scenarios where a required statistical library is available on a user's computer but not on the analytics extension instance that Tableau Cloud is using.

A warning will be displayed when you publish a workbook if it contains views that use an analytics extension.

> This worksheet contains external service scripts, which cannot be viewed on the target platform until the administrator configures an external service connection.

# Table Extensions

Table Extensions allow you to create new data tables with an analytics extensions script. You can write a custom TabPy or Rserve script and optionally add one or more input tables. Table extensions are supported by Tableau Cloud, Tableau Server, and Tableau Desktop. This document focuses on Tableau Server.

> **Note:** The data refreshes every time you open up a workbook or refresh a data source.

### Benefits

Table Extensions have the following benefits for both new and experienced users.

- Faster data processing
- Low code editor
- Integrates with Ask Data and Explain Data
- Integrates with TabPy and Rserve
- Results can be used to construct dashboards or visualizations.

## Prerequisites

Before you can use table extensions, you must complete the following list.

- Configure an analytics extension
  - For steps to configure analytics extension connections, see Configure Connections with Analytics Extensions..
- Publish your workbook.

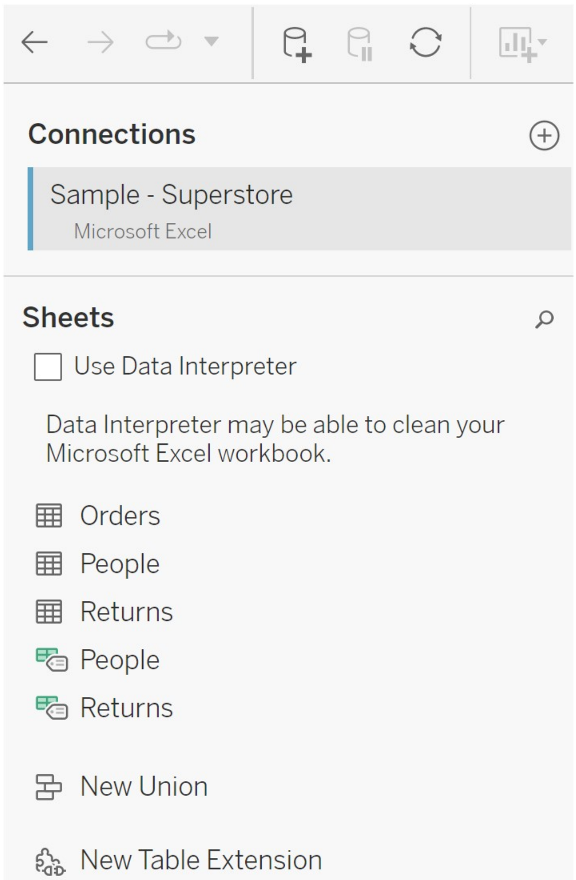
## Create a Table Extension

To create a new table extension, complete the steps below.

1. Open a published workbook.

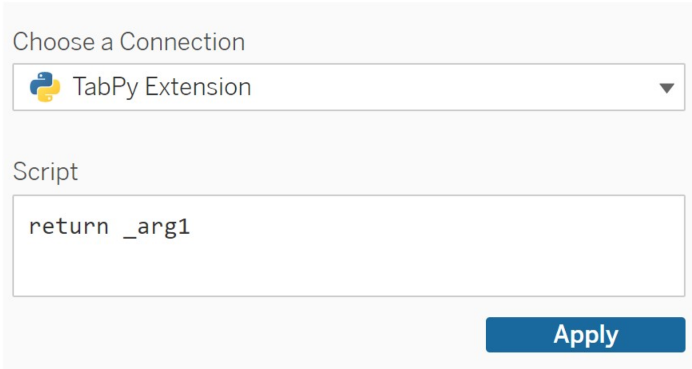
   **Note:** The workbook must be published before you can add a table extension.

2. Under **Sheets**, choose **New Table Extension**.

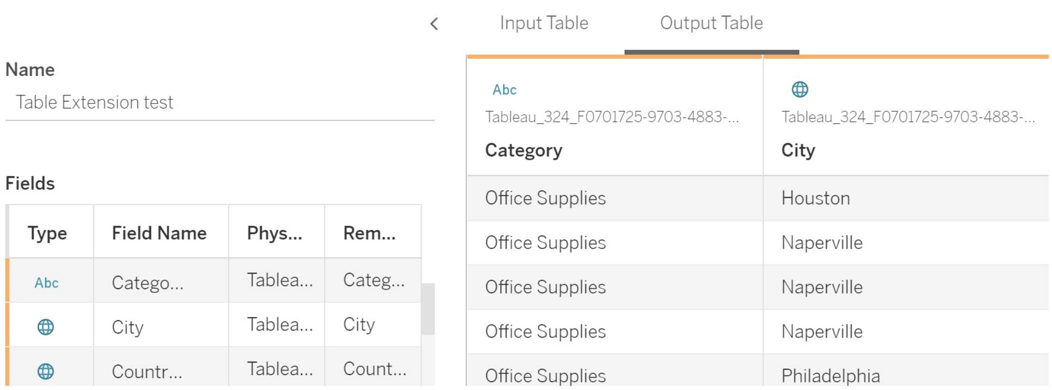



3. (Optional) Drag sheets into the table extension pane.

4. Under **Choose a Connection**, select an analytics extension.




5. In **Script**, enter your script.
6. Select **Apply**.
7. Choose **Update Now** and the results will appear in the **Output Table** tab.




8. In the **Name** field, enter a unique name for your new table extension.
9. Go to the sheet tab and publish the workbook to save it.

**Note:** If you edit the input table you have to press **Apply** again before you can see or use the updated output table data.

**Troubleshooting tip**: If your table extension is hitting an error, try using the circular **Refresh Data Source** button, located next to the **Save** button.

### Table Extensions vs Analytics Extensions

Tableau has a few different features with "extension" in the name. While some of these products aren't related, table extensions and analytics extensions are. The table extensions feature relies on a connection with a analytics extensions to work. Let's break down each feature.

Table Extensions

The table extensions feature lets you create workbook calculations that send data and a processing script to your analytics extension. The returned results are displayed as a table on the Data Source tab and as measures and dimensions in the workbook.

Analytics Extensions

The analytics extensions feature allows you to extend Tableau dynamic calculations with programming languages like Python, external tools, and external platforms. After you create a connection to an analytics extension, you can communicate with your external server through calculated fields. For more information, see Configure Connections with Analytics Extensions.

# Configure Einstein Discovery Integration

Beginning March, 2021, Tableau Cloud supports integration with Einstein Discovery, making Einstein Discovery predictions available to authors and viewers of dashboards. Starting in version 2021.2.0, Einstein Discovery predictions is also now available when authoring flows on the web.

Einstein Discovery in Tableau is powered by salesforce.com. Consult your agreement with salesforce.com for applicable terms.

For details on how to use Einstein Discovery predictions in Tableau, including licensing and permission requirements, see Integrate Einstein Discovery Predictions in Tableau in the

Tableau Desktop and Web Authoring Help. For information about adding predictions in flows, see Add Einstein Discovery Predictions to your flow.

## Einstein Discovery dashboard extension

The Einstein Discovery dashboard extension allow workbook authors to surface real-time predictions in Tableau. The dashboard extension delivers predictions interactively, on-demand, using source data in a Tableau workbook and an Einstein Discovery-powered model deployed in Salesforce.

By default Tableau Cloud site configuration allows saved OAuth access tokens, so the only step necessary is to configure Cross-Origin Resource Sharing (CORS) in the Salesforce org that hosts Einstein Discovery. This requires permissions in the Salesforce org. For details on necessary licenses and permissions, see Requirements for access - Einstein Discovery. For details on configuring CORS in Salesforce, see Configure CORS in Salesforce.com for Einstein Discover Integration in Tableau Cloud.

## Einstein Discovery analytics extension

The Einstein Discovery analytics extension gives your users the ability to embed predictions directly in Tableau calculated fields. A table calc script requests predictions from a model deployed in Salesforce by passing its associated prediction ID and input data that the model requires. Use Model Manager in Salesforce to auto-generate a Tableau table calculation script, and then paste that script into a calculated field for use in a Tableau workbook.

By default Tableau Cloud site configuration allows saved OAuth access tokens, so the only step necessary is to configure Cross-Origin Resource Sharing (CORS) in the Salesforce org that hosts Einstein Discovery. This requires administrator permissions in the Salesforce org. For details, see Configure CORS in Salesforce.com for Einstein Discover Integration in Tableau Cloud.

## Einstein Discovery Tableau Prep extension

*Supported in Tableau Server and Tableau Cloud starting in version 2021.2.0*

The Einstein Discovery Tableau Prep extension enables users to embed Einstein predictions directly in their flows when authoring flows on the web.

By default, Tableau Cloud site configuration allows saved OAuth access tokens, so the only step necessary is to enable Tableau Prep Extensions for the server. This requires administrator permissions in the Salesforce org. For details, see Enable Tableau Prep Extensions.

# Configure CORS in Salesforce.com for Einstein Discover Integration in Tableau Cloud

In version 2021.1.0 the ability to integrate Einstein Discovery predictions into Tableau Dashboards was added. You can do this using the Einstein Discovery dashboard extension. A prerequisite for this is configuring Cross-Origin Resource Sharing (CORS) in the Salesforce org that hosts Tableau CRM and includes the model and predictions that are going to be used.

This procedure explains how an administrator in a Salesforce.com organization would do this configuration. You can find more information about CORS in the Salesforce documentation, Configure Salesforce CORS Allowlist.

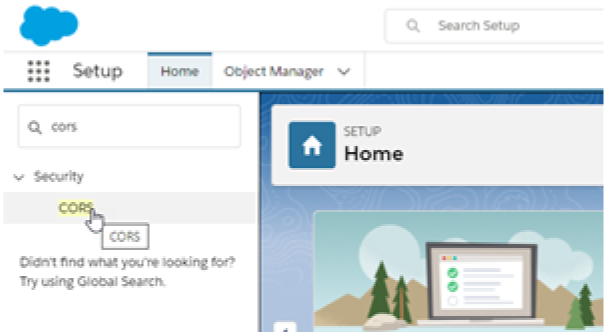
## Configure CORS for Einstein Discovery.

> **Note:** This procedure documents the process in Salesforce Lightning. If you are using the traditional interface, the navigation may be different but the configuration is the same.

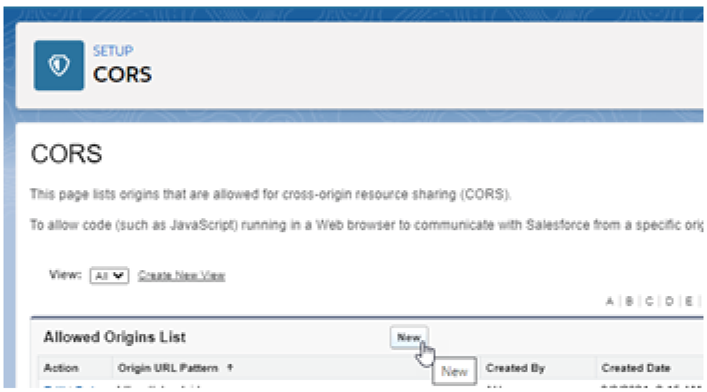
1. Sign in to your Salesforce.com developer account, click your user name in the upper-right, and then select **Setup**.

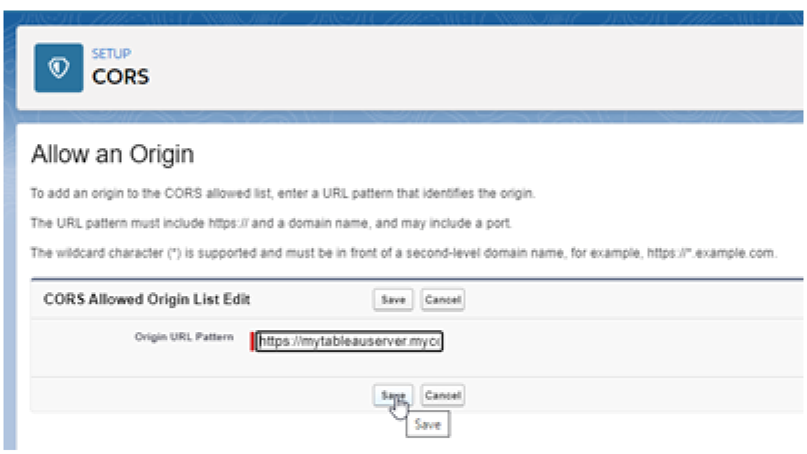
2. In the left navigation column, search for "cors" and select **CORS** .




3. In **CORS**, in the **Allowed Origins List** section, click **New**.




4. In **CORS Allowed Origin List Edit**, enter the URL of Tableau Cloud, beginning with "https://".



For more information about the URL pattern, see the Salesforce developer documentation: https://developer.salesforce.com/docs/atlas.en-us.chatterapi.meta/chatterapi/extend_code_cors.htm

5. Click **Save**.

# Integrate Tableau with a Slack Workspace

Beginning with version 2021.3, Tableau Server and Tableau Cloud support integration with the Tableau App for Slack, so your team can collaborate-share Tableau snapshots, search for Tableau content, and receive notifications about Tableau data–right where they're working in a Slack workspace.

The Tableau App for Slack lets you connect your Tableau site with a Slack workspace. After it's enabled, Tableau users can:

- See notifications in Slack when teammates share content with them, when they're mentioned in a comment, or when data meets a specified threshold in a data-driven alert. If a site administrator in Tableau Cloud or a server administrator in Tableau Server enables notifications on a site, users can control which notifications they receive in Slack by configuring their Account Settings.
- See a preview of a viz when a Tableau URL is pasted into Slack, allowing users to share data-related content with context directly in Slack.
- Search for Tableau views or workbooks in Slack DMs and channels.
- Access Recents and Favorites from the Tableau App for Slack.

For more information, see Receive Notifications, Search, and Share Using the Tableau App for Slack.

> **Note:** Some notifications preferences might not be available if the features are turned off for your site. For example, if the User Visibility setting is set to Limited, notifications are turned off. For more information, see Site Settings Reference and Manage Site User Visibility.

To integrate Slack with your Tableau site, there are a few necessary configuration steps, including some in your Tableau site, and some in the Slack workspace you want to connect. This overview outlines these steps for both Tableau site administrators on Tableau Cloud or a Tableau Server Administrator on Tableau Server, and Slack workspace administrators.

**Requirements**

Enabling Tableau in Slack requires both a Slack workspace administrator and either a Tableau site administrator in Tableau Cloud, or a Tableau server administrator in Tableau Server.

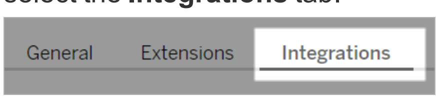
# Connect a Tableau Cloud site to a Slack workspace

Tableau Cloud site administrators can connect one or more Tableau Cloud sites to a single Slack workspace. However, you can't connect a Tableau site to more than one Slack workspace. Connecting consists of these tasks:

- **Tableau site administrator**: Request permission to the Slack workspace through Tableau's site settings.
- **Slack workspace administrator**: Add the Tableau App for Slack to a Slack workspace by approving a request from the Tableau administrator for permission to access the Slack workspace.
- **Tableau site administrator**: Connect your Tableau site to Slack.

## Step 1: Request permission to the Slack workspace

**Tableau site administrator**

1. Sign in to the site you'd like to connect to Slack. On the **Settings** page of your site, select the **Integrations** tab.


2. Under **Slack Connectivity**, select **Connect to Slack**.
Follow the prompt to sign in to your Slack workspace.
3. Request to install the Tableau App for Slack. This request goes to the Slack workspace administrator. You can add a message to the workspace administrator, if needed.

4. Select **Submit**.

   The Slack administrator receives a notification for the request. For more information about this process, see An Admin's Guide to Slack Management in Slack's documentation.

   Slackbot (Slack's notifications center) will notify you when your request is approved.

## Step 2: Add the Tableau App for Slack to the Slack workspace

**Slack workspace administrator**

Approve the request from the Tableau site administrator in **Manage Apps** to add the Tableau App for Slack to the Slack workspace.

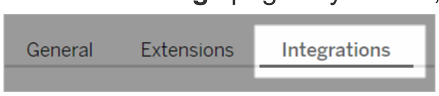
For more information, see An Admin's Guide to Slack Management in Slack's documentation.

## Step 3: Connect your Tableau site to Slack

**Tableau site administrator**

After the Slack workspace administrator approves the Tableau application, a Tableau administrator can finalize the app's connection to a Tableau site.

1. From the **Settings** page of your site, select the **Integrations** tab.




2. Under **Slack Connectivity**, select **Connect to Slack**.
3. Follow the prompt to sign in to your Slack workspace.
4. Select **Allow** to give your Tableau site access to the Slack workspace.

The Tableau site and Slack workspace are now connected.

# Disconnect a Tableau site from Slack

As a site admin, you can disconnect a Tableau site from a Slack workspace by selecting **Disconnect from Slack** in the **Integrations** tab of site settings. Users continue to receive notifications for some time. The OAuth client information you added in Step 2 is retained and can be used to connect to a new workspace, if needed.

As a Slack user, you can disconnect from Slack by selecting **Disconnect from Tableau** from the **Home** tab in the Tableau App for Slack.

## Update your Tableau App for Slack

When a new version of the Tableau App for Slack is available, Tableau recommends updating the application to maintain app performance and use new features.

To update the Tableau App for Slack:

1. From the **Settings** page of your site, select the **Integrations** tab.


2. Under **Slack Connectivity**, select **Connect to Slack**.
3. Select **Update**.

**Note:** App updates applied by any Tableau admin affect all Tableau sites connected to the same workspace.

## Troubleshoot the Tableau App for Slack

It's a best practice to Manage app approvals for your Slack workspace. However, if your Slack workspace allows users who aren't admins to remove apps, it's possible that a user can remove the Tableau App for Slack for the site. In this scenario, other users will see the Tableau App for Slack, but its features won't work as expected. To resolve this issue, have your Slack admin uninstall and reinstall the Tableau App for Slack. Then, have your admin follow the steps to connect Slack with your Tableau site.

# Receive Notifications, Search, and Share Using the Tableau App for Slack

The Tableau App for Slack lets you work and collaborate right where you work in Slack. In Tableau 2023.1 or later, you can search for views and workbooks, and easily access your favorite and recently viewed Tableau content from the Tableau App for Slack. With the Tableau App for Slack, you can also see snapshots of visualizations, with links back to your Tableau site for further exploration. Some features (such as sharing and searching Tableau content from Slack) aren’t yet available in Tableau Server. Currently, Tableau Server users can receive notifications.

In Tableau 2021.3 and later, you can get Tableau notifications in Slack for data-driven alerts, sharing activity, and comment mentions. If the notification contains a view or workbook you have access to, the notification will also contain a visual snapshot.

Administrators can connect their Tableau site to a Slack workspace to enable the Tableau App for Slack for their entire organization. For more information, see "Integrate Tableau with a Slack Workspace" in the Tableau Cloud or Tableau Server help.

After your Tableau admin connects your Tableau site to a Slack workspace:

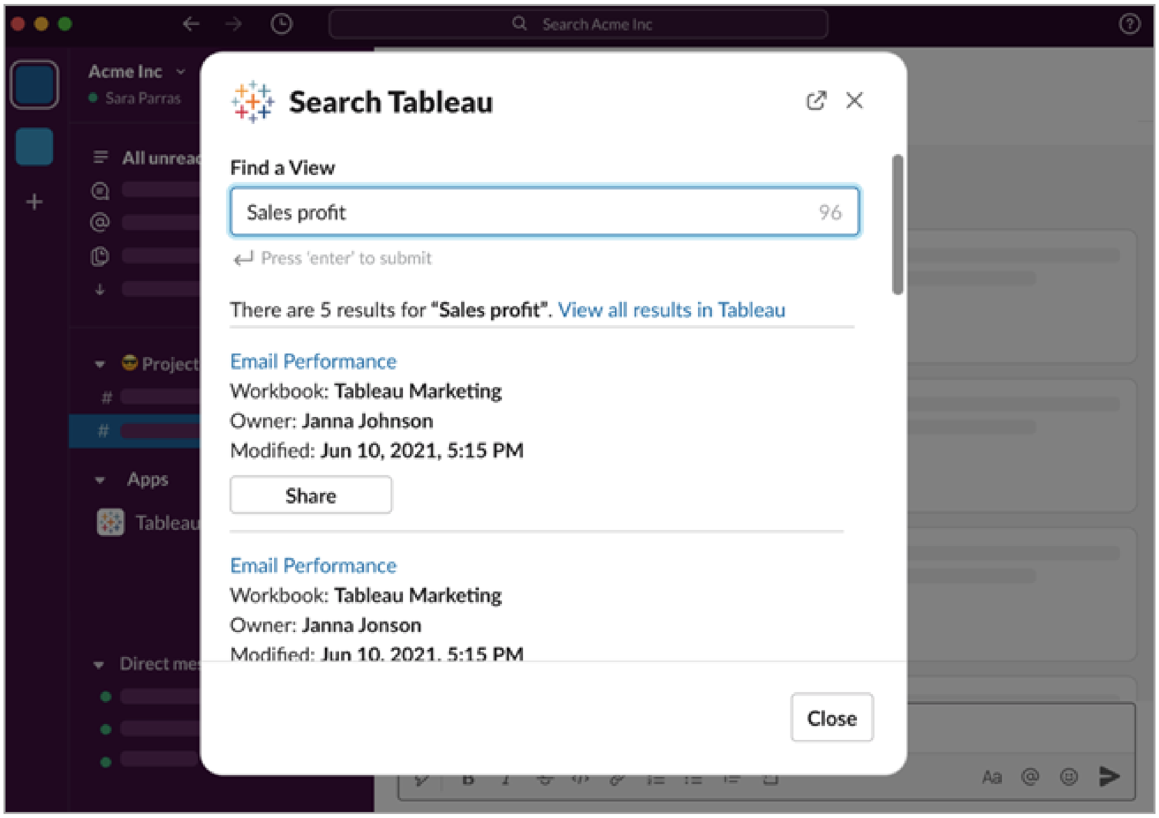
1. Add the Tableau App for Slack.
2. Select **Connect to Tableau**.
3. Log in to your Tableau site.
4. Authorize the app by choosing **Allow**.

**Note:** For information about privacy, see the Privacy Policy.

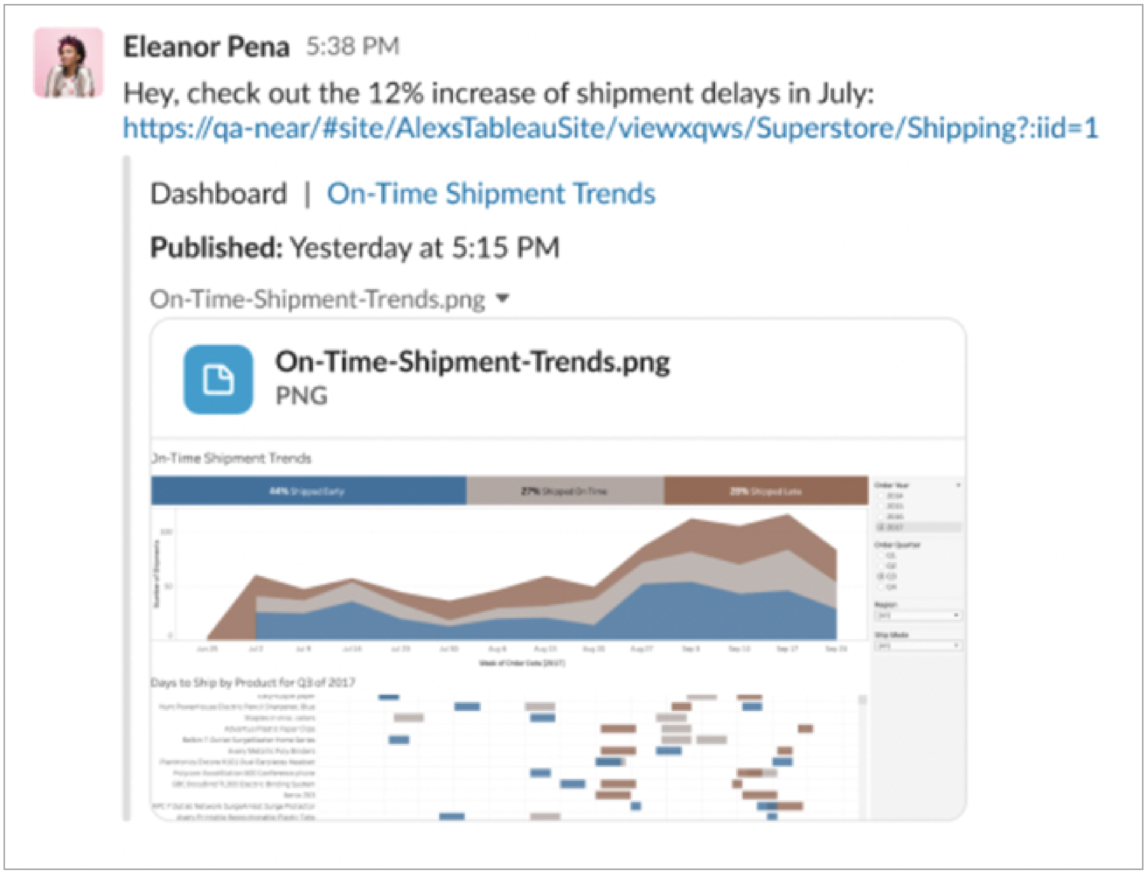
## Search, share, and access recents and favorites from Slack

From the Tableau App for Slack **Home** tab, you can search for views and workbooks on your Tableau Cloudsite.

After you've found the Tableau content you're looking for, select the name of the Tableau content to open it directly in Tableau or select Share to send the content to an individual or Slack channel. You can also write a custom message to provide context about the Tableau content you're sharing.




Choose **Share with Snapshot** to include a preview (Slack link unfurling) of the Tableau content in your message. You can share a snapshot if the Tableau content doesn't contain filters that restrict data access (for example, row-level security). The snapshot is visible to all people you share it with, regardless of their access level.



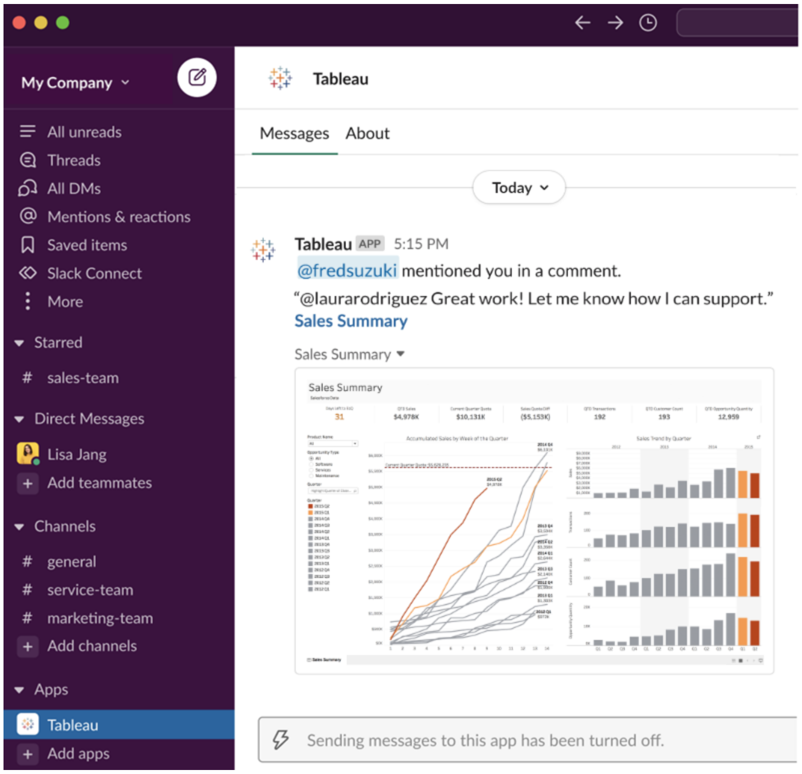

And without leaving Slack, you can access recently viewed Tableau content and your Tableau favorites. From the Tableau App for Slack **Home** tab, you see the five Tableau views or workbooks you visited most recently. You can also access five of your favorite Tableau views or workbooks.

Select the name of the Tableau view or workbook to open it directly in Tableau, or select the more actions menu (...) to share favorite or recently viewed Tableau content.

## Receive Tableau notifications in Slack

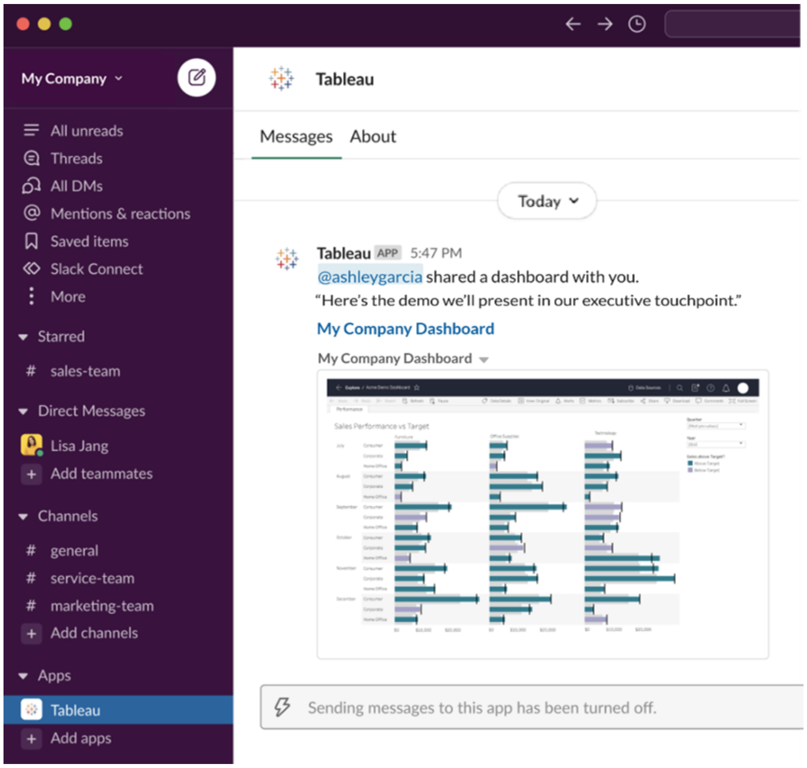
Comments

Get notified when you're @mentioned in a comment to keep the conversation going. For more information, see Comment on Views.



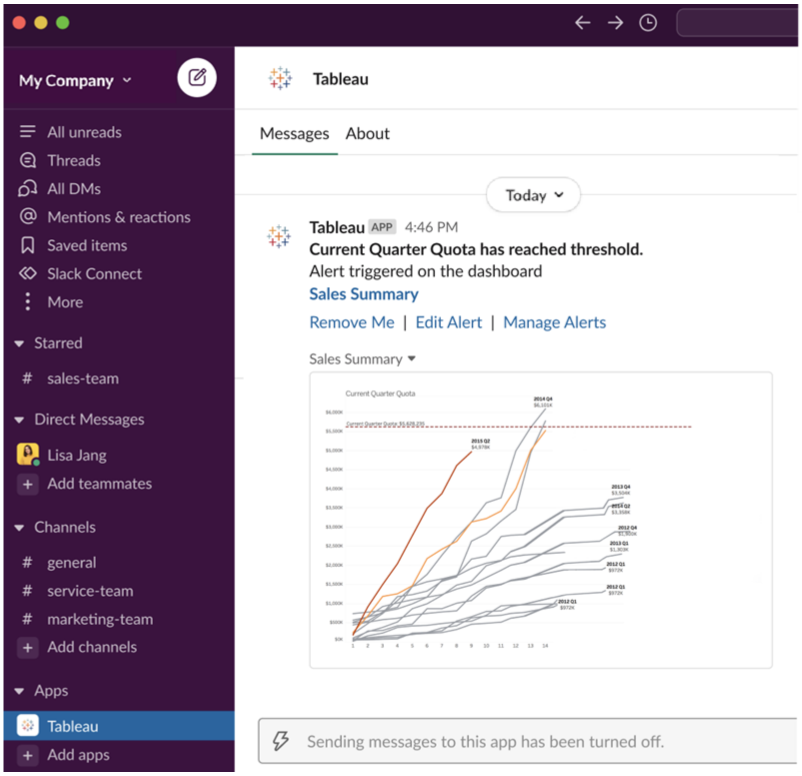

Share

See when a teammate sends a Tableau asset your way, including views, workbooks, and more. For more information about sharing, see Share Web Content.




Data-driven Alerts

You can specify a threshold for your data and get alerted when it's met. For more information, see Send Data-Driven Alerts from Tableau Cloud or Tableau Server.

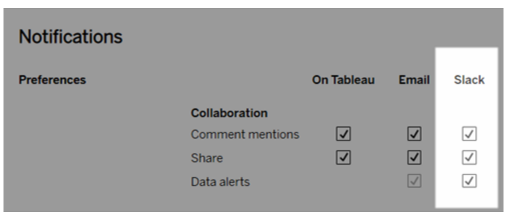



## Manage Tableau notifications for Slack

Your Tableau site admin can turn on or off all notifications across the site. Tableau admins and Slack workspace admins integrate your Tableau site with Slack, and control whether site users can receive notifications. If it's enabled and your Tableau site administrator allows notifications, all site users can receive notifications in Slack through the Tableau App for Slack. Sometimes notification preferences aren't available because the site has other settings configured that affect notifications.

To control which notifications appear in your Slack workspace, or to turn off Slack notifications, at the top of a page, click your profile image or initials, and then select **My Account Settings**.


Under Notifications, select or clear the check boxes under **Slack** for comment mentions, share, and data alerts.




Select **Save Changes**.

For more information, see **Change notification settings** in Manage Your Account Settings.

# Automate Tasks Using tabcmd

Automate site administration tasks on your Tableau Cloud site with the tabcmd command-line utility. For example, you can use tabcmd to create or delete users, projects, and groups. The topics in this section contain information about installing and using tabcmd commands.

## tabcmd

**Important:** tabcmd 1.0 will stop working with Tableau Cloud when the pod that your site resides on moves to Hyperforce. Plan your migration to tabcmd 2.0 as soon as possible to ensure you will not be impacted. For more information about Tableau Cloud's migration to Hyperforce, see the Tableau Cloud Migration to Hyperforce knowledge article. This retirement will not impact Tableau Server.

**Note:** In most cases, you must use tabcmd command-line utility 2.0 (tabcmd 2.0) with Tableau Cloud. Tabcmd 2.0 is available at Tableau tabcmd. This new version allows you to: run tabcmd commands on MacOS and Linux, authenticate using personal access tokens (PATs), and allows you to be multi-factor authentication (MFA) compliant. Version 2.0 is built on public endpoints available in the Python-based Tableau Server Client (TSC).

Tableau provides the tabcmd command-line utility which you can use to automate site administration tasks on your Tableau Cloud site. For example, creating or deleting users, projects, and groups.

**Important:** tabcmd 1.0 does not support multi-factor authentication (MFA). To use tabcmd with Tableau Cloud, use Tableau tabcmd 2.0 (new window). For more information about Tableau Cloud and MFA, see Multi-Factor Authentication and Tableau Cloud.

## Install tabcmd

**Note:** These instructions are for installing the tabcmd 1.0 command-line utility. To install the tabcmd 2.0 command-line utility, go to Tableau tabcmd (new window).

When Tableau Server or Tableau Cloud is upgraded to a new version, if an updated version of tabcmd is required, you can download it from the Tableau *Server* Releases page on the Tableau website.

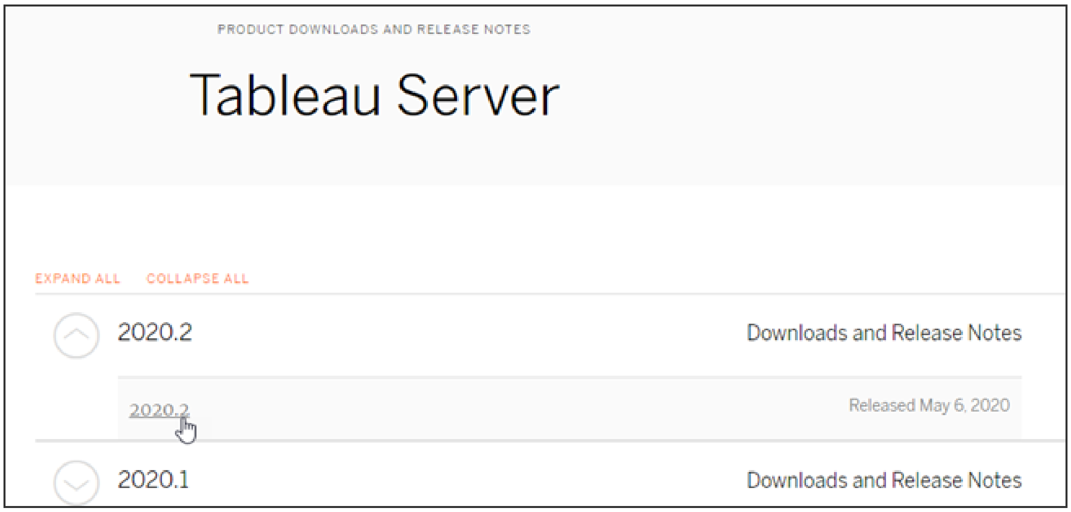
For Tableau Server, we recommend you download the version that matches your server version. For Tableau Cloud, we recommend you always download the latest version to avoid issues caused by version incompatibilities. In either case, using an out of date version of tabcmd can cause errors and unpredictable results.

1. Open a web browser and go to the Tableau Server Releases page. Go to this page even if you use Tableau Online.

2. If you're using:

- **Tableau Cloud**, use Tableau tabcmd 2.0 (new window).
- **Tableau Server (Windows or Linux):** select the release that matches your server version.

In either case, if the expanded information shows maintenance releases, select the latest maintenance release or the one that matches your server version.




This takes you to the release notes page, called Resolved Issues, where you can read about security improvements and resolved issues.

3. Scroll to the **Download Files** section under the resolved issues, select the tabcmd download link that is compatible with the computer on which you'll run the tabcmd commands.


The remaining steps refer to this computer as "the tabcmd computer."

4. Save the installer to the tabcmd computer, or a location accessible from that computer .

5. Complete the installation steps as appropriate for the operating system of the tabcmd computer:

- ## Windows

  By default tabcmd is installed to `C:\Program Files\Tableau\Tableau Server\<version>\extras\Command Line Utility`. You can change this during installation and recommend that you install tabcmd to a folder named `tabcmd` at the root of the C:\ drive (`C:\tabcmd`). This can make it easier to locate and run, and will accommodate some limitations with the Windows operating system if you add the tabcmd directory to the Windows PATH.

  > **Note** The tabcmd Setup program does not add the tabcmd directory to the Windows PATH variable. You can add it manually, or you can include the full path to tabcmd each time you call it.

  You can install tabcmd in two ways on Windows:

  - Double-click the installer to follow the steps in the UI:

    a. Accept the license agreement.

    b. If you want to install to a non-default location, click **Customize** and type or browse to the location you want to install tabcmd to.

    c. Click **Install**.

       If you are prompted by Windows Defender Firewall or User Account Control, click **Allow access**.

  - Run the installer from a command prompt:

a. Open a command prompt as administrator on the tabcmd computer.

b. Navigate to the directory where you copied the tabcmd installer.

c. Install tabcmd:

```
tableau-setup-tabcmd-tableau-<version_code>-x64.exe /quiet ACCEPTEULA=1
```

To install to a non-default location:

```
tableau-setup-tabcmd-tableau-<version_code>-x64.exe /quiet ACCEPTEULA=1 INSTALLDIR="<path\to\install\directory>"
```

For example:

```
tableau-setup-tabcmd-tableau-<version_code>-x64.exe /quiet ACCEPTEULA=1 INSTALLDIR="C:\tabcmd"
```

For a complete list of command line options you can use with the tabcmd installer, run the installer with a /?. For more information on tabcmd installer command line options, see Install Switches and Properties for tabcmd (Windows).

The tabcmd Setup program creates logs in `C:\Users\<user>\AppData\Local\Temp` you can use if you have problems installing tabcmd. The logs use the naming convention `Tableau_Server_Command_Line_Utility_(<version_code>)_##############.log`.

- ## Linux

> **Note:** To run tabcmd on a Linux computer, you must have Java 11 installed. On RHEL-like systems, this will be installed as a dependency when you install tabcmd. On Ubuntu systems, you need to install Java 11 separately if it is not already installed.
>
> As of July 2022, Debian distributions are no longer supported. For more information, see this Tableau Community post.

a. Log on as a user with sudo access to the tabcmd computer.

b. Navigate to the directory where you copied the `.rpm` or `.deb` package that you downloaded.

   - On RHEL-like distributions, including CentOS, run the following command:

     ```
     sudo yum install tableau-tabcmd-<ver-
     sion>.noarch.rpm
     ```

   - On Ubuntu, run the following command:

     ```
     sudo apt-get install ./tableau-tabcmd-<version>_
     all.deb
     ```

To uninstall tabcmd from a Linux computer, see the documentation for the Linux variety you are running.

6. (Optional) Add the fully qualified location where tabcmd is installed to your system path to allow you to run tabcmd commands without changing to that location, or specifying the location with each command. Steps to do this depend on the type and version of your operating system. For more information, see PATH_(variable).

## How to use tabcmd

The basic steps for using tabcmd are as follows:

1. Open the Command Prompt as an administrator.

   > **Note:** Do not use PowerShell to run tabcmd commands on Windows. Using PowerShell can cause unexpected behavior.

2. On a Windows computer, if you installed tabcmd on a computer other than the initial node, change to the directory where you installed tabcmd.

   On a Linux computer, you do not need to change to the install directory.

3. Run the tabcmd command.

When you use tabcmd, you must establish an authenticated server session. The session identifies the server or Tableau Cloud site and the user running the session. You can start a session first, and then specify your command next, or you can start a session and execute a command all at once.

> **Important:** If you are using tabcmd to perform more than one task, you must run tasks one after another (serially), rather than at the same time (in parallel).

Commands (such as `login`) and the options (such as `-s`, `-u`, etc.) are not case sensitive, but the values you provide (such as `User@Example.com`) are case sensitive.

## Examples

The following command demonstrates starting a session:

```
tabcmd login -s https://prod-useast-b.online.tableau.com -t mysite
-u authority@email.com -p password
```

Here's how to start a session and delete a workbook with one command—note that you do not need `login` here:

```
tabcmd delete "Sales_Workbook" -s https://prod-useast-b.on-
line.tableau.com -t campaign -u admin@email.com -p password
```

The options `-s`, `-t`, `-u`, and `-p` are among the tabcmd global variables, which can be used with any command.

For more information, see tabcmd Commands.

## tabcmd Commands

**Important:** tabcmd 1.0 will stop working with Tableau Cloud when the pod that your site resides on moves to Hyperforce. Plan your migration to tabcmd 2.0 as soon as possible to ensure you will not be impacted. For more information about Tableau Cloud's migration to Hyperforce, see the Tableau Cloud Migration to Hyperforce knowledge article. This retirement will not impact Tableau Server.

**Note:** In most cases, you must use tabcmd command-line utility 2.0 (tabcmd 2.0) with Tableau Cloud. Tabcmd 2.0 is available at Tableau tabcmd. This new version allows you to: run tabcmd commands on MacOS and Linux, authenticate using personal access tokens (PATs), and allows you to be multi-factor authentication (MFA) compliant. Version 2.0 is built on public end-points available in the Python-based Tableau Server Client (TSC).

You can use the following commands with the tabcmd command line tool in Tableau Cloud:

login

logout

get *url*

addusers (to group)

creategroup

deletegroup

export

createproject

deleteproject

publish

createextracts

refreshextracts

deleteextracts

delete *workbook-name* or *datasource-name*

createsiteusers

deletesiteusers

removeusers

version

## addusers *group-name*

Adds users to the specified group.

**Example**

```
tabcmd addusers "Development" --users "users.csv"
```

Options

`--users`

> Add the users in the given `.csv` file to the specified group. The file should be a simple list with one user name per line. User names aren't case sensitive. The users should already be created on Tableau Cloud.
>
> For more information, see CSV Import File Guidelines.

`--[no-]complete`

When set to `complete` this option requires that all rows be valid for any change to succeed. If not specified, `--complete` is used.

### Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## createextracts

Creates extracts for a published workbook or data source.

Options

`-d, --datasource`

The name of the target data source for extract creation.

`--embedded-datasources`

A space-separated list of embedded data source names within the target workbook. Enclose data source names with double quotes if they contain spaces. Only available when creating extracts for a workbook.

`--encrypt`

Create encrypted extract.

`--include-all`

Include all embedded data sources within target workbook. Only available when creating extracts for workbook.

`--parent-project-path`

Path of the project that is the parent of the project that contains the target resource. Must specify the project name with --project.

`--project`

The name of the project that contains the target resource. Only necessary if --workbook or --datasource is specified. If unspecified, the default project 'Default' is used.

`-u, -url`

The canonical name for the resource as it appears in the URL.

`-w, -workbook`

The name of the target workbook for extract creation.

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## creategroup *group-name*

Creates a group. Use `addusers` to add users after the group has been created.

**Example**

```
tabcmd creategroup "Development"
```

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## createproject *project-name*

Creates a project.

**Example**

```
tabcmd createproject -n "Quarterly_Reports" -d "Workbooks showing
quarterly sales reports."
```

Options

`-n, --name`

Specifies the name of the project that you want to create.

`--parent-project-path`

Specifies the name of the parent project for the nested project as specified with the `-n` option. For example, to specify a project called "Nested" that exists in a "Main" project, use the following syntax: `--parent-project-path "Main" -n "Nested"`.

`-d, --description`

Specifies a description for the project.

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

--

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## createsiteusers *filename.csv*

Adds users to a site, based on information supplied in a comma-separated values (CSV) file. If the user isn't already created on the server, the command creates the user before adding that user to the site.

The CSV file must contain one or more user names and can also include (for each user) a password, full name, license type, administrator level, publisher (yes/no), and email address. For information about the format of the CSV file, see CSV Import File Guidelines.

As an alternative to including administrator level and publisher permissions in the CSV file, you can pass access level information by including the `--role` option and specifying the site role you want to assign users listed in the CSV file.

By default, users are added to the site that you're logged in to. To add users to a different site, include the global `--site` option and specify that site. (You must have permissions to create users on the site you specify.)

**Example**

```
tabcmd createsiteusers "users.csv" --role "Explorer"
```

Options

`--admin-type`

Deprecated. Use the `--role` option instead.

`--auth-type`

Sets the authentication type (`TableauID` or `SAML`) for all users in the `.csv` file. If unspecified, the default is `TableauID`.

**Note:** To use SAML authentication, the site itself must be SAML-enabled as well. For information, see Enable SAML Authentication on a Site.

`--[no-]complete`

Deprecated. Default error behavior: if there are more than 3 errors within a ten-row span, then the command will fail.

`--no-publisher`

Deprecated. Use the `--role` option instead.

`--nowait`

Don't wait for asynchronous jobs to complete.

`--publisher`

Deprecated. Use the `--role` option instead.

`--role`

Specifies a site role for all users in the `.csv` file. When you want to assign site roles using the --role option, create a separate CSV file for each site role.

Valid values are: `ServerAdministrator`, `SiteAdministratorCreator`, `SiteAdministratorExplorer`, `SiteAdministrator`, `Creator`, `Explorer-CanPublish`, `Publisher`, `Explorer`, `Interactor`, `Viewer`, and `Unlicensed`.

The default is `Unlicensed` for new users and unchanged for existing users. Users are added as unlicensed also if you have a user-based server installation, and if the `createsiteusers` command creates a new user, but you have already reached the limit on the number of licenses for your users.

> **Note:** On a multi-site Tableau Server, if you want to assign the `Server-Administrator` site role using the `--role` option, use the `createusers` command instead of `createsiteusers`.

`--silent-progress`

Don't display progress messages for the command.

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## delete *workbook-name* or *datasource-name*

Deletes the specified workbook or data source from the server.

This command takes the name of the workbook or data source as it is on the server, not the file name when it was published.

**Example**

```
tabcmd delete "Sales_Analysis"
```

Options

`-r, --project`

The name of the project containing the workbook or data source you want to delete. If not specified, the “Default” project is assumed.

`--parent-project-path`

Specifies the name of the parent project for the nested project as specified with the `-r` option. For example, to specify a project called "Nested" that exists in a "Main" project, use the following syntax: `--parent-project-path "Main" -r "Nested"`.

`--workbook`

The name of the workbook you want to delete.

`--datasource`

The name of the data source you want to delete.

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## deleteextracts

Deletes extracts for a published workbook or data source.

Options

`-d, --datasource`

The name of the target data source for extract deletion.

`--embedded-datasources`

A space-separated list of embedded data source names within the target workbook. Enclose data source names with double quotes if they contain spaces. Only available when deleting extracts for a workbook.

`--encrypt`

Create encrypted extract.

`--include-all`

Include all embedded data sources within target workbook.

`--parent-project-path`

Path of the project that is the parent of the project that contains the target resource. Must specify the project name with --project.

`--project`

The name of the project that contains the target resource. Only necessary if --workbook or --datasource is specified. If unspecified, the default project 'Default' is used.

`-u, -url`

The canonical name for the resource as it appears in the URL.

`-w, -workbook`

The name of the target workbook for extract deletion.

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## deletegroup *group-name*

Deletes the specified group from the server.

**Example**

```
tabcmd deletegroup "Development"
```

### Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## deleteproject *project-name*

Deletes the specified project from the server.

Using `tabcmd`, you can specify only a top-level project in a project hierarchy. To automate tasks you want to perform on a project within a parent project, use the equivalent Tableau REST API call.

**Example**

```
tabcmd deleteproject "Designs"
```

Option

`--parent-project-path`

Specifies the name of the parent project for the nested project as specified with the command. For example, to specify a project called "Designs" that exists in a "Main" project, use the following syntax: `--parent-project-path "Main" "Designs"`.

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## deletesiteusers *filename.csv*

Removes users from from the site that you're logged in to. The users to be removed are specified in a file that contains a simple list of one user name per line. (No additional information is required beyond the user name.)

By default, if the server has only one site, or if the user belongs to only one site, the user is also removed from the server. On a Tableau Server Enterprise installation, if the server contains multiple sites, users who are assigned the site role of **Server Administrator** are removed from the site but aren't removed from the server.

If the user owns content, the user's role is change to **Unlicensed**, but the user isn't removed from the server or the site. The content is still owned by that user. To remove the user completely, you must change the owner of the content and then try removing the user again.

**Example**

```
tabcmd deletesiteusers "users.csv"
```

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## export

Exports a view or workbook from Tableau Cloud and saves it to a file. This command can also export just the data used for a view. View data is exported at the summary level. To export detail-level data, you must use the Tableau Server UI. For details, see Download Views and Workbooks.

Note the following when you use this command:

- **Permissions**: To export, you must have the **Export Image** permission. By default, this permission is Allowed or Inherited for all roles, although permissions can be set per workbook or view.
- **Exporting data**: To export just the data for a view, use the `--csv` option. This exports the summary data used in a view to a .csv file.
- **Specifying the view, workbook, or data to export**:
  - Use part of the URL to identify what to export, specifically the `"workbook/view"` string as it appears in the URL for the workbook or view. Don't use the “friendly name,” and exclude the `:iid=<n>` session ID at the end of the URL.

    For example, the Tableau sample view *Order Details* in the *Superstore* workbook has a URL similar to this: `<server_name>/#/views/Superstore/OrderDetails?:iid=2`

    To export the *Order Details* view, use the string `Superstore/OrderDetails`.

    Do *not* use `Superstore/Order Details`, or `Superstore/OrderDetails?:iid=2`.
  - If the server is running multiple sites and the view or workbook is on a site other than Default, Use `-t <site_id>`.
  - To export a workbook, get the URL string by opening a view in the workbook, and include the view in the string you use.

    In the above example, to export the *Superstore* workbook, use the string `Superstore/OrderDetails`.
  - To export a workbook, it must have been published with **Show Sheets as Tabs** selected in the Tableau Desktop Publish dialog box.

    **Note:** The Tableau workbook that contains the admin views can't be exported.

- To filter the data you download, add a parameter filter using this format:

  `?<filter_name>=value`

  or, if filtering on a parameter and that parameter has a display name that matches the name of a measure or dimension:

  `?Parameters.<filter_name>=value`

- **The saved file's format**: Your format options depend on what's being exported. A workbook can only be exported as a PDF using the `--fullpdf` argument. A view can be exported as a PDF (`--pdf`) or a PNG (`--png`).

- **The saved file's name and location** (optional): If you don't provide a name, it will be derived from the view or workbook name. If you don't provide a location, the file will be saved to your current working directory. Otherwise, you can specify a full path or one that's relative to your current working directory.

  > **Note**: You must include a file name extension such as `.csv` or `.pdf`. The command doesn't automatically add an extension to the file name that you provide.

- **Dashboard web page objects not included in PDF exports**: A dashboard can optionally include a web page object. If you're performing an export to PDF of a dashboard that includes a web page object, the web page object won't be included in the PDF.

- **Non-ASCII and non-standard ASCII characters and PDF exports**: If you're exporting a view or workbook with a name that includes a character outside the ASCII character set, or a non-standard ASCII character set, you need to URL encode (percent-encode) the character.

  For example if your command includes the city `Zürich`, you need to URL encode it as `Z%C3%BCrich`:

```
tabcmd export "/Cities/Sheet1?locationCity=Z%C3%BCrich" -full-
pdf
```

**Clearing the Cache to Use Real-Time Data**

You can optionally add the URL parameter `?:refresh=yes` to force a fresh data query instead of pulling the results from the cache. If you're using tabcmd with your own scripting and the `refresh` URL parameter is being used a great deal, this can have a negative impact on performance. It's recommended that you use `refresh` only when real-time data is required—for example, on a single dashboard instead of on an entire workbook.

**Examples**

*Views*

```
tabcmd export "Q1Sales/Sales_Report" --csv -f "Weekly-Report.csv"
```

```
tabcmd export -t Sales "Sales/Sales_Analysis" --pdf -f "C:\Tableau_
Workbooks\Weekly-Reports.pdf"
```

```
tabcmd export "Finance/InvestmentGrowth" --png
```

```
tabcmd export "Finance/InvestmentGrowth?:refresh=yes" --png
```

*Workbooks*

```
tabcmd export "Q1Sales/Sales_Report" --fullpdf
```

```
tabcmd export "Sales/Sales_Analysis" --fullpdf --pagesize tabloid -f
"C:\Tableau_Workbooks\Weekly-Reports.pdf"
```

Options

`-f, --filename`

Saves the file with the given filename and extension.

`--csv`

View only. Export the view's data (summary data) in `.csv` format.

`--pdf`

View only. Export as a PDF.

`--png`

View only. Export as an image in `.png` format.

`--fullpdf`

Workbook only. Export as a PDF. The workbook must have been published with **Show Sheets as Tabs** enabled.

`--pagelayout`

Sets the page orientation (`landscape` or `portrait`) of the exported PDF. If not specified, its Tableau Desktop setting will be used.

`--pagesize`

Sets the page size of the exported PDF as one of the following: `unspecified`, `letter`, `legal`, `note folio`, `tabloid`, `ledger`, `statement`, `executive`, `a3`, `a4`, `a5`, `b4`, `b5`, or `quarto`. Default is `letter`.

`--width`

Sets the width in pixels. Default is 800 px.

`--height`

Sets the height in pixels. Default is 600 px.

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## get *url*

Gets the resource from Tableau Cloud that's represented by the specified (partial) URL. The result is returned as a file.

Note the following when you use this command:

- **Permissions**: To get a file, you must have the **Download/Web Save As** permission. By default, this permission is allowed or inherited for all roles, although permissions can be set per workbook or view.

- **Specifying a view or workbook to get**: You specify a view to get using the `"/views/<workbookname>/<viewname>.<extension>"` string, and specify a workbook to get using the `"/workbooks/<workbookname>.<extension>"` string. Replace `<workbookname>` and `<viewname>` with the names of the workbook and view as they appear in the URL when you open the view in a browser and replace <extension> with the type of file you want to save. Don't use the session ID at the end of the URL (`?:iid=<n>`) or the "friendly" name of the workbook or view.

  For example, when you open a view *Regional Totals* in a workbook named *Metrics Summary*, the URL will look similar to this:

  `/views/MetricsSummary_1/RegionalTotals?:iid=1`

  Use the string `/views/MetricsSummary_1/RegionalTotals.<extension>` to get the view.

  Use the string `/workbooks/MetricsSummary_1.<extension>` to get the workbook.

  When downloading workbooks and views from Tableau Cloud, the content of the .twb or .twbx file is stored in plain text. All data, including filter values that may give semantic clues to the data, will be readable by anyone who opens the file.

- **File extension**: The URL must include a file extension. The extension determines what's returned. A view can be returned in PDF, PNG, or CSV (summary data only) format. A Tableau workbook is returned as a TWB if it connects to a published data source or uses a live connection, or a TWBX if it connects to a data extract.

> **Note**: If you're downloading a view to a PDF or PNG file, and if you include a `--filename` parameter that includes the .pdf or .png extension, you don't have to include a .pdf or .png extension in the URL.

- **The saved file's name and location** (optional): The name you use for `--filename` should include the file extension. If you don't provide a name and file extension, both will be derived from the URL string. If you don't provide a location, the file is saved to your current working directory. Otherwise, you can specify a full path or one that's relative to your current working directory.
- **PNG size** (optional): If the saved file is a PNG, you can specify the size, in pixels, in the URL.

**Clearing the cache to use real-time data**

You can optionally add the URL parameter `?:refresh=yes` to force a fresh data query instead of pulling the results from the cache. If you're using tabcmd with your own scripting, using the `refresh` parameter a great deal can have a negative impact on performance. It's recommended that you use `refresh` only when real-time data is required—for example, on a single dashboard instead of on an entire workbook.

**Examples**

*Views*

```
tabcmd get "/views/Sales_Analysis/Sales_Report.png" --filename "Weekly-Report.png"
```

```
tabcmd get "/views/Finance/InvestmentGrowth.pdf" -f "Q1Growth.pdf"
```

```
tabcmd get "/views/Finance/InvestmentGrowth" -f "Q1Growth.pdf"
```

```
tabcmd get "/views/Finance/InvestmentGrowth.csv"
```

```
tabcmd get "/views/Finance/InvestmentGrowth.png?:size=640,480" -f growth.png
```

```
tabcmd get "/views/Finance/InvestmentGrowth.png?:refresh=yes" -f growth.png
```

*Workbooks*

```
tabcmd get "/workbooks/Sales_Analysis.twb" -f "C:\Tableau_Workbooks\Weekly-Reports.twb"
```

### Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## login

**Important:** tabcmd 1.0 does not support multi-factor authentication (MFA). To use tabcmd with Tableau Cloud, use Tableau tabcmd 2.0 (new window). For more information about Tableau Cloud and MFA, see Multi-Factor Authentication and Tableau Cloud.

Logs in a Tableau Cloud user.

Use the `--server`, `--site`, `--username`, `--password` global options to create a session.

**Note**: When you use the **tabcmd login** command, you can't use SAML single sign-on (SSO), even if your site is configured to use SAML. To log in, you must pass the user name and password of a user who has been created in your site. You will have the permissions of the Tableau Cloud user that you're signed in as.

If you want to log in using the same information you've already used to create a session, just specify the `--password` option. The server and user name stored in the cookie will be used.

If the server is using a port other than 80 (the default), you will need to specify the port.

You need the `--site` (`-t`) option only if the server is running multiple sites and you're logging in to a site other than the Default site. If you don't provide a password you will be prompted for one. If the `--no-prompt` option is specified and no password is provided the command will fail.

Once you log in, the session will continue until it expires on the server or the `logout` command is run.

**Example**

Log in to the Tableau Cloud site with the specified site ID:

```
tabcmd login -s https://prod-useast-b.online.tableau.com -t siteID
-u user@email.com -p password
```

Options

`-s, --server`

If you're running the command from a Tableau Server computer that's on your network, you can use `http://localhost`. Otherwise, specify the computer's URL, such as `http://bigbox.myco.com` or `http://bigbox`.

If the server is using SSL, you will need to specify `https://` in the computer's URL.

For Tableau Cloud, specify the full URL including the pod that your site is deployed to. For example: `https://prod-useast-b.online.tableau.com`.

`-t, --site`

Include this option if the server has multiple sites, and you're logging in to a site other than the default site.

The site ID is used in the URL to uniquely identify the site. For example, a site named West Coast Sales might have a site ID of west-coast-sales.

`-u, --username`

The user name of the user logging in. For Tableau Cloud, the user name is the user's email address.

`-p, --password`

Password for the user specified for `--username`. If you don't provide a password you will be prompted for one.

`--password-file`

Allows the password to be stored in the given `filename.txt` file rather than the command line, for increased security.

`-x, --proxy`

Use to specify the HTTP proxy server and port (Host:Port) for the tabcmd request.

`--no-prompt`

Don't prompt for a password. If no password is specified, the `login` command will fail.

`--cookie`

Saves the session ID on login. Subsequent commands won't require a login. This value is the default for the command.

`--no-cookie`

Don't save the session ID information after a successful login. Subsequent commands will require a login.

`--timeout SECONDS`

The number of seconds the server should wait before processing the `login` command. Default: 30 seconds.

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## logout

Logs out of the server.

**Example**

```
tabcmd logout
```

## publish *filename.twb(x)*, *filename.tds(x)*, or *filename.hyper*

Publishes the specified workbook (.twb(x)), data source (.tds(x)), or extract (.hyper) to Tableau Cloud.

If you're publishing a workbook, by default, all sheets in the workbook are published without database user names or passwords.

The permissions initially assigned to the workbook or data source are copied from the project that the file is published to. Permissions for the published resource can be changed after the file has been published.

If the workbook contains user filters, one of the thumbnail options must be specified.

**Example**

```
tabcmd publish "analysis_sfdc.hyper" -n "Sales Analysis"
--oauth-username "user-name" --save-oauth
```

If the file isn't in the same directory as tabcmd, include the full path to the file.

**Example**

```
tabcmd publish "\\computer\volume\Tableau Workbooks\analysis_sfd-
c.hyper" -n "Sales Analysis" --oauth-username "username" --save-
oauth
```

Options

`-n, --name`

Name of the workbook or data source on the server. If omitted, the workbook, data source, or data extract will be named after filename.

`-o, --overwrite`

Overwrites the workbook, data source, or data extract if it already exists on the server.

`-r, --project`

Publishes the workbook, data source, or data extract into the specified project. Publishes to the “Default” project if not specified.

`--parent-project-path`

Specifies the name of the parent project for the nested project as specified with the `-r` option. For example, to specify a project called "Nested" that exists in a "Main" project, use the following syntax: `--parent-project-path "Main" -r "Nested"`.

`--db-username`

Use this option to publish a database user name with the workbook, data source, or data extract.

If you connect to the data through a protected OAuth connection and access token, us the `--oauth-username` option instead.

`--db-password`

Use this option to publish a database password with the workbook, data source, or extract.

`--save-db-password`

Stores the provided database password on the server.

`--oauth-username`

The email address of the user account. Connects the user through a preconfigured OAuth connection, if the user already has a saved access token for the cloud data source specified in `--name`. Access tokens are managed in user preferences.

For existing OAuth connections to the data source, use this option instead of `--db-username` and `--db-password`.

`--save-oauth`

Saves the credential specified by `--oauth-username` as an embedded credential with the published workbook or data source.

Subsequently, when the publisher or server administrator signs in to the server and edits the connection for that workbook or data source, the connection settings will show this OAuth credential as embedded in the content.

If you want to schedule extract refreshes after publishing, you must include this option with `--oauth-username`. This is analogous to using `--save-db-password` with a traditional database connection.

`--thumbnail-username`

If the workbook contains user filters, the thumbnails will be generated based on what the specified user can see. Can't be specified when `--thumbnail-group` option is set.

`--thumbnail-group`

If the workbook contains user filters, the thumbnails will be generated based on what the specified group can see. Can't be specified when `--thumbnail-username`option is set.

`--tabbed`

When a workbook with tabbed views is published, each sheet becomes a tab that viewers can use to navigate through the workbook. Note that this setting will override any sheet-level security.

`--append`

Append the extract file to the existing data source.

`--replace`

Use the extract file to replace the existing data source.

`--disable-uploader`

Disable the incremental file uploader.

`--restart`

Restart the file upload.

### Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## refreshextracts *workbook-name* or *datasource-name*

Performs a full or incremental refresh of extracts belonging to the specified workbook or data source.

This command takes the name of the workbook or data source as it appears on the server, not the file name when it was published. Only an administrator or the owner of the workbook or data source is allowed to perform this operation.

**Notes:**

- This method will fail and result in an error if your Server Administrator has disabled the **RunNow** setting for the site. For more information, see Tableau Server Settings.
- You can use tabcmd to refresh supported data sources that are hosted in the cloud. For example, SQL Server, MySQL, PostgreSQL on a cloud platform; Google Analytics; and so on.
- To refresh on-premises data with tabcmd, the data source must be a type that can be configured for Tableau Bridge Recommended schedules. For all other data sources that connect to on-premises data, you can use Bridge or the command-line data extract utility. Learn more at Use Bridge to Keep Data Fresh and Automate Extract Refresh Tasks from the Command Line.

**Examples**

```
tabcmd refreshextracts --datasource sales_ds
```

```
tabcmd refreshextracts --project "Sales External" --datasource
sales_ds
```

```
tabcmd refreshextracts --project "Sales External" --parent-project-
path "Main" --project "Sales External" --datasource sales_ds
```

```
tabcmd refreshextracts --workbook "My Workbook"
```

```
tabcmd refreshextracts --url SalesAnalysis
```

```
tabcmd refreshextracts --workbook "My Workbook" --addcalculations
```

```
tabcmd refreshextracts --datasource sales_ds --removecalculations
```

Options

`--incremental`

Runs the incremental refresh operation.

`--synchronous`

Adds the full refresh operation to the queue used by the Backgrounder process, to be run as soon as a Backgrounder process is available. If a Backgrounder process is available, the operation is run immediately. The refresh operation appears on the Background Tasks report.

During a synchronous refresh, `tabcmd` maintains a live connection to the server while the refresh operation is underway, polling every second until the background job is done.

> **Note:** The `--synchronous` option isn't available for data sources refreshed with Tableau Bridge.

`--workbook`

The name of the workbook containing extracts to refresh. If the workbook has spaces in its name, enclose it in quotes.

`--datasource`

The name of the data source containing extracts to refresh.

`--project`

Use with `--workbook` or `--datasource` to identify a workbook or data source in a project other than *Default*. If not specified, the Default project is assumed.

`--parent-project-path`

Specifies the name of the parent project for the nested project as specified with the `--project` option.

For example:

- To specify a project called "Nested" that exists in a "Main" project, use the following syntax:
- `--parent-project-path "Main" --project "Nested"`
- To specify a project called "Nested2" that is nested within the "Nested" project:
- `--parent-project-path "Main/Nested" --project "Nested2"`

`--url`

The name of the workbook as it appears in the URL. A workbook published as “Sales Analysis” has a URL name of “SalesAnalysis”.

`--addcalculations`

Use with `--workbook` to materialize calculations in the embedded extract of the workbook or `--datasource` to materialize calculations in the extract data source. Adds the operation to the queue used by the Backgrounder process. If a Backgrounder process is available, the operation runs immediately. This operation appears on the Background Tasks for Extracts administrative view.

`--removecalculations`

Use with `--workbook` or `--datasource` to remove calculations that were previously materialized. Adds the operation to the queue used by the Backgrounder process. If a Backgrounder process is available, the operation runs immediately. This operation appears on the Background Tasks for Extracts administrative view.

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tabcmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

## removeusers *group-name*

Removes users from the specified group.

**Example**

```
tabcmd removeusers "Development" --users "users.csv"
```

Options

`--users`

Remove the users in the given `.csv` file from the specified group. The file should be a simple list with one user name per line.

`--[no-]complete`

Requires that all rows be valid for any change to succeed. If not specified `--complete` is used.

Global options

The following options are used by all `tabcmd` commands. The `--server`, `--user`, and `--password` options are required at least once to begin a session. An authentication token is stored so subsequent commands can be run without including these options. This token remains valid for five minutes after the last command that used it.

`-h, --help`

Displays the help for the command.

**Note:** Some commands listed may not apply when using tabcmd with Tableau Cloud.

`-s, --server`

The Tableau Cloud URL, which is required at least once to begin session.

`-u, --user`

The Tableau Cloud username, which is required at least once to begin session.

`-p, --password`

The Tableau Cloud password, which is required at least once to begin session.

`--password-file`

Allows the password to be stored in the given `.txt` file rather than the command line for increased security.

`-t, --site`

Indicates that the command applies to the site specified by the Tableau Cloud site ID, surrounded by single quotes or double quotes. Use this option if the user specified is associated with more than one site. Site ID is case-sensitive when using a cached authentication token. If you do not match case you may be prompted for a password even if the token is still valid.

`--no-prompt`

When specified, the command will not prompt for a password. If no valid password is provided the command will fail.

`--[no-]cookie`

When specified, the session ID is saved on login so subsequent commands will not need to log in. Use the `no-` prefix to not save the session ID. By default, the session is saved.

`--timeout`

Waits the specified number of seconds for the server to complete processing the command. By default, the process will wait until the server responds.

`--`

Specifies the end of options on the command line. You can use `--` to indicate to `tab-cmd` that anything that follows `--` should not be interpreted as an option setting and can instead be interpreted as a value for the command. This is useful if you need to specify a value in the command that includes a hyphen. The following example shows how you might use `--` in a `tabcmd` command, where `-430105/Sheet1` is a required value for the `export` command.

```
tabcmd export --csv -f "D:\export10.csv" -- -430105/Sheet1
```

**Tip**: For Tabcmd 1.0 commands available for Tableau Server, see tabcmd commands.

## Install Switches and Properties for tabcmd (Windows)

**Important:** tabcmd 1.0 will stop working with Tableau Cloud when the pod that your site resides on moves to Hyperforce. Plan your migration to tabcmd 2.0 as soon as possible to ensure you will not be impacted. For more information about Tableau Cloud's migration to Hyperforce, see the Tableau Cloud Migration to Hyperforce knowledge article. This retirement will not impact Tableau Server.

**Note:** In most cases, you must use tabcmd command-line utility 2.0 (tabcmd 2.0) with Tableau Cloud. Tabcmd 2.0 is available at Tableau tabcmd. This new version allows you to: run tabcmd commands on MacOS and Linux, authenticate using personal access tokens (PATs), and allows you to be multi-factor authentication (MFA) compliant. Version 2.0 is built on public endpoints available in the Python-based Tableau Server Client (TSC).

You can use the following switches when installing the Tableau Server Command Line Utility (tabcmd) version 2019.4.0 or later from the command line on Windows.

**Note:** There are no equivalent switches for the Linux version of the tabcmd installer.

| Switch | Description | Comments |
|---|---|---|
| `/install` \| `/re-pair` \| `/un-install` \| | Run Setup to either install, repair, or unin- | Default is to install, displaying UI and all prompts. If no directory is specified on a fresh install, `C:\Pro-gram Files\Tableau\Tableau Server-` |

| | | |
|---|---|---|
| `/layout "<directory>"` | stall tabcmd, or with `/layout`, create a complete local copy of the installation bundle in the directory specified. | `\<version>\extras\Command Line Utility` is assumed. |
| `/passive` | Run Setup with minimal UI and no prompts. | |
| `/quiet` \| `/silent` | Run Setup in unattended, fully silent mode. No UI or prompts are displayed. | **Note:** Use either `/silent` or `/quiet`, not both. |
| `/norestart` | Run Setup without restarting Windows, even if a restart is necessary. | **Note:** In certain rare cases, a restart cannot be suppressed, even when this option is used. This is most likely when an earlier system restart was skipped, for example, during installation of other software. |
| `/log "<logfile>"` | Log information to the | If no file location is specified, the log file is written to the user's TEMP folder (`C:\User-` |

| | | |
|---|---|---|
| | specified file and path.<br><br>By default log files are created in the user's `%TEMP%` folder with a naming convention of `Tableau_Server_Command_Line_utility_<version_code>.log`. | `s\<username>\AppData\Local\Temp`). Check this log file for errors after installation.<br><br>Example: `<Setup file> /silent /log "C:\Tableau\Logs\tabcmd-Install" ACCEPTEULA=1` |

| Properties | Description | Comments |
|---|---|---|
| `ACCEPTEULA=1\|0` | Accept the End User License Agreement (EULA). Required for quiet, silent, and passive | If not included when using `/passive`, `/silent` or `/quiet`, Setup fails silently.<br><br>If included but set to 0, Setup fails. |

| | | |
|---|---|---|
| | install. 1 = accept the EULA, 0 = do not accept the EULA. | |
| INSTALLDIR-R="<path\to\installation\directory>" | Install tabcmd to the specified non-default install location. | Specifies the location to install tabcmd. If not used, tabcmd is installed to C:\Program Files\Tableau\Tableau Server\<version_code>\extras\Command Line Utility<br><br>Example: <Setup file> /silent INSTALLDIR-R="C:\tabcmd" |

# Managing Background Jobs in Tableau Cloud

In Tableau Cloud, users can schedule extract refreshes, subscriptions, or flows to run periodically. These scheduled items are referred to as **Tasks**. The Backgrounder process initiates unique instances of these tasks to run them at the scheduled time. The unique instances of the tasks that are initiated as a result are referred to as **Jobs**. Jobs are also created for runs that are initiated manually, by clicking the **Run Now** option in the web interface, programmatically through REST API, or tabcmd commands.

For example, an extract refresh task is created to run daily at 9 AM. This is an extract refresh task, and every day at 9 AM, a job will be created for the Backgrounder to run.

Running all these jobs can mean that Backgrounder uses a lot of resources at various times during the day. Using the Job Management feature, Site administrators can get more details on these jobs that happen in their Site, and take action on those jobs to better manage resource usage. .

The **Run Now** settings on the **General** settings page also allows you to manage your resources by either allowing or blocking users from running jobs manually. By default, this option is selected to allow users to run jobs manually. Clear the check box to prevent users from running jobs manually.

The Jobs page which contains the information about jobs can be accessed by navigating to the **Existing Tasks** menu of the left navigation menu.

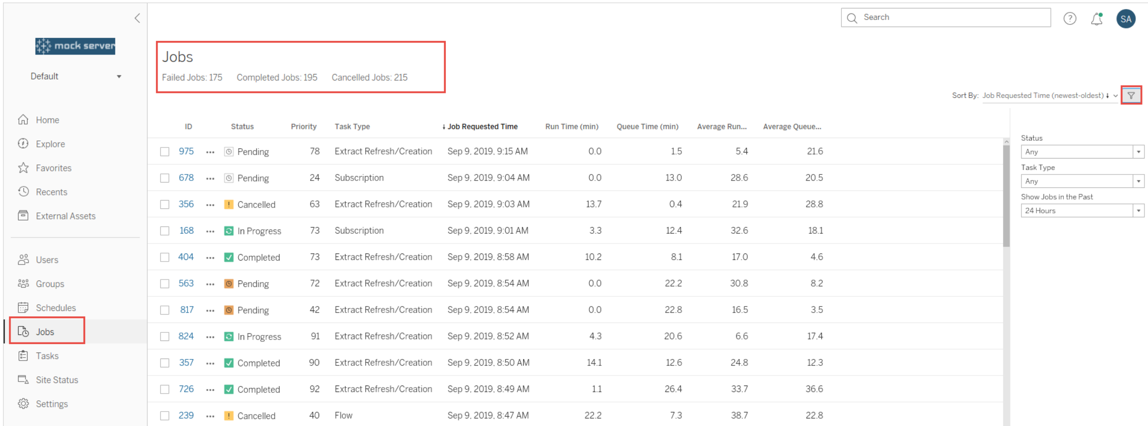
**Note:** Information about jobs can only be viewed by site administrators.

## Overview

This topic describes how to view and understand the information displayed in the Jobs page.

Your Tableau Cloud site comes with capacity to support all your users' analytic needs. A site's capacity includes capacity for storage and tasks that need to be performed on the site for extracts, metrics, subscriptions, and flows. (The legacy Metrics feature was retired in February 2024 for Tableau Cloud and in Tableau Server version 2024.2. For more information, see Create and Troubleshoot Metrics (Retired).) The jobs page allows you to monitor the tasks for your Tableau Cloudsite. For more information on site capacity, see Tableau Cloud Site Capacity.

At the top of the page there are high level statistics for the number of **Failed**, **Completed**, and **Canceled** jobs within the past 24 hours. Applying filters do not change these values.

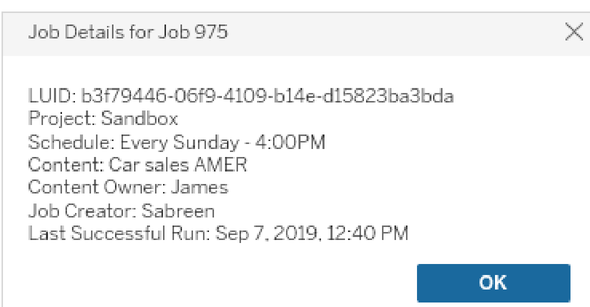



For each job generated, there is a Job ID, the status of that job, the priority, the type of task that the job was generated from, the current run time - if the job is in-progress, current queue time - if queued, as well as the average run time, and average queue time.

**Note:** The priority for tasks and schedules can't be adjusted in Tableau Cloud.

Tableau records historical run times and queue times to compute the average run times and average queue times. Both average run times and average queue times are calculated as weighted averages using the following formula: ((current run time or queue time average x 4) + most recent run time or queue time)/ 5.

The Job ID can be useful when viewing jobs on **Admin views** . When you click on the Job ID, you will see more detailed information about the job, such as the Job LUID, the project name, the schedule , the content name, content owner, job creator, and the last time the job ran successfully.



**Note:** Doing a **Refresh Now** from the **Data Sources** page will only show the LUID information in the **Job Details** dialog box.

## Task Types

There are several types of tasks:

- Bridge Refresh: Includes full and incremental extract refreshes that use Cloud schedules. For more information, see About Bridge Refresh jobs.

- Extracts: This includes extract creation, incremental extract refreshes, and full extract refreshes. .

- Subscriptions: Includes subscriptions for workbooks and views.  For more information, see Create a Subscription to a View or Workbook.

- Flow: This includes scheduled flows and manual flow runs. See Job runtime capacity for information about the maximum runtime for flows and Concurrent jobs capacity for capacity limits when running concurrent flow jobs. Scheduling more flows than the number of resource blocks you have can result in an error. See the Knowledge Base article Flow Job Pending for more information.

- Encryption: Includes the following:
  - Extract encryption and decryption
  - Flow encryption and decryption
  - Re-key extracts and flows

## Filters

You can filter to see only certain jobs. The available filters are by Job Status type, Task Type, and Time Range. For the Time Range filter, you can choose from past one to 24 hours, in four hour increments.

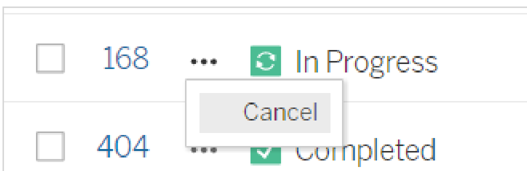
## Canceling Jobs

Extract refreshes, subscriptions and flow run jobs can be canceled. You can only cancel one job at a time, and selecting multiple jobs at one time for cancellation is not supported.

When you cancel a job, an email with the time the job was canceled, the affected content, and the time the job ran before being canceled is sent to the recipients that you select in the **Cancel Job** dialog box . In addition you can add your customized notes to be included in the email.

If you do not select any recipients, the job will be canceled, but no email will be sent.

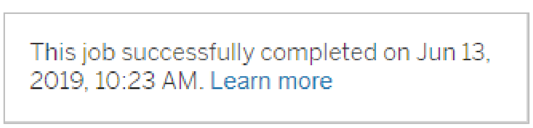
To cancel a job, click on the ellipses next to the Job ID and use the dialog to cancel the job:



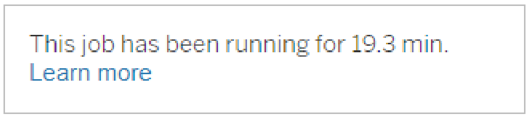

## Status

There are seven types of status that jobs can be in, and hovering over each status will display more relevant information.

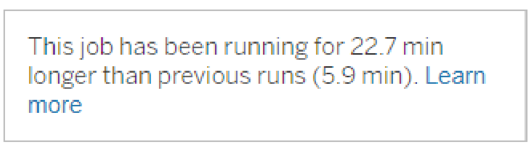
- **Completed:** This job shows as **Completed successfully** and you can see the time when the job completed in the tooltip that is displayed when you hover over the status.

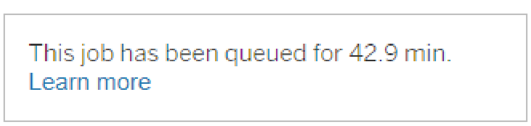
- **In Progress:** This job shows as **In Progress**. A time for how long the job has been running for is displayed in the tooltip when you hover over the status.

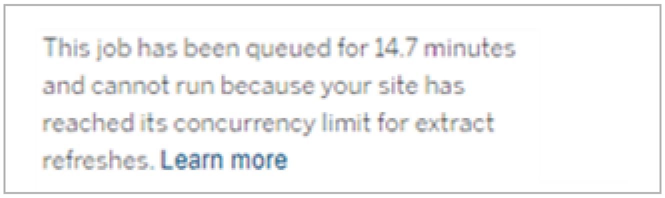

- **In Progress:** This job is **In Progress**, but is **running late**. Tableau keeps track of the average run times for the same job, and if the current run time is longer than the average run time, then it is considered running late. Times for how much longer than average the job has been running and its average run time is provided in the tooltip that is displayed when you hover over the status.

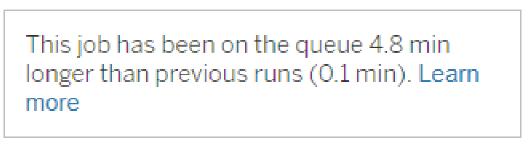

- **Pending:** This job is currently **Pending**, waiting to be run when there is available Backgrounder capacity. A time for how long the job has been in the queue for is provided in the tooltip that is displayed when you hover over the status.

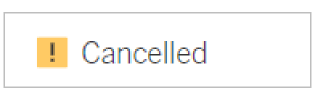
- **Pending:** The flow cannot be run because the number of Resource Blocks is less than the number of flow you have scheduled and the site has reached its concurrency limit.

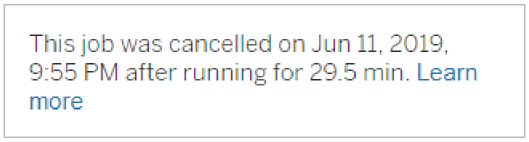




- **Pending:** This job is currently **Pending**, but is **running late**. Tableau keeps track of the average queue times for the same job, and if the current queue time is longer than the average queue time then it is considered running late. Times for how much longer than average the job has been queued is provided in the tooltip that is displayed when you hover over the status.

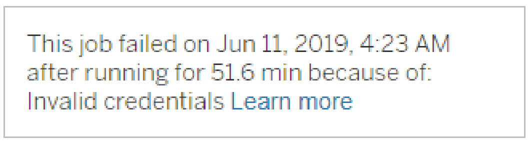




- **Canceled:** This job was **Canceled** by a Site administrator. The time the job was canceled and how long it ran for before cancellation is provided in the tooltip that is displayed when you hover over the status.

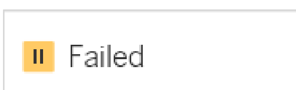


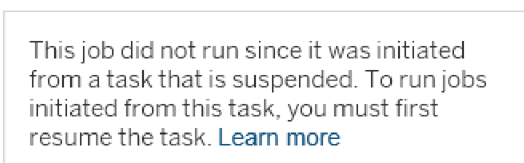



- **Failed:** This job is showing as **Failed**. The time when the job failed, how long it ran for before it failed, and why the job has failed is provided in the tooltip that is displayed when you hover over the status.


- **Suspended:** This job is showing as **Failed** with a pause icon. If the job fails 5 times consecutively, then the job is suspended. Suspended tasks are still available but Backgrounder will not create jobs for these tasks until they are resumed by the user.




## About Bridge Refresh jobs

Although Bridge Refresh jobs can generate the same statuses as other job types, Bridge Refresh jobs differ in the following ways:

- **Canceling jobs:** Bridge Refresh jobs can't be canceled from the Jobs page. Instead, ensure that Bridge clients are configured with the appropriate timeout limit to prevent any misuse of refreshes. For more information, see Change the Bridge Client Settings

- **"Sent to Bridge" job status:** A "Sent to Bridge" status indicates a completed Bridge Refresh job. A completed Bridge Refresh job means that the refresh job was successfully sent to a Bridge client in the pool. A completed Bridge Refresh job does not indicate whether the refresh itself completed successfully. If a refresh fails for whatever reason, the publisher (data source owner) is notified through both an account alert and a failure email alert. These alerts provide the publisher troubleshooting steps to help resolve the issue.

- **Subscription and Bridge Refresh jobs:** Subscription jobs can't be initiated by completed Bridge Refresh jobs. This is because a completed Bridge Refresh job only indicates whether the refresh job was successfully sent to a Bridge client in the pool and not whether the refresh job was completed successfully.

**Notes:**

- Refresh jobs that originate from Bridge (legacy) schedules are not captured on the Jobs page. To monitor refresh jobs for Bridge (legacy) schedules, you can refer to the Bridge Extracts admin view. For more information, see Bridge Extracts.
- For troubleshooting Bridge errors you see on the Jobs page, see Troubleshoot pooling.

## Monitoring solutions for Data Connect and Tableau Bridge

Several monitoring solutions are available in Tableau Cloud to help you manage different monitoring scenarios for Data Connect and Tableau Bridge. All of these solutions are available to administrators by default. Admin Insights can be made available for other individuals if desired.

- Jobs page: Monitor real-time extract job status for jobs performed in the last 24 hours as described earlier in this topic.

- Administrative Views: Monitor real-time extract job status and performance. Includes recent job history for longer term analysis. See Find Admin Views.

- Admin Insights: Monitor job status and performance using Tableau Cloud data sources that are published in your environment. This data is updated daily and shows historical data for longer term analysis. It can be shared with non-admin users if desired. See Use Admin Insights to Create Custom Views.

For more information on how to use these tools and other best practices for deploying Data Connect and Bridge, download the whitepaper, Accessing Your Private Network Data with Tableau Cloud - Best Practices for Data Connect and Tableau Bridge.

# Manage Data

After you configure your Tableau Cloud site with your logo and authentication options, you can start organizing the *content* framework for the way you and your users want to share Tableau data. To populate your Tableau Cloud site with content (data, reports, and so on), you or the data professionals in your organization *publish* that content. Depending on the type of license, users can connect to and publish content from Tableau Desktop, or from the Tableau Cloud web editing environment.

Types of content you can publish include standalone data sources that users can share among multiple workbooks, and workbooks that contain *embedded* data connections with visualizations based on that data. Each of these types has pros and cons, which are explained in the Publishing resources below.

## Determine your organization's publishing needs

As the site administrator, before you open the site for publishing, evaluate how much preparation you think is appropriate for your level of Tableau Cloud use:

- If you don't have strict requirements around data access—for example, you have just a few users who all share the same data—you might dive in to the Publishing resources, starting with publishing steps, and adjust your publishing and content management practices as you go.
- If people use Tableau across distinct areas of your organization, or if you have a large Tableau user population, we recommend using the Publishing resources to create a test environment, and working out access and discoverability wrinkles. You can still adjust practices as you go, but it's not as easy to do this after you open up the site to a large group of active users.

Examples of additional factors you might need to consider are authorization (permissions for who gets access to what), data security and compliance requirements, minimizing users' need to contact you for help if they can't figure out where to publish or find their data, and so on. For more information, see Configure Projects, Groups, Group Sets, and Permissions for Managed Self-Service.

## Summary of the publishing process

In Tableau Desktop, you open the workbook or data connection you want to upload to Tableau Cloud, and go to the Server menu to publish it.

During the publishing steps, you sign in to Tableau Cloud, entering the Tableau Cloud address (**https://online.tableau.com**) and your credentials.

The publishing steps require you to make decisions related to how you and others in your organization will access your data source or workbook. In some cases, this can involve a few layers of complexity, and it helps for you to understand how these layers fit together. Use the topics in the following lists to determine the level of complexity you need and to help establish appropriate publishing guidelines.

## Publishing resources

These resources are part of the Tableau User Help and open in a new browser window.

- **Publishing concepts**

  Prepare for Publishing a Workbook

  Publish Data Sources and Workbooks

  Best Practices for Published Data Sources

- **Basic publishing steps for informal collaboration**

  Simple Steps to Share a Workbook

- **Comprehensive data source planning and publishing steps for meeting compliance and security standards, creating a data “source of truth,” and using best practices**

  Plan the Data Source

  Publish a Data Source

  Publish a Workbook

# Tableau Cloud storage limit

A site has a 1 TB storage limit for workbooks and extracts. The storage limit is not configurable. For enterprises that require more storage, Tableau+ or Tableau Enterprise licensing may be a good option For more information, see Understanding License Models.

For additional technical specifications for Tableau Cloud, see Technical Specifications on the Tableau website.

# Tableau Cloud data connection support

You can publish data sources and workbooks using direct (live) or extract connections to your underlying database. You can also publish multi-connection data sources that use either or both types of connection. The database connections defined in the workbook or data source determines how you can publish and keep the data fresh on Tableau Cloud.

If you’re familiar with connection types and want a more specific list of data types and their supported connections, see Keep Data Fresh. Otherwise, read on.

## Connector types that support direct (live) connections to Tableau Cloud

When you use live connections, published workbooks and data sources always reflect what is current in the underlying database.

Tableau Cloud supports live connections to:

- Google BigQuery, Amazon Redshift data, or SQL-based data hosted on a cloud platform; for example, Amazon RDS, Microsoft SQL Azure, or similar service.

  For direct connections to cloud data, you usually need to add Tableau Cloud to your data provider's authorized list.

- On-premises relational data, such as SQL Server or Oracle, when you use Tableau Bridge to maintain the connection.

  To learn more about Tableau Bridge, see Use Tableau Bridge to Keep Data Fresh.

You can embed database credentials in live connections so all users who have access to the published content can see the underlying data. Or you can require users to provide their own database credentials. In that case, even if they can open the published content on the server, they need to sign in to the underlying database to see it.

## Connector types that support extract connections

For any type of data that Tableau can connect to, users can publish extracts with embedded database credentials, and set up recurring refresh schedules.

You can create an extract in Tableau Desktop, before you initiate the publishing process, to have finer control over the connection definition. You might do this if you want to publish a sampling of the data, or to set up the ability to refresh incrementally. Otherwise, Tableau creates the extract during publishing, and you can do full refreshes only.

After Tableau completes the publishing step, it guides you through the steps for setting up a schedule for refreshing your data. If your Tableau data source or workbook connects to underlying data in the cloud, refreshes are run from Tableau Cloud directly. If the underlying data is on your local network, you use Tableau Bridge.

To learn more about Tableau Bridge, see Use Tableau Bridge to Keep Data Fresh.

# Creators: Connect to Data on the Web

Before you can create a workbook and build a view on the web to analyze your data on the web, you must connect to your data. Tableau supports connecting to data sources on the web published through Tableau Desktop, or, connecting to data directly through Tableau Cloud, Tableau Server, or Tableau Public.

Starting in 2019.3, Tableau Catalog is available as part of the Data Management offering for Tableau Server and Tableau Cloud. When Tableau Catalog is enabled in your environment, in addition to navigating and connecting to data from Explore, you can navigate and connect to more kinds of data, like databases and tables, from Tableau Catalog For more information about Tableau Catalog, see "About Tableau Catalog" in the Tableau Server or Tableau Cloud Help. Starting in 2021.4, Data Management includes virtual connections, a central access point to data. For more information, see "About Virtual Connections and Data Policies" in the Tableau Server or Tableau Cloud help.

## Open the Connect to Data page

On the web, you use the Connect to Data page to access data to connect to. After you sign in to Tableau Server or Tableau Cloud, you can open this page two ways:

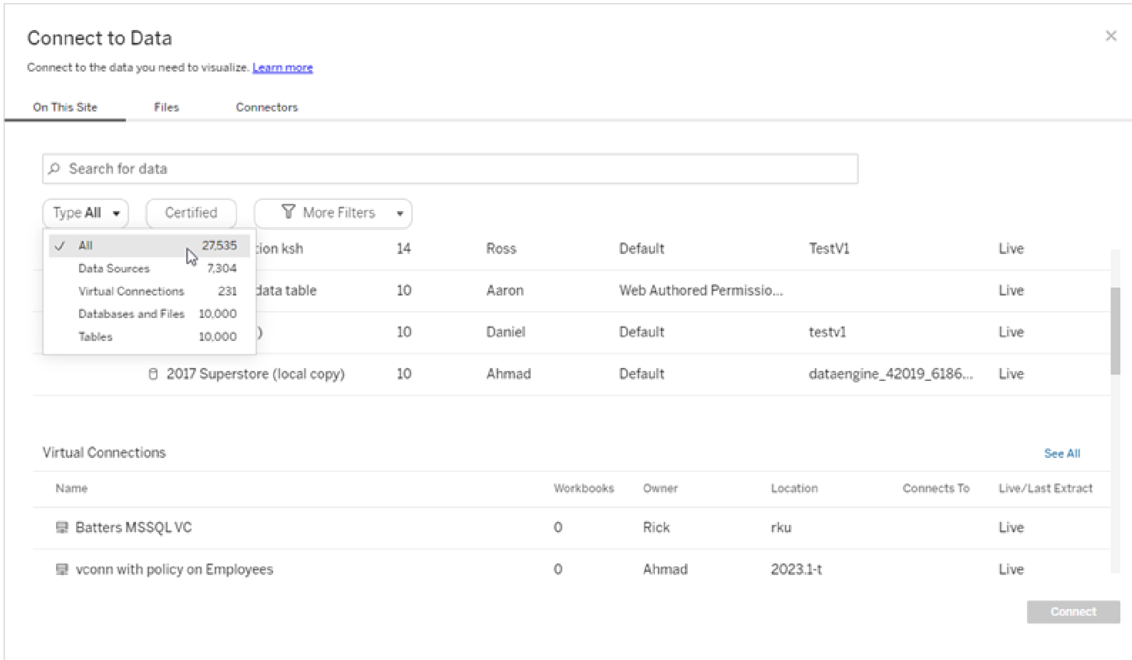
- **Home** > **New** > **Workbook**
- **Explore** > **New** > **Workbook**

If you’re on Tableau Public, you can open this page from your author profile:

- **My Profile** > **Create a Viz**

The **Connect to Data** dialog displays a scrollable list of mixed content that’s popular. If you have a Data Management license, you can connect to data with a virtual connection, and if you have Data Management with Tableau Catalog enabled, you can also connect to external assets, like databases, files, and tables.

The responsive search field shows a list of suggestions that updates as you enter text. Filter search results by type of data, certification status, or other filters that depend on the type of data selected. For example, some types of data may allow you to filter based on tags, connection type, data quality warnings, or other criteria. Older versions of the dialog look and function slightly differently, but the overall function is similar.




On the Connect to Data page, the tabs you see depend on the product you have.

## Tableau Server

On Tableau Server, select from the following tabs to connect to data: On this site, Files, and Connectors.

### Connect to data On this site

1. Select **On this site** to browse to or search for published data sources.
2. Select the data source under **Name** and click the **Connect** button.

> **Note:** In addition to connecting to data sources, when you have Data Management, you can use **On this site** to connect to data using a virtual connection. When Tableau Catalog is enabled you can also connect to databases, files, and tables.

## Connect to files

Tableau supports uploading Excel, text-based data sources (.xlsx, .csv, .tsv), and spatial file formats that only require one file (.kml, .geojson, .topojson, .json, and Esri shapefiles and Esri File Geodatabases packaged in a .zip) directly in your browser. In the **Files** tab of the **Connect to Data** pane, connect to a file by dragging and dropping it into the field or clicking **Upload from Computer**. The maximum file size you can upload is 1 GB.

## Use connectors

From the **Connectors** tab, you can connect to data housed in a cloud database or on a server in your enterprise. You must supply connection information for each data connection that you make. For example, for most data connections, you must supply a server name and your sign-in information.

Supported Connectors has information on how to connect Tableau to each of these connector types to set up your data source. If the connector you need doesn't appear in the Connectors tab, you can connect to data through Tableau Desktop and publish your data source to Tableau Cloud or Tableau Server for web authoring. Learn more about how to Publish a Data Source in Tableau Desktop.

When Tableau successfully connects to your data, the Data Source page opens so that you can prepare the data for analysis and begin building your view. To learn more, see Creators: Prepare Data on the Web.

Tableau Server connectors

| | | |
|---|---|---|
| Actian Matrix* | Google BigQuery**‡ | OData‡ |
| Alibaba AnalyticDB for MySQL‡ | Google BigQuery JDBC**‡ | OneDrive‡ |
| Alibaba Data Lake Analytics‡ | Google Cloud SQL‡ | Oracle‡ |
| Alibaba MaxCompute‡ | Google Drive‡ | Pivotal Greenplum Database‡ |
| | Impala‡ | PostgreSQL‡ |

- Amazon Athena‡
- Amazon Aurora for MySQL‡
- Amazon EMR Hadoop Hive‡
- Amazon Redshift‡
- Apache Drill‡
- Aster Database*
- Azure Data Lake Storage Gen2‡
- Box‡
- Cloudera Hadoop‡
- Databricks‡
- Datorama by Salesforce‡
- Denodo‡
- Dremio by Dremio‡
- Dropbox‡
- Esri Connector‡
- Exasol‡
- Kognito*
- Kyvos‡
- Hortonworks Hadoop Hive
- IBM BigInsights
- IBM DB2‡
- IBM PDA (Netezza)*
- Kyvos‡
- MariaDB‡
- MarkLogic*
- Microsoft Azure SQL Database‡
- Microsoft Azure Synapse Analytics‡
- Microsoft SQL Server‡
- MonetDB*
- MongoDB BI Connector‡
- MySQL‡
- Progress OpenEdge*
- Presto‡
- Qubole Presto‡
- SAP HANA (for virtual connections only)‡
- SAP Sybase ASE*
- SAP Sybase IQ*
- Salesforce‡
- SharePoint Lists‡
- SingleStore (formerly MemSQL)‡
- Snowflake‡
- Spark SQL‡
- Teradata***‡
- Vertica‡

*Not available on Linux servers.

**Google BigQuery needs OAuth when creating data sources from the web. Learn more about how server administrators can Set up OAuth for Google.

***Teradata web authoring currently doesn’t support query banding functionality. See Teradata for details.

‡Supports virtual connections if you have Data Management. See About Virtual Connections and Data Policies in the Tableau Server help for details.

Tableau Catalog Supported Connectors

Tableau Catalog supports making a connection with a subset of the data connectors that Tableau Server supports. If a data source, database, file, or table is grayed out, you can't connect from Tableau Server. You can, however, connect from the Tableau Desktop **Connect** pane, if you have the correct permissions.

# Tableau Cloud

On Tableau Cloud, select from the following tabs to connect to data: On this site, Files, Connectors, and Dashboard Starters.

## Connect to data On this site

1. Select **On this site** to browse to or search for published data sources.
2. Select the data source under **Name** and click the **Connect** button

> **Note:** In addition to connecting to data sources, when you have Data Management, you can use **On this site** to connect to data using a virtual connection. When Tableau Catalog is enabled you can also connect to databases, files, and tables.

## Connect to files

Tableau supports uploading Excel or text-based data sources (.xlsx, .csv, .tsv) directly in your browser. In the **Files** tab of the Connect to Data pane, connect to an Excel or text file by dragging and dropping it into the field or clicking **Upload from Computer**. The maximum file size you can upload is 1 GB.

## Use connectors

From the **Connectors** tab, you can connect to data housed in a cloud database or on a server in your enterprise. You must supply connection information for each data connection that you make. For example, for most data connections, you must supply a server name and your sign-in information.

Supported Connectors has information on how to connect Tableau to your data using connectors. If the connector you need doesn't appear in the Connectors tab, you can connect to data through Tableau Desktop and publish your data source to Tableau Cloud or Tableau Server for web authoring. Learn more about how to Publish a Data Source in Tableau Desktop.

> **Note**: If you're unable to connect to your data from Tableau Cloud, check to see if the database is publicly accessible. Tableau Cloud can only connect to data that's accessible from the public internet. If your data is behind a private network, you can connect using Tableau Bridge. To learn more, see Publishers: Use Tableau Bridge to Keep Tableau Cloud Data Fresh.

Tableau Cloud Connectors

- Alibaba AnalyticsDB for MySQL‡
- Alibaba Data Lake Analytics‡
- Amazon Athena‡
- Amazon Aurora for MySQL‡
- Amazon EMR Hadoop Hive‡
- Amazon Redshift‡
- Apache Drill‡
- Dropbox*‡
- Esri Connector‡
- Exasol‡
- Google BigQuery*‡
- Google Cloud SQL (MySQL compatible)‡§
- Google Drive‡
- Hortonworks Hadoop Hive
- OData‡
- OneDrive*‡
- Oracle‡
- Pivotal Greenplum Database‡
- PostgreSQL‡
- Presto‡
- Qubole Presto‡

Azure Data Lake Storage Gen2‡

Azure Synapse Analytics (SQL Server compatible)

Box‡

Cloudera Hadoop‡

Databricks‡

Datorama by Salesforce‡

Denodo‡

Dremio by Dremio‡

Impala‡

Kyvos‡

MariaDB‡

Microsoft Azure SQL Database‡

Microsoft Azure Synapse Analytics‡

Microsoft SQL Server‡

MongoDB BI Connector‡

MySQL‡

Salesforce‡

SAP HANA (for virtual connections only)‡

SharePoint Lists‡

SingleStore (formerly MemSQL)‡

Snowflake‡

Spark SQL‡

Teradata**‡

Vertica‡

*For more information about using OAuth 2.0 standard for Google BigQuery, OneDrive, and Dropbox connections in Tableau Cloud, see OAuth Connections.

**Teradata web authoring currently doesn’t support query banding functionality. See Teradata for details.

‡Supports virtual connections if you have Data Management. See About Virtual Connections and Data Policies in the Tableau Cloud help for details.

§Tableau Cloud doesn't support SSL using Google Cloud SQL.

Tableau Catalog Supported Connectors

Tableau Catalog supports making a connection with a subset of data connectors that Tableau Cloud supports. If a data source, database, file, or table is grayed out, you can't connect from Tableau Cloud. You can, however, connect from the Tableau Desktop **Connect** pane, if you have the correct permissions.

### Use Dashboard Starters

On Tableau Cloud, you can author and analyze data from LinkedIn Sales Navigator, Oracle Eloqua, Salesforce, ServiceNow ITSM, and QuickBooks Online using Dashboard Starters. On the **Dashboard Starter** tab, from the list of pre-built designs, select an option and click **Use Dashboard**. See Dashboard Starters for Cloud-based Data Sources for details.

## Tableau Public

On Tableau Public, you can connect to data by uploading a supported file.

### Connect to files

Tableau supports uploading Excel or text-based data sources (.xlsx, .csv, .tsv) directly in your browser. In the **Files** tab of the Connect to Data pane, connect to an Excel or text file by dragging and dropping it into the field or clicking **Upload from Computer**. The maximum file size you can upload is 1 GB.

If you don’t have a data set, check out the free sample data sets on the Tableau Public website.

### Use connectors

From the **Connectors** tab, you can connect to data housed in a cloud database. You must supply connection information for each data connection that you make. For example, for most data connections, you must supply your sign-in information.

Supported Connectors has information on how to connect Tableau to your data using connectors. If the connector you need doesn't appear in the Connectors tab, you can connect to data through Tableau Desktop and create an data extract.

**Note**: If you're unable to connect to your data from Tableau Public, check to see if the database is publicly accessible. Tableau Public can only connect to data that's accessible from the public internet.

Tableau Public Connectors

Google Drive

OData

## After you connect

When Tableau connects to your data, the Data Source page opens so that you can prepare the data for analysis and begin building your view. To learn more, see Creators: Prepare Data on the Web.

## Keep data fresh in web authoring

**Update uploaded files in Tableau Cloud or Tableau Server**: If you manually upload a file (Excel or text) for web authoring, Tableau can't refresh the file automatically. To update your data, select "Edit Connection" to upload a new version of the file.

In Tableau Public, go to your viz and click **Request Update**. You can also keep your data fresh automatically by selecting "Keep this data in sync" in Tableau Desktop Public Edition.

**Update file-based published data sources in Tableau Cloud**: If you have a published data source in Tableau Cloud (published through Tableau Desktop) that uses file-based data, you can keep it fresh using Tableau Bridge. For more information, see Expand Data Freshness Options by Using Tableau Bridge.

# Run Initial SQL

**Note**: Tableau Prep Builder version 2019.2.2 and later supports using Initial SQL, but doesn't yet support all of the same options supported by Tableau Desktop For information about using Initial SQL with Tableau Prep Builder, see Use Initial SQL to query your connections in the Tableau Prep Builder Salesforce Help.

When connecting to some databases, you can specify an initial SQL command that will run or use a cached value when a connection is made to the database, for example, when you open the workbook, refresh an extract, sign in to Tableau Server, or publish to Tableau Server.

**Note:** Initial SQL is different than a custom SQL connection. A custom SQL connection defines a relation (or table) to issue queries against. For more information, see Connect to a Custom SQL Query.

You can use this command to:

- Set up temporary tables to use during the session.
- Set up a custom data environment.

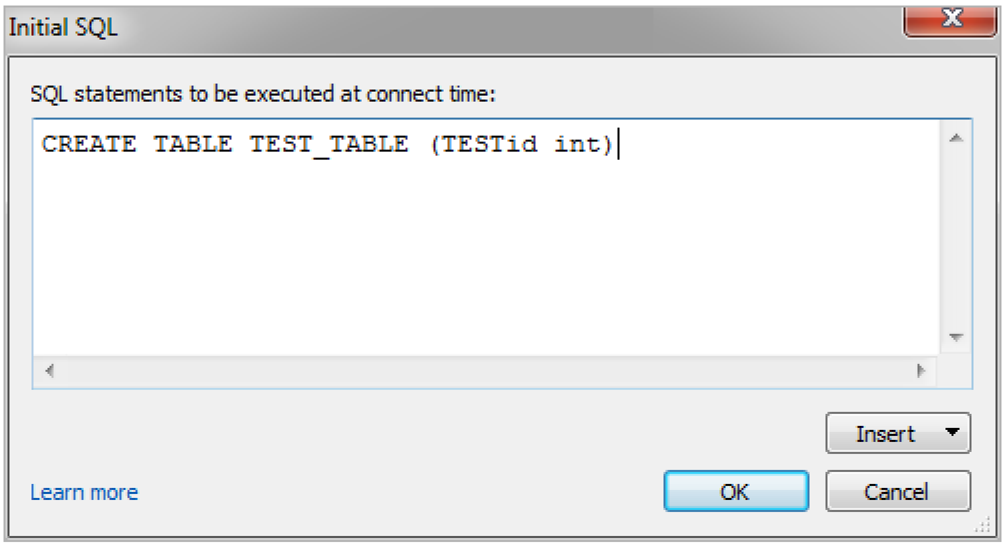
You have the option to add an initial SQL command in the Server Connection dialog box or on the Data Source page.

**Note:** If your data source supports running an initial SQL statement, an **Initial SQL** link appears in the lower-left corner of the Server Connection dialog box. For information about your data source, see Supported Connectors.

## To use initial SQL

1. In the Server Connection dialog box, click **Initial SQL**. Or, on the Data Source page, select **Data** > **Initial SQL** or **Data** > **Query Banding and Initial SQL** depending on the database you connect to.

2. Enter the SQL command into the Initial SQL dialog box. You can use the **Insert** drop-down menu to pass parameters to your data source.




> **Note:** Tableau doesn't examine the statement for errors. This SQL statement is sent to the database when you connect.

Your software license may restrict you from using initial SQL with your connection. If you publish to Tableau Server, the server must be configured to allow Initial SQL statements. By default, the server software is configured to allow these statements to run when the workbook is loaded in a web browser.

Administrators can configure the server to ignore initial SQL statements by using the `tsm configuration set` command:

```
tsm configuration set -k vizqlserver.initialsql.disabled -v true
```

If the server doesn't allow initial SQL statements, the workbook opens, but the initial SQL commands aren’t sent.

For more information about the `tsm configuration set` command, see the Tableau Server Help.

## Parameters in an initial SQL statement

You can pass parameters to your data source in an initial SQL statement. The following list has several benefits of using parameters in a initial SQL statement.

- You can configure impersonation using the **TableauServerUser** or **TableauServerUserFull** parameters.
- If your data source supports it, you can set up row-level security (for example, for Oracle VPD or SAP Sybase ASE) to make sure that users see only the data that they’re authorized to see.
- You can provide more details in logging, for example, the Tableau version or the workbook name.

The following parameters are supported in an initial SQL statement:

| Parameter | Description | Example of returned value |
|---|---|---|
| **TableauServerUser** | The username of the current server user. Use when setting up impersonation on the server. Returns an empty string if the user isn’t signed in to Tableau Server. | jsmith |
| **TableauServerUserFull** | The username and domain of the current server user. Use when setting up impersonation on the server. Returns an empty string if the user isn’t signed in to Tableau Server. | domain.lan\jsmith |

| | | |
|---|---|---|
| **TableauApp** | The name of the Tableau application. | Tableau Desktop Professional<br><br>Tableau Server |
| **TableauVersion** | The version of the Tableau application. | 9.3 |
| **WorkbookName** | The name of the Tableau workbook. Use only in workbooks with an embedded data source. | Financial-Analysis |

**Warning:** Tableau Desktop doesn't include domain. You can include it if you aren't using delegation and you set tsm configuration set -k DelegationUseFullDomainName=-v true--force-keys

The following examples show different ways you can use parameters in an initial SQL statement.

- This example sets the security context on Microsoft SQL Server:

  ```
  EXECUTE AS USER = [TableauServerUser] WITH NO REVERT;
  ```

- This example shows how, on a DataStax data source, you can use parameters to add detail to logging or to set up a session variable to track the data:

  ```
  SET TABLEAUVERSION [TableauVersion];
  ```

- This example can be used to help set up row-level security for Oracle VPD:

  ```
  begin

   DBMS_SESSION.SET_IDENTIFIER([TableauServerUser]);

  end;
  ```

**Note:**Oracle PL/SQL blocks require a trailing semicolon to terminate the block. Consult Oracle documentation for the proper syntax.

### Defer execution to the server

You can defer an initial SQL statement so that it's executed only on the server. One reason to defer execution to the server is if you don't have permission to execute the commands that set up impersonation. Use <ServerOnly></ServerOnly> tags to enclose the commands to be executed only on the server.

Example:

```
CREATE TEMP TABLE TempTable(x varchar(25));
INSERT INTO TempTable VALUES (1);
<ServerOnly>INSERT INTO TempTable Values(2);</ServerOnly>
```

### Security and impersonation

When you use the **TableauServerUser** or **TableauServerUserFull** parameter in an initial SQL statement, you'll create a dedicated connection that can't be shared with other users. This can also restrict cache sharing, which can enhance security, but may also slow performance.

## Troubleshoot 'create table' for MySQL and Oracle connections

For MySQL connections, tables aren't listed after using initial SQL to create a table

After you connect to MySQL and run an initial SQL statement, the tables might not show because of the way Tableau constructs the query.

```
CREATE TABLE TestV1.testtable77(testID int);
```

To resolve this issue, add `IF NOT EXISTS` to the SQL statement:

```
CREATE TABLE IF NOT EXISTS TestV1.TestTable(testID int);
```

For Oracle connections, using initial SQL to create a table causes Tableau to stall

After you connect to Oracle and run an initial SQL statement, Tableau is stalled with a spinning wheel because of the way Tableau constructs the query.

```
CREATE TABLE TEST_TABLE (TESTid int)
```

To resolve this issue, use the following SQL statement:

```
BEGIN
EXECUTE IMMEDIATE 'create table test_table(testID int)';
EXCEPTION
WHEN OTHERS THEN NULL;
END;
```

# Extract Upgrade to .hyper Format

In Tableau version 2018, we introduced the `.hyper` format for Tableau extracts to replace the old `.tde` format. The `.hyper` format has been the standard format used by Tableau to create extracts since 2018, and the large majority of extracts are now `.hyper` files. Beginning in early 2023, Tableau discontinued support for the `.tde` format on Tableau Cloud and Tableau Public. For more details about this deprecation, see this Tableau Community post.

## Discontinuation of support for .tde files

Beginning in 2023, the `.tde` format for Tableau extracts was deprecated. This format was replaced by the `.hyper` format in 2018 but continued to be valid for uploaded files until March 2023.

- This change took place for Tableau Cloud and Tableau Public as of March 2023.
- Beginning with version 2023.1.0 of Tableau Server, the uploading of `.tde` format files is disabled.
- 2024.2 is the last version of Tableau Desktop that supports any .tde-based workbooks, data sources, or bookmarks. Versions 2024.3 and beyond only support .hyper format.

### Manually upgrade your .tde extract using Tableau Desktop

If you manage extracts locally, you can manually upgrade your `.tde` extract to a `.hyper` extract using Tableau Desktop.

**Note**: This functionality is only available in Tableau Desktop versions 2024.2 and older.

1. In Tableau Desktop, open a workbook that uses a `.tde` extract.
2. Select the extract data source from the **Data** menu and then select **Extract** > **Upgrade**.
3. Select **File** > **Save**, which saves the workbook and also completes the extract upgrade.

### Manually upgrade your .tde with a live connection

If your .tde file uses a live connection (as opposed to an extract), you need to upgrade the file by following the instructions in this Tableau Community post about updating to .hyper files. It is not possible to update .tde files with live connections using Tableau Desktop.

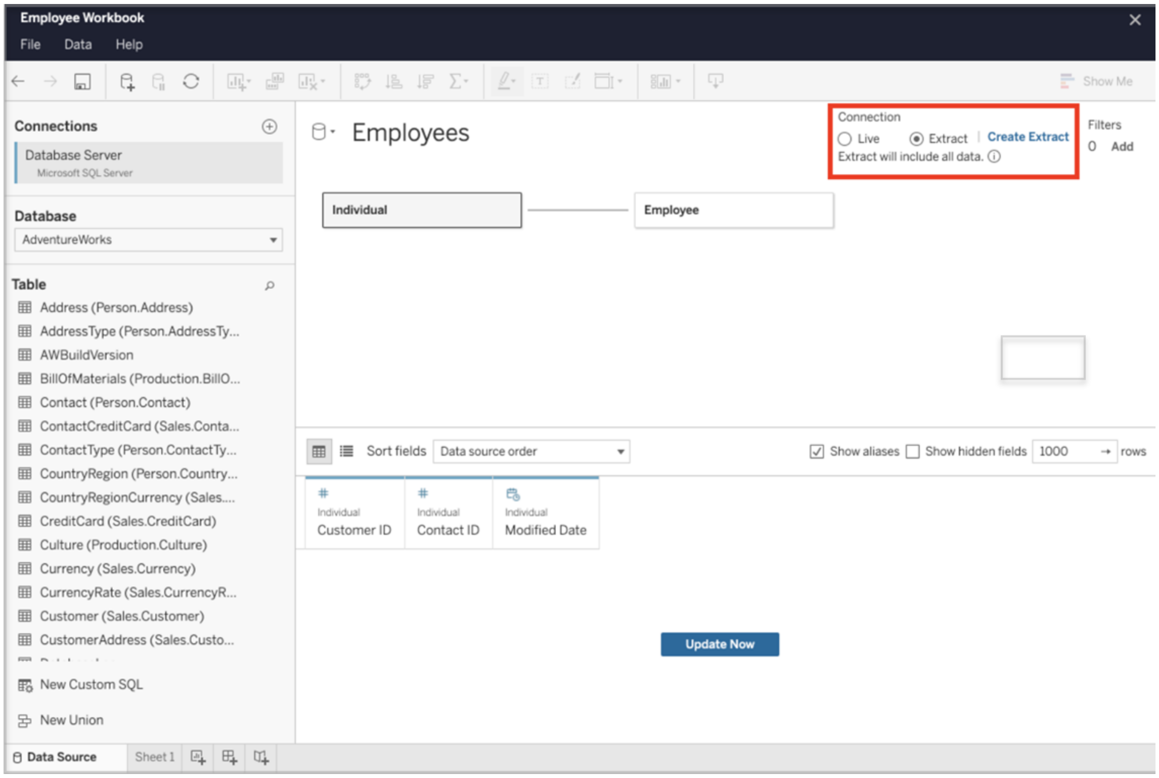
# Create Extracts on the Web

You can extract your data sources on the web (without using Tableau Desktop) to improve data source performance and support additional analytical functions. When you extract your data source, Tableau will copy the data from your remote data store to Tableau Server or Tableau Cloud. To learn more about the benefits of extracting your data, see Extract Your Data. On the web, you can extract while in Web Authoring or while in Content Server.

### Create extracts in Web Authoring

You can create extracts directly in web authoring with default extract settings.

## Extract an Embedded Data Source in Web Authoring




Complete the following steps to create an extract in web authoring.

**Tip**: It's recommended to finalize your data model before you create the extract. Extract creation may take a long time and any changes to your data model, such as adding new logical tables, will invalidate the extract.

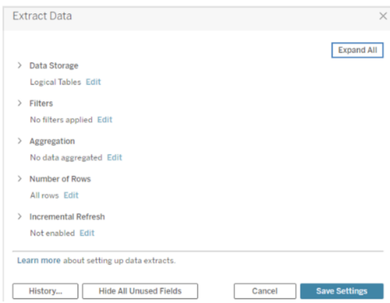
1. Select the **Data Source** tab in the bottom left corner of the web authoring pane. For new workbooks, you will start in the **Data Source** tab.
2. In the top-right corner, change the connection type from **Live** to **Extract**.
3. Select **Create Extract**. You will see the **Creating Extract** dialog box.

Extract creation might take a long time and you can close your authoring session while the extract is being created. To ensure your extract creation isn't lost, in the dialog box, choose **Notify Me When Complete** to specify a location for the extracted workbook to be saved. If your extract succeeds, your workbook will be saved to the specified location and you will be notified that you can continue your web authoring session.

If your extract creation fails, you will be notified that the extract couldn't be created and you can restore your unsaved changes by reopening the original workbook in web authoring.

## Define your Extract Settings

You can configure one or more of the following options to tell Tableau how to store, define filters for, and limit the amount of data in your extract.




### Decide how the extract data should be stored

You can choose to have Tableau store the data in your extract using one of two structures (schemas): logical tables (denormalized schema) or physical tables (normalized schema). For more information about logical and physical tables, see The Tableau Data Model. The option you choose depends on what you need.

### Logical Tables

Logical Tables store data using one extract table for each logical table in the data source. Physical tables that define a logical table are merged and stored with that logical table. For example, if a data source was made of a single logical table, the data would be stored in a single table.

If a data source was made of three logical tables (each containing multiple physical tables), the extract data would be stored in three tables—one for each logical table.

Select **Logical Tables** when you want to limit the amount of data in your extract with additional extract properties like extract filters, aggregation, Top N, or other features that require denormalized data. Also use when your data uses pass-through functions (RAWSQL). This is the default structure Tableau uses to store extract data.

If you use this option when your extract contains joins, the joins are applied when the extract is created.

**Physical Tables**

Physical Tables stores data using one extract table for each physical table in the data source.

Select **Physical Tables** if your extract is comprised of tables combined with one or more equality joins and meets the conditions for using the Physical Tables option listed below. If you use this option, joins are performed at query time.

This option can potentially improve performance and help reduce the size of the extract file. For more information about how Tableau recommends you use the Physical Tables option, see Tips for using the Physical Tables option in the Tableau Desktop help.

In some cases, you can also use this option as a workaround for row-level security. For more information about row-level security using Tableau, see Restrict Access at the Data Row Level in the Tableau Desktop help.

## Conditions for using the Physical Tables option

To store your extract using the Physical Tables option, the data in your extract must meet all of the conditions listed below.

- All joins between physical tables are equality (=) joins.
- Data types of the columns used for relationships or joins are identical.
- No pass-through functions (RAWSQL) used.
- No incremental refresh configured.
- No extract filters configured.
- No Top N or sampling configured.
- When the extract is stored as physical tables, you can't append data to it.

- For logical tables, you can't append data to extracts that have more than one logical table.

> **Note:** Both the Logical Tables and Physical Tables options only affect how the data in your extract is stored. The options don't affect how tables in your extract are displayed on the Data Source page.

#### Determine how much data to extract

Select **Add** to define one or more filters to limit how much data gets extracted based on fields and their values.

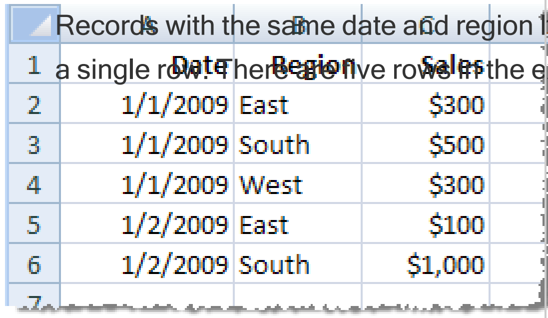
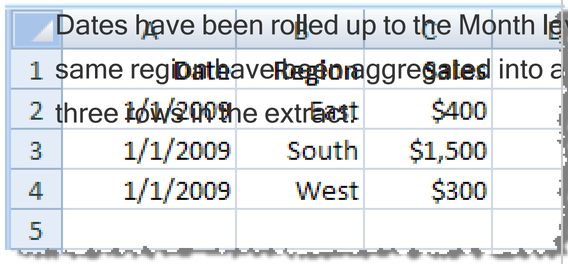
#### Aggregate the data in the extract

Select **Aggregate data for visible dimensions** to aggregate the measures using their default aggregation. Aggregating the data consolidates rows, can minimize the size of the extract file, and increase performance.

When you choose to aggregate the data, you can also select **Roll up dates** to a specified date level such as Year, Month, etc. The following examples show how the data will be extracted for each aggregation option you can choose.

| | | |
|---|---|---|
| **Original data** | Each record is shown as a separate row. There are seven rows in your data | |

| | A | B | C |
|---|---|---|---|
| 1 | **Date** | **Region** | **Sales** |
| 2 | 1/1/2009 | South | $500 |
| 3 | 1/1/2009 | West | $200 |
| 4 | 1/1/2009 | West | $100 |
| 5 | 1/1/2009 | East | $300 |
| 6 | 1/2/2009 | South | $600 |
| 7 | 1/2/2009 | South | $400 |
| 8 | 1/2/2009 | East | $100 |
| 9 | | | |

<table>
<tr>
<td>Aggregate data for visible dimensions<br><br>(no roll up)</td>
<td>Records with the same date and region have been aggregated into a single row. There are five rows in the extract.<br>
<table>
<tr><th></th><th>A</th><th>B</th><th>C</th></tr>
<tr><td>1</td><td>Date</td><td>Region</td><td>Sales</td></tr>
<tr><td>2</td><td>1/1/2009</td><td>East</td><td>$300</td></tr>
<tr><td>3</td><td>1/1/2009</td><td>South</td><td>$500</td></tr>
<tr><td>4</td><td>1/1/2009</td><td>West</td><td>$300</td></tr>
<tr><td>5</td><td>1/2/2009</td><td>East</td><td>$100</td></tr>
<tr><td>6</td><td>1/2/2009</td><td>South</td><td>$1,000</td></tr>
<tr><td>7</td><td></td><td></td><td></td></tr>
</table>
</td>
</tr>
<tr>
<td>Aggregate data for visible dimensions<br>(roll up dates to Month)</td>
<td>Dates have been rolled up to the Month level and records with the same region have been aggregated into a single row. There are three rows in the extract.<br>
<table>
<tr><th></th><th>A</th><th>B</th><th>C</th></tr>
<tr><td>1</td><td>Date</td><td>Region</td><td>Sales</td></tr>
<tr><td>2</td><td>1/1/2009</td><td>East</td><td>$400</td></tr>
<tr><td>3</td><td>1/1/2009</td><td>South</td><td>$1,500</td></tr>
<tr><td>4</td><td>1/1/2009</td><td>West</td><td>$300</td></tr>
<tr><td>5</td><td></td><td></td><td></td></tr>
</table>
</td>
</tr>
</table>

### Choose the rows to extract

Select the number of rows you want to extract.

You can extract All rows or the Top N rows. Tableau first applies any filters and aggregation and then extracts the number of rows from the filtered and aggregated results. The number of rows options depend on the type of data source you are extracting from.

**Notes:**

- Not all data sources support sampling. So, you might not see the Sampling option in the Extract Data dialog box.
- Any fields that you hide first in the Data Source page or on the sheet tab will be excluded from the extract.

### Configure Incremental Refresh Settings

Most data sources support an incremental refresh. Rather than refreshing the entire extract, you can configure a refresh to add only the rows that are new since the previous time you extracted the data.

For example, you may have a data source that is updated daily with new sales transactions. Rather than rebuild the entire extract each day, you can just add the new transactions that occurred that day. To have incremental refresh as an option when you schedule a refresh you must first define the settings.

Periodically you might want to do a full refresh to ensure you have the most up to date data.

**Note:** If the data structure of the source data changes (for example, a new column is added), you will need to do a full extract refresh before you can start doing incremental refreshes again.

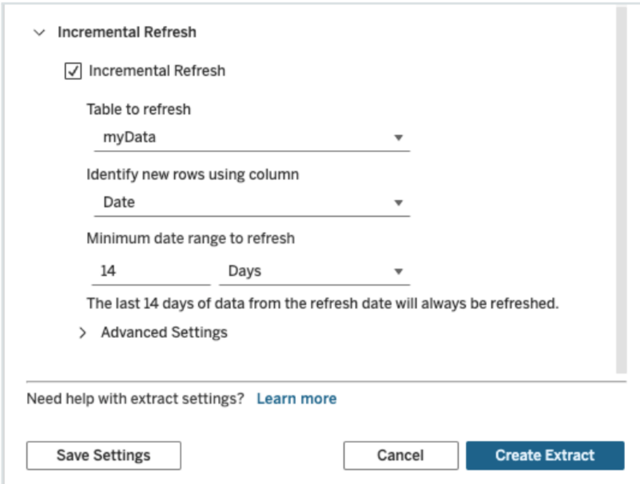
## Set up Incremental Refresh

Follow the steps below to set up an extract to be refreshed incrementally. Ensure you've selected **All rows** in the **Number of Rows** section.

Incremental refreshes can only be defined when you are extracting from all rows in the database. You can't incrementally refresh a sample extract.

1. Expand the **Incremental Refresh** section.
2. Check the **Incremental refresh** box.
3. Choose a table to refresh.
4. Select a column to use for identifying new rows.
5. (Optional) Enter an amount of time and unit of time in the **Minimum date range to refresh** fields to extract new data added since the last refresh, and also replace a subrange of existing data in the extract to capture changes that may have occurred in the data source. You have the option to define the length of time in multiple ways from seconds to years within this field. For example, you could enter "2" and "months" to have the extract refresh get all new rows, plus refresh the previous two months worth of data.

**Note**: Configuring extract refreshes along with a minimum date to refresh can be complex to understand. Before you use it, see Configure an incremental extract refresh.




## Use Advanced Settings

You can expand **Advanced Settings** to establish how new rows are retrieved.

> **Note:** If you have set a Minimum date range for refreshing, the Advanced Settings feature won't be accessible.

Advanced Settings allow you to either replace the last rows added by refreshing values equal to or greater than the last recorded value, or retain the last rows added by only refreshing the extract with values greater than the last recorded value.

In the first approach, Tableau allows users to incrementally refresh extracts with a non-unique key column such as date, datetime, or ID.

This method adds a new step when performing an incremental refresh. Tableau will first delete rows in the extract that are equal to the previous highest value seen. Tableau then queries for all rows that are higher than or equal to the previous highest value which will pick up all the deleted rows and any new ones.

Conversely, you can still opt to not replace the last rows added and only add rows with values greater than the last recorded value.

To finish, select **Create Extract**.

Considerations when refreshing extracts

**Editing an extract:**

If you're editing an existing extract, the last refresh is shown so you can be sure you are updating the extract with the correct data.

**Full Refresh:**

A Full Refresh replaces all of the rows with the data in the original data source every time you refresh the extract. A Full Refresh can take longer and be expensive on the database.

**Date/Time precision and extracts:**

The data engine, which is the underlying mechanism that Tableau uses to create extracts, stores time values with a precision of up to 3 decimal places.

If you specify a datetime or timestamp column for Identify new rows using column, and your database uses a higher precision than Tableau, you can end up with duplicate rows after an incremental refresh.

For example, if the database has two rows, one with a datetime value of 2015-03-13 17:30:56.502352 and one with a datetime value of 2015-03-13 17:30:56.502852, Tableau will store both rows using a datetime value of 2015-03-13 17:30:56.502 thereby creating duplicate rows.

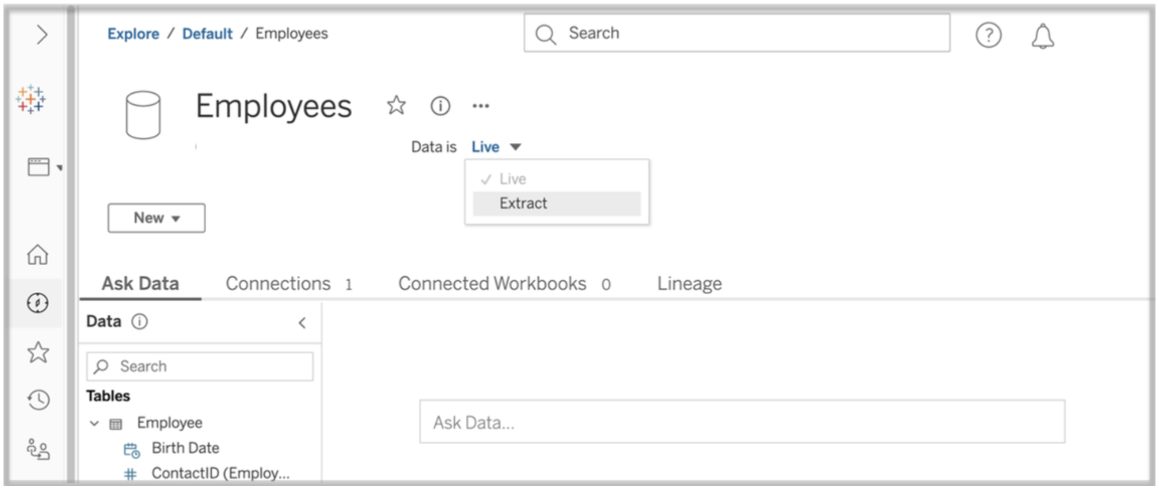
## Limitations

- You can't create extracts for embedded data sources that reference published data sources. As a workaround, create the extract directly on the published data source. For more information, see Extract a Published Data Source on Content Server.
- You can't create extracts for file-based data sources. File-based data sources already have special performance features and adding extraction will have no performance benefit.
- This feature doesn't apply to bridge-based data sources in Tableau Cloud.

- Custom SQL Limitation: Custom SQL queries aren't supported with Advanced Settings. Users relying on custom SQL will need to adjust their approach if they wish to use the Advanced Settings for incremental refresh.

# Create extracts in Content Server

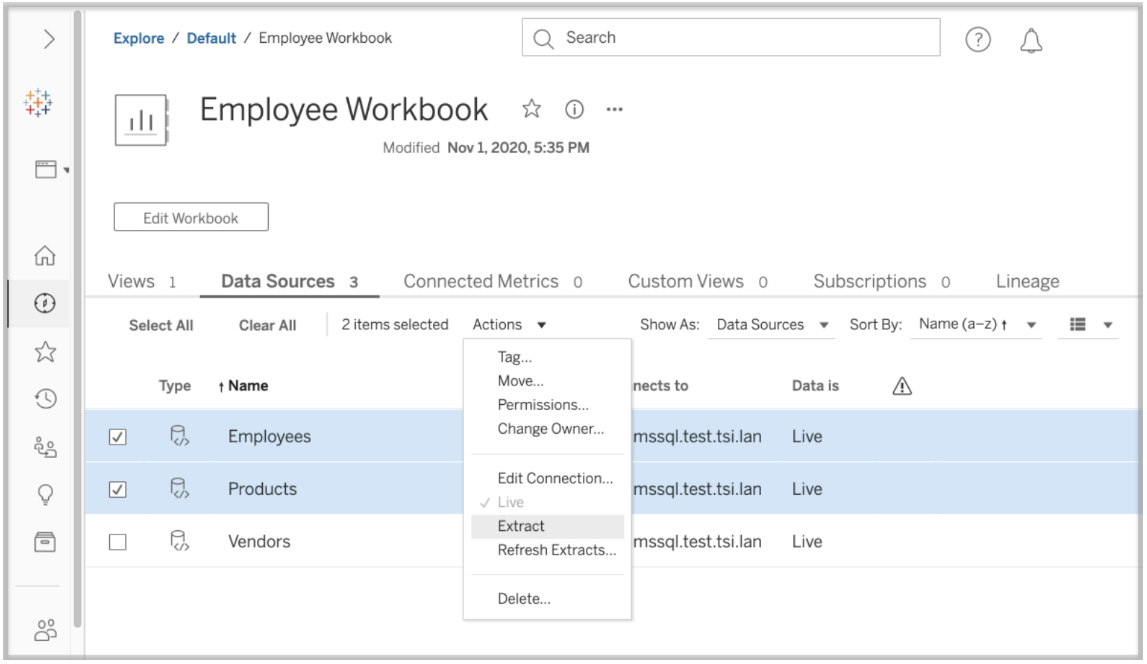
## Extract a Published Data Source on Content Server




Complete the following steps to extract a published data source.

1. Sign in as an administrator or as the owner of the data source.
2. On the Content tab, select **Explore,** and then select **Data sources**.
3. Select a data source by clicking on the Data Source name.
4. At the top of the screen, under the Data Source name, select the drop-down menu that says **Live**.
5. Change the connection type from **Live** to **Extract**. If the extract encryption at rest feature is enabled on the site, select either **Encrypted** or **Unencrypted**.
6. If you see an error message about embedded credentials, embed your credentials in the data source. To do this, choose **Edit Connection**. Select "Embedded password in connection" and then choose **Save**.

## Extract an Embedded Data Source on Content Server




Complete the following steps to extract one or more data sources that are embedded in a published workbook.

1. Sign in as an administrator or as the owner of the data source.
2. Navigate to the published workbook.
3. Navigate to the Data Sources tab
4. Select one or more of the data sources.
5. Choose the **Action** button.
6. Select **Extract**. If the extract encryption at rest feature is enabled on the site, select either **Encrypted** or **Unencrypted**.

## Limitations

- Your connection credentials must be embedded in the data source.
- You can't create extracts for embedded data sources that reference published data sources. As a workaround, create the extract directly on the published data source.

- You can't create extracts for file-based data sources. File-based data sources already have special performance features and adding extraction will have no performance benefit.
- This feature doesn't apply to bridge-based data sources in Tableau Cloud.

## Keep Extracted Data Fresh

After data is extracted, you can optionally set up an extract refresh schedule to keep the data fresh. For more information, see Schedule Refreshes on Tableau Cloud.

## Monitor and Manage Extracts

Server administrators can monitor extract creation on the **Background Tasks for Extracts** admin view. For more information, see Background Tasks for Extracts.

Server administrators can manage extracts on the Jobs page. For more information, see Managing Background Jobs in Tableau Cloud.

# Keep Data Fresh

After you publish workbooks and data sources to Tableau Cloud, you can decide how you want to keep the data current. Options for keeping published data fresh depend on the characteristics of your data sources.

## Data freshness options by data source

The following table lists data freshness options (and exceptions) that are available depending on the data source.

Exceptions

- Tableau Cloud does not support connections to any cube-based data source.
- Tableau Cloud does not support published connections that use Kerberos authentication.
- Although you can publish extracts of SAP BW data to Tableau Cloud, refreshes are not supported. The best way to update SAP BW data sources is to republish them.

Options

| Source | Publish options | Freshness options | Authentication |
|---|---|---|---|
| On-premises data (accessible only from a private network) | | | |
| File-based data<br><br>(Excel, .csv, .txt) | Extract only | Use Tableau Bridge (recommended)<br><br>Manual refresh from Tableau Desktop<br><br>Automated command-line scripts | n/a |
| Statistical file<br><br>(SAS (*.sas7bdat)) | Extract only | Use Tableau Bridge (recommended)<br><br>Manual refresh from Tableau Desktop<br><br>Automated command-line scripts | n/a |
| Data hosted on a cloud platform<br><br>(For example, Oracle on Amazon RDS) | Live connection or extract, depending on database | Use Tableau Bridge (recommended)<br><br>Manual refresh from Tableau Desktop | Embedded credentials in Tableau Bridge settings |

| Source | Publish options | Freshness options | Authentication |
|---|---|---|---|
| | | Automated command-line scripts | |
| Relational database<br><br>(Relational databases that Tableau Desktop connects to. For example, SQL Server, Oracle, IBM DB2) | Live connection or extract, depending on database | Use Tableau Bridge (recommended)<br><br>Manual refresh from Tableau Desktop<br><br>Automated command-line scripts | Embedded credentials in Tableau Bridge settings |
| Cloud data (accessible from the public internet) | | | |
| Data hosted on cloud platforms<br><br>(See the list of supported platforms in Allow Live Connections to Data Hosted on a Cloud Platform | Live connection or extract | Extracts:<br><br>Schedule directly on Tableau Cloud | Embedded credentials + IP safe list<br><br>Edit Connections on Tableau Cloud |
| Salesforce, Google Analytics | Extract only | Schedule directly on Tableau Cloud<br><br>Refresh Data Using Saved Credentials | OAuth Connections |

| Source | Publish options | Freshness options | Authentication |
|---|---|---|---|
| Google BigQuery,<br><br>Google Sheets | Live connection or extract | Extracts:<br><br>Schedule directly on Tableau Cloud<br><br>Refresh Data Using Saved Credentials | OAuth Connections |
| Cloud (Box, Dropbox, OneDrive, Google Drive) file-based data<br><br>(Excel, .csv, .txt, .tab, .tsv, .json) | Live connection or extract | Extracts:<br><br>Schedule directly on Tableau Cloud<br><br>Refresh Data Using Saved Credentials | OAuth Connections |
| Anaplan<br><br>Oracle Eloqua<br><br>ServiceNow ITSM | Extract only | Schedule directly on Tableau Cloud<br><br>Refresh Data Using Saved Credentials | Embedded credentials<br><br>Edit Connections on Tableau Cloud |
| Marketo | Extract only | Schedule directly on Tableau Cloud | Embedded credentials |
| Web Data Connectors | Extract only | For basic user name and password credentials, use Tableau Bridge.<br><br>For custom (non-basic) user | Tableau Bridge: Embedded credentials<br><br>Other: n/a |

| Source | Publish options | Freshness options | Authentication |
| --- | --- | --- | --- |
| | | name and password credentials, use the Tableau Desktop **Refresh From Source** command, or run a manual refresh from Tableau Desktop. For more information, see the WDC Authentication topic in the Tableau Web Data Connector API Help. | |

## Tableau Cloud IP addresses for data provider authorization

As a security measure, cloud data providers might require you to supply authorized IP addresses from which external applications request access to your data. A request from an IP address that is not explicitly approved could be rejected. To make sure live connections you publish to Tableau Cloud remain uninterrupted, add Tableau Cloud to your data provider's allowlist.

The table lists IP address ranges Tableau Cloud uses, depending on your site location. You can see its location in the URL that appears after you sign in to Tableau Cloud.

IP addresses are dedicated to and controlled by Salesforce.

> **Note:** In addition to enabling communication over the Tableau Cloud IP range, you might need to enable access over the appropriate database port (for example, 80 or 443) depending on the communication type (HTTP or HTTPS).

**Important:** From August 2024 to March 2025, Tableau Cloud sites will be migrating to Salesforce's Hyperforce, one pod at a time. Because Hyperforce uses different IP addresses, the migration to Hyperforce will require you to update your data provider's allowlist if using live connections. Going forward, IP addresses will be added periodically. For more information, see the New IP addresses (after Hyperforce migration) section below.

For more information about Tableau Cloud's migration to Hyperforce, including when your pod will be moving, see the Tableau Cloud Migration to Hyperforce knowledge article.

## New IP addresses (after Hyperforce migration)

From August 2024 to March 2025, Tableau Cloud sites will be migrating to Salesforce's Hyperforce by pod. Before your pod's migration to Hyperforce, your data provider's allowlist will need to be updated to use Hyperforce IP addresses if using live connections.

IP address process change

Hyperforce IP addresses are added periodically and will require your data provider's allowlist to be updated. To stay informed about new IP addresses, you have one or both options:

1. **Periodically review the IP address tables below:** At least 30 days before the IP addresses are enabled, the IP address tables below are updated. Site admins will also receive an email notification alerting them of the new IP addresses.

2. **Automate IP address updates using the JSON text file:** Salesforce recommends that your data provider's allowlist mirror the https://ip-ranges.salesforce.com/ip-ranges.json text file at all times by automating the IP address updates. New IP addresses are added to the text file at least 30 days before they're enabled.

   In the text file, the IP address and range for your pod are listed by the Hyperforce region that your pod resides in. To determine the Hyperforce region that your pod resides in, refer to the "Pod Name" and the associated "Hyperforce Region Name" in the tables below. For example, if your pod name is "prod-ca-a", your Hyperforce region name is "ca-central-1". In https://ip-ranges.salesforce.com/ip-ranges.json text file, search for "ca-central-1" for the appropriate IP addresses to include in your data provider's allowlist.

**Notes:**

- When new IP addresses become available, a new version of the text file that contains both new and existing IP addresses replaces the previous text file.
- The text file version is indicated by the “createDate” (in UTC).
- Salesforce recommends that you make a copy of the previous versions of the text file for your records.
- Not all regions will receive new IP addresses at the same time.

Pods migrated to Hyperforce

| Pod Name (Host Name) | Location | Hyperforce Region Name | Initial IP Address and Range after Hyperforce Migration<br><br>(Alternatively, search for the Hyperforce region in https://ip-ranges.salesforce.com/ip-ranges.json) |
|---|---|---|---|
| prod-ca-a<br><br>(prod-ca-a.online.tableau.com) | Canada - Quebec | ca-central-1 | 155.226.152.0/23 |
| prod-uk-a<br><br>(prod-uk-a.online.tableau.com) | Europe - UK | eu-west-2 | 145.224.200.0/23 |
| useast-1<br><br>(us-east-1.online.tableau.com) | US East - Virginia | us-east-1 | 155.226.144.0/22 |
| 10AY<br><br>(10ay.online.tableau.com) | US West - Oregon | us-west-2 | 155.226.128.0/21 |

| | | | |
|---|---|---|---|
| DUB01<br><br>(dub01.online.tableau.com) | Europe - Germany (formerly Europe - Ireland) | eu-central-1 | 145.224.208.0/23 |
| prod-useast-a<br><br>(prod-useast-a.online.tableau.com) | US East - Virginia | us-east-1 | 155.226.144.0/22 |
| 10AZ<br><br>(10az.online.tableau.com) | US West - Oregon | us-west-2 | 155.226.128.0/21 |
| EW1A<br><br>(ew1a.online.tableau.com) | Europe - Germany (formerly Europe - Ireland) | eu-central-1 | 145.224.208.0/23 |
| prod-apsoutheast-a<br><br>(prod-apsoutheast-a.online.tableau.com) | Asia Pacific - Australia | ap-southeast-2 | 141.163.192.0/23 |

Pods not migrated to Hyperforce

| **Location** | **Pod Name** | **Hyperforce Region Name** | **Initial IP Address and Range after Hyperforce Migration**<br><br>(Alternatively, search for the Hyperforce region in https://ip-ranges.salesforce.com/ip-ranges.json) |
|---|---|---|---|
| US East - | prod-useast-b | us-east-1 | 155.226.144.0/22 |

| | | | |
|---|---|---|---|
| Virginia | | | |
| US West - Oregon | UW2B | us-west-2 | 155.226.128.0/21 |
| Asia Pacific - Japan | prod-apnorth-east-a | ap-northeast-1 | 141.163.208.0/23 |
| US West - Oregon | 10AX | us-west-2 | 155.226.128.0/21 |

New pods on Hyperforce

| Pod Name (Host Name) | **Location** | **Hyperforce Region Name** | **Initial IP Address and Range after Hyperforce Migration**<br><br>(Alternatively, search for the Hyperforce region in https://ip-ranges.-salesforce.com/ip-ranges.json) |
|---|---|---|---|
| prod-useast-c<br><br>(prod-useast-c.online.tableau.com) | US East - Virginia | us-east-1 | 155.226.144.0/22 |
| prod-apsoutheast-b<br><br>(prod-apsoutheast-b.online.tableau.com) | Asia Pacific - Singapore | ap-south-east-1 | 141.163.196.0/23 |

For more information, see one of the following:

- About the Hyperforce migration, see Tableau Cloud Migration to Hyperforce knowledge article
- About the Hyperforce migration schedule, see the Schedule for Tableau Cloud Migration to Hyperforce knowledge article

## Old IP addresses (before Hyperforce migration)

The IP addresses in the table below only apply if the pod where your Tableau Cloud site resides has not migrated to Hyperforce yet.

For more information, see one of the following:

- About the Hyperforce migration, see Tableau Cloud Migration to Hyperforce knowledge article
- About the Hyperforce migration schedule, see the Schedule for Tableau Cloud Migration to Hyperforce knowledge article

Pods and IP addresses (before Hyperforce migration)

| Host Name (Pod) | Location | Hyperforce Region Name | IP Addresses or Range |
|---|---|---|---|
| 10ax.online.tableau.com (10AX) | US West - Oregon | us-west-2 | 34.208.207.197<br><br>52.39.159.250 |
| 10ay.online.tableau.com (10AY) | US West - Oregon | us-west-2 | ~~34.218.129.202~~<br><br>~~52.40.235.24~~ |
| 10az.online.tableau.com (10AZ) | US West - Oregon | us-west-2 | ~~34.218.83.207~~<br><br>~~52.37.252.60~~ |
| us-west-2b.on- | US West - | us-west-2 | 34.214.85.34 |

| Host Name (Pod) | Location | Hyperforce Region Name | IP Addresses or Range |
| --- | --- | --- | --- |
| line.tableau.com (UW2B) | Oregon | | 34.214.85.244 |
| us-east-1.online.tableau.com (useast-1) | US East - Virginia | us-east-1 | ~~50.17.26.34~~<br>~~52.206.162.101~~ |
| prod-useast-a.online.tableau.com (prod-useast-a) | US East - Virginia | us-east-1 | ~~3.219.176.16/28~~ |
| prod-useast-b.online.tableau.com (prod-useast-b) | US East - Virginia | us-east-1 | 3.219.176.16/28 |
| dub01.online.tableau.com (DUB01) | EU West - Ireland<br>**Note:** Formerly Ireland prior to the migration to Hyperforce. For more information, see Tableau Cloud Migration to Hyperforce knowledge article. | eu-central-1 | ~~34.246.74.86~~<br>~~52.215.158.213~~ |

| Host Name (Pod) | Location | Hyperforce Region Name | IP Addresses or Range |
|---|---|---|---|
| eu-west-1a.online.tableau.com (EWA1) | EU West - Ireland<br><br>**Note:** Formerly Ireland prior to the migration to Hyperforce. For more information, see Tableau Cloud Migration to Hyperforce knowledge article. | eu-central-1 | ~~34.246.62.141~~<br><br>~~34.246.62.203~~ |
| prod-apnortheast-a.online.tableau.com (prod-apnortheast-a) | Asia Pacific - Japan | ap-southeast-1 | 18.176.203.96/28 |
| prod-apsoutheast-a.online.tableau.com (prod-apsoutheast-b) | Asia Pacific - Australia | ap-southeast-2 | ~~3.25.37.32/28~~ |
| prod-uk-a.online.tableau.com (prod-uk-a) | EU West - UK | eu-west-2 | ~~18.134.84.240/28~~ |

| Host Name (Pod) | Location | Hyperforce Region Name | IP Addresses or Range |
|---|---|---|---|
| prod-ca-a.online.tableau.com (prod-ca-a) | Canada - Quebec | ca-central-1 | ~~3.98.24.208/28~~ |

## Find authorization steps for your data provider

The following links take you to the steps on common data providers' websites for authorizing external applications on their platforms.

Amazon:

- Redshift
- RDS
- EC2

Microsoft Azure

Google Cloud Platform

**Disclaimer:** The links in the list above take you outside of Tableau.com. Although we make every effort to ensure links to external websites are accurate, up to date, and relevant, Tableau cannot take responsibility for the accuracy or freshness of pages maintained by external providers. Contact the external site for answers to questions regarding its content.

## Tableau Bridge connections to Tableau Cloud

To facilitate connections between on-premises data and Tableau Cloud, Tableau Bridge uses common port 443 to make outbound requests to Tableau Cloud. For more information, see Network access section in the Install Tableau Bridge topic.

## See also

- Manage Data
- Best Practices for Published Data Sources (Tableau Help)
- Notify Owners When Extract Refreshes Fail
- Edit Connections on Tableau Cloud

# Allow Live Connections to Data Hosted on a Cloud Platform

You have many options for managing the data underlying your Tableau Cloud workbooks. You can choose how to keep the data current based on your business needs. Depending on the data source, you can leverage a live connection, or you can create an extract and define an extract schedule to keep the data fresh. You can also embed credentials or require users to provide credentials for accessing the data when they open views that connect to content.

If you maintain relational data on a cloud platform, you can use live connections to that data when you publish workbooks and data sources to Tableau Cloud. When you use a live connection, you don't need to publish a static extract of the data.

# Enable encrypted connections

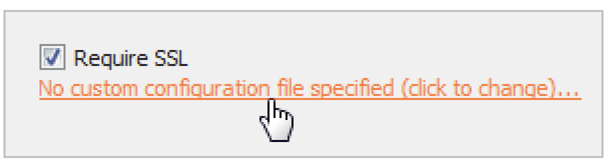
Encrypting connections using SSL is an option for underlying data sources. You can enable SSL encryption for connections to your hosted SQL data when you create the connection in Tableau Desktop. Complete the following steps to enable encrypted connections.

**Tip**: Make sure that Tableau Cloud is on your data provider's authorized list (safe list).

1. In Tableau Desktop, connect to the data.
2. In the **Server Connection** dialog box, select the **Require SSL** check box.
3. For PostgreSQL, SQL Server-compatible connections, and other connections that don't have an option to embed certificates in the data source, click **OK** to finish.

   For some compatible connections, linked text appears under the **Require SSL** check-box. This indicates that you can specify an alternative certificate file to use, such as a self-signed certificate.
4. (Optional) Use a self-signed or other custom certificate to connect to this data over SSL.

   a. Select the link text that appears.

   b. In the **Configure and Use SSL Certificate** dialog, specify the certificate's **.pem** file.

   For example, for MySQL connections to data hosted on Amazon RDS, you can point to Amazon's self-signed certificate file at this address.

### Untrusted certificates

If you are using certificates that aren't trusted by Tableau Cloud, such as self-signed certificates, or certificates signed by your company's internal CA, you may have problems connecting from Tableau Cloud. Try one of the following solutions.

- If your connector allows embedding custom certificates, then use that. (This is the method used in the previous section)
- Get new certificates for your database which are signed by a trusted public CA.
- Use Tableau Bridge, which is Tableau's connection proxy. You can configure your certificates to be trusted on the machine running Bridge, either by using TDC files, properties files, or by installing your certificates in the Windows System Trust Store.

### Supported connectors

Refer to the "Tableau Cloud" tab in the Creators: Connect to Data on the Web topic for the list of supported connectors.

For more information about supported features by connector, refer to the specific connector topic in the  Supported Connectors section of the Tableau User Help.

**Note**: Not all connectors in this list are supported by Tableau Prep Conductor. To see the supported list of connectors, open Tableau Prep Builder and expand the **Connect** pane.

## See also

- Connector Examples in the Tableau Help

# Overview of Row-Level Security Options in Tableau

Sometimes you want to filter data based on the user that is requesting it. For example:

- You want regional salespeople to see sales figures only for their region.
- You want sales managers to see statistics only for salespeople that report to them.
- You want students to see visualizations based only on their own test scores.

An approach to filtering data this way is called row-level security (RLS). There are multiple methods to accomplish row-level security both inside and outside of Tableau, each with its own pros and cons.

## Create a user filter and map users to values manually

The simplest way to achieve row-level security in Tableau is through a user filter where you manually map users to values. For example, you could manually map a user named “Alice” to the value “East” so that she only sees rows in the data source where the “Region” column is “East”.

This method is convenient but high maintenance, and attention must be paid to security. It must be done per-workbook, and you must update the filter and republish the data source as your user base changes. When you publish an asset with this type of user filter, you need to set permissions so that users cannot save or download it and remove the filter, thereby gaining access to all of the data.

For more information, see Create a user filter and map users to values manually in the Tableau Desktop and Web Authoring help.

## Create a dynamic user filter using a security field in the data

Using this method, you create a calculated field that automates the process of mapping users to data values. This method requires that the underlying data include the security information you want to use for filtering. For example, using a calculated field, the USERNAME() function, and a “Manager” column in the data source, you could determine if the user requesting the view is a manager and adjust the data in the view accordingly.

Because filtering is defined at the data level and automated by the calculated field, this method is less error prone than mapping users to data values manually. When you publish an asset with this type of user filter, you need to set permissions so that users cannot save or download it and remove the filter, thereby gaining access to all of the data.

For more information, see Create a dynamic filter using a security field in the data in the Tableau Desktop and Web Authoring help.

## Use a data policy

Starting in Tableau 2021.4, when Data Management is enabled in Tableau Server or Tableau Cloud, users with a Creator license can implement row-level security through data policies on virtual connections. Because virtual connections are centralized and reusable, you can manage row-level security for each connection in one place, safely and securely, across all content that uses that connection.

Unlike the above solutions for row-level security in Tableau, this method doesn't carry the same risk of exposing information if an author neglects to properly secure permissions on the workbook or data source, because the policy is enforced on the server for every query.

Row-level security through virtual connection data policies was developed to address shortcomings of other row-level security solutions. We recommend this solution in most situations where it's an option.

For more information on row-level security using data policies on virtual connections, see About Virtual Connections and Data Policies.

## Use existing RLS in the database

Many data sources have mechanisms for RLS built in. If your organization has already put effort into building row-level security in a data source, you may be able to take advantage of your existing RLS.

It is not necessarily easier or better to implement a built-in RLS model vs. building it with Tableau in mind; these techniques are generally leveraged when an organization has already invested in these technologies and they want to take advantage of that investment, or when they need to apply the same security policies to other database clients in addition to Tableau.

The main benefit of using built-in RLS is that administrators can implement and control their data security policy in one place: their databases.

## Pass user attributes

You can pass user attributes included in a JSON Web Token (JWT) to customize and control access to data in Tableau Cloud embedding workflows. For more information, see Embedding v3 API Help.

## Row-level security option comparison

| RLS option | Useful when | Pros | Cons |
|---|---|---|---|
| Manual user filter | • You are doing a proof of concept or testing user filtering functionality<br>• You are creating a static workbook to use with an unchanging group of users<br>• You understand the data security risk of having the permissions set incorrectly | • Simple at small scales<br>• Easy to understand mapping<br>• Good for testing | • High-maintenance<br>• Need to update filter and republish as user base changes<br>• Permissions must be secured to prevent users from seeing unfiltered data<br>• Must be replicated in every workbook |
| Dynamic user filter | • You don't have a Data Management license<br>• The data contains information you can use to filter it | • Relatively easy to set up | • Permissions must be secured to prevent users from seeing unfiltered data<br>• Must be replicated in every workbook or data |

| | | | |
|---|---|---|---|
| | • You understand the data security risk of having the permissions set incorrectly | | source |
| Data policy | • You have a Data Management license<br>• The data contains information you can use to filter it<br>• Ease of data security is a significant concern | • Centralized<br>• Secure<br>• Low-maintenance<br>• Responsibilities for security and analytics can be separated | • Data Management license required |
| RLS in the database | • Your database has an existing RLS security built into the database<br>• You aren't using extracts | • Might already be built into your organization's database<br>• Policies can be applied to database clients other than Tableau | • Must use live queries<br>• Might have limitations or requirements. Your IT team can identify them |
| User attributes | • You are authenticating and authorizing access to embedded content using Tableau connected apps | • Manage data access policies in the same place you manage other policies and personalization for your users | • Requires user attributes defined in the JWT, site setting enabled, and content authored with user attribute functions |

# Configure Connections with Analytics Extensions

Analytics extensions allow you to extend Tableau dynamic calculations in a workbook with languages like R and Python, with Einstein Discovery, and with other tools and platforms. These settings endpoints enable you to configure analytics extensions on your site in Tableau Cloud. For more information, see Analytics Extensions API.

For more information about user scenarios and configuring analytics connections in Tableau Desktop or for web authoring, see Pass Expressions with Analytics Extensions, in the *Tableau Desktop and Web Authoring Help*.

> **Note:** Beginning in June 2021, you can create multiple analytics extensions connections for a site, including multiple connection for the same type of extension (you are presently limited to a single Einstein Discovery analytics extension for each site). For details, see Tableau Cloud Release Notes.

This topic describes how to configure sites on Tableau Cloud with analytics extensions.

## Security requirements and configuration

For increased security, Tableau Cloud requires an encrypted channel and authenticated access to the external services used for analytics extensions.

### Certificate

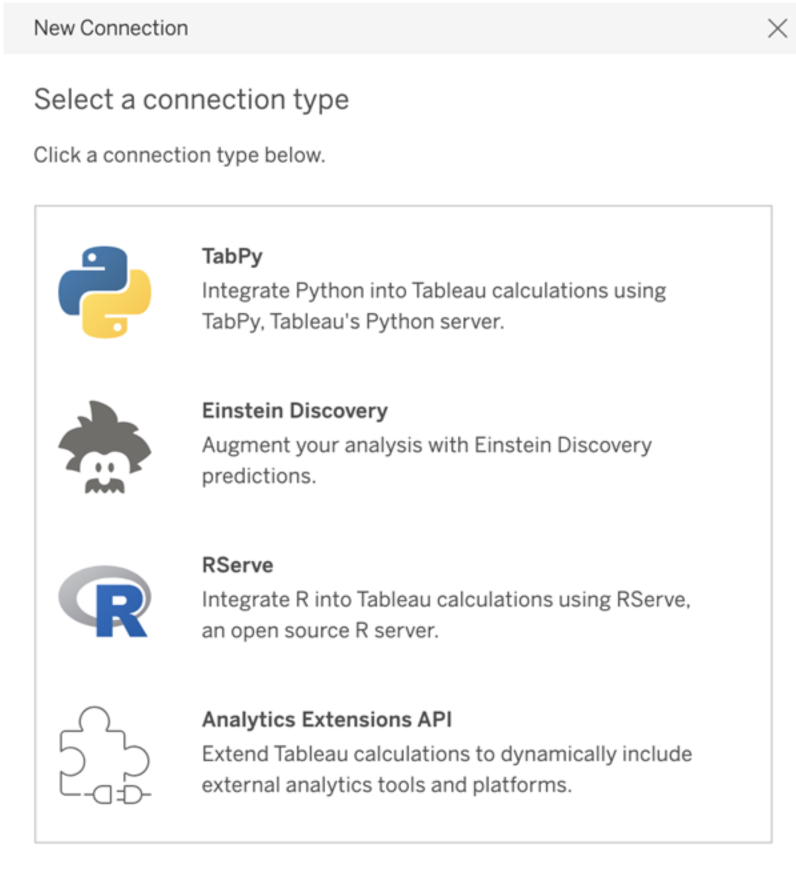
The server running the external service for analytics extensions must be configured with a valid TLS/SSL certificate from a trusted 3rd party certificate authority (CA). Tableau Cloud will not establish a connection with external servers that are configured with a self-signed certificate, a certificate from a private PKI, or a certificate that is not trusted by an established 3rd party CA.

### Safelist firewall configuration

Many organizations deploy a firewall that requires safelist exceptions for known hosts outside the network. In this scenario, you will need to specify two Tableau Cloud IP addresses as exceptions. The Tableau Cloud IP addresses used for connections to analytics extensions servers are `44.224.205.196` and `44.230.200.109`.

## Configure analytics extensions settings

1. Sign in to Tableau Cloud as a site administrator.
2. Click **Settings**.
3. On the Settings page, click the **Extensions** tab and then scroll to **Analytics Extensions**.
4. Select **Enable analytics extensions for site**.
5. Click **Create new connection**.
6. In the **New Connection** dialog, click the connection type you want to add, then enter the configuration settings for your analytics service:



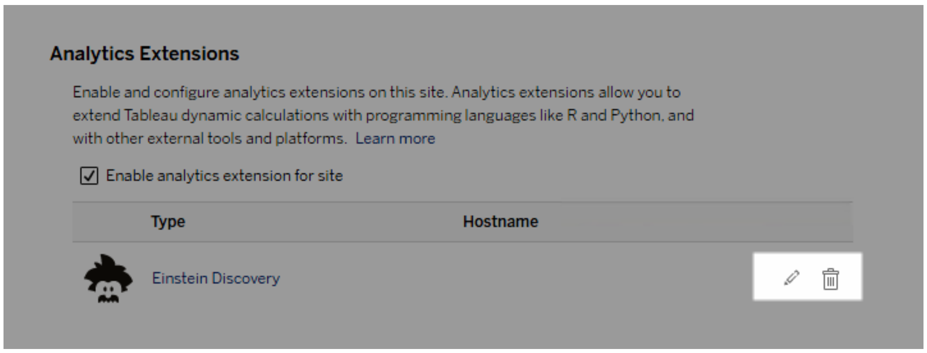

1. The options you need to configure depend on the connection type you choose:
   - For an Einstein Discovery connection, click **Enable**.
   - For TabPy, RServer, and Analytics Extensions API connections, enter the following information:
     - **Connection Name**: Specify the server type you are connecting to. RSERVE supports connections to R using the RServe package. TABPY supports connections to Python using TabPy, or to other analytics extensions.
     - **Require SSL**: Select this option to encrypt the connection to the analytics service. If you specify a `HTTPS` URL in the **Hostname** field, then you must select this option.
     - **Hostname**: Specify the computer name or URL where the analytics service is running. This field is case sensitive.
     - **Port**: Specify the port for the service.

- **Sign in with a username and password**: Select this option to specify user name and password that is used to authenticate to the analytics service.

7. Click **Save**.

## Edit or delete an analytics extension connection

To edit or delete a configuration, navigate to **Analytics Extensions** on the **Extensions** tab of your site.




Click the **Edit** or **Delete** icon and follow the prompts to change the configuration.

# Script errors

Tableau cannot verify that workbooks that use an analytics extension will render properly on Tableau Cloud. There might be scenarios where a required statistical library is available on a user's computer but not on the analytics extension instance that Tableau Cloud is using.

A warning will be displayed when you publish a workbook if it contains views that use an analytics extension.

> This worksheet contains external service scripts, which cannot be viewed on the target platform until the administrator configures an external service connection.

# Table Extensions

Table Extensions allow you to create data tables with an analytics extensions script. You can write a custom TabPy or Rserve script and optionally add one or more input tables. Table extensions are supported by Tableau Cloud, Tableau Server, and Tableau Desktop. This document focuses on Tableau Cloud.

> **Note:** Similar to a live connection, the Table Extension refreshes every time you open up a workbook or refresh a data source.

## Benefits

Table Extensions have the following benefits for both new and experienced users.

- Easily integrate scripts or advanced functions into Tableau
- Easily drag data from Tableau data connections as input into scripts
- Low code editor makes adding code to data sources easy
- Integrates with Data Guide and Explain Data
- Integrates with TabPy, Rserve, and other analytics extensions
- Results can be used to construct dashboards or visualizations

# Prerequisites

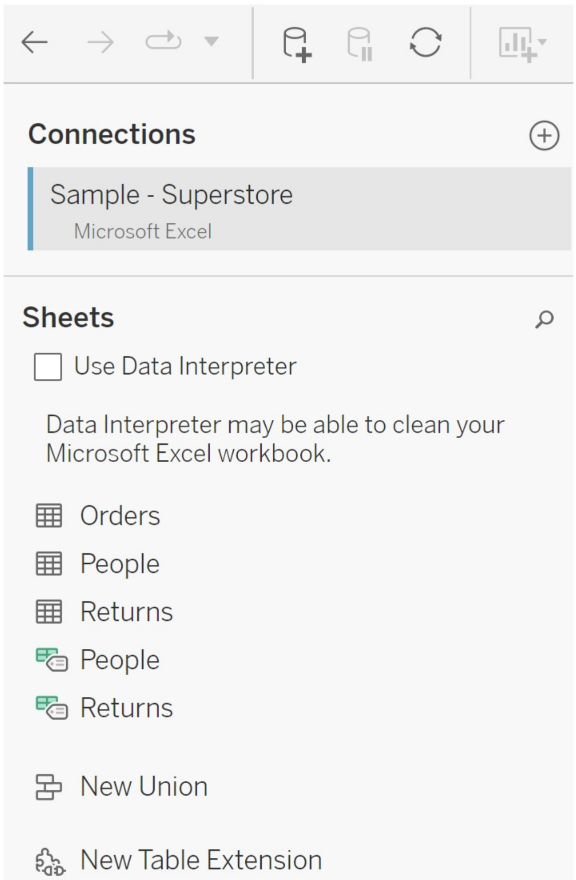
Before you can use table extensions, you must complete the following list.

- Open a data source in Desktop or Web Authoring.
- Configure an analytics extension
  - For steps to configure analytics extension connections, see Pass Expressions with Analytics Extensions.

# Create a Table Extension

To create a table extension, complete the following steps.

1. Open a published workbook.
2. Open a data source or create one.
3. Under **connections**, choose **New Table Extension**.




4. Drag it into the data model.

5. (Optional) Drag tables from the data connection into the table extension pane to use as input into your analytics extensions script or function.

   - By default data from Tableau is passed to the analytics extension and defined as the `variable _arg1`, a dictionary-like structure such as: `{'colum_`

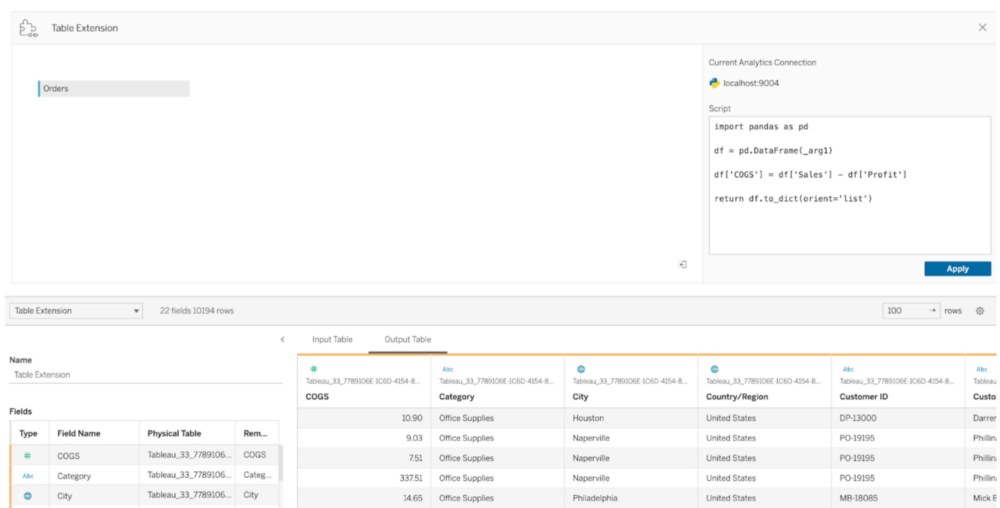
```
name': [1,2,3], 'column_name_2': [3,4,5]
```

**Python example:** The input data could be converted to a pandas dataframe using the following.

```
import pandas as pddf = (pd.DataFrame(_arg1))
```

- When using RServe, the input data is defined as the variable .arg1 and the data type are a named list of lists.

- For supported relational data sources, you can use Custom SQL as an input into a table extension. When parameters are used in the Custom SQL query, changing the parameter causes the query to rerun and the script to recompute. This creates a path to dynamically update parameters in a dashboard and filter or otherwise pass values to the table extension script.



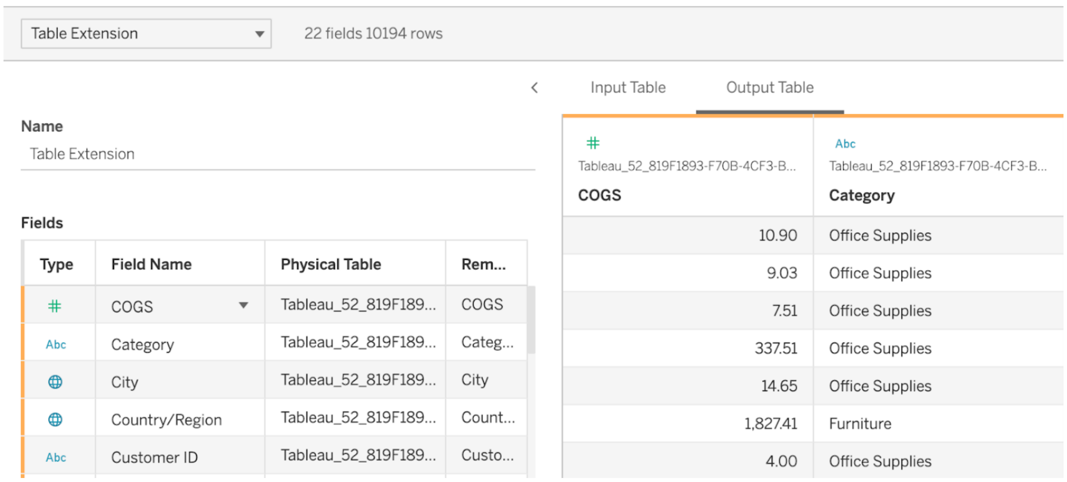
6. In the Script area, enter your script or function call. The script must return a dictionary or list of lists, essentially a JSON object. A script for RServe must return a data.frame or list of named lists while the script for Python must return a dictionary.

   **Python example:** We use the following explicit return command.

   ```
   return df.to_dict(orient='list')
   ```

> **Note:** Table extensions don't support directly calling TabPy endpoints if TABPY_EVALUATE_ENABLE is disabled in TabPy.

7. Select **Apply** to run the script.
8. (Optional) If you're relating the table extension to another table in the data model, define the relationship between at least one field in each table. If the fields have the same name, this may happen automatically.
9. Choose **Update Now** and the results appear in the **Output Table** tab.




> **Note:** If you don't define a relationship to a table in the data model, the Input Table tab is empty and will display the message 'Data preview unavailable'.

10. (Optional) In the **Name** field, enter a unique name for your table extension.
11. Go to the Sheet tab to start exploring and visualizing the data. Results from a table extension functions like any other data in Tableau queried from a flat file or relational source.
12. Publish the workbook to share it. The publishing destination, Server or Tableau Cloud, must have an analytics extension of the appropriate type enabled and configured.

**Troubleshooting tip**: Errors from analytics extensions will be surfaced in a Tableau error message if there's a problem executing the script. If your table extension is hitting an error, ensure all code and formatting is correct and try using the circular Refresh Data Source button, located next to the Save button, or click Apply again.

## Table Extensions vs Analytics Extensions

While some of these products aren't related, table extensions and analytics extensions share several features. The table extensions feature relies on a connection with analytics extensions to work. Let's break down each feature.

Dashboard Extensions

Dashboard extensions allow custom web applications to be added to dashboards using the Dashboard Extension SDK, however, this extension type isn't related to table extensions.

Table Extensions

The Table extensions feature lets you create a table in a data source that can send data and a script to your analytics extension and return a full table of arbitrary shape as a result. The returned results are displayed as a table in the data model in the Data Source tab and as measures and dimensions in the workbook.

Analytics Extensions

The Analytics extensions feature allows you to extend Tableau calculations with programming languages like Python, external tools, and external platforms. After you create a connection to an analytics extension, you can communicate with your external server through calculated fields called SCRIPT_X or MODEL_EXTERNAL_X, where X is the data type of the expected return values. For more information, see Pass Expressions with Analytics Extensions.

# Use Certification to Help Users Find Trusted Data

In a self-service environment with multiple publishers, it's common for a project on Tableau Cloud to contain a variety of content that is named similarly, or is based on the same or similar underlying data, or is published without any descriptive information about it. When this is the case, analysts might lack confidence about the data they should use.

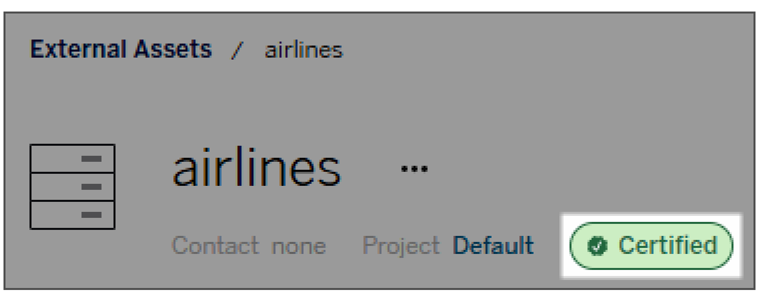
To help your users find the data that's trusted and recommended for their type of analysis, you can *certify* the data that complies with your organization's data standards.

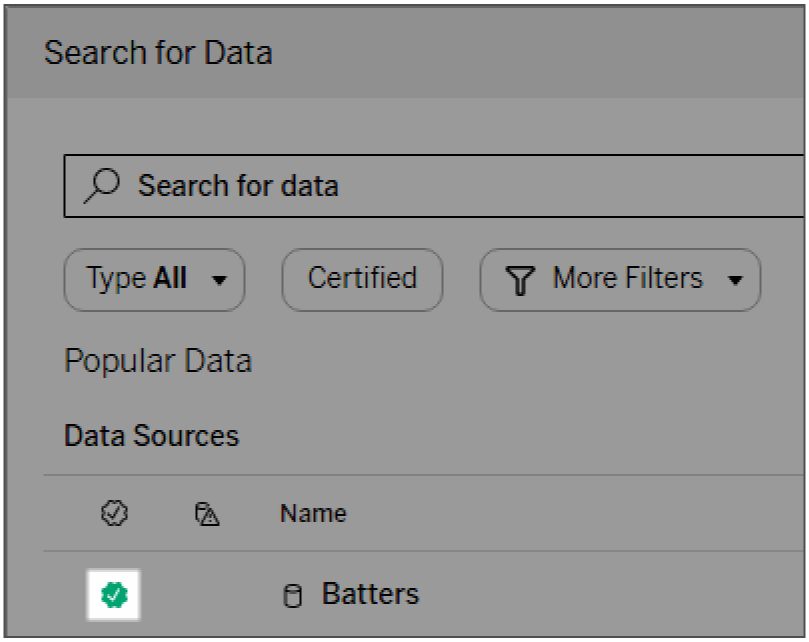
In addition to certifying published data sources, if you have a Data Management license for Tableau Server or Tableau Cloud:

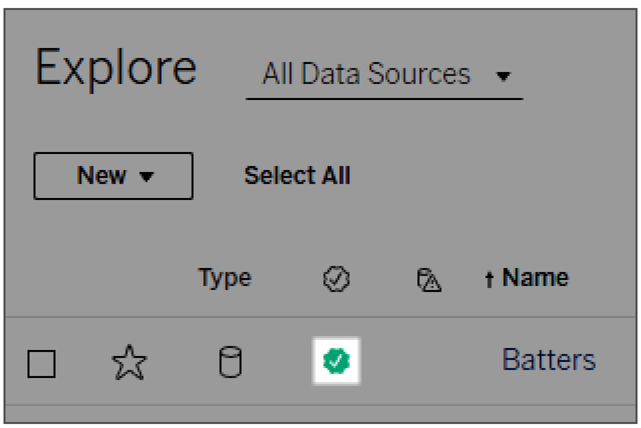
- If Tableau Catalog is enabled, you can certify databases and tables that are associated with your Tableau content. (For more information about Tableau Catalog, see "About Tableau Catalog" in the Tableau Server or Tableau Cloud Help.)
- Starting in Tableau 2022.1, you can certify virtual connections and virtual connection tables.

## How certification helps users find trusted data

When you certify an asset, users see a green badge or green check mark, depending on where the asset is being viewed.

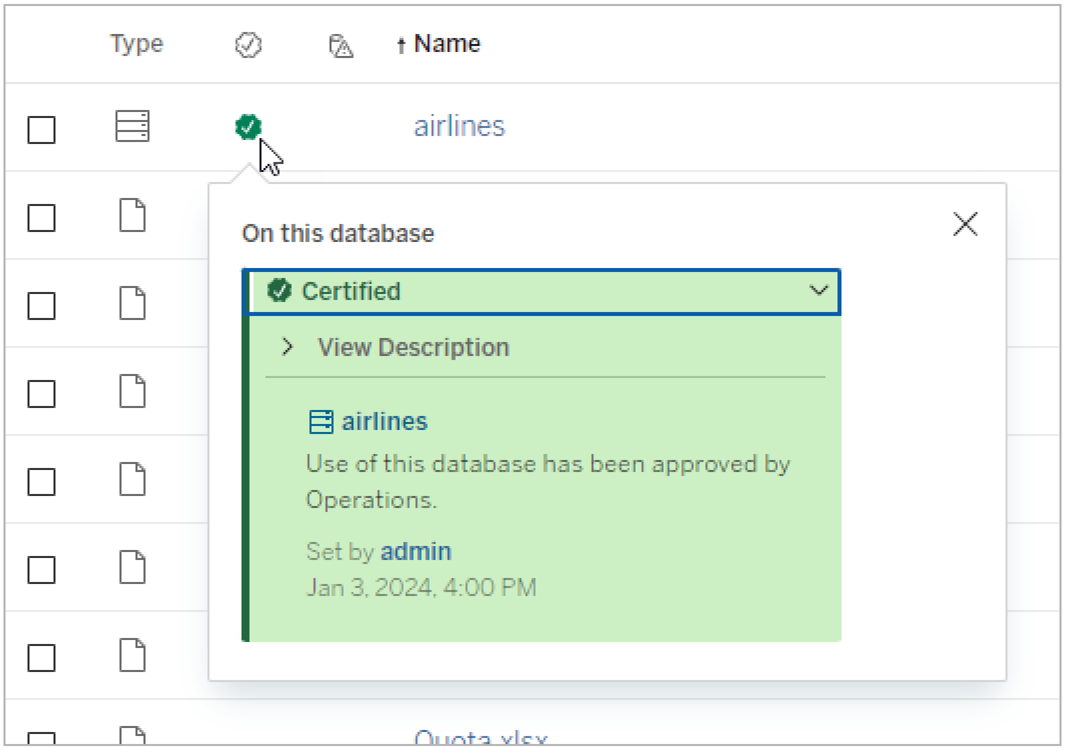





Certified data sources rank higher in search results and are added to recommended data sources.

In addition, you can provide notes about the certification status, which appear when users click the badge, or in a tooltip when they hover over the data source icon in web authoring or Tableau Desktop. The information also shows who certified the data source.




## Create guidelines for selecting data to certify

As with most Tableau functionality, certification is flexible. You can define for your organization the criteria you use to determine when to certify an asset. As you do so, document and share your guidelines. The guidelines can help you, other administrators, and project leaders to be consistent with your certification choices. They can also help users understand what certification means.

Whether you use the same certification criteria across all projects, or define unique criteria for each project, the important thing is to be clear about what certification means in your environment.

## Who can certify data

To certify a data source, you must

- be a Server or Site Administrator, *or*
- have a site role of **Explorer (Can Publish)** or **Creator** *and* be the project owner or have the **Project Leader** capability for the project containing the data you want to certify.

To certify virtual connections and virtual connection tables, you must have a Data Management license in your environment, and you must

- be a Server or Site Administrator, *or*
- have a site role of **Explorer (Can Publish)** or **Creator** *and* be the project owner or have the **Project Leader** capability for the project containing the data you want to certify.

To certify databases or tables, you must have Tableau Catalog enabled in your environment, and you must

- be a Server or Site Administrator, *or*
- have the **Set permissions** capability on the database to certify that database or any tables within that database.

## How to certify data

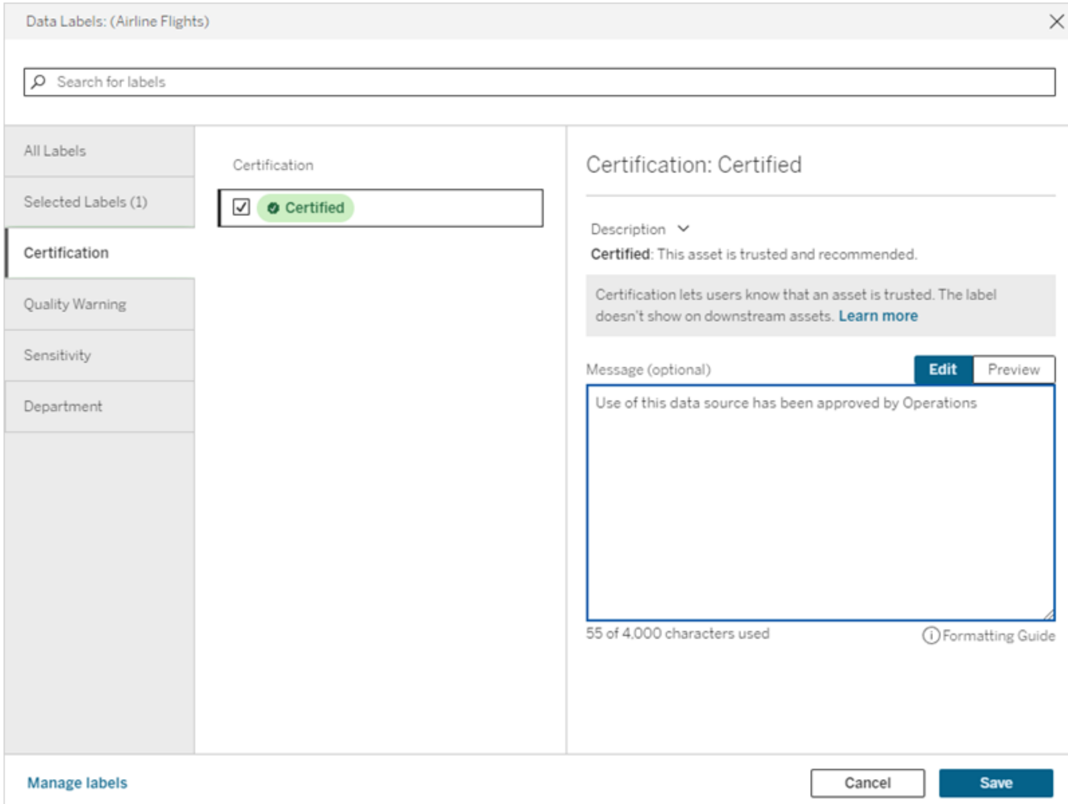
The data you can certify depends on the permissions you have, and whether you have a Data Management license and Tableau Catalog enabled in your environment.

- All users with permissions can certify data sources.
- If you have a Data Management license, users with permissions can also certify virtual connections and virtual connection tables.
- If you have a Data Management license and Tableau Catalog is enabled, users with permissions can also certify databases, tables, and files.

To certify an asset:

Note: Starting in Tableau Cloud February 2024 and Tableau Server 2024.2, you add and remove certifications using the consolidated Data Labels dialog instead of separate dialogs for each type of label. For information on the Data Labels dialog, see The Data Labels dialog.

1. Search for or navigate to the asset. The steps to navigate depend on the type of asset you want to certify:
   - Data source or virtual connection - on the **Explore** page, select **All Data Sources** or **All Virtual Connections**.
   - Virtual connection table - on the **Explore** page, select **All Virtual Connections**, and select the virtual connection that contains the virtual connection table you want to certify. Then select the virtual connection table.
   - Database or table - on the **Explore** page, navigate to the database or table. Or on the **External Assets** page, select **Databases and Files** or **Tables and Objects**.
2. On the page, select the More actions menu (...) next to the asset name you want to certify.
3. Select **Data Labels** > **Certification** (or **Edit Certification** in Tableau Server 2023.1 and earlier)
4. Select the **Certified** checkbox. (In earlier versions of Tableau Server, use the switch.)
5. Add a message if desired. The message gives users context for the certification status, intended use for the data, or other helpful information. Information you add to the **Message** section appears in the certification badge or tooltip, mentioned earlier in How certification helps users find trusted data. You can format the text in a message with bold, underline, and italics, and include a link or an image. To see text formatting tips, click the information (i) icon above the **Save** button. (Starting in Tableau Cloud February 2024, the message is optional. Earlier versions of Tableau Cloud and Tableau Server required it.)




6. Select **Save**.

## Customize certification

Beginning with Tableau Cloud June 2023 and Tableau Server 2023.3, using the label manager on the Data Labels page or the REST API, an administrator can change the certification description that users see in the certification dialog. For more information, see Manage Data Labels.

# Notify Owners When Extract Refreshes Fail

A scheduled extract refresh can fail to complete for a variety of reasons, such as outdated embedded credentials or file path. For scheduled refreshes that run directly from Tableau Cloud, after a refresh has failed five consecutive times, Tableau Cloud suspends the schedule until a site admin or the data source owner takes an action to address the cause.

A site admin can enable Tableau Cloud to send email to the owner of a data source when its scheduled extract refresh does not complete successfully. The data source owner can then opt out individually in their account settings.

The email contains the following information:

- Extract or workbook name.
- The date and time of the last successful refresh. Or, if the last refresh was longer than 14 days ago, the email shows “not in the last *N* days.”
- The number of consecutive times the refresh has failed.
- A suggested action to take to address the cause of the failure, such as updating embedded credentials or a file path, and a link to Tableau Cloud to take the action.

When receiving email about data sources refreshed by Tableau Bridge, there will be some differences. For more information, see Differences for Tableau Bridge refreshes later in this topic.

## Enable refresh failure emails

As a site admin, you have the ability to enable (or disable) refresh failure emails for your site using the procedure below. If you opt in, each user can potentially opt out from receiving refresh failure emails from his or her individual account.

1. Sign in to Tableau Cloud as a site admin and click **Settings**.
2. Under **Manage Notifications** , select or clear the check boxes to allow or disable notifications for all of your site users.

## Differences for Tableau Bridge refreshes

For data sources that are refreshed through Tableau Bridge, notifications will vary. For more information, see Manage Email Alerts for Bridge.

# Refresh Data on Tableau Cloud

The topics in this section describe how to manually refresh data, as well as schedule data refreshes.

## Schedule Refreshes on Tableau Cloud

You can schedule refresh tasks directly on Tableau Cloud for extracts of cloud-hosted data. This can include extracts of the following types of data:

- Salesforce.com or Google Analytics.
- Google BigQuery or Amazon Redshift, if you do not want to use a live connection. For on-premises Redshift, you must use Tableau Bridge.
- SQL-based or other data hosted on cloud platforms, such as Amazon RDS, Microsoft Azure, or Google Cloud Platform, if you do not want to use a live connection, or if live connection isn't supported for that data source.

  For a list of supported data sources, see Allow Live Connections to Data Hosted on a Cloud Platform.

Schedules are also available when creating extract refresh with Tableau Bridge. For more information see, Set Up a Bridge Refresh Schedule.

**Notes:**

- For information about refreshing extracts of Microsoft Excel, SQL Server or other data Tableau Cloud cannot reach directly, see Connectivity with Bridge.
- Your Tableau Cloud site comes with capacity to support all your users' analytic needs. A site's capacity includes capacity for storage and tasks that need to be performed on the site includes extracts. For more information, see Tableau Cloud Site Capacity.

### Create a refresh schedule

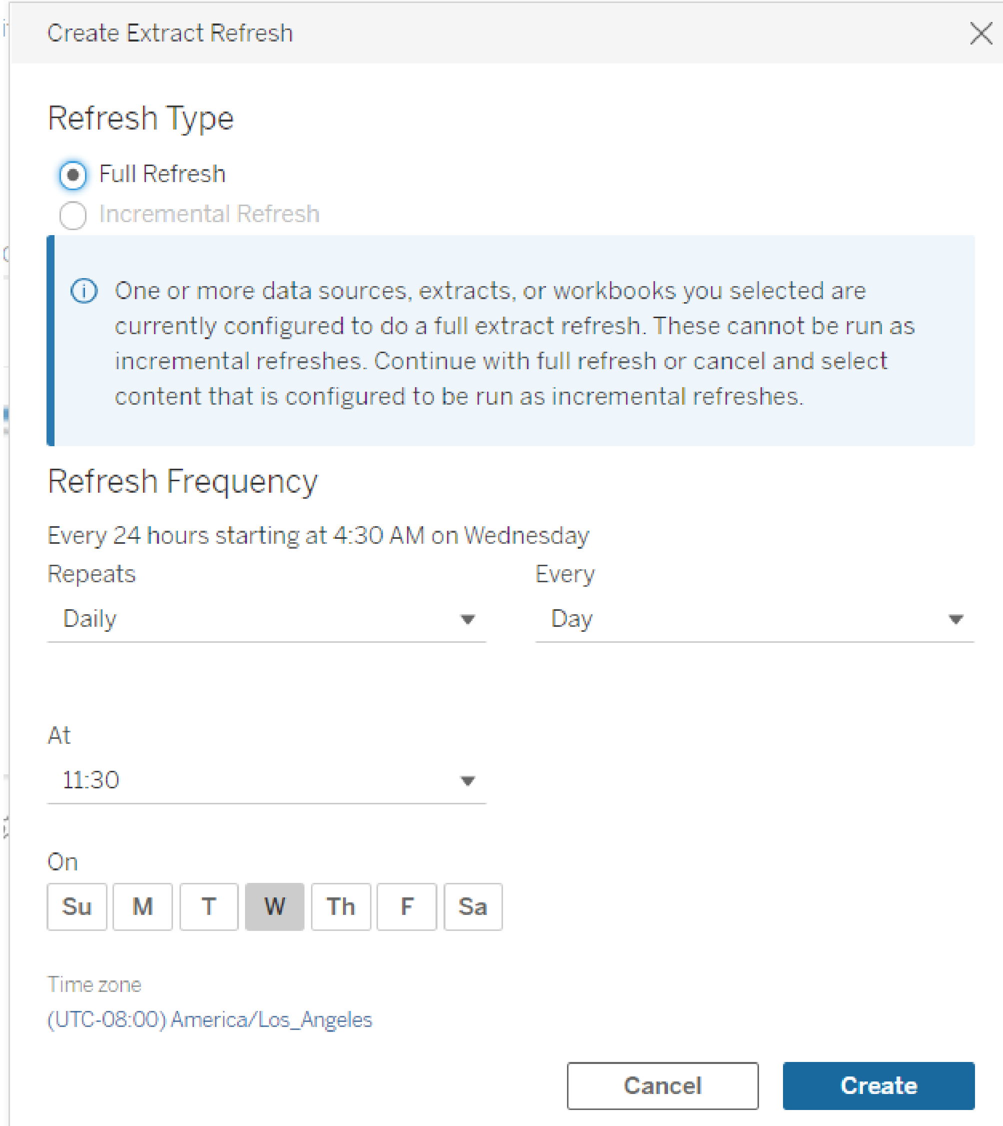
**Important!**

- The **Run Now** option is no longer available in **Create an Extract Refresh** dialog box. **Run Now** option is now listed in the **Actions** drop down menu.
- You cannot configure tasks to run sequentially (serially). Instead, you might want to stagger your start time for the extract refreshes, so the tasks run one after the other.
- If you migrate your existing tasks to custom schedules, please note that unless you change your start times for these tasks, they will run in parallel, which may not be desired.
- If you schedule more than one extract refresh for the same workbook or published data source, the jobs are run serially, with one waiting for the previous one to finish.

1. When you're signed in to Tableau Cloud, select Explore from the left navigation pane, and then, depending on the type of content you want to refresh, select All Workbooks or All Data Sources from the drop-down menu.

2. Select the check box for the workbook or data source you want to refresh, and then select **Actions > Refresh Extracts**.

3. In the Refresh Extracts dialog, select Schedule a Refresh, and complete the following steps:




- **Refresh Type:** Select the type of refresh you want. A full refresh is performed by default. Incremental refresh is available only if you configured for it in Tableau Desktop or web authoring in Tableau Cloud before publishing the extract. If you select one of more workbook or data source that has been set to do full refreshes, then the option to select incremental refresh is disabled. For more information, see Refreshing Extracts in the Tableau Help.

- **Refresh Frequency:** Setup the frequency for the extract refreshes to run. You can set the frequency to run hourly, daily, weekly or monthly. The time and day intervals depend on the repeat frequency that you select as described below:

- **Hourly:** The available frequency is every hour from a specific time to a specific time. This means that the task will run every hour during the specified time.
- **Daily:** The available frequencies are every two, four, six, eight, or twelve hours, or just once a day. You can also choose one or more days of the week, in addition to start and end times. This means you can run a task on all or certain days of the week at specific hourly intervals or once a day.
- **Weekly:** The available frequency is one day of the week at a specific time. This means you can run the task on a certain day of the week, once a week at a certain time.
- **Monthly:** You can set this up in two different ways:
    1. You can select **Day** as the frequency interval which then allows you to select specific dates of the month. For example you can select the task to run on the 2nd, 15th and 28th of every month at 2:45 pm.
    2. You can also choose the first, second, third, fourth, fifth, and the last day of the week at a specific time. For example you can choose to run the task every second Wednesday of the month at 2:45 pm.

## Update an Existing Schedule

When making changes to an existing schedule, you will no longer choose from a list of existing schedules, but directly change the recurrence in the schedule.

## Time limit for extract refreshes

To ensure that long running refresh tasks don't take up all system resources and don't prevent refreshes of other extracts on your site, Tableau Cloud enforces a time limit, also known as a timeout limit, of 7200 seconds (120 minutes or two hours) for refresh tasks. The timeout limit is the longest allowable time for a single extract to complete a refresh before it's canceled. The timeout limit is not configurable.

### Staying within the timeout limit

Although reaching the timeout limit is not common, if you're working in an extract-heavy environment, there are few modifications you can make to your extracts to help avoid reaching the timeout limit.

- Schedule Refreshes on Tableau Cloud
- Set up incremental refreshes
- Decrease the size of extracts
- Use an alternative method for refreshing extracts
- Schedule refreshes at a different time

### Set up incremental refreshes

Consider configuring your extracts to be incrementally refreshed instead of fully refreshed each time a refresh task is performed.

By default, extracts are set up to fully refresh. Although a full refresh gives you an exact copy of the data, a full refresh can take a long time to complete. To reduce the time it takes to refresh an extract, consider setting up incremental refreshes of your extracts instead. For more information, see Configure an incremental extract refresh in the Tableau Help.

> **Note:** You must set up the incremental refresh before publishing the extract to Tableau Cloud. After publishing, you will then be able to select Incremental Refresh option in the Create Extract Refresh dialog.

### Decrease the size of extracts

You can help refresh tasks complete faster by decreasing the size of your extracts.

There are two common methods for decreasing the size of extracts: hide all unused fields and use data source filters.

- **Hide all unused fields:** Fields that you hide in your data source are excluded when the extract is created. To hide fields while creating the extract, see Create an extract in the Tableau Help.
- **Add data source filters:** You can reduce the number of rows in your extract by adding a data source filter. For more information, see Filter Data from Data Sources in the Tableau Help.

> **Note:** You must hide all unused fields or add data source filters before publishing the extract to Tableau Cloud.

Use an alternative method for refreshing extracts

If possible, consider refreshing your extracts outside of Tableau Cloud.

- **Tableau Desktop:** You can manually refresh published extracts from Tableau Desktop. For more information, see Refresh Published Extracts from Tableau Desktop.
- **Tableau Bridge:** Depending on the data source, you can use Tableau Bridge to set up and refresh published extracts on a schedule. For more information, see Use Bridge to Keep Data Fresh.
- **Tableau Data Extract Command-Line utility (Deprecated):** Depending on the data source, you can use the command-line utility that comes with Tableau Desktop to programmatically refresh published extracts. For more information, see Automate Extract Refresh Tasks from the Command Line.

  > **Deprecated October 2022:** This utility is not available in later releases. To refresh data sources or virtual connections data that Tableau Cloud can't reach

> directly, use Tableau Bridge instead. To initiate refresh jobs using a script, use tabcmd refreshextracts or REST API Run Extract Refresh Task.

Schedule refreshes at a different time

Consider changing when the refresh tasks occur. For more information, see Manage Refresh Tasks.

Errors when refresh tasks reach timeout limit

If a refresh task reaches the timeout limit, you or others might see one of the errors listed below. If you published the extract or are the extract owner, you might see one of these errors in an email notification. If you're a site administrator, you might see one of these errors in the administrative view about Background Tasks for Extracts.

- *The query time resource limit (7200 seconds) was exceeded.*
- *com.tableau.nativeapi.dll.TableauCancelException: Operation cancelled.*
- *The query time resource limit (8100 seconds) was exceeded.*

To help resolve and avoid these errors in the future, see the section above, Staying within the timeout limit.

## Refresh Data Using Saved Credentials

To keep data fresh for Salesforce, Google Analytics, Google BigQuery, OneDrive, Dropbox, Quickbooks Online, Anaplan, Oracle Eloqua, and ServiceNow ITSM, you must do the following:

1. Embed credentials into the data connection. The steps are described in this topic

2. If your data source or workbook contains an extract, you can add the extract to a refresh schedule. For the steps to schedule a refresh, see Schedule Refreshes on Tableau Cloud.

If your data source or workbook contains a direct (live) connection to the data, then the data is always fresh, and you don't need to create a scheduled task to refresh it.

## Embed credentials into the data connection

You can embed credentials for your connection by following these steps.

1. Sign in to Tableau Cloud and navigate to **Data Sources** page.
2. Select the data source with the connection you want to refresh, and on the **Actions** menu, select **Edit Connection**.
3. The options in the Edit Connection dialog box will vary depending on the data source you selected. Review the options available to you and select the one that meets your needs.

   If you select **Prompt user for <connector name> credentials**, you will need to refresh data manually. You can do this by asking users to republish the data source from Tableau Desktop or by initiating a refresh task on Tableau Cloud.

## Connector-specific credential information

### Use OAuth credentials

Secure data connections are made using OAuth access tokens for data connections to Google Analytics, Google BigQuery, Google Sheets, OneDrive, Dropbox, Salesforce, and QuickBooks Online. You create access tokens by signing in to the data from Tableau Cloud and approving Tableau Cloud access to the data as long as the credentials exist (or you manually revoke access). When you add a new account, the sign-in page appears. When you sign in, you create a new access token for the credentials you submit.

> **Note:** Dropbox uses OAuth credentials, however Tableau doesn't currently support authenticating to Dropbox using a Google account.

You can embed shared credentials, as you might do if you use a dedicated database account for a group of users. Or you can embed an individual user's credentials. The account you use to create the access token must allow a level of access for running the refresh task.

Use other credentials

Anaplan, Oracle Eloqua, and ServiceNow ITSM each support using saved credentials (for example, user name and password) to connect to the data.

Use Salesforce security tokens

If you embed standard Salesforce credentials, Salesforce might require a security token for you to access a data. For example, if you want to access the Salesforce connection from an IP address that is not included in your organization's trusted IP list. This security token must be appended to the password used in the data connection.

The security token can expire. When Tableau is unable to refresh a Salesforce connection because the security token has expired, Tableau displays an alert to the following users:

- Authors of the relevant workbooks and data sources.
- Authors of workbooks that connect to the relevant data sources.
- Site administrators.

You can renew an expired security token by editing the data connection on the server.

For more information about Salesforce authentication and security tokens see Security and the API in the Salesforce.com *SOAP API Developer's Guide*.

## Start a Refresh Task Manually

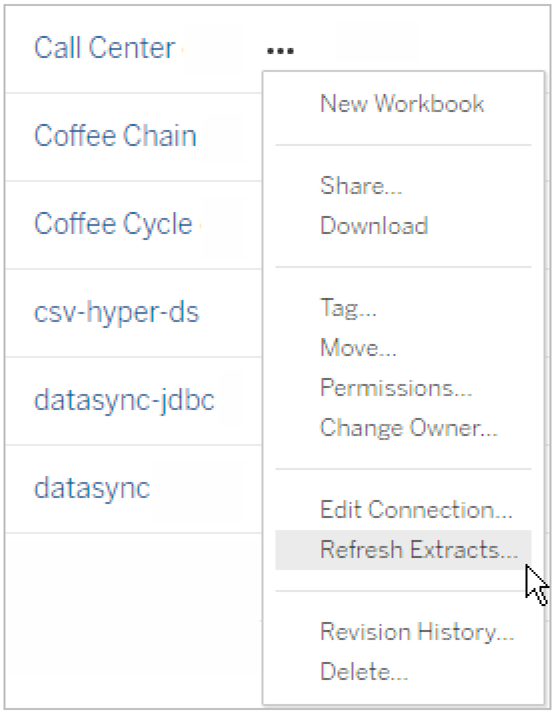
You can refresh extracts of data hosted with most cloud data providers directly on Tableau Cloud. You can run a refresh from Tableau Bridge for data sources you've set up there.

If a data source has scheduled refreshes, running a manual refresh does not affect the schedule.

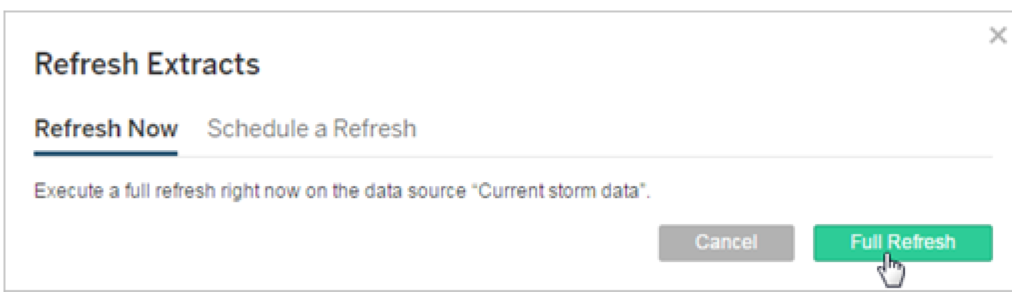
## Run a refresh on Tableau Cloud

1. Sign in to the Tableau Cloud site to which the data source is published.

2. On the Data Sources page, select the **More actions** icon (…) next to the data source you want to refresh, and then select **Refresh Extracts** from the menu.




3. Under **Refresh Now**, select **Full Refresh**.



**Note:** For data sources that have scheduled refreshes, site administrators can initiate a refresh also from the **Actions** menu on the **Tasks** > **Extract Refreshes** page.

### Run a refresh in the Tableau Bridge client

Open Tableau Bridge from the Windows system tray, and select the **Run now** icon ( ) for the data source.

## Manage Refresh Tasks

Administrators can manually refresh extracts or delete their schedules.

1. Sign in to the site that has the schedules you want to manage, and then click **Tasks**.
2. Select one or more scheduled extract refreshes.
3. From the **Actions** menu, do any of the following:
    - Select **Change Schedule**, and choose a new schedule from the list.
    - Select **Run Now** to refresh manually.

      **Note:** If an extract does not have a scheduled refresh, you can refresh it on demand from the Data Connections page.
    - Select **Delete** to completely remove the schedule for the selected data sources.

### See also

Notify Owners When Extract Refreshes Fail

# Automatically Suspend Extract Refreshes for Inactive Workbooks and Data Sources

To save resources you can automatically suspend extract refresh tasks for inactive workbooks and published data sources. This feature applies to full extract refreshes that occur more frequently than once a week. Incremental refreshes and those that occur less frequently than weekly are not impacted.

Extract refresh tasks for an inactive workbook are suspended after the workbook has been inactive for 32 days.

**Note:** Support for automatic suspension of extract refreshes for data sources is available beginning in the Tableau Cloud July 2023 release.

For a workbook, if any of the following events occur, the workbook's inactivity countdown timer is reset:

- Viewing the workbook sheets
- Having any data-driven alert or subscription set-up on the workbook
- Downloading the workbook
- Moving the workbook's location or changing the owner

For a published data source, any event which fetches the data from the data source will cause its inactivity countdown timer to be reset. These include:

- Loading a workbook view that is connected to the data source
- Visiting the data source’s Ask Data page
- Tableau Desktop connecting to the data source

## Notifications

An email notification is sent three days before the extract refresh schedule is suspended.

Another email notification is sent when the extract refresh schedule is suspended.

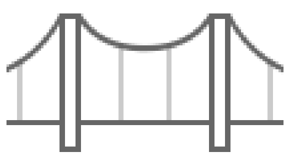
### Resume suspended extract refreshes

Suspended extract refreshes won't automatically resume if someone uses the workbook. It must be done manually by a site administrator.

To view and resume extract refreshes that were suspended:

1. Sign in to the site as an administrator and click **Tasks**.
2. Click the **Extract Refreshes** tab.
3. Select one or more items.
4. From the **Actions** menu, select **Resume**.

# Use Tableau Bridge

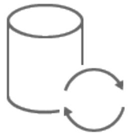


Get Started

- Use Bridge to Keep Data Fresh
- Install Bridge
- Set Up a Bridge Refresh Schedule
- Use Bridge for Private Cloud Data
- Tableau Bridge FAQ

Quick Reference for Site Admins 

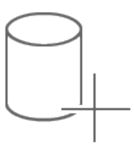
- About the Bridge Client
- Configure the Bridge Client Pool
- Manage the Bridge Client Pool
- Change the Bridge Client Settings

Quick Reference for Publishers 

- Publish a Bridge Data Source with a Live Connection
- Stop Keeping Data Fresh Through Bridge
- Manage Email Alerts for Bridge
- Troubleshoot Issues with Bridge

Enterprise

- Plan Your Bridge Deployment
- Best Practices for Data Connect and Tableau Bridge
- Monitor Bridge Extracts Activity
- Monitor Traffic to Bridge Connected Data Sources
- Monitor Bridge Refresh Jobs

Connectivity 

- Connectivity with Bridge
- Update Bridge Connection Information

Security 

- Bridge Windows Security

# Use Bridge to Keep Data Fresh

For data sources or virtual connections data that Tableau Cloud can't reach directly, you can use Tableau Bridge to keep data fresh. For example, use Bridge when your data source connects to data hosted behind a firewall.

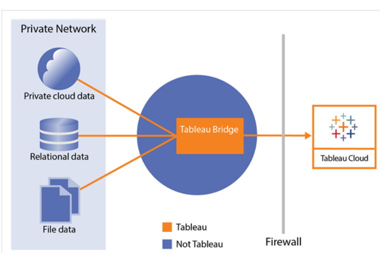
**Note:** If a data source connects to underlying data hosted in the cloud and is accessible from the public internet, connections run from Tableau Cloud directly.

## What is Bridge

Tableau Bridge is client software that runs on a machine in your network. The client works in conjunction with Tableau Cloud to keep data sources that connect to private network data, which Tableau Cloud can't reach directly, up to date. Private network data includes on-premises data and private network cloud data.

## How does it work

Tableau Bridge functions like a conduit between private network data, such as Excel files and SQL Server data, and Tableau Cloud. The client communicates with Tableau Cloud through an outbound encrypted connection to enable connectivity between data behind a firewall and your Tableau Cloud site.




For more information about how Bridge communicates with Tableau Cloud, see Tableau Bridge Security.

## Who can use it

Although any authorized user of Tableau Cloud can use Bridge, Bridge is optimized for users that perform the following functions in an organization: site admins and data source owners.

**Site admins**, or users who have the Site Administrator or Site Administrator Creator role on Tableau Cloud, install and manage Bridge clients. For more information, see Plan Your Bridge Deployment.

**Content owners**, or users who have the Creator or Explorer (can publish) role on Tableau Cloud, typically publish and manage their own content. Content owners use Bridge to facilitate the live and extract connections between Tableau Cloud and private network data.

- For **live connections**, Bridge is detected automatically as part of the data source or virtual connection publishing process. Support for live connections are enabled through pooling.

  **More about data sources:** Users see the option to publish the data source with a live connection during the publishing process. This option is available when live connections are supported for relational or cloud databases accessible only from inside the network.

  After the user publishes the data source, an available client in the pool facilitates the live queries. That's all there is to it.

  To get started, users publish a data source to Tableau Cloud, and select the option to maintain a live connection. Or, publish a workbook, then specify a live connection. For more information about publishing data sources, see Publish a Bridge Data Source with a Live Connection.

  **Note:** If publishing a data source that connects to a private cloud database, follow the steps described at Publish private cloud-based data sources to ensure Bridge is used to facilitate the data freshness tasks.

- For **extract connections**, users can set up refresh schedules for data sources or virtual connections. For more information, see Set Up a Bridge Refresh Schedule.

  **Note:** If publishing a data source that connects to a private cloud database, follow the steps described at Set up schedules for private cloud-based data sources to use Bridge facilitated refresh schedules.

# Tableau Bridge FAQ

Find answers to commonly asked questions about Tableau Bridge.

## Bridge Basics

What is Tableau Bridge?

Tableau Bridge is a proxy client that runs on a machine in your network and is used to connect your private network data to Tableau Cloud. Bridge is installed behind your organization's firewall. It can access on-premises and virtual cloud (isolated private cloud hosted within a public cloud) data through an established and secure outbound connection from your data to Tableau Cloud.

See Use Tableau Bridge.

What is Tableau Bridge used for?

If some or all of your data is on premise or in a virtual cloud that is behind the firewall, you can use Bridge to securely access and connect data to Tableau Cloud. The data can range from .csv files on your private network or stored in a data warehouse.

Bridge also keeps your data current. If you have a viz that must be refreshed as the data is modified, Bridge can keep data fresh in Tableau Cloud, either by automatically refreshing extracts, or by passing live queries to your on-premise data sources.

What's the cost of Tableau Bridge?

Tableau Bridge is a free, supported client that is used with Tableau Cloud.

What are the supported OS systems and minimum hardware requirements for Tableau Bridge?

Bridge is supported on Windows 64-bit machines and Linux. For Bridge for Linux you must create a customized Docker image. For information about minimum hardware requirements, see Recommended software and hardware.

Do we need a separate Tableau Bridge installation for each Tableau Cloud site?

Yes. Tableau Bridge can only connect to one Tableau Cloud site at any given time. Tableau recommends installing the Bridge client on a dedicated virtual machine behind your firewall so that it doesn't compete with resources from other applications. Only one client can be installed on a machine. For more information, see Install Bridge.

Can I use Bridge even if I can connect to the data directly from Tableau Cloud?

You don't need to use Bridge if Tableau Cloud can access the data directly. Bridge acts as a proxy, and depending on throughput, it's possible that Bridge will be slower than a direct connection to the data source.

How do I install Bridge?

(Windows) Download the installer from the Downloads page and follow the Install Bridge instructions. See Recommended software and hardware.

(Linux) To use Bridge for Linux you must create a customized Docker image, install the RPM package, and then run Bridge from inside the container image.

## Security

How does Bridge keep data secure?

All traffic between Bridge and Tableau Cloud is secured using TLS. Bridge makes an initial outbound connection; all communication is initiated from behind a firewall using ports 80 and 443. After the initial outbound connection, communication is bidirectional. Data in transit, to and from Tableau Bridge, is encrypted. Bridge uses the following protocols depending on the connection type used by the content:

- For live connections and extract refreshes that use Bridge refresh schedules, secure WebSockets (wss://).
- For extract refreshes that use Bridge (legacy) schedules, HTTP Secure (https://).

To ensure that your data is transmitted to Tableau Cloud only, you can implement domain-based filtering on outbound connections (forward proxy filtering) from the Bridge client.

See Bridge Security.

Are there other ways to secure data?

You can use whitelisting to identify sites that are allowed access to your data and exclude sites that aren't included in the list. Some data sources are always "cloud-native", such as Amazon Athena, Redshift, Azure SQL Database, Google Cloud SQL. In these cases, Tableau Cloud expects to connect directly through IP whitelisting by default when the native connector is used.

It's possible to configure Tableau Bridge to work with "cloud-native" data sources if the data is isolated from the Internet in a private subnet (and therefore IP whitelisting isn't an option).

What permissions do I need?

- You need access to the Tableau Cloud account used to log in to the Tableau Bridge client and the site associated with the data.
- To assign the Bridge client to a pool (either a default pool or a named pool), you need either Site Administrator Creator or Site Administrator Explorer role.
- To run refresh extracts:
  - For Bridge refresh schedules, the user needs Creator or Explorer (can publish). The Bridge client must be set up correctly by site admin.
  - For Bridge legacy schedules, because the schedule must be assigned to a particular Bridge client, the user must either be the owner of that Bridge client (if the customer only has Creator or Explorer (can publish) permission) or be a site admin.
- The Creator or Explorer (can publish) role and the Data Management license is required to publish virtual connections and refresh data with Bridge.
- (Windows) The Windows account that is running Bridge must have access to all data sources that are being connected to.

- (Windows) The Windows user account must be a member of the local admin group to run the client in service mode. If the user isn't a local admin, they can run the Bridge client in Application mode, but they must remain logged in to the Windows machine.

What credentials are used when accessing data?

For extracts with Bridge legacy schedules, access information must be embedded in the Bridge client. The Bridge client owner must log in to the Windows machine and manually enter the credentials. This process results in database credentials being stored on the computer using the Windows credentials manager.

For Bridge refresh schedules, the credentials can be embedded for the published data source in Tableau Cloud.

For data sources accessed via Windows Authentication, there are no credentials to embed, but the Windows account that Bridge is running under must have access to the source database.

Tableau Bridge supports OAuth when connecting to private data that uses OAuth and public data that uses OAuth when it's joined to private data. Both saved credentials or managed keychain connectors are supported by OAuth: The type of functionality depends on the connector that you use. Bridge supports both live and extract refreshes for data sources with OAuth authentication.

Tableau Bridge supports integrated Windows authentication that uses Kerberos. See Integrated Windows Authentication However, Bridge doesn't support connections that use Kerberos as a standalone authentication mechanism.

What are the multi-factor authentication requirements?

If multi-factor authentication (MFA) is enabled with Tableau authentication, he connected client option must be enabled for the site to allow Bridge clients to run unattended and, if enabled, support multi-factor authentication with Tableau authentication. If connected clients are disabled for the site, Bridge can only support Tableau username and password authentication.

See Access Sites from Connected Clients.

## Connections

What connection types does Bridge support?

**Extract connection**: When data sources or virtual connections use extracts to connect to private network data, Bridge can be used to perform scheduled refreshes of those extracts. See Additional requirements for extract connections.

**Live connection**: Bridge supports data sources or virtual connections with live connections to a private network. If the content owner publishes a data source or virtual connection that uses a live connection to data that Tableau Cloud detects that it can't reach directly, live queries are used to keep the content fresh. See Additional requirements for live connections.

The type of data that Bridge can support falls into one of the following categories:

- Relational data
- File data, including Excel, text, and statistical (.sas7bdat) files.
- Private cloud data, including Amazon Redshift, Teradata, and Snowflake. For more information, see Use Bridge for Private Cloud Data.
- (Limited) JDBC data.
- (Limited) ODBC data.
- Web Data Connector 2.0 SDK. See Keep Data Fresh.
- Data used in a multi-connection data source (that is, data sources that contain a cross-database join), when all connectors are supported by Bridge. For more information, see Refreshing Cross-Database Joined Data Sources on Tableau Bridge in the Tableau Knowledge Base.

What connection types does Bridge not support?

Unsupported connectors:

- Microsoft Analysis Services
- Microsoft PowerPivot
- Oracle Essbase
- SAP NetWeaver Business Warehouse
- Connectors (.taco) built with the Tableau Connector SDK and connectors available through Tableau Exchange.

Unsupported connection types:

- Live connections to file-based data (excel, .csv, and so on)
- Live connections to Google Cloud SQL, OData, Progress OpenEdge, and Tableau extracts
- All connections to cube-based data
- Snowflake when used with virtual connections

Can Bridge be set up to run continuously?

(Windows) Bridge can run in two different modes: Application mode and Service mode. Tableau recommends that you run Bridge in Service mode. If your client is set up to run in Service mode, you don't need to be logged on to the computer running the client, but your computer must be on. By default, the client runs as an Application. This means the Windows user must be logged on to the computer where the client is running for scheduled refreshes to complete. After sign-in, the Bridge client opens from the system tray.

(Linux) Bridge on Linux runs in the background of Linux, which is the equivalent to Service mode in Tableau Bridge on Windows.

See Application versus Service mode.

Can I connect to a data source embedded in a workbook?

Yes. Tableau Bridge supports publishing a workbook directly to Tableau Cloud using embedded data sources.

## Load Balancing and Pooling

How can I load balance data refreshes with Bridge?

You can configure a pool to distribute data refresh tasks among the available Bridge clients. Pools map to domains, allowing you to dedicate pools to keeping specific data fresh and maintaining security by restricting access to protected domains in your private network.

See Configure the Bridge Client Pool.

## Scaling and Deployment

How can I scale with Bridge?

As a starting point, we recommend initially configuring at least two Tableau Bridge clients for redundancy, and in many Bridge deployments, more than one Bridge client is necessary to support data freshness needs.

Bridge supports up to 10 concurrent published data source extract refreshes by default. This value can be changed based on your workload and hardware requirements. See Change the Bridge Client Settings. Determine how many published data source extracts are necessary in the available time window. In many situations, there are several concentrated time blocks when extracts must occur. You need enough Bridge clients to complete all required extract refreshes this time window. For example, if you have 7 hours of extract refreshes to run, and a 4-hour window to run them in, then 2 Bridge clients would be a reasonable number to use.

Bridge supports 16 live queries per client. Determine the number of concurrent users. Site admins can monitor traffic to data sources with live connections using a built-in administrative view in Tableau Cloud. This gives a high-level view into how often particular data sources with live connections are being accessed.

As part of your pilot and rollout you should monitor usage over time.

See Plan Your Bridge Deployment.

## Monitoring

How can I monitor Bridge?

You can use the Traffic to Bridge Connected Data Sources admin view to see the usage of data sources with live connections. This view can help you determine which data sources are most heavily used and those that are used less often.

The Bridge Extracts admin view captures the last 30-days' worth of refresh activity by Tableau Bridge. Only jobs that have been successfully started by the Bridge client have a record in the Bridge Extract admin view.

# Plan Your Bridge Deployment

As a site admin, if you're setting up Tableau Bridge for the first time or upgrading, there are a set of recommendations, best practices, and planning tasks to follow to optimize Bridge for your organization.

For a general overview of Bridge, see Use Bridge to Keep Data Fresh.

Before you deploy Bridge, review the following information to help you, as the site admin, understand the different components of Bridge, how these components work together, and how they impact your Bridge deployment.

Bridge software

Bridge is stand-alone software, provided at no additional cost, to use in conjunction with Tableau Cloud. Bridge is a thin client that you install behind a firewall to enable connectivity between private network data and Tableau Cloud.

To take advantage of the latest security and feature updates, always install the latest version of the Bridge client from the Downloads page. For more information, see the Install Bridge topic.

In most cases, you will own the set up and management of several clients, or pools of clients, in your organization.

- Clients can only be registered to one site at a time.
- There is no limit on how many clients that can be registered to a site.

Database drivers

To facilitate connectivity between private network data and Tableau Cloud, Bridge requires drivers to communicate with some databases. Some driver software is installed with the client. Other driver software must be downloaded and installed separately. For more information, see the Install Bridge section in the Install Bridge topic.

Pooling capacity

By default, data freshness tasks, live queries, and data sources or virtual connections that use extract connections refreshed with Bridge refresh schedules, are distributed and load balanced across available clients in a pool.

| Data Freshness Task | Pooling Support | Concurrency Capacity |
|---|---|---|
| Live query | Yes | 16 live queries per client |
| Extract connection - Bridge refresh schedule (Published data sources) | Yes | 10 refreshes per client (can be configured) |
| Extract connection - Bridge legacy schedule | No | 1 refresh per client |

Bridge is designed to scale up and scale out. When configuring your Bridge deployment, consider the following:

- For a smaller pool of clients running on higher specification machines, each client can be scaled up to run more scheduled refresh jobs in parallel.
- For a larger pool of clients running on lower specification machines, though each client can run fewer refresh jobs in parallel, each client still provides high throughput and capacity for the pool as a whole.

For information about Tableau site capacity, see Concurrent jobs capacity.

Data access and authentication

The underlying data that a data source or virtual connection connects to often requires authentication. If authentication is required, the publisher or owner can configure how the database credentials are obtained.

**For data sources**

The authentication configuration options for data sources are: **Prompt user** or **Embedded password**.

If the data source is set to prompt users, database credentials are not stored with the connection. This means, a user who opens the data source (or workbook that uses the data source) must enter his or her own database credentials to access the data. If a data source is set up with the password embedded, database credentials ares saved with the connection and used by anyone who accesses the data source (or workbook that uses the data source). For more information, see Set Credentials for Accessing Your Published Data.

**For virtual connections**

Database credentials are stored with a virtual connection's connection and used by anyone who accesses the virtual connection.

Content management

In most cases, the site admin owns and manages the Bridge clients. Content owners manage the data sources or virtual connections themselves for tasks that range from publishing to updating database credentials and refresh schedules.

Timeout limits

Live queries have a timeout limit of 15 minutes. This limit is not configurable. Refreshes have a default timeout limit of 24 hours and is configurable by the client. For more information, see Change the Bridge Client Settings.

## Linux deployment

To use Bridge on Linux you must create a customized Docker image, install the RPM package, and then run Bridge from inside the container image. The Bridge on Linux project is supported on Red Hat and Amazon Linux. For more information, see Install Bridge for Linux for Containers.

## Windows deployment

Minimum hardware recommendations

Tableau recommends installing the Bridge client on a computer behind your firewall. Only one client can be installed on a computer.

- Microsoft Windows 10 or later, 64-bit
- Windows Server 2016 or later
- CPUs must support SSE4.2 and POPCNT instruction sets

For more information, see Windows Client requirements

The following table shows hardware guidelines for virtual environments running Bridge. These guidelines are based on the number of concurrent refreshes you need each client to be able to run in parallel.

| | **Refreshes running in parallel per client** | |
|---|---|---|
| | **<=5** | **<=10** |
| vCPU | 4 | 8 |
| RAM | 16 GB | 32 GB |
| NVMe SSD | 150 GB | 300 GB |

**Virtual environments**

All of Tableau's products operate in virtualized environments when they are configured with the proper underlying Windows operating system and minimum hardware requirements.

- Amazon EC2
- Citrix environments (non-streaming)
- Google Cloud Platform
- Microsoft Azure
- Microsoft Hyper-V
- Parallels
- VMware

Required accounts for Windows

There are two types of accounts that your Bridge deployment requires: a Windows service account and a Tableau Cloud account.

**Windows services account**

Bridge clients can run in one of two modes: Application or Service. To run the client in Service mode, a Windows services account is required. Service mode allows the client to run continuously without a dedicated logged-on user. Service mode is recommended to support 1) data sources or virtual connections with live connections to private network data, and 2) load balancing (pooling) of clients. For more information about each mode, see About the Bridge Client.

**Important:** We recommend that no more than 10 clients run under a single Windows services account.

**Tableau Cloud account**

Tableau Cloud authenticates the client by the user that is signed in to and managing the client. Therefore, a Tableau Cloud site admin account is necessary to perform certain management tasks, like adding or removing a client from a pool, both on the client and Tableau Cloud site.

One of the following site roles is required to manage Bridge:

- Site Administrator Creator
- Site Administrator Explorer

The non-administrator site roles, Creator and Explorer can publish data sources, refresh data, and use Bridge to facilitate the live and extract connections between Tableau Cloud and private network data. The Creator or Explorer role and Data Management is required to publish virtual connections and refresh data with Bridge.

Scheduling capacity

Because Bridge clients can easily be connected and disconnected, you can leverage scripts to schedule Bridge capacity (that is, the number of running client machines) in advance of anticipated data freshness workloads.

For example, if your Bridge clients run on virtual machines on AWS, the following AWS resources can help you get started with scheduling:

- AWS Instance Scheduler
- How do I stop and start my instances using the AWS Instance Scheduler?
- How do I stop and start Amazon EC2 instances at regular intervals using Lambda?

New Bridge deployment on Windows

To deploy Bridge, do the following:

1. For each machine, log on using your Windows services account, and install the latest client.
2. After installation, sign in to the client using your Tableau Cloud site admin credentials to ensure that the client is running under Service mode (on by default).
3. Open a browser, sign in to Tableau Cloud using your site admin credentials and go to the Bridge settings page to ensure:
   a. Installed clients are properly linked to the site.
   b. Clients are part of the client pool.
4. Monitor the Bridge live queries using the **Bridge Connected Data Sources** admin view, and refresh jobs from the **Jobs** page on Tableau Cloud.

Upgrade an existing Bridge deployment

As with previous releases, the enterprise improvements in this release are designed to complement your existing Bridge deployment. As with other deployments, we recommend the following steps below.

**Notes:**

- Sites with default pools can't be configured to access a specific private network. To reduce the scope of access of this pool and to enable more advanced scheduling capabilities, we recommend you create new pools and map them to specific domains. For more information, see Step 2: Configure a pool.

- Because Bridge pools are mapped to and refresh data from specific domains, we strongly recommend that extract data sources that contain connections to multiple domains be updated in one of the following ways:
  - Consolidate underlying data locations so that the connections are in the same domain
  - Change the connection type of each connection to use liver query
  - Convert each connection to a data source
- When using 1) Tableau Desktop on a Mac, 2) publishing a file-based data source from a Windows network file share, and then 3) configuring a Bridge refresh schedule, the refreshes will fail. If this file-based data source is business critical resource for your organization, consider configuring a Bridge legacy schedule instead. For more information, see Set up a Bridge legacy schedule.
- Existing data sources, including all file-based data sources that are already configured with Bridge legacy schedules and associated with specific clients will continue to run as expected. **Important:** Support for Bridge legacy schedules will be removed in version 2025.1. To ensure a smooth transition, we recommend you use Bridge refresh schedules. For more information, see Migrate from Bridge legacy to Bridge refresh schedules.

Upgrade steps

1. Add new clients.
2. Create new pools, map domains to a pool, and assign version clients to pools.

   Follow the procedures described in Step 2: Configure a pool, Step 3: Specify a domain for a pool, and Step 4: Add clients to a pool.
3. If you have Bridge legacy schedules, request data source owners to convert the (legacy) schedules. See Migrate from Bridge legacy to Bridge refresh schedules.

   **Important:** We recommend that data source owners begin the process by converting refresh schedules for extract data sources that are least critical to daily business. This is because converting Bridge legacy to Bridge refresh schedules will immediately delete the existing refresh schedules.

4. Upgrade existing clients. For more information, see Install Bridge.

5. Add existing clients to a pool.

After upgrade, ensure the upgraded clients are running as a Window service and then add those clients to the pool. For more information, see Step 4: Add clients to a pool.

## Bridge Site Capacity

A site has a 1 TB storage limit for workbooks and extracts. An individual workbook or data source (live or extract) published to your site can have a maximum size of 15 GB.

Tableau Bridge can have an impact on the site capacity.

- Extracts generated by Tableau Bridge do have an impact on the site storage capacity.
- Virtual connections and embedded data sources that are extracted through Bridge also have an impact on the site capacity. This is because the data is processed through Tableau Cloud Backgrounder.

| | **Capacity Type** | **Bridge Impact on Site Capacity?** |
|---|---|---|
| | | |
| **Storage** | Site | Yes (Extracts) |
| | Individual workbook, published data source, or flow size | Yes<br>See Tableau Cloud Site Capacity. |
| | | |
| **Extract Published Data Sources with Bridge** | Daily refreshes | No |
| | Concurrent refreshes | No |
| | Individual refresh runtimes | No |

| | Capacity Type | Bridge Impact on Site Capacity? |
|---|---|---|
| | | |
| **Virtual Connections and Embedded Data Sources with Bridge** | Daily refreshes | Yes |
| | Concurrent refreshes | Yes |
| | Individual refresh runtimes | Yes |
| | | |

# Install Bridge

Tableau Bridge is software that you can install and use in conjunction with Tableau Cloud. Always install the latest version of Bridge to take advantage of the latest security and feature updates.

Tableau Bridge is available for Windows installations and Linux for Docker containers.

## Before installing Bridge

You do not need a product key to use Bridge. Use of Bridge is subject to your End User License Agreement (EULA). Users of Bridge must be authorized users of Tableau Cloud.

You can find all available versions on the Tableau Bridge Product Download and Release Notes page.

### Network access

Because Bridge facilitates connections between your private network data and Tableau Cloud, it requires the ability to make outbound connections through the internet. After the initial outbound connection, communication is bidirectional.

### Required ports

Tableau Bridge uses port 443 to make outbound internet requests to Tableau Cloud and port 80 for certificate validation.

### Tableau with MFA

Bridge supports multi-factor authentication (MFA). For more information about Tableau with MFA, see About multi-factor authentication and Tableau Cloud.

### Database drivers

Bridge uses Tableau connectors to connect to different databases to maintain data freshness. Some of those connectors require drivers to communicate with the databases.

To get drivers for connectors that the client supports, go to the Driver Download page on the Tableau website. Make sure to filter the list for the operating system and use the instructions listed for the data source.

## Install the Windows Client

For Windows installations Tableau recommends installing the Bridge client on a dedicated machine behind your firewall so that it doesn't compete with resources from other applications. Only one client can be installed on a machine.

### Bridge client requirements

The following are the admin and access requirements for the Bridge client.

- The Bridge client UI is required to perform interactive login to Tableau Cloud.
- A *User profile* on the boot drive for storing the contents of `My Tableau Bridge Repository.`
- The login user must be, or the equivalent of, the local admin of the machine to run Bridge client in Service mode.
- Access to the OS vault specific to the current login user for storing:
  - Online server login tokens specific to the current login user of the Windows session.
  - Data connection credentials (simple login info) for Remote extract requests.

### System recommendations

Bridge is available for the Windows operating system. You can also install the client on a virtual machine. For more information about which versions of Windows are supported and other recommendations, review Plan Your Bridge Deployment

Install Bridge

Follow the procedure below to install a Windows Bridge client. You don’t need a Tableau product key to install or use the client.

1. Download the installer from the Downloads page on the Tableau website. We recommend downloading the latest version listed on the page to take advantage of the latest security and feature updates.

2. Run the installer. You can install the client using a shared Windows service account.

   The account that is used to run the client is the account that is logged into Windows at the time of configuration.

   If the client is set up with an individual local user account, you can't change the account to a shared service account without reinstalling Bridge. To change the account, uninstall Bridge as the current user, sign into the shared service account, then reinstall and configure Bridge.

   For Service mode, the Windows user account must be a member of the local Administrators group on the machine. In addition, to refresh file-based data sources, the account must have domain access to the network shared drive where the file data is hosted.

3. When prompted, accept the license agreement to continue.

4. (Optional) Customize the installation by clicking **Customize**. You can change any of the following options:

   - **Install location:** You can specify a different location to install the client.
   - **Create a desktop shortcut:** Clear the check box if you don't want to automatically create a desktop shortcut for Bridge.
   - **Create a Start menu shortcut:** Clear the check box if you don't want to automatically add a shortcut for Bridge to the Start menu

- **Enable error reporting:** If Bridge has a problem and closes unexpectedly, crash dump files and logs are generated and sent to Tableau. To turn off this option, clear this check box during installation. You can also turn off this option (or back on) in the client after installation. For more information, see Error reports.

5. Click **Install** to begin the client installation.

After the client is installed, you can start the client by double-clicking the Bridge shortcut on your desktop or from Tableau Desktop (if it's installed on the same machine as Bridge).

About My Tableau Bridge Repository

As part of the Bridge installation, a folder called **My Tableau Bridge Repository** is created on the machine where the client is installed. This repository folder contains critical subfolders, such as **Logs** and **Configuration**, that Bridge needs to operate properly.

The repository folder is created under the Documents folder: *\Users\<user>\Documents\My Tableau Bridge Repository*.

**Important:** We strongly recommend that you don’t change the folder that Bridge uses as its repository.

Upgrade Bridge

Staying in sync with the latest version of Bridge ensures that you can take advantage of the latest features and fixes included with each new version of the Bridge client.

Parallel upgrade (recommended)

To minimize downtime, we recommend running a parallel upgrade process. In this scenario, you install the new Tableau Bridge client on different hardware from where your existing Bridge client is running. Running a parallel upgrade process allows you to ensure stability and to fall back immediately to a known good state if anything goes wrong during the upgrade.

To run a parallel upgrade of the Bridge client, follow the procedure below.

1. Log on to the machine where the existing Bridge client is installed.
2. If you're running the client in Service mode, in the lower-left corner of the client, next to Mode, select **Application**. Changing to Application mode ensures that the Tableau Bridge service stops completely before the upgrade. Select **Settings** > **Exit**.
3. Add the new computer and install the new Tableau Bridge client as documented in the section above, Install Bridge.
4. Add the new Bridge client to the relevant pool. See Configure the Bridge Client Pool.
5. Monitor the health of the Bridge jobs to validate stability before continuing to the next step.
6. Remove the previous Bridge client from the pool. Open the pool, identify the client machine to be removed, and click **Delete**.
7. Wait for the extract refresh timeout process to finish on the Bridge client. The default timeout is 24 hours. For more information, see dataSourceRefreshSettings.
8. After refresh timeout period has elapsed, you may remove the hardware that the previous version of Bridge was running on.

After installation is complete, the client will start as normal. If the client was running in Service mode before the upgrade process, switch back to Service mode.

Non-parallel upgrade

If running two parallel computers is not an option, follow the below steps to upgrade a Bridge client on the same computer. Please note that jobs will not be able to run between steps #2 and #3. You will also not be able to monitor the stability of Bridge jobs before removing the old version.

1. Log on to the machine where the existing Bridge client is installed.

2. If you're running the client in Service mode, in the lower-left corner of the client, next to Mode, select **Application**. Changing to Application mode ensures that the Tableau Bridge service stops completely before the upgrade. Select **Settings** > **Exit**.

3. Follow the steps to install the new Tableau Bridge client as documented in the section above, Install Bridge.

After installation is complete, the client will start as normal. If the client was running in Service mode before the upgrade process, switch back to Service mode.

Error reports

You can help improve Bridge by automatically sending error reports to Tableau. Error reports are composed of crash dump files that are sent to Tableau when the Bridge client has to close unexpectedly (crash). These files are used by Tableau to identify and address issues that can cause the client to close unexpectedly.

**Important:** Turn off this option if your data is subject to any privacy regulations.

What's in an error report

The encrypted package is made up of the following files: crash and core dump files and manifest files related to the crash.

The files can contain data that include:

- Machine-specific information. For example: hardware, operating system, domain, and so on.

- Snapshot of the memory contents at the time of the crash. For example: which data sources had extracts refreshed, which data sources had live queries, and so on.

- Information that Bridge was processing at the time of the crash, including customer-identifiable information that might be used to correct the error. For example: who is using Bridge with which site, the name of the client that the user is signed in to, and so on.

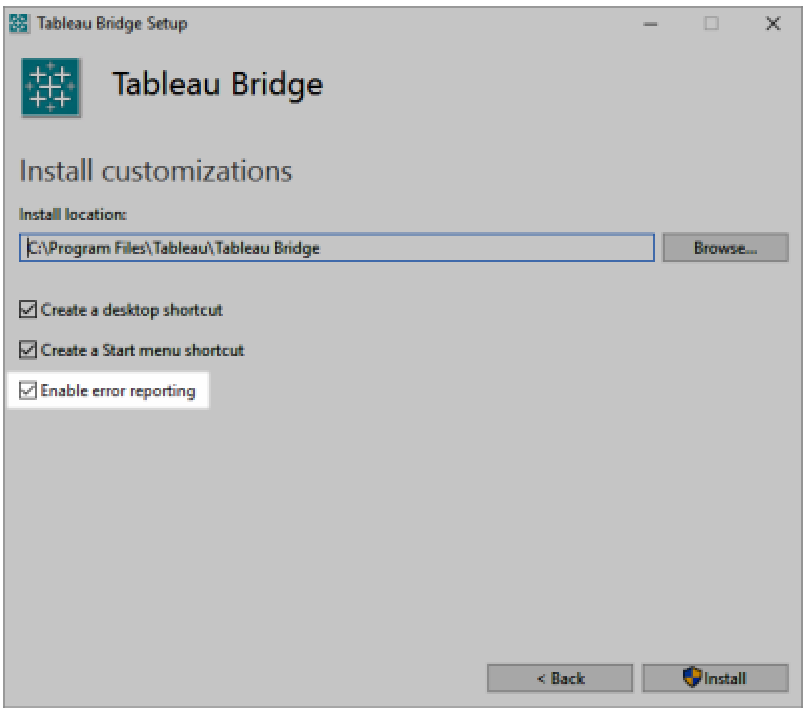
For more information about how Tableau treats sensitive information, see the Tableau privacy policy on the Tableau website.

Configure automatic error reporting

You can configure Bridge to send error reports automatically in one of two places: During the client installation process or after installation directly in the client.

## Enable the automatic error reporting option during client installation

During installation, the option to automatically send error reports from the client is selected by default. However, you can remove the selection.




## Disable the automatic error reporting option in the client

If you decided to use the default setting during the installation process and decide later on that you don't want to allow error reports to be sent automatically, you can modify the option from the client menu.


Install Bridge from the command line

You can install the Bridge client from the command line if you're a local administrator on the machine.

General command line syntax

The syntax for running the Bridge installer from the command line is the following:

```
tableauBridge<installer_name>.exe /option1 /option2 PROPERTY1 PROPERTY2
```

A few notes about the syntax:

- The `tableau<installer_name>.exe` file is the client installer for the product and version you're installing.
- The options specify how the installation process should run. For example, whether it should display output while installing and whether it should create log files.
- The properties settings specify configuration settings that the installer should make during the installation process.

## Example installer command

The following example shows an installer command with some options and property settings.

```
TableauBridge-20232.23.0611.2007-x64.exe/quiet /passive ACCEPTEULA=1
```

You must run the command from the directory where the .exe file is located or specify a full path to the location of the .exe file on the machine. Don’t run the installer from a shared directory on your network. Instead, download the .exe file to a directory on the machine where you want to install the client.

Installer options and properties

You can specify one or more options in the command line for the installer.

## Installer options

A couple of notes about the options:

- Each option is prefixed with a slash (/).
- Options must come before properties.

| Option | Description |
|---|---|
| `quiet` | Run the installer without messages (status or installation progress) and without requiring user interaction. The client doesn't launch after installation is complete. |
| `passive` | Run the installer and display dialog boxes and installation status. Doesn’t prompt the user for input. The client launches after installation is complete. |
| `norestart` | Suppress any attempts to restart. By default, the installer prompts you before restart unless you run the installer in quiet mode. |
| `log "`*`log-file.txt`*`"` | Log installation information to the specified path and file. Specify the path and file name, such as `/log "c:\logs\logfile.txt"`. The default log file is the system `%TEMP%` directory. |
| `repair` | Run the installer to repair an existing installation of Bridge. |
| `h` | Help—lists options and properties for the installer. |

## Installer properties

You can also include one or more properties in the command line for the installer.

Some notes about the properties:

- All of these properties can be used for the initial installation of the client. They can't be used to update any settings after initial installation.
- Property names are case-sensitive.
- There are no spaces on either side of the equal sign.
- Each property set is delimited with a space.
- Properties must go after options.

| Property | Description | Value |
|---|---|---|
| `ACCEPTEULA` | Accept the End User License Agreement (EULA). If you don't set this option to `1`, Bridge can't be installed using quiet mode. | 1=Accept<br>0=Don't accept (default) |
| `CRASHDUMP` | You can set this option to "1" to help improve Bridge by sending error reports to Tableau automatically when the client crashes. For more information, see Error reports. | 1=Yes (default)<br>0=No |
| `DESKTOPSHORTCUT` | Create a desktop shortcut. | 1=Yes (default)<br>0=No |
| `DRIVERDIR` | Specify an installation directory (other than the default) for the database drivers. This option creates the directory and creates an entry in the HKEY_LOCAL_MACHINE\ registry. The default location for drivers is C:\Program Files\Tableau\Drivers. | A path such as `D:\Drivers` |

| | | |
|---|---|---|
| `INSTALLDIR` | Specify an installation directory other than the default.<br><br>If you specify a custom directory for the installation location and plan to install future releases to this same location, you must specify a version-specific subfolder to install to. Otherwise, you must uninstall the previous version first.<br><br>Side-by-side installations of multiple versions in the same subdirectory isn’t supported. | A path such as `D:\Software\Tableau Bridge`. |
| `SKIPAPPLICATIONLAUNCH` | You can set this option to "1" to prevent the new application from opening automatically when the installation process is complete. This option applies to manual installation. This option doesn't apply to quiet installations because Tableau Bridge doesn't open automatically when using that option. | 1=Yes<br>0=No (default) |

| | | |
|---|---|---|
| STARTMENUSHORTCUT | Create a Tableau Bridge entry on the Windows Start menu. | 1=Yes (default)<br>0=No |

Uninstall Bridge

Although it's not necessary to uninstall previous versions of the Bridge client when installing a newer version, you can uninstall Bridge 2018.2 and later if you no longer need it on your machine.

The primary method for uninstalling the client is through the Windows Control Panel.

Alternatively, you can use the following procedure to uninstall Bridge from the command line.

1. Open the Command Prompt as an administrator.
2. In the location where the .exe was installed, run the following command:

   ```
   tableau<installer_name>.exe /uninstall /quiet
   ```

## Install Bridge for Linux for Containers

Bridge for Linux provides the scalability and streamlined management capabilities of containerized workloads. The following instructions describe a lightweight way to run Bridge for Linux and assumes you have basic knowledge of Docker and the key terms used in the ecosystem.

Install and run Bridge from a Docker container

To use Bridge on Linux you must create a customized Docker image, install the RPM package, and then run Bridge from inside the container image.

- Bridge legacy schedules are not supported. See Migrate from Bridge (legacy) to Online schedules for more information.
- To connect to SAP HANA using live connections, parameters and variables must be disabled.

Prerequisites

- Installed Docker Engine. For the base image of the docker container, Bridge on Linux is supported on:
  - Amazon Linux 2
  - Amazon Linux 2023
  - Red Hat 8.3 and higher

    **Note**: CentOS is not supported.
- The latest Tableau Bridge RPM package from the Downloads page on the Tableau website.
- Experience with the Linux operating system.
- Basic shell scripting.
- Docker experience.
- Tableau Site admin Personal Access Token (PAT). We recommend that you use one PAT token per Bridge client.

Step 1: Create a Bridge container image

The following steps are the basic instructions for building a Bridge on Linux base image. For more information, see Docker overview.

When Docker is installed, the only user with permission to run commands is root. You can run Docker commands with `sudo` or by a user who is a member of the docker group.

1. Download the Bridge `.rpm` package from the Downloads page on the Tableau website.
2. (Optional) You can edit the configuration settings to change how the client will run. See Change the Bridge Client Settings for more information.
3. Create a working directory and move the `.rpm` package into the directory.

   ```
   cd ~

   $ mkdir Docker

   $ cd Docker

   $ mv <RPM_location>.rpm .
   ```

4. Create a Docker file in the working directory. For example:

   ```
   $ touch Dockerfile
   ```

5. Edit the Docker file and add the commands to run `yum update`.

   **Red Hat Example**

   For Red Hat 8:

   ```
   FROM registry.access.redhat.com/ubi8/ubi:latest
   ```

   ```
   RUN yum -y update
   ```

6. Edit the Docker file and then enter the commands to copy, install, and remove the bridge RPM package from the image. For example:

   ```
   COPY <your_bridge_rpm>.rpm /<path_of_container>
   ```

   ```
   RUN ACCEPT_EULA=y yum install -y $(find . -name *.rpm) && rm -rf *.rpm
   ```

7. Build a new container image using the `docker` build command.

   For example, the following command builds an image in the current directory, tagging it with the word "`bridge_base`":

   ```
   docker buildx build --platform=linux/amd64 -t bridge_base .
   ```

8. Check that the base image you created is displayed in the list of images:

   ```
   docker images | grep bridge
   ```

Step 2: Install the drivers

The Bridge client requires drivers to facilitate connectivity between private network data and Tableau Cloud. For drivers, go to Driver Download, select the data source, and then select **Linux** for the Operating system.

1. Installation can be done interactively after the base image is launched, or separate Dockerfiles can be written as a layer on top of the base image.

   **Example**

   With the MySQL driver RPM copied into the directory, you can create a separate working directory for layering MySQL drivers using the following Dockerfile:

   ```
   # Using previously built bridge_base image

   FROM bridge_base COPY mysql-connector-odbc-8.0.26-1.el7.x86_
   64.rpm .

   RUN yum install -y mysql-connector-odbc-8.0.26-1.el7.x86_64.rpm
   ```

   **Example**

   Install a postgres JDBC driver. This can also be done in a separate Dockerfile.

   ```
   # Using previously built bridge_base image

   FROM bridge_base COPY postgresql-42.3.3.jar /op-
   t/tableau/tableau_driver/jdbc/
   ```

   **Example**

   Install the Amazon Redshift driver.

   ```
   # Using previously built bridge_base image

   FROM bridge_base

   yum install -y unixODBC

   yum --nogpgcheck localinstall -y

   AmazonRedshiftODBC-64-bit-1.4.59.1000-1.x86_64.rpm

   odbcinst -i -d -f /opt/amazon/redshiftodbc/Setup/odbcinst.ini
   ```

2. Create a new image:

   ```
   docker image build -t bridge_final .
   ```

   The `bridge_final` image uses the cached image from the previous step and automates the driver installation for all your Bridge instances. If you have an image repository, you can publish the image to the repository and distribute the image to all the machines you want to run Bridge on.

Step 3: Run the Bridge container

Now that you have a base image built, you can deploy it using a variety of methods. The basic steps are:

1. Start the instance of the Bridge container.
2. Log in and start the worker.
3. Assign the agent to a pool.

> **Note**: Bridge for Linux doesn't support Bridge (legacy schedules). See Migrate from Bridge (legacy) to Online schedules for more information.

1. Before you start deploying the container, create a Personal Access Token (PAT). The PAT is required to log in to the agent. Tableau Cloud supports 104 PATs per user. We recommend that you use one PAT token per client.

   > **Note**: The following token names must match: The patTokenId (used when running the `run-bridge.sh` command), the token name in the JSON file, and the token name when generating the PAT in Tableau Cloud.

2. Set the locale in Docker using `ENV LC_ALL en_US.UTF-8`. You can also set the locale by adding the following to the `/etc/profile` file:

   ```
   export LANG="en_US.utf8"

   export LANGUAGE="en_US.utf8"
   ```

```
export LC_ALL="en_US.utf8"
```

3. Start an instance of the Bridge container. There are many ways you can set up and start the container image. The following interactive method illustrates the steps necessary to start the worker. When you exit, the container stops running.
   a. Use the following method to move to the shell prompt for the container as `root`. The rest of the commands are executed in the context of this interactive session of the container.

      ```
      docker container run -it bridge_final /bin/bash
      ```

   b. Add the PAT token to a flat file in JSON format. For example:

      ```
      /home/jSmith/Documents/MyTokenFile.txt
      ```

      Example token syntax:

      ```
      {"MyToken" : "uLICC7e8SUS8ZNGe8RIFn4u-
      u==:lRihmYHI0XBKle7e8S4uSORXGqAkAl4"}
      ```

   c. Change the file permissions to restrict access to the current user. For example:

      ```
      chmod 600 MyTokenFile.txt
      ```

   d. Start the worker with the `run-bridge.sh` command and provide the following command options:

| Command | Description |
|---|---|
| `--patTokenId` | The ID of the PAT. See Personal Access Tokens for more information. |
| `--userEmail` | User email associated with the PAT. |
| `--client` | The name that you want to give to the Worker. |
| `--site` | Site name as it appears in the URI. |

| | |
|---|---|
| | Don't include the URI path. |
| `--patTokenFile` | File name and path to the PAT text file. |
| `-e` | (Optional) By default, the Bridge client worker runs as a background service. To run the worker in the foreground, include the -e argument. |
| --`poolId` | (Optional) Pool Id that is assigned to the client. See Using a pool ID. |

**Command example**

```
/opt/tableau/tableau_bridge/bin/run-bridge.sh -e --
patTokenId="Mytoken" --userEmail="admin@tableau.com" --cli-
ent="myBridgeAgent" --site="mySite" --patTokenFile-
e="/home/jSmith/Documents/MyTokenFile.txt" --
poolId="1091bfe4-604d-402a-b41c-29ae4b85ec94"
```

**Note**: If you are installing older versions of the Bridge for Linux, you must run a different command to start the worker. For versions 2024.2 and older, start the worker with the `TabBridgeClientWorker` command (not the `run-bridge.sh` command. All of the command options are the same.

The following message indicates the agent is started. “`Service started: ...`”

Use `Control-C` to stop the worker. Rather than restart the worker, you can start a new worker for the container image.

If you didn't assign a pool using the command option `--poolId`, the client is assigned to the default pool. If you want to use the client with specific domains or VConns, you can assign the client to a named pool using the UI. The menu for this on Tableau Cloud

**Home** > **Settings** > **Bridge**. For more information, see Configure the Bridge Client Pool.

Using a pool ID

When starting the Bridge worker with the `run-bridge.sh` command, the `poolId` is optional. However, the behavior of the client depends on whether the client is registered to a site, and whether the client is assigned to a pool. Tableau Bridge can only connect or register to one Tableau Cloud site at any given time. The client is registered to a site when you log off and log back in.

#### If a pool ID isn't provided

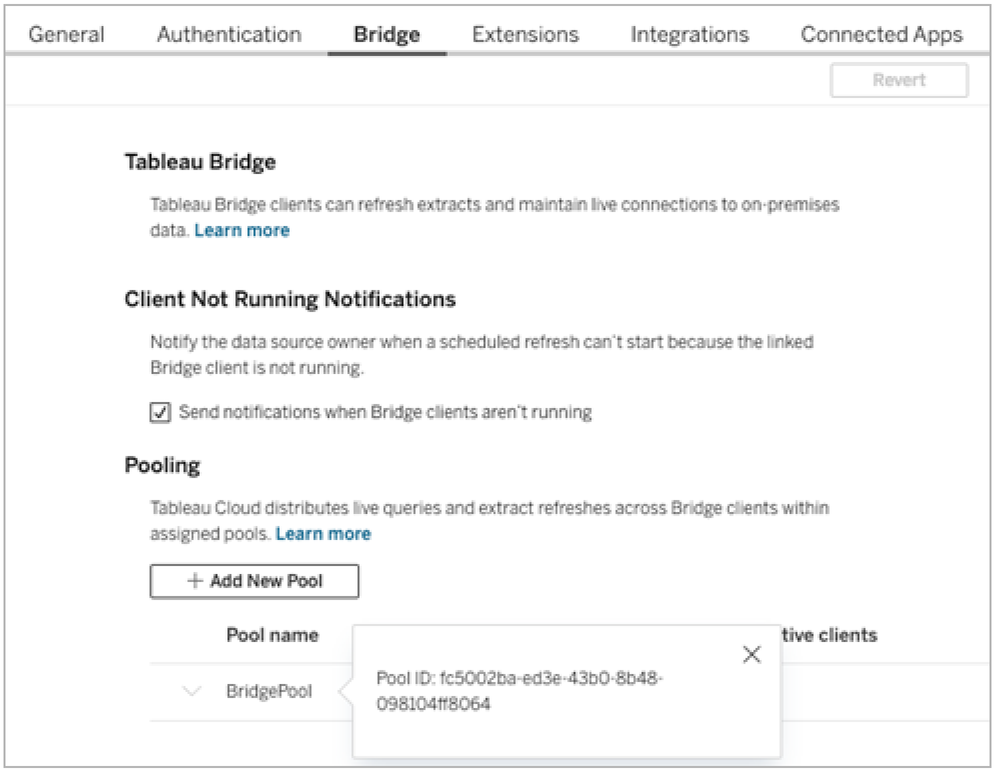
- If the Bridge client has been registered, the client status remains the same:
  - If the client is assigned to a pool, it remains assigned to the pool, regardless of whether it's a named pool or default pool.
  - If the client isn't assigned to a pool, it will remain unassigned.
- If the Bridge client is new (you never signed in to Tableau Cloud), the client is assigned to the default pool.

#### If a pool ID is provided

- If the pool ID is provided and is correct, the Bridge client is assigned to the named pool.
- If the pool ID is provided and incorrect:
  - If the Bridge client isn't t registered, then the client is assigned to the default pool.
  - If the Bridge client is registered, the client status remains the same, regardless of named pool, default pool, or unassigned.

## Finding the Pool ID

To find the pool ID, go to the **Settings** > **Bridge** page and click on the name of the pool. For example:




## Upgrading Bridge for Linux client

Staying in sync with the latest version of Bridge ensures that you can take advantage of the latest features and fixes included with each new version of the Bridge client.

1. Install and configure the new Tableau Bridge client as documented in the sections above.
2. Add the new Bridge client to the relevant pool. See Configure the Bridge Client Pool.
3. Monitor the health of the Bridge jobs to validate stability before continuing to the next step.
4. Remove the previous Bridge client from the pool. Open the pool, identify the client machine to be removed, and click **Delete**.

5. Wait for the extract refresh timeout process to finish on the Bridge client. The default timeout is 24 hours. For more information, see dataSourceRefreshSettings.

6. After refresh timeout period has elapsed, you may remove the previous instance of Bridge client.

Troubleshooting

Installing older versions

If you are installing older versions of the Bridge for Linux, you must run a different command to start the worker. For versions 2024.2 and older, start the worker with the `TabBridgeClientWorker` command (not the `run-bridge.sh` command).

All of the command options are the same as documented above in Step 3: Run the Bridge container .

For example:

```
/opt/tableau/tableau_bridge/bin/TabBridgeClientWorker -e --
patTokenId="Mytoken" --userEmail="admin@tableau.com" --cli-
ent="myBridgeAgent" --site="mySite" --patTokenFile-
e="/home/jSmith/Documents/MyTokenFile.txt" --poolId="1091bfe4-604d-
402a-b41c-29ae4b85ec94"
```

Worker start up error

In some cases, the following error will be displayed after running the `run-bridge.sh` command:

```
Missing log in parameters. Aborting the attempt to start service
worker.
```

In most cases, re-running the command with the original options and the `-e` option fixes the issue. The `-e` option runs the Bridge worker service in the foreground.

Working with log files

Log files are stored in the user's `My_Tableau_Bridge_Repository/Logs` folder. To save logs in a `tmp` folder, run the following command:

```
docker container run --volume /tmp/bridge_logs:/root/Documents/My_
Tableau_Bridge_Repository/Logs -it bridge_final /bin/bash
```

In this example, the location is specified by */tmp/bridge_logs*. Using the docker command simplifies saving the log files and avoids having to manually copy the Bridge logs files from the container to your local file system.

MySQL driver fails

If `LC_MESSAGES` aren't set with `UTF-8` locales, you may experience read and display issues. You can edit the `/etc/profile` file, or relaunch the worker using the following command:

```
LC_ALL=en_US.UTF-8 /opt/tableau/tableau_bridge/bin/run-bridge.sh -e
```

Bridge Client stops unexpectedly due to Personal Access Token expiration

When a Personal Access Token (PAT) expires it will cause the Bridge Client to become disconnected from Tableau Cloud and may cause the container to shut down. From the Bridge Client you can validate if your PAT has expired by executing the Start command in the foreground. If the PAT is expired you will see the following error:

```
The client credentials are invalid. To complete the request, reset
the credentials, and sign in to the Tableau Bridge client.
```

If you are the original PAT owner, you can also verify if the PAT is expired by visiting **Manage Account Settings** in Tableau Cloud. To resolve the issue, you will need to generate a new PAT and follow the steps above, Step 3: Run the Bridge container .

Embedded extract and embedded live connection timeout errors

The 24.3 release of Bridge on Linux provided significant performance improvements for embedded extracts and embedded live connections. If you experience timeout errors on prior releases, we recommend upgrading to a 24.3+ release of Bridge on Linux. If this does not resolve the issue, Publish the Data Source separately from the workbook.

## Connectivity with Bridge

When data sources or virtual connections connect to private network data that Tableau Cloud can't reach directly, Tableau Bridge is used to facilitate connectivity.

### Connection types

Tableau Bridge supports on-premise data or data in a virtual cloud that is behind the firewall. The data can range from CSV files on your private network or data stored in a data warehouse.

For cloud data that Tableau Cloud can reach directly, setting up refresh schedules directly with Tableau Cloud is almost always a better choice. For example, you might be able to connect to a MySQL database hosted on a cloud platform. In a scenario like this, you can set up a refresh schedule for extracts that connect to this type of data directly with Tableau Cloud.

**Extract refreshes**

When data sources or virtual connections use extracts to connect to private network data, Bridge can be used to perform scheduled refreshes of those extracts. Refreshes can be scheduled, in most cases, by the content owner as part of the publishing process. For extract refresh requirements, see Additional requirements for extract connections.

**Live connections**

Bridge supports data sources or virtual connections with live connections to private network data using a feature called live queries. If the content owner publishes a data source or virtual connection that uses a live connection to data that Tableau Cloud detects that it can't reach directly, live queries are automatically used. For live query requirements, see Additional requirements for live connections.

- Bridge doesn't support live connections for some cloud data sources. These include Google Cloud SQL, OData, and Progress OpenEdge. Use extract connections to keep

data fresh.
- Bridge doesn't support live connections for some private cloud-based data sources. These include Google Drive, Box, OneDrive, Dropbox, and Azure Data Lake Storage Gen2. Use extract connections to keep data fresh.
- Live connections to file-based data such as CSV, text, Excel, statistical (.sas7bdat) isn't supported.

#### Virtual connections

Bridge supports virtual connections, which provide a sharable central access point to data.

- Snowflake isn't supported when used with virtual connections.
- OAuth for virtual connections is supported on a connector basis. See the following Knowledge base article and OAuth Connections.

#### File data

The latest version of Bridge supports file data including CSV, Excel, text, statistical (.sas7b-dat), PDF, and spatial files.

- Extract refreshes for published data source files are supported on the Bridge Windows client. If you are connecting to a local file path, you must use the Default pool.

- Extract refreshes for embedded data source files are supported on the Bridge Windows client. You must use a configured pool for embedded data sources and the file path must use the UNC format.

- File data isn't supported on Bridge for Linux.

- Extract refreshes and live query of Hyper files on a file share are not supported.

- Live connections to file-based data aren't supported on the Windows client or Bridge for Linux for Containers.

#### Connections to cube-based data

Cube-based data is not supported.

#### Embedded data sources

Tableau Bridge supports data sources that are embedded in workbooks.

- Live connections for files data such as CSV, text, Excel, statistical (.sas7bdat) aren't supported.
- The default pool does not support embedded data sources. You must use a pool that has been configured. For more information, see Configure the Bridge Client Pool.

#### Published data sources

Scheduled extracts of published data sources don't support multiple pools.

#### Tableau Prep Builder

Private network connections for Tableau Prep through Tableau Bridge are not supported.

### Connectors and data types

Bridge supports a combination of connectors that Tableau Desktop and Tableau Cloud supports. Unsupported connectors and limitations for connectors and data types are listed below.

#### Include External Files

Include External Files is not supported for Published Data Sources. To refresh published flat files, change the connection information so that the data source references a full UNC path. For example, rather than connecting to `D:\datasource.xls`, you would connect to `\\filesrv\datasource.xls`.

#### Private cloud data

In most cases, Tableau Cloud will automatically detect the Bridge client. In some cases, you might need to manually configure your connection to ensure that Bridge is used. For more information, see Use Bridge for Private Cloud Data.

#### Unsupported connectors

- Connectors built by third parties that are not on the Tableau Exchange are not supported.

- Some Exchange Connectors are not supported. See section below.
- Microsoft Analysis Services.
- Microsoft PowerPivot.
- Oracle Essbase.
- SAP NetWeaver Business Warehouse.

**Exchange Connectors**

Tableau Bridge can be used to query data using the select connectors available on the Tableau Exchange connector page. The Exchange connectors that are supported are Actian JDBC, Altinity Connector for ClickHouse, Guidanz BI Connector, Couchbase Analytics, Stratio Crossdata, Data Virtuality JDBC, Jethro ODBC, Oracle NetSuite, SAP SuccessFactors, ServiceNow, and SingleStoreDB JDBC.

To use Exchange Connectors with Tableau Bridge, follow these steps for each Exchange connector and each Bridge client in the pool that will access the target data source.

1. Download the .taco file from the Tableau Exchange connector page.
2. Add the .taco file to the Tableau repository connector directory:
   - On Windows: `C:\Users[Windows User]\Documents\My Tableau Bridge Repository\Connectors`
   - On Linux: `/root/Documents/My_Tableau_Bridge_Repository/Connectors`
   - For Data Connect, run the following command to create the Connector directory in your base image: `mkdir -p /home/tableau/Documents/My_Tableau_Bridge_Repository/Connectors`
3. Follow the instructions on the Tableau Exchange for your connector to download the required driver.
4. Install the driver on the Bridge client.
5. Restart the Bridge client.

#### Connectors that don’t support Live connections

- Google Cloud SQL
- OData
- Progress OpenEdge

#### SAP HANA

To connect to SAP HANA using live connections, parameters and variables must be disabled.

#### Snowflake

Snowflake isn’t supported when used with virtual connections.

#### Data used in a multi-connection data source

Tableau Bridge can be used to refresh cross-database joined data sources. The database connections defined in the workbook or data source determine how you can publish and keep the data fresh on Tableau Cloud. As long as all the individual data connections are of a type that Tableau Bridge can refresh, then the cross-database joined data source can be refreshed.

#### Other Databases

- Tableau provides limited customer support for connections using JDBC. See Tableau support for Other Databases (JDBC) connections.
- Tableau provides limited customer support for connections using ODBC. See Tableau support for Other Databases (ODBC) connections.

#### Web data connectors

- Bridge is not able to connect to data from Web Data Connector 3.0. For more information, see Connectors Built with the Web Data Connector 3.0 SDK.
- The Web Data 2.0 is deprecated as of the 2023.1 release. See Web Data Connector 2.0.
- Tableau doesn’t support connectors or other programs written to interface with the WDC API.

## Bridge for Linux

Tableau Bridge supports a Linux-based operating system designed for container workloads. Limitations and differences include:

- Bridge for Linux does not support legacy schedules.
- Bridge for Linux runs in the background, which is the equivalent to Service mode in Tableau Bridge on Windows.
- To save log files, copy the files or folders between your docker container and your local file system.
- Currently, Bridge for Linux is installed by running commands in a running container using docker executables.
- Bridge for Linux does not support flat files (Excel, .csv, etc), live or extract.
- Bridge for Linux does not support Windows (UNC) file share paths
- Bridge for Linux does not support Window integrated authentication

## Authentication

The connected client option must be enabled for the site to allow Bridge clients to run unattended and, if enabled, support multi-factor authentication with Tableau authentication. If connected clients are disabled for the site, Bridge can only support Tableau username and password authentication.

**OAuth**

- Tableau Bridge for Windows and Bridge for Linux do not support OAuth for Azure SQL, Azure Synapse, and Dremio.

- OAuth with embedded data sources and pubished data sources for Google Drive and OneDrive is supported.

- When using your own identity provider (IdP) with the Amazon Athena connector, you must set up the OAuth client configuration file. See Use your own identity provider with Amazon Athena.

**Windows Authentication**

The Windows user account must be a member of the local admin group to run the client in service mode. If the user isn't a local admin, they can run the Bridge client in Application mode, but they must remain logged in to the Windows machine.

**Kerberos**

Bridge on Windows supports Integrated Windows authentication through the "run-as" account, for both files and some databases

## Update Bridge Connection Information

This topic describes how a data source owner can update the connection information for a data source that connects to private network data.

**Note:** For information about connection information for virtual connections, see Create a Virtual Connection.

Embed or update database credentials

For live queries and scheduled refreshes to run as expected, data sources that require user authentication must have the database credentials embedded with the data source.

You can embed database credentials for your data source in one of two ways: 1) during publish time from Tableau Desktop or 2) after publishing from the data source's Connection tab in Tableau Cloud. The procedure below describes how to embed database credentials on Tableau Cloud. For more information about embedding database credentials in Tableau Desktop, see Set Credentials for Accessing Your Published Data.

1. Sign in to Tableau Cloud and navigate to your data source.
2. From the data source page, click the **Connections** tab.
3. Select the check box next to the connection, click the Actions menu, and select **Edit Connection**.
4. In the Edit Connection dialog box, enter the database credentials required for accessing the data, and click **Save**.

### Embed or update database credentials for Bridge legacy schedules

If you use **Bridge legacy** schedules to refresh your data sources, you must embed the database credentials in the connection information in the Bridge client. This task must be done even if you embedded the database credentials at publishing time on Tableau Desktop.

1. Open the Windows system tray and click the Bridge icon to open the client.
2. Point to the data source, and then click the **Edit** icon ( ) that appears.
3. In the dialog box, enter the database credentials required for accessing the data, and then click **Save**.

### Change the file path for a data source

In some cases, you might need to update the file location that the client references under the following circumstances:

- **Source file location has changed**
- **Data source was published from a mapped drive:** If a client used to perform refresh is running in Service mode and the data source was published from a mapped drive, the file path referenced by the client must be updated to use the full UNC path. The Windows services account that the client is running under must also have access to the UNC path location of the file. We strongly recommend clients running in Application mode also reference the UNC path for its file-based data sources.

If you are using Bridge refresh schedules, you can change the data source file path to use the full universal naming convention (UNC) path by performing the following steps:

1. Download the data source from Tableau Cloud.
2. Launch Tableau Desktop.
3. Open the published data source or workbook.
4. Navigate to the **Data Source** tab.
5. Right-click the data source name then select **Edit Connection**.
6. In the file navigator window and the file path field, type the UNC path to the file. For example: *server_name**datasource.xls*.
7. Select **Server** > **Publish Data Source** and publish the data source.

You can confirm the UNC path is recognized for the data source in Tableau Desktop, by right-clicking the data source and selecting **Properties**.

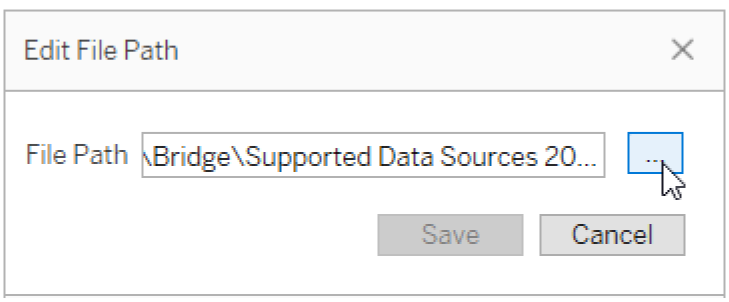
Change the file path for (legacy)

If **Bridge legacy** schedule is used to refresh, saved with the data source is the location of the file.

You can use the following procedure below to change the file path for the data source.

1. Open the Windows system tray and click the Bridge icon to open the client.
2. Point to the data source, and then click the **Edit** icon ( ) that appears.


3. In the dialog box, enter the path location information and then click **Save**.




Use .tdc files for generic JDBC or ODBC connections

You can use the steps described below to ensure customizations for generic JDBC or ODBC connections enabled through a Tableau Datasource Customization (TDC) file are also used by Bridge.

**Step 1: Customize the generic JDBC or ODBC connection**

If you aren't already familiar with the type of customizations you can make to your JDBC and ODBC connections and how to create a TDC file, see Customize and Tune a Connection in the Tableau Help.

### Step 2: Save the TDC file in the My Tableau Bridge Repository

In order for Bridge to use the customizations specified for generic ODBC or JDBC connections, you must save the TDC file in the location specified by the procedure below. To refresh JDBC or ODBC connections through Bridge pools, this step must be performed for all clients in the pool.

1. On the machine where the client is installed, go to the **Datasources** folder in the My Tableau Bridge Repository.

   The default location of the folder is

   - Windows: `C:\Users\myuser\Documents\My Tableau Bridge Repository\Datasources`
   - Linux: `/root/Documents/My_Tableau_Bridge_Repository/Datasources/`

2. Place the TDC (.tdc) file into the **Datasources** folder.

3. Exit and restart the client for the changes to take effect. The way you restart the client depends on whether the client is running in Application or Service mode.

   - For Application mode - from the client menu, select **Exit**.
   - For Service mode - from the Mode drop-down menu, select **Application**; then from the client menu, select **Exit**.

4. Repeat steps 1-3 for all clients in the pool.

**Notes:**

- For more information about creating and customizing a TDC file, see the Tableau Desktop help topic, Customize and Tune a Connection.
- After you save the TDC file to the required location, customizations are applied to all generic JDBC or ODBC connections to the same underlying data.
- To validate the TDC file is being used, you can review the client log files (for example, C:\Users\jsmith\Documents\My Tableau Bridge Repository\Logs) for either of the

following log entries:

- `Found matching TDC`
- `Applying customization for genericjdbc` or `Applying customization for genericodbc`

Change the connection type

A data source can use one of two connection types: live or extract. The connection type determines the frequency at which the content can be updated to reflect the changes in the underlying data. Depending on the data that is being connected to, some data sources can have live or extract connections but other data sources can only have extract connections. For more information, see Connectivity with Bridge.

To change the connection type of an embedded data source of a workbook, see Editing the data source.

Repair connections

Occasionally something causes one or more of the connections to stop functioning normally. When this happens, an alert appears in the client, and it usually provides information that can direct you toward the cause of the problem. However, if the alert can't provide any troubleshooting information and your client is running in **Service** mode, you can use the **Repair** option to try to reset the connections.

1. Open the Windows system tray and right-click the Bridge icon.
2. From the drop-down menu, select **Repair**. This option stops and restarts the service, which can be enough to resolve the issue.

## Publish a Bridge Data Source with a Live Connection

This topic describes how a data source owner can publish a data source that uses a live connection to private network data. Data sources that connect to private network (including private cloud) data rely on Tableau Bridge. The tasks described in this topic assume Bridge has already been set up and is being maintained by your site admin.

- Bridge supports keeping data fresh for data sources embedded in workbooks. To publish a workbook with embedded data sources, see Use Embedded Data Sources.
- To publish a private cloud-based data source that uses a live connection, see Use Bridge for Private Cloud Data.
- To publish a virtual connection with a live connection, see Create a Virtual Connection

### Publish a data source

The procedure below describes how you can publish a data source that uses a live connection. To support live connections to data sources that connect to private network data, Bridge uses functionality called live queries. To keep the data source up to date, Bridge queries the database directly and returns the results of the query for use in the data source.

1. In Tableau Desktop, create your data source.
2. Select **Server** > **Publish Data Source** to begin the publishing process. If you haven't already signed in to Tableau Cloud, you will be prompted to.
3. In the Publish Data Source to Tableau Cloud dialog box, configure the various options for your data source and ensure you do the following:
   - Under Authentication, click **Edit** and select **Embedded password** or **Server Run As account** depending on the option you see.
   - Depending on the data that the data source is connected to or how you've configured the data source, the dialog can default to publishing a live connection or give you the option to publish a live connection or extract. If you are provided with options, select **Maintain a live connection**.
4. Click the **Publish** button. This opens a browser window to Tableau Cloud.
5. In the Publishing Complete dialog box, click the **Done** button.

## Use Embedded Data Sources

Tableau Bridge supports embedded data sources (EDS) and published data sources. With EDS support, existing content requiring Bridge can be migrated as-is rather than converting embedded data sources to published data sources.

**Note**: For Bridge extract refresh connections that contain embedded data sources, you can combine data from multiple sources. See Multiple connection scenarios.

## Considerations

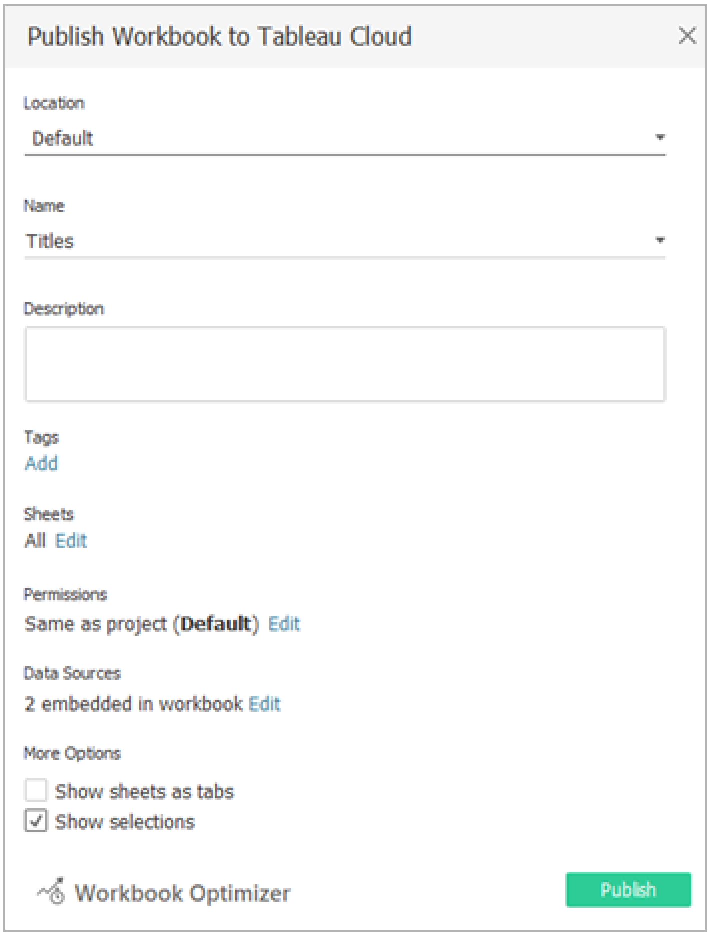
- Bridge can support up to 16 live queries per client. With embedded data sources support, there's an additional count against the refreshed quota.
- See Bridge Site Capacity for information about how Tableau Bridge can impact site capacity.
- When data is embedded in the workbook it's exclusive to the workbook; it's not available for other Tableau Desktop users to connect to. You can set up extract refresh schedules as you do for data sources that are published.
- Each embedded data source has a separate connection to the data. Performance can be affected when connecting to duplicate copies of data, for example when connecting to the same original data and each workbook has its own refresh schedule.
- Existing scheduled jobs will be routed to Bridge once the pool mappings and private network allowlist for the data source are configured. This is because the network type for embedded data sources is determined by the pool mappings and private network allowlist.
- A published data source is typically the best option for long-running extract refresh tasks. For more information, see Optimize Bridge Refresh Performance.

Limitations

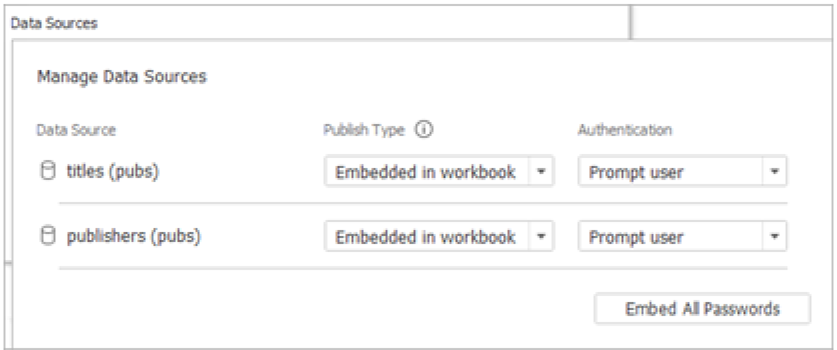
- Bridge legacy schedules aren't supported.
- The default pool does not support embedded data sources. You must use a pool that has been configured. For more information, see Configure the Bridge Client Pool.
- Live connections for file data (such as .cvs and .xlsx) aren't supported by Bridge when the connection is an embedded data source.
- Extract refreshes for embedded data source files are supported on the Bridge Windows client. You must use a configured pool for embedded data sources and the file path must use the UNC format. Tableau recommends that you limit the size of files to 5 GB.
- File data isn't supported on Bridge for Linux for Containers.

Embedded Data Source with a Live connection

1. Set up pool mappings for the data source. For more information, see Configure the Bridge Client Pool.
2. From Tableau Desktop set the data source connection to **Live**.
3. From the worksheet, click **Server** > **Publish Workbook**.




4. To see the data sources embedded in the workbook, click **Data Sources**.

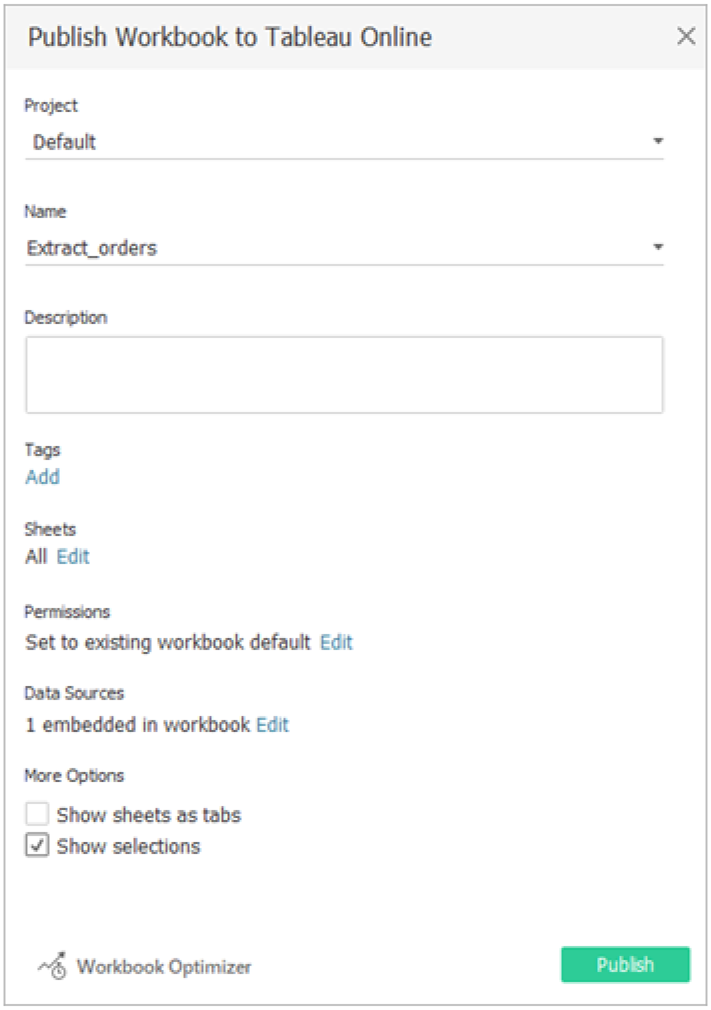



5. Click **Publish**.

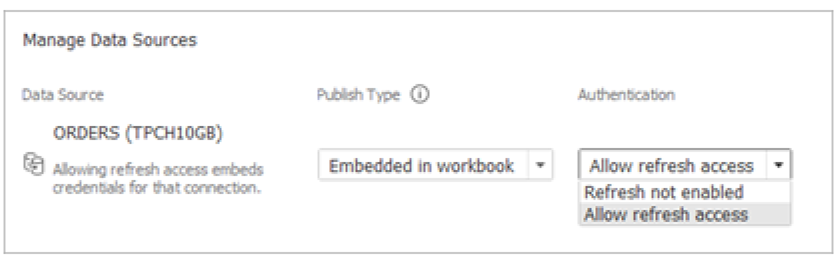
   After the workbook is published, the workbook is rendered with the data sources included in the workbook.

Embedded Data Source with an Extract connection

1. Set up pool mappings for the data source. For more information, see Configure the Bridge Client Pool.
2. From Tableau Desktop set the data source connection to **Extract**.
3. Click the worksheet and in the **Save Extract As** form, provide a name for the extract data source.
4. From the worksheet, click **Server** > **Publish Workbook**.




5. (Optional) In the Manage Data Sources menu, choose to allow refresh access.




6. Click **Publish**.

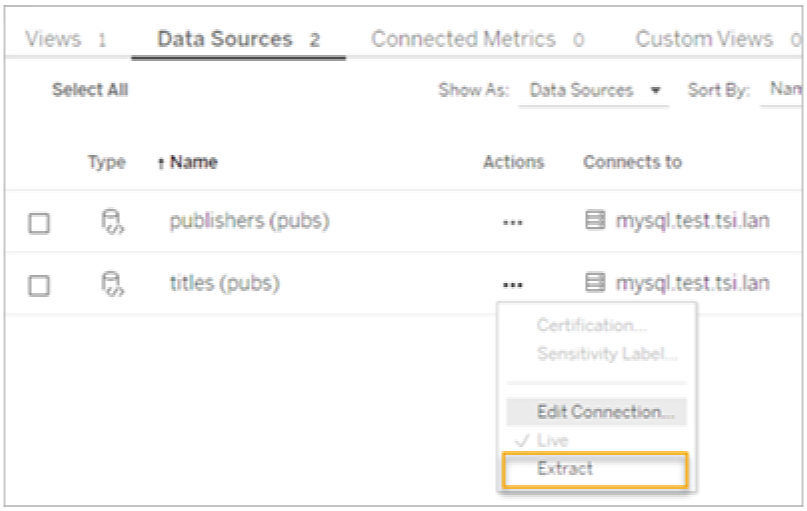
   After the workbook is published, the workbook is rendered with the data sources included in the workbook.

Editing the data source

Optionally, after you publish the workbook, you can change the connection type from Live to Extract from the Data Sources tab or from the workbook. You can also change the connection type from Extract to Live from the workbook.

To change the connection type from Live to Extract from the Data Sources tab:

1. Go to the **Data Sources** tab.
2. From the Actions menu, select **Extract**.




To change the connection type from Live to Extract from the workbook:

1. Go to the **View** tab.
2. Click **Edit Workbook**.

3. Click the **Data Source** tab in the lower left corner, and then click **Extract** in the upper right corner.
4. Click **Create Extract**.

   When a workbook data source is changed to Extract, a job is automatically created.

To change the connection type from Extract to Live, change the connection from the workbook. Do not change the data source from Extract to Live from the **Data Sources** tab.

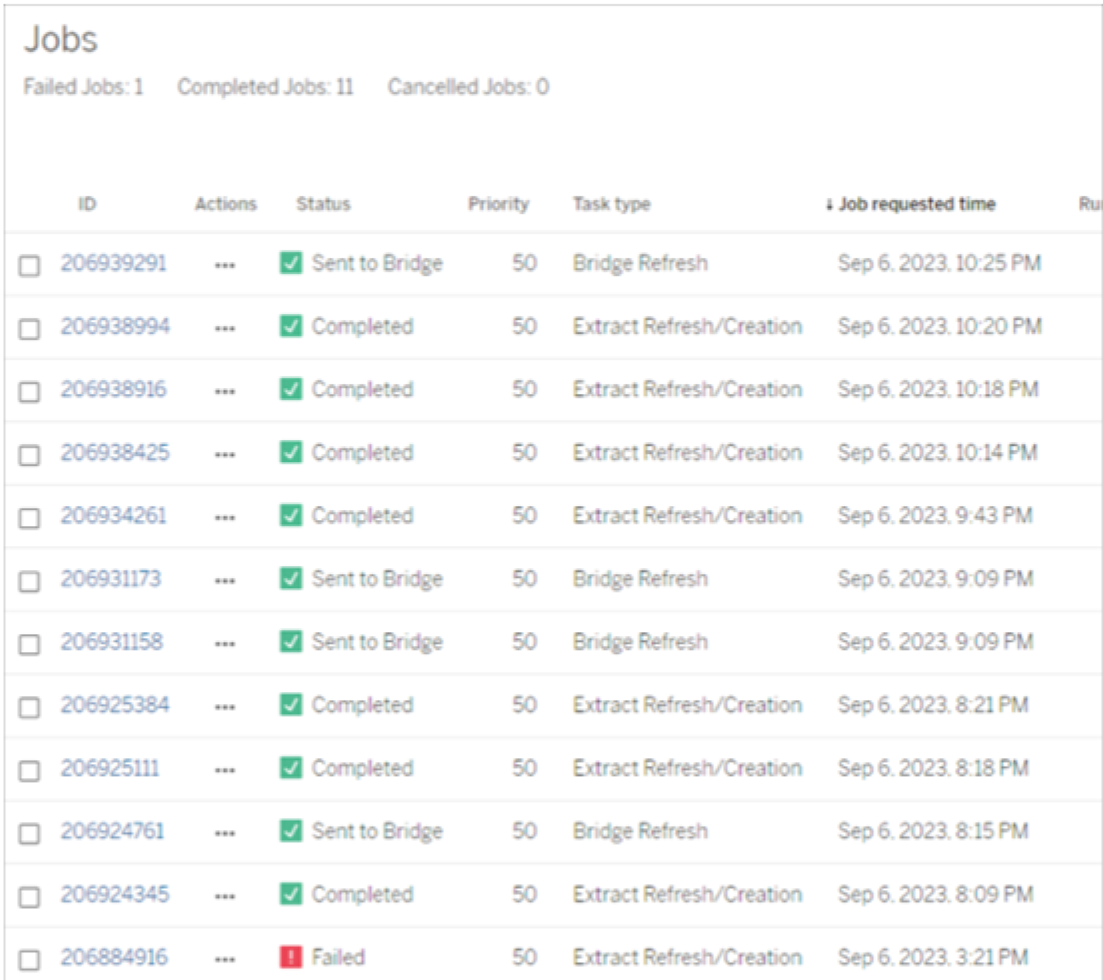
1. Go to the **View** tab.
2. Click **Edit Workbook**.


3. Click the **Data Source** tab in the lower left corner, and then click **Live** in the upper right corner.
4. Click **Publish** and refresh the workbook page.

Viewing refresh jobs

There are several Task Types available to view from the Jobs page.

For embedded data sources that use Bridge, the task type is **Extract Refresh/Creation**. For published data sources that use the Bridge client, the task type is **Bridge Refresh**.



Jobs

Failed Jobs: 1 Completed Jobs: 11 Cancelled Jobs: 0

| ID | Actions | Status | Priority | Task type | ↓ Job requested time | Ru |
|---|---|---|---|---|---|---|
| 206939291 | ••• | Sent to Bridge | 50 | Bridge Refresh | Sep 6, 2023, 10:25 PM | |
| 206938994 | ••• | Completed | 50 | Extract Refresh/Creation | Sep 6, 2023, 10:20 PM | |
| 206938916 | ••• | Completed | 50 | Extract Refresh/Creation | Sep 6, 2023, 10:18 PM | |
| 206938425 | ••• | Completed | 50 | Extract Refresh/Creation | Sep 6, 2023, 10:14 PM | |
| 206934261 | ••• | Completed | 50 | Extract Refresh/Creation | Sep 6, 2023, 9:43 PM | |
| 206931173 | ••• | Sent to Bridge | 50 | Bridge Refresh | Sep 6, 2023, 9:09 PM | |
| 206931158 | ••• | Sent to Bridge | 50 | Bridge Refresh | Sep 6, 2023, 9:09 PM | |
| 206925384 | ••• | Completed | 50 | Extract Refresh/Creation | Sep 6, 2023, 8:21 PM | |
| 206925111 | ••• | Completed | 50 | Extract Refresh/Creation | Sep 6, 2023, 8:18 PM | |
| 206924761 | ••• | Sent to Bridge | 50 | Bridge Refresh | Sep 6, 2023, 8:15 PM | |
| 206924345 | ••• | Completed | 50 | Extract Refresh/Creation | Sep 6, 2023, 8:09 PM | |
| 206884916 | ••• | Failed | 50 | Extract Refresh/Creation | Sep 6, 2023, 3:21 PM | |

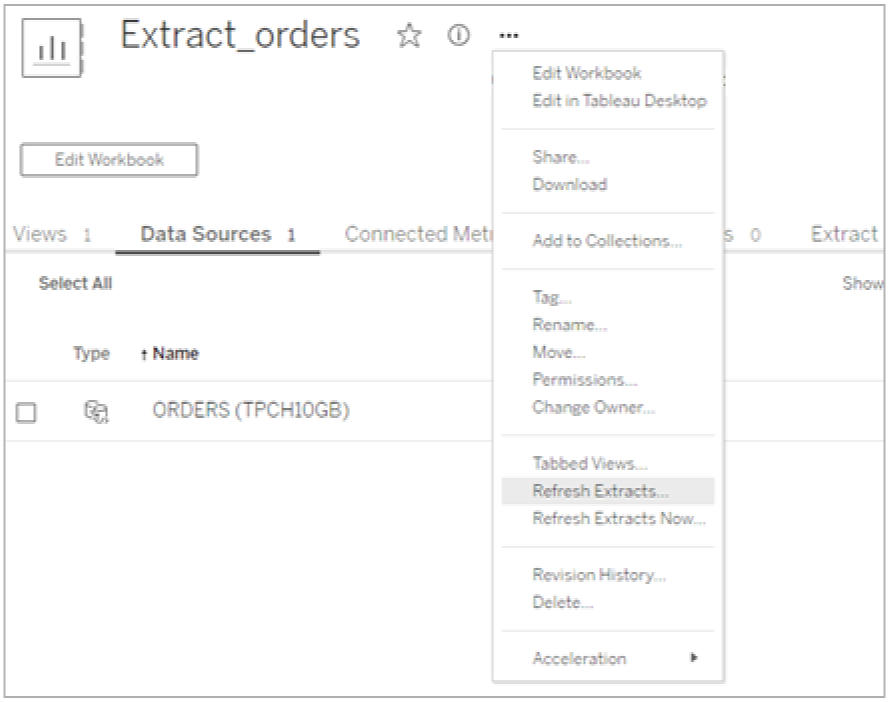
**Note**: When changing the published workbook connection type from Live to Extract, a scheduled job is created. However, the Task type doesn't indicate that the Bridge client was used for the data source for the scheduled job refresh or when running Refresh Now. The task type is listed as **Extract Refresh/Creation**.

Refreshing an Extract

You can refresh extracts of data hosted with most cloud data providers directly on Tableau Cloud.

1. Sign in to the Tableau Cloud site to which the data source is published.

2. On the Data Sources page, select the More actions icon (…) next to the data source you want to refresh, and then select Refresh Extracts or Refresh Extracts from the menu.




3. Selecting Refresh Extract schedules the refresh, but doesn't run the refresh immediately. To run the refresh, go to the **Extract Refreshes** tab, select the **More actions** icon (**…**) next to the data source, then click **Run Now**.

## Optimize Bridge Refresh Performance

Tableau Bridge supports extract refreshes of published data sources and embedded data sources. Publish data sources allow you to widen the audience for your data analysis within your organization. Embedded data sources are saved to a workbook and can be shared easily without having to separately share the data source.

Both published data sources and embedded data sources have advantages. In general, a published data source refresh through bridge is best for long-running refresh tasks. An embedded data source refresh through bridge is best for short running refresh tasks and for integrated data sources.

The table below shows a few recommendations for choosing between published data sources and embedded data sources based on performance when using Bridge.

**Note**: Performance can vary depending on the hardware and infrastructure you’re running on.

| **Use a published data source** | **Use an embedded data source** |
|---|---|
| Publishing data sources is a step toward centralizing data management. You can share the data source with multiple workbooks and create policies geared toward minimizing data source proliferation and helping people find the right data for the work they do. For more information about published data sources, see Best Practices for Published Data Sources. | You don’t want to share the data sources. Data is available only inside the workbook; it isn’t available for other users to connect to. |
| When connecting to an integrated data source that includes only private network connections or where there are only lightweight public connections along with private network connections. | The embedded data source includes large data sets from a public network data source and short-running tasks from private network connections. |
| For long-running refresh tasks, and depending on your Bridge deployment, a published data source can deliver better performance. | For short running refresh tasks. Using embedded data sources may not provide optimal performance if the refresh time for your data source is expected to be more than 10 minutes on an existing published data source or workbook with direct connections to data.<br><br>To ensure that long-running refresh tasks don't take up all system resources and don't prevent refreshes of other extracts on your |

| | |
|---|---|
| | site, Tableau Cloud enforces a timeout limit of 120 minutes for refresh tasks. See Time limit for extract refreshes. |

Troubleshooting an embedded data source extract refresh

If a refresh task reaches the timeout limit, you can try to resolve the issue using the following options.

- Reduce the size of extracts. For more information, see Optimize for Extracts.
- If you're using a full refresh, using an incremental refresh may help in some instances. For more information, see Staying within the timeout limit.
- Convert the embedded data source to a published data source.

# Set Up a Bridge Refresh Schedule

This topic describes how a Tableau data source owner can set up and update refresh schedules for data sources that connects to private network data. Refresh schedules for data sources that connect to private network data rely on Tableau Bridge. The tasks described in this topic assume Bridge has been set up and is being maintained by your site admin. Exceptions are noted.

This topic does not cover setting up refresh schedules for virtual connections. For more information about virtual connections, see Schedule Extract Refreshes for a Virtual Connection.

**Notes:**

- Bridge supports keeping data fresh for data sources embedded in workbooks. See Using Embedded Data Sources.
- To set up and configure refresh schedules for a private cloud-based data sources, see Use Bridge for Private Cloud Data.

## Bridge refresh schedules versus Bridge legacy schedules

For data sources that are set up to use extract connections, Bridge uses refresh schedules to keep data fresh.

There are two types of refresh schedules that you can configure for Bridge to use:

- Bridge refresh schedules
- Bridge legacy schedules: Support for Bridge legacy schedules will be removed in the 2025.1 release. For more information about how to migrate to Bridge refresh schedules see the section below, Migrate from Bridge legacy to Bridge refresh schedules.
  **Note:** Bridge legacy schedules do not support refreshes for virtual connections.

The schedule you use can depend on a couple of factors, including the version the original schedule was created and the type of underlying data that the data source connects to. In summary, Bridge refresh schedules are designed to leave client management tasks to the site admin and enable you to perform all your data source management tasks directly on Tableau Cloud.

Version

Beginning with Bridge 2021.4.3, extract refreshes for file-based published data sources can use Bridge refresh schedules. Bridge refresh schedules for file-based data sources require at least one Bridge 2021.4.3 (or later) client be set up and added to the client pool by your site admin.

Beginning with Bridge 2024.2.1, extract refreshes for file-based embedded data sources can use Bridge refresh schedules. Bridge refresh schedules for file-based embedded data sources require at least one Bridge 2024.2.1 (or later) client to be set up and add to a Named Pool by your site admin.

By default, schedules created for file-based data sources that were created prior to Bridge 2021.4.3 use Bridge legacy schedules. Bridge legacy schedules can be converted to Bridge refresh schedules.

Compare schedules

The following table describes the differences between Bridge refresh and Bridge legacy schedules.

| | **Bridge refresh schedule** | **Bridge legacy schedule** |
|---|---|---|
| **Supported data types** | Relational data<br><br>File data<br><br>On premises data<br><br>Private cloud data | Relational data<br><br>File data<br><br>On premises data |
| **Supported query types** | Published Data Sources<br><br>Live and Extract<br><br>Embedded Data Sources<br><br>Virtual Connections<br><br>Incremental refresh | Published Data Sources<br><br>Live and Extract |
| **Schedule management** | Data source page<br><br>Workbook (live connections only)<br><br>Distributed schedule management<br><br>Integrated with Tableau Cloud schedules allowing for more control and shared visibility | Data source page<br><br>Only accessible by user that is signed into Bridge client |
| **Additional feature support** | Supports pooling to load balance work loads<br><br>Monitoring available: Jobs, Admin | Not supported |

| | | |
|---|---|---|
| | Insights, and Admin Views.<br><br>REST API: Run Extract Refresh Now<br><br>REST API:Update Data Source Now | |

## Manage schedules

Though the scheduling tasks are exactly the same, there are two primary entry points for setting up a Bridge refresh schedule for a data source that connects to private network data. The first entry point is during the data source publishing process, from Tableau Desktop. The second entry point is at any time after the data source publishing process.

Set up a schedule

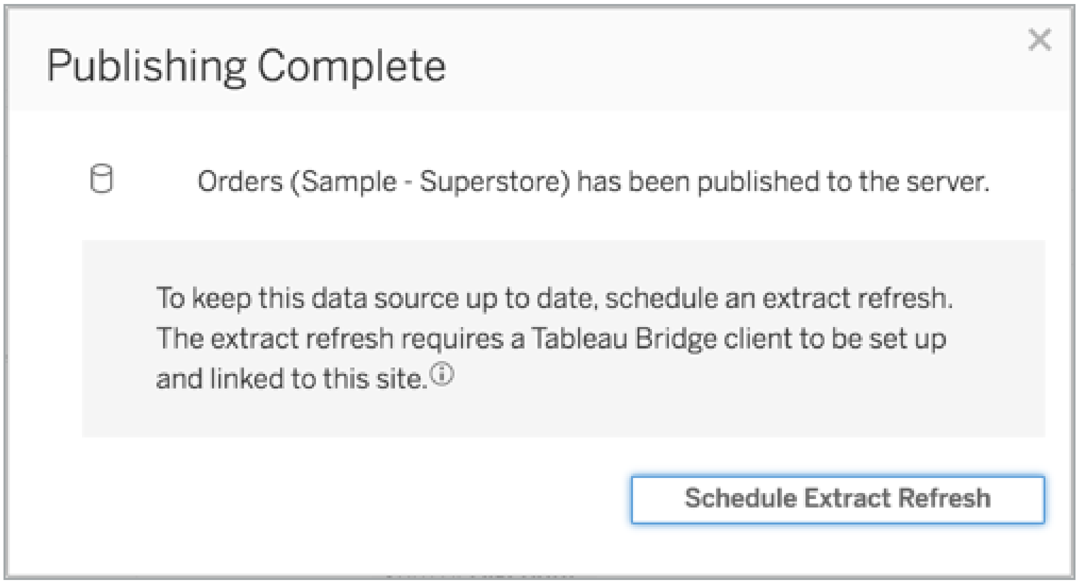
In most cases, you will set up a schedule as you publish your data source from Tableau Desktop.

> **Note**: Scheduled extracts of published data sources do not support multiple pools. Multiple pools may be necessary when you have a connection in a single data source to data sources that are located in two or more network locations.

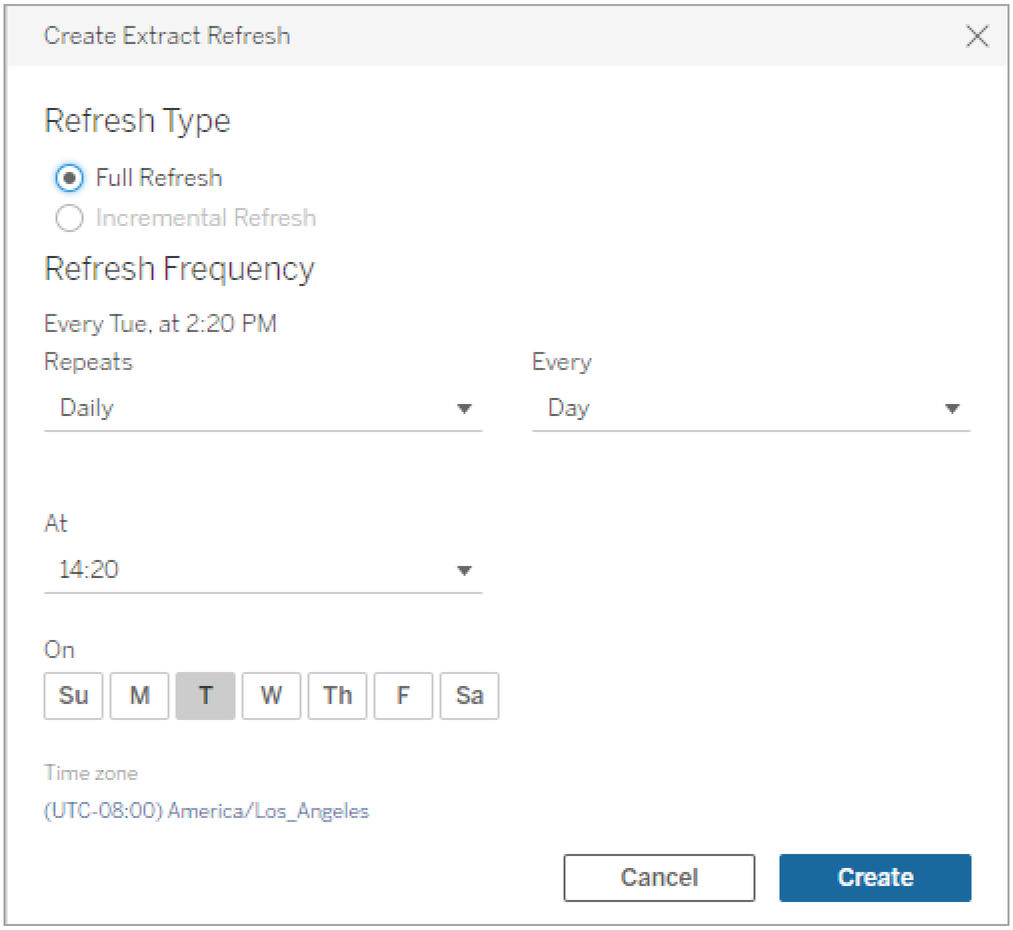
1. In Tableau Desktop, create your data source.
2. Select **Server** > **Publish Data Source** to begin the publishing process. If you haven't already signed in to Tableau Cloud, you will be prompted to.
3. In the Publish Data Source to Tableau Cloud dialog box, configure the various options for your data source, and then click the **Publish** button. This opens a browser window to Tableau Cloud.

   **Note:** Depending on the data that the data source is connected to or how you've configured the data source, the dialog will default to publishing an extract or will give you the option to publish an extract. If you are provided options, select the option to publish an extract.

4. In the Publishing Complete dialog box, click the **Schedule Extract Refresh** button.




5. In the Create Extract Refresh dialog box, configure a schedule for the refresh. For more information about how to configure the schedule, see Schedule Refreshes on Tableau Cloud.




6. Click the **Create** button.

Add or update an existing schedule

For whatever reason you are unable to schedule a refresh during the data source publishing process, you can add a new or update a schedule anytime after.

1. Sign in to Tableau Cloud and navigate to your data source.

2. From the data source page, click the **Extract Refreshes** tab.

3. Do one of the following:

   a. To set up a new schedule, click the **New Extract Refresh** button and configure a schedule for your refresh.

   b. To update an existing schedule, select the check box next to the schedule, click the Actions menu, and then select **Change Frequency** to reconfigure the schedule for the refresh.

4. Click the **Create** button.

Change refresh connection type

By default, Tableau Cloud uses Bridge when a published data source has at least one public cloud and one on-premise connection.

For more information about how to edit the connection type, see Change the connection type of a refresh to use Tableau Cloud.

## Alternative: Manage Bridge legacy schedules

Optionally, you can use the Bridge legacy schedule to keep your data fresh.

**Notes:**

- **Important:** Support for Bridge legacy schedules will be removed in version 2025.1. To ensure a smooth transition, we recommend you use Bridge refresh schedules. For more information, see Migrate from Bridge legacy to Bridge refresh schedules.
- Bridge refresh schedules have greater flexibility, support more data source types and offer much simpler administration of Tableau Bridge.
- Bridge legacy schedules can only complete successfully if you embed your database credentials in the connection through the Bridge client. For more information, see Embed or update database credentials.
- When you use a Bridge legacy schedule, the time that shows on the client and the time that shows on Tableau Cloud correspond to the time zone of the machine from which the client is running.

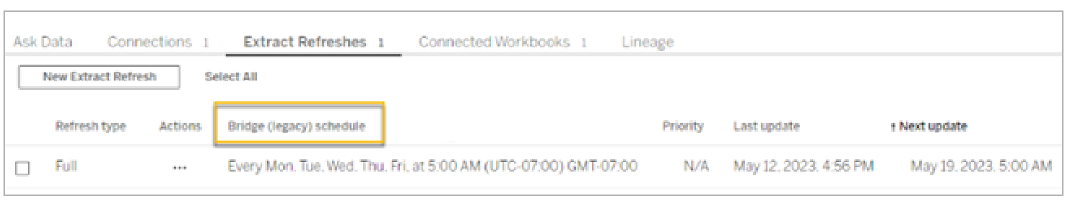
Migrate from Bridge legacy to Bridge refresh schedules

Refresh schedules for file-based data sources that were created before Bridge 2021.4.3 use Bridge legacy schedules by default. You can migrate Bridge legacy schedules to use Bridge refresh schedules to keep your data fresh. Bridge refresh schedules run on Bridge clients managed by your site admin and take advantage of pools of available clients to perform the refreshes.

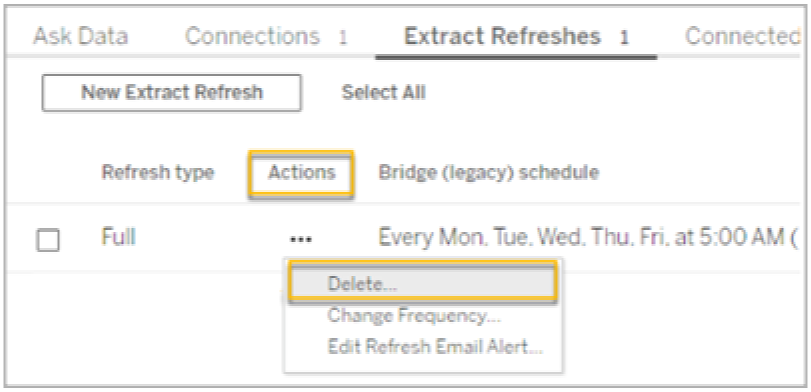
1. Ensure that you have a named pool with at least one client assigned to it. Pools are used to distribute (or load balance) data freshness tasks among the available clients. Pools also give you the ability to dedicate clients to keeping specific data fresh and centrally maintaining security.

2. In that pool, provide the domains of the private network locations that you want to make accessible to Bridge on behalf of Tableau Cloud. For more information, see Configure Pooling.

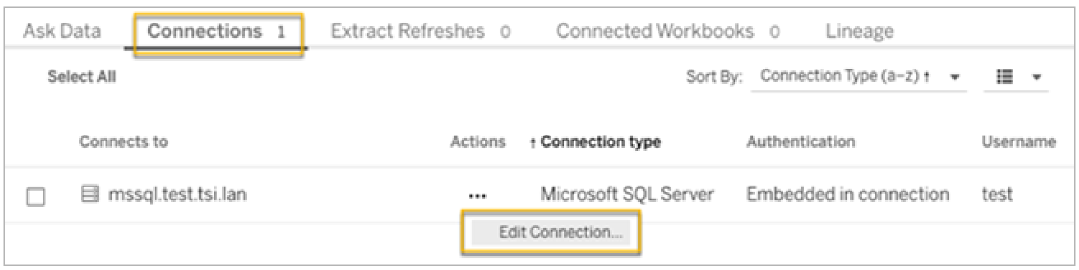
3. Validate that the client is configured to run in Service mode and not Application mode. (More information: Linux | Windows).
4. In the legacy schedule, go to the published data source and click the **Extract Refreshes** tab to display the **Bridge (legacy) schedule**.



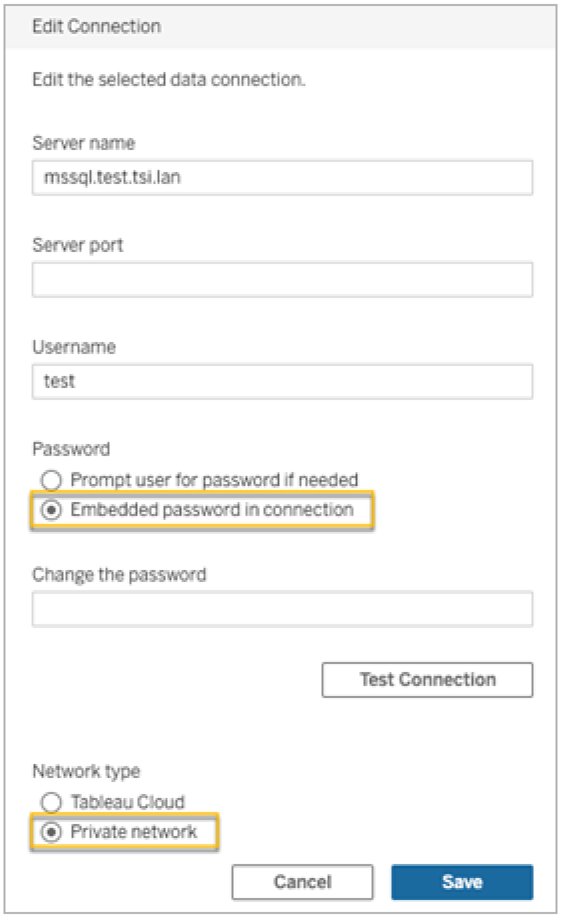

5. Use the action menu to delete all legacy schedules.



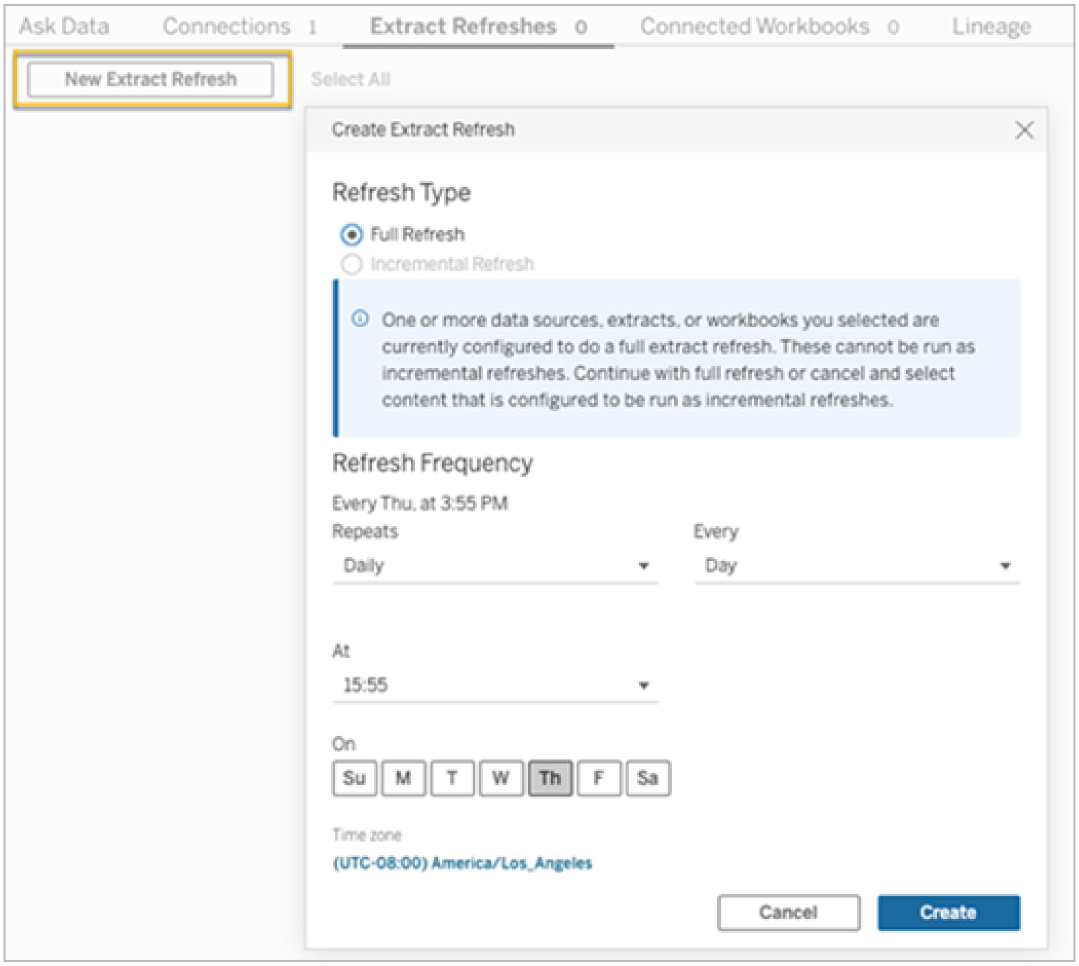

6. On the **Connections** tab, click **Edit Connection**, and then enter the user name and password for the connection.




7. For all Published Data Sources, **Embedded password in connection** and **Private network** must be selected.




8. On the **Extract Refreshes** tab, click **New Extract Refresh** to schedule a refresh for the named pool.



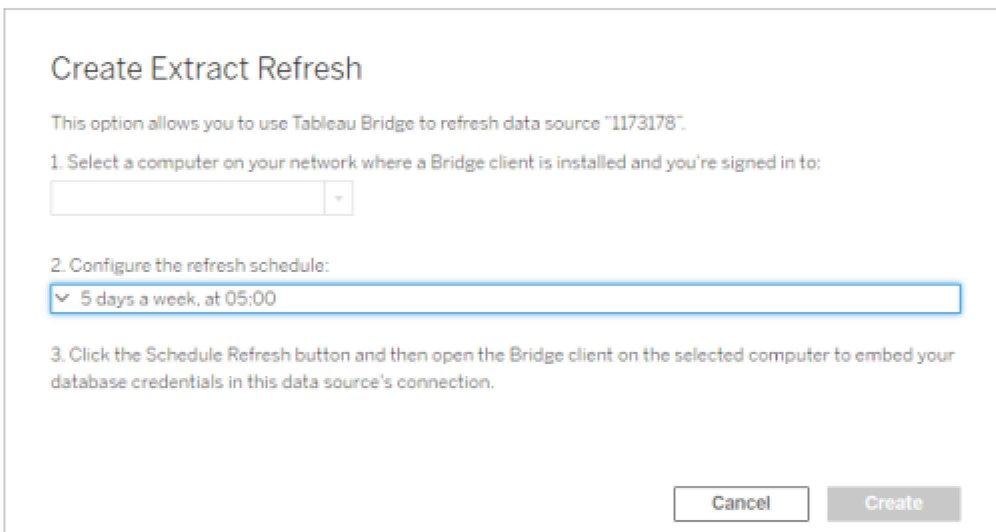

9. Click **Create** to add the replacement scheduled refresh. The new schedule is listed as **Schedule** rather than **Bridge legacy schedule.**
10. Continue this process for any Bridge legacy schedules that you have running on your site. You can find a list of all current Bridge legacy schedules by signing into the Bridge Client on the client's machine. All active Bridge legacy schedules will be displayed on the client.

Set up a Bridge legacy schedule

**Important:** Support for Bridge legacy schedules will be removed in version 2025.1. To ensure a smooth transition, we recommend you use Bridge refresh schedules. For more information, see Migrate from Bridge legacy to Bridge refresh schedules.

Just like with Bridge refresh schedules workflow, in most cases, you will set up a Bridge legacy schedule as you publish your data source from Tableau Desktop.

1. In Tableau Desktop, create your data source.
2. Select **Server** > **Publish Data Source** to begin the publishing process. If you haven't already signed in to Tableau Cloud, you will be prompted.
3. In the Publish Data Source to Tableau Cloud dialog box, configure the various options for your data source, and then click the **Publish** button. This opens a browser window to Tableau Cloud.
4. In the Publishing Complete dialog box, click the **Schedule Extract Refresh** button. The **Create Extract Refresh** dialog box, where you configure the Bridge legacy schedule, displays.
5. In the Create Extract Refresh dialog box, follow each step to configure the schedule.




**Notes:**

- **To refresh during a specific time period on selected days:** Select **Hourly**, specify the time range during the day using the **From** and **To** drop-down lists, and then select the days of the week.

To optimize performance on the server, refresh tasks are distributed within a range of up to five minutes of the time of day you specify. For example, if you set an hourly schedule, the occurrence set to run at 1:00 AM could run any time between 1:00 and 1:05 AM.

- **Full or incremental refresh:** If available, you specify whether you want a full or incremental refresh. By default, Tableau Cloud runs a full refresh. Incremental refresh is available only if you configured the data source for an incremental refresh in Tableau Desktop before publishing. For information, see Refreshing Extracts in the Tableau Help.

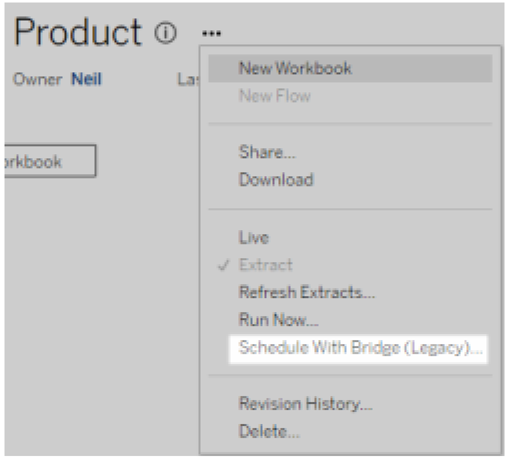
6. Click the **Create** button.

Add a new or update an existing Bridge legacy schedule

**Important:** Support for Bridge legacy schedules will be removed in version 2025.1. To ensure a smooth transition, we recommend you use Bridge refresh schedules. For more information, see Migrate from Bridge legacy to Bridge refresh schedules.

If you're unable to schedule a refresh during the data source publishing process, you can add a new or update a Bridge legacy schedule anytime after. New (for sites that have been migrated)

1. Sign in to Tableau Cloud and navigate to your data source.
2. From the data source page, click the **Extract Refreshes** tab.
3. Do one of the following:
   a. To set up a new Bridge legacy schedule, in the data source's actions menu, select **Schedule with Bridge legacy**, configure the schedule, and then click the **Schedule Refresh** button.




b. To update an existing Bridge legacy schedule, select the check box next to the existing schedule, click the data source's actions menu, and then select **Change Schedule**. In this workflow, you can't change the client that performs the refresh. If you need to change the client that performs the refresh, see Change the client that performs the Bridge legacy schedule. When finished, click the **Change Schedule** button.

Other Bridge legacy schedule management tasks

Add a new or update an existing schedule from the client

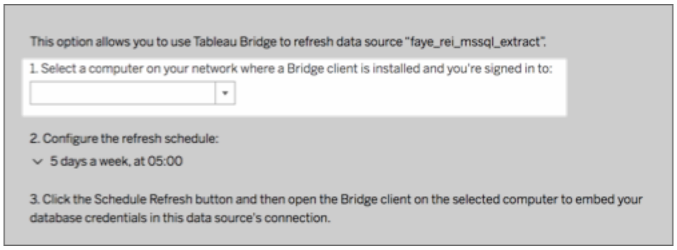
If you, not your site admin, are managing the "named" clients, you can add a new or update an existing Bridge legacy schedule directly from the Bridge client.

1. Open the Windows system tray and click the Bridge icon to open the client.
2. Hover over the data source and click the **Schedule** icon. This opens a browser window to the data source page in Tableau Cloud.
3. Repeat steps 2-3 from the above Add a new or update an existing Bridge legacy schedule section to set up the schedule.

### Add a new computer (client) to perform a scheduled refresh

As part of the scheduling process, in the scheduling dialog, you must specify a machine. The machine you specify is the Bridge client that performs the refresh.

The Bridge legacy schedule displays the clients that you signed into.



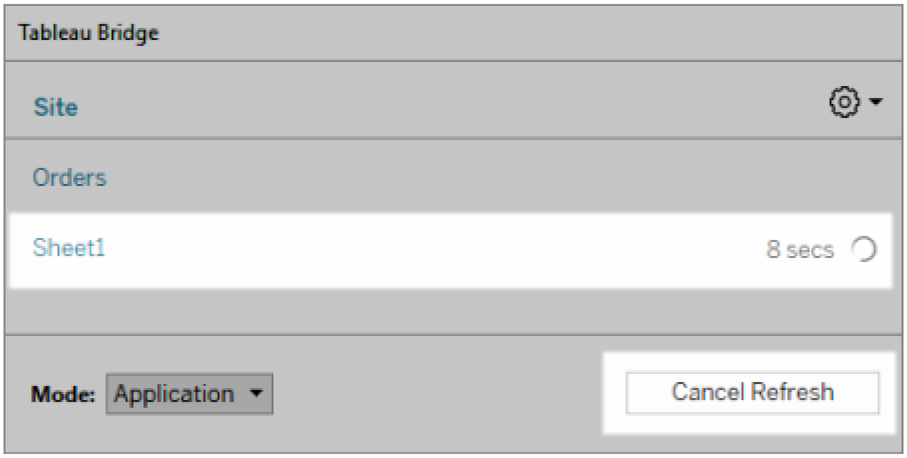

If the client you want to select is not available from the drop-down list, it can be one of a few reasons:

- You're not signed in to the client.
- The client is not properly registered or connected to the site. Go to and open the client and make sure that it has a green or "Connected" status.
- Your site admin manages all clients in your organization. When using Bridge legacy schedules, the data source owner and the user signed into the client must be the same. If your site admin is signed into the client, he or she must reassign ownership of the data source to him or herself in order to schedule a refresh.

### Cancel an in-progress refresh

In some cases, you might need to cancel an in-progress refresh. You can cancel a refresh for a data source that uses the Bridge legacy schedule only.

1. Open the Windows system tray and click the Bridge icon to open the client.
2. Click the **Cancel Refresh** button. This action will cancel the in-progress refresh.




**Note:** A client can perform one Bridge legacy refresh at a time. If you need to run more than one Bridge legacy refresh at the same time, discuss with your site admin about setting up additional clients on different machines to perform the extract refreshes.

Change the client that performs the Bridge legacy schedule

If you're working with a Bridge legacy schedule and want to change the location or machine that performs the refresh, you must set up a new refresh schedule. You can only schedule a refresh using a client that you are signed in to.

To set up a new Bridge legacy schedule, see Set up a Bridge legacy schedule. When you're done setting up a new refresh schedule, make sure that you delete the previous schedule identical to the new schedule.

**Important:** If the data source requires database credentials to access the underlying data, you must go back to the client and edit the connection information to re-embed the database credentials. You can use the **Test Connection** option in the client to check whether the data source can access the underlying data.

Remove a client from a site

After you change the client that performs the Bridge legacy schedule, consider permanently removing the client from the site if it's no longer being used for any other data freshness tasks.

1. Sign in to Tableau Cloud.
2. In the upper-right corner of the browser, click your profile image or initials, and select **My Account Settings**.
3. Under Connected clients, click **Delete** next to the client you want to remove from the site.

### Verify a previous or upcoming refresh

You can check when a previous refresh took place or find out when the next refresh will occur.

1. Sign in to Tableau Cloud and navigate to your data source.
2. From the data source page, click the **Extract Refreshes** tab.
3. Next to the schedule, review **Last update** and **Next** update columns.

### Delete a refresh schedule

1. Sign in to Tableau Cloud and navigate to the data source whose refresh schedule you want to delete.
2. On the data source page, click the **Extract Refreshes** tab.
3. Select the check box next to the schedule you want to delete and select **Actions** > **Delete**.

## Use Bridge for Private Cloud Data

This topic describes how a data source owner can publish a data source that connects to cloud data, such as Amazon Redshift and Snowflake, that can only be accessed from a private network.

Data sources that connect to private cloud data rely on Tableau Bridge to keep data fresh. In most cases, Tableau Cloud will automatically detect that Bridge is required as part of the publishing process. However, in some cases, you might need to manually configure your connection to ensure that Bridge is used.

No additional steps are required to use Bridge when publishing virtual connections that connect to cloud data.

The tasks described in this topic assume Bridge has already been set up and is being maintained by your site admin.

Bridge supports keeping data fresh for data sources embedded in workbooks. See Using Embedded Data Sources.

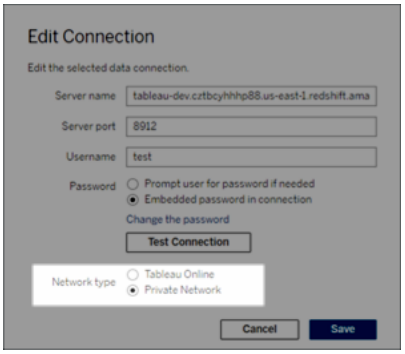
## Limitations

Bridge doesn't support live connections for some private cloud-based data sources. These include Google Drive, Box, OneDrive, Dropbox, and Azure Data Lake Storage Gen2. Use extract connections to keep data fresh. Use Bridge client version 20224.23.0209.1653 or higher when connecting to these private cloud-based data sources. After upgrading the client, republish your data sources.

## Set up schedules for private cloud-based data sources

Use the following procedure to ensure that Bridge schedules are used to keep extracts of your private cloud-based data sources up to date.

1. Follow steps 1-7 in the Publish a Data Source topic in the Tableau User Help.
2. If not already signed in to Tableau Cloud, sign in and navigate to your data source.
3. From the data source page, click the **Connections** tab and select the check box next to the connection.
4. From the Actions drop-down menu next to the connection, select **Edit Connection**.
5. In the dialog box next to Network type, select the **Private Network** radio button and click **Save**.




**About switching network types**

Changing the network type does not change the network type used by existing schedules for the data source.

If you change the network type for a data source that has an existing schedule associated with it, you must create a new schedule. This also means, if you created a refresh schedule prior to changing the network type, you must delete it before using the **Run Now** option. For more information about deleting a refresh schedule, see Delete a refresh schedule.

You can proceed to the next step so that a previous Bridge refresh schedule is automatically deleted when you create a new Bridge-dependent refresh schedule.

6. Follow one of the steps below depending on the schedule you need to configure:

    - For a Bridge refresh schedule, follow the steps described here: Add or update an existing schedule.

    - For a Bridge legacy schedule, follow the steps described here: Add a new or update an existing Bridge legacy schedule.

    **Note:** If you had previously set up a Tableau Cloud refresh schedule, it will be deleted automatically when you save the Bridge-dependent schedule.

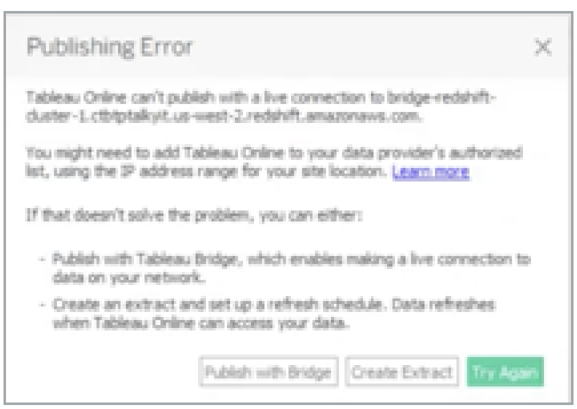
7. Click the **Schedule Refresh** button.

## Publish private cloud-based data sources that use live connections

Use the following procedure to ensure that Bridge live queries are used to keep private cloud-based data sources up to data.

Bridge doesn't support refreshing live connections with pools for some private cloud-based data sources. For more information, see Limitations

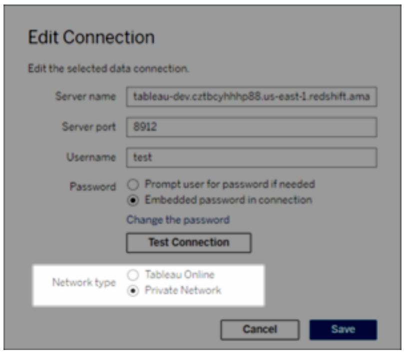
1. In Tableau Desktop, create your data source.
2. Select **Server** > **Publish Data Source** to begin the publishing process. If you haven't already signed in to Tableau Cloud, you will be prompted to.
3. In the Publish Data Source to Tableau Cloud dialog box, configure the various options for your data source and ensure you do the following:
   - Under Authentication, click **Edit** and select **Embedded password**.
   - Depending on the data that the data source is connected to or how you've configured the data source, the dialog can default to publishing a live connection or give you the option to publish a live connection or extract. If you are provided with options, select **Maintain a live connection**.
4. Click the **Publish** button. This opens a dialog box.
5. In the dialog box, click the **Publish with Bridge** button. This opens a browser window to Tableau Cloud.




6. In the Publishing Complete dialog box, click the **Done** button.

7. From the data source page, click the **Connections** tab and select the check box next to the connection.

8. In the dialog box next to Network type, if not selected automatically, select the **Private Network** radio button and click **Save**.




## Publish OAuth enabled private cloud-based data sources

Tableau Bridge supports OAuth when connecting to private data that uses OAuth and public data that uses OAuth when it’s joined to private data. Bridge currently supports these connectors when using OAuth: Snowflake, Google BigQuery, Google Drive, Salesforce, and OneDrive. For most data sources, live connections and extracted data are supported.

**Note**: For Azure data sources, the data source must be published through Tableau Cloud instead of Tableau Desktop when using OAuth as the authentication type.

Both saved credentials or managed keychain connectors are supported by OAuth. The type of functionality is dependent on the connector that you use.

1. In Tableau Desktop, connect to your data housed in a private cloud database.
2. Depending on the connector, you may be prompted to choose the authentication type. If you are provided with options, select **Sign in using OAuth**.
3. The **Data Source** page opens so that you can prepare the data for analysis and begin building your view.
4. Choose whether to publish as a live connection or an extract. Some data sources, such as Salesforce, don’t support live connections.

5. For extracts, click the **Sheet** tab to create and save the extract.
6. Select **Server** > **Publish Data Source** to begin the publishing process. If you haven't already signed in to Tableau Cloud, you will be prompted to.
7. Under **Authentication**, click select the authentication type. The options displayed are dependent on the data source. In most cases, Saved Credentials are recommended. For more information, see Refresh Data Using Saved Credentials.
   - If you have saved credentials data source in My Account Settings, select **Embed** <*data source name*>.
   - For extracted data, choose whether to allow refresh access. When you allow refresh access for extracts, you are prompted to set up a schedule. To schedule for a refresh, you must use embedded credentials.
8. When Bridge is required, your connection will be detected as Private during the publish operation. To change your network connection status, click the **Actions** menu, and select **Edit** Connection.

# Configure the Bridge Client Pool

This topic describes how site admins can configure and manage pooling for Bridge clients. Pooling allows clients across the site to load balance data freshness tasks for data sources or virtual connections that connect to private network data.

## Configure pooling

The purpose of a pool is to distribute (or load balance) data freshness tasks among the available clients in a pool whose access is scoped to a domain within your private network. Pools map to domains, giving you the ability to dedicate pools to keeping specific data fresh and maintaining security by restricting access to protected domains in your private network.

Although the client in the pool that performs the data freshness task is chosen at random, if for whatever reason a client can no longer perform the task, the task is automatically rerouted to another available client in the pool to handle the task. There is no additional intervention required from you or your users to support or manage the pool of clients.

Pooling is optimized for keeping data sources or virtual connections that connect to data on one or more private networks fresh. Pooling support does not extend to data sources that use Bridge (legacy) schedules.

In general, pooling is optimized for the following situations:

- **Bridge is used as a critical service.** If your organization requires that live query and scheduled refresh support must be available even if a client becomes unavailable.
- **Client is at capacity.** If your existing site traffic exceeds the current capacity of the client.
- **Tableau Cloud-managed schedules for file-based data sources.** Beginning with Bridge client version 2021.4.3, Bridge pools enable Bridge refresh schedules for file-based data sources.
- **Keeping data fresh on multiple private networks.**
- **Virtual connections.** (Requires Data Management) Bridge is required to refresh data in virtual connections that connect to private network data. For more information about virtual connections, see About Virtual Connections and Data Policies.

Before configuring the pool

Before you can configure a client pool for your site, review the following:

- Clients must be installed and running. For more information about software and hardware, see Bridge is designed to scale up and scale out. When configuring your Bridge deployment, consider the following:.
- Clients are configured to run as a service. For more information, see Application versus Service mode.
- The user authenticated into a client is a Tableau Cloud site admin. For more information about deploying Bridge, see Plan Your Bridge Deployment.
- To keep virtual connections fresh, ensure all clients in the pool are running Bridge 2021.4 (or later).

- To load balance file-based data sources, ensure the following:
  - All clients in the pool are running Bridge 2021.4.3 (or later).
  - References to file data must use the full UNC path that includes the server name or hostname. For more information, see About the Bridge Client.
  - File-based data sources are extract only.

Note about user roles

Only site admins, or users with either the Site Administrator or Site Administrator Creator role, can configure and maintain pooled clients. Regardless of the type of user authenticated into the client, only site admins can add new pools, add clients to a pool, remove clients from a pool, and monitor clients in a pool.

Note about refresh jobs

The Jobs page can show you the completed, in progress, pending, canceled, and suspended all Bridge refresh jobs that use Bridge refresh schedules. This includes refreshes for file-based and non-file based data sources. For more information, see About Bridge Refresh jobs. For more information about various ways you can monitor Bridge activity, see Monitor data freshness tasks.

Step 1: Ensure clients can connect to the site

In order for Bridge to work with your site, you must allow clients to authenticate to the site.

1. Sign in to Tableau Cloud using your site admin credentials and go to the **Settings** page.

2. Click the Authentication tab and validate that the **Let clients automatically connect to this Tableau Cloud site** check box under the Connected Clients heading is selected. For more information about this check box, see Access Sites from Connected Clients.

   **Note:** If enabled, the connected clients option must be enabled to support multi-factor authentication with Tableau authentication. If connected clients are disabled for your site, Bridge can only support Tableau username and password authentication.

### Step 2: Configure a pool

Pools, which require Bridge 2021.4 (or later) clients, help route live query and extract refresh jobs to the appropriate private network. Use pools to access data distributed across multiple private networks, enable extract refreshes for file-based data sources, and to support data freshness tasks for virtual connections.

1. On the Bridge tab, under Pooling, click the **Add New Pool** button.
2. In the dialog box, enter a new pool name in the Pool text box and click **Save**.

After you have at least one pool configured, as part of the publishing process, Tableau Cloud associates certain data sources or virtual connections with Bridge and client pools automatically.

### Step 3: Specify a domain for a pool

Each new pool requires a domain to be specified through the **Private Network Allowlist**. This information is required to enable Bridge access to data in the private network on behalf of Tableau Cloud.

The total number of domains on the allowlist and pools in your organization may not exceed 100.

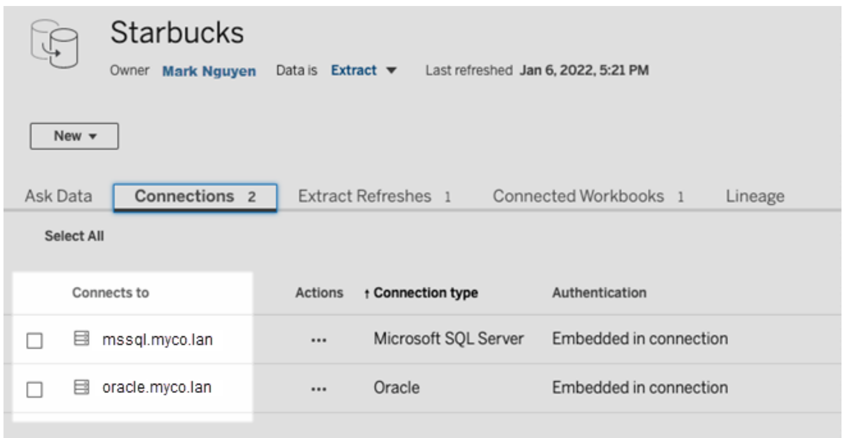
Using the private network allowlist, you must specify the domains of the private network where you want to enable client access. These domains should correspond to private network locations of databases and file shares that you want to make accessible to Bridge on behalf of Tableau Cloud.

#### Domain names

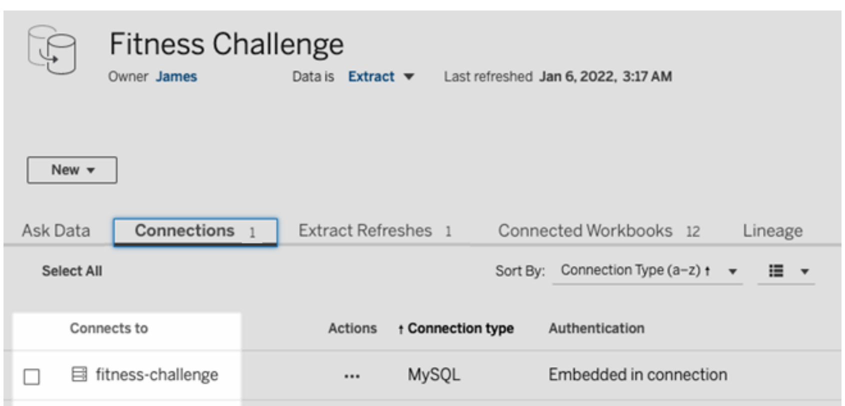
The domain names that you specify in the allowlist are the server names used in the data source connection or virtual connection. In some cases, you can find the server name listed in the **Connections** tab of the data source page in Tableau Cloud.

**Note**: When accessing workbooks which connect to published data sources, do not use *.tableau.com in the Private Network Allowlist. The domain *.online.tableau.com is used for proxy filtering for outbound connections. See Optional forward proxy filtering.

For example, to keep data sources like “Starbucks” up to date, you might specify “mssql.-myco.lan” and “oracle.myco.lan” or “*.myco.lan” in the allowlist.




To keep data sources like "Fitness Challenge" up to date, specify "fitness-challenge" in the allowlist.




In other cases, the **Connections** tab might not list the server name. When the server name is not listed, consider working with the content owner to identify where the data is hosted and specify the server name in the allowlist when you have that information. As a temporary alternative, you can skip to Step 4: Add clients to a pool to assign clients to use the **Default Pool** instead.

IP addresses

Instead of domain names, you can specify IPv4 addresses in the allowlist. We recommend you specify IPv4 addresses in the allowlist if IPv4 addresses are used in the data source connections or virtual connections. Consider working with your content owners to get this information. If you don’t have that information, as a temporary alternative, you can skip to Step 4: Add clients to a pool to assign clients to use the Default Pool instead.

**Notes:**

- For security purposes, the allowlist is empty by default to prevent Tableau access. This ensures that site admins specify what data can be sent to Tableau Cloud using Bridge.
- You can use Fiddler with Tableau Desktop to capture the URI that is used when connecting to a data source. For more information, see Fiddler.
- You can assign one or more domains to a pool.
- If your site was set up to use pooling prior to Tableau 2021.4, the **Default Pool** remains for backward compatibility purposes but can't be configured to access a specific private network. To reduce the scope of access of this pool and to enable more advanced scheduling capabilities, we recommend you create new pools and map them to specific domains.

To map a domain to a pool, do the following:

1. While on the Bridge tab, under the Private Network Allowlist, click the **Add New Domain** button.

2. In the **Domain** text box, enter the URI of the domain using the information described in Allowlist registry rules.

3. Under Domain permissions, ensure the **Allow** radio button is selected.

4. Under **Pool**, select the pool whose scope of access should be limited to the URI you specified in step 2.

5. Repeat steps 1-4 for each additional domain.

6. When finished, click **Save**.

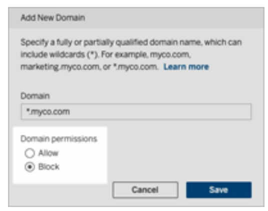
Allowlist registry rules

Use the following rules when specifying the domains that you want to enable Bridge access to. This allows Bridge, on behalf of Tableau Cloud, to access the data on your private network to perform data freshness tasks. A domain enables Bridge to connect to both databases and file data hosted in that domain.

**Notes:**

- The total number of pools + domains in the allowlist registry may not exceed 100. If you exceed 100 of these combined objects, you will be unable to add new pools.
- Domains are *not* verified when added to the allowlist, when data sources or virtual connections are published, or when refresh schedules are configured.
- Duplication due to the same domain being added to the allowlist as both the domain name and its IP address are not verified. In this scenario, if one pool maps to the domain name and another pool maps to the IP address, the format specified in the data source connection or virtual connection determines which pool keeps the data fresh.
- Domains must be accessible by Bridge. This means, all clients in the pool must have access to the specified domain.
- If no domains are specified, Bridge is unable to run data freshness tasks for data sources or virtual connections configured for Bridge refresh schedules. **Note:** Data sources configured for Bridge legacy schedules will continue to run in the same way.

| Scenario | Description | Example |
|---|---|---|
| Exact domain name | Can either be a FQDN or PQDN. Port numbers are not allowed. | myco.com<br>marketing.myco.com<br>oracle.myco.com |
| Range of domain names | Use an optional leading wildcard (*) to include all subdomains. The * must be followed directly by a period (.). | *.myco.com |

| | | |
|---|---|---|
| Exact IPv4 address | Use an IPv4 literal (abbreviations are not allowed). IPv6 addresses are not allowed. | 255.255.0.1<br>192.168.0.0 |
| Range of IPv4 addresses | Use a subnet mask to include a range of IPv4 addresses. | 255.255.0.1/16 |
| Block domains | (Named pools only) Block Bridge connectivity to hosts in this domain. | When adding or editing a domain in the private network allowlist, select the **Block** radio button option.<br> |

Allowlist registry examples

**Example 1 - database data**

Suppose you want Bridge to do the following:

- Perform data freshness tasks for data located in **data.lan** and **sqlserver.myco.lan**.
- *Prevent* data freshness tasks for data located in **oracle.myco.lan**.

To enable Bridge to support these scenarios, you can map the domains to two pools (A and B) and block the third domain.

| If you specify... | and map to pool... | ...data is refreshed in locations |
|---|---|---|
| *.lan | Pool A | data.lan |
| sqlserver.myco.lan | Pool B | sqlserver.myco.lan |
| *.myco.lan | (Blocked) | - |

| | | |
|---|---|---|
| **Note:** Although this domain range blocks data freshness tasks on oracle.myco.lan, a blocked domain range can unblock a specific domain within it if the domain is explicitly allowed, such as sqlserver.myco.lan. | | |

**Example 2 - file data**

Suppose you have file data, C:\Shared\employees.csv, located on **fileserv.myco.lan**. To enable Bridge access to this data, map the domain of the machine to a pool. You can specify *one* of the following domains to a pool:

- Option #1: *.lan
- Option #2: *.myco.lan
- Option #3: fileserv.myco.lan

**Note:** The host machine must allow network access to the "Shared" folder.

Step 4: Add clients to a pool

Follow the procedure below to assign clients not already assigned to a pool.

**Note:** To support data freshness tasks for all data, ensure clients in the pool are running Bridge 2021.4 (or later).

1. On the Bridge tab in the **Unassigned Clients** table, navigate to the client you want to assign to a pool and click **Assign**.
2. In the **Pool** drop-down menu, select the pool you want to associate with the client.
3. Repeat step 2 for each unassigned client you want to assign to a pool.

## Troubleshoot pooling

**Bridge Refresh jobs fail with one of the errors listed below.**

The following errors can be seen on the Jobs page and the Background Tasks for Non Extracts admin view.

- **"errorID=NO_POOLED_AGENTS_ASSIGNED"**

  This issue is specific to default pools and can occur for one of two reasons:

  - When the server address or IP address of a data source does not match a domain specified in the **Private Network Allowlist**. This causes refresh jobs to be sent to the Default Pool where there are no assigned clients.

    To resolve this issue, make sure 1) the allowlist contains the domains (server addresses or IP addresses) used by the data sources, and 2) at least one pool is associated with those domains (sever addresses or IP addresses). For more information, see Step 3: Specify a domain for a pool.

  - When there are no clients in the default pool. To resolve this issue, add at least one Bridge 2020.2 (or later) client to the default pool. For more information, see Step 4: Add clients to a pool.

- **"errorID=NO_POOLED_AGENTS_ASSIGNED_NAMED_POOL"**

  This issue can occur when there are no clients in the named pool. To resolve this issue, add at least one Bridge 2021.4 (or later) client to the named pool. For more information, see Step 4: Add clients to a pool.

- **"errorID=NO_AGENT_IN_POOL_SUPPORTS_REMOTE_EXTRACT_REFRESH"**

  This issue can occur when a refresh job tries to run without at least one Bridge 2020.2 (or later) client in the pool. To resolve this issue, add at least one Bridge 2020.2 (or later) client to the pool. For more information, see Step 3: Specify a domain for a pool.

- **"errorID=NO_POOLED_AGENTS_CONNECTED"**

  This issue can occur when none of the clients in the pool are available to run data freshness tasks. For more information, see the Configure the Bridge Client Pool section above.

- **"errorID=REMOTE_EXTRACT_REFRESH_ALL_AGENTS_BUSY"** or **"errorMessage: Maximum concurrency reached"** in the client

  These issues can occur if the number of refresh jobs running at a given time exceeds the capacity of your client pool. To help resolve this issue, you can do the following:

  - Add additional clients to the pool. For more information, see Step 4: Add clients to a pool.
  - Increase the size of the **connectionPool** setting on each client. For more information, see Change the Bridge Client Settings.

- **"errorID= AGENTS_IN_POOL_REQUIRE_UPGRADE"**

  Beginning with Tableau 2021.4, this issue can occur when the clients in the pool need to be upgraded to Bridge 2021.4 (or later) in order to run data freshness tasks. For more information about upgrading clients, see Install Bridge.

**Bridge clients are being signed out**

This issue can happen if you deploy a large number of clients under the same Windows services account. When there are more than 10 clients running under one Windows services account, account security measures can cause clients to be logged out. For more information, see Windows services account.

**Other potential pooling issues**

When trying to diagnose issues related to pooling, consider reviewing the following log files for a client on the Bridge client machine: *tabbridgeclijob_<process_id>*, *jprotocolserver_<process_id>*, *stdout_jprotocolserver_<process_id>*. For more information, see Change the Bridge Client Settings.

**Adding a new pool results in error, An internal system error occurred**

This error may occur if the total number of pools in your organization combined with the number of domains in the allowlist registry exceeds 100.

# Manage the Bridge Client Pool

There are a few ways you can manage your pooled Bridge clients.

## Monitor data freshness tasks

You can monitor client activity using a combination of the Jobs page and built-in admin views.

### Live queries

To monitor live query activity, you can use the Traffic to Bridge Connected Data Sources admin view.

### Refresh jobs

To monitor refresh jobs, you can use the following resources:

- **Jobs** page: The Jobs page can show you the completed, in progress, pending, canceled, and suspended Bridge refresh jobs that use Bridge refresh schedules. For more information, see About Bridge Refresh jobs.
- **Background Tasks for Non Extracts** admin view: After filtering on **Refresh Extracts Via Bridge**, this admin view shows Bridge refresh jobs that use refresh schedules. For more information, see Background Tasks for Non Extracts.
- **Bridge Extracts** admin view: This admin view shows Bridge refresh jobs that use both Bridge refresh schedules and Bridge legacy schedules. For more information about this view, see Bridge Extracts.
- **Create a data source or view using client logs:** Using JSON log files generated by a client, create your own data sources and views to monitor refresh jobs. For more information, see the Refresh jobs by client section below.

### Multiple connection scenarios

For Bridge extract refresh connections that contain embedded data sources, you can connect to more than one Bridge client, therefore allowing data from multiple sources to be combined and accessed as if it were a single source. This behavior differs from published data sources.

Multiple published data source connections must be assigned to one Bridge client. Pool mappings that have conflicting connections are not supported.

**Scenario 1**

Data source 1: Embedded data source for Snowflake that has direct connection to a data source through Tableau Cloud.

Data source 2: Published data source for Snowflake that has a connection to union on-premises databases.

**Pool mapping**

- For the embedded data sources, don't add the Snowflake to the **Private Network Allowlist**. Edit connection type from the **Connections** tab and set the network type as **Tableau Cloud**.

  > **Note**: You don't need to use Bridge if the data source can access Tableau Cloud directly.

- For the Snowflake published data sources that have union connections to on-premise databases, add the connection to the **Private Network Allowlist**, edit the connection type from the **Connections** tab, and set the network type as **Private Network**.

**Scenario 2: *Not Supported***

- Published data source with two connections: Connection one is assigned to *pool1* and connection two is assigned to *pool2*.

Refresh jobs by client

As an alternative to monitoring refresh jobs using the admin views listed above, consider creating your own data sources and views to monitor refreshes performed by a Bridge client. You can do this by using Tableau Desktop to connect to a client's JSON log files on the machine where the client is running.

**Note:** A client's JSON log files do not capture refreshes for virtual connections.

The JSON log files are comprised of objects, “k” and “v”. The “k” objects capture refresh jobs and “v” objects capture refresh details. The refreshes and their details include:

- Schedule type - Bridge refresh or Bridge legacy
- Data source type and name
- Refresh start and end time, duration, time to upload and publish
- Errors

Step 1: Before you begin

If you want to build a view from the data of one log file, you can skip to **Step 2**.

If the data for a client is in multiple log files, you’ll need to union the files. You can create a script to union the log files locally or use Tableau Desktop to perform the union as described in the procedure below.

**Notes:**

- The procedure described below assumes you are running Tableau Desktop on the same machine as the client.
- If you are working with multiple log files from different clients in a pool, in addition to unioning multiple logs files for a client, you can join the log files from multiple clients to monitor refreshes in a pool.
- Connecting to JSON files directly from Tableau Cloud web authoring is currently not supported. For more information, see Creators: Connect to data on the web.

Step 2: Connect to JSON logs

To build a data source and view, connect to a client’s log files using Tableau Desktop.

1. Start Tableau Desktop and under Connect, select **JSON file**. Do the following:
   a. In the Select Schema Levels dialog box, select the top level schema to include “k” object details and optionally, select the "v"-level schema to include "v" object details, and then click **OK**.
   b. Navigate to the log file you want to connect to (for example, C:\Users\jsmith\Documents\My Tableau Bridge Repository\Logs), select it, and then click **Open**.

2. (Optional) On the data source page, right-click the log files and click **Convert to Union** to set up a union. Do the following:
   a. Select **Wildcard (automatic)** tab.
   b. Next to **Search In**, verify the path shows the client's Log folder.
   c. Under Matching pattern, enter **ExtractRefreshMetrics_*** and click **OK**.
3. Select the sheet tab to start your analysis and build your view.
4. When finished, publish the data source and view to Tableau Cloud separately. To ensure that your data source is kept up to date, you can set up a Bridge (legacy) schedule for the data source after publishing.

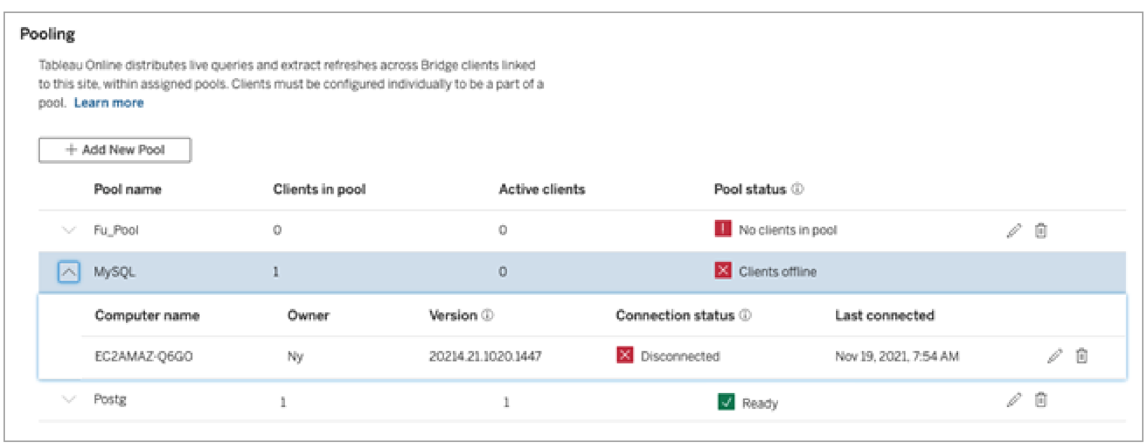
Be aware that the data sources and views you create can change without warning because new log files can be generated and old log files can be deleted after certain log-specific limits are met. For more information about these limits and how to adjust them, see Change the Bridge Client Settings.

## Manage pools and clients

Under the Pooling section, you can see up to five tables of pooling and client related information in your Bridge deployment.

### About pools

The first table consists of clients registered to the site organized by the pools they are assigned to.



The second table, **Unassigned Clients**, shows clients not assigned to a pool. In most cases, these clients need to be assigned to a pool before they can load balance live query and extract refresh jobs. In other cases, clients in this table might be dedicated to refreshing data sources using Bridge (legacy) schedules.

**Unassigned Clients**

| Computer name | Owner | Version | Connection status | Last connected | | |
|---|---|---|---|---|---|---|
| nde | Ny | 20214.21.1020.1447 | Disconnected | Nov 17, 2021, 11:22 AM | → Assign | Delete |
| WIN-KRHT80AQC | Faye | 20214.21.1020.1447 | Connected | Nov 24, 2021, 11:31 AM | → Assign | Delete |

The third table, **Default Pool**, shows clients in the default pool. Clients configured to use pooling prior to Bridge 2021.4 are included in this pool by default. Because the default pool's domain can't be configured to access a specific private network, we recommend you reduce its scope of access by creating new pools and mapping them to specific domains.

**Default Pool**

| Computer name | Owner | Version | Connection status | Last connected |
|---|---|---|---|---|
| EC2AMAZ-UVMDBO | Ny | 20202.20.0525.1210 | Disconnected | Feb 23, 2021, 5:41 PM |
| EC2AMAZ-AKUSQK | Faye | 20213.21.0722.1317 | Disconnected | Aug 11, 2021, 10:59 PM |
| WIN-KRHT80AQC5 | Faye | 20214.21.1010.1953 | Connected | Oct 11, 2021, 10:32 AM |

The clients you see in the first three tables can tell you the following information:

- Client name, also known as the computer name, is the name of the machine the client is installed on and running from.
- Owner name, which in most cases is a site admin. This is the user who is authenticated (signed in) to Tableau Cloud from the client.
- Pool status, applies to the first table only, can indicate 1) whether there are assigned clients in the pool, 2) clients are connected and available to handle data freshness tasks, or 3) pool is offline because all clients int he pool are disconnected.
- Client version:

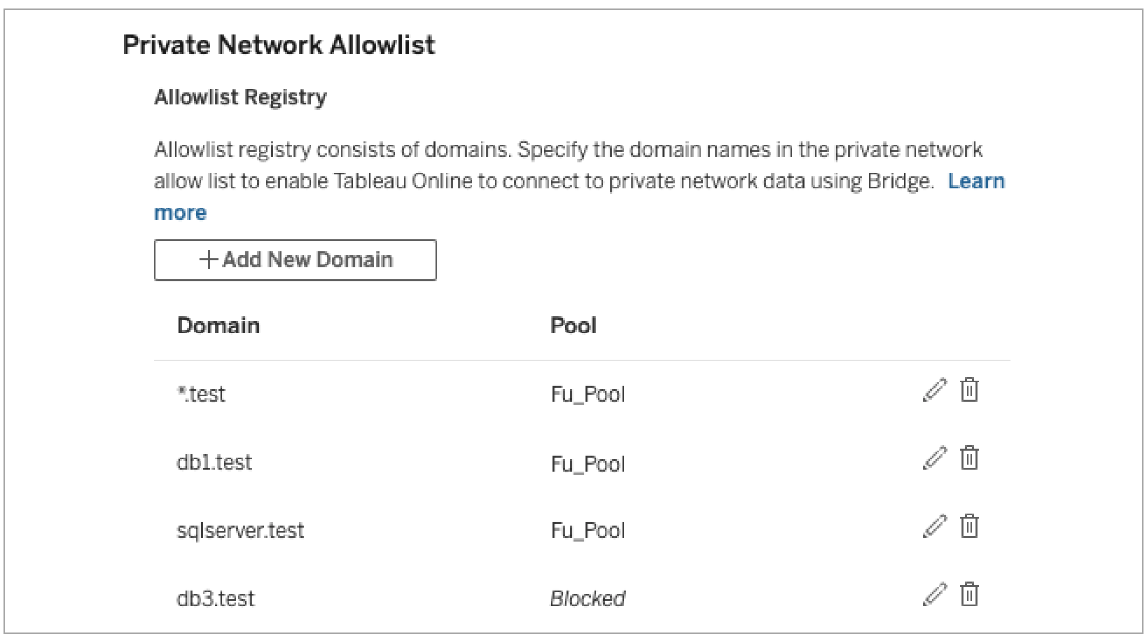
- A warning icon ( ) displays in this column when the client is not running the latest version of Bridge. Although not required, we strongly recommend upgrading to take advantage of the latest security and feature updates. To download the latest version of Bridge, go to the Downloads page on the Tableau website.

  **Note:** The warning icon shows only when there is a newer client available for download. The warning icon is not an indication that there are issues with the client or related Bridge data sources or virtual connections.

- Connection status—for more information see the Client connection status, below.
- Last connected—shows the day and time Tableau Cloud was last able to reach the client.

About Private Network Allowlist

The fourth table, **Allowlist Registry**, contains a list of domains that pools are scoped to.



The fifth table, **Allowlist Requests**, shows pending domains that users have requested to connect to when trying to create virtual connections. These domain requests should be addressed as soon as possible to unblock users from their virtual connection workflows.

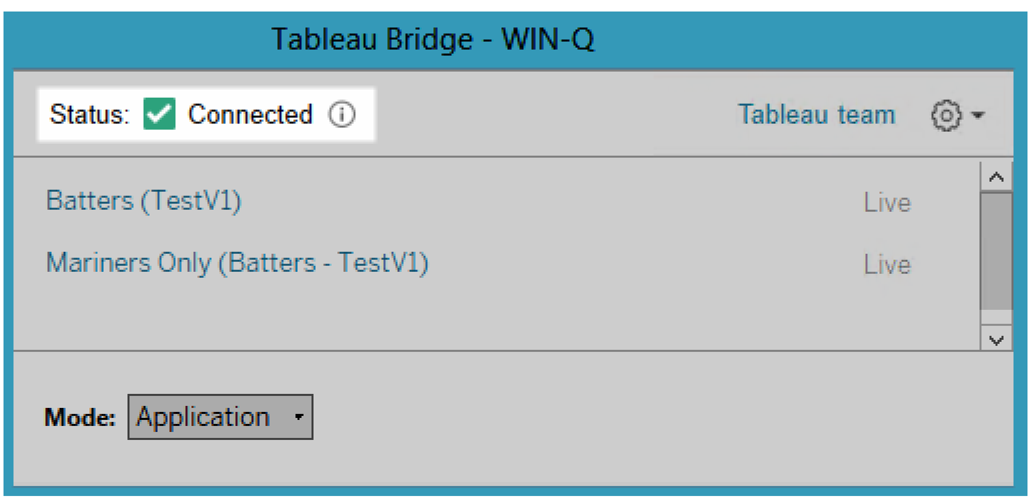
## Client connection status

Where clients are listed, the colored squares and status labels indicate the *availability* of the client to support data freshness tasks.

- Green or "Connected": A green or **Connected** state indicates that the client is connected and *available* to support live queries and extract refreshes.
- Red or "Disconnected": A red or **Disconnected** state can indicate one of a few conditions that have temporarily put the client in a disconnected state. The most common scenario is if the client is not running or was unable to establish communication with Tableau Cloud after being launched. You can hover over the status to see a tooltip that describes the condition.

  **Notes:** When the client is in a disconnected state, live queries might be disrupted. In cases like this, views that depend on data sources or virtual connections with live queries might not properly display until the issue is resolved.

The states described above reflect and correspond to the status you see in the client.



# About the Bridge Client

This topic describes the Bridge client and requirements for running and using it. In most cases, the site admin is responsible for installing and managing the client.

## Client overview for Linux and Windows

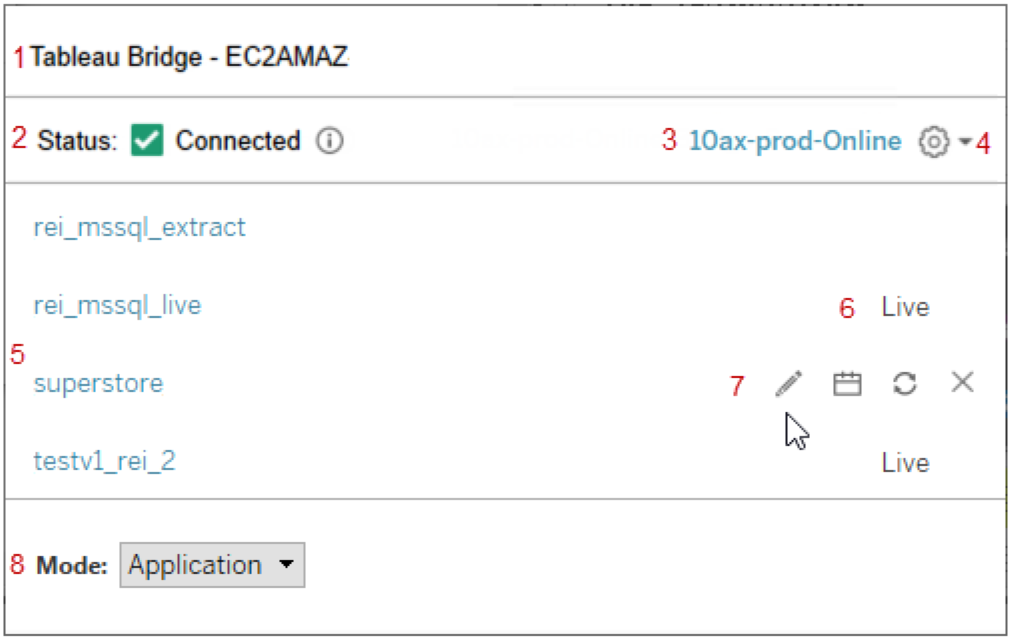
- The Bridge client is required to enable connectivity between Tableau Cloud and private network data.
- The connected client option must be enabled for the site to allow Tableau Bridge clients to run unattended and, if enabled, support multi-factor authentication with Tableau authentication.
- Client sessions are managed by refresh tokens which are generated after a successful sign-in to Tableau Cloud from the Bridge client. If the refresh token has not been used in 14 days, then it expires. After the refresh token has expired, a new sign-in to Tableau Cloud is required. If a refresh token is being used regularly, their expiration period depends on when a site was activated. Refresh tokens generated on sites activated in June 2023 (Tableau 2023.2) or later expire after 180 days. Refresh tokens generated on all other sites expire after one year.
- Only one client can be installed on a machine.
- The appropriate database drivers must be installed on the machine where the client is running.
- For extract connections, the user signed in to Tableau Cloud from the client must have a **Creator**, **Explorer (Can Publish)**, or one of the two types of site admin role: **Site Administrator Creator** or **Site Administrator Explorer**. If the user is not a site admin, he or she must be the content owner.
- For live connections, the user signed in to Tableau Cloud from the client must have one of the two types of site admin roles: **Site Administrator Creator** or **Site Administrator Explorer**.
- To maintain live connections, the databases that the Tableau content connect to *can't* be accessible from the public internet.

### About the Linux Bridge Client

You can deploy the Tableau Bridge client within a container on Linux. To use Bridge on Linux you must create a customized Docker image, install the RPM package, and then run Bridge from inside the container image. See Install Bridge for Linux for Containers.

About the Windows Bridge Client

When the client is running, it's accessible from the Windows system tray on the machine where it is installed.




The client is comprised of the following parts:

1. **Client name**, which is also the name of the machine where the client is installed.

2. **Connection status** indicates whether the client is connected to Tableau Cloud.

3. **Site**: The Tableau Cloud site that the client is registered to.

4. **Settings menu**, which contains options to disable error reports and unlink the client from a site.

5. **Data sources**: By default, this area displays a list of live queries that are being load balanced (or pooled) by clients across the site. This list can also contain data sources that have been assigned to this specific client using Bridge (legacy) schedules.

**Note:** This list does not show data sources or virtual connections that are refreshed with the Bridge refresh schedules. To see data sources or virtual connections refreshed with Bridge refresh schedules, go to the Jobs page and filter on **Bridge Refreshes**.

6. **Pooling status**: This shows whether the data source is part of the client pool.
   - Live: A Live status indicates the data source has a live connection and is part of the pool of clients. **Note:** Virtual connections with live connections do not show in this list.
   - Blank: A blank status indicates the client is not part of the pool. This is because the data source is using Bridge (legacy) schedules.
7. **Legacy options**: These options display on hover to edit or view connection information, go to the schedule, and run a manual refresh on hover for data sources that use Bridge (legacy) schedules.
8. **Client mode** indicates if the client is running as a Windows application or service. For more information, see the section below.

Windows Requirements for extract connections

- To refresh extracts, the client can run as a Windows service or as an application.
- If the client is set to run as an application, it completes refreshes only when the machine is powered on, and the Windows user is logged on and running Bridge.

  If the machine is turned off, if the user logs off of Windows, or if the user exits the client, updates for the data sources or virtual connections running on that client (either through the pool or manually) will not be able to reach Tableau Cloud, and the data sources or virtual connections won't get refreshed until the user signs in again. During this time, the content owner will receive refresh failure notification emails from Tableau Cloud. For more information, see Stop Keeping Data Fresh Through Bridge.
- To ensure refreshes of file-based data sources complete without any issues, a client that has been set up to run as a service must reference the full UNC path of the source file and not the mapped drive path. For example, use "\\filesrv\Data\file.csv" instead of

"C:\Data\file.csv".

For a client that has been set up to run as an application, we strongly recommend that the client also references the full UNC path. For more information, see Change the file path for a data source.

Windows Requirements for live connections

- To run live queries, the client can run as a Windows service or as a Windows application.
- Each Tableau Cloud site can have multiple clients that maintain live connections. Those clients can also be used to refresh extracts.
- If the client is set up to run as an application, live queries can only occur when the computer is on and the Windows user is logged on and running Bridge.

  If the computer is turned off, if the user logs off of Windows, or if the user exits the client, updates to the data sources or virtual connections will not be able to reach Tableau Cloud, and the content can't be kept up to date.

Application versus Service mode

A client can operate in one of two modes: Application or Service.

The mode the client can run depends on the Windows user account it's running under, the Tableau Cloud site settings that the client is registered to, and general data freshness needs.

- **Application:** When the client is set to run in Application mode, it runs as a Windows *application*.

  In this mode, the client can facilitate live queries and scheduled refreshes for content that connects to private network data while the dedicated user is logged on to Windows. If the dedicated user logs off Windows, the client cannot maintain live queries and refresh extracts on a schedule.
- **Service:** When the client is set to run in Service mode, it runs as a Windows *service*.

In this mode, the client runs continuously even if the user is logged out of Windows. The Windows user account must be a member of the local Administrators group to run the client in service mode. This mode is recommended for pooled clients that load balance live queries and scheduled refreshes. Service mode is the default mode.

**Mode guidelines**

<table>
<tr><th></th><th>Extract connection with scheduled refresh</th><th>Live connection</th></tr>
<tr><td>Application mode</td><td colspan="2">• Quickly set up and validate that the client is keeping content up to date.<br>• Have more control over when the client is performing data freshness tasks.<br>• Doesn't require the user to be a local admin on the machine.<br>• Requires the user to be logged on to Windows.</td></tr>
<tr><td rowspan="2">Service mode</td><td colspan="2">• Set up the client once — if the machine has to restart, the client reconnects to Tableau Cloud automatically.<br>• Requires the Windows user account to be a member of the local Administrators group on the machine. In addition, to refresh file-based data sources, the account must have domain access to the network shared drive where the file data is hosted.<br>• Doesn't require the user to be logged on to Windows.</td></tr>
<tr><td>Recommended for load balancing refreshes. For more information, see Configure the Bridge Client Pool.</td><td>Recommended for load balancing live queries. For more information, see Configure the Bridge Client Pool.</td></tr>
</table>

Windows Client requirements

In order to run and use the client, a certain set of requirements must be met as well as some additional requirements that are unique to the data freshness task.

Core requirements

- Microsoft Windows 10 or later, 64-bit
- Windows Server 2016 or later
- Tableau recommends installing the Bridge client on a dedicated computer behind your firewall.
- The computer on which the client is running must be on the same Windows domain and have access to the underlying database specified in the data source or virtual connection.
- Both the computer and the Windows user account must have access to the underlying data specified in the data source or virtual connection.
- Tableau Cloud's *connected clients* option must remain enabled to allow the client to run unattended and, if enabled, support multi-factor authentication with Tableau authentication. For more information about the connected clients option, see Connected client requirement for Tableau Bridge.

For more information, see Bridge is designed to scale up and scale out. When configuring your Bridge deployment, consider the following:.

Additional requirements for Service mode

- To run the client in **Service** mode, the Windows user account running Bridge must be a member of the local Administrators group on the machine. The user doesn't need to be logged on to Windows, but the machine must be powered on with Windows running.
- When using the client in **Service** mode and connecting to file data hosted on a network

shared drive, it's required that the account have domain access to the network shared drive.

### Repair a client running in Service mode

Occasionally something causes content connections to stop functioning normally. When this happens, an alert appears, and it usually provides information that direct you toward the cause of the problem. However, if Tableau Cloud cannot provide troubleshooting information in the alert, and if you run Tableau Bridge as a service, you can use the **Repair** command to try to reset connections.

To help repair a client in Service mode, in the Windows system tray, right-click the Bridge icon and select **Repair**. This stops and restarts the service, which can be enough to resolve the issue.

### Temporary files

The Bridge temporary files are located in the `C:\Users\<username>\AppData\Local\Temp` folder.

Temporary files are periodically removed when connected to Tableau Cloud or after you close the client.

- After a refresh, the `TEMP_*` files are removed.
- The `hyper_` files are deleted after the Bridge client is closed.
- The TableauTemp folder isn’t removed due to system requirements.

The `cleanUpTempDirOnStartUp` client setting determines whether to remove the temp files when the Bridge client starts. When set to false, the temp files are not removed.

## Change the Bridge Client Settings

There are several Bridge client settings that the site admin can configure to change how a client runs.

### Windows Client

For Windows clients, the default location of the Configuration file is `C:\Users\jsmith\Documents\My Tableau Bridge Repository\Configuration\TabBridgeClientConfiguration.txt`. The client must be restarted for any changes made to the configuration file to take effect.

### Bridge for Linux for Containers

The `TabBridgeClientConfiguration.txt` file is generated with default configurations the first time you run the Bridge client.

To make changes to the configuration settings, edit the `TabBridgeClientConfiguration.txt` file, and create a new Docker container with the updated file. For more information about how to create and update a container, see Containerize an application.

### Bridge legacy schedules

In some cases, a data source owner might be responsible for some of the tasks described in this topic if they maintain their own client to run Bridge legacy schedules.

### Bridge client settings

serviceConnectionSettings

Configuration: `serviceConnectionSettings`

Options:

| | |
|---|---|
| `serviceUrl` | Tableau site URL.<br><br>*Not configurable*. |
| `proxyServer` | Proxy Server and port.<br><br>*Configurable* |

Example

The client must be restarted for any changes made to the configuration file to take effect.

```
"serviceConnectionSettings" : {
       "serviceUrl" : "https://online.tableau.com",
       "proxyServer" : {
       "serverName" : "http://localhost",
       "serverPort" : 8888
       }
```

connection

Configuration: `connection`

Options:

| | |
|---|---|
| `connectTimeout` | The Bridge client wait time when trying to connect to Tableau Cloud.<br><br>Default value: 1 minute<br><br>*Configurable.* |
| `operationTimeout` | The Bridge client wait time for each server (such as VizPortal) API call after successfully connecting to Tableau Cloud.<br><br>Default value: 15 minutes<br><br>*Configurable*. |
| `maxAttemptsToRedirectHttpRequests` | An API call to a server can be redirected from POD to POD. This number specifies the maximum number of redirects per server API call. Default value: 20<br><br>*Configurable*. |

Example

```
"connection" : {
       "connectTimeout" : "00:01:00",
       "operationTimeout" : "00:15:00",
       "maxAttemptsToRedirectHttpRequests" : 20
       }
```

connectionPool

Configuration: `connectionPool`

Options:

| | |
|---|---|
| `size` | Applies to Bridge refresh schedules.<br><br>The number of refresh tokens generated at the time of login. The Bridge client uses refresh tokens when a connection to Tableau Cloud is needed. Refresh jobs are processed simultaneously and each job needs a token.<br><br>Default value: 10<br><br>Minimum value: 1<br><br>Maximum value: 100.<br><br>*Configurable*. |

Example

By default, each client in a pool can load balance up to 10 refresh jobs at one time. If the number of refresh jobs running at a given time exceeds the capacity of your client pool or you have the hardware resources to support it, consider increasing each client's capacity.

On windows, changing the `size` value requires unlinking the client. Unlinking removes the association between the site and the client. This means for data sources that are refreshed using Bridge legacy schedules, unlinking the client removes associations to those data sources, its schedules, and any connection information from the client. As part of modifying the size of the Bridge pool, we recommend you click the Bridge icon in the Windows System tray and note the data sources listed to aid the rescheduling process.

```
"connection" : {
       "connectTimeout" : "00:01:00",
       "operationTimeout" : "00:15:00",
       "maxAttemptsToRedirectHttpRequests" : 20
       },
"connectionPool" : {
       "size" : 10
}
```

dataSourceRefreshSettings

Configuration: `dataSourceRefreshSettings`

Options:

| | |
|---|---|
| `shutdownTimeoutInSeconds` | *Not configurable*. |
| `downloadDataSourcesInterval` | The time interval for the temporary downloading the names of live data sources and extract data sources that are assigned to the client for Bridge legacy schedules.<br><br>Default value: 30 minutes.<br><br>*Configurable*. |
| `checkRefreshDataSourcesInterval` | The time interval for the Bridge client to check data sources assigned to the client to establish if a refresh is needed for Bridge legacy schedules.<br><br>Default value: 5 seconds<br><br>*Configurable*. |

| | |
|---|---|
| `extractRefreshTimeout` | Enforces a time limit for refreshes performed by the client. The timeout limit is the longest allowable time for a single extract to complete a refresh before it's canceled by the client. If an extract refresh is canceled as a result of reaching the timeout limit, you will see a message in the client and an email alert will be sent to the data source owner.<br><br>Default value: 24 hours.<br><br>For virtual connections, the default extract refresh timeout limit is 2 hours and is controlled on by Tableau Cloud The time limit can't be controlled by the Bridge client.<br><br>*Configurable*. |
| `maxRemoteJobConcurrency` | Applies to Bridge refresh schedules. Maximum number of remote refresh jobs allowed by the client. The value for this configuration must be the same or less than connectionPool. Adjust the maximum value to your machine's capabilities such as CPU and RAM. Requires a restart of the client.<br><br>Default value: 10<br><br>Minimum: 1<br><br>Maximum: The value for `connectionPool`<br><br>*Configurable*. |

| | |
|---|---|
| `JSONLogForExtractRefresh` | When set to true, the client generates an additional log file in JSON format. The log captures the metrics of extract refreshes, for both Bridge legacy and Remote refreshes, with one line per extract.<br><br>The format of the JSON log file is readable by Tableau Desktop and can be used as a data source to create live vizzes. For more information, see JSON File.<br><br>An example of the log file is: `ExtractRefreshMetrics_<timestamp>.json`<br>Changing the value of this configuration option requires a restart of the Bridge client.<br><br>The `loggerSettings` configuration options apply to the JSON log file.<br><br>Default value: false<br><br>*Configurable*. |
| `dataSources` | Applies to Bridge legacy schedule refresh jobs. Not user editable.<br>Provides a list of mapped local file locations for file-based data sources.<br><br>*Not configurable* |

Example

To govern the misuse of extracts or refreshes, you can enforce a time limit using `extractRefreshTimeout`, also known as a timeout limit, for refreshes performed by a client. The timeout limit is the longest allowable time for a single extract to complete a refresh before it's canceled by the client.

> **Note**: For extracts of virtual connections, the default for `extractRefreshTimeout` is 2 hours and can’t be controlled by the Bridge client. As an alternative, you can modify the virtual connection to refresh within the default 2 hour window or switch to a published data source.

By default, the timeout limit for a client is set to 24 hours. You can change the timeout limit for a client through the Bridge configuration file. If an extract refresh is canceled as a result of reaching the timeout limit, you will see a message in the client and an email alert will be sent to the data source owner.

The client must be restarted for any changes made to the configuration file to take effect.

```
"dataSourceRefreshSettings" : {
        "shutdownTimeoutInSeconds" : "00:00:30",
        "downloadDataSourcesInterval" : "00:30:00",
        "checkRefreshDataSourcesInterval" : "00:00:05",
        "extractRefreshTimeout" : "24:00:00",
        "maxRemoteJobConcurrency" : 10,
        "JSONLogForExtractRefresh" : false,
        "dataSources" : [
        ]
}
```

loggerSettings

Configuration: `loggerSettings`

Options:

| | |
|---|---|
| `maxLogFileSizeInMB` | Maximum size of the log files in MB. When a log file exceeds the size limit, a new log file is created. |

| | |
|---|---|
| | Default value: 25 MB.<br><br>*Configurable*. |
| maxBackupLogFileCount | Maximum number of allowed Bridge log files. When the number of log files exceed the limit, the oldest log file is deleted.<br><br>Default is 40.<br><br>*Configurable*. |
| remoteRequestLogFileLifeSpan | For each Bridge Refresh job that is sent to the client, a new set of log files is created:<br><br>tabbridgeclijob_<process_id, and if the data source is JDBC-based: fjprotocolserver_<process_id>, and stdout_jprotocolserver_<process_id>.<br><br>By default, the maximum amount of time the log files remain in the Logs folder before being deleted is 8 hours if the number of log files exceeds maxBackupLogFileCount. Otherwise, these log files remain indefinitely while the number of log files is less than or equal to maxBackupLogFileCount.<br><br><process_id> represents the Windows process ID.<br><br>Default value: 8 hours<br><br>*Configurable*. |

Example

The client creates logs of activities as part of its normal operation. You can use these logs to monitor refreshes, troubleshoot issues with Bridge, or if Tableau Support requests logs from you to help resolve an issue.

You can manage the size of Bridge log files or increase the time log files remain before being deleted in the TabBridgeClientConfiguration.txt file.

Note: Log files named tabprotosrv* vary from other Bridge log files. The maximum size is 1 MB and the maximum number of allowed log files is 8,192. These values are also not configurable.

```
"loggerSettings" : {
        "maxLogFileSizeInMB" : 25,
        "maxBackupLogFileCount" : 40,
        "remoteRequestLogFileLifeSpan" : "00:00:00"
}
```

dataSyncRestartInterval

Configuration: `dataSyncRestartInterval`

Sets the restart interval of the Data Sync.

*Configurable*.

internetConnectionMonitorInterval

Configuration: `internetConnectionMonitorInterval`

Interval for Bridge to ping the internet to determine if there is a valid connection.

Default value: 30 seconds

*Configurable*.

secureStorageMonitorInterval

Configuration: `secureStorageMonitorInterval`

Interval for Bridge to determine secure storage.

*Not Configurable*.

cleanUpTempDirOnStartUp

Configuration: `cleanUpTempDirOnStartUp`

Determines whether to remove the temp files when the Bridge client starts.

Default value: true

*Configurable*.

JSONLogForLiveQuery

Configuration: `JSONLogForLiveQuery`

When set to true, the client generates an additional log file in JSON format. The log captures the metrics of live query request, with one line per extract

The format of the JSON log file is readable by Tableau Desktop and can be used as a data source to create live vizzes. For more information, see JSON File.

Changing the value of this configuration option requires a restart of the Bridge client.

Default value: true

*Configurable*.

Example

```
"dataSyncRestartInterval" : "24:00:00",
"internetConnectionMonitorInterval" : "00:00:30",
"secureStorageMonitorInterval" : "00:00:30",
"cleanUpTempDirOnStartUp" : true,,
"JSONLogForLiveQuery" : true
}
```

## Default configuration file

To copy the default configuration file, click the **Copy to clipboard** icon in the upper right corner.

```
{
        "serviceConnectionSettings" : {
                "serviceUrl" : "https://online.tableau.com/",
                "connection" : {
                        "connectTimeout" : "00:01:00",
                        "operationTimeout" : "00:15:00",
                        "maxAttemptsToRedirectHttpRequests" : 20
                },
                "connectionPool" : {
                        "size" : 10
                }
        },
        "dataSourceRefreshSettings" : {
                "shutdownTimeoutInSeconds" : "00:00:30",
                "downloadDataSourcesInterval" : "00:30:00",
                "checkRefreshDataSourcesInterval" : "00:00:05",
                "extractRefreshTimeout" : "24:00:00",
                "maxRemoteJobConcurrency" : 10,
                "JSONLogForExtractRefresh" : false,
                "dataSources" : [
                ]
        },
        "loggerSettings" : {
        "maxLogFileSizeInMB" : 25,
                "maxBackupLogFileCount" : 40,
                "remoteRequestLogFileLifeSpan" : "08:00:00"
        },
        "dataSyncRestartInterval" : "24:00:00",
        "internetConnectionMonitorInterval" : "00:00:30",
        "secureStorageMonitorInterval" : "00:00:30",
        "cleanUpTempDirOnStartUp" : true,
```

```
        "JSONLogForLiveQuery" : true
}
```

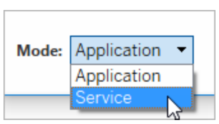
## Change the Windows Client Service

In order for a client to be included in a pool, the client should run as a Windows service (**Service** mode). By default, a client is set to run as a Windows service so that it can load balance live queries and refreshes in the background without requiring a dedicated user to be logged in to the machine. For a client to run as a Windows service, the Windows user account that runs the client must be a member of the local Administrator group on the machine.

**Note:** If you're a data source owner and managing the client yourself, your client will not be included in the pool. However, if you want the Bridge (legacy) schedule to run in the background even when you're not logged on to your machine, your client must be running as a Windows service (**Service** mode).

1. Open the Windows system tray and click the Bridge icon to open the client.

2. From the Mode drop-down menu, select **Service**. A sign-in windows displays.

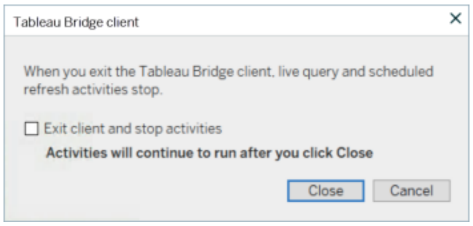
   
   

1. Enter your local admin credentials.

   In your list of Windows services, Bridge appears as **Tableau Bridge service**. You can see this in the Windows Services console or on the **Services** tab in the Task Manager.

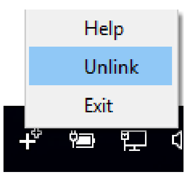
Restarting the Windows Client

The way you restart the client depends on whether the client is running in Application or Service mode.

- For Application mode: from the client menu, select **Exit**.
- For Service mode: from the Mode drop-down menu, select Application; from the client menu, select **Exit**. In the dialog box, select the **Exit client and stop activities** check box and click **Close**.
- 


Unlinking the Windows Client

Right-click the Bridge icon in the Windows System tray and select **Unlink**.

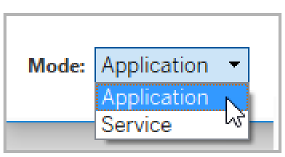



For more information about the Unlink option, see Stop Keeping Data Fresh Through Bridge.

Stop running Bridge as a Windows service

To stop the client from running as a service, change its mode.

1. Open the Windows system tray and click the Bridge icon to open the client.
2. From the Mode drop-down menu, select **Application**.



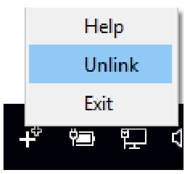
When the client is running in Application mode, live queries and scheduled refreshes can only run when the user is logged in to the Windows user account on the machine where the client is running from.

Switch the site a Client is associated with

When you want to use a client to keep content published to a different Tableau Cloud site fresh, you can unlink the existing client and authenticate to the new site from the client.

1. Open the Windows system tray and click the Bridge icon to open the client.

2. From the drop-down menu, select **Unlink**.

   Unlink removes the list of data sources that use Bridge (legacy) schedules, schedules, and connection information from the client.

3. Open the Windows system tray and click the Bridge icon to open the client.

4. When prompted, sign in to the new site with your site admin credentials.

5. Do one or both of the following to configure the client:

   - If this client refreshes data sources associated with a specific client, ask data source owners to reconfigure their data sources and refresh schedules.

   - If you want this client to facilitate live connections or extract connections that use Online schedules, ensure that the new client is part of the pool. For more information, see Configure the Bridge Client Pool

When you unlink a client, you might also need to remove the Bridge (legacy) schedules for the data sources that the client was refreshing. The other data sources continue to have data freshness tasks performed by other registered clients in the pool.

For more information, see Stop Keeping Data Fresh Through Bridge.

## Stop Keeping Data Fresh Through Bridge

You can stop refreshing data through Tableau Bridge when running Bridge schedules.

If you stop using Bridge, views that depend on data sources that rely on Bridge will no longer display data and produce blank pages instead.

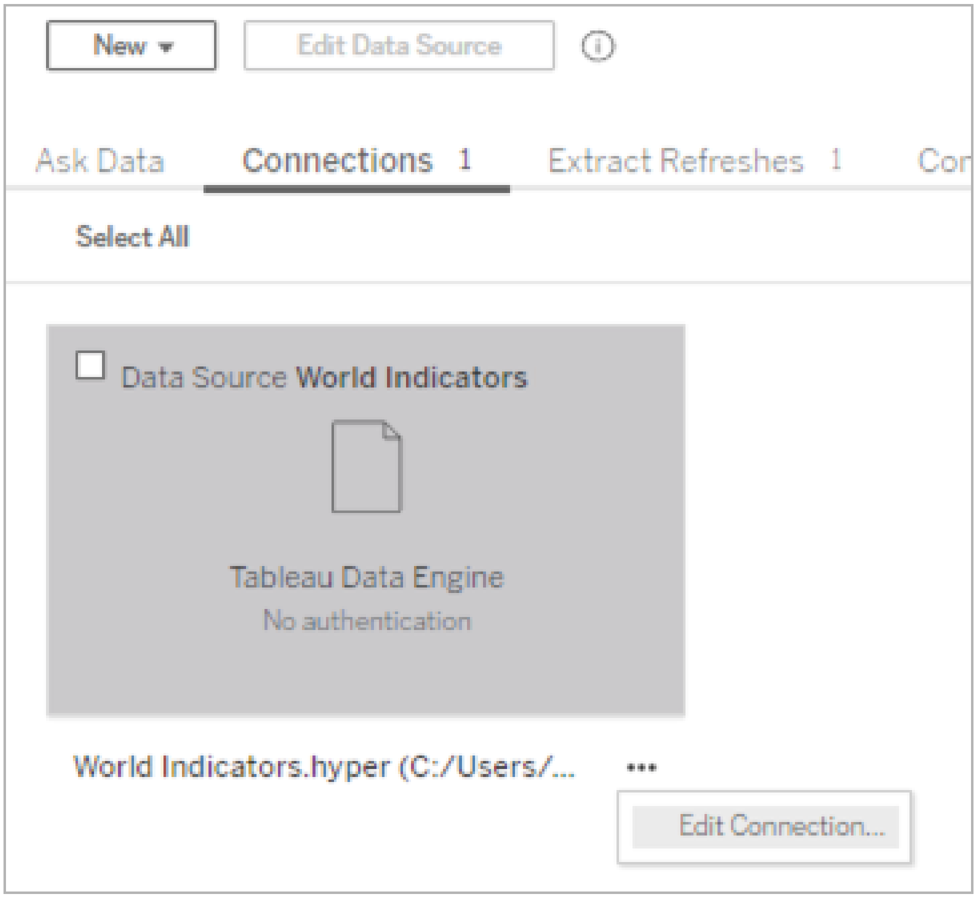
Bridge legacy schedules do not support refreshes for virtual connections.

### Change the connection type of a refresh to use Tableau Cloud

By default, Tableau Cloud uses Bridge when a published data source has multiple data connections. Multiple data connection types are data sources that have at least one public cloud connection and one on-premise connection. You can edit the connection type of extract refreshes for Bridge refresh schedules to use Tableau Cloud instead of Bridge.

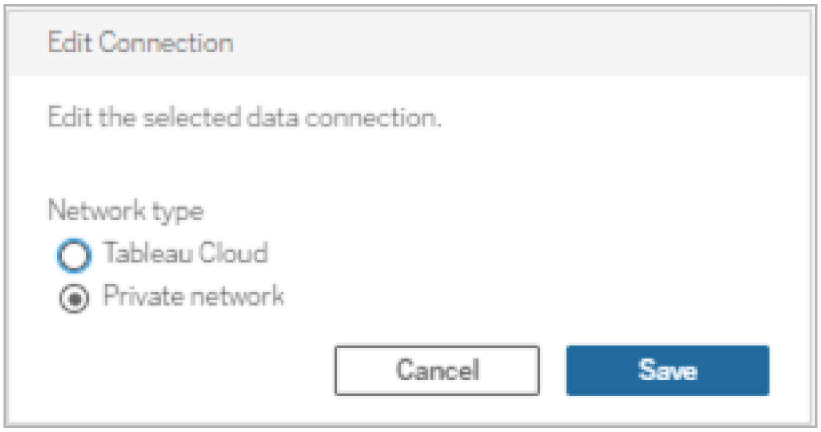
To change the connection type:

1. From the Connections tab of the data source, click **Edit Connection**.




2. To stop using Bridge for the network connection type, choose **Tableau Cloud**. To use Bridge for the connection type, choose **Private Network**.

> **Note**: You must change all data connections related to the data source to the same connection type.




## Stop Refreshing Data Through the Windows Client

This topic describes the ways a data source owner can stop refreshing data through Tableau Bridge Windows client when running Bridge schedules.

Remove a data source

One way you can stop a client from refreshing a data source that uses the Bridge (Legacy) schedule by removing the data source from the client.

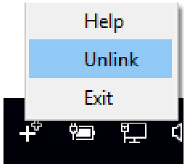
1. Open the Windows system tray and click the Bridge icon to open the client.
2. Hover over the data source name and click the Remove icon next to the data source name.

Stop using Bridge temporarily or permanently

- To stop using a client and temporarily suspend updates to data sources performed by the client, open the client from the system tray, and on the settings menu in the upper-right, select **Exit**.

  When you exit, the data sources and connection settings remain intact.

- To stop a client and permanently remove the data sources the client links to Tableau Cloud, right-click the Bridge icon in the system tray, and select **Unlink**.




Unlinking a client also removes all connection information from the client, including stored database credentials and Tableau Cloud account credentials.

Effects of exit and unlink

If you exit the client and the next refresh occurs while the client is temporarily stopped, the data source owner will see an alert in Tableau Cloud and be sent an email notification.

If you unlink a client, we recommend you delete the Bridge (legacy) schedules the client runs. For more information, see Delete the Bridge (legacy) schedule after unlinking a client, below.

Delete the Bridge (legacy) schedule after unlinking a client

When you unlink the client, you should also delete the Bridge (legacy) refresh schedules that the client runs. If a schedule is not deleted, the refresh will attempt to run as scheduled. In cases like this, you might receive refresh failure notifications.

1. Sign in to Tableau Cloud and navigate to the data source.
2. On the data source page, click the **Extract Refreshes** tab.
3. Select the check box next to the schedule and select **Actions** > **Delete**.

Permanently remove a client from a site

You can permanently remove a client from a site, which will make the client no longer visible when setting up a Bridge (legacy) schedule.

1. Sign in to Tableau Cloud and navigate to your Account Settings page.
2. Under Connected Clients, click **Delete** next to the client you want to permanently remove from the site.

# Manage Email Alerts for Bridge

A scheduled refresh can fail for a variety of reasons. As a data source owner, it's important to be aware of these refresh failures so that you can troubleshoot any issues and minimize gaps in data freshness.

If enabled by your site admin, you will receive email alerts about refresh failures for all of the data sources that you own. When refreshes for your data sources are facilitated by Bridge refresh or Bridge legacy schedules, the type of alerts you receive, when you receive the alerts, and the alerts that you can configure will differ from Tableau Cloud alerts.

**Note:** This topic applies to Bridge data sources only. Email alerts about virtual connections from Bridge are not currently supported.

**Differences with Bridge email alerts**

- Timeout refresh failure emails are sent when the timeout limit is exceeded. Unlike refreshes that run directly on Tableau Cloud, Bridge refreshes timeout after 24 hours (default). However, a timeout limit for refreshes can be increased (or decreased) through each Bridge client by a site admin. For more information, see Change the Bridge Client Settings.

- In addition to refresh failure emails, data source owners will receive email warnings for the following two scenarios:

  - **Bridge client is not running:** When an upcoming scheduled refresh can't start because the client linked to the data source is not running.

  - **Incomplete refresh:** When a scheduled refresh hasn't completed after a specified amount of time.

- Data source owners and site admins will receive email failure alerts for the following Backgrounder process runs:

- **Bridge pool at capacity:** When extract refreshes can’t run because the pool is at capacity.

- **No clients in Bridge pool:** When extract refreshes can’t run because there are no clients in the pool.

- **Refresh job failure:** When a refresh job fails for reasons other than no clients in the named pool or when the pool is at capacity. This is a catch all for Backgrounder refresh jobs that fail to be sent to the Bridge client.

  > **Note**: There isn’t a daily limit to the number of failure emails you can receive for Backgrounder failure alerts.

- For a particular data source, Tableau Cloud sends email about the first five consecutive refresh-related failures (i.e., refresh failures, alerts because the client is not running, or alerts because the refresh hasn't completed yet) on the first day. If the data source continues to have refresh issues after the first day, Tableau Cloud sends one email per day.

- A data source owner can receive up to 10 emails, one email per data source with active and consecutive refresh issues, in one day. The time period of *one day* is 24 hours starting at the time of the first refresh issue.

- Data refresh-initiated Subscription emails are not supported for views or workbooks that rely on Bridge extract data sources to keep data fresh. For more information, see Missing subscription emails.

## Configure pooling

Extract refreshes can fail because of issues with the Bridge pool and load balancing. Site admins can configure and manage pooling for Bridge clients by adding a new pool or modifying the pooling capacity. For more information, see Configure the Bridge Client Pool and Manage the size of the Bridge pool.

## Configure incomplete refresh email alerts for legacy schedules

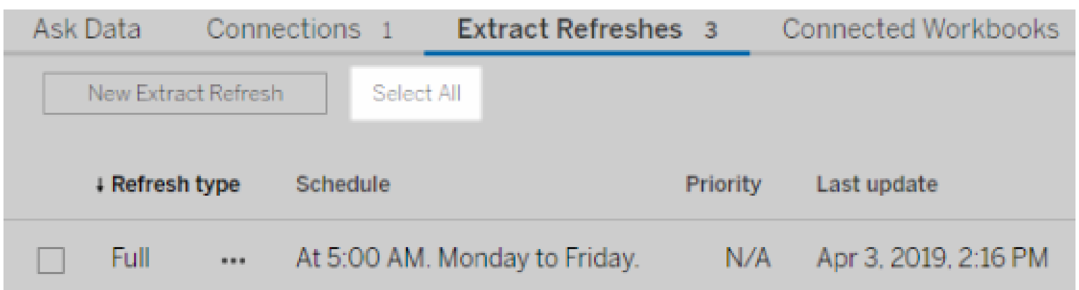
For data sources that use Bridge (legacy) schedules, by default, a refresh email alert is sent 24 hours after the scheduled start time for a data source with an incomplete refresh. If a scheduled refresh completes within 24 hours of its scheduled start time, you will not see an email alert.

In some cases, you might want to be notified sooner than 24 hours. If a refresh is configured to use Bridge (legacy) schedule, you can configure the email alert to send after an amount of time that better aligns with the duration of a particular refresh.

1. Sign in to Tableau Cloud and navigate to your data source.

2. From the data source page, click the **Extract Refreshes** tab, and then click the **Select All** button.

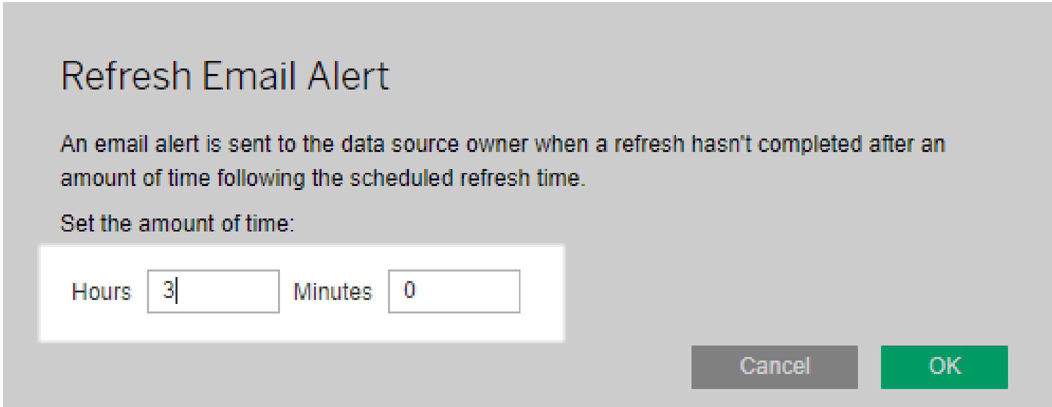
   The email alert factors all the schedules for a data source when determining when to send the email alert even if you select only one schedule.

3. From the Actions menu, select **Edit Refresh Email Alert**.

4. In the Refresh Email Alert dialog box, specify the hours and minutes following a sched-

uled refresh time that the alert should be sent, and click **OK**.




Considerations when managing alerts

- **Bridge (legacy) schedules only:** You can configure email alerts only for refreshes that are configured for Bridge (legacy) schedules.

- **One email alert per data source:** You can configure one refresh email alert for a data source. If a data source has multiple refresh schedules, the email alert is sent based on the next scheduled time across all schedules. Review the following two scenarios that demonstrate how the email alert timing works.

  **Scenario 1**

  Suppose you have an extract data source with one scheduled refresh set to run daily at 5 AM. For the purposes of this example, the refresh usually takes 30 minutes for Bridge to complete at that time of day.

  If you specify 3 hours for the email alert, you will be sent an email at around 8 AM if the refresh hasn't completed by that time.

  **Scenario 2:**

  Suppose you have the same data source from Scenario 1, with same time specified for the email alert against the following three schedules:

- Schedule 1 - runs daily at 5 AM
- Schedule 2 - runs twice a week, Tuesday and Thursday, at 1 PM
- Schedule 3 - runs once a week, on Saturday, at 12 AM

For the purposes of this example, though it can take as few as 30 minutes for Bridge to complete the refresh at 5 AM, during business hours, the refresh can take up to 3 hours to complete.

Like the first scenario, if the refresh for schedule 1 hasn't completed by 8 AM, you will be sent an email. Regardless of the refresh for "schedule 1" being completed or not, you will be sent an email at around 4 PM on Tuesday if the refresh for "schedule 2" hasn't completed. Similarly, regardless of what happened on Tuesday, if the refresh for "schedule 2" hasn't completed by 4 PM on Thursday, you will be sent an email. Finally, if the refresh for "schedule 3" hasn't completed by 3 AM, you will be sent an email.

- **Email alert time is based on the expected start time of the scheduled refresh:** The time you specify for the refresh email alert is the amount of time *after* the scheduled start time of the refresh. If you see email alerts too frequently or never at all, consider increasing the time to decrease email alert frequency or decrease the time to increase email alert frequency.

  The default is 24 hours.

- **Legacy schedule email alert can't be turned off:** Though email alerts can't be turned off, you can increase the time for an email alert so that the scheduled refresh completes before the email alert can be sent.

- **Refresh failure emails must be enabled:** In addition to refresh failure emails being enabled for the site (by the site admin), as the data source owner, you must also have refresh failure emails enabled for your account.

## Stop receiving email alerts when a client is not running

By default, Tableau Cloud is configured to notify data source owners when scheduled refreshes can't start because the Bridge client linked to the data source is not running.

There are two primary reasons why you might be receiving this email:

- The computer where the client is running from is not on.
- An extract data source continues to be associated with a client that is no longer in use.

If any of these reasons apply to your situation, consider taking a few moments to: 1) make sure the machine where the client is installed on is on and the client itself is running and 2) if you're a site admin, delete unused clients from the site. If you're not a site admin, you can delete the data source from the client. For more information, see Scheduled refreshes appear to be running outside of schedule:.

# Bridge Windows Security

Tableau Bridge applies the following security designs:

- All communication is initiated from behind the private network firewall and therefore does not require you to manage additional exceptions.
- Data in transit, between Tableau Bridge and Tableau Cloud, is encrypted.
- Database credentials are stored on the computer using Windows credentials manager if the data source or virtual connection is set up to use Bridge legacy schedules. For refresh schedules, the credentials are passed on to the client that is selected to perform the refresh.

You can find more details about Bridge security in the sections below.

## Transmission security

**Note**: Tableau Bridge uses port 443 to make outbound internet requests to Tableau Cloud and port 80 for certificate validation.

Tableau Bridge initiates a secure, bidirectional communication to your Tableau Cloud environment using a WebSocket (wss://) connection. The WebSocket connection is persistent and coordinates the data upload between Bridge and Tableau Cloud. All users are authenticated and authorized before the connection is made, and all inputs are validated to be from trusted sources within Tableau Cloud.

## Authentication

There are two primary authentication points for Bridge: Tableau Cloud and private network data.

If the client is unlinked or you upgrade to a new version, you don't need to re-login. In this scenario, Bridge uses the existing token that is saved locally in the Windows credentials store.

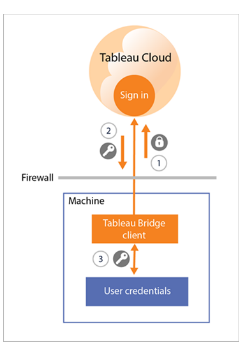
If the client is shut down, or the Exit option on the Windows task bar is used, you are required to re-login and provide credentials. This creates a new refresh token which is saved to the Windows credentials store.

You can check the tokens in the credentials manager and check the Generic credentials for *TABLEAU_CONNECTIONS_online.tableau.com*.

Tableau Cloud

To connect to Tableau Cloud, a users Tableau Cloud credentials are entered through the Bridge client.

After 1) the credentials are entered, 2) an authorization token is returned by Tableau Cloud. The 3) token is stored on the computer where the client is running using the credentials manager of the Windows operating system. Bridge uses the token to perform various tasks such as downloading the refresh schedule information for an extract.



Private network data

To access private network data, some data sources or virtual connections require authentication using database credentials. Depending on the connection type of the content, the client handles database credentials in one of the following ways:

- For **live connections and extract connections that use refresh schedules**, database credentials are sent at the time of the request and use a TLS 1.2 connection.
- For **extract connections that use Bridge legacy schedules**, if the data source requires database credentials, these credentials must be entered in the client directly. The database credentials are stored on the computer using the credentials manager of the Windows operating system. The client sends the database credentials to the database, which is also behind the private network firewall, at the scheduled refresh time.

The client supports domain-based security (Active Directory) and user name/password credentials to access private network data.

## Changes to private network firewall

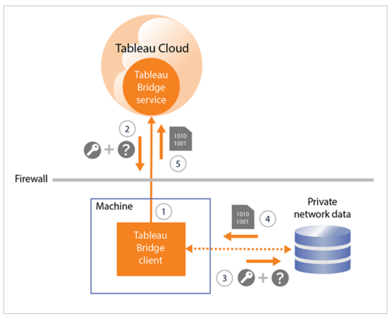
The Bridge client requires *no* changes to the private network firewall. The client achieves this by making only outbound connections to Tableau Cloud. To allow outbound connections, the client uses the following protocols depending on the connection type used by the content:

- For **live connections and extract connections that use refresh schedules**, secure WebSockets (wss://).
- For **extract connections that use Bridge legacy schedules**, HTTP Secure (https://).

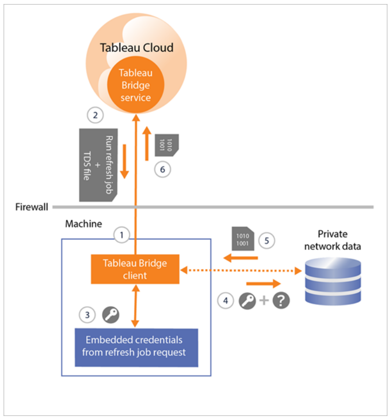
## Access to private network data

Connections to private network data are initiated by the Bridge client on behalf of Tableau Cloud. The process by which the connection is initiated depends on the content type and connection type.

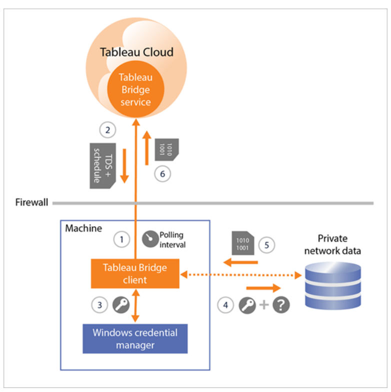
- For **data sources with live connections or virtual connections**, the client 1) establishes a persistent connection to a Tableau Bridge service, which is the part of the client that resides on Tableau Cloud, using secure WebSockets (wss://). The client then waits for a response from Tableau Cloud before 2) initiating a live query to the private network data. The client 3) passes the query to the private network data, then 4) returns the private network data using 5) the same persistent connection.




- For **data sources with extract connections that use refresh schedules**, the client 1) establishes a persistent connection to a Tableau Bridge service, which is the part of the client that resides on Tableau Cloud, using secure WebSockets (wss://). The client then waits for a request from Tableau Cloud for new refresh schedules. When the client receives the requests, 2) the client contacts Tableau Cloud using a secure connection (https://) for the data source (.tds) files. 3/4) Then the client connects to the private network data using the embedded credentials that are included in the job request. The client 5) creates an extract of the data and then 6) republishes the extract to Tableau Cloud using the Tableau Bridge service. Steps 2-6 can be occurring in parallel to allow multiple refresh requests to happen.




- For **data sources with extract connections that use Bridge legacy schedules**, the client 1) contacts Tableau Cloud using a secure connection (https://) for new refresh schedules and data source (.tds) files. If 2) this information is available, at the scheduled time, 3/4) the client connects to the private network data using the stored credentials. The client 5) creates an extract of the data and then 6) republishes the extract to Tableau Cloud using a Tableau Bridge service. The Tableau Bridge service is a part of the client that resides on Tableau Cloud.




## Forward proxy filtering

To ensure that your data is transmitted to Tableau Cloud only, we recommend implementing domain-based filtering on outbound connections (forward proxy filtering) from the Bridge client. After the initial outbound connection, communication is bidirectional.

Tableau Bridge doesn't support pass-through or manual proxy authentication.

The following list contains the partially qualified domain names that Bridge uses for outbound connections:

- ***.online.tableau.com**
- ***.compute-1.amazonaws.com**, Amazon VPC's public DNS hostname, which takes the form ec2-<public-ipv4-address>.compute-1.amazonaws.com, for the us-east-1 region
- ***.compute.amazonaws.com**, Amazon VPC's public DNS hostname, which takes the form ec2-<public-ipv4-address>.compute.amazonaws.com, for all other regions (outside of us-east-1)
- (Optional) ***.salesforce.com**, **id.tableau.com**, and **identity.idp.tableau.com** if multi-factor authentication (MFA) with Tableau authentication (**Tableau with MFA**) is enabled for your site and your environment is using proxies that prevent clients from accessing other necessary services
- (Optional) **crash-artifacts-747369.s3.amazonaws.com**, used for receiving crash dump reports
- (Optional) **s3-us-west-2-w.amazonaws.com**, used for receiving crash dump reports
- (Optional) **s3-w-a.us-west-2.amazonaws.com**, used for receiving crash dump reports
- (Optional) **bam.nr-data.net**, used for New Relic's web analytic platforms
- (Optional) **js-agent.newrelic.com**, sends performance data to New Relic

# Troubleshoot Issues with Bridge

Different parts of the Tableau Bridge workflow require coordination with Tableau Desktop and Tableau Cloud. Depending on the task you're trying to complete, the underlying data that you're working with, and the data source's connection (live or extract), and on the symptoms you're seeing, some troubleshooting steps might require you to work in one or both of these respective products in addition to the client itself.

The issues and the steps to help resolve these issue might apply to data source owners or site admins.

## Understand common issues after upgrade

After upgrading to Bridge, you might notice some changes to your Bridge-specific workflows.

**Can't configure 15 minute or 30 minute refreshes**

Bridge refresh schedules only run as frequently as every 60 minutes. However, you can have multiple refresh schedules on the same data source. To enable a refresh to occur more frequently, set up four refresh schedules on the same data source. Then have all four schedules start at 15 minute increments and repeat hourly. This will result in refreshes that begin every 15 minutes.

**Note:** When using Bridge legacy schedules, the data source owner must be the same user that is signed into the client that is designated to refresh the data source. Depending on how client management is administered in your organization, your site admin might need to take ownership of your data source.

**Can't find the "Refresh this extract on" or "Select where to run refreshes" button**

Beginning with Bridge 2020.2, Bridge schedules are better integrated with Tableau Cloud schedules and can be accessed and set up directly in the same location as Tableau Cloud schedules. For more information about Bridge schedules, see Set Up a Bridge Refresh Schedule.

**Can't find the Run Now option**

The **Run Now** option in Tableau Cloud is not available on individual data source pages for data sources that use Bridge legacy schedules. In most cases, a manual refresh of a data source that uses a Bridge legacy schedule can only be performed from the client that the data source is linked to.

**Can't refresh data sources that use Relationships**

Bridge 2019.4 (or earlier) does not support data sources created with Relationships in Tableau 2020.2 (or later). To keep your private network data fresh, make sure you're running the latest version of the client. To get the latest client, see the Downloads page.

**Some data sources are not listed or missing from the client**

Data sources that use Bridge refresh schedules or whose schedules have been migrated to use Bridge refresh schedules are not visible from the client. As a site admin, you can monitor data sources with Bridge refresh schedules using the Jobs page. For more information, see About Bridge Refresh jobs.

Data sources that use live queries and Bridge legacy schedules (which includes schedules created with Bridge 2020.1 and earlier) continue to display in the client.

## Locate Bridge

If you can't find the Bridge client or the option to use Bridge, try one or more of the suggestions below.

**Can't find the Bridge installer**

To download the client, go to the Downloads page on the Tableau website and click the download button. For more information about the Bridge installer and the installation process, see Install Bridge topic in the Tableau Cloud Help.

**Can't find Bridge on my machine**

After installing the client on your machine, you can do one of the following tasks to open the client:

- Double-click the Bridge shortcut ( ) on your desktop.
- From your desktop, in the Windows system tray, click the Bridge icon ( ).
- Using Windows file explorer, search **Tableau Bridge** to locate the client.
- If Tableau Desktop is installed on the same machine as the client, open Tableau Desktop and select **Server** > **Start Tableau Bridge Client**.

  **Note:** This task opens the correct client if you're using Tableau Desktop 2018.2 and later. If you're using Tableau Desktop 2018.1 and earlier, using the **Start Tableau Bridge Client** option will cause an older version of the client to open.

**Can't find the Bridge option in the publishing dialog**

The reason you might not see Bridge option in the publishing dialog depends on what you are publishing to Tableau Cloud: a data source or a workbook.

If you're publishing a data source:

- The data source is file-based. Therefore, the option to use Bridge displays *after* you have successful published the data source to Tableau Cloud.

  After you successfully publish the data source, you see the Publishing Complete dialog, which allows you to schedule refreshes for your file-based data source using Bridge while on Tableau Cloud. For more information about scheduling refreshes using Bridge while on Tableau Cloud, see Set Up a Bridge Refresh Schedule.

- The data source connects to data that Tableau Cloud can reach directly.

  If Tableau Cloud can reach the data directly, you don't need to use Bridge to keep the data fresh. For a list of connectors that Tableau can use to reach the data directly, see Allow Live Connections to Data Hosted on a Cloud Platform.

- The data source connects to data that is not supported by Bridge.

  For a list of connectors that Bridge can support, see Connection types.

## Resolve installation issues

**Using macOS or Linux**

Bridge is not supported on macOS (operating system). To use Bridge, you must use a Windows or Linux computer. For more information about other system requirements, see Connectivity with Bridge.

**Local admin on the machine**

The Windows user account you're logged in to must be a member of the local Administrators group. For more information about minimum installation requirements, see Before installing Bridge. For more information on system requirements, see About the Bridge Client.

## Resolve sign-in issues

**Working with multiple Tableau Cloud sites or Bridge is signed in to the incorrect site**

Make sure you're entering the correct user name and password for the Tableau Cloud site that the client is associated with. If you suspect that an incorrect user name and password is saved for a site or that the client is singed in to the incorrect site, use the **Unlink** option in the client to remove its association with the site and to clear the password.

## Identify causes for scheduled refresh issues

There are several symptoms that can indicate that scheduled refreshes are not performing as expected. Symptoms might include, but not limited to, the following:

- As the site admin or data source owner, you see an alert on Tableau Cloud that a scheduled refresh could not complete.
- As the site admin or data source owner, you receive an email notification from Tableau indicating that a Bridge refresh could not complete.
- As a data source owner, you receive an email notification from Tableau indicating that a Bridge refresh could not start on schedule because the Bridge client is not running.
- You see an alert in the client next to the data source whose refresh could not complete.
- Outdated data in the view.

If any of the above symptoms apply to your situation, follow the procedure below. If the procedure doesn't resolve your issue, then try one or more of the tasks below the procedure to help identify the cause of the refresh issue.

1. Open the client, click the data source, and then click the **Details** button to review the error message.

2. If the error message doesn't provide enough information to resolve the refresh issue, go to the Tableau Knowledge Base and search for the refresh issue.

**Important:** If you see the "There was a problem and the data engine could not start properly" error message and you're running client version 2018.2-2018.3, Tableau strongly recommends upgrading to version 2019.1 or later. For more information, see Error "There was problem and the data engine could not start properly" article in the Tableau Knowledge Base.

If the Tableau Knowledge Base doesn't address your specific issue, then try one or more of the following tasks:

- **Validate authentication information in the client:** If a data source requires authentication, ensure that the correct database credentials are being reference by the client, even if the database credentials are already referenced in Tableau Cloud. For information about embedding database credentials in the client, see Embed or update database credentials.
- **Upgrade the client:** Upgrade to the latest version of the client. You can get the latest version of the client from the Downloads page on the Tableau website. For more information about installation, see Install Bridge.
  **Note:** Because of an issue that's preventing Bridge 2018.2-2018.3 from performing extract refreshes, Tableau strongly recommends that you upgrade to Bridge 2019.1 or later.
- **Make sure that the client is running:** Log onto the machine where client is installed and make sure the client is running. After you verify the client is running, you can run a manual refresh of the data source or wait until the next scheduled refresh.
- **Confirm file-based data source uses UNC path:** If you're working with a file-based data source using Bridge legacy schedules, ensure that the client references the UNC path. For more information, see Change the file path for a data source.
- **Confirm whether Application mode or Service mode requirements are met:** If the client is set up to run in **Application** mode, you must be logged onto the machine where the client is running in order for scheduled refreshes to complete. If your client is set up to run in **Service** mode, you don't have to be logged on to the machine where the client is running. However, the machine must be on.
- **Confirm that all connections in the data source are supported by Bridge:**

  If refreshing a multi-connection data source (that is, a data source that uses a cross-database join), make sure all connections in the data source are supported by Bridge. If one or more connections are not supported, Bridge is unable to refresh the data source until the unsupported connection is removed. For a list of supported connectors, see Connection types. To remove a connection from a data source, you must edit the data source in Tableau Desktop. For more information, see Editing a Published Data Source in the Tableau knowledge base.

- **Manually refresh the data source:** Manually refreshing the data source can help determine whether the issue is caused by the client or by a different part of the Bridge workflow, such as publishing from Desktop or the data source itself.

  - **From the client** - To determine if the issue is isolated to the specific scheduled refresh or all scheduled refreshes managed by the client, do a manual refresh of the published data source from the client.

    1. Open the client.
    2. Hover over the data source whose schedule refresh is not working, and click the Run Now icon ( ) to manually start a refresh.

    If the manual refresh is successful, you have a temporary workaround for the refresh issue. If the refresh is unsuccessful, review the error in the client to help resolve the issue.

  - **From Tableau Desktop** - To determine whether or not the issue is a client issue or an issue with the published data source, you can do a manual refresh of the data source from Tableau Desktop.

    1. Open Tableau Desktop.
    2. In the Connect pane, click **Tableau Server** and connect to the published data source that is not refreshing.
    3. From the Data menu, select the data source and then select **Tableau Data Server** > **Refresh from Source**.

    If the refresh from source is successful, you have temporary workaround for the refresh issue. If the refresh is unsuccessful with the same error that shows in the client, contact Tableau Technical Support on the Tableau website.

  - **From Tableau Desktop, create a local copy of the data source** - To determine that the issue is not with the publishing process or with Tableau Cloud in general, first create a local copy and then manually refresh the published data source.

1. Open Tableau Desktop.
2. In the Connect pane, click **Tableau Server** and connect to the published data source that is not refreshing.
3. From the Data menu, select the data source and then select **Create Local Copy**.
4. From the Data menu, select the local copy of the data source and then select **Refresh**.

If refreshing from a local copy of the data source is successful, you have a temporary workaround for the refresh issue. The issue is likely with the publishing process.

- **Refresh the data source using the Tableau Extract Command-Line Utility:** Refreshing the data source using the Tableau Extract Command-Line Utility is another method for isolating whether the issue is specific to the client or with the data source or other part of the Bridge workflow. This method can also provide an automated or temporary way of refreshing the extract. For more information about setting up and using the Tableau Extract Command-Line utility, see Automate Extract Refresh Tasks from the Command Line.

  If the refresh is successful through the command line utility, you have a temporary workaround for the refresh issue. If the refresh is unsuccessful, contact Tableau Technical Support on the Tableau website.

- **Scheduled refreshes appear to be running outside of schedule:**

  After Tableau Cloud's upgrade to 2019.2, a data source owner might receive multiple email notifications when an upcoming scheduled refresh can't start because the client is not running. Because a data source owner can receive up to five consecutive email notifications per day for up to ten data sources that they own, it might appear the scheduled refreshes are running outside of their scheduled times. As a data source owner, you might be receiving the notifications for the following reasons:

- **The machine where the client is running from is not on.** To stop notifications in this scenario, make sure the machine where the client is installed on is on and the client itself is running before the upcoming scheduled refresh is to occur. Alternatively, if the extract data source doesn't need to be refreshed regularly, consider removing the schedule and manually refreshing it from the client when needed. For more information about removing a schedule, see Stop Keeping Data Fresh Through Bridge.
- **Extract data sources continue to be associated with a client that is no longer in use.** To stop notifications in this scenario, as a site admin, you can delete the client from the site. For more information, see Stop Keeping Data Fresh Through Bridge.
  If you're not a site admin, consider the following:
  - If the extract data source doesn't need to be refreshed, you can remove the data source from the client. For more information, see Stop Keeping Data Fresh Through Bridge.
  - If the extract data source needs to be refreshed, albeit infrequently, you can change the client associated with that extract data source (and its schedule). For more information, see Change the Bridge Client Settings.

#### Refreshes stop responding for data sources that use JDBC-based connections

**Note:** Bridge provides limited support for data sources that use JDBC drivers to connect to unsupported databases. For more information, see Connectivity with Bridge.

Refreshes for extract data sources whose connections rely on JDBC-based drivers can fail with timeout errors or the refreshes themselves stop responding, or hangs, because of CPU or RAM spikes. In most cases, these refresh issues can occur when there are several concurrent refreshes of data sources that use JDBC-based connections being handled by a client on a machine that does not have sufficient hardware to support the resource-intensive JDBC-based connections. To help resolve this type of issue, review the following suggestions:

- **If you’re a site admin managing the clients in your organization**, review the log files, *jprotocolserver_<process_id>* and *stdout_jprotocolserver_<process_id>*, in the Logs folder in the My Tableau Bridge repository. Then, consider doing one of the following:

  - Reduce the number of concurrent refreshes allowed by the client. For more information, see Change the Bridge Client Settings.
  - Consider increasing CPU cores and RAM on the machine running the Bridge client to better handle the resource intensive JDBC-based connections.

- **If you're the data source owner**, update the data sources to use a Tableau built-in connector instead. For more information, see Supported Connectors in the Tableau User Help.

**Refresh issues after changing network type to Private Network**

After updating the network type associated with a data source, from **Tableau Cloud** to **Private Network** or **Private Network** to **Tableau Cloud**, existing schedules associated with the data source must be recreated. For more information, see About switching network types.

**Refresh issues when a published data source has multiple data connections**

After publishing a file-based online data source to Tableau Cloud, the extract refresh can fail when the published data source has multiple data connections. By default, Tableau Cloud uses Bridge when a published data source has multiple data connections. You can edit the connection type of extract refreshes for Bridge refresh schedules to use Tableau Cloud instead of Bridge. For more information, see Change the connection type of a refresh to use Tableau Cloud.

**Refresh issues on file-based data published from Tableau Desktop on a Mac**

When using 1) Tableau Desktop on a Mac, 2) publishing a file-based data source from a Windows network file share, and then 3) configuring a Bridge refresh schedule, the refreshes will fail. If this file-based data source is business critical resource for your organization, consider configuring a Bridge legacy schedule instead. For more information, see Set up a Bridge legacy schedule.

## Identify causes for live query issues

Issues around live queries are typically due to the option not being enabled or that Bridge doesn't support the data source type.

**No "Live" data sources listed in the client**

A few things need to happen in order for "Live" data sources to display in the client. First, the site admin has to enable pooling for the site. Second, the site admin must also add at least one client to the pool. Finally, the data source must be published with a live connection. All three factors need to happen in order for "Live" data sources to display in the client.

**The option to publish with a live connection or the "Maintain connection to a live data source" option during publishing is missing**

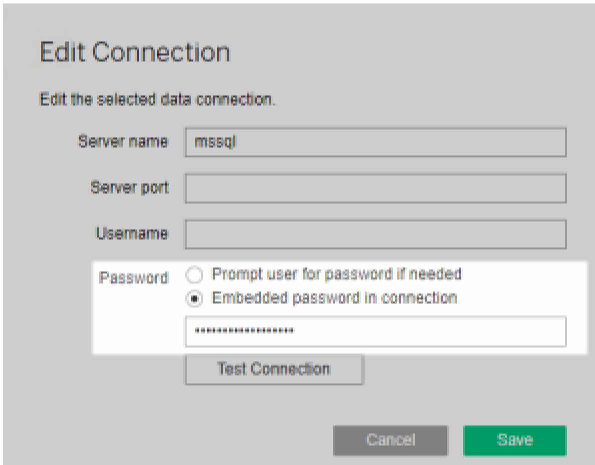
The option to use Bridge to support live queries for an private network data source must be enabled by your Tableau Cloud site admin through pooling. If the option is not available to you during publishing, consider contacting your site admin to enable the option. If you're a site admin, see Configure the Bridge Client Pool.

**You're prompted for database credentials**

If the data source requires authentication by the database, the credentials must be embedded in the data source at the time of publishing. If the credentials are not embedded in the data source at the time of publishing, the credentials can be added to the published data source on Tableau Cloud.

1. Sign in to Tableau Cloud and navigate to the data source.
2. From the data source page, on the Connections tab, select the check box next to the connection.
3. From the Actions menu, click **Edit Connections**.
4. Select the **Embedded password in connection** and enter the necessary database cre-

dentials.




#### You're working with a file-based or statistical file-based data source

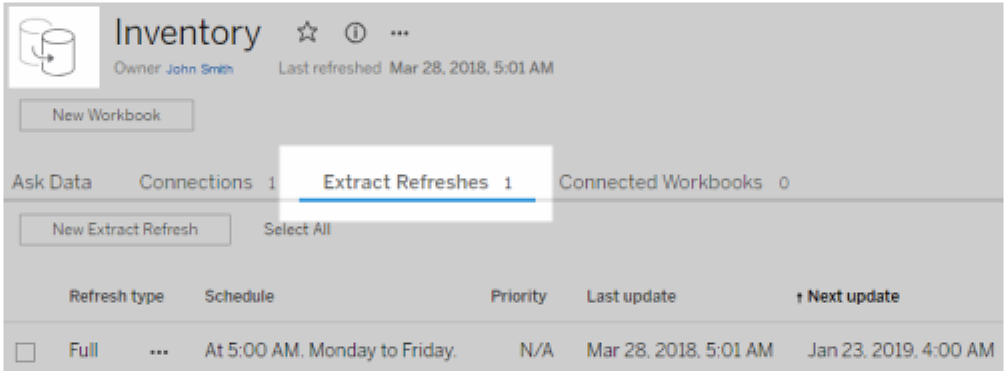
Bridge doesn't support data sources with live connections to file-based and statistical file-based data sources. To keep data fresh for these types of data sources, you can publish extracts and set up a refresh schedule for each data source instead. For a list of connectors that Bridge supports, see Connection types. For more information about setting up refresh schedule, see Set Up a Bridge Refresh Schedule.

#### Data source doesn't display as "Live" in the client:

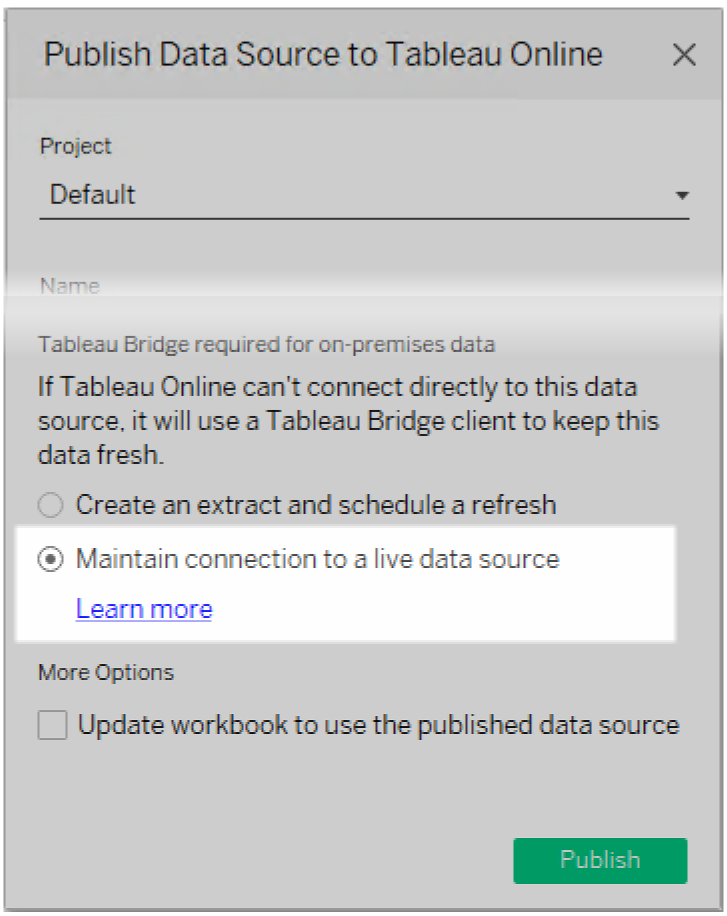
If the data source doesn't show as "Live" in the client, the data source was likely published as an extract. To validate that the data source was published as an extract, follow the steps below.

1. Sign in to Tableau Cloud and navigate to the data source.
2. On the data source page, check whether the data source has an "Extract Refreshes" tab or an extract icon (). If the data source shows the tab then it was published as

an extract.




To resolve the issue, republish the data source from Tableau Desktop, ensuring that you select the **Maintain connection to a live data source** option. This option tells Bridge to maintain a live connection to your data.



#### Client is running Application mode

If you're using Bridge 2018.2 and later, after the site admin has enabled pooling, live queries are supported in both Application and Service modes. However, if the client is running Application mode, you must be logged on to keep data fresh.

If you're using Bridge 2018.1 and earlier, even if live queries are enabled by the site admin, Bridge can't support live queries in Application mode. The client must be running in Service mode to support live queries.

For more information about running the client in Application mode or Service mode, see Application versus Service mode.

### Understand other common issues

#### Delay before list of data sources populate in client

There is a short delay, usually several seconds, populating the list of data sources in the client. This is expected behavior. The client is contacting Tableau Cloud to get the list of data sources before it can display that information.

#### "No linked data found" in the client

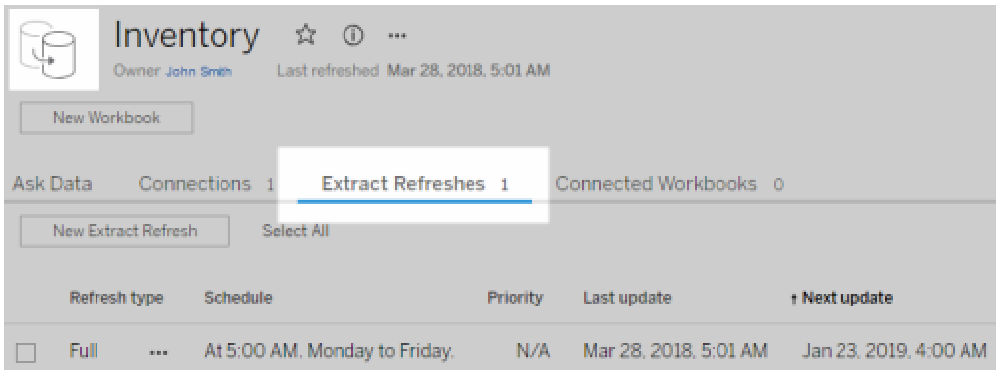
If the client shows a green indicator and "Connected" status, but also shows a "No linked data found," review the suggestions below based on the type of data source you're expecting to see.

If you're expecting to see an extract data source that uses a Bridge legacy schedule listed in the client, try the following:

- Validate that the extract refresh schedule is assigned to the correct client. For more information, see Change the Bridge Client Settings.

If you're expecting to see a data source with a live connection or an extract data source that uses Bridge refresh schedules, try one or more of the following:

- Validate that the data source was published with a live connection.
  1. Sign in to Tableau Cloud and navigate to the data source.
  2. From the data source page, check whether the data source has an "Extract Refreshes" tab or a extract icon (). If the data source shows the tab then it was published as an extract.




- Make sure at least one client is part of the pool to facilitate data sources with live connections. To do this, contact your site admin. If you're the site admin, verify that you've enabled pooling for the site and client. For more information, see Configure the Bridge Client Pool.

**Red indicator and "Disconnected" status in the client**

If the client shows a red indicator and "Disconnected" status, try the following tasks, in the order listed:

1. In the client menu, click **Repair**.
2. If step 1 doesn't resolve the issue, from the Mode drop-down menu, select **Application** and wait a few seconds. Switch back to **Service** and wait a few more seconds.
3. If step 2 doesn't resolve the issue, restart the machine. Make sure that there are no scheduled refreshes that are in progress.

In some cases, the client shows a red indicator and "Disconnected" status if the client is running on a machine that is "locked down." This means that the client is restricted to connecting to a minimum set of domains. For a list of the minimum set of domains that the client needs to connect to in order to work, see Forward proxy filtering.

#### Missing subscription emails

Data refresh-initiated Subscriptions are not supported for views and workbooks that rely on Bridge to keep data fresh. This means you do not receive subscription emails when the following are true: 1) subscriptions are configured for **When Data Refreshes** and 2) the views or workbooks you're subscribing to rely on extract data sources that refresh using Bridge. To use subscriptions in this scenario, consider configuring your subscriptions to use **On Selected Schedule** instead. For more information, see Troubleshoot Subscriptions.

#### "Test Connection" button doesn't support Bridge connections

**Test connection** only supports data sources that connect to Tableau Cloud. As an alternative to testing your connection with this button, consider running a manual refresh to test the connection instead. For more information about running a manual refresh, see Start a Refresh Task Manually.

## Understand common errors

While using Bridge, you might see one of the following errors.

***"An error occurred while communicating with Tableau Server: Tableau Bridge does not have a client configured for your site to handle live connections."*** or ***"Cannot connect to database"***

This is an error that you might see when connecting to a published data source whose data freshness is being facilitated through Bridge. To resolve these errors, try the following tasks in the order listed.

- Make sure the client is added to the pool. To do this, contact your site admin. If you're a site admin, verify that you've enabled pooling for the site and at least one client. For more information, see Configure the Bridge Client Pool.

- Make sure the client shows a green indicator and "Connected status. If it shows a red or "Disconnected" status, see Red indicator and "Disconnected" status in the client.

***"This data source requires a correct file path"*** or ***"Unable to refresh data source because of an unsupported operation"***

If you're working with a file-based or statistical file-based data source (that uses Bridge legacy schedules) you might see this error because the path referenced by the client is the mapped drive path instead of the UNC path. To resolve this issue, you must update the file location path in the client. For more information, see Change the file path for a data source.

While refreshing on Tableau Cloud, you might see the following error:

**"Error: Failed to queue *n* tasks"**

This error can occur if you've selected to use the **Run Now** option on multiple data sources and one or more data sources connect to file data. The Run Now option can only be used for data sources that use Bridge refresh schedules.

Virtual connections

While trying to create a virtual connection, you might see one of the following errors:

- **INVALID_ARGUMENT**:

  "*INVALID_ARGUMENT: Can't display the view because of Tableau Cloud site settings that affect the data source used by this view. Contact your site administrator to connect at least one Tableau Bridge client to the site.*"

  This error can occur when there are no Bridge 2021.4 clients in a pool to perform data freshness tasks for virtual connections that connect private network data. To resolve this error, contact your site admin to ensure that version 2021.4 clients are running and in a connected state, and the pool is mapped to the domain where the underlying data is located.

- **UNKNOWN**:

"*UNKNOWN: There was an unknown connection error to the database. The error message below has additional information, but you might need to ask the database administrator to review the database logs.*"

This error can occur when the domain where the underlying data of the virtual connection is located does not map to a specific Bridge pool. To resolve this error, contact your site admin to ensure that the domain where the underlying data is located is mapped to a Bridge pool and at there is at least one Bridge 2021.4 client running, in a connected state, and is assigned to a pool.

## Prepare and send log files to Tableau Technical Support

If the troubleshooting steps in this article don't help isolate or solve the issue you're having with Bridge, you can contact Tableau for help. Before you contact Tableau for help, consider following the steps below to gather and send the necessary Bridge client log files that Tableau will needs to diagnose and help resolve the issue.

Prepare clean log files

1. On the machine, close the client:

    - If your client is running Application mode, from the client menu, select **Exit**.

    - If your client is running Service mode, change the client to Application mode, and then from the client menu, select **Exit**.

2. Go to and open the **My Tableau Bridge Repository** folder.

    The default location of the My Tableau Bridge Repository folder is C:\Users\jsmith\Documents\My Tableau Bridge Repository.

3. In the My Tableau Repository folder, rename the **Log** folder. For example, Logs_archive. By changing the name of this folder, the client will create a new "Logs" folder.

4. Open the Command Prompt as an admin.

5. Change to the Tableau Bridge bin folder. For example: C:\Program Files\T-ableau\Tableau Bridge\bin.

6. Run the following command: `TabBridgeClient.exe -DLogLevel=Debug`

   **Note:** The above command is case-sensitive. If the command is not typed exactly as written, the log files will not capture the issue at the level of detail that is necessary to help diagnose the issue.

   After this step, the client opens automatically.

Reproduce the issue

After you prepare the client to create new log files, try to reproduce the issue you're having with Bridge. By reproducing the issue, the new log files can capture specific details about the issue. These details are essential for Tableau to have in order to isolate, diagnose, and resolve the problem.

Send log files

1. After the issue has been reproduced, right-click the Bridge icon in the Windows system tray and select **Exit** to stop Bridge. This step ensures that all errors are recorded in the log file.

2. Using Windows file explorer, go to and open the **My Tableau Bridge Repository** folder.

3. Right-click the **Logs** folder and select **Send to** > **Compressed (zipped) folder**.

4. Contact Tableau Technical Support on the Tableau website.

   **Note:** If the .zip file you created in step 2 is larger than 5 MB, see Sending Large Files in the Tableau Knowledge Base.

5. Locate and start Bridge. If the client was previously running in Service mode, ensure that **Service** is selected in the client.

# Data Connect for Private Network Data

Tableau Bridge provides a way to access private network data that is behind a corporate firewall, or locked down inside a virtual private cloud. After a connection is established to Tableau Cloud, Bridge queries your local data as requests arrive and sends the private results back to Tableau Cloud.

Similar to Tableau Bridge, Data Connect provides access to private network data, but pivots towards the SaaS experience by providing a remotely managed, monitored, and streamlined solution for connecting to your on-premise data.

Data Connect operates as a shared responsibility model. With this model, you supply the compute resources, which consist of a Data Connect Kubernetes cluster that is hosted in your environment and Tableau is responsible for managing the cluster. Tableau reduces the overhead of administration by remotely managing, monitoring, and maintaining the Kubernetes cluster. With the ability to perform remedial actions to enable continuous availability, Tableau eliminates the need to monitor traffic and connection status. In addition, to reduce latency and lower network congestion, Data Connect allows you to determine the data center, and edge locations and environments that best meet your requirements for performance.

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## About Data Connect

Data Connect allows Tableau Cloud users to access data sources on your private network or cloud service. Data Connect operates as a shared responsibility model. With this model, customers supply the physical or virtual compute resources, and Tableau hosts and manages the Data Connect Kubernetes cluster on those resources.

In your environment, the Data Connect Kubernetes cluster oversees a set of containers. The containers support the runtime environment that consists of one or more agents. The agent is the program that runs tasks and enables secure communication across the firewall between your organization.

Data Connect services include:

- Cluster monitoring and troubleshooting: Tableau monitors the health and usage of the Data Connect agent. Telemetry data are collected to ensure resources are used in the most effective and efficient manner.
- Cluster maintenance: Upgrades are automatically deployed and the cluster operation and maintenance is owned and fully performed by Tableau. Data Connect automatically optimizes the deployment for your workload based on needs and available compute pool.
- Alert monitoring: Incident management is provided continuously to quickly resolve issues to limit business impact.

## Connector support

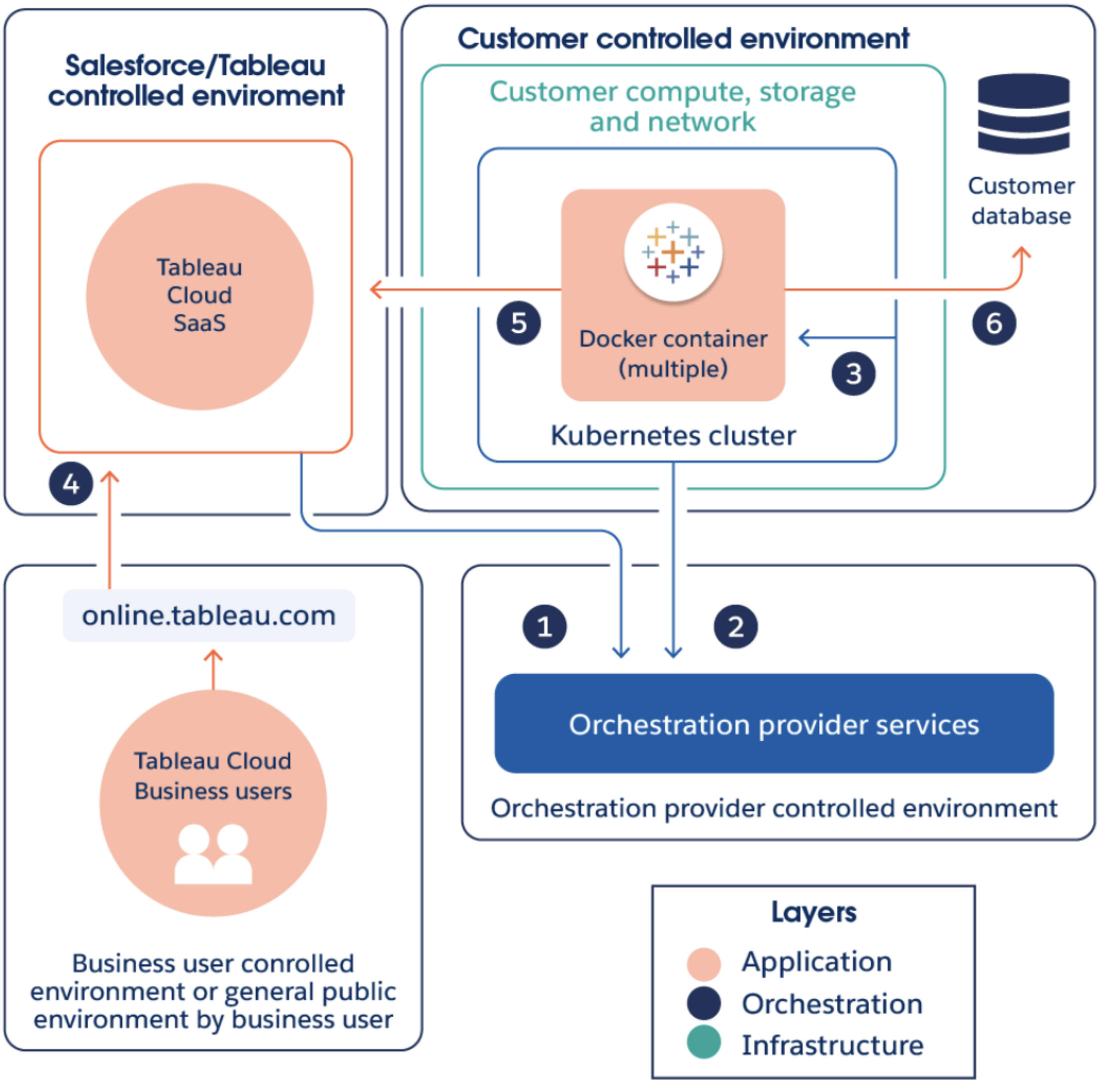
Data Connect supports the same Connectors that Tableau Bridge for Linux supports. For a full review of connectivity options please refer to Connectivity with Bridge.

## Environment support

Data Connect currently supports on-premise and VCP environments: Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP). Data Connect nodes are compatible with a single Tableau Cloud Site. Nodes must be installed in the same network as the data. Therefore customers should plan for at least three nodes per private network per Site to maintain availability of the service. Data Connect nodes must be dedicated to Data Connect. You cannot deploy any other containers to the Tableau-owned cluster. And you cannot use an existing cluster for Data Connect.

## Architecture

The Data Connect architecture consists of three main components and responsibility boundaries. While there's some overlap, Tableau is primarily responsible for the application and orchestration layers and customers are responsible for the infrastructure (compute, OS, networking, and storage) and where it’s located.




1. Tableau Cloud → orchestration service

2. Kubernetes cluster → orchestration service

3. Kubernetes cluster → container

4. Tableau user → Tableau Cloud

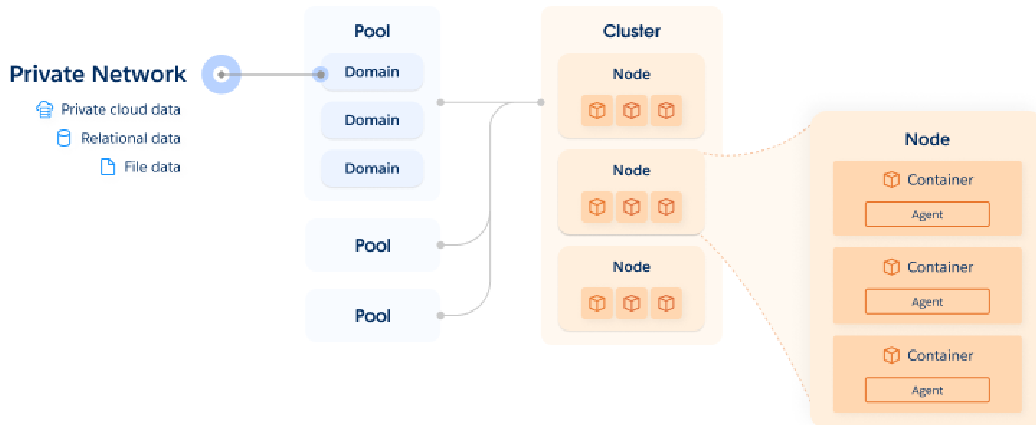
5. Data Connect agent (container) → Tableau Cloud

6. Data Connect agent (container) → customer database

## Security

See Data Connect Security.

## Data Connect components

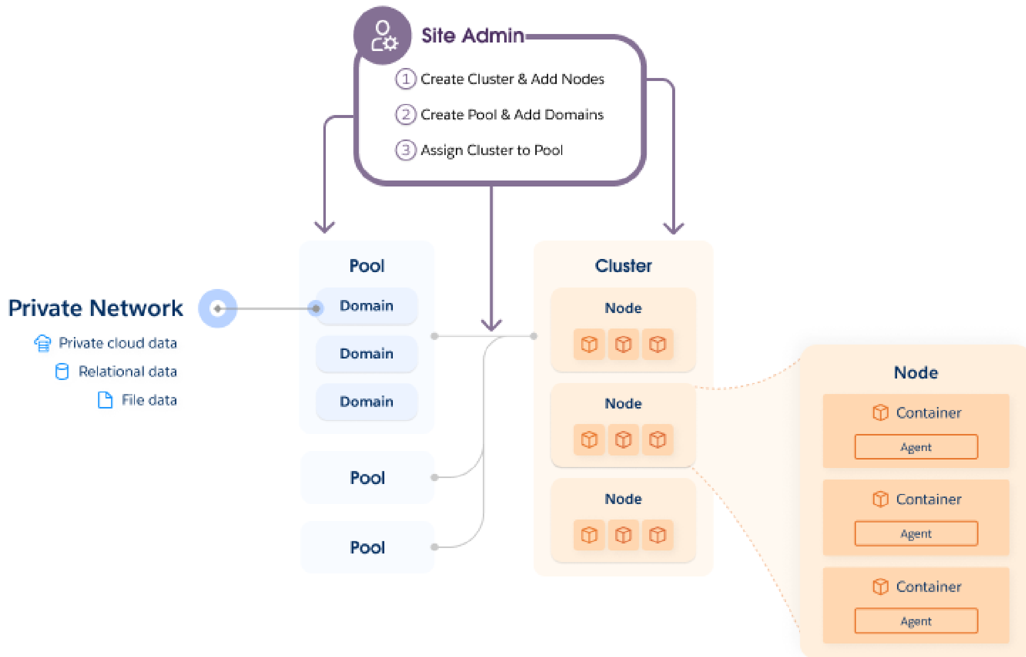



The primary component of the Data Connect solution is a cluster. The cluster is a Kubernetes cluster that is made up of one or more nodes. Each Kubernetes node hosts at least one container, which in turn, hosts the Data Connect agent. Agents perform live and extract queries.

A pool is a logical grouping of networking rules that specify which clusters should complete specific queries. In the context of deployment planning, a pool hosts a collection of endpoints (domains or IP addresses) for the purposes of load balancing. Domains include private cloud data, relational data, file data, etc.

To allow a cluster to access and refresh data sources, each pool is assigned to a cluster. To distribute load, you can add multiple pools to a cluster.

## Deployment overview



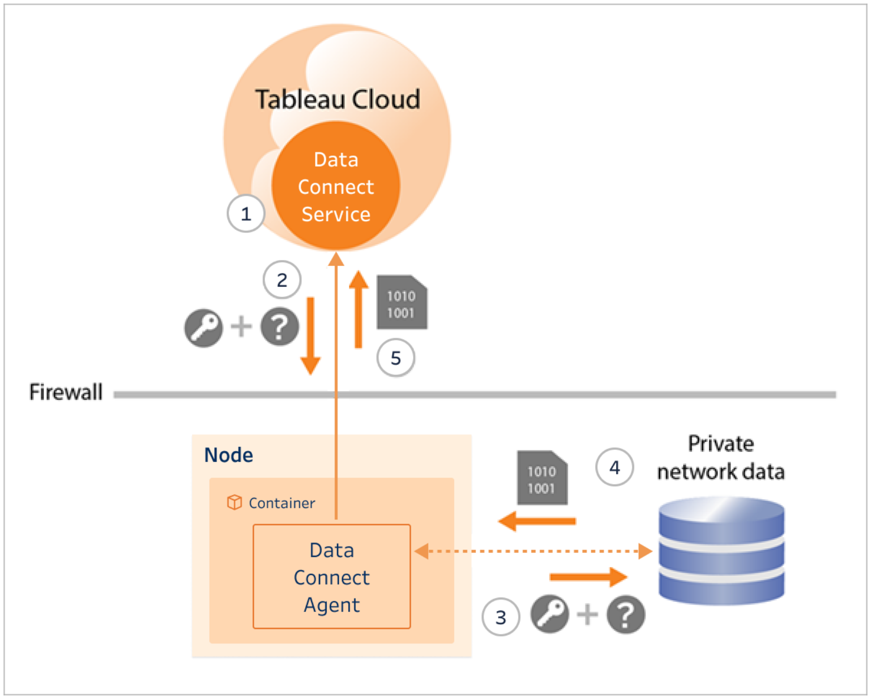

To get started, run a script on each of your Linux servers. This script configures a Tableau-managed Kubernetes cluster in your environment. The Kubernetes cluster is managed by Tableau.

After Kubernetes is configured, you deploy a Docker container to the cluster. Tableau will then deploy and remotely manage the Data Connect agent within the container. After this configuration with Tableau is established, you will then map connections to your private network data sources.

For more information about deploying Data Connect, download the whitepaper, Accessing Your Private Network Data with Tableau Cloud - Best Practices for Data Connect and Tableau Bridge.

## Database connectivity

Queries are managed from the Data Connect agent in the cluster. Your data is transmitted directly from the Data Connect agent to Tableau Cloud. Data Connect doesn't require external network access, firewall holes, or remote machine access.




1. The agent establishes a persistent connection to the Tableau Cloud Data Connect service using secure WebSockets (wss://). The client then waits for a request from Tableau Cloud.
2. - For data sources with live connections or virtual connections, Tableau Cloud initiates a query to the Data Connect agent.
   - For data sources with extract connection that use refresh schedules, the client receives the refresh schedule request and contacts Tableau Cloud using a secure connection (https://) for the data source (.tds) files.

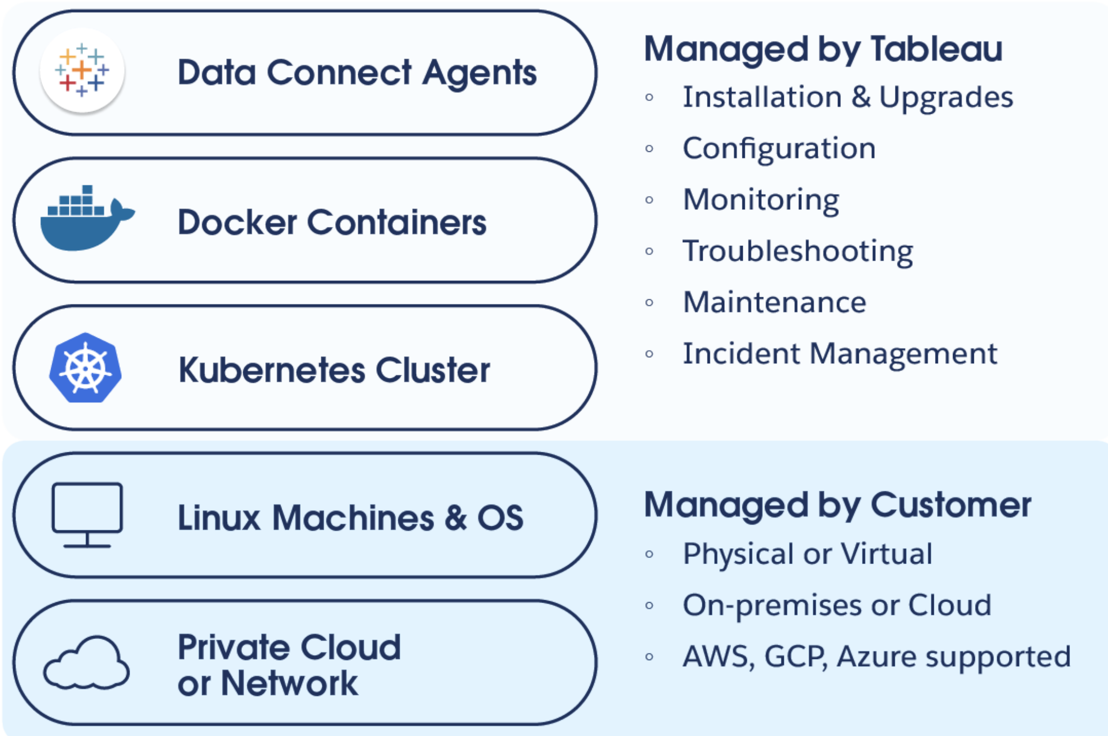
3. The agent connects to the private network data using the credentials included in the job request.

4. The database returns the results of the query.

5. The Data Connect agent receives the payload and returns it to the Data Connect service.

## Data Connect Security

Data Connect operates as a shared responsibility model. With this model, you supply the physical or virtual compute resources, and Tableau hosts and manages the Data Connect Kubernetes cluster on those resources. Tableau reduces the overhead of administration by remotely managing, monitoring, and maintaining the Kubernetes cluster. With the ability to perform remedial actions to enable continuous availability, Tableau eliminates the need to monitor traffic and connection status. In addition, to reduce latency and lower network congestion, Data Connect allows you to determine the data center, edge locations and environments that best meet your requirements for performance. In this model, Tableau is responsible for operating the Data Connect service securely and you are responsible for managing the infrastructure and networking layers.



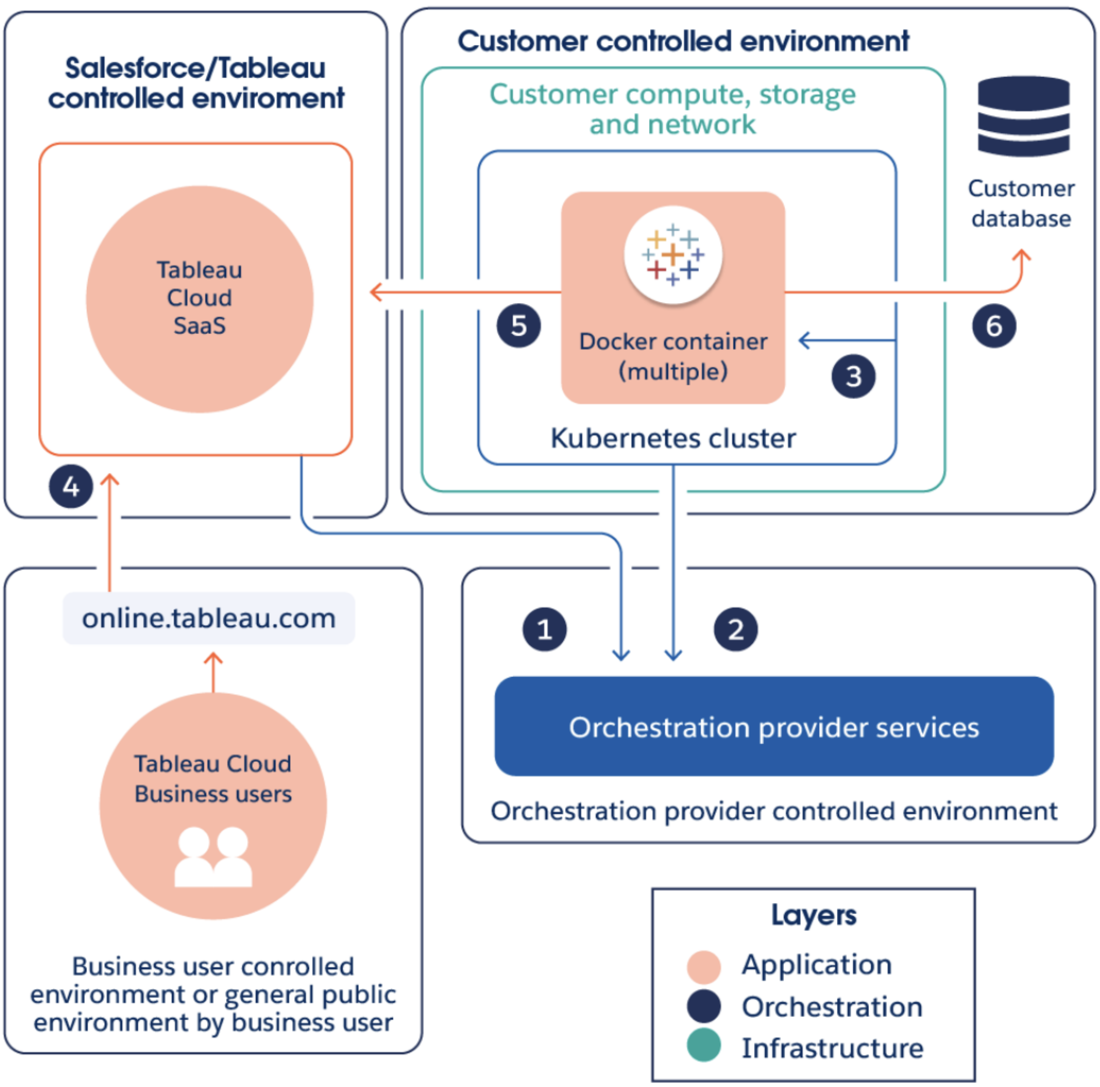

## Security designs

Data Connect applies the following security designs:

- The Data Connect service is a control plane service and does not have access to your data. The underlying component for Data Connect service is Tableau Bridge.
- To facilitate secure data transfer, Data Connect uses Tableau Bridge which leverages secure web sockets to establish persistent connections with Tableau Cloud.
- The Data Connect service does not interact with database credentials or database access. Database credentials are securely stored on Tableau Cloud and are passed on to the Tableau Bridge client that is selected to perform the refresh. Tableau Bridge clients are hosted on the Data Connect agent.
- All communication is initiated from behind your firewall and therefore does not require any additional explicit inbound firewall rules to manage exceptions.

Tableau Bridge is the underlying component in the Data Connect agent. Among other operations, Bridge is responsible for accessing your data and establishing secure web socket connections with Tableau Cloud. See Bridge Windows Security.

## Architecture




1. Tableau Cloud → orchestration service
2. Kubernetes cluster → orchestration service

3. Kubernetes cluster → container
4. Tableau user → Tableau Cloud
5. Data Connect agent (container) → Tableau Cloud
6. Data Connect agent (container) → your database

## Security Layers

There are three layers to the Data Connect solution. The *application* that is installed in your infrastructure, the *orchestration* layer that is used to deploy and manage application(s) and the supporting network and hardware *infrastructure*.

- Application layer: Database authentication, sending data to Tableau Cloud, and networking considerations, see Bridge Windows Security.
- Orchestration layer: See the section, Container orchestration, below.
- Infrastructure layer: In the Data Connect shared responsibility model, the security of the infrastructure itself will be your responsibility. Security details about how the Data Connect orchestration layer interacts with your infrastructure are covered in the sections below.

## Service configuration

During the configuration of Data Connect, you will be responsible for configuring and initiating the service from within your network. This process provides the correct level of access and specifies which Data Access nodes to integrate with your Tableau Cloud site. For details describing service configuration for Data Connect, see Step 2: Set Up Your Cluster.

On initialization of the Data Connect solution, the following takes place:

- Data Connect node health is validated.
- A secure connection is established with the orchestration provider service over port 443.

- Kubernetes operations software is downloaded and installed onto the computer. This software allows Tableau to remotely deploy and manage Data Connect.
- Data Connect node information is queried over the secure connection to maintain the health of the service.

Your data is never transferred over the orchestration connection.

## Tableau Cloud communication

All communication from your infrastructure to Tableau Cloud is initiated from behind your firewall. You do not have to manage additional exceptions.

For more information about Data Connect communication and your infrastructure configurations, see Networking specifications.

## Tableau Cloud authentication

Authentication and authorization of the Tableau Bridge clients deployed by Data Connect to Tableau Cloud is achieved with Personal Access Tokens (PATs). Before deploying Data Connect, you will need to create PATs in the Tableau Cloud administrative console. You will then configure Data Connect service to use those tokens for authentication from your Data Connect agent to Tableau Cloud.

## Database authentication

You can find more details about Authentication in Bridge Windows Security.

In the context of database authentication, it's important to understand that Data Connect only supports Bridge refresh schedules and does not support Bridge legacy schedules.

## Container orchestration

The orchestration layer is exclusively a control layer and does not have access to the data layer and therefore does not interact with customer data. The only aspect of Data Connect that interacts with the data layer is the application installed on your infrastructure. This application is the Data Connect agent, a service which runs the Tableau Bridge client.

## Security FAQ

What code is provisioned onto containers?

In addition to software required for Kubernetes operations (kops), Tableau Bridge for Linux for Containers is deployed. You must provision database drivers when you create the base image.

How can I manage detected vulnerabilities on the software deployed by Data Connect?

You supply all of the software deployed by Data Connect through the base image. To change the software deployed, you supply a new base image. The image will then be deployed to all Data Connect nodes in that pool.

What level of computer access does Data Connect require?

Data Connect requires administrative level access to your infrastructure. This access allows Tableau to update and maintain the service.

# Get Started

While Tableau will perform the majority of activities necessary, the following infrastructure must be provided.

## Infrastructure specifications

- **Compute**: A location for hosting Data Connect. This can be a bare-metal or VM, and can be located in a private network or in the cloud.
- **Operating System (OS)**: An up-to-date and patched installation of a supported Linux distribution.
- **Storage**: Allocated storage space to host the OS, Data Connect, and the extracts it creates when performing refreshes.
- **Network**: The compute must be able to connect to your data source and two locations on the public internet.

## Technical specification

Node specifications

| | |
|---|---|
| Number of nodes | Production workload minimum: three nodes per network per site.<br><br>Development/test workload minimum: one node per network per site. |
| vCPU | Minimum: 8 vCPU<br>Recommended: 16 vCPU or more |
| Memory | Minimum: 16 GB<br>Recommended: 64 GB or more |
| Storage (two disk)<br><br>**Important**: The secondary disk must be raw and unformatted. | Root disk<br>Minimum: 200 GB disk space<br>Recommended: Greater than 300 GB<br><br>Secondary disk<br>Minimum: 200 GB<br>Recommended: Greater than 500 GB |
| Permission | Root access to host |

Linux Operating System

| | |
|---|---|
| Supported distributions | RHEL-8<br>RHEL-9<br>Ubuntu-20.04<br>Ubuntu-22.04 |

Networking specifications

| | |
|---|---|
| Proxy filtering | See Optional forward proxy filtering. |
| Outbound TLS client authentication on port | 52.42.211.235 |

| | |
|---|---|
| 443 with mutual TLS authentication<br>(Orchestration layer) | 52.10.6.79<br>35.167.70.143 |
| Outbound listing of Fully Qualified Domain Names (FQDN)<br>(Orchestration layer) | tunnel.rafay-edge.net<br>api.rafay.dev<br>control.rafay.dev<br>fluentd-aggr.rafay-edge.net<br>influxdb01.core.rafay-edge.net<br>debug.core.rafay-edge.net<br>edge.core.rafay-edge.net<br>registry.rafay-edge.net<br>app.rafay.dev<br>console.rafay.dev<br>*.connector.kubeapi-proxy.rafay.dev<br>*.user.kubeapi-proxy.rafay.dev<br>event.core.rafay-edge.net<br>repo.rafay-edge.net<br>*.connector.cdrelay.rafay.dev<br>*.user.cdrelay.rafay.dev<br>*.connector.infrarelay.rafay.dev<br>*.user.infrarelay.rafay.dev |
| Internal network | The cluster nodes will need the same network access to the data source as is required by Tableau Desktop. |
| Tableau Cloud permissions | Site Admin role and the credentials to access the data source. |
| Data source | An authentication method for the data source that is currently supported by Data Connect and that is network accessible from the cluster. |

# Step 1: Contact Tableau

To purchase Data Connect, contact your account executive. You can order the number of nodes needed and those nodes are allocated to one or more clusters. After the purchase agreement is complete, contact the Tableau Data connect team at: data-connect@salesforce.com. You will need to provide information such as your Tableau Cloud site name, Tableau Cloud URL, and email addresses for server administrators.

## Data Connect setup workflow

Step 1: Contact Tableau

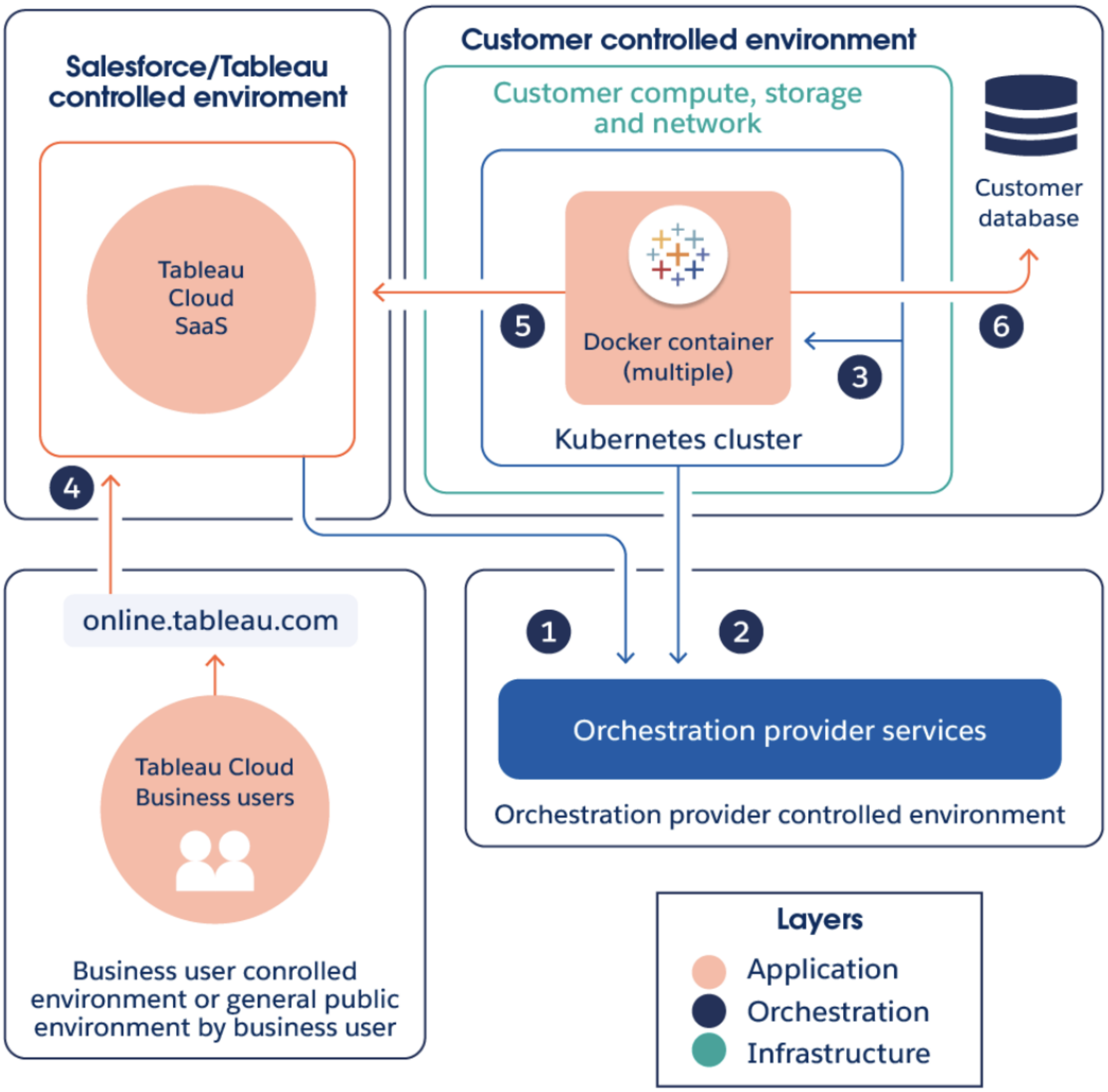
Step 2: Set Up Your Cluster

Step 3: Build Your Base Image and Publish

Step 4: Map a Domain to a Pool

Step 5: Create a Data Source for a Live Connection

# Step 2: Set Up Your Cluster




## Before you begin

Verify the following connectivity and access:

- Data Connect infrastructure, cluster, and container require networking access to the orchestration provider services (#2 in the image above) and to Tableau Cloud (outbound only, #5).

- Data Connect infrastructure, cluster, container, and Agent require networking access to your database (#6).

See Networking specifications.

## Deploy and configure

Run the following procedure on each computer in your organization where you want to run the Kubernetes cluster.

1. Verify that your secondary volume is unformatted. On the Linux node, run the following command:

   ```
   lsblk -f
   ```

   The following image shows an example where the extra volume `nvme1n1` on a cluster node is unformatted and the `FSTYPE` is empty:

   ```
   NAME          FSTYPE   LABEL           UUID                                 FSAVAIL FSUSE% MOUNTPOINT
   loop0         squashfs                                                            0   100% /snap/amazon-ssm-agent/6563
   loop1         squashfs                                                            0   100% /snap/core18/2785
   loop2         squashfs                                                            0   100% /snap/core20/1891
   loop3         squashfs                                                            0   100% /snap/snapd/19457
   loop4         squashfs                                                            0   100% /snap/snapd/19361
   loop5         squashfs                                                            0   100% /snap/core20/1950
   loop6         squashfs                                                            0   100% /snap/lxd/24061
   nvme1n1
   nvme0n1
   ├─nvme0n1p1   ext4     cloudimg-rootfs 4da61a03-cfdf-43ca-80d3-22c7444d0165  227.2G     6% /
   ├─nvme0n1p14
   └─nvme0n1p15 vfat     UEFI            77C5-7EA9                              98.3M     6% /boot/efi
   ```

2. On the Data Connect tab, under Pools, click **New Pool**. In the New Pool window, enter a pool name and then click **Create**.

3. On the Data Connect tab, under Cluster and Nodes, click New **Cluster**. In the New Cluster window, enter a cluster name and then click **Create**.

4. On the cluster you just created, click the **Actions** column and then click **New Node**. In the Add New Node window, click **Download File**.

A *cluster.tar* file is downloaded to your Downloads folder. This file contains the bootstrapping scripts that you will run on the node.

5. Copy the cluster.tar file onto your computer. The following example shows how to copy the tar file, extract the files, change the script to an executable file, and then run the script. The example shows this in the context of AWS. Change the file paths for your environment. You must run these commands as root or sudo user:

   ```
   > scp -i <xxx>.pem /Downloads/cluster.tar ec2-user@ip-<xx-xx-xx-xx>.us-west-2compute.internal:~/

   > ssh -i <xxx>.pem ex2-user@ip-<xx-xx-xx-xx>.us-west-2compute.internal

   > tar -xvf clustertar.tar

   > chmod +x onboard_node.sh preflight_check.sh

   > ./onboard_node.sh
   ```

   After the script is run, you see *Successfully performed all operations* in the terminal window and the Tableau team will begin the provisioning process.

6. On the Data Connect tab for your site, find in the pool you created in step 2. Under the Actions column, click **Assign Cluster** and then select the cluster you created in step 3.

7. Click the chevron (v) on the cluster to see the host name and available actions. If this information isn't displayed, you may need to reload the page. After confirming the hostname is the target node, click **Accept Node** and then click **Confirm**.

   The cluster node will transition to Provisioning status. Provisioning the node may take an hour or more.

8. When the status on your node changes to Available, navigate to the pool to which you assigned the cluster and click the actions button (**...**), and then click **Refresh Tokens**.

Verify that you are refreshing tokens for the correct pool, and then click **Confirm**.

9. Wait for the token refresh to complete. When complete, the pool status is set to Available. Navigate back to the cluster and click the chevron (`v`) to collapse the cluster name section. Click the actions button for the cluster (**...**) and then click **Get Docker Registry**.
   - If you receive an error when attempting this step, the registry is not yet deployed and the provisioning process may still be finalizing. Wait a few minutes and try again.
   - When the registry information (server name, user name, and password) is displayed, copy it for the next step: Step 3: Build Your Base Image and Publish.

## Data Connect setup workflow

Step 1: Contact Tableau

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# Step 3: Build Your Base Image and Publish

In this step, you will build your base image with the drivers you need, then publish the image to your Docker container registry.

## Before you begin

- Verify that you have your Docker container registry information from the previous step.
- Each pool can have its own unique base image and set of drivers.
- If you plan to connect using a TDC file, you will need to include this file in your base image. The system user, `tableau`, must have read access to this file. For more

information about how to create and store this file, see the Tableau Desktop help topic, Customize and Tune a Connection.

## Build the container

The following procedure shows an example on a RHEL distribution. You may need to install package manager tools or other tools specific to your distribution.

1. Log in to any node in your Kubernetes cluster. Install Docker and supporting tools as required:

```
sudo dnf install -y container-tools
sudo dnf install -y git podman-docker
```

2. Create the Dockerfile:

```
touch Dockerfile
```

3. Update the Dockerfile to include the drivers to support your connections. The commands specified in this Dockerfile will run during build time for your base image. For example:

```
# example base
FROM registry.access.redhat.com/ubi8
RUN yum -y update
WORKDIR /
# Go to https://tableau.com/support/drivers
# Follow the instructions to install your drivers for linux
CMD [“/bin/bash”]
```

The target directory for driver files will vary. See Tableau Driver Download for more details.

Example Dockerfile lines for public JDBC driver, using curl command to download the driver:

```
RUN mkdir -p /opt/tableau/tableau_driver/jdbc
RUN curl --location --output /opt/tableau/tableau_driver-
/jdbc/<file> <URL>
```

Example Dockerfile lines for non-public JDBC driver, using copy:

```
RUN mkdir -p /opt/tableau/tableau_driver/jdbc
COPY  <file> /opt/tableau/tableau_driver/jdbc
```

4. While you are still logged into your Kubernetes cluster node, set the variable POOL_ID with the value of your bridge pool id. To display the pool id value, open the Data Connect tab and click the bridge pool name.

   - Set the registry value that you copied to the respective values.

     ```
     REGISTRY_HOSTNAME=registry_host_name_you_copied
     REGISTRY_USERNAME=registry_user_name_you_copied
     REGISTRY_PASSWORD=registry_password_you_copied
     ```

   - Set the pool ID value:

     ```
     POOL_ID=<pool_id_value>
     ```

5. Build the container, which is used as your base image.

   ```
   docker build -f <path_to_dockerfile> -t $REGISTRY_
   HOSTNAME/bridge-base:$POOL_ID .
   ```

6. Login and push the image to the local container registry.

   ```
   docker login --username $REGISTRY_USERNAME $REGISTRY_HOSTNAME
   docker push $REGISTRY_HOSTNAME/bridge-base:$POOL_ID
   ```

7. Under the pool you are configuring, click the actions button (...) and click **Refresh Base Image**. This action will initiate a deployment using the base image and may take up to 10 minutes.

> **Note**: Whenever a new base image is created and refreshed, a new deployment will be created. The bridge agent used for the prior base image will persist as an unassigned asset. Do not delete unassigned bridge agents.

### Data Connect setup workflow

Step 1: Contact Tableau

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Step 3: Build Your Base Image and Publish

Step 4: Map a Domain to a Pool

Step 5: Create a Data Source for a Live Connection

## Step 4: Map a Domain to a Pool

The domain names that you specify in the allowlist are the server names used for the data source connection.

1. While on the Data Connect tab, under the pool section, select the pool you have assigned and click **New Domain** in the Actions column.

2. In the Domain text box, enter the URI of the domain using the information described in Allowlist registry rules. The domain URI that you specify will be scoped only to the pool you are configuring.

3. Under Domain permissions, confirm that the Allow radio button is selected.

4. When finished, click **Save**.

### Troubleshooting connection errors

You must configure your network infrastructure so that the Data Connect can reach all required data sources that you would like to connect to. To verify that Data Connect can reach your data sources, run the following curl command from the nodes where Data Connect will run:

```
$ curl -v $DB_HOSTNAME:$DB_PORT
```

If you have successfully set up your connection, you should see a collection of responses. Some examples are shown here:

- `Host $DB_HOSTNAME:$DB_PORT was resolved`: Confirms the DNS servers successfully resolved the hostname.
- `Connected to $DB_HOSTNAME`: Confirms the node has network connection.
- `Empty reply from server. Closing connection`: This is expected since curl is not a database client.
- `Could not resolve host: $DB_HOSTNAME`: There is an issue with DNS resolution.
- `Trying $DB_IP_ADDRESS:$DB_PORT`: When this message is followed by a hanging result, there is a network problem.

If you are using a third party for the Data Connection infrastructure, ensure that networking logic is not being disrupted by the third party.

## Data Connect setup workflow

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Step 5: Create a Data Source for a Live Connection

## Step 5: Create a Data Source for a Live Connection

To keep the data source up to date, Data Connect queries the database directly and returns the results of the query for use in the data source.

1. In Tableau Desktop, create a connection to the data source and choose the data you want to bring into Tableau.

2. Select **Server** > **Publish Data Source** to begin the publishing process. If you haven't already signed in to Tableau Cloud, you are prompted to do so.

3. In the Publish Data Source to Tableau Cloud dialog box, configure the various options for your data source and ensure you do the following:

   - Under Authentication, click **Edit** and select **Embedded password**.

   - Depending on the data that the data source is connected to or how you've configured the data source, the dialog can default to publishing a live connection or give you the option to publish a live connection or extract. If you're provided with options, select **Maintain a live connection**.

1. Click the **Publish** button. This opens a dialog box.

2. In the dialog box, click the **Publish** with Bridge button. This opens a browser window to Tableau Cloud.

3. In the Publishing Complete dialog box, click the **Done** button.

4. From the data source page, click the **Connections** tab and select the check box next to the connection.

5. In the dialog box next to Network type, if not selected automatically, select the **Private Network** radio button and click **Save**.

## Data Connect setup workflow

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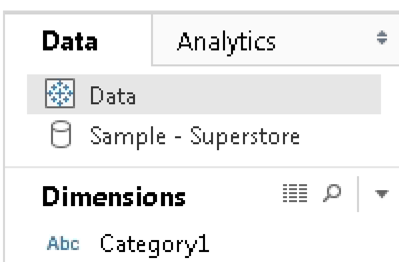
# Refresh Published Extracts from Tableau Desktop

You can send updates to published extracts from Tableau Desktop. This option is best for refreshing extracts of data you maintain on your local network.

1. In Tableau Desktop, connect to the data source that is published to Tableau Cloud or open a workbook that connects to it.

   To connect to the server, use the address **https://online.tableau.com**.

   In the Data pane, a data source published to a Tableau server shows a Tableau icon next to its name.

2. Select **Data** > **Tableau Data Server**, and then choose one of the following options:

   - **Refresh from Source**

     Refreshes the extract (full or incremental) using the data in the original data source.

This command is available only for extracts that include a connection to the original data source. If you connected directly to a extract file and then published it, the connection to the original data source is not included.

- **Append Data from Data Source**

  Updates the extract from another data source in the workbook.

- **Append Data from File**

  Updates the extract from the contents of a file if the original data source type of the extract is the same file-based data source or extract file.

**Note:** If you do not see the Tableau Data Server option, your data source may not be published to Tableau Cloud (in which case it will not show the icon above). If you see the Tableau Data Server option, but refresh commands are unavailable, the data source exists on the server, but it is not an extract. For example, it is a live connection to data hosted on the internet.

## See also

Topics in the Extracting Data section in the Tableau Help.

# Automate Extract Refresh Tasks from the Command Line

You can automate extract refresh tasks using the Tableau Data Extract Command-Line Utility. This is a command-line utility that comes with Tableau Desktop, through which you can refresh published extract data sources or append data to them from a file.

Requirements for using the Tableau Data Extract Command-Line Utility include the following:

- It is available with Tableau Desktop on Windows and can run only on a Windows system.
- It is not available with the trial version of Tableau Desktop.
- You can use it for extract data sources that don't use OAuth.
- You can use it to refresh single-connection data sources only. It does not work for multi-connection data sources.

**Deprecated October 2022:** This utility isn't available in later releases due to the multi-factor authentication requirement in Tableau Cloud. To refresh data sources or virtual connections data that Tableau Cloud can't reach directly, use Tableau Bridge instead. For more information, see Set Up a Bridge Refresh Schedule.

To initiate refresh jobs using a script, use tabcmd refreshextracts or REST API Run Extract Refresh Task.

## Run the utility

1. Open the Command Prompt as an administrator and change to the Tableau Desktop bin directory. For example:

   ```
   cd C:\Program Files\Tableau\Tableau Current\bin
   ```

2. Use either of the following commands, adding parameters described in the tables below.

   - `tableau refreshextract`
   - `tableau addfiletoextract`

**Note:** When using the utility, always specify `tableau` on the command line or in scripts, never `tableau.exe`.

**Note:** To troubleshoot, check the logs in the tableaucom.txt file in the \My Tableau Repository\Logs folder.

**Note:** In a multiple-site environment, specify the site to which the command applies.

## Syntax and parameters for the tableau refreshextract command

Use `tableau refreshextract` to refresh an extract on Tableau Server or Tableau Cloud. Refreshing an extract updates an existing extract with any modifications that have been made to the data source since the last refresh.

To see help for this command, at the Windows command prompt, type the following command:

```
tableau help refreshextract
```

### Using parameters

- All options have a full form that you use with a double hyphen (for example, `--server`).
- Some options also have a short form that you use with a single hyphen (for example, `-s`).
- If the value for an option contains spaces, enclose it in quotation marks.
- The source being refreshed must be the original data source, not an extract (`.hyper`).

## tableau refreshextract command options

| Short Form | Full Form | Description |
|---|---|---|
| | --source-username <user name> | A valid user name for the data source connection.<br><br>Use this option with --source-password, or use<br><br>--original-file instead of the user name and password options.<br><br>**Note**: You must provide the user name and password when refreshing a published extract, even if the data source was originally published with embedded credentials. |
| | --source-password "<password>" | The password for the data source user. |
| | --original-file <path and file name><br><br>or<br><br>--original-file <path and folder name> | Path and file name for the data source to be refreshed on the server. For example: --original-file c:\folder\file.csv<br><br>To refresh a multi-file data source, pass the path to a folder that contains the data files. For example: --original-file c:\folder.<br><br>If the file is on a network share, use the UNC format for the path: \\server\path\filename.csv |
| | --force-full-refresh | If the data source is set up for incremental refreshes, use this option to force a full extract |

| | | |
|---|---|---|
| | | refresh. If this option is not included, an incremental refresh is performed. Not all data sources support incremental refresh. |
| `-s <server http address>` | `--server <URL>` | The URL for the Tableau server on which the data is published.<br><br>For Tableau Cloud, specify `https://online.tableau.com`. |
| `-t <site id>` | `--site <siteid>` | In a multiple-site environment, specifies the site to which the command applies. For Tableau Cloud, use this argument if your user name is associated with more than one site. For Tableau Server, if you do not specify a site, the default site is assumed.<br><br>The site id is independent of the site name, and it is indicated in the URL when you view the site in a browser. For example, if the URL for the page you see after signing in to Tableau Cloud is<br><br>`https://online.tableau.com/t/vernazza/views`<br><br>the site id is *vernazza*. |
| | `--datasource <datasource>` | The name of the data source, as published to Tableau Server or Tableau Cloud. |
| | `--project <projectname>` | The project to which the data source belongs. If this option is not included, the default project is assumed.<br><br>If the project you want to specify is a child project nested within a project hierarchy, you must use this |

| | | |
|---|---|---|
| | | parameter along with the `--parent-project-path` parameter. |
| | `--parent-project-path path/to/-project` | If a project to which the data source is published is not at the top level of a project hierarchy, use this parameter along with the `--project` parameter to specify the path to a nested project.<br><br>Use the forward slash character (`/`) to delimit project levels in the hierarchy. Use the backward slash (`\`), to escape instances of forward or backward slash characters in project names.<br><br>For example, for a project named Sandbox, in project Social, under top-level Marketing:<br><br>`--project Sandbox --parent-project-path Marketing/Social` |
| `-u <user name>` | `--username <username>` | Valid Tableau Server or Tableau Cloud user. |
| `-p "<password>"` | `--password "<password>"` | The password for the specified Tableau Server or Tableau Cloud user. |
| | `--proxy-username <username>` | The user name for a proxy server. |
| | `--proxy-password "<password>"` | The password for a proxy server. |
| `-c "<path and file name>"` | `--config-file "<path and file name>"` | Path and file name information for a file containing configuration options for the command. Always enclose the path in double quotation marks. For |

more information, see Using a config file below.

## Sample tableau refreshextract command

The following command refreshes an extract named CurrentYrOverYrStats that has been published to Tableau Cloud. This command specifies the following:

- Tableau Cloud user and password.
- Tableau Cloud site and project names.
- The data source, which in this case is hosted by a cloud-based data source provider (for example, Salesforce.com), and the username and password to sign in to the hosted data source.

```
C:\Program Files\Tableau\Tableau Current\bin>tableau refreshex-
tract --server https://online.tableau.com --username email@-
domain.com --password "OurServerPwd" --site vernazza --project
"New Animations" --datasource "CurrentYrOverYrStats" --source-
username database_user@hosted_datasource_provider.com --source-
password "db_password"
```

To refresh an extract of file-based data source, provide the path to the original file from which you created the extract. If the file is on a network share, use the UNC format instead of a mapped drive.

```
C:\Program Files\Tableau\Tableau Current\bin>tableau refreshex-
tract --server https://online.tableau.com --username email@-
domain.com --password "OurServerPwd" --site vernazza --project
"New Animations" --datasource "CurrentYrOverYrStats" --ori-
ginal-file "\\server\path\filename.csv"
```

## Syntax for tableau addfiletoextract

Use `tableau addfiletoextract` to append file content to an extract that has been published to Tableau Server or Tableau Cloud. This command combines the two files.

If you want simply to update an existing extract with the latest changes, use the `refreshextract` command instead. Using `addfiletoextract` to update an existing extract will duplicate data instead.

To see help for this command, at the Windows command prompt, type the following command:

```
tableau help addfiletoextract
```

All options have a full form that you use with a double hyphen (for example, `--server`). Some options also have a short form that you use with a single hyphen (for example, `-s`). If the value for an option contains spaces, enclose it in quotation marks.

### tableau addfiletoextract command options

| Short Form | Full Form | Description |
|---|---|---|
| | `--file <path and file name>` | Path and file name information for the data file containing data to append. The file can be from Excel, Access, a Tableau data extract, or a delimited text file. It cannot be password protected. Use UNC format if the file is on a network share. For example, `\\server\path\filename.csv` |
| `-s <server http address>` | `--server <URL>` | The URL for the Tableau server on which the data is published.<br><br>For Tableau Cloud, specify `https://online.tableau.com`. |

| | | |
|---|---|---|
| `-t <site id>` | `--site <site id>` | In a multiple-site environment, specifies the site to which the command applies. For Tableau Cloud, you must include this argument if your user name is associated with more than one site. For Tableau Server, if you do not specify a site, the default site is assumed. |
| | `--datasource <datasource>` | The name of the data source, as published to Tableau Server or Tableau Cloud. |
| | `--project <projectname>` | The project to which the data source belongs. If this option is not included, the default project is assumed.<br><br>If the project you want to specify is a child project nested within a project hierarchy, you must use this parameter along with the `--parent-project-path` parameter. |
| | `--parent-project-path path/to/project` | If a project to which the data source is published is not at the top level of a project hierarchy, use this parameter along with the `--project` parameter to specify the path to a nested project.<br><br>Use the forward slash character (`/`) to delimit project levels in the hierarchy. Use the backward slash (`\`), to escape instances of forward or backward slash characters in project names.<br><br>For example, for a project named Sandbox, in project Social, under top-level Marketing: |

| | | |
|---|---|---|
| | | `--project Sandbox --parent-project-path Marketing/Social` |
| `-u <username>` | `--username <username>` | Valid Tableau Server or Tableau Cloud user. |
| `-p "<password>"` | `--password "<password>"` | The password for the specified Tableau Server or Tableau Cloud user. |
| | `--proxy-username <username>` | The user name for a proxy server. |
| | `--proxy-password "<password>"` | The password for a proxy server. |
| `-c "<path and filename>"` | `--config-file "<path and filename>"` | Path and file name information for a file containing configuration options for the command. Always enclose the path in double quotation marks. For more information, see Using a config file below. |

### Sample tableau addfiletoextract command

```
C:\Program Files\Tableau\Tableau Current\bin>tableau add-
filetoextract --server https://online.tableau.com --username
email@domain.com --password "OurServerPwd" --site vernazza --
project "New Animations" --datasource "CurrentYrOverYrStats" --
file "C:\Users\user2\Documents\DataUploadFiles\AprMay.csv"
```

## Using a config file

You can use a plain text editor, such as Notepad or Text Edit, to create a config (configuration) file that you can use with `tableau refreshextract` or `tableau addfiletoextract`. A config file can be useful if you expect to update the same data source regularly over time. Instead of having to type the same options each time you run a command, you specify the config file. A config file also has the advantage of not exposing user names and passwords on the command line.

## Create the config file

For example, say you created a file called config.txt and saved it to your Documents folder. And in the file, you included the parameter information shown below.

For an extract from a hosted data source, published to Tableau Cloud, where **server** is **https://online.tableau.com**:

```
server=https://online.tableau.com
site=vernazza
username=email@domain.com
password=OurPassword
project=New Animations
datasource=CurrentYrOverYrStats
source-username=database_user@hosted_datasource_provider.com
source-password=db_password
```

## Reference the Config File from the Command Line

After you create the config file, you run the `tableau refreshextract` or `tableau add-filetoextract` command, pointing to the config file as the only option you use on the command line, and enclosing the config file’s path in double quotation marks. The syntax is as follows:

```
tableau refreshextract --config-file "<path>"
```

For example, to refresh the extract specified in the sample in the Create the config file section, you would run the following command (making sure that you are working in the bin directory for your version of Tableau Desktop):

```
C:\Program Files\Tableau\Tableau Current\bin>tableau refreshex-
tract --config-file "C:\Users\user1\Documents\config.txt"
```

### Syntax Differences for Config Files

The syntax for specifying options inside a config file differs from the syntax you use on the command line in the following ways:

- Option names do not begin with dashes or hyphens.
- You use an equals sign (with no spaces) to separate option names from option values.
- Quotation marks are not necessary (or allowed) around values, even when they include spaces (as for the `project` option in the example shown earlier).

## Use Windows Task Scheduler to Refresh Extracts

You can use Windows Task Scheduler, in combination with the Tableau Data Extract Command-Line Utility, to automate regular updates to Tableau Cloud data sources from within your corporate firewall. You can configure a task to occur once per day, week, or month, or after a specific system event. For example, run the task when the computer starts.

To learn more, see the Task Scheduler How To... page in the Microsoft TechNet library.

# Set Up for Data-Driven Alerts

When data reaches important thresholds for your business, data-driven alerts automatically send email notifications to key people users specify. As a Tableau Cloud administrator, you set up data-driven alerts much like you do subscriptions. For information about how users create and manage these alerts, see Send Data-Driven Alerts in Tableau User Help.

## Manage all data-driven alerts in a site

1. At the top of the browser window, click **Tasks**, and then click **Alerts**.

2. Select any alerts you want to update.

3. From the **Actions** menu, do any of the following:

   - Add or remove yourself as a recipient.
   - Edit alerts to change data thresholds, delivery schedules, and the full list of recipients.
   - Change alert ownership to different users, or delete alerts.

## Disable data-driven alerts for a site

Data-driven alerts are supported for all sites by default, but administrators can disable them for specific ones.

1. While viewing a site, click **Settings** on the left-side navigation pane.
2. Under Data-Driven Alerts, uncheck **Let users create alerts and receive alert emails**.
3. Click **Save**.

## Suspend data-driven alerts

### Resume suspended alerts

If an alert fails enough times, you'll receive a notification email that your alert has been suspended. There are a few ways that administrators or alert owners can resume a suspended alert:

- From the Tasks > Alerts area of Tableau web pages, an icon appears in the Last checked column to indicate that the alert is suspended. Select **...** > **Resume Alert** to resume the alert.
- Click **Resume Alert** in the notification email to resume the alert. A notification will either allow you to resume the alert, or indicate that the view has changed and the alert should be deleted.

- From the Alerts panel of the affected view or workbook. To resume the alert from a view or workbook, select **Alert** to open the Alerts panel. An icon appears next to the suspended alert. Select **Actions** > **Resume Alert** on the affected alert to resume.

Alert owners will receive an email notification when the alert is working again.

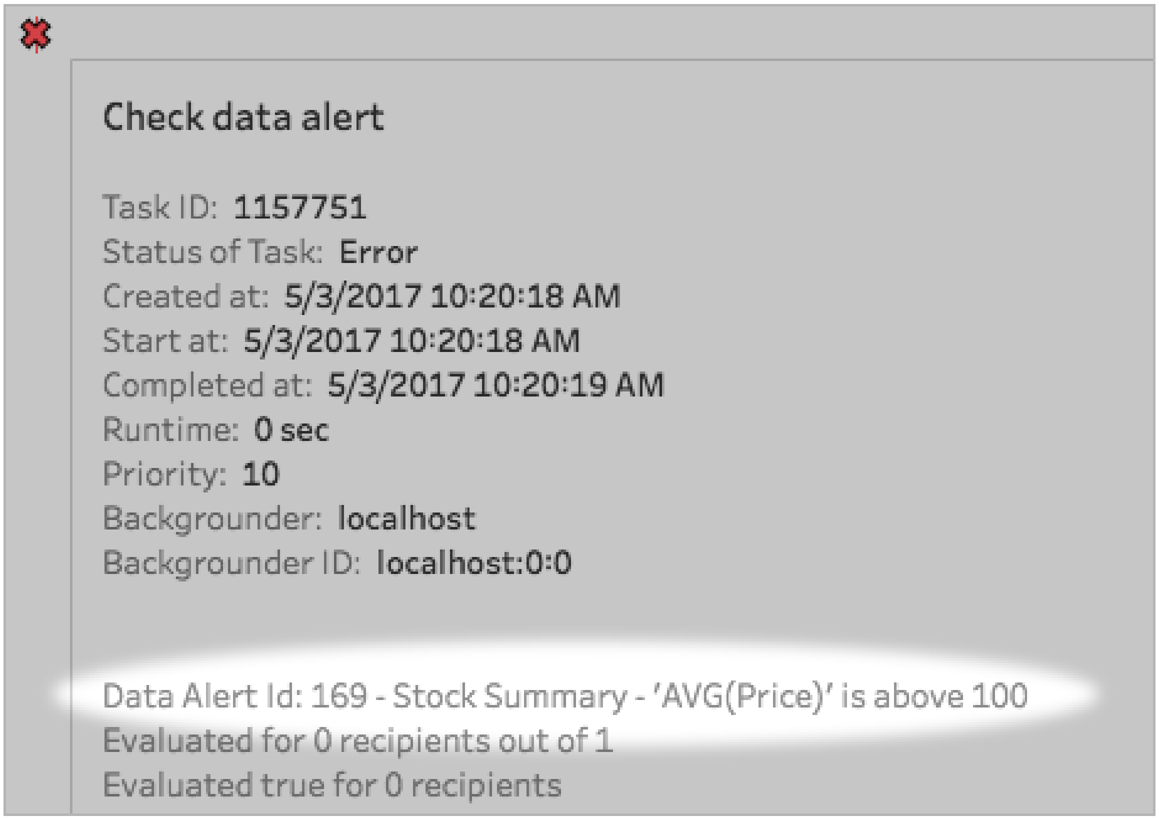
## Identify and fix failing alerts

As an administrator, you can proactively identify failing alerts that users may be unaware of. To check:

1. Select Status in your site menu.
2. Select Background tasks for non-extracts.
3. From the Task dropdown menu, select Check if Data Alert is True.
4. In the far right, click Error to see a list of failing alerts.
5. Hover over the red failure icon to display a tooltip with alert details.

To determine the alert owner, look for the alert ID number in the data_alerts table of the Tableau Cloud Repository. (In the alert management area of a site, you can also look for the alert name following the number, but be aware that multiple different alerts may use the same name.)

**Note:** Alert owners are automatically notified when an alert fails ten times. Administrators can customize when alert owners receive notifications.




Failing alerts are often caused by content changes on Tableau Cloud. Encourage users to recreate alerts if changes like the following occur:

- A workbook, view, or data field is removed or renamed.
- Database credentials embedded in workbooks expire.
- Data Driven Alerts require embedded credentials for Live Connections, the use of OAuth isn't currently supported with Alerts.
- A data source becomes inaccessible.

# Set Up for Metrics

**Retirement of the legacy metrics feature**

Tableau's legacy metrics feature was retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. In October 2023, Tableau retired the ability to embed legacy metrics in Tableau Cloud and in Tableau Server version 2023.3. With Tableau Pulse, we've developed an improved experience to track metrics and ask questions of your data. For more information, see Create Metrics with Tableau Pulse to learn about the new experience and Create and Troubleshoot Metrics (Retired) for the retired feature.

Metrics are a type of Tableau content that tracks the value of an aggregate measure, such as sum of sales. Because metrics refresh frequently and display their current value in an easy-to-glance format, they are useful for monitoring data. To learn more about how users work with metrics, see Create and Troubleshoot Metrics (Retired).

## Ensure that users can create metrics

When metrics are enabled for a site, all users with a Creator or Explorer (can publish) site role can create metrics, if they have the correct permissions.

Metrics are created from existing views on a Tableau site. To ensure that users can create metrics on a view, verify that:

- Users have the Create/Refresh Metrics permission capability for the workbook that the view belongs to. For more information, see Permissions.
- The password for the data source is embedded, if it is required. For more information, see Edit Connections on Tableau Cloud.

## Disable metrics for a site

Metrics are enabled on all sites by default. You can disable metrics on a per-site basis.

1. On the site where you want to disable metrics, from the navigation panel, click **Settings**.
2. Under **Metrics Content Type**, uncheck **Enable metrics**.
3. Click **Save**.

When you disable the metrics content type, metrics no longer appear on the site. The data for any existing metrics is retained, but these metrics will no longer refresh. If you re-enable metrics, these metrics will reappear and resume refreshing.

You can also disable metrics on a specific workbook by denying the Create/Refresh Metrics permission capability. For more information, see Permissions.

## Manage metrics

Though metrics are created from a view, they are not tied to the view like alerts or subscriptions. This means you can manage metrics similar to how you manage workbooks, by renaming, moving, tagging, deleting, or setting permissions on a metric.

Find metrics to manage either by navigating the project hierarchy or via the following paths.

- To see all metrics on a site: Navigate to the Explore section, then select **All Metrics**.
- To see metrics created from all the views in a workbook: Navigate to the workbook, then select the **Connected Metrics** tab.
- To see metrics created from a single view: Open the view, then select **Watch** > **Metrics** from the toolbar.

## Address failing and suspended metric refreshes

Metric refreshes may fail for one of the following reasons.

- The connected view was deleted or modified.
- Permissions changed for the connected view.
- The password for the data source is no longer embedded or is no longer valid.
- The metric owner doesn’t have the required site role to refresh the metric. A site role of Creator or Explorer (can publish) is required.
- There was a temporary connectivity issue, which will resolve itself.

**Note:** If the metric refresh is suspended because the owner doesn’t have the required site role for it to refresh, you won’t be able to resume the refresh unless you change the owner.

For more information on why metric refreshes fail and what users can do to fix them, see Fix failing refreshes.

Encourage users to overwrite a metric if the connected view was modified in a way that caused the refresh to fail, but the view is still available. Users can overwrite a metric by creating a metric with the same name in the same project as the existing metric.

### Resume suspended refreshes

If the cause of the failure is fixed, for example by embedding the correct password for the data source, you can resume the metric refresh.

1. Locate the affected metric. Metrics with suspended refreshes display the text **Refresh Suspended**, instead of the time of last refresh, in grid and list view.
2. On the warning message, click **Resume refresh.**

Tableau attempts to perform the refresh. If this attempt succeeds, you'll receive a confirmation, and the refresh will resume on schedule. If the attempt doesn't succeed, the refresh remains suspended. You or the metric owner can delete or overwrite the metric, or keep it to reference historical data.

## Monitor metric activity with administrative views

Use the administrative views for Tableau Cloud to monitor metric activity.

To monitor metric refresh activity:

1. From the navigation panel, click **Site Status**.
2. Select the **Background Tasks for Non Extracts** dashboard.
3. Filter for the tasks **Find Metrics to Update** or **Update All Metrics on a View**. For more information, see Background Tasks for Non Extracts.

To monitor more metric events, create a custom view using Admin Insights. Connect to the Admin Insights **TS Events** data source and use the **Event Name** dimension to see the following events: Create Metric, Delete Metric, Move Metric From, Move Metric To, and Update Metric. For more information, see Use Admin Insights to Create Custom Views.

# Troubleshoot Refresh Issues

When Tableau Cloud is unable to complete a scheduled refresh, an alert appears to indicate that the refresh has failed. If a scheduled refresh fails five consecutive times, Tableau Cloud suspends the refresh. When a refresh is suspended, Tableau Cloud does not try to run it again until you take an action that attempts to correct the cause of the failure.

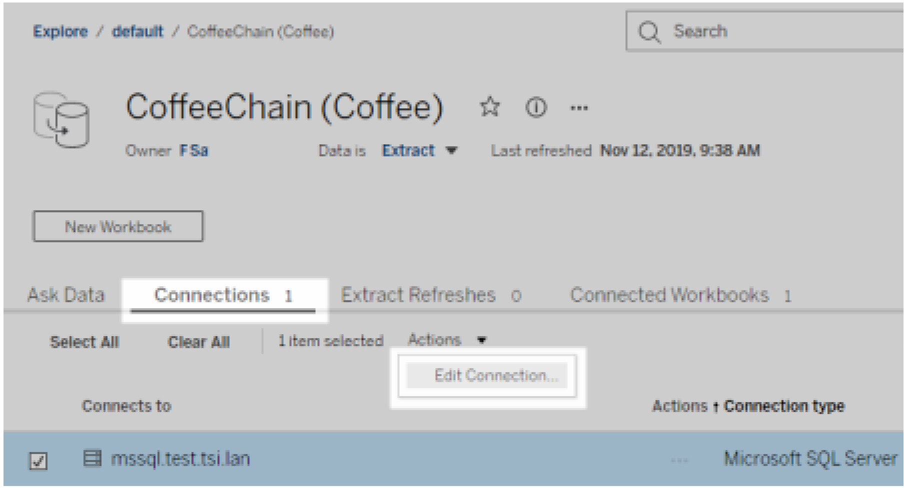
To display an alert that describes the reason the refresh failed, select the notification icon () in the upper-right corner of the browser window.

## Resolve errors and resume suspended refreshes

To help resolve refresh issues, you can take any of these actions, based on the cause indicated in the alert:

- **Errors related to access token validation or user credentials**

  To correct these issues, click the **Connection Details** link in the alert to go to the **Connection** tab on the data source page for the data source whose scheduled failed. On the Connections tab, select the check box next to the data connection, and click **Edit Connection** so you can update a user name or password, or select a different access token. After you update the connection information, Tableau Cloud restarts the refresh schedule.




If you originally embedded the credentials or other data connection information when you published the workbook or data source from Tableau Desktop, you can also republish the workbook or data source. As part of the publishing process, you can choose to set a new refresh schedule. Otherwise, Tableau Cloud restarts the existing schedule.

- **Errors that indicate the database was unreachable**

  Confirm that the underlying database is online and that you can sign in to access its data. You can use the **Try again** link in the alert to restart the refresh schedule.

- **Errors related to Tableau Bridge**

  To troubleshoot errors related to Bridge, see Troubleshoot Issues with Bridge.

# Troubleshoot Subscriptions

## "The view snapshot in this email could not be properly rendered."

If you receive a subscription with this error message, there could be several reasons:

- **Missing credentials**: Some views are published with embedded credentials. You may receive the above error if the embedded credentials are now out-of-date, or if the view was republished without the embedded credentials.
- **Database temporarily down**: If the view has a live database connection and the database was temporarily down when the subscription was being generated, you might receive the above error.

## Can't see images in email

For images of content to display in a subscription email, users subscribed to views, in addition to **View** permissions, must also have **Download Image/PDF** permissions. For more information, see Permissions.

## Can't subscribe

If you can see a view on Tableau Server and it has a subscription icon () in the upper right corner, you can subscribe to it.

To subscribe to a view, the view you're subscribing to must either have embedded credentials for its data source or not rely on credentials at all. Examples of the latter include a workbook that connects to an extract that isn't being refreshed, or a workbook whose data is in a file that was included with the workbook at publish time. Embedding credentials is a step that happens in Tableau Desktop (see the Tableau Help for details).

## No subscription icon

It's possible to see a view but be unable to subscribe to it. This can happen :

- **The view uses a live database connection**: Views with live database connections, where you’re prompted for your database credentials when you first click the view, aren't available for subscription. A subscription includes a view (or workbook), data, and a schedule. To deliver the data required for the view, Tableau Server either needs embedded database credentials or data that doesn't require credentials. Where live database connections are concerned, Tableau Server doesn't have the credentials, only the individual users do. This is why you can only subscribe to views that either don’t require credentials or have them embedded.

## Missing attachments

You can add a PDF attachment to your subscription if your administrator has it enabled. If the PDF attachment is missing from your subscription, it might be because the size of the PDF exceeds the email size limit. In Tableau Cloud, each site has a maximum email size of 2MB. For details, see Tableau Cloud Site Capacity.

Starting in Tableau 2024.1, you can send emails with your own sending server, which will allow you to send attachments with a maximum email size of 10MB.

To enable this feature, navigate to site settings, find the **Customize Email Notifications** section, and check the box next to **Use your SMTP server**.

> Note: If you're using your own sending server, Tableau will attempt to send a subscription email with a subset of the attachment that is under the 10MB limit, but this is not guaranteed. If Tableau can't send the attachment, you'll see a message letting you know that the attachment is too large to send.

## Suspended Subscriptions

By default, a subscription is suspended after 5 consecutive subscription failures.

### Resume suspended subscriptions

Subscription owners can resume subscriptions:

- from My Subscription tab in Content Settings
- from the Subscriptions tab per workbook

When a subscription is resumed, the alert failing count goes back to zero. The next evaluation of the subscription will occur at the next scheduled evaluation time.

### Can't set subscription frequency to "When Data Refreshes"

You can set subscriptions to run when an extract refreshes if the workbook uses a connection to a published extract. When creating or modifying a subscription, you might not see a **Frequency** option if the workbook uses:

- An extract refresh through Tableau Bridge
- More than one extract refresh
- A live data connection

**Note**: If a workbook's data source contains multiple connections where one connection is to a published extract and the other connection requires Tableau Bridge, you might be able to set the subscription frequency to **When Data Refreshes**. If selected, the subscription will run on the extract refresh, not the Tableau Bridge refresh.

## Missing data quality warnings or sensitivity labels

Data quality warnings and sensitivity labels are included in subscription emails when:

- Tableau Server or Tableau Cloud is licensed with Data Management. For more information, see About Data Management.
- Tableau Catalog is enabled. For more information, see Enable Tableau Catalog.
- In site settings, the check box under **High-Visibility Data Labels in View and Workbook Subscriptions** is selected. (In earlier versions, the check box is under **Data Quality Warnings in Subscriptions**.)

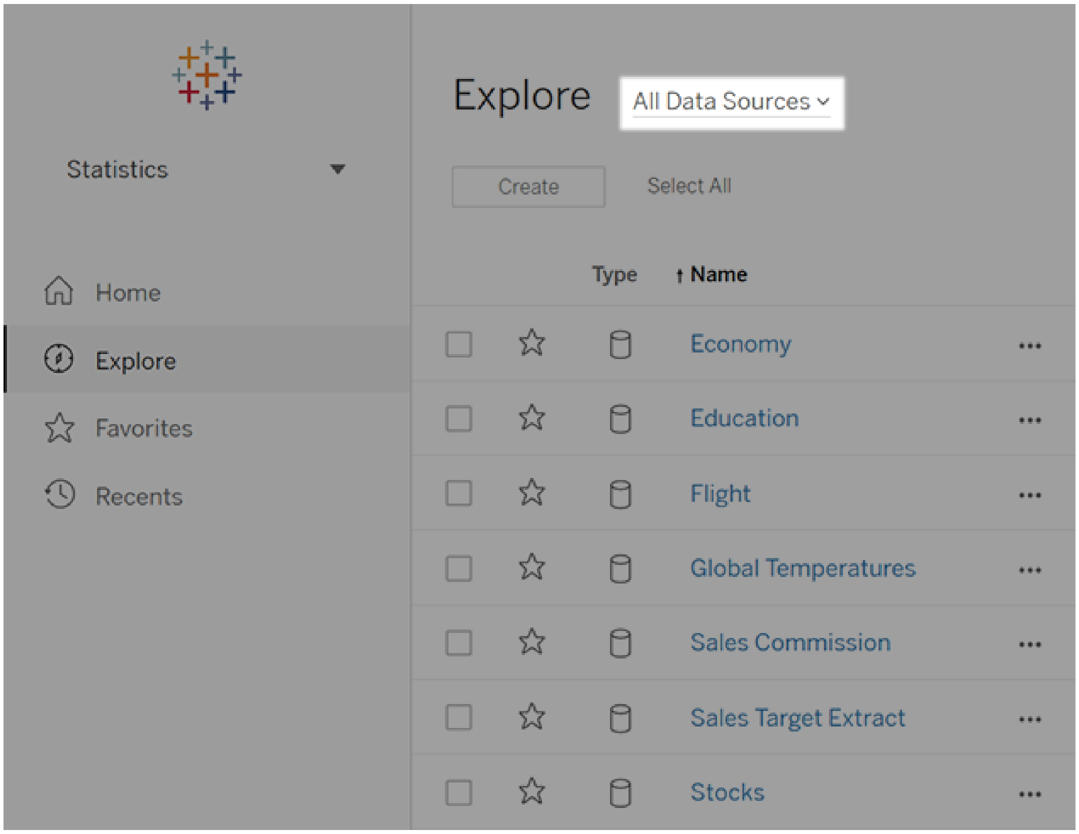
# Manage Connection Information

## Edit Connections on Tableau Cloud

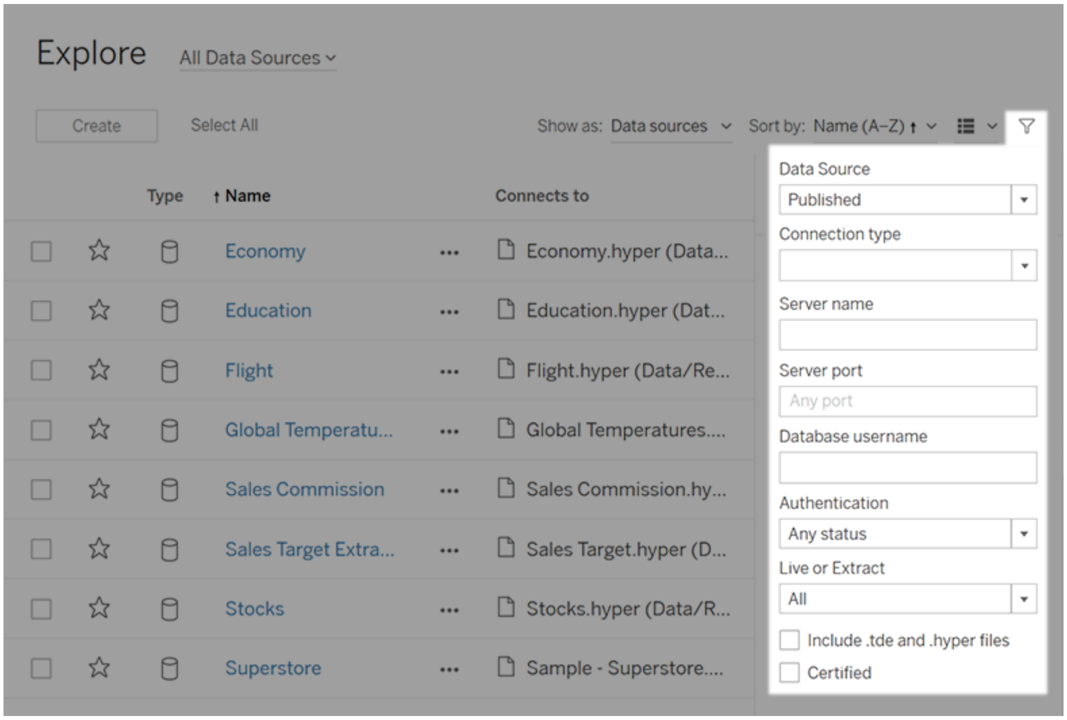
Administrators and data source owners can manage a published data source's connection information. The connection information describes the data source, its owner, and how to access the data. You can embed database credentials in the connection to allow users to access the data directly or to enable scheduled refreshes for extracts. Alternatively, you can set the connection so that users are prompted to sign in. You can also change the server name for cloud-based data.

The data source owner or a site administrator can manage this information directly on the site. For example, you can update tags or change the data source owner, without having to republish the data source.

1. On the site that has the data source you want to modify, open the Explore page, then filter to show **All Data Sources**.




If there are a large number of data sources, use filters to narrow the list.




2. Select the check box next to the data source you want to update, and on the **Actions** menu, select **Edit Connection**.

   **Note:** To edit the connection type of extract refreshes for online schedules to use Tableau Cloud instead of Bridge, see Change the connection type of a refresh to use Tableau Cloud.

3. Update the connection information and click **Save**.

   For connections that support using saved credentials to refresh the data, see Refresh Data Using Saved Credentials.

> **Note**: The **Test connection** button doesn't support Bridge connections. As an alternative to testing your connection with this button, consider running a manual

refresh to test the connection instead. For more information about running a manual refresh, see Start a Refresh Task Manually.

4. Refresh the Data Connections page (press F5 or Ctrl+R) for your changes to take effect.

## OAuth Connections

An alternative to storing your sensitive database credentials with Tableau Cloud or Tableau Server is to create connections using the **OAuth 2.0** standard. The following connectors support OAuth authentication:

- Anaplan
- Azure Data Lake Storage Gen2, Azure SQL, Azure Synapse
- Box
- Esri ArcGIS Server
- Databricks
- Dremio
- Dropbox
- Google Ads, Google Analytics, Google BigQuery, Google Drive
- LinkedIn Sales Navigator
- Marketo
- OneDrive
- Oracle Eloqua
- QuickBooks Online
- Salesforce, Salesforce CDP
- SAP HANA
- ServiceNow ITSM
- Snowflake

From Tableau, when users sign in to data with a connector that uses OAuth, users are redirected to the authentication provider's sign in page. After users provide their credentials and authorize Tableau to access their data, the authentication provider sends Tableau an **access token** that uniquely identifies Tableau and the users. This access token is used to access data on users' behalf. For more information, see Overview of the OAuth process below.

Using OAuth-based connections provides the following benefits:

- **Security:** Your database credentials are never known to or stored in Tableau Cloud, and the access token can be used only by Tableau on behalf of users.
- **Convenience:** Instead of having to embed your data source ID and password in multiple places, you can use the token provided for a particular data provider for all published workbooks and data sources that access that data provider.

> **Note:** For live connections to Google BigQuery data, each workbook viewer can have a unique access token that identifies the user, rather than sharing a single username and password credential.

## Overview of the OAuth process

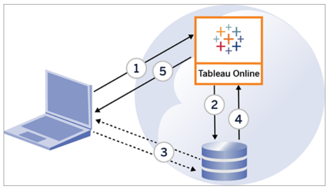
The following steps describe a workflow in the Tableau environment that calls the OAuth process.

1. A user takes an action that requires access to a cloud-based data source.

   For example, you open a workbook that’s published to Tableau Cloud.

2. Tableau directs the user to the cloud data provider’s sign in page. The information that is sent to the data provider identifies Tableau as the requesting site.
3. When the user signs in to the data, the provider prompts the user to confirm their authorization for Tableau Cloud to access the data.
4. Upon the user's confirmation, the data provider sends an access token back to Tableau Cloud.

5. Tableau Cloud presents the workbook and data to the user.




**Note**: Single use refresh tokens (sometimes called rolling refresh tokens or refresh token rotation) are not supported for OAuth connections to Tableau at this time. Support for these tokens are planned for a future release.

The following user workflows can use the OAuth process:

- Creating a workbook and connecting to the data source from Tableau Desktop or from Tableau Cloud.
- Publishing a data source from Tableau Desktop.
- Signing in to a Tableau Cloud site from an approved *client*, such as Tableau Mobile or Tableau Desktop.
- Using Tableau Bridge to access on-premises data. See Connectivity with Bridge.

## Default saved credential connectors

*Saved credentials* refers to the functionality where Tableau Cloud stores user tokens for OAuth connections. This allows users to save their OAuth credentials to their user profile on Tableau Cloud. After they've saved the credentials, they won't be prompted when they subsequently publish, edit, or refresh when accessing the connector.

**Note**: When editing Tableau Prep flows on the web, you may still be prompted to reauthenticate.

All supported connectors are listed under **Saved Credentials for Data Sources** on users' **My Account Settings** page on Tableau Cloud. Users manage their saved credentials for each connector.

Access tokens for data connections

You can embed credentials based on access tokens with data connections, to enable direct access after the initial authentication process. An access token is valid until a Tableau Cloud user deletes it, or the data provider revokes it.

It's possible to exceed the number of access tokens your data source provider allows. If that's the case, when a user creates a token, the data provider uses the length of time since last access to decide which token to invalidate to make room for the new one.

Access tokens for authentication from approved clients

By default, Tableau Cloud sites allow users to access their sites directly from approved Tableau clients, after users provide their credentials the first time they sign in. This type of authentication also uses OAuth access tokens to store the users' credentials securely.

For more information, see Access Sites from Connected Clients.

## Default-managed keychain connectors

*Managed keychain* refers to the functionality where OAuth tokens are generated for Tableau Cloud by the provider and shared by all users in the same site. When a user first publishes a data source, Tableau Server prompts the user for the data source credentials. Tableau Cloud submits the credentials to the data source provider, which returns OAuth tokens for Tableau Cloud to use on behalf of the user. On subsequent publishing operations, the OAuth token stored by Tableau Cloud for the same class and username is used so that the user isn't prompted for the OAuth credentials. Should the data source password change, then the preceding process is repeated and the old token is replaced by a new token on Tableau Cloud.

Additional OAuth configuration on Tableau Cloud isn't required for the default-managed keychain connectors:

- Google Analytics, Google BigQuery, and Google Sheets (deprecated in March 2022)
- Salesforce

## Configure custom OAuth

Beginning with 2021.2, as a site admin, you can configure a custom OAuth client, for each OAuth supported data provider (connector), to override the pre-configured OAuth client settings for your site. You might consider configuring a custom OAuth client to support securely connecting to data that requires unique OAuth clients.

When a custom OAuth client is configured, default configurations are ignored and all new OAuth credentials created on the site use the custom OAuth client by default.

**Important:** Existing OAuth credentials established before the custom OAuth client is configured are temporarily usable but both site admins and users must update saved credentials to help ensure uninterrupted data access.

Step 1: Prepare the OAuth client ID, client secret, and redirect URL

Before you can configure the custom OAuth client, you must collect the information listed after this. After you have this information, you can configure the custom OAuth client for each of the OAuth supported connector.

- **OAuth client ID and client secret:** First register the OAuth client with the data provider (connector) to retrieve the client ID and client secret. Supported connectors include:
  - Azure Data Lake Storage Gen2, Azure SQL Database, Azure Synapse
  - Databricks
  - Dremio
  - Dropbox
  - Google Analytics, Google BigQuery, Google Sheets (deprecated in March 2022)
  - Intuit Quick books Online
  - Salesforce, Salesforce CDP
  - Snowflake (For more information, see OAuth Configuration and Usage in the Tableau Connector SDK documentation.)

- **Redirect URL:** Note the pod your Tableau Cloud site is located to ensure you enter the correct redirect URL during the registration process in **Step 2** below. The redirect URL uses the following format:

  https://<your_pod>.online.tableau.com/auth/add_oauth_token

  For example, https://us-west-2b.online.tableau.com/auth/add_oauth_token

  > **Note:** For more information about pods, see the Salesforce Trust page.

Step 2: Register OAuth client ID and client secret

Follow the procedure described below to register the custom OAuth client to your site.

1. Sign in to Tableau Cloud using your site admin credentials and navigate to the **Settings** page.

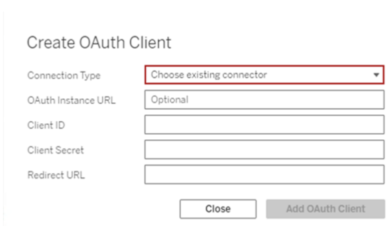
2. Under OAuth Clients Registry, click the **Add OAuth Client** button.

3. Enter the required information, including the information from **Step 1** above:

   a. For **Connection Type**, select a database class value that corresponds to the connector whose custom OAuth client you want to configure.

   b. For **Client ID**, **Client Secret**, and **Redirect URL**, enter the information you prepared in **Step 1** above.

   c. Click the **Add OAuth Client** button to complete the registration process.



4. (Optional) Repeat step 3 for additional connectors.

5. Click the **Save** button at the bottom or top of the Settings page to save changes.

Step 3: Validate and update saved credentials

To help ensure uninterrupted data access, you (and your site users) must delete the previous saved credentials and add it again to use the custom OAuth client instead of the default OAuth client.

1. Navigate to your **My Account Settings** page.

2. Under **Saved Credentials for Data Sources**, do the following:

    1. Click **Delete** next to the existing saved credentials for the connector whose custom OAuth client you configured in **Step 2** above.

    2. Next to the same connector, click **Add,** and follow the prompts to 1) connect to the custom OAuth client configured in **Step 2** above and 2) save the latest credentials.

Step 4: Notify users to update their saved credentials

Make sure you notify your site users to update their saved credentials for the data provider whose custom OAuth client you configured in **Step 2** above. Site users can use the procedure described in Update saved credentials to update their saved credentials.

## Connect Tableau Cloud Web Authoring to Salesforce Data Cloud

The Salesforce Data Cloud connector was released in Tableau Cloud October 2023. This connector seamlessly connects Tableau to Data Cloud, and is available for Tableau Desktop, Tableau Cloud, Tableau Server, and Tableau Prep. Compared to the older CDP connector, the Salesforce Data Cloud connector is easier to connect with, shows object labels instead of API names, and is powered by accelerated queries.

**Note**: Data Cloud was previously called Customer Data Platform (CDP). The Customer Data Platform connector was deprecated in October 2023, was made unavailable for new connections in Tableau Cloud June 2024, and is removed entirely from Tableau Cloud October 2024 and later. Existing assets that use the CDP connector must be recreated using the Salesforce Data Cloud connector.

Connect Tableau Cloud Web Authoring to the Customer Data Platform by completing the following steps.

1. From an **Explore** page, select **New**, then **Workbook**. Or select the **Data** menu, then **New Data Source**.
2. In the **Connect to Data** window, select the **Connectors** tab.
3. Select **Salesforce Data Cloud**.
4. Log in and allow access when prompted.
5. Select the **Data space**. Data spaces represent a logical segregation of the data in Data Cloud. Data spaces didn't exist before the Salesforce June' 23 release.
6. Use **Object** to filter by the type of Data Cloud object, or select **All Objects**.

## External OAuth for SAP HANA

Starting in Tableau 2024.3 for Tableau Cloud, you can use OAuth 2.0/OIDC to federate identity from an external identity provider to HANA.

Depending on the identity provider, there are different steps needed to configure the integration. This is a high-level overview.

**Note**: Single use refresh tokens are not supported for OAuth connections to Tableau at this time. In most cases, you can set up your identity provider (such as Okta) to use rolling refresh tokens instead. For more information, see your provider’s OAuth documentation.

### Configure IDP on HANA

For information on configuring your IdP on HANA, see Single Sign-On Using JSON Web Tokens in the SAP help system.

Here are some examples of different ways to set up IdP:

- Okta IdP using HANA Cockpit: Empower your users to access SAP HANA data with Okta identities
- Azure IdP using HANA Studio: Setting Up an SAP HANA Instance with OAuth or SSO

### Configure the IDP

1. Create OAuth clients on the IDP for Tableau Desktop, and Tableau Server or Tableau Cloud. The Desktop client should enable `PKCE` and use `http://localhost` redirects.

2. Create the Tableau OAuth config files. For details on how to do this, see OAuth Configuration and Usage on GitHub, and examples here. We welcome examples for other IDPs.

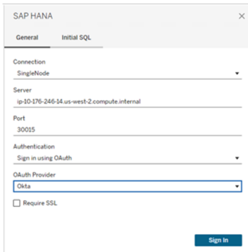
   a. Be sure to prefix the Tableau OAuth config IDs with “`custom_`”.

   b. If your IDP supports dynamic localhost port then disable `OAUTH_CAP_FIXED_PORT_IN_CALLBACK_URL`. If your IDP does not support this, make sure to add several localhost callback URLs to the allowlist in the config file and on the IDP.

3. Install the new Tableau OAuth configuration files in the `OAuthConfigs` folder associated with each application on desktop hosts (Tableau Desktop, Tableau Prep Builder, Tableau Bridge), and on each Tableau Server and Tableau Cloud site that will be using OAuth, via the site settings page. For more details, see Custom OAuth Configs on Desktop and Site Level OAuth Clients.

### Connect to HANA

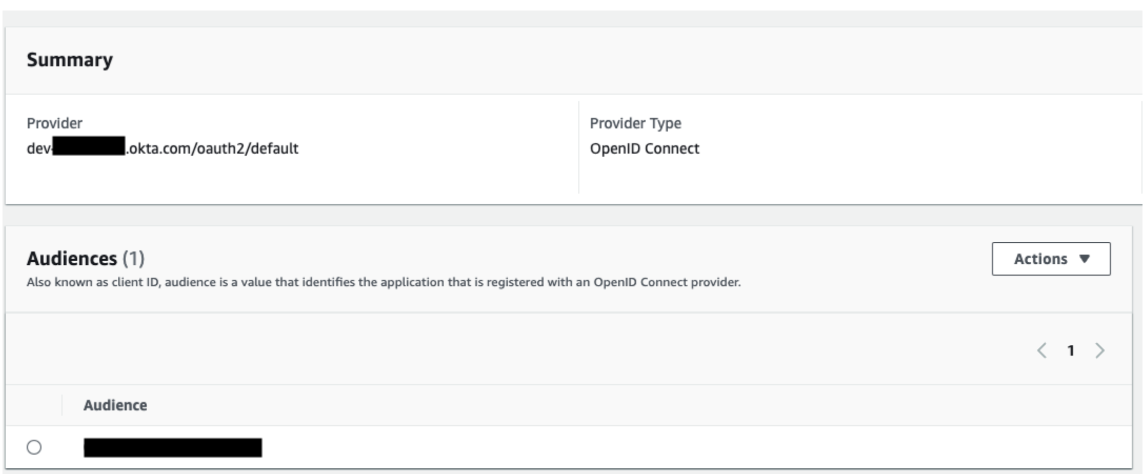
The user must select **Sign in using OAuth**, and select the **OAuth Provider** installed earlier.




Okta

If using Okta it’s better to use a “custom authorization server” rather than the “org authorization server.” The custom authorization servers are more flexible. There is a custom authorization server created by default, which is called “default”. The authorization URL should look like this:

```
https://${yourOktaDomain}/oauth2/{authServerName}/v1/authorize
```




## External OAuth for Snowflake

Starting in Tableau 2024.3, you can use OAuth 2.0/OIDC to federate identity from an external identity provider to Snowflake.

Depending on the identity provider, there are different steps needed to configure the integration. This is a high-level overview intended to guide your configuration without providing the necessary details you'll find in your identity provider documentation. It is assumed you are familiar with configuring OAuth and understand the technical details required in setting up authentication with an external identity provider.

Configure IDP on Snowflake

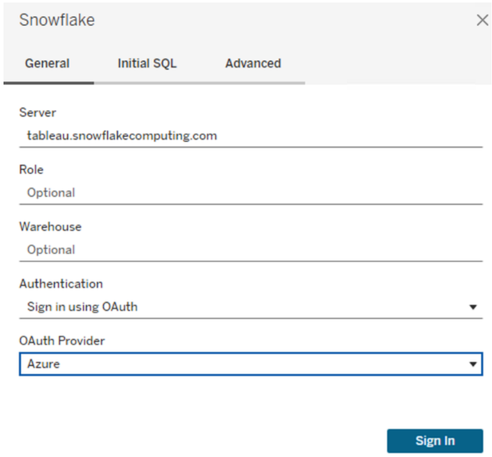
For information on configuring your IDP, see External OAuth overview in Snowflake's help system.

Configure the IDP on Tableau

1. Create OAuth clients on the IDP for Tableau Desktop, and on Tableau Cloud or Tableau Server. The Desktop client enables PKCE and uses `http://localhost` redirects.
2. Create the Tableau OAuth config file. For details on how to do this, see OAuth Configuration and Usage on github, and examples here. We welcome additional examples for other IDPs.
    A. Be sure to prefix the Tableau OAuth config IDs with “custom_”.
    B. If your IDP supports dynamic localhost port, disable `OAUTH_CAP_FIXED_PORT_IN_CALLBACK_URL`. If your IDP does not support this, make sure to add several localhost callback URLs to the allowlist in the config file and on the IDP.
3. Install the new Tableau OAuth configuration files in the OAuthConfigs folder associated with each application on desktop hosts (Tableau Desktop, Tableau Prep Builder, Tableau Bridge), and on each Tableau Server and Tableau Cloud site that will be using OAuth via site settings page. For more details, see Custom OAuth Configs on Desktop and Site Level OAuth Clients.

Connect to Snowflake

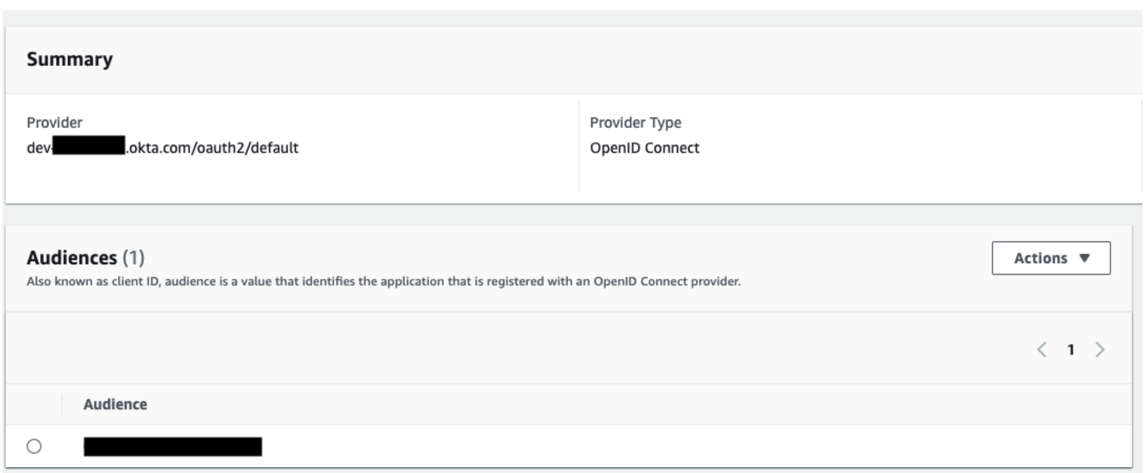
When connecting, you must select OAuth and choose the OAuth configuration installed earlier.




Okta

If using Okta it's better to use a "custom authorization server" rather than the "org authorization server." The custom authorization servers are more flexible. There's a custom authorization server created by default, which is called "default". The authorization URL should look like this:

```
https://${yourOktaDomain}/oauth2/{authServerName}/v1/authorize
```




## Set Up Amazon Redshift IAM OAuth

These instructions are for the older AWS IAM service. For IAM IDC integration see Set Up Amazon Redshift IAM Identity Center OAuth.

Depending on the identity provider, there are different steps needed to configure the integration. This is a high-level overview. Tableau cannot provide detailed instructions for how to configure AWS or the IDP, but the general approach is described below.

> **Note**: Single use refresh tokens (sometimes called rolling refresh tokens or refresh token rotation) are not supported for OAuth connections to Tableau at this time. Support for these tokens are planned for a future release.

Step 1: Configure the IDP

1. Create OAuth clients on the IDP for Tableau Desktop, and Tableau Server or Tableau Cloud. The Desktop client should enable `PKCE` and use `http://localhost` redirects.

2. Add custom claims to use for authorization to roles. In particular, if you are using original IAM, you may want to add claims for `DbUser` and `DbGroups`. These can be used in your IAM policies later.

3. Create the Tableau OAuth config files. See documentation on GitHub, and examples here. We welcome examples for other IDPs.

   a. Be sure to prefix the Tableau OAuth config IDs with “`custom_`”.

   b. If your IDP supports dynamic localhost port then disable `OAUTH_CAP_FIXED_PORT_IN_CALLBACK_URL`. If your IDP does not support this, make sure to add several localhost callback URLs to the allowlist in the config file and on the IDP.

4. Install the new Tableau OAuth configuration files in the `OAuthConfigs` folder associated with each application on desktop hosts (Tableau Desktop, Tableau Prep Builder, Tableau Bridge), and on each Tableau Server and Tableau Cloud site that will be using OAuth.

Configure IDP on AWS

1. Create the IDP model on the AWS. See Amazon docs Web Identity Federation and Create OIDC Identity Provider.

2. Create roles and policies specifically for the IDP. See Create Role for OIDC in the AWS docs.

Configure Roles for Redshift Users

Attach the policies needed for Redshift. You may use custom claims from the token to authorize to roles. There are several examples with SAML in the AWS documentation. These can be easily adapted to OAuth. In the case of OAuth, the claims are just "`DbUser`", "`DbGroups`", etc.

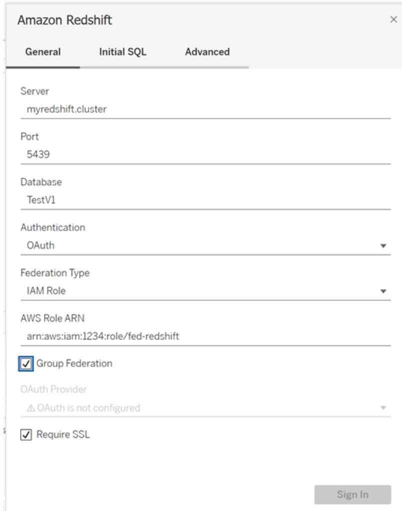
Here is an example of the policy from the AWS documentation:

```
{
"Version": "2012-10-17",
"Statement": [
    {
        "Effect": "Allow",
        "Action": "redshift:GetClusterCredentials",
        "Resource": [
            "arn:aws:redshift:us-west-1:123456789012:db-
name:cluster-identifier/dev",
            "arn:aws:redshift:us-west-1:123456789012:d-
buser:cluster-identifier/${redshift:DbUser}",
            "arn:aws:redshift:us-west-1:123456789012:cluster-
:cluster-identifier"
        ],
        "Condition": {
            "StringEquals": {
                "aws:userid": "AROAJ2UCCR6DPCEXAMPLE:${red-
shift:DbUser}@example.com"
            }
        }
    },
```

```
    {
        "Effect": "Allow"
        "Action": "redshift:CreateClusterUser",
        "Resource": "arn:aws:redshift:us-west-1:12345:d-
buser:cluster-identifier/${redshift:DbUser}"
    },
    {
        "Effect": "Allow",
        "Action": "redshift:JoinGroup",
        "Resource": "arn:aws:redshift:us-west-1:12345:d-
bgroup:cluster-identifier/my_dbgroup"
    },
    {
        "Effect": "Allow",
        "Action": [
            "redshift:DescribeClusters",
            "iam:ListRoles"
        ],
        "Resource": "*"
    }
]
}
```

Connect to Redshift

The user must specify the **role ARN** to assume, and select the OAuth config installed earlier.




When properly configured, the user will be redirected to the IDP to authenticate and authorize tokens for Tableau. Tableau will receive openid and refresh tokens. AWS is able to validate the token and signature from the IDP, extract the claims from the token, look up the mapping of claims to IAM role, and either permit or block Tableau from assuming the role on the user's behalf. (in other words, AssumeRoleWithWebIdentity).

Tokens

By default Redshift OAuth IAM passes the ID token to the driver. For on-premise customers, including those using Tableau Bridge, you may use a TDC file to pass the access token instead.

```
<connection-customization class='redshift' enabled='true' ver-
sion='10.0'>
       <vendor name='redshift' />
       <driver name='redshift' />
       <customizations>
               <customization name='CAP_OAUTH_FEDERATE_ACCESS_TOKEN' value-
='yes'/>
       </customizations>
</connection-customization>
```

For more information about configuring and installing .tdc files, see Customize and Tune a Connection and Using a .tdc File with Tableau Server.

About Group Federation

When using OAuth authentication with an IAM Role, you can select whether or not you are using Group Federation. This will change how the connector interacts with the authentication API to interface with Redshift.

- When the Group Federation box (available in versions 2025.1 and beyond) is checked while connecting, the Redshift driver will use the `getClusterCredentialsWithIAM` API for obtaining the credentials in provisioned clusters.
- When the Group Federation box is not checked, the `getClusterCredentials` API will be used instead.

These two APIs will return IAM tokens with slightly different properties. For more information, consult the AWS API documentation linked above, and ODBC driver options.

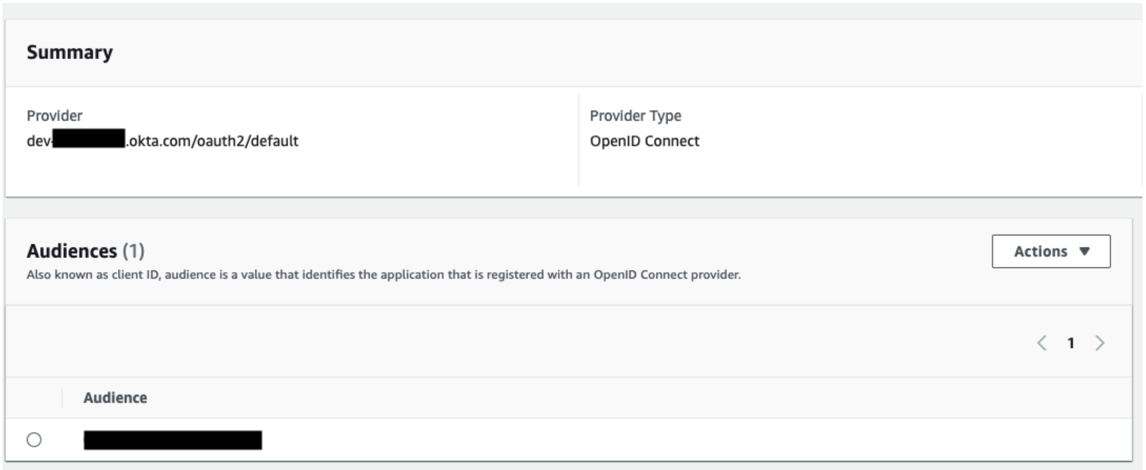
## Usage Notes

- For Tableau Desktop and Tableau Prep Builder before version 2024.3, this can be set in the advanced driver configuration field using 'group_federation=1'. It can also be configured by using a TDC file to define custom connection properties. For more information on using a TDC, see Customize and Tune a Connection.
- Starting in version 2024.3, there is a group_federation field in the connection dialog for on-premise (Tableau Desktop, Tableau Prep Builder, and Tableau Server). This will be available in Tableau Cloud starting in 2025.1 (Available in February 2025).
- To use Group Federation with Tableau Server, group_federation must be added to the ODBC extras allowlist. For more information, see Customize Connection String for Native Connectors.

Okta

If using Okta it’s better to use a “custom authorization server” rather than the “org authorization server.” The custom authorization servers are more flexible. There is a custom authorization server created by default, which is called “default”. The authorization URL should look like this:

```
https://${yourOktaDomain}/oauth2/{authServerName}/v1/authorize
```




Update Driver

For Redshift OAuth using the original IAM service, you may use either:

- Redshift ODBC v1 driver starting with version 1.59, which can be downloaded from https://docs.aws.amazon.com/redshift/latest/mgmt/configure-odbc-connection.html.
- Redshift ODBC v2 driver starting with version 2.0.1.0, which can be downloaded from https://github.com/aws/amazon-redshift-odbc-driver/tags. Note there is no v2 driver for OSX.

Troubleshooting

The best way to diagnose errors is to remove Tableau from the picture. You can instead test using the driver manager or a similar tool. This is just for troubleshooting - you shouldn't use a DSN or the "Other ODBC" connector for regular usage of this feature. To help ensure a valid test, the parameters should be the same as shown below, except for the cluster information, database, token, and namespace.

If you see an error message about invalid/expired token coming from the driver on the first connection (it will have a SQLState error code like [28000] or [08001] in the error message), then Tableau successfully completed the OAuth flow, and failed in the driver. This means there is a misconfiguration on either the AWS side or the IDP side. There may also be permissions or authorization errors returned from the driver, which is also out of Tableau's control.

Before you begin testing, you first need to get an access token (the default for IAM IDC) or refresh token (if customized) to send to the driver.

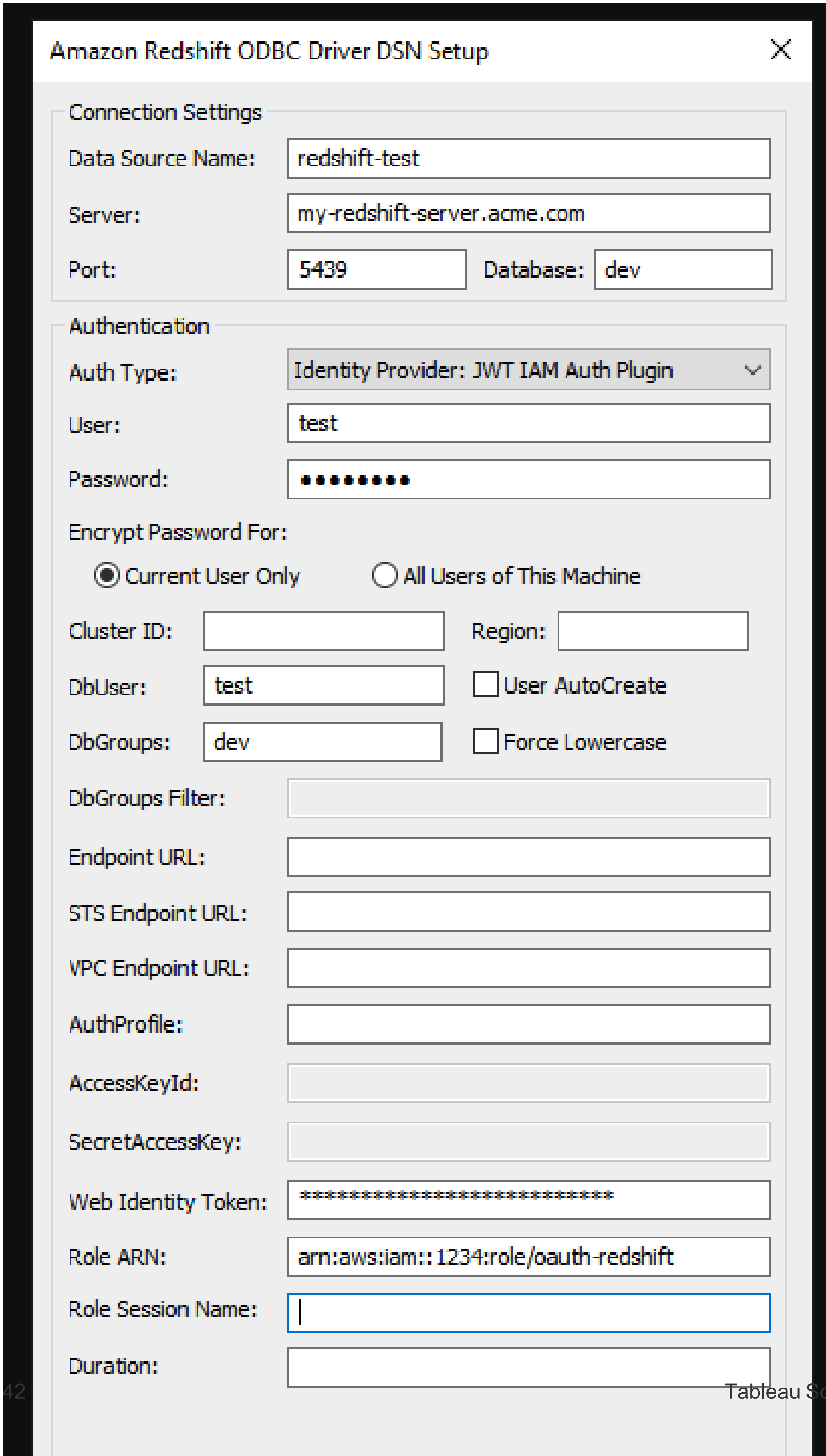
Here is an example with Okta. Almost all IDPs have a way to do this which is quite similar. Note that to use this flow you need to have enabled resource owner password grant type. Substitute the IDP URL, client secret, client ID, username, and password.

```
curl -X POST "https://OKTA_URL/v1/token" \
-H 'accept: application/json' \
-H "Authorization: Basic $(echo -n 'CLIENTID:CLIENTSECRET' |
base64)" \
-H "Content-Type: application/x-www-form-urlencoded" \
-d "grant_type-
e=password&username=USER&password=PASSWORD&scope=openid"
```

Once you have the token, you can use a DSN to test. For Windows, you can use the ODBC driver manager. On Mac you can use the iODBC driver manager UI. On Linux you can use the isql command line tool that is included with Tableau Server in the customer-bin folder.

Tableau recommends you do not use other plugins to test, because they may not work in a server environment. They either use a fixed AWS profile, or require direct access to a browser.

Below is an example of using the ODBC driver manager on Windows.


Amazon Redshift ODBC Driver DSN Setup
Connection Settings
Data Source Name:
redshift-test
Server:
my-redshift-server.acme.com
Port:
5439
Database:
dev
Authentication
Auth Type:
Identity Provider: JWT IAM Auth Plugin
User:
test
Password:
Encrypt Password For:
Current User Only
All Users of This Machine
Cluster ID:
Region:
DbUser:
test
User AutoCreate
DbGroups:
dev
Force Lowercase
DbGroups Filter:
Endpoint URL:
STS Endpoint URL:
VPC Endpoint URL:
AuthProfile:
AccessKeyId:
SecretAccessKey:
Web Identity Token:
Role ARN:
arn:aws:iam::1234:role/oauth-redshift
Role Session Name:
Duration:

## Set Up Amazon Redshift IAM Identity Center OAuth

These instructions are for the newer AWS IAM IDC service. For original IAM integration see Set Up Amazon Redshift IAM OAuth.

Depending on the identity provider, there are different steps needed to configure the integration. This is a high-level overview. Tableau cannot provide detailed instructions for how to configure AWS or the IDP, but this is the general approach.

For some detailed examples of implementing authentication with Redshift, see "Integrate Tableau and Okta with Amazon Redshift using AWS IAM Identity Center" and "Integrate Tableau and Microsoft Entra ID with Amazon Redshift using AWS IAM Identity Center".

> **Note**: Single use refresh tokens (sometimes called rolling refresh tokens or refresh token rotation) are not supported for OAuth connections to Tableau at this time. Support for these tokens are planned for a future release.

Step 1: Configure the IDP

1. Create OAuth clients on the IDP for Tableau Desktop and Tableau Server or Tableau Cloud. The Desktop client should enable `PKCE` and use `http://localhost` redirects.

2. Add any required custom claims to use for authorization to roles.

3. Create the Tableau OAuth config files. See documentation on GitHub, and examples. We welcome examples for other IDPs.

   a. Be sure to prefix the Tableau OAuth config IDs with “`custom_`”.

   b. If your IDP supports dynamic localhost port then disable `OAUTH_CAP_FIXED_PORT_IN_CALLBACK_URL`. If it does not, make sure to add several localhost callback URLs to the allowlist in the config file and on the IDP.

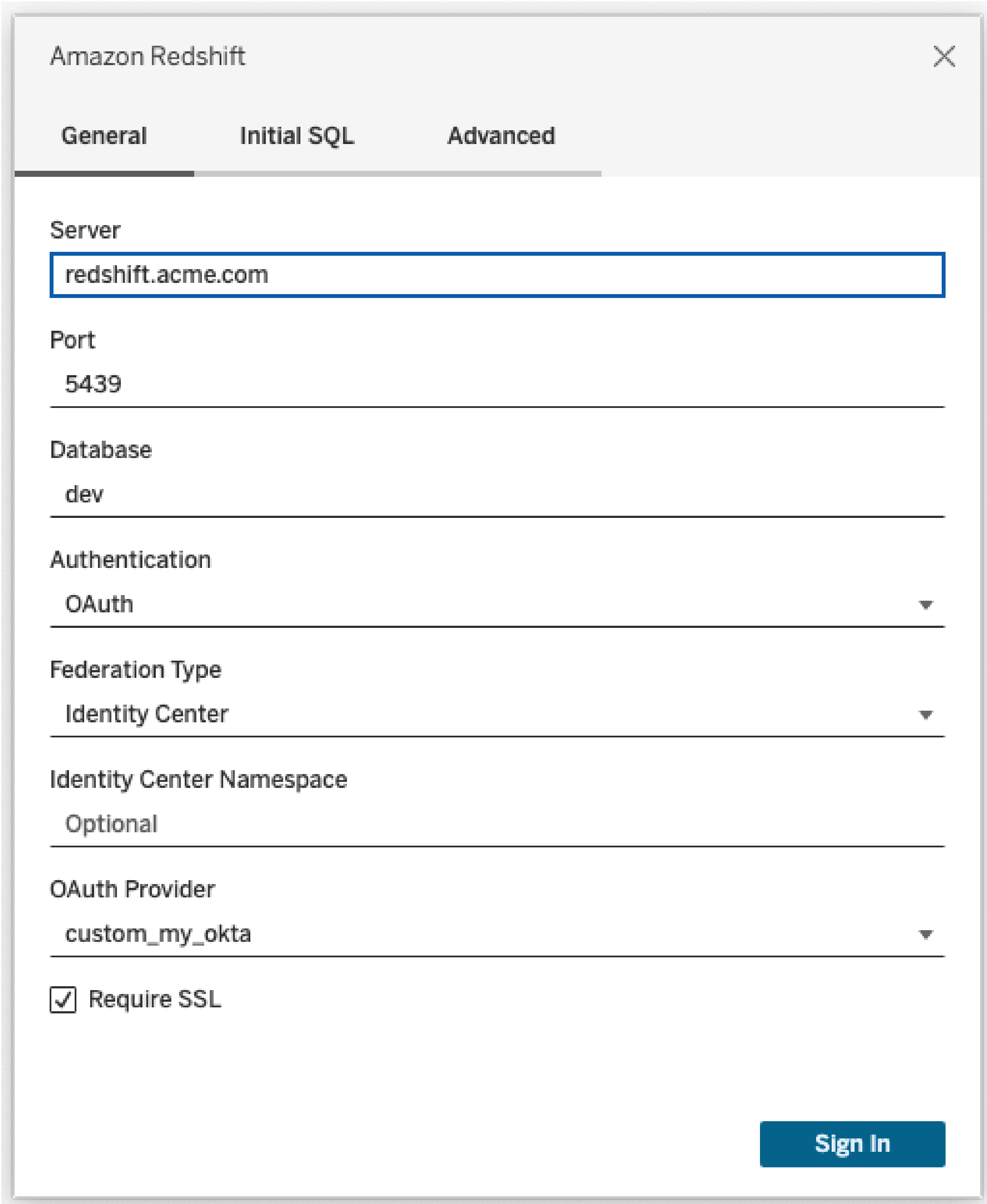
4. Install the new Tableau OAuth configuration files in the `OAuthConfigs` folder associated with each application on desktop hosts (Tableau Desktop, Tableau Prep Builder, Tableau Bridge), and on each Tableau Server and Tableau Cloud site that will be using OAuth.

Step 2: Configure IDP and Roles on AWS

See your AWS documentation for information on doing this.

Step 3: Connect to Redshift

1. Connect to Redshift.
2. Select OAuth for **Authentication**.
3. Select Identity Center for **Federation Type**.
4. (Optional) Specify the **Identity Center Namespace** if necessary.




When correctly configured, you will be redirected to the IDP to authenticate and authorize tokens for Tableau. Tableau will receive an access token and refresh tokens. It will send the access token to the driver for authentication.

Tokens

By default Redshift OAuth to IAM IDC passes the access token to the driver. For on-premise customers, including those using Tableau Bridge, you may use a TDC file to pass the ID token instead.

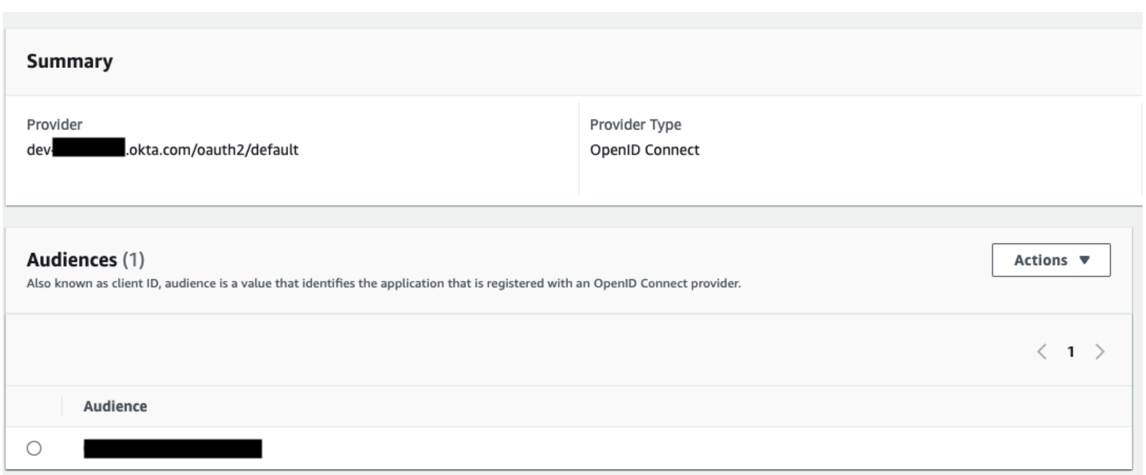
```
<connection-customization class='redshift' enabled='true' ver-
sion='10.0'>
       <vendor name='redshift' />
       <driver name='redshift' />
       <customizations>
               <customization name='CAP_OAUTH_FEDERATE_ID_TOKEN' value='yes'/>
       </customizations>
</connection-customization>
```

For more information about configuring and installing .tdc files, see Customize and Tune a Connection and Using a .tdc File with Tableau Server.

Okta

If you are using Okta, it's better to use a "custom authorization server" instead of the "org authorization server." The custom authorization servers are more flexible. A custom authorization server is created by default and called "default". The authorization URL should look like this:

```
https://${yourOktaDomain}/oauth2/{authServerName}/v1/authorize
```



### Update the driver

For Redshift OAuth using the IAM IDC service, you need to use at least version 2.x of the ODBC driver. Download the latest version of the Redshift ODBC driver found on https://-github.com/aws/amazon-redshift-odbc-driver/tags. Note that there is no v2 driver yet for OSX.

### Troubleshooting Redshift IAM IDC OAuth

The best way to diagnose errors is to remove Tableau from the picture. You can instead test using the driver manager or a similar tool. This is just for troubleshooting - you shouldn't use a DSN or the "Other ODBC" connector for regular usage of this feature. To help ensure a valid test, the parameters should be the same as shown below, except for the cluster information, database, token, and namespace.

If you see an error message about invalid/expired token coming from the driver on the first connection (it will have a SQLState error code like [28000] or [08001] in the error message), then Tableau successfully completed the OAuth flow, and failed in the driver. This means there is a misconfiguration on either the AWS side or the IDP side. There may also be permissions or authorization errors returned from the driver, which is also out of Tableau's control.

Before you begin testing, you first need to get an access token (the default for IAM IDC) or refresh token (if customized) to send to the driver.

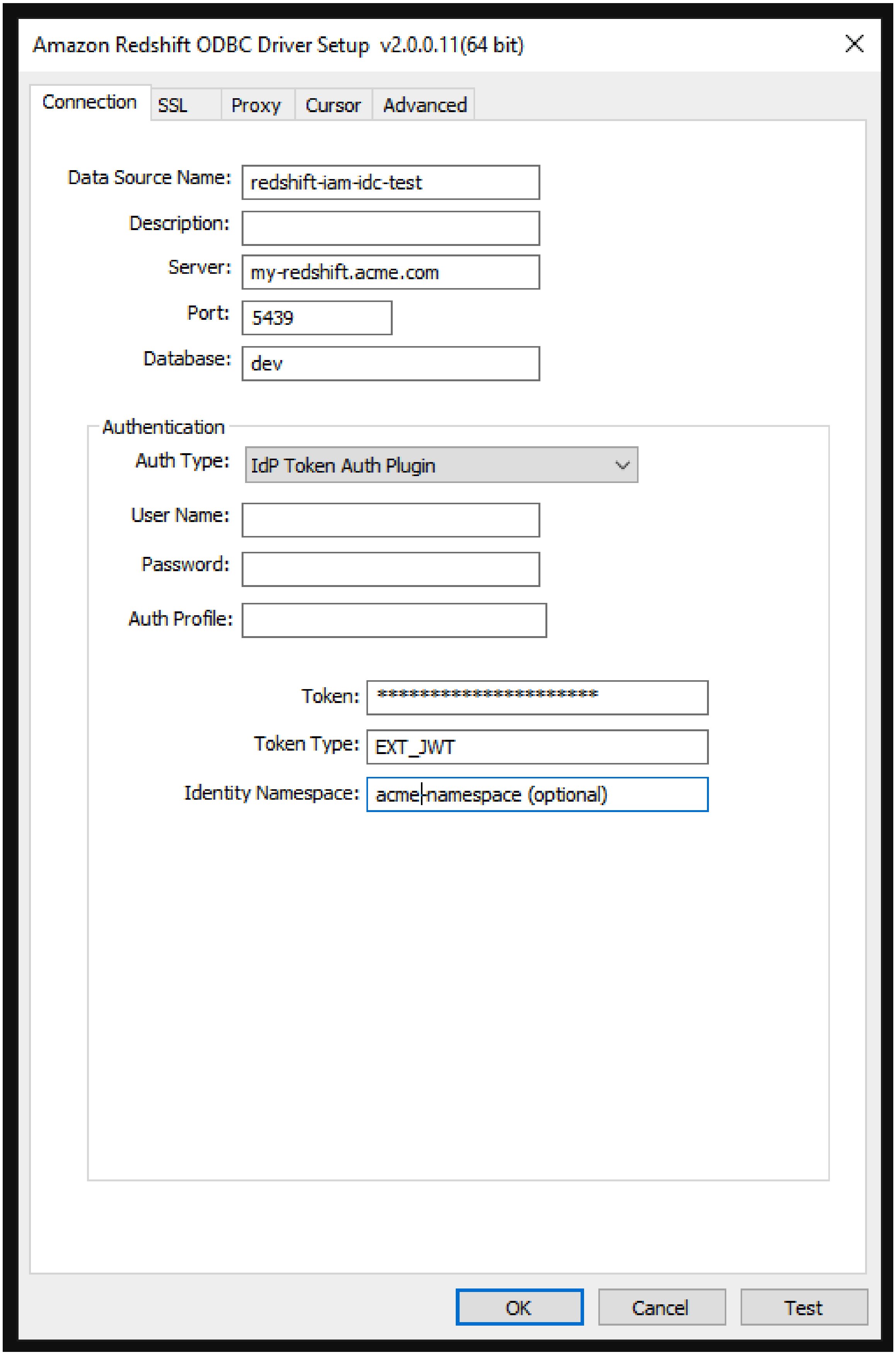
Here is an example with Okta. Almost all IDPs have a way to do this which is quite similar. Note that to use this flow you need to have enabled resource owner password grant type. Substitute the IDP URL, client secret, client ID, username, and password.

```
curl -X POST "https://OKTA_URL/v1/token" \
-H 'accept: application/json' \
-H "Authorization: Basic $(echo -n 'CLIENTID:CLIENTSECRET' |
base64)" \
-H "Content-Type: application/x-www-form-urlencoded" \
-d "grant_type-
e=password&username=USER&password=PASSWORD&scope=openid"
```

Once you have the token, you can use a DSN to test. For Windows, you can use the ODBC driver manager. On Linux you can use the isql command line tool that is included with Tableau Server in the customer-bin folder.

Tableau recommends you do not use other plugins to test, because they may not work in a server environment. They either use a fixed AWS profile, or require direct access to a browser.

Below is an example of using the ODBC driver manager on Windows.


Amazon Redshift ODBC Driver Setup v2.0.0.11(64 bit)
Connection
SSL
Proxy
Cursor
Advanced
Data Source Name: redshift-iam-idc-test
Description:
Server: my-redshift.acme.com
Port: 5439
Database: dev
Authentication
Auth Type: IdP Token Auth Plugin
User Name:
Password:
Auth Profile:
Token: ************************
Token Type: EXT_JWT
Identity Namespace: acme-namespace (optional)
OK
Cancel
Test

# Configure Snowflake for Key-pair Authentication

**Note**: Key-pair authentication is not available in Tableau Server until version 2025.1.

To publish workbooks using Snowflake data sources protected with Key-pair authentication from Tableau Desktop to a Tableau Cloud site, you must also configure Tableau Cloud to support those credentials. This involves adding your new or updated authentication details for Snowflake Key-pair authentication to the Saved Credentials section of your Account Settings.

**Note**: You need to use OpenSSL version 3.x or newer to create the keys for this authentication.

**Note**: Each instance of Tableau Desktop that uses Snowflake data protected by Key-pair authentication will require the user to provide the key file as part of connecting to data. For more information, see Snowflake.

**Note**: Publishing workbooks with Snowflake key-pair authentication is not supported in web authoring. You must use Tableau Desktop to create the workbooks, which can then be published to Tableau Cloud.

## Add Key-pair Authentication Details

1. Sign in to Tableau Cloud and navigate to your **My Account Settings** page.
2. Locate **Saved Credentials for Data Sources** in the **Security** section.
3. Next to **Snowflake**, click **Add**.
4. In the **Add a New Saved Credential** window, select **Key-pair Authentication**, and then click **Add**.
5. In the **Add Key-pair Authentication Credential** window, enter your Snowflake server, the optional Role, and the Username associated with these credentials.

6. For **Private Key File**, click Choose a file and select the .p8 file that contains your private key.
7. (Optional) If the key has a password or passphrase associated with it, enter it in the **Password** field, and then click **Add**.

You are now ready to share workbooks protected by Key-pair authentication from Tableau Desktop to Tableau Cloud.

### See also

- Snowflake - Learn how to set up a connection to Snowflake to retrieve and analyze data.

## Manage Saved Credentials for Data Connections

Saved credentials enable you to connect to a data source without being prompted for your credentials. The credentials saved for your connection can be OAuth access tokens, or other credentials, such as user name and password. You can manage saved credentials on your account settings page.

On Tableau Cloud, you can manage saved credentials on your **Account Settings** page.

> **Note:** When editing Tableau Prep flows on the web, you may still be prompted to re-authenticate.

### Test connections using saved credentials

If the connector supports test functionality, you can test the connection using saved credentials.

1. While you're signed in to Tableau Server or Tableau Cloud, display your Account Settings page.

2. In the Saved Credentials section, select the **Test** link next to the stored connection that you want to test.

This test confirms that Tableau Cloud or Tableau Server can access your account using this corresponding saved credential. If the test succeeds, but you can't access your data through this managed connection, confirm that the credentials you provided for this connection can access your data.

For example, if you accidentally created the connection using your personal Gmail account, but you use a different account to access a Google Analytics database, you'll need to delete the saved credentials and sign in to the data using the appropriate Gmail account.

## Update saved credentials

To help ensure uninterrupted data access from existing Tableau content after a custom OAuth client has been configured for your site, we encourage you to update your saved credentials. To update saved credentials, you can delete the previous saved credentials for a particular connector and then add it again.

When you add saved credentials again, both new and existing Tableau content will access the data using the custom OAuth client configured by your site admin. For more information about custom OAuth clients, see OAuth Connections.

1. Sign in to Tableau Server and navigate to your **My Account Settings** page.
2. Under **Saved Credentials for Data Sources**, do the following:
    1. Click **Delete** next to the saved credentials for a connector.
    2. Next to the same connector, click **Add** and follow the prompts to 1) connect to the custom OAuth client that your site admin notified you about and 2) save the latest credentials.

## Clear all saved credentials

When you select **Clear All Saved Credentials**, the following items are removed from your user account:

- All saved credentials for connections that are stored in your account.

> **Caution:** If any of these saved credentials are stored with published workbooks or data sources, deleting them also removes access to the data source from those locations. Effectively, this is like "changing the locks" anywhere the affected saved credentials are used.

- Passwords you’ve used to access published data extracts or workbooks that connect to them.

### Remove saved credentials

To remove Tableau access to data, delete the associated saved credentials for that data from your account. After you delete the credentials, you’ll need to sign in to the data the next time you access it. This creates new saved credentials.

Your administrator might choose for all users to use the same shared credentials for connecting to a data source. If this is the case, the saved credential is associated with the data connection for all users, and it doesn’t appear under Saved Credentials on your Account Settings page.

> **Note:** If you're a Tableau Server user and can't delete saved credentials, ask your administrator if they've cleared the Allow users to save data source access tokens option in the server settings.

# Create and Interact with Flows on the Web

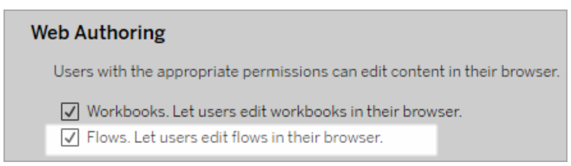
Starting in version 2020.4, you can create and interact with flows on Tableau Cloud to clean and prepare your data. Connect to your data, build a new flow, or edit an existing flow and your work is automatically saved every few seconds as you go. Create draft flows that are only available to you or publish your flow to make it available for others. Run your individual flows right from the web or run your flows automatically on a schedule using Tableau Prep Conductor if Data Management is licensed. For more information, see Tableau Prep on the Web.

## Turn flow web authoring on or off for a site

Enabled by default, this option controls whether users can create and edit flows on Tableau Server or Tableau Cloud

**Note:** You can only change this setting in Tableau Server. Web authoring is automatically enabled for Tableau Cloud and can't be turned off.

1. In a web browser, sign in to the server as an administrator, go to the site and click **Settings**.
2. In the **Web Authoring** section, clear or select **Flows. Let users edit flows in their browser.** to turn the functionality off or on.

3. If you want the change to take effect immediately, restart the server. Otherwise, the change takes effect after server session caching expires or the next time users sign in after signing out.

## Enable linked tasks

*Supported in Tableau Cloud and Tableau Server version 2021.3 and later.*

Use the **Linked Tasks** option to schedule up to 20 flows to run sequentially, one after the other. Linked tasks can only be run on schedules with the **Linked Tasks** option selected. For more information about setting up linked tasks, see Schedule Linked Tasks.

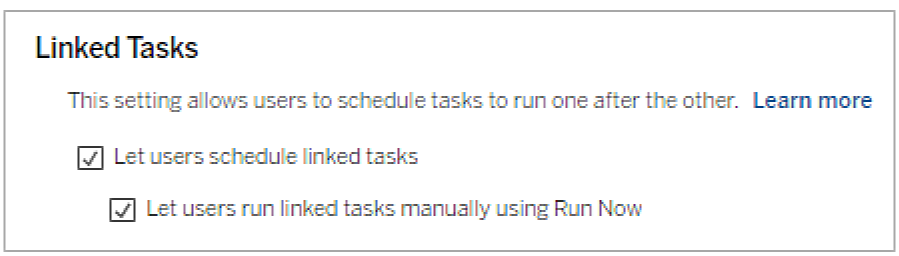
Starting in version 2022.1, **Linked Tasks** is enabled by default on the **Server Settings** and for any new flow schedules that you create. In prior versions, administrators must first enable the option.

If you have multiple sites, you can turn off **Linked Tasks** for individual sites by clearing the check boxes described below.

If the setting is turned off after linked tasks are scheduled, any tasks that are running will complete and the scheduled linked tasks are hidden and no longer show on the **Scheduled Tasks** tab.

**Enable Linked Tasks** (version 2021.4 and earlier)

1. In a web browser, sign in to the server as an administrator and go to the site in which you want to enable **Linked Tasks** for flows. In that site, click **Settings**.
2. In the **Linked Tasks** section, select **Let users schedule linked tasks** to enable administrators to configure schedules to run linked tasks.
3. Select **Let users run linked tasks manually using Run Now** to enable users to run linked flow tasks using **Run Now**.




## Enable flow parameters

Enable users to schedule and run flows that include parameters. Parameters enable users to scale their flows by building them once, then changing the parameter values to accommodate different data scenarios.

Parameters can be entered in an input step for file name and path, table name, or when using custom SQL queries, in an output step for file name and path and table name, and in any step type for filters or calculated values.

Starting in Tableau Prep Builder and Tableau Cloud version 2023.2, you can add system parameters to flow output names to automatically include the flow run start date and time.

Flow parameter settings can be applied at the server level to include all sites on Tableau Server. The settings can be disabled at the site level to include only specific sites.

For more information about using parameters in flows, see Create and Use Parameters in Flows in the Tableau Prep help.

1. In a web browser, sign in to the server as an administrator and go to the site in which you want to enable **Flow Parameters**. In that site, click **Settings**.

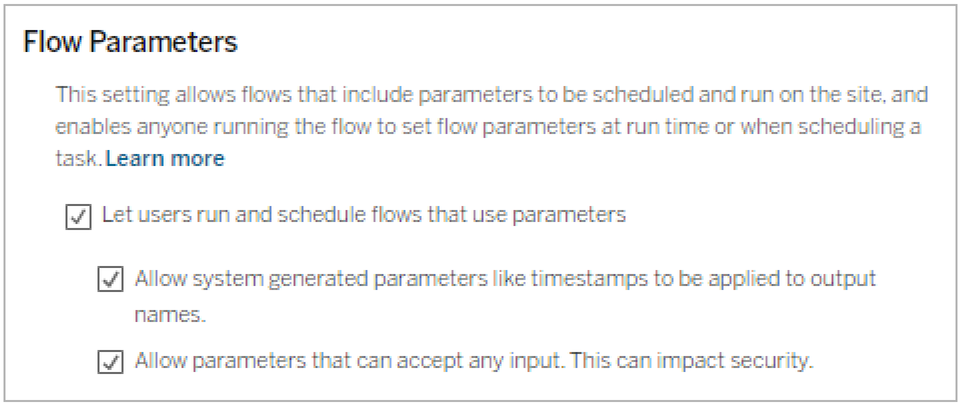
2. In the **Flow Parameters** section, select **Let users run and schedule flows that use parameters** to enable the functionality.

3. (version 2023.2 and later) Select **Allow system generated parameters like timestamps to be applied to output names** to enable users to add a date or time stamp to the flow output name at runtime for file and published data source output types.

4. Select **Allow parameters that can accept any input** to enable anyone running the flow to enter any parameter value in the flow at run time.

   **Important**: Setting this option enables any flow user to enter any value in a parameter, potentially exposing data that the user should not have access to.

   If this option is not selected, users can only select from predefined list of parameter values and any flows that include parameters that accept any value cannot be run or scheduled to run.

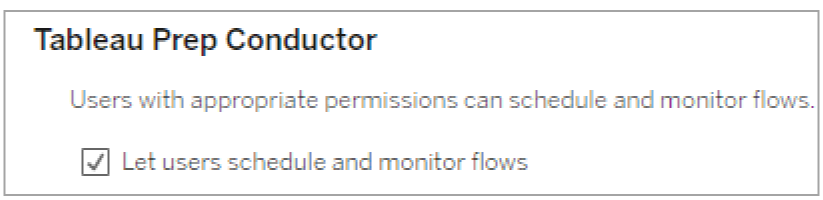



## Enable Tableau Prep Conductor

If Data Management is licensed, enable this option to let users schedule and track flows in Tableau Server and Tableau Cloud. For information about the additional configuration requirements for Tableau Prep Conductor, see Tableau Prep Conductor.

1. In a web browser, sign in to the server as an administrator and go to the site in which you want to enable Tableau Prep Conductor. In that site, click **Settings**.

2. In the **Tableau Prep Conductor** section, select **Let users schedule and monitor flows** to enable the functionality.

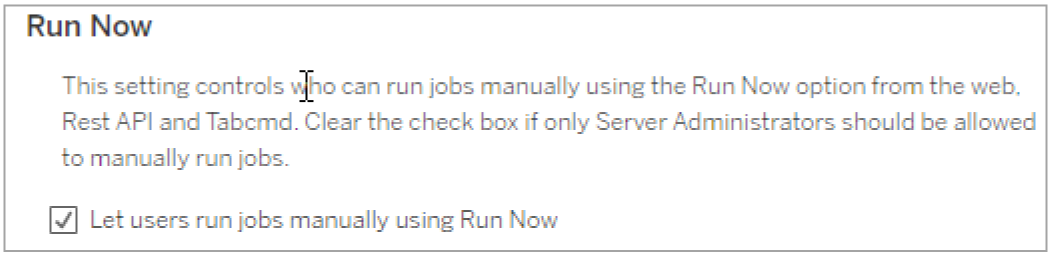



## Enable Run Now

Control whether users or only administrators can run flows manually using the **Run Now** option. Data Management is not required to run flows manually.

1. In a web browser, sign in to the server as an administrator and go to the site in which you want to enable Run Now for flows. In that site, click **Settings**.

2. In the **Run Now** section, select **Let users run jobs manually using Run Now** to enable the functionality.



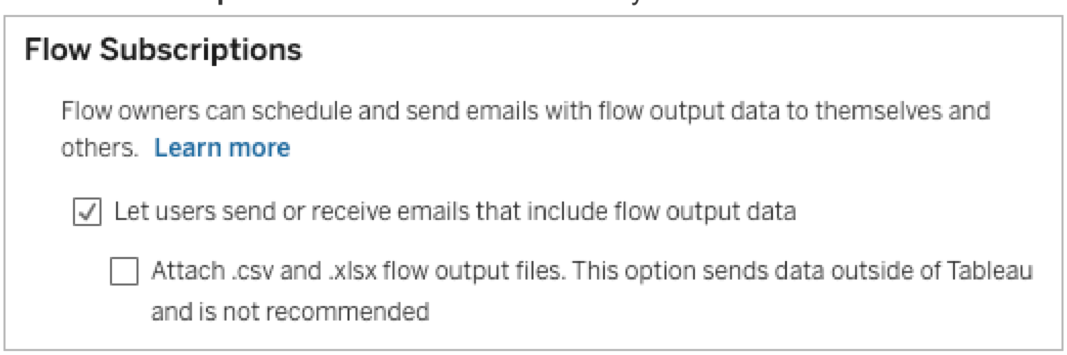

Clear the check box if only Server Administrators can run flows manually.

## Flow Subscriptions

Control whether users can receive flows notifications about scheduled tasks for successful flow runs. Data Management is required to enable notifications.

1. In a web browser, sign in to the server as an administrator and go to the site in which you want to enable flow subscriptions. In that site, click **Settings**.

2. In the **Flow Subscriptions** section, select **Let users send or receive emails that include flow output data** to enable the functionality.



**Note**: The option to attach either a .csv or .xlsx file type to the email is only available for on-premise environments.

## Enable Tableau Prep Extensions

*Supported in Tableau Server and Tableau Cloud starting in version 2021.2.0*

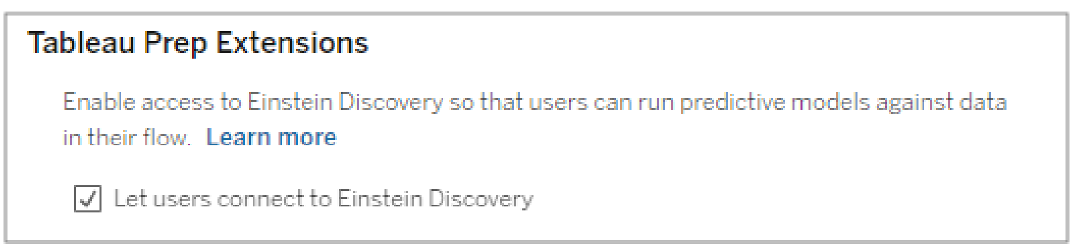
Set this option to control whether users can connect to Einstein Discovery to run predictive models against data in their flow.

You can use Einstein Discovery-powered models to bulk score predictions for the data in your flow when authoring flows on the web. Predictions can help you make better informed decisions and take actions to improve your business outcomes.

You'll need to configure additional settings to include predictions in our flow. For more information, see Add Einstein Discovery Predictions to your flow and Configure Einstein Discovery Integration.

1. In a web browser, sign in to the server as an administrator and go to the site in which you want to enable Tableau Prep Extensions. In that site, click **Settings** > **Extensions**.

2. In the **Tableau Prep Extensions** section, select **Let users connect to Einstein Discovery** to enable the functionality.




## Turn autosave off or on

Enabled by default, this feature automatically saves a user's flow work every few seconds.

While not recommended, administrators can disable autosave on a site using the Tableau Server REST API method "Update Site" and `flowAutoSaveEnabled` setting. For more information, see Tableau Server REST API Site Methods: Update Site. For more information about autosave on the web, see Turn autosave off or on.

For more information about configuring site settings, see Site Settings Reference in the Tableau Server help.

# Tableau Prep on the Web

*Internet Explorer 11 on Windows and compatibility mode for Internet Explorer is not supported.*

Starting in version 2020.4 ,Tableau Prep supports web authoring for flows. Now you can create flows to clean and prepare your data using Tableau Prep Builder, Tableau Server, or Tableau Cloud. You can also manually run flows on the web and the Data Management is not required.

While most of the same Tableau Prep Builder functionality is also supported on the web, there are a few differences when creating and working with your flows.

**Important**: To create and edit flows on the web you must have a Creator license. Data Management is only required if you want to run your flows on a schedule using Tableau Prep Conductor. For more information about configuring and using Tableau Prep Conductor, see Tableau Prep Conductor in the Tableau Server or Tableau Cloud help.

## Installation and Deployment

To enable users to create and edit flows on the web, you'll need to configure several settings on your server. For more information about each of these settings, see Create and Interact with Flows on the Web.

- **Web Authoring**: Enabled by default, this option controls whether users can create and edit flows on Tableau Server or Tableau Cloud.

- **Run Now**: Controls whether users or only administrators can run flows manually using the **Run Now** option. The Data Management isn't required to run flows manually on the web.
- **Tableau Prep Conductor**: If Data Management is licensed, enable this option to let users schedule and track flows.
- **Tableau Prep Extensions** (version 2021.2.0 and later): Controls whether users can connect to Einstein Discovery to apply and run predictive models against data in their flow.
- **Autosave**: Enabled by default, this feature automatically saves a user's flow work every few seconds.

Sample data and processing limits

To maintain performance while working with flows on the web, limits are applied to the amount of data you can include in a flow.

The following limits apply:

- When connecting to files, the maximum file size is 1GB.
- The data sampling option to include all data is not available. The default sample data limit is 1 million rows.
- The maximum number of rows that a user can select when using large data sets is configured by the administrator. As a user, you can select the number of rows up to that limit.
- In Tableau Cloud, the number of flow runs you can perform in a day is limited by the site administrator. For more information, see Tableau Cloud Site Capacity.

For more information about setting your data sample, see Set your data sample size in the Tableau Prep help.

## Available features on the web

When you create and edit flows on the web you may notice a few differences in navigation and the availability of certain features. While most features are available across all platforms, some features are limited or not yet supported in Tableau Server or Tableau Cloud. The following table identifies features where differences might apply.

| Feature area | Exceptions | Tableau | Tableau | Tableau |
|---|---|---|---|---|

| | | **Prep Builder** | **Server** | **Cloud** |
|---|---|---|---|---|
| Connect to Data | Some connectors may not be supported on the web. Open the **Connect** pane on your server to see supported connectors. | ✓ | ✓ | ✓ |
| Build and Organize your Flow | | ✓ | ✓ | ✓ |
| Set your data sample size | In Tableau Server and Tableau Cloud, the data sample size is subject to limits set by your administrator | ✓ | ✓ | ✓ |
| Union files and database tables in the input step | Input unions can't be edited or created in Tableau Server or Tableau Cloud. Only in Tableau Prep Builder. | ✓ | ✓ | ✓ |
| Clean and Shape Data | | ✓ | ✓ | ✓ |
| Copy data grid values | Available in Tableau Prep Builder and Tableau Server starting in version 2022.3 and Tableau Cloud starting in 2022.2 (August) | ✓ | ✓ | ✓ |
| Aggregate, Join, or Union Data | | ✓ | ✓ | ✓ |
| Use R and Python Scripts in your Flow | Script steps can't be added when creating or editing a flow in Tableau Cloud. This is cur- | ✓ | ✓ | ⊘ |

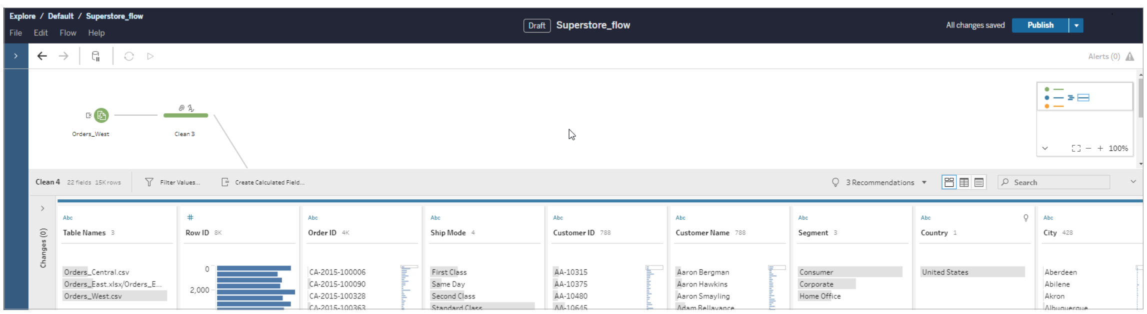
| | | | | |
|---|---|---|---|---|
| | rently supported only in Tableau Prep builder and Tableau Server. | | | |
| Create reusable flow steps | | ✅ | 🚫 | 🚫 |
| Automatically save your flows on the web | | Not Applic-able | ✅ | ✅ |
| Automatic file recovery | | ✅ | Not Applic-able | Not Applic-able |
| View flow out-put in Tableau Desktop | | ✅ | 🚫 | 🚫 |
| Create an extract to a file | | ✅ | 🚫 | 🚫 |
| Create an extract to a Microsoft Excel worksheet | | ✅ | 🚫 | 🚫 |
| Connect to a Custom SQL Query | | ✅ | ✅ | ✅ |
| Create a pub-lished data source | | ✅ | ✅ | ✅ |
| Save flow out-put to external databases | | ✅ | ✅ | ✅ |
| Add Einstein | | ✅ | ✅ | ✅ |

| | | | | |
|---|---|---|---|---|
| Discovery Predictions to your Flow | | | | |

Autosave and working with drafts

When you create or edit flows on the server, your work is automatically saved as a draft every few seconds so that in the event of a crash, or when closing a tab by accident, you don't lose your work.

Drafts are saved to the server and project you are signed into. You can't save or publish a draft to another server, but you can save the flow to another project on that server using the **File** > **Publish As** menu option.




Draft content can only be seen by you until you publish it. If you publish changes and need to revert them, you can use the **Revision History** dialog to view and revert to a previously published version. For more information about saving flows on the web, see Automatically save your flows on the web.

## Publishing flows on the web

Whether you create a flow from scratch on the web or edit an existing flow, before you can run the flow you'll need to publish it.

- You can only publish draft flows to the same server you are signed into.
- You can publish a draft to a different project using the **File** menu and selecting **Publish As**.

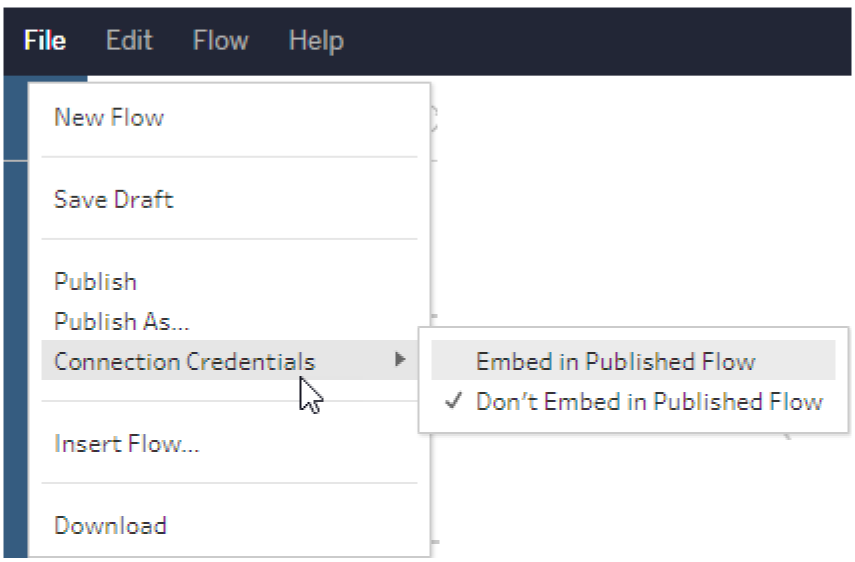
- You can embed credentials for your flow's database connections to enable the flow to run without having to manually enter the credentials when the flow runs. If you open the flow to edit it, you'll need to re-enter your credentials.

Embed credentials

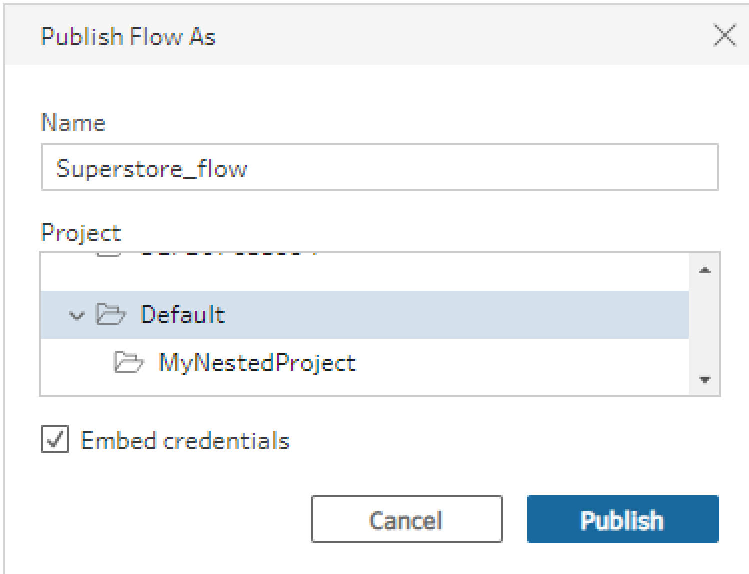
Embedding credentials only applies to running flows on your server. Currently, you will manually need to enter your credentials when editing a flow connected to a database. Embedding credentials can only be set at the flow level and not at the server or site level.

Do one of the following:

- From the top menu, select **File** > **Connection Credentials** > **Embed in Published Flow**.




- When publishing a flow, select the **Embed credentials** check box. This option shows when you select **Publish As** to publish the flow to a new project for the first time or when you are editing a flow that was last published by someone else.

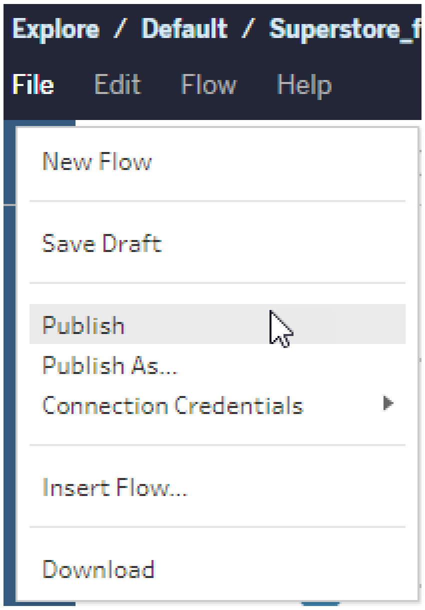



Publish a flow

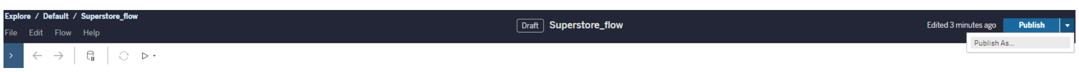
When you publish your flow, it becomes the current version of the flow and can be run and seen by others who have access to your project. Flows that are never published or flow changes that you make to a draft can only be seen by you until you publish the flow. For more information about flow statuses, see Automatically save your flows on the web.

To publish your flow, do one of the following:

- From the top menu, select **File** > **Publish** or **File** > **Publish As**




- From the top bar, click the **Publish** button or click the drop arrow to select **Publish As**.




Who can do this

- Server Administrator, Site Administrator Creator, and Creator allow full connecting and publishing access.
- Creator can perform web authoring tasks.

# Create Views and Explore Data on the Web

You can create and interact with views on Tableau Cloud. For more information, see the following topics in the Tableau Help for users.

Using Tableau on the Web

Tour your Tableau Site

Edit Views on the Web

Join your Data

Create a Dashboard

Create a Story

Embed Views and Dashboards in Web Pages

Make Workbooks Compatible Between Versions

## Alerts and subscriptions

Troubleshoot Subscriptions

Send Data-Driven Alerts from Tableau Cloud or Tableau Server

# Web Authoring and Tableau Desktop Feature Comparison

For anyone familiar with Tableau Desktop and new to the web authoring environment in Tableau Server and Tableau Cloud, this topic provides a summary of the web features that you use similarly to the way you do in Tableau Desktop. It also lists some fundamental differences between the two environments.

> **Note:** This topic summarizes core authoring functionality and does not cover every difference between the desktop and web environments.

## Features listed by version

For a list of the latest web editing features to be added to each release, see the web authoring sections in Tableau Desktop and Web Authoring Release Notes and Tableau Cloud Release Notes, or check out the Release Navigator viz to filter and compare changes by release.

## General differences in web authoring

- Your authoring capabilities are determined by your license level. For an overview of what you can do with each license level, see What can I do with a Tableau site?
- You can access right-click menu actions on fields in the view, but not on every item in the workspace.
- Keyboard shortcuts for web authoring and Tableau Desktop are not the same. For a list of web authoring keyboard shortcuts, see Shortcuts for web authoring.

## Web authoring capabilities

In the web environment, you can connect to data and create workbooks from those data sources, or data published through Tableau Desktop. You can edit views created on the web or published from Tableau Desktop.

Administrators can set at the site level what web authoring abilities users can have. Explorers can edit workbooks, create new workbooks from published data sources, connect to published data sources, and create and edit views, dashboards, and stories. Creators have those same capabilities, but can also create new workbooks, connect to data on the web, and use Ask Data and (in Tableau Cloud) Dashboard Starters to quickly dive into analysis.

## Data management

- **Creators**: Connect to data sources, upload files (text, excel, and Tableau workbooks), or use pre-built Dashboard Starter templates for certain data sources. For more information, see Creators: Connect to Data on the Web.

- **Creators**: Prepare data on the web in the Data Source page. For more information, see Creators: Prepare Data on the Web.

  **Note**: There is a limitation on the number of rows that can be viewed in the Data Source page when authoring data on the web, determined by browser:
  - Internet Explorer: 10,000 rows
  - Other browsers: 100,000 rows

  Independent of browser, the total number of records (rows by columns) that can be viewed in the Data Source page on the web is **3 million**.

  - Run Initial SQL when connecting with some data sources

  - Relate your data to combine data from multiple tables

  - Join data from different tables in the same data source or from different databases using a multi-connection data source

  - Add a join calculation

- Union data
- Pivot data
- Copy values in a grid (Ctrl+C, or Command-C on a Mac)
- Edit Data Sources
- Clean data using the Data Interpreter
- Create a Custom SQL query

- **Explorers**: Connect to published data sources.
  - Blend published data sources.
  - Save a data source (embedded in a published workbook) as a separate, published data source.
  - Change aggregation of measures in the view. Change the default aggregation of measures in the Data pane.
  - Search for fields in the schema.
  - Duplicate, hide, or rename fields.
  - Change the data type of fields.
  - Convert measures to dimensions or vice versa.
  - Convert a discrete field to continuous and vice versa. This option is available for measures and date dimensions.
  - Assign a geographic role for a field.
  - Create aliases for members of dimensions.
  - Create and edit groups.

- Create and edit sets (conditioned sets are not available)
- Create, edit, and remove parameters. Formatting numbers and dates, and adding comments for the parameter are not supported on the web.

## Analytics

- Create, edit, rename, duplicate, and clear sheets (views, dashboards, and stories) in a workbook.
- Use Ask Data to automatically create views.
- Use Explain Data to automatically create views.
- Search for fields in the Data pane with schema search
- Drag fields to the view, Rows, Columns, and different mark types in the **Marks** card.
- Use **Show Me** to create views. Also, from the Data pane, select and drag a field of interest to the view area to automatically create a "Show Me" view.
- View underlying data (via tooltips).
- Viz in Tooltip works in web views, but must be configured in Tableau Desktop. Viz in Tooltip worksheets can be hidden, the same way you would hide worksheets used in stories or dashboards.
- Actions work in web views, but must be configured in Tableau Desktop.
- Create and edit calculated fields.
- Create bins from continuous measures, and edit bins.
- Create and edit table calculations, and use quick table calculations.
- Create sets and show set controls. (Note that you cannot create sets from cube data sources in web authoring.)

- Use the **Analytics** pane to drag reference lines, trend lines, and other objects into the view. Edit reference lines, trend lines, and bands. Create and configure reference distributions on a continuous axis. Adding a cluster, and adding and modifying a forecast, are not supported for the web.
- Create groups by selecting marks in the view and then clicking Group Members (paperclip) in the tooltip for that selection. You can also edit existing groups in the Data pane.
- Create hierarchies by dragging one dimension onto another in the Data pane. **Note**: You can't create hierarchies when fields are already grouped within a folder.
- Change options for interacting with maps, including enabling or disabling pan and zoom, or showing map search, the view toolbar, or map scale. Users can also map units.
- Drill up and down a continuous hierarchy in the view. In a view with a continuous hierarchy, hover near the headers on a continuous axis to display the + and - controls. Click to drill down or up.
- Show labels, totals, and subtotals.
- Show, hide, and format mark labels
- Show and hide titles and captions.
- Show and hide cards for filters and highlighters.
- Show, hide, and resize headers in the view.
- Swap X and Y axes. Resize axes in the view.
- Change the view size.
- Show and hide the View Toolbar for any view or dashboard.
- Duplicate a sheet as a crosstab view.

## Filtering and sorting

- Use data highlighting.
- Add, edit, and remove filters, and edit filter control layouts.

  > **Note**: There is a limitation on the number of results that can be filtered when authoring data on Tableau Cloud or Tableau Server. Only the first 100 results are returned to limit the performance impact one user has when loading a large domain on the server.

- Filter across published data sources.
- Apply filters to multiple sheets
- Create context filters (**Add to Context** option in the Filters shelf) and dependent filters (**Only Relevant Values** option in a filter control shown in a view).
- Apply table calculation filters to totals in the view.
- Show hidden fields, and exclude or remove fields from the view.
- Sort fields in the view in ascending or descending order. Access the **Sort** dialog box by right-clicking a dimension on the Rows or Columns shelf. Nested sorting on dimension values within the context of each pane.
- Drag and drop headers to create a custom sort order within a view.

## Formatting

- Resize the width of row headers and the height of column headers.
- Edit workbook formatting, including formatting lines.
- Edit worksheet and dashboard titles.

- Edit axes (double-click an axis in the view). Other options available: **Synchronize dual axes**, clearing the axis range (**Reset**), and tick mark settings. Enable or disable **Dual axis** in a field context menu (right-click a measure field on Rows or Columns shelf). Logarithmic scales can be positive or symmetric (includes 0 and negative values).
- Edit number formatting (decimal places, percentage, thousands separator, units, and currency).
- Create, edit, move, and resize point, mark, and area annotations.
- Add and edit dashboards objects, including: horizontal and vertical layout containers, text, images, navigation buttons, web page links, and dashboard extensions.
- Create transparent worksheet backgrounds (set background color to **None**). Combine transparent worksheets with transparent filters, highlighters, and parameters.
- Change the color palette. For categorical fields you can assign specific colors and custom colors (using a hex code) to data items. For continuous fields, you can set custom colors for start and end colors (using a hex code).
- Create, rearrange, and preview device-specific dashboard layouts
- Set a dashboard item's exact size, position, and spacing.
- Add padding, borders, and background colors around items in dashboards.
- Select a background map in map views.
- Legends per measure. If you create separate color legends for the measures in your view, Tableau assigns the default color palette to each new color legend. To change the color legend for each measure, click the drop-down arrow on the color legend to open the **Edit Colors**dialog box and select the palette that you want to use. For more details, see Legends per measure.

## Related topics

What can I do with a Tableau site?

# Set a Site’s Web Authoring Access and Functions

Tableau Server administrators can specify at the site level whether to allow users to edit published views in the web environment and configure other web authoring functionality.

By default web authoring functionality is enabled for all sites. Users with the **Web Edit** capability can create and edit workbooks directly on the server. Turn off web authoring if you want users to be able to view and interact with published workbooks but not make any changes to the core information.

The steps below describe how to set web authoring and other associated functionality for an entire site. For more granular control over which users can use web editing, you can use projects, groups, and permissions. See Set Web Edit, Save, and Download Access on Content.

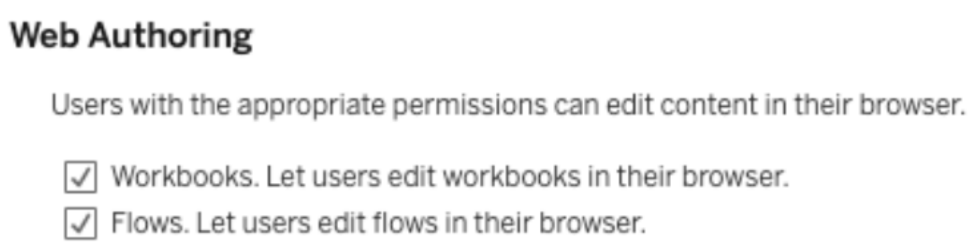
For information about how to enable authoring for flows on the web, see Create and Interact with Flows on the Web.

# Turn web authoring on or off for a site

> **Note:** This setting is only available for Tableau Server. Web authoring is enabled for Tableau Cloud and cannot be turned off.

1. In a web browser, sign in to the server as an administrator and go to the site in which you want web authoring to be enabled. In that site, click **Settings**.
2. In the **Web Authoring** section, select **Workbooks. Let users edit workbooks in their browser.** to enable the functionality.

   Clear the check box to turn off web authoring for that site.

3. If your site is already in production, and you want the change to take effect immediately, restart the server.

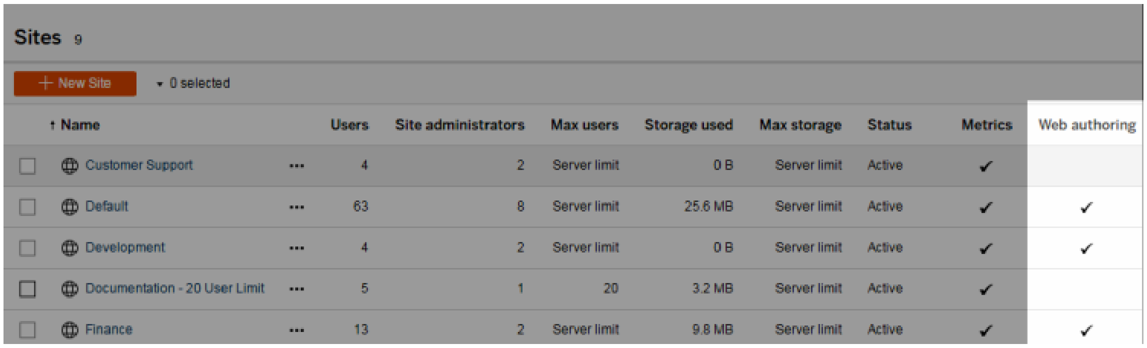
   Otherwise, the change takes effect after server session caching expires or the next time users sign in after signing out.

## Notes

- When you enable web authoring, make sure that, on the appropriate workbooks or views, the permission rule for a user or group allows the **Web Edit** capability.
- If you turn off web authoring on a production site and do not complete the last step to restart the server, users might continue to have authoring access until their session caches expire or they sign out.

## See which sites allow web authoring

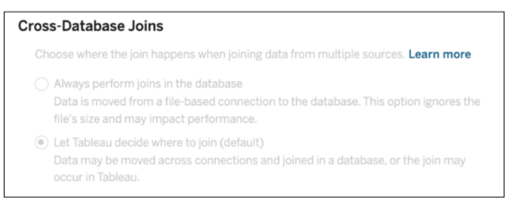
To confirm which sites allow web authoring, on the site-selection menu at the top, select **Manage All Sites**, and then go to the **Sites** page.




## About cross-database joins

To improve performance for cross-database joins, Tableau will now default to deciding whether it should perform joins within Tableau using Hyper, or move data into the connected live database as a temporary table and perform joins there.

The option in **Settings** for each site to configure cross-database joins is still visible, but it can no longer be changed from the default.




For more information, see Improve performance for cross-database joins.

# Create and Edit Private Content in Personal Space

Personal Space is a private location for all Explorers and Creators to save content to when working in a Tableau Site. Content saved in Personal Space can't be shared with other users but can be moved to a project when you're ready for others to see it. Within Personal Space, you can create a new workbook or save a workbook to Personal Space as a separate copy. You can also move existing content you own into Personal Space for editing, then move it back to a project later. Explorers can download workbooks in Personal Space, including all data included in the workbook.

## Privacy in Personal Space

Content saved to your Personal Space is only visible to you and site administrators. Site administrators can't directly access any user's Person Space or edit content in someone else's Personal Space, but they can view and manage Personal Space workbooks. Personal Space workbooks appear in administrator search results and as a workbook location on the Explore page. In addition, the permissions menu is unavailable when a workbook is in Personal Space because the workbook is private.

### Tableau Catalog and Personal Space

Starting in 2019.3, Tableau Catalog is available with Data Management in Tableau Server and Tableau Cloud. For more information, see "About Tableau Catalog" in the Tableau Server or Tableau Cloud Help.

When Tableau Catalog is enabled in your work environment, the information about workbooks you save in your Personal Space is indexed by Catalog. These workbooks are included in lineage counts, however, only you can see the workbooks. Furthermore, users who browse through the lineage tool see Permissions required instead of information about workbooks in your Personal Space.

### Collaboration tools

When a workbook is in Personal Space, some functionality is disabled, including share, metrics, comments, alerts, and subscriptions. Existing alerts and subscriptions to you will continue running, but alerts and subscriptions to others will fail, since the content is now private. Metrics can't be created in Personal Space but will continue to work if a connected workbook is moved there. (The legacy Metrics feature was retired in February 2024 for Tableau Cloud and in Tableau Server version 2024.2. For more information, see Create and Troubleshoot Metrics (Retired).)

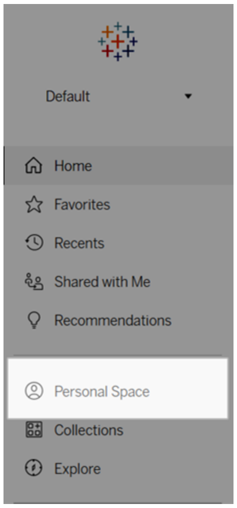
These limitations are removed when the workbook is moved or saved to another location. For example, if a workbook contains comments and moves to Personal Space, existing comments are hidden. Comments restore when the workbook is moved to another location.

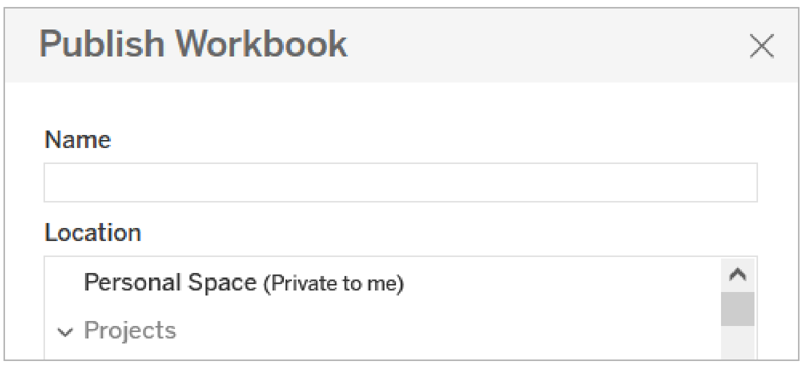
### Extract refreshes in Personal Space

To limit resource consumption, existing extract refreshes continue to run if they've been scheduled, but new extract refreshes can't be scheduled while a workbook is in Personal Space.

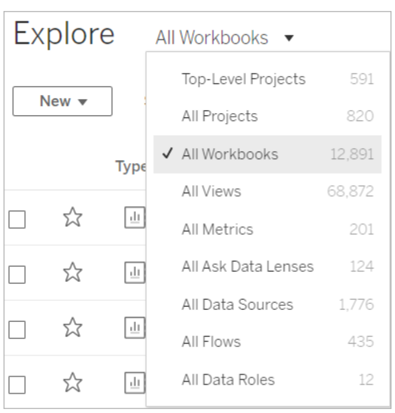
## Find content in Personal Space

You can access Personal Space from the left navigation menu to see all your Personal Space content or create a new workbook, and you can save to Personal Space when creating or editing a workbook anywhere on the site.




You can also see workbooks in Personal Space from the Explore page when All Workbooks is selected, and you can filter down to Personal Space content.



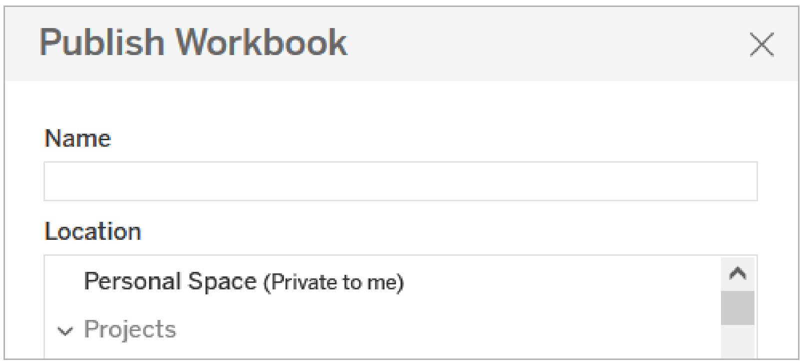
# Publish a workbook to Personal Space

Personal Space works much like a private project for you to publish a new or existing workbook to from Tableau Cloud, Tableau Server, or Tableau Desktop.

## Publish a workbook to Personal Space on Tableau Server or Tableau Cloud

1. With the workbook open, select **File** > **Publish As**.

2. Under Location, select **Personal Space**.




**Note:** Explorers can only save workbooks to Personal Space and may not see a location selection dialog.

## Publish a workbook to Personal Space from Tableau Desktop

Starting in 2023.1, you can publish a workbook to Personal Space from Tableau Desktop.

1. With the workbook you want to publish open in Tableau Desktop, select **Server** > **Publish Workbook**.

2. Under Project, select **Personal Space**.

3. Under Data Sources, select **Edit**.

4. In the Manage Data Sources popup under Publish type, select **Embedded in workbook** for all data sources. You must embed data sources when publishing from Tableau Desktop, because you can't publish data sources separately to Personal Space.

5. Fill out the remainder of the publishing options as usual. For more information, see Comprehensive Steps to Publish a Workbook.

## Move workbooks to Personal Space

You can move an existing workbook to Personal Space if you are the owner of the workbook and there is room in your Personal Space. Personal Space storage limits are set by administrators.

To move a workbook to Personal Space:

- Select a workbook, then click the **Actions** drop-down menu.
- Select **Move**.
- Under Location, Select **Personal Space**.

> **Note:** Explorers can only save workbooks to Personal Space and may not see the move action or location selection dialog.

For more information, see Perform actions in the Manage Web Content help topic.

When you move an existing workbook or data source to Personal Space, tools like share, alerts, and subscriptions become hidden. Existing extract refreshes continue to run if they've been scheduled, but users can't schedule new extract refreshes within their Personal Space.

Existing subscriptions and alerts also continue but can't be edited from Personal Space and will fail if other users are recipients. Existing connected metrics will continue to refresh, but the connected view will not be visible to other users.

## Move workbooks from Personal Space

When you move a workbook out of Personal Space, collaboration tools like share, alerts, and subscriptions become visible, and any existing comments reappear.

# Explore Your Data with Tableau Agent

**Note**: Einstein Copilot has been renamed Tableau Agent, as the platform expands to accommodate more AI agent functionality. Starting in October 2024, you'll see updates to page sections, field names, and other UI text throughout Tableau Prep, Tableau Catalog, and Tableau Cloud Web Authoring. Help content and Trailhead modules are also being updated to reflect these changes.

Tableau Agent is a generative AI feature that helps you explore your data, create visualizations, and uncover insights with the help of a conversational assistant. Connect to a workbook or data source and use natural language to perform visual analysis. Use Tableau Agent and the Tableau UI together to get to insights faster. With Tableau Agent, staring at a blank canvas becomes a thing of the past.

In the Tableau authoring experience, you can open the Tableau Agent conversation pane in a worksheet. Tableau Agent can help with tasks like:

- **Jumpstart your analysis**: Tableau Agent can suggest analytical questions based on your data
- **Build a viz**: "How many action movies did each director make?"
- **Choose the best chart type for an analysis**: "Show me the distribution of student's grades"
- **Perform time series analysis**: "What month had the largest growth in number of donors compared to the previous month?"
- **Create calculated fields**: "Create a field that calculates the difference between case open and closed dates and round up to weeks"

- **Explain calculations**: "Explain the "Days to Ship Actual" calculation"
- **Filter and sort data**: "Only look at Saltwater and show me the fish with the smallest tank options"

Tableau Agent creates visualizations based on your data, just like **Show Me** in Tableau. Chart types that Tableau Agent can currently support include:

- Text
- Heatmap
- Bar
- Stacked bar
- Line
- Dual line
- Area
- Gantt
- Box plot
- Scatter plot
- Histogram
- Symbol map
- Filled map
- Tree map
- Pie
- Bullet
- Bubble

For more information about Tableau chart types, see Choose the Right Chart Type for Your Data.

**Note**: To use this feature you must have Tableau+ and AI in Tableau must be turned on in your site settings. If you don't have Tableau+, but want to try Tableau Agent features, you can sign up for a Tableau Cloud free trial which now includes Tableau Agent features. To start your trial, fill out this form, or contact your Account Executive. For more information about the free trial or to configure AI in Tableau, see Turn on AI in Tableau for Your Site.

## Tableau Agent and Trust

Tableau Agent is built on top of the Einstein Trust Layer and inherits all of its security, governance, and Trust capabilities. As you interact with Tableau Agent, neither your data nor your conversations that are sent to the Large Language Model (LLM) are saved to the LLM, and no customer data is ever used to train the model.

Tableau Agent only works with the data sources your workbook is connected to. It isn't aware of any other Tableau data sources, so it can't suggest relevant content, answer data lineage questions, or answer general-knowledge questions. User-defined policies for row and column level security are respected. The data a user has access to while using Tableau Agent conforms to any row or column-level security policies that you have in place.

When you first open Tableau Agent, it indexes your data to understand the context. This helps Tableau Agent return relevant results based on your questions and your data source. The information it indexes includes field metadata (field captions, field descriptions, data roles, and data types) and up to 1000 unique field values if the data type is string (text).

The Einstein Trust Layer can be used to mask Personally Identifying Information (PII) before it is sent to the LLM using pattern-based data masking. Using machine learning and pattern matching techniques, PII in prompts are replaced with generic tokens and then unmasked with original values in the response. For more information about how to configure data masking, see Select What Data to Mask in the Salesforce help. For an additional layer of protection, the Einstein Trust Layer guarantees that after the prompt and response are processed by the LLM, the LLM forgets both the prompt and the response.

## Get started with Tableau Agent

Tableau Agent is available through a new conversation pane in the web authoring environment of a Tableau Cloud site. It's only available for worksheets, so you won't see this option in dashboards or stories. You also must have the site role of Creator or Explorer to use this feature.

Start by creating a new workbook or opening an existing one. For new workbooks, you start by connecting to your data. For faster results, we recommend using Tableau Agent with extracts. However, you can also use Tableau Agent with live database connections, and uploaded files with the following file types:

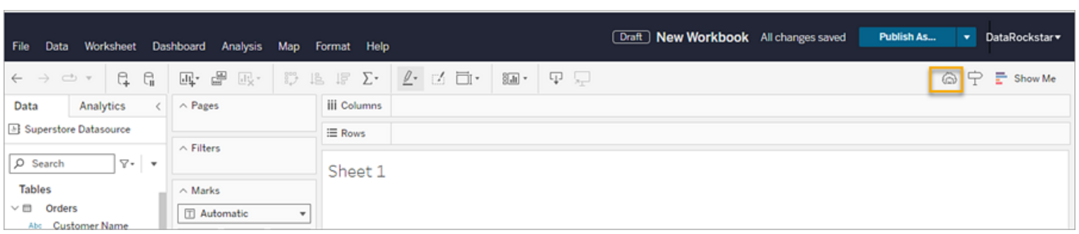
- .hyper
- .csv
- .txt
- .xlsx

Tableau Agent doesn't support cubes. Also, if you're using data blending, Tableau Agent can only be used with the primary data source.

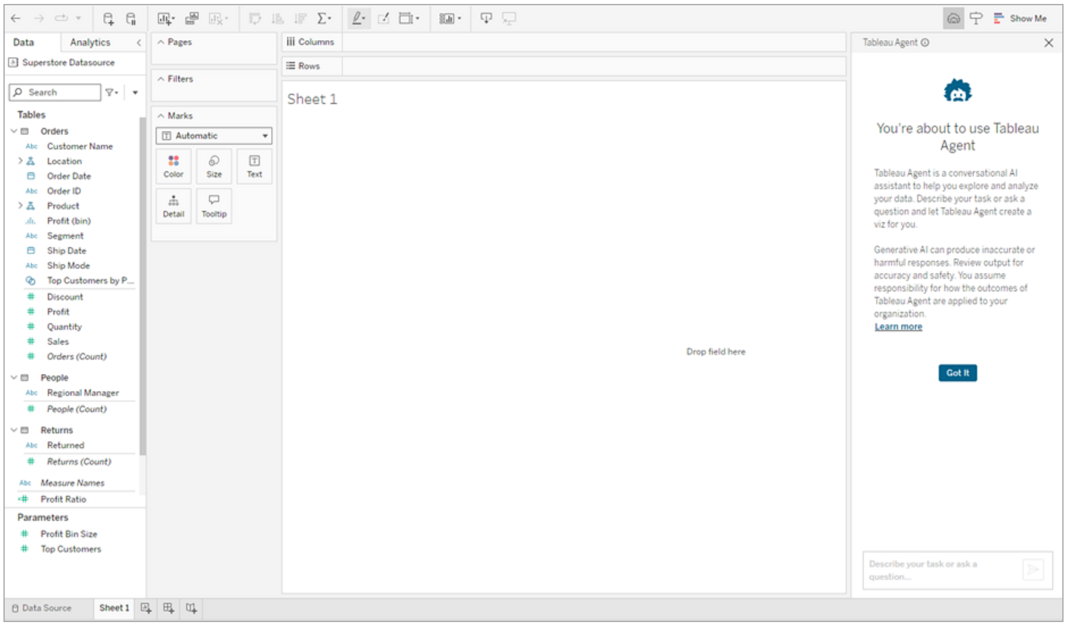
## Launch Tableau Agent

To open the Tableau Agent conversation pane, do the following:

1. Select the Tableau Agent icon in the toolbar next to **Show Me**.



2. When the pane opens, select **Got It** to acknowledge the disclaimer and get started.



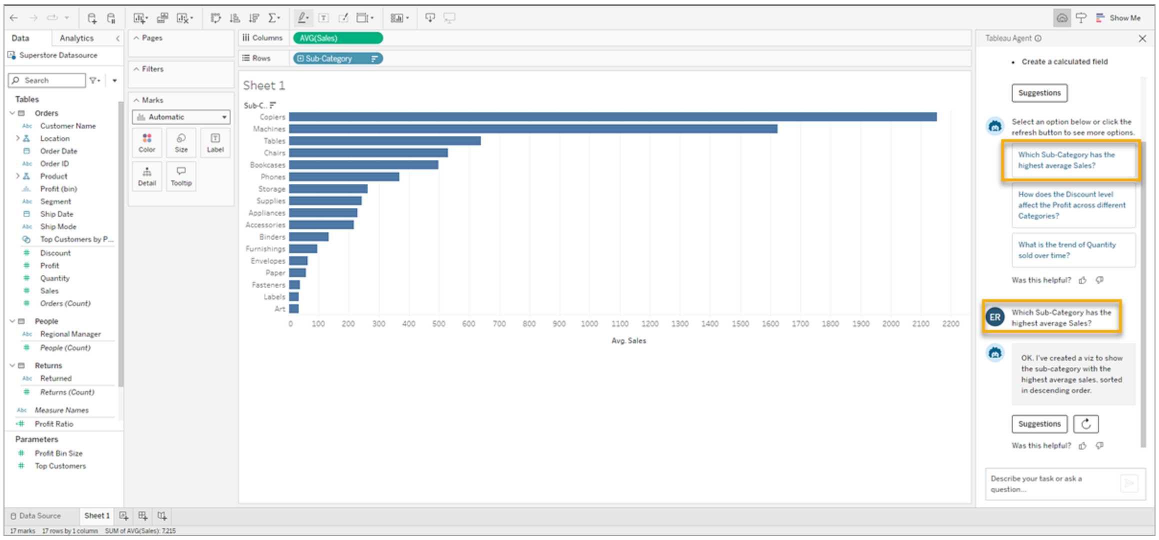

## Build and change a viz

Tableau Agent isn't an open-ended chatbot. It can only work within your data set and perform a specific set of actions around analysis and viz creation. To understand your data, Tableau Agent starts by indexing the data set you're connected to. If you're connected to more than one data set, it will work with the selected data set shown in the Data pane. Tableau Agent only works with the primary data source in a data blend.

**Note**: If you switch to a different data source while Tableau Agent is processing your request, this can cause an error. Wait until Tableau Agent responds before changing data sources; then make a new request using that data source.

Indexing scans the field names, data types (such as dates, text, or number fields), and samples 1000 unique field values to get a sense of what kind of data is in that field. Re-indexing occurs periodically when a change is made, such as renaming a field or creating a new calculated field.

After indexing is complete, Tableau Agent provides some suggested questions you could ask about your data to help you get started, or type your own questions into the text box using natural language to describe what you want.



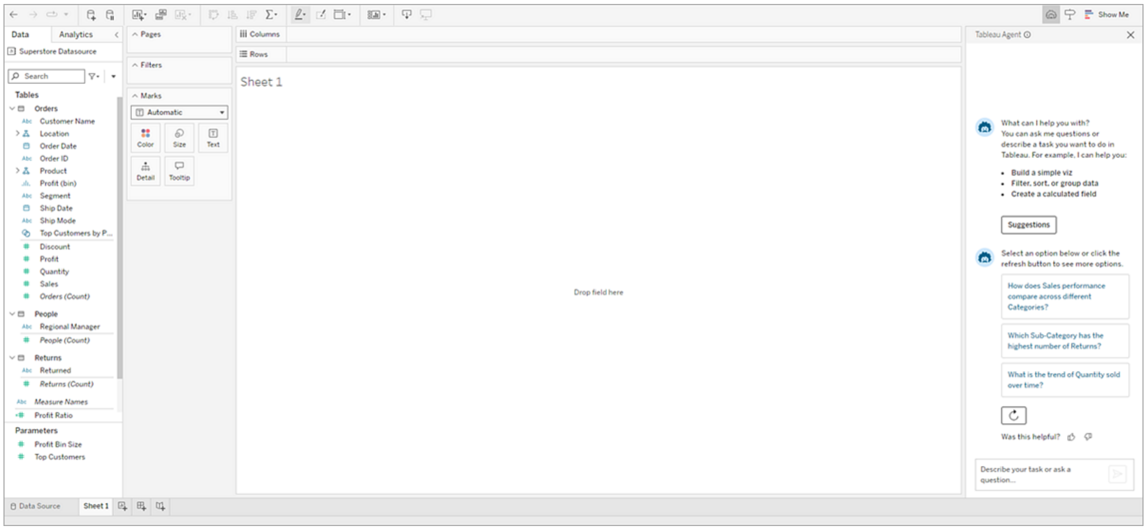

After Tableau Agent creates the viz, you can interact and modify it, just like if an analyst built and shared a viz with you. Ask more questions with Tableau Agent to iterate and explore your data further, or take the reins and continue your analysis on your own directly in the Tableau interface.

If the viz that Tableau Agent created isn't what you're expecting, you can either provide additional information by typing what you want in the text box, or try selecting the **Retry with Tableau Agent** and Tableau Agent will query the LLM again and provide a new response to your request.

## Use suggestions to jump start your analysis

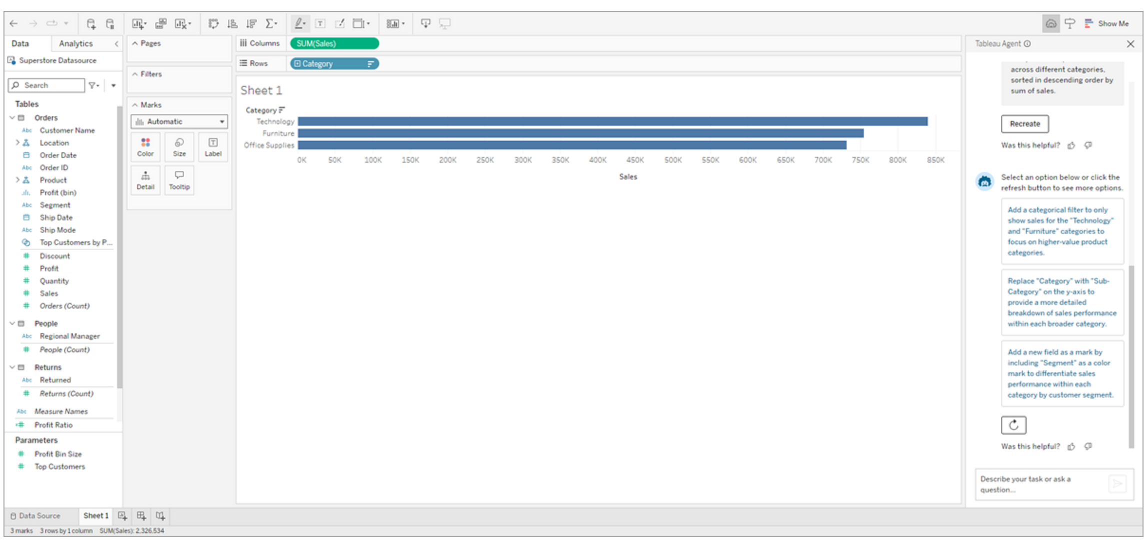
Whether you're facing a blank canvas or are deeper into your analysis, Tableau Agent can help by suggesting questions you can ask to dig deeper into your data. Before you begin, select the **Suggestions** button and Tableau Agent will create three questions you might ask based on your data source. To see more questions, select **Retry with Tableau Agent** .

Select a question, and Tableau Agent creates the corresponding viz for you.




You can also use suggestions to dive deeper into your analysis as you interact with vizzes Tableau Agent has created. At the bottom of the confirmation response from Tableau Agent, select the **Suggestions** button and Tableau Agent will suggest some actions you might take to discover more insights about your data. When you do this, the **Suggestions** button is converted to a **Recreate** button so that you can go back and recreate the previous viz if needed.

Simply select an option to apply the suggested action to your viz. If you don't like those suggestions, just select **Retry with Tableau Agent** to see more options.



## Create calculations

Building calculations in Tableau can sometimes be tricky. If you're new to Tableau, you might not know the right syntax to use or how to properly format your calculation. Tableau Agent can do the heavy lifting for you, keeping you in the flow of your analysis.

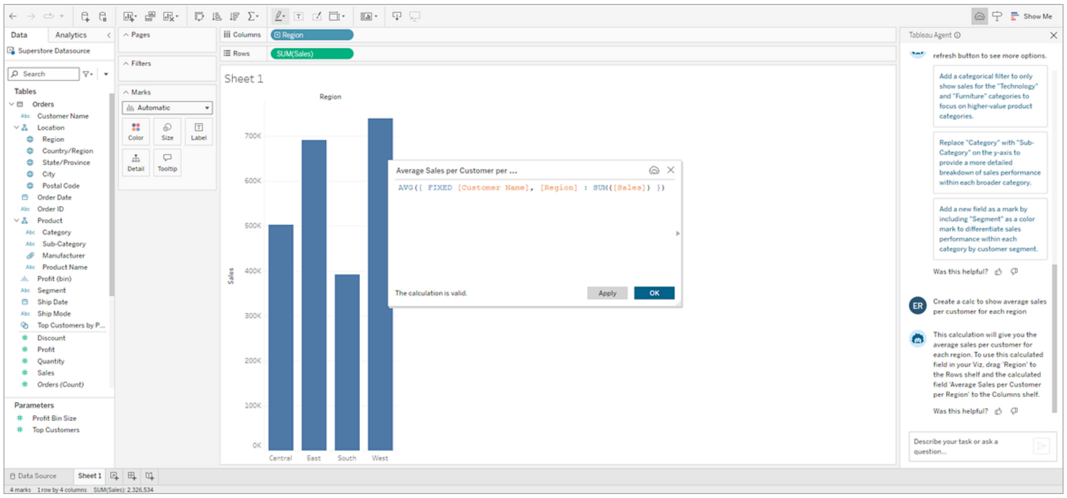
Simply ask Tableau Agent to help you create a calculation using natural language to describe what you want to do. Tableau Agent does the following:

- Opens the Calculation Editor
- Adds the suggested syntax
- Names the calculation
- Provides an explanation of the calculation in the Tableau Agent pane to help you evaluate it for accuracy and build proficiency

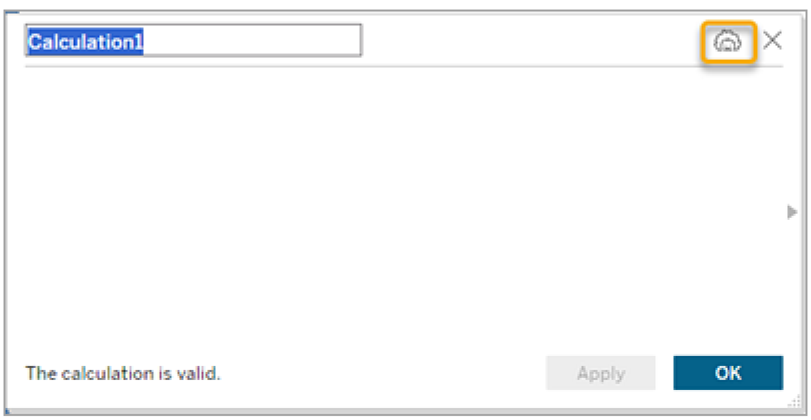
Review the calculation, edit it if needed, and accept it. Tableau Agent adds the new calculated field to the Data pane and it’s ready to use in your analysis.

There are two ways to ask for help with calculations:

1. **In the conversation pane**: Ask Tableau Agent to create calculations for you as part of the flow of your conversation. Just describe your calculation using natural language, and Tableau Agent does the rest.




2. **In the Calculation Editor**: Open the Calculation Editor and select the **Tableau Agent** Icon. This opens the conversation pane if it isn't already open. If it is, just type your calculation description in the text box, and Tableau Agent adds the suggested syntax right into the open Calculation Editor.




Tips for creating calculations

To get the best results when asking Tableau Agent to help you create a calculation, be specific. When your goal is to have Tableau Agent write a calculation for you, use that specific language. For example, "Create a calc…", "Write a calc…", "Create a calculated field…", or simply just "Calculate…"

It's also important to avoid being too generic. For example, instead of saying “Identify my most profitable products”, try “Calculate the profit ratio by product name”.

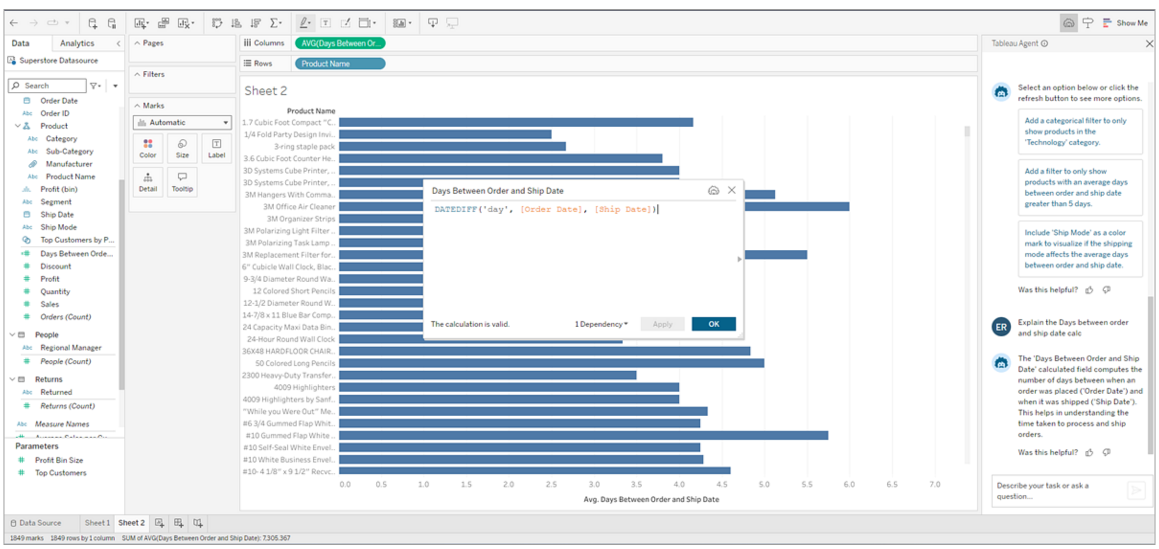
This helps Tableau Agent understand both your intent (to create a calculation) as well as what you mean by the fields you want to calculate.

### Calculation Descriptions

Understanding what a calculation does is just as important as creating the calculation itself. Tableau Agent can help with that.

Whether it’s a calculation that Tableau Agent created for you or one that exists as part of your data set, you can ask Tableau Agent to explain the calculation. For example, “Explain the Business Days Between Order and Ship calculation.”

Not only can this help you verify that the calculation does what you need, this feature can also help you build proficiency in using calculated fields in your Tableau analysis.



### Edit calculations

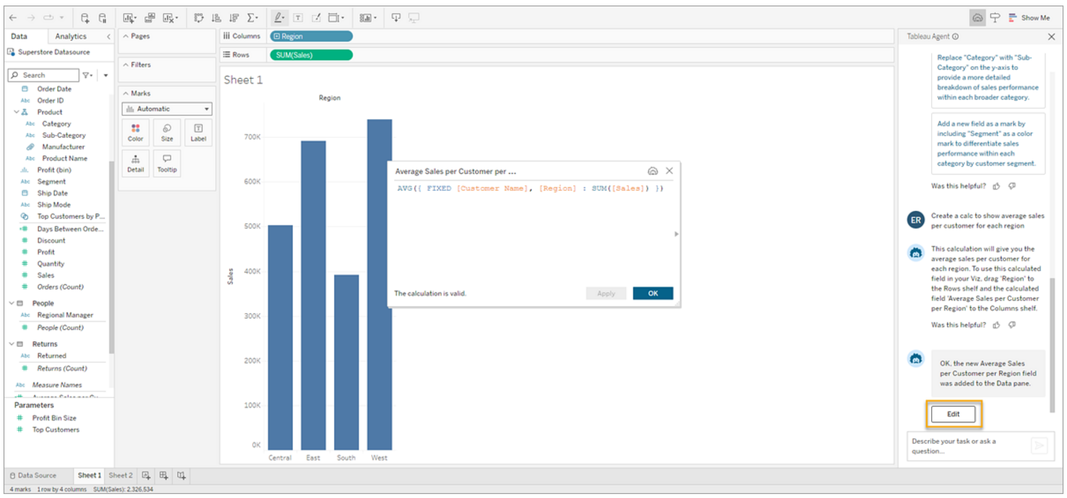
At any time you can go back to any calculation that Tableau Agent created for you and edit it. Currently, you can manually edit the calculation in the Calculation Editor. Iterating on the calculation in Edit mode is not yet supported with Tableau Agent.

To edit a calculation, do the following:

1. In the conversation pane, find the calculation you want to edit.

2. Click **Edit**.

3. In the Calculation Editor, make any changes you need, then click **OK**.




To ask Tableau Agent to update an existing calculation in the **Data** pane, open the calculation in the **Calculation Editor** first.

1. Right-click or Cmd+Click (MacOS) on the field in the **Data** pane.

2. Select **Edit...**

3. Type the update you want to make in the text box in the Tableau Agent conversation pane.

Calculation limitations

When creating calculations using Tableau Agent, the following functionality is not yet supported:

- When creating a calculation, Tableau Agent can't yet ask clarifying questions. You might need to be specific or iterate, such as specifying "change the field FIRST NAME into proper capitalization" if there is more than one field with the word "name" in its name.

- Available calculations can vary by connection type. For example, certain date functions such as DATEPARSE are only supported by data extracts and a subset of possible connectors.

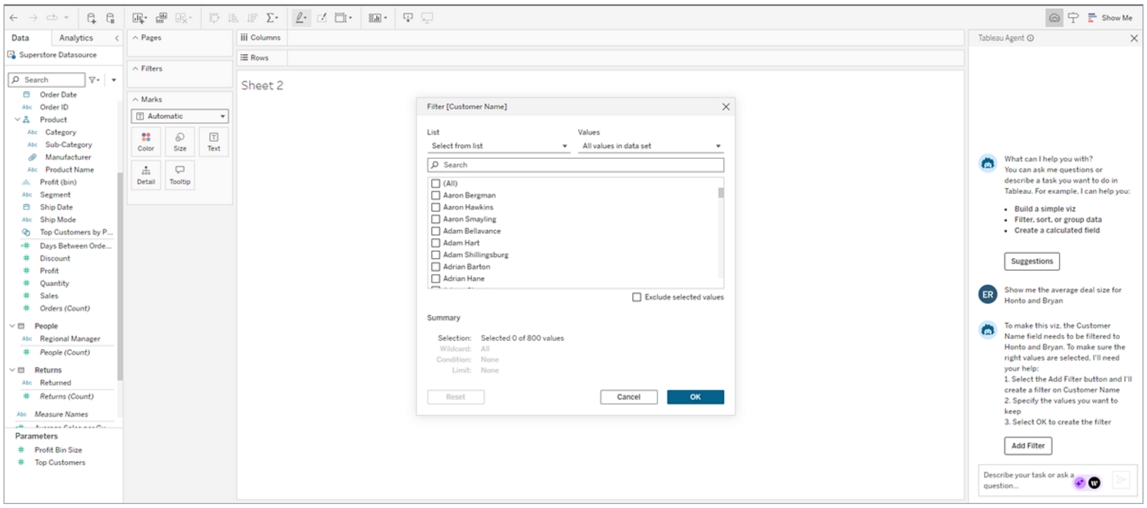
  If your request involves a function that isn't supported by your live data connection, Tableau Agent may create the calculation for you but it will be in an error state. To use the calculation, you'll need to take an extract of your data source first. In some cases there may be alternative functions you can request, such as using DATE instead of DATEPARSE. For more information about these alternatives, see the functions documentation.

- Tableau Agent can't create a calculation and then automatically use it in the viz. Instead do this as a two-step process. Ask for the calculation and add it to the Data pane; then ask for the viz and reference the new calculated field by name.

## Working with filters

You can ask Tableau Agent to filter your viz using natural language. While Tableau Agent does its best to understand your request and return a solution, sometimes it might need your help to return the response that you're looking for. For example, if you have high cardinality fields, fields with a lot of values, Tableau Agent might ask you to select the values you want.

In cases like this, you can select **Add Filter** in the Tableau Agent pane, and Tableau Agent opens the Filter dialog for you. Just select the values you want and select **OK** to add your filter to the viz.




## Conversation history and viz recreation

You interact with Tableau Agent in the conversation pane. The pane is where Tableau Agent offers suggestions for analysis and maintains your conversation history for that session. If you ask a new question, the viz itself updates, but the conversation pane maintains a history of all your requests and Tableau Agent's responses.

It also has interactive elements such as **Retry with Tableau Agent** to ask Tableau Agent to query the LLM again with the same request and create another version of the viz or **Recreate** Recreate to go back to return to a previous viz without querying the LLM, maintaining the same results.

If you close and reopen the conversation pane while still in your same session, your conversation history persists. If you close your workbook, this clears the conversation with Tableau Agent. The conversation history isn't saved and doesn't appear the next time you open the workbook.

Tableau Agent is a per-sheet experience. There's no awareness of other worksheets in your workbook and conversations can't be shared between worksheets. If you change to a new sheet, this starts a new conversation. Additionally, if you publish your workbook using **Publish As**, Tableau Agent won't retain the conversation history.

If you want Tableau Agent to forget the context of what you've done so far, start a new sheet so there's no history in the conversation pane.

## Tips for getting the best results from Tableau Agent

Tableau Agent does its best to understand your intent and your data. But it's still learning. Use the following tips to help Tableau Agent do its best and deliver great results for you.

| Tip | Problem | What to Do |
|---|---|---|
| **Use clean data** | Messy data is hard to analyze and Tableau Agent won't know how to clean and prep your data for you. | • Use certified data sources. The better the data quality, the better results Tableau Agent can return.<br>• Clean and prep your messy data before analysis.<br>• Make sure field names are descriptive and unique. |
| **Hide irrelevant fields** | Similarly named fields in your data set can be confusing to Tableau Agent. | Hide fields you don't need and Tableau Agent won't use these hidden fields. |
| **Be careful with synonyms** | Tableau Agent does a good job of understanding common synonyms. For example, it would know that "titles" and "films" could apply to a field called "movies." However, it doesn't know about any of your company specific terminology or acronyms that you may use. | Refer to the specific fields you're interested in to help Tableau Agent be more accurate. |
| **Be explicit with your intent** | Tableau Agent does its best to infer your intent, but it might not always get it right. | If you know you want Tableau Agent to generate a viz, use clues in your request like "show me," |

| | | |
|---|---|---|
| | | “create a viz,” “build a bar chart.” Alternatively, if you want Tableau Agent to create a calculation, try starting your request with the phrase “Create a calc that...” |
| **Specify how to evaluate “top”** | Requests like “top products,” “best salespeople,” “highest quarter” can be ambiguous to Tableau Agent and it might not know how to evaluate what “top,” “best,” or “highest is.” | State how “top” should be measured and displayed. For example, try asking Tableau Agent to show you the “top 10 products based on profit” or "top 3 products based on sales volume". |
| **Use specific terminology in your requests** | Tableau Agent can scan your data source for the field names and data in those fields, but it doesn't truly understand the data the way a human can. | The more descriptive you are in your request, the better Tableau Agent is at providing a relevant visualization. If you know your data should be evaluated with an aggregation of MEDIAN instead of AVERAGE, specify that. |
| **Break down complex tasks** | Tableau Agent can’t update the data model and generate a visualization as part of a single step. | Break down your tasks into parts and iterate. For example:<br>• <Task 1> "Create a calc called profit"<br>• <Task 2> "Show me how profit has varied over time" |
| **Only asks questions about your data** | Tableau Agent isn’t a general-purpose chatbot. It can’t answer consulting questions like “how should I analyze my data?” or general questions like “which cat breed makes the best pet?” | Ask questions targeted at analyzing your data and iterating and digging deeper into the viz results. |

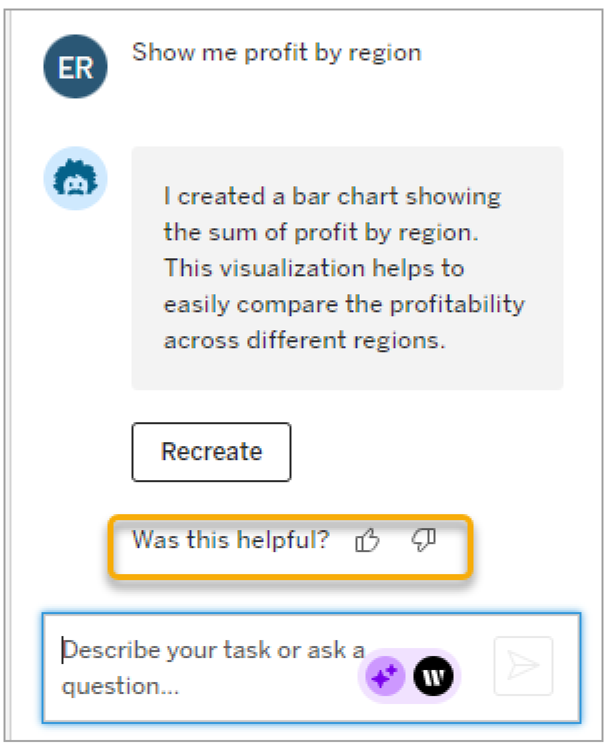
## Be the human in the loop

As with all AI, its important to review the results you get when using Tableau Agent. Tableau Agent will do it's best to understand your data and your intent when asking questions, but it might not always get it right.

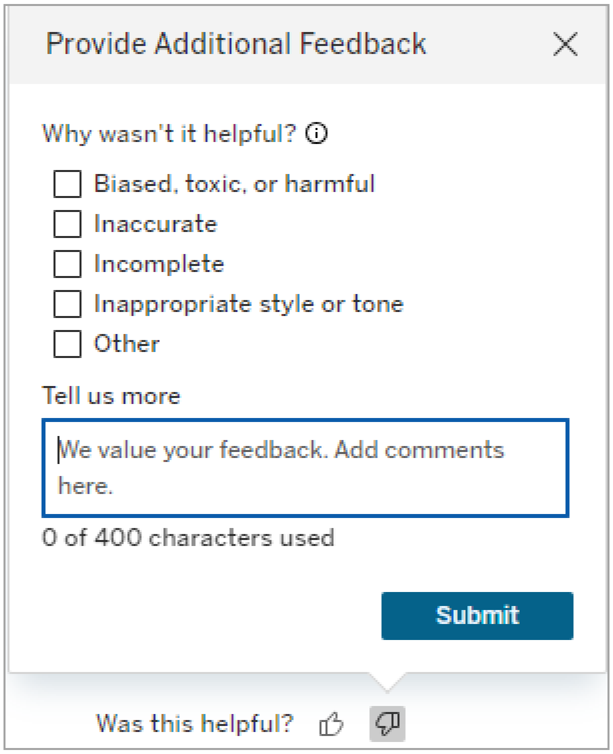
For example, Tableau Agent tries to pick a default for things like date granularity (such as year, month, or day) or aggregation (such as median or average). If you know the aggregation you want, it's better to specify this in your request.

If Tableau Agent gets it wrong, you can either restate your request and clarify what you want, or you can interact directly with the viz. After all, you're in the standard authoring environment and have access to all of Tableau's functionality.

You can also provide feedback at any time on the results with the thumbs up or thumbs down buttons that show up with every Tableau Agent response.



If you click the thumbs down option, provide additional feedback to help improve Tableau Agent's responses.




## Tableau Agent limitations

Tableau provides powerful tools for the human analyst, and Tableau Agent is no different. AI in Tableau isn't meant to replace analysts and data explorers; it's here to give you a boost. Your participation in the process is crucial.

### Types of analysis

Tableau Agent can't yet manage consultative questions like "how should I analyze my data?" or "Is there seasonality in this data?". Instead, you need to specify what you'd like to see, such as "What are my sales over time?"

## Unsupported features

Tableau Agent doesn't have access to all of Tableau's authoring features — yet, and it is currently only available in web authoring.

Some things that Tableau Agent is currently unable to do include:

- Choose a data source for you or do data modeling (such as creating joins or relationships)
- Support data in languages other than English. You can enter your requests in other supported languages, but the response will also only be in English.
- Change data types, field roles, or caption names
- Format a viz. Such as adding fields to the Marks card properties. For example detail, tooltips, and size.
- Add reference lines
- Organize or customize fields using groups, sets, or parameters
- Create interactivity with elements such as filter controls, parameters, and actions
- Build dashboards
- Analyze large data sets. Tableau Agent will not work as well if you have 100’s or thousands of fields in your data set, especially if they are similarly named. If you try to filter against fields that are high-cardinality (many distinct values for a single field), Tableau Agent might need you to manually perform your filter operations.
- Block indexing refreshes after data model changes

# Tableau Agent FAQ

**Note**: Einstein Copilot has been renamed Tableau Agent, as the platform expands to accommodate more AI agent functionality. Starting in October 2024, you'll see updates to page sections, field names, and other UI text throughout Tableau Prep, Tableau Catalog, and Tableau Cloud Web Authoring. Help content and Trailhead modules are also being updated to reflect these changes.

Find answers to commonly asked questions about using Tableau Agent in Tableau Cloud web authoring. To learn more about Tableau Agent in Tableau Prep or Tableau Catalog, see Create Calculated Fields with Tableau Agent or Describe projects, workbooks, or data sources.

## General Information

What is Tableau Agent?

Tableau Agent is a generative AI feature in Tableau that helps you explore data, create visualizations, and uncover insights using a conversational assistant. It allows you to interact with your data through natural language in a web authoring environment.

Is there a free trial?

Yes. You can sign up for a Tableau Cloud free trial which now includes Tableau Agent features. Simply fill out this form, or contact your Account Executive. You can currently try Tableau Agent in Tableau Cloud web authoring and Tableau Prep on the web as part of a limited trial.

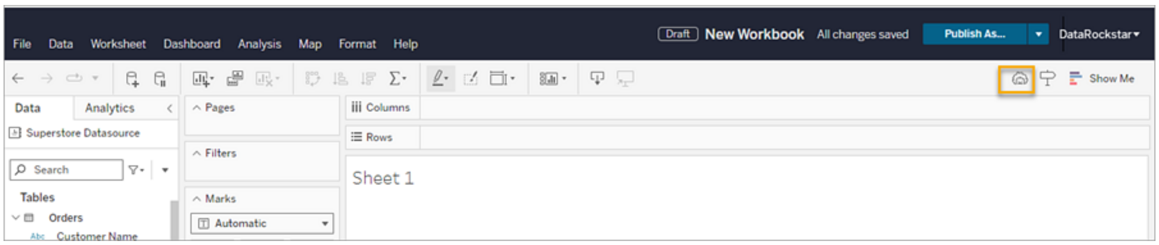
The trial gives you full access to Tableau Agent functionality but there are some restrictions on the overall experience.

- You can only trial in a new site, not add a trial of Tableau Agent to your existing production site.
- Tableau Agent in Tableau Catalog isn't included in the trial.

- Tableau Agent is free to use during the trial but limits may apply to the number of requests you can make per hour.

How do I access Tableau Agent?

You can find Tableau Agent in the web authoring environment of a Tableau Cloud site. Look for the Tableau Agent icon in the toolbar next to **ShowMe**. The icon is only active when Tableau AI is turned on for web authoring, and you are on a worksheet tab and connected to a data source. You must also be assigned the role of Creator or Explorer.




Why is the Tableau Agent button grayed out?

To use Tableau Agent, the following must be true:

- You must be connected to a Tableau Cloud site
- You must be on a worksheet
- You must be connected to a data source
- Tableau AI must be enabled for your site and the **Tableau Web Authoring: Builds visualizations or completes tasks for you using a conversational AI** check box is selected.

## Usage and Capabilities

Can I use Tableau Agent on any type of data?

Tableau Agent is recommended for use on data extract or file-based data for improved performance, but Tableau Agent also works with live connections, or uploaded files with .hyper,

.csv, .txt, and .xlsx file types. Cubes are not supported. Also, if you're using data blending, Tableau Agent can only be used with the primary data source.

Only data in English is formally supported. Tableau Agent responses are English only.

What can I ask Tableau Agent to do?

Tableau Agent has two top level capabilities - viz generation and working with calculations.

Tableau Agent can help you build visualizations, choose the best chart types for your data, perform date-based analysis, and manage data filtering and sorting. For example, you can ask it to "show sales data for a specific region" or "compare sales to profit". For more information, see Build and change a viz.

Tableau Agent can also create calculations from natural language. Using the same conversation pane that you would use for generating a viz, you can ask Tableau Agent to create, update, or explain a calculation. For more information, see Create calculations.

Are there limitations to what Tableau Agent can do?

Yes, Tableau Agent has some limitations. For example, it can't pick a data source for you, do data modeling, build dashboards, suggest relevant content or answer data lineage questions, answer consulting questions (such as “How should I analyze my data?”), or create interactivity with elements like filter controls and parameters. It's primarily aimed at helping novice users and those exploring ad-hoc data questions. For more information, see Tableau Agent limitations.

What is the best way to use Tableau Agent effectively?

Start by working with clean data

- Make sure field names are descriptive and unique
- When you start an Tableau Agent session, if you see similarly named fields in a data source, hide the ones that aren't relevant. Tableau Agent won't ground its answers on hidden fields
- Specify the aggregation function for a measure if you know what you want

- Make sure fields have the correct field role (measure or dimension) and data type (location, string, boolean, etc.)
- Like traditional Tableau, Tableau Agent performs better with extracts. When using live data sources, the time it takes to initiate your Tableau Agent session might be longer and viz load time will be slower

Only ask about analyzing your data. Tableau Agent isn't a general-purpose chat-bot. When it comes time to ask questions, start each request as if Tableau Agent is only aware of the current state of the visualization. Ask questions about what you want to see. For example, “What are my sales over time in California?".

Be specific and descriptive in your requests to help Tableau Agent better understand and respond to your data analysis needs. Break your request into discrete tasks. For example, first request a calculation, then ask for a viz that uses that new field, instead of asking for a viz and a new calculated field at the same time. For more information, see Tips for getting the best results from Tableau Agent.

Can I use Tableau Agent for dashboards or stories?

No, currently Tableau Agent is only available for worksheets.

## Technical Details

How does Tableau Agent handle data privacy and security?

Tableau Agent ensures data privacy and security by adhering to a zero data retention policy with third-party LLM providers. It respects all existing permissions and data policies within Tableau Cloud, ensuring only authorized users have access. Additionally, it can also employ pattern-based data masking techniques to protect personally identifiable information (PII) before it is processed by LLMs.

For more information, see Tableau AI and the Einstein Trust Layer and Select What Data to Mask in the Salesforce help.

How does Tableau Agent know what is in my data?

Tableau Agent indexes your data source at the start of each session to understand what data is present. Indexing takes in the data type, field name, and samples 1000 unique values for a field. This ensures responses are grounded in your data. Remember that Tableau Agent respects data masking if it is enabled, and might not be able to respond to requests that involve masked data.

If you have fields with high cardinality (many distinct values for a single field), Tableau Agent might not have indexed all the values. If you try to filter on a high cardinality field, Tableau Agent creates a filter for the field but might prompt you to select the values you want to include or exclude.

What if the viz created by Tableau Agent isn’t correct?

As with all AI, it's important to review the results you get when using Tableau Agent. Although Tableau Agent can scan your data source for the field names and data in those fields, it doesn't truly understand the data the way a human can. Always review the results from Tableau Agent. If a viz doesn't meet your expectations, try clarifying your request or asking Tableau Agent to recreate it. You can also interact directly with the viz to adjust the analysis to meet your needs. Think of the viz created by Tableau Agent as a starting point to jump start your analysis.

You can also always provide feedback using the thumbs up and thumbs down icon in the conversation pane.

Does Tableau Agent remember previous interactions?

Tableau Agent is a per-sheet experience, meaning it doesn't retain conversation history across different sheets. It has limited memory based on the information in the conversation pane of the current sheet. Additionally, if you publish your workbook using **Publish As**, Tableau Agent will not retain the conversation history.

Why was my request cut off?

There's a limit on how long your input can be (500 characters), and how much context from your data Tableau Agent can evaluate.

# Create a Tableau Data Story (English Only)

**Important changes for Tableau Data Stories**

Tableau Data Stories will be retired in Tableau Desktop, Tableau Cloud, and Tableau Server in January of 2025 (2025.1). With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see How Tableau Pulse powered by Tableau AI is Reimagining the Data Experience.

If you've ever written an executive summary of your Tableau dashboard, then you know it can be time-consuming. It takes time to choose which insights to share, and you have to rewrite your summaries each time the data is updated. Tableau Data Stories automatically generates narrative insights within your dashboard, saving time and surfacing relevant insights. As you explore the vizzes in your dashboard, the stories written by Data Stories adjust, allowing you to dive deeper into data and identify key insights faster.

From where you're already working in Tableau, you can quickly add the **Data Story** object to your dashboard. And you can customize the terms and metrics used in your story, so Data Stories speaks the language used by your business.

Today, you can write and view a Tableau Data Story anywhere you use Tableau. After you create your story, you can also view your Data Story in Tableau Mobile. However, Data Stories aren't included if you export your dashboard, for example to a PDF.

## Understand how Data Stories handles data

To write Data Stories, Tableau uses a service hosted in your Tableau Cloud or Tableau Server environment. When you Add a Tableau Data Story to a Dashboard or view a Data Story from a dashboard, Tableau sends associated worksheet data to the environment that you're logged in to (i.e., your Tableau Cloud site or your Tableau Server instance), using the security standards outlined in Security in the Cloud and Security in Tableau Server. Data Stories can be written and viewed from anywhere you use Tableau.

## Learn about how Data Stories are written

Tableau Data Stories is powered by rules-based templated natural language generation (NLG). Data Stories performs automated analytics to determine relevant and accurate facts about the underlying data–from basic calculations to more advanced statistics. To write a story, Data Stories uses a library of predefined language templates to synthesize these facts into natural language insights. Data Stories processes these templates at run-time, using the most up-to-date summary data from the Tableau worksheet it is connected to. You can leverage the custom language feature to generate your own language templates, add functions, and define business rules, helping you build a more relevant and contextual Data Story.

**Note:** Data Stories doesn't use generative AI, large language models (LLMs), or machine learning to write insights and stories.

## Manage Data Stories for your site

Tableau administrators can choose whether Tableau Data Stories are available for their site. Data Stories are turned on by default.

1. Sign in to your Tableau site.
2. From the left pane, choose **Settings**.
3. From the **General** tab, scroll to the **Availability of Data Stories** section.
4. Choose whether you want to **Turn on** or **Turn off** Data Stories.

**Note:** If Data Stories are turned off, then turning the feature back on restores Data Stories that were already in dashboards.

# Add a Tableau Data Story to a Dashboard

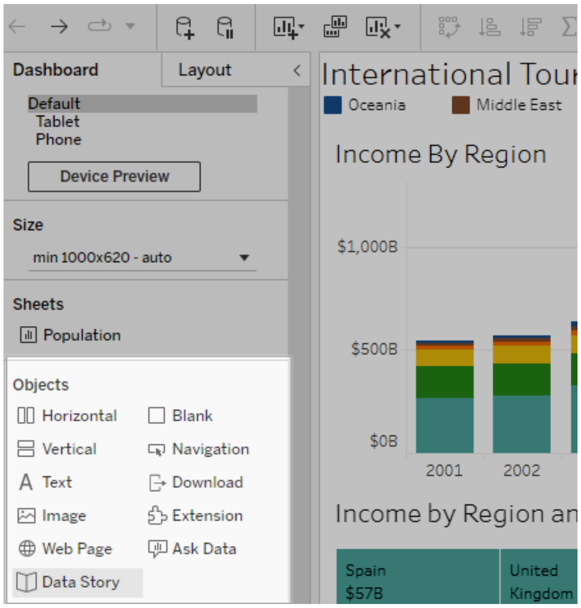
**Important changes for Tableau Data Stories**

Tableau Data Stories will be retired in Tableau Desktop, Tableau Cloud, and Tableau Server in January of 2025 (2025.1). With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see How Tableau Pulse powered by Tableau AI is Reimagining the Data Experience.

After you Create a Dashboard, you can add the **Data Story** object to your dashboard to display insights about your viz that are written in natural language. Today, Tableau Data Stories are written in English only and are available in Tableau Cloud, Tableau Server (version 2023.1 and later), and Tableau Desktop. There is no data size limit when creating **Data Stories**. However, story generation times out after 45 seconds if it's trying to analyze a lot of data. We recommend using **Data Stories** with visualizations that have 1,000 or fewer data points.

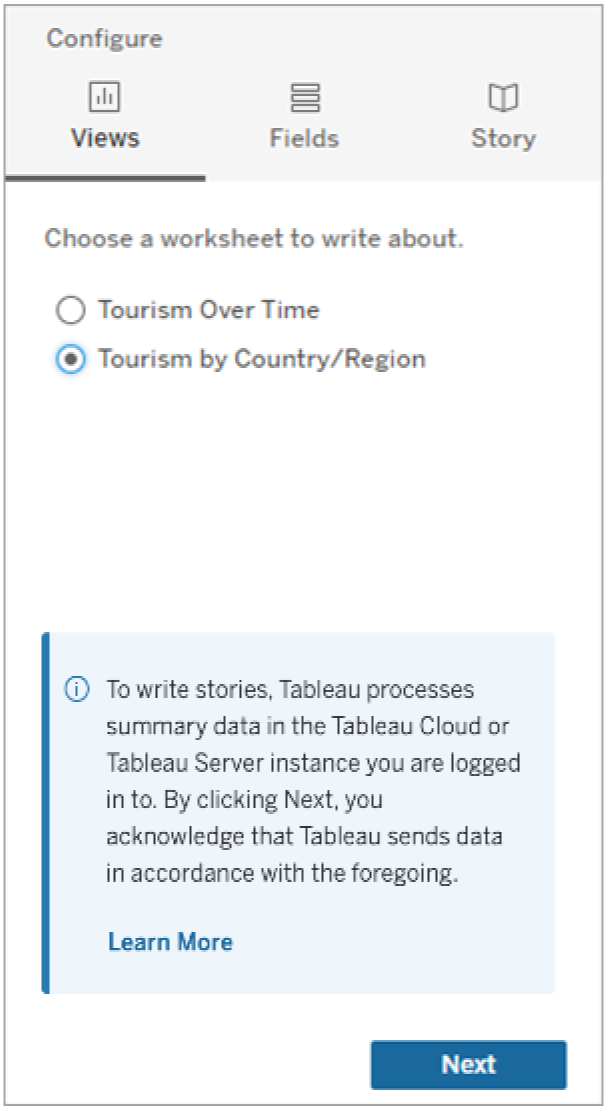
**Note:** Tableau Data Stories opens in a pop-up window, so be sure to allow pop-ups. If you're using full screen mode, then Data Stories can open in a new tab.

1. Drag the **Data Story** object into your Tableau dashboard. If you haven't already, add a sheet to your dashboard to use Tableau Data Stories.

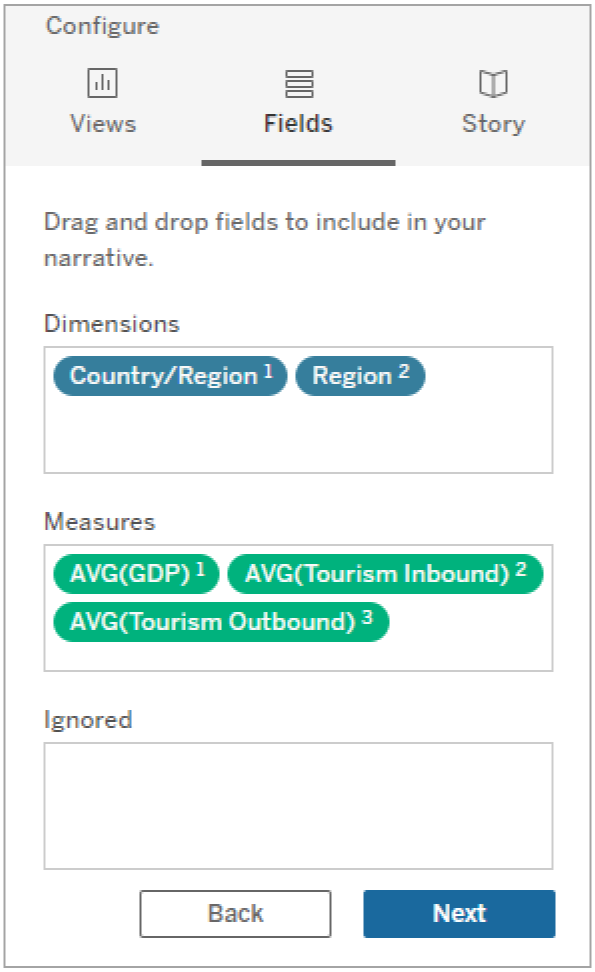



2. In the Data Story dialog box, configure your story by first choosing the worksheet to write about. When you click **Next**, Tableau sends all associated workbook data to the

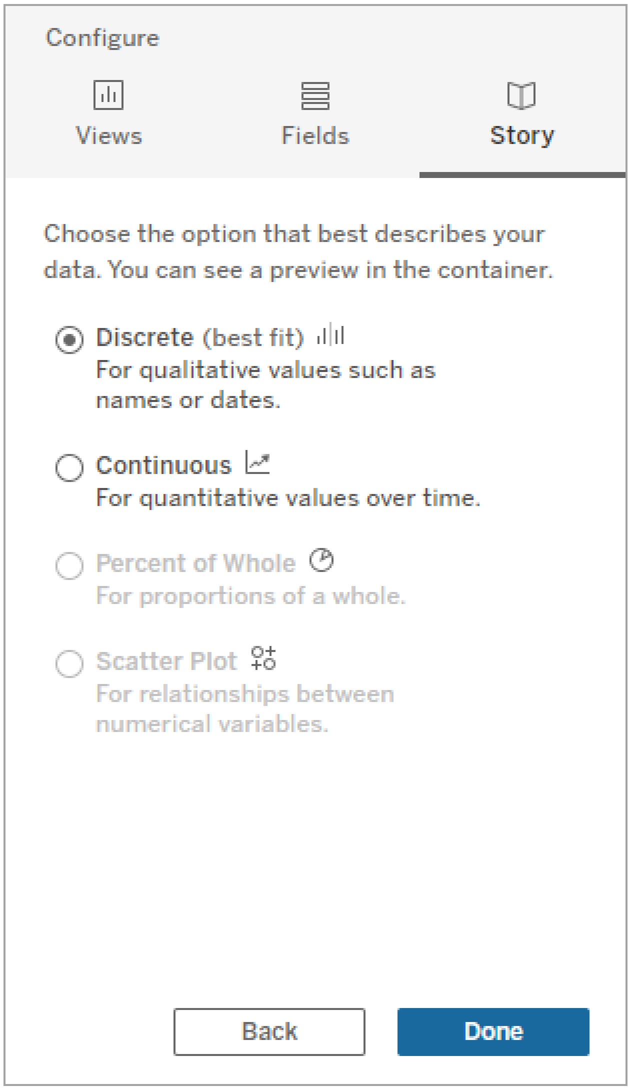
Tableau Cloud or Tableau Server instance that you are logged in to.



3. Choose the dimensions and measures to include in your story.



4. Choose the type of story that best describes your data:




**Discrete** is best for qualitative values such as names or dates, such as in bar or column charts.
**Continuous** is best for quantitative values over time, such as a plotted in a line chart.
**Percent of Whole** is best for proportions of a whole, such as a pie chart.
**Scatter Plot** is best for relationships between numerical values, such as a scatter plot chart.

5. Click **Done**.

To filter your Data Story by clicking different sections on your visualization, open the menu on your visualization and click **Use as filter**.

After your story is generated, click **Settings** at the top of your **Data Story** object for a guided experience that helps you personalize and contextualize your story. For more information, see Configure Settings for a Tableau Data Story.

**Note:** If you experience a discrepancy in your Tableau Data Story (for example, if the numbers in your story are different than in your visualization), it may be caused by way your visualization is set up. Try creating a new visualization on a different sheet, and then add a new Data Story with the Use a hidden sheet technique to uncover the underlying issue.

## Choose the Right Story Type for Your Tableau Data Story

**Important changes for Tableau Data Stories**

Tableau Data Stories will be retired in Tableau Desktop, Tableau Cloud, and Tableau Server in January of 2025 (2025.1). With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see How Tableau Pulse powered by Tableau AI is Reimagining the Data Experience.

When you Add a Tableau Data Story to a Dashboard, it’s important to choose the right type of story for your data. Do you want your story about trends over time? Or do you want your story about two values that you’re comparing? To help you tell the right story, this topic describes the different types of stories, including an example of each story type.

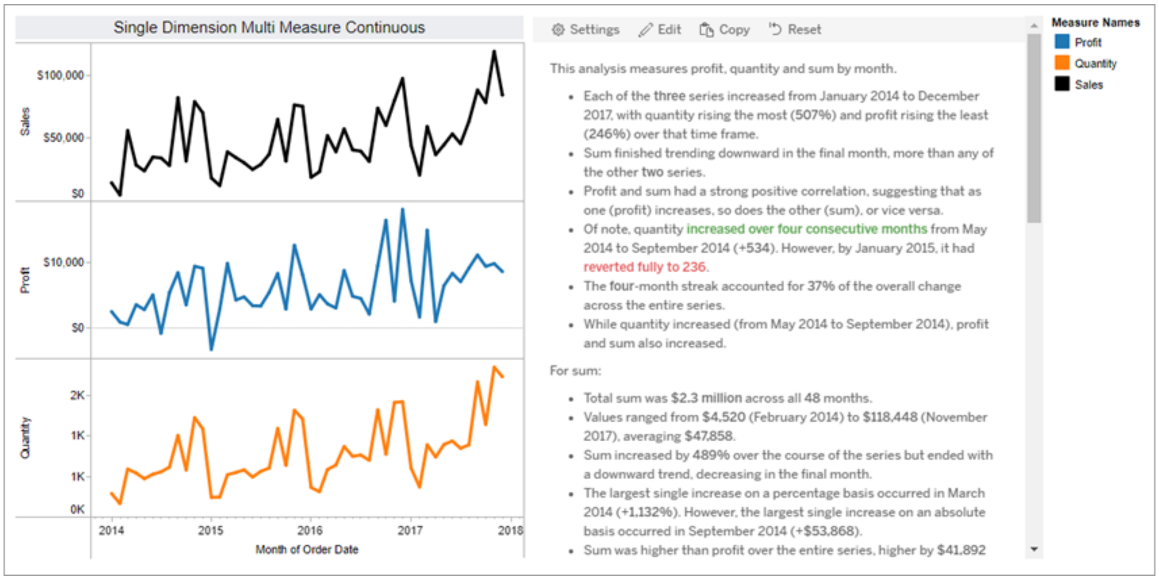
### Continuous

Continuous stories are best for analyzing trends or progress over time.

When you create a continuous story, it includes content for performance, segments, volatility, and trend lines. The story also includes contribution analysis and correlation for stories that use more than one dimension. To use a continuous story, your worksheet must have:

- 1 dimension that has between 1-10 measures
- 2 dimensions and up to 3 measures

The following example is a continuous story for a line chart that has a single dimension and multiple measures:




## Discrete

Discrete stories are best for comparing values and understanding the distribution of data in each value. When you create a discrete story, the story includes content about the distribution and groupings or clusters across the data. And the story includes contribution analysis for worksheets that use multiple dimensions.

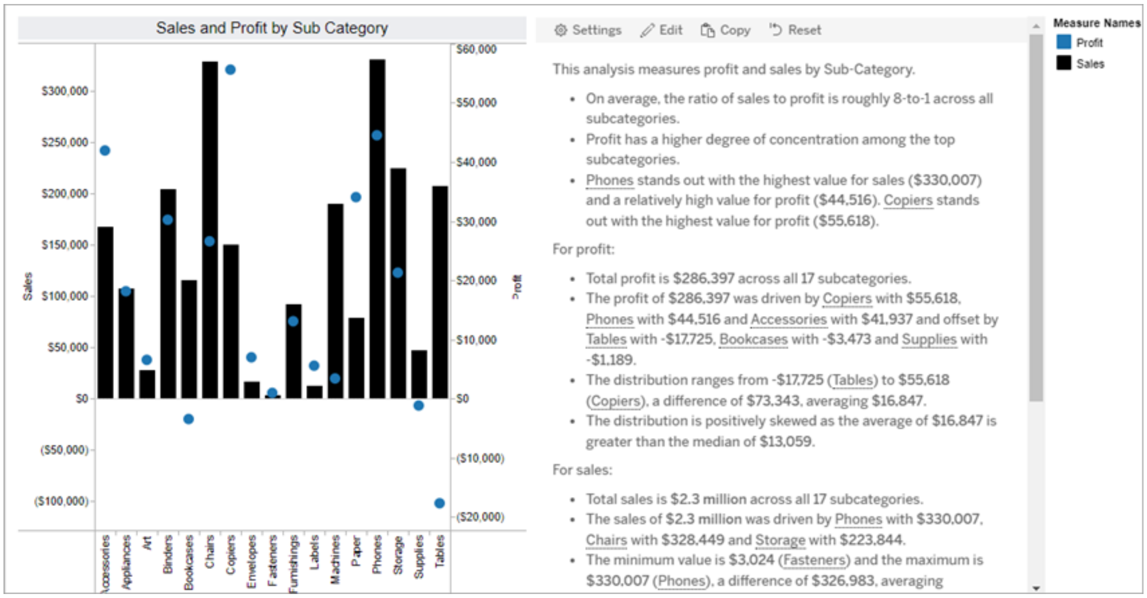
Consider using a discrete story when you want to:

- Understand drivers of your key performance indicators (KPIs) in sales reports.
- Identify and understand outliers quickly during data discovery.
- Identify trends that aren’t easily observable in the visual when performing an audit.
- Uncover complex utilization insights instantly for geographic analysis.
- Identify and call out key relationships, for example, between sales and profit.

To use a discrete story, your worksheet must have:

- 1 dimension that has between 1-10 measures
- 2 dimensions and up to 3 measures

The following example is a discrete story for a bar chart that has a single dimension and two measures:

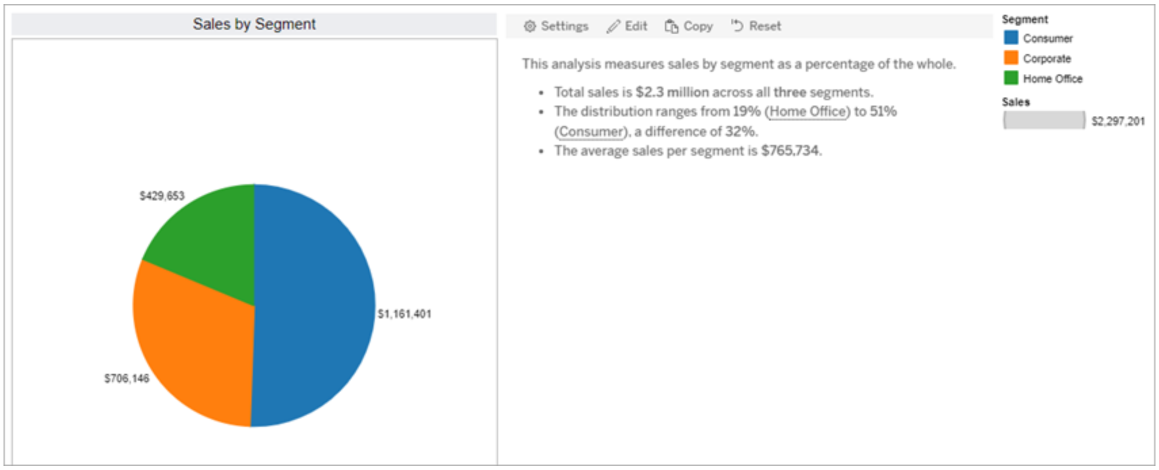



## Percent of whole

Percent of whole stories are best for pie charts. To use a percent of whole story, your worksheet must have:

- 1 dimension
- 1 measure

The following example is a percent of whole story that uses a pie chart with a single dimension and a single measure:




## Scatter plot

Scatter plot stories are best for understanding the relationship between two measures. When you create a scatter plot story, the story includes content about the relationship (regression) between two measures. And the story includes content about groups (clusters) within the data, when they exist.

Consider using a scatter plot story when you want to:

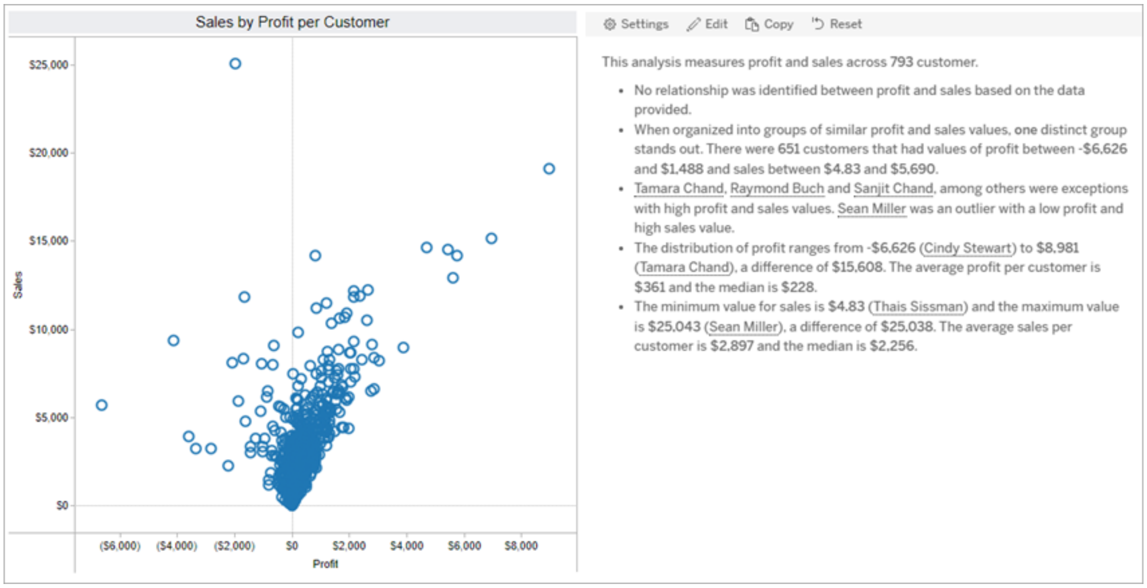
- Call out relationships between two measures to identify impact (regression analysis).
- Identify and understand outliers that are above or below defined thresholds.
- Analyze how your data is distributed.

To use a scatter plot story, your worksheet must have:

- 1 dimension
- 2 or 3 measures

**Note:** When you create your scatter plot story, the first measure you select is treated as the independent variable and the second measure is the dependent variable.

The following example is a scatter plot story that uses a scatter plot that has a single dimension and two measures:




# Configure Settings for a Tableau Data Story

**Important changes for Tableau Data Stories**

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After you Add a Tableau Data Story to a Dashboard, you can configure and edit your Tableau Data Story so it's tailored to your needs–use language specific to your data, specify which analytics are written about, and customize how your Tableau Data Story is displayed.

## Configure Tableau Data Story Settings: Analytics

**Important changes for Tableau Data Stories**

Tableau Data Stories will be retired in Tableau Desktop, Tableau Cloud, and Tableau Server in January of 2025 (2025.1). With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see How Tableau Pulse powered by Tableau AI is Reimagining the Data Experience.

Within your Tableau Data Story, you can choose which analytics to write about and when those analytics are written about. Different types of analytics are available depending on your story type and how many dimensions and measures your story has. However, analytics aren't currently supported for scatter plot story types. For more information, see Choose the Right Story Type for Your Tableau Data Story.

Configure analytics for your story

1. Add a Tableau Data Story to a Dashboard.
2. From your dashboard, click the **Settings** icon at the top-left corner of your **Data Story** object.
3. In the Data Story dialog box, click the **Analytics** tab.
4. Click the switches to turn on different types of analytics.
5. For **Segments** and **Trend line**, expand **Settings** to set thresholds for performing those analytics.
6. Click **Save**.

Understand different types of analytics

Correlation

Use **Correlation** to identify true statistical correlations between two series. If you have more than two series, then all combinations are analyzed for correlations. For example, you might turn on **Correlation** to identify when two products are often purchased together.

Clustering

Use **Clustering** to identify distinct groups of data points (clusters) using a single statistical analysis. For example, you might turn on **Clustering** to identify when a product is very popular in a specific geographic region.

Distribution

Use **Distribution** to rank data points relative to each other using nonstatistical observations, such as mean, median, skew, etc. For example, you might turn on **Distribution** to identify which product has the highest profit ratio.

Segments

Use **Segments** to highlight noteworthy changes to data points within a series. First, set the minimum percentage of change that you want to be written about in a segment. Changes that fall below your defined threshold aren't written about. For example, if you set your segment threshold for changes that are greater than 60%, then your story doesn't write about a trough in a time series that features a 30% decrease.

After you’ve set your threshold, choose whether to **Apply formatting**, and set the minimum percentage of change that you want formatted.

Trend line

Use **Trend line** to calculate a linear best fit line and identify data that falls within a defined percentage of confidence. Data that has high variability has a lower confidence level than data that's more consistent, and that confidence level affects whether trend lines are written about. You can use trend lines for stories that have one dimension and one measure, or you can use trend lines in a drilldown. For more information about drilldowns, see Configure Tableau Data Story Settings: Narrative.

Set the minimum percentage of confidence for your trend line. If you set your threshold at 95%, but a trend line could be drawn at 90% confidence, then your story doesn't write about trend lines. After you’ve set your threshold, choose whether to **Apply formatting**. Then set the minimum percentage of change that you want formatted.

Tableau Data Stories about trend lines communicate the absolute change over a period. The story written about your trend line varies depending on the level of verbosity you set for your story. If your story uses high verbosity, then your story writes about the R-squared value, which is a statistical concept that quantifies how well your data fits the trend line. For more information about verbosity settings, see Configure Tableau Data Story Settings: Narrative.

Within the **Trend line** settings, you can also choose how many periods into the future for which you want your story to write predictions. When you use predictions, your story uses the slope and intercept of the trend line to calculate predicted values for future periods. The confidence of the prediction adds upper and lower bounds to the confidence threshold you set for trend lines. You can use predictions when your story has at least 30 data points that are linear.

Volatility

Use **Volatility** to analyze standard deviations over time. For example, use **Volatility** when you want your story to write about values that fall outside the average range for your data.

Break down how analytics are used to generate stories

At this point, you might be wondering how the analytics for different story types work. Let's take a look at an example for each story type and break down each sentence in the story.

Understand analytics for discrete stories

Because continuous stories measure trends over time, Data Stories writes about performance, progression, averages, totals, streaks, volatility, segments, and predictions.

The following example of a continuous story is about sales per month:

> This analysis measures Sales by month.
>
> - Average Sales was **$47,858** across all **48** months.
> - The minimum value was **$4,520** (February 2014) and the maximum was **$118,448** (November 2017).
> - Sales increased by **489%** over the course of the series but ended with a downward trend, decreasing in the final month.
> - The largest single increase on a percentage basis occurred in March 2014 (+**1,132%**). However, the largest single increase on an absolute basis occurred in September 2014 (+**$53,868**).
> - Sales experienced cyclicality, repeating each cycle about every **12** months. There was also a pattern of smaller cycles that repeated about every **three** months.
> - Sales had a **significant positive peak between October 2014 ($31,453) and February 2015 ($11,951), rising to $78,629 in November 2014**.
> - The **overall linear trend of the series rose at $902 per month** for an absolute change of **$42,394** over the course of the series.

| Example story | Story breakdown |
|---|---|
| • Average Sales was **$47,858** across all **48** months.<br>• The minimum value was **$4,520** (February 2014) and the maximum | The first two sentences use average and range functions to write about the average, maximum, and minimum values across the period you're analyzing. |

| | |
|---|---|
| was **$118,448** (November 2017). | |
| • Sales increased by **489%** over the course of the series but ended with a downward trend, decreasing in the final month. | The third sentence is about overall performance of the measure over the period. For example, a sentence can be about whether sales increased, decreased, or trended differently during a specific period. |
| • The largest single increase on a percentage basis occurred in March 2014 (**+1,132%**). However, the largest single increase on an absolute basis occurred in September 2014 (**+$53,868**). | The fourth sentence uses progression analysis. This sentence writes about the largest increase and decrease based on the measure during the period using both a percentage basis and absolute basis. |
| • Of the **three** series, the strongest relationship was between Corporate and Home Office, which had a moderate positive correlation, suggesting that as one (Corporate) increases, the other (Home Office) generally does too, or vice versa. | This sentence is a **Correlation** insight. This type of analytic insight writes about notable correlations between different series in your data. |
| • Sales experienced cyclicality, repeating each cycle about every **12** months. There was also a pattern of smaller cycles that repeated about every **three** months.<br>• Sales had a **significant positive peak between October 2014 ($31,453) and February 2015 ($11,951), rising to $78,629 in November 2014**. | This sentence is a **Segment** insight. This type of analytic insight writes about noteworthy increases and decreases over time. |
| • The **overall linear trend of the series rose at $902 per month** for an absolute change of **$42,394** over the course of the series. If this trend | This sentence is a **Trend line** insight. This type of insight writes about how well trends fit your data with a certain percentage of confidence, and trend lines allow you to make |

| | |
|---|---|
| continued for the next one month, Sales is **predicted to be about $69,958**. | predictions based on historic trends. |

Understand analytics for discrete stories

Because discrete stories allow you to compare values and understand the distribution of the data, the story writes about distribution, averages, totals, and groupings or clusters across the data.

The following example of a discrete story is about sales by product:

This analysis measures Sales by product.

- Total Sales is **$2.3 million** across all **17** products.
- The Sales of **$2.3 million** was driven by Phones with **$330,007**, Chairs with **$328,449** and Storage with **$223,844**.
- The distribution ranges from **$3,024** (Fasteners) to **$330,007** (Phones), a difference of **$326,983**, averaging **$135,129**.
- The distribution is positively skewed as the average of **$135,129** is greater than the median of **$114,880**.
- Sales is somewhat concentrated with **eight** of the **17** products (**47%**) representing **78%** of the total.
- The top **two** products represent over a quarter (**29%**) of overall Sales.
- Phones (**$330,007**) is more than **two** times bigger than the average across the **17** products.

| Example story | Story breakdown |
|---|---|
| • Total Sales is **$2.3** million across all **17** products. | The first sentence calculates the total value of your measure. |
| • The Sales of **$2.3** million was driven by Phones with **$330,007**, Chairs with **$328,449**, and Storage with **$223,844**. | The second sentence writes about the dimension drivers. In this example, the dimension drivers are the products that contributed the most to total sales. |
| • The distribution is positively skewed as the average of **$135,129** is greater than the median of **$114,880**.<br>• Sales is relatively concentrated with **78%** of the total represented by **eight** | The third and fourth sentences analyze the distribution of the data. This analyzes the averages, medians, concentration of data (if any exist), and how the data is skewed. This |

| | |
|---|---|
| of the **17** products (**47%**). | helps identify how balanced these grouped variables are compared to one another. |
| • The top **two** products combine for over a quarter (**29%**) of overall Sales. | This sentence uses **Clustering** to write about measures that can be grouped. This helps identify whether there are distinct groups that stand out in the data. |
| • Phones (**$330,007**) is more than two times bigger than the average across the **17** products. | The final sentence writes about notable outliers. |

Understand analytics for scatter plot stories

Scatter plot story types are best used to understand the relationship between two measures, and for that reason, scatter plot stories require 2–3 measures. The scatter plot analysis writes about the relationship (regression) between two measures, and it writes about groups (clusters) within the data, if they exist.

The following example of a scatter plot story is about profit and sales across a dimension:

This analysis measures profit, quantity and sales across 793 customer.

- As quantity increased and profit increased, sales increased based on the data provided. Specifically, when quantity increased by 1, sales increased $49.55, and when profit increased by $1.00, sales increased $1.20.
- Few customers deviated from this general relationship, indicating a good fit.
- When organized into groups of similar profit, quantity and sales values, one distinct group stands out. There were 651 customers that had values of profit between -$6,626 and $1,488, quantity between 2 and 122 and sales between $4.83 and $5,690.
- Tamara Chand, Raymond Buch and Sanjit Chand, among others were outliers with high profit and sales values. Sean Miller stood out with a low profit and high sales value.
- The minimum value for profit is -$6,626 (Cindy Stewart) and the maximum value is $8,981 (Tamara Chand), a difference of $15,608. The average profit per customer is $361 and the median is $228.
- The minimum value for quantity is 2 (Anthony O'Donnell) and the maximum value is 150 (Jonathan Doherty), a difference of 148. The average quantity per customer is 47.76 and the median is 44.
- The distribution of sales ranges from $4.83 (Thais Sissman) to $25,043 (Sean Miller), a difference of $25,038. The average sales per customer is $2,897 and the median is $2,256.

| Example story | Story breakdown |
|---|---|
| • As quantity increased and profit increased, sales increased based on the data provided. Specifically, when quantity increased by **1**, sales increased **$49.55**, and when profit increased by **$1.00**, sales increased **$1.20**.<br>• Few customers deviated from this general relationship, indicating a good fit. | The first two sentences are powered by regression analytics. Regression shows how one measure affects another. Notice that in the first sentence, the story has identified a relationship between profit and sales. |
| • When organized into groups of similar profit, quantity and sales values, one distinct group stands out. There were **651** customers that had values of profit between **-$6,626** and **$1,488**, quantity between **2** and **122** and sales between **$4.83** and **$5,690**. | The third sentence is derived from clustering. Clustering analytics tries to identify key groups or clusters across all the variables in the data. |
| • Tamara Chand, Raymond Buch, and Sanjit Chand, among others were outliers with high profit and sales values. Sean Miller stood out with a low profit and high sales value. | The fourth sentence is written about outliers–values that fall significantly above or below the average. |
| • The minimum value for profit is **-$6,626** (Cindy Stewart) and the maximum value is **$8,981** (Tamara Chand), a difference of **$15,608**. The average profit per customer is **$361** and the median is **$228**.<br>• The minimum value for quantity is **2** (Anthony O'Donnell) and the maximum value is **150** (Jonathan Doherty), a difference of **148**. The average quantity per customer is | The remaining sentences for scatter plot stories use range and average analysis to write insights. |

| | |
|---|---|
| **47.76** and the median is **44**.<br>• The distribution of sales ranges from **$4.83** (Thais Sissman) to **$25,043** (Sean Miller), a difference of **$25,038**. The average sales per customer is **$2,897** and the median is **$2,256**. | |

Understand analytics for percent of whole stories

Percent of whole story types are best for understanding what part of a whole a dimension or measure represents.

The following example of a percent of whole story is about sales by segment:

> This analysis measures sales by segment as a percentage of the whole.
>
> - Total sales is $2.3 million across all three segments.
> - The minimum value is 19% (Home Office) and the maximum is 51% (Consumer), a difference of 32%.
> - The average sales per segment is $765,734.

| Example story | Story breakdown |
|---|---|
| • Total SUM(Sales) is 2.3 million across all three entities. | The first sentence calculates the total value of your measure. |
| • The SUM(Sales) of 2.3 million was driven by Consumer with 1.2 million, Corporate with 706,146 and Home Office with 429,653. | The second sentence writes about drivers. In this example, the drivers are segments that contributed the most to total sales. |
| • The minimum value is 429,653 (Home Office) and the maximum is 1.2 million (Consumer), a difference of 731,748, averaging 765,734. | The final sentence analyzes the distribution of the data. |

# Configure Tableau Data Story Settings: Characteristics

**Important changes for Tableau Data Stories**

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Within your Tableau Data Story, you can configure the characteristics settings to give context to your data, so you get more insightful stories. For example, in your story you can specify that in the context of sales, a higher number is good. But in the context of customer complaints, a higher number is bad.

## Use dimension and measure characteristics

Your story and number formatting adjusts based on what the measure is. By default, your story writers all measure values as numbers, and your story won't perform any additional calculations or apply any special rendering rules.

1. Add a Tableau Data Story to a Dashboard.
2. From your dashboard, click the **Settings** icon at the top-left corner of your Data Story object.
3. In the Data Story dialog box, click the **Characteristics** tab.
4. Configure your formatting, such as number type, decimal places, and negative values.
5. Click **Save**.

## Learn more about measure characteristics

### Formatting

If values are formatted as **Percentages**, then the story writes about percentage point differences, rather than percent changes as a story would for number values. When you format a number as a **Percentage** in the **Characteristics** tab, the **Data Story** multiplies the value of the number by 100 to create the percentage that shows in your story.

If values are formatted as **Currency**, then you can specify your preferred currency. You can also specify how you want large values (numbers greater than one million) formatted, for example $1.3 million instead of $1,300,000.00.

For both **Numbers** and **Currency**, you can specify how you want large values and negative values to be written about. If you choose to have negative values written about in parentheses, you might see nested parentheses in your story when the negative value is written about in a parenthetical phrase.

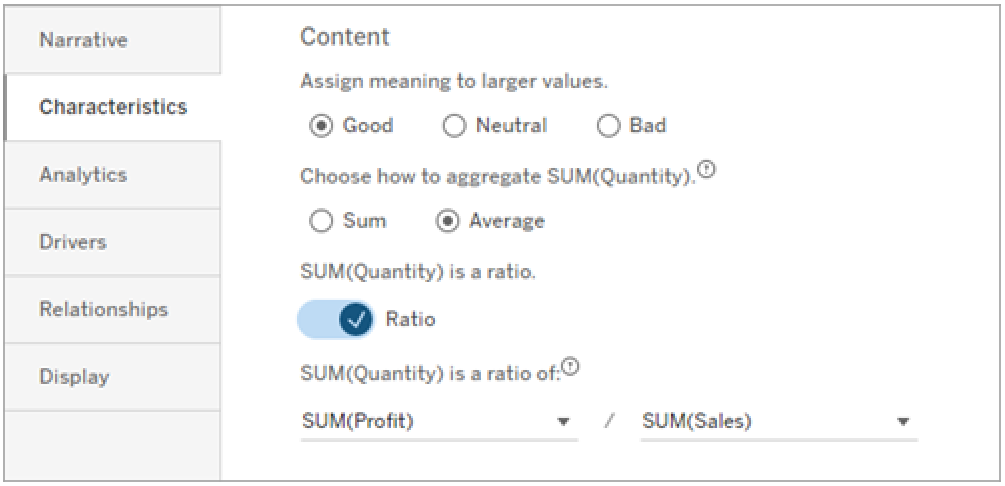
When you choose **Number** formatting, you can also specify whether you want numbers less than or equal to 10 to be spelled out (rather than using a numeral) in your story.

For decimal places, **Dynamic** is the default option. This means that the story rounds to different decimal places depending on how large or small the number is. If the percent value is less than 10, then the number has two decimal places. If the percent value is greater than 10, then the number rounds to the nearest whole number. You can also specify how many decimal places you want used, which is used consistently throughout your story.

Content

You can assign meaning to larger values. For example, larger values for sales are good, but larger values for losses are bad.

In addition, you can choose how to aggregate values by sum or average. It’s a best practice to choose the same aggregation method that you’re using in the viz. For ratio measures, choose **Average** and then define the ratio by selecting the component measures of that ratio measure. Measures that are components of a ratio must be summable.




For cumulative measures (available for continuous stories only), choose **Sum** and then specify that the measure is already cumulative. Continuous stories write about the total of the measure across the series.

Sorting

To sort dimension values, click the arrow up/down icon to sort based on the oldest or newest time values in your dimension.

**Note:** Sorting dimension values is available for only continuous stories.

## Configure Tableau Data Story Settings: Display

**Important changes for Tableau Data Stories**

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You can configure how the text in your Tableau Data Story is displayed, such as font color and size. You can also choose whether your story uses bulleted lists or paragraphs.

Configure the display for your story

1. Add a Tableau Data Story to a Dashboard.
2. From your dashboard, click the **Settings** icon at the top-left corner of your Data Story object.
3. In the Data Story dialog box, click the **Display** tab.
4. Choose whether you want your story structure to be **Bullets** or **Paragraphs**.
5. Choose your **Font Size**.
6. Pick colors to represent good and bad changes (available for continuous stories).
7. Choose whether to use **Dynamic Ordering**.
8. Choose whether to use a **Condensed View**.
9. Click **Save**.

Understand when to use story display settings

To use color, your story must be continuous. When using color, you can choose colors from the palette to represent good changes and bad changes. For your story to know whether a change is good or bad, you must assign meaning to larger values in the **Characteristics** tab. For more information, see Configure Tableau Data Story Settings: Characteristics. After you configure your display, the styles and colors are applied in your story based on thresholds for trend line or segment analytics.

If you turn on **Dynamic Ordering**, then the insights for measures in a story are dynamically ordered from the best to the worst average value. If you already have an order you want to maintain, turn off **Dynamic Ordering**.

If you turn on **Condensed View**, then additional space is removed from your story. This is helpful if you don’t have much extra space in your dashboard or when you have multiple Data Story objects in a dashboard.

## Configure Tableau Data Story Settings: Drivers

**Important changes for Tableau Data Stories**

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Hypothetically, let’s say your month-over-month sales increased significantly. What drove that increase in sales? And what might have detracted from (offset) those increased sales? Setting up drivers in your Data Story can answer those questions.

In Data Stories, drivers contribute toward a total value. Offseters detract from a total value. You’ll find insights about drivers and offsetters in discrete and continuous stories. And these insights make it easy to understand exactly what's going on in the data and why.

Set dimension drivers

1. Add a Tableau Data Story to a Dashboard.
2. From your dashboard, click the **Settings** icon at the top-left corner of your Data Story object.
3. In the Data Story dialog box, click the **Drivers** tab.
4. From the **Dimension Drivers** section, select the type of driver that has the greatest impact on your analysis:
   For **Count**, set the maximum number of contributors and offsetters.
   For **Individual %**, set thresholds for writing about individual contributors and offsetters.
   For **Cumulative %**, set thresholds for writing about contributors and offsetters based on their collective value.
5. Click **Save**.

Understand dimension driver types

- **Count** specifies the number of entities (contributors and offsetters) called out in your story. For example, use **Count** to see the top three contributors and offsetters in your data.
- **Individual %** sets a threshold, and values higher than that threshold are included in your story. For example, use **Individual %** to specify that you want to write about only entities that represent more than 5% of the total value.
- **Cumulative %** sets a percentage threshold of the total value that included entities collectively account for. For example, use **Cumulative %** to specify that you want to write about the entities that contributed to at least 90% of that total value. In this example, entities are written about in order of magnitude until the cumulative value of those entities account for 90% of the total value.

Use secondary contributors

To use secondary contributors, you must have a second dimension that isn't time. When you use secondary contributors, each driver that is written about also has details about and drivers for its secondary contributor. For example, if you are analyzing store sales, a secondary contributor would be a class within a department. Secondary contributors allow for deeper analysis. But secondary contributors can also contain a lot of information to fit into a single sentence in your story.

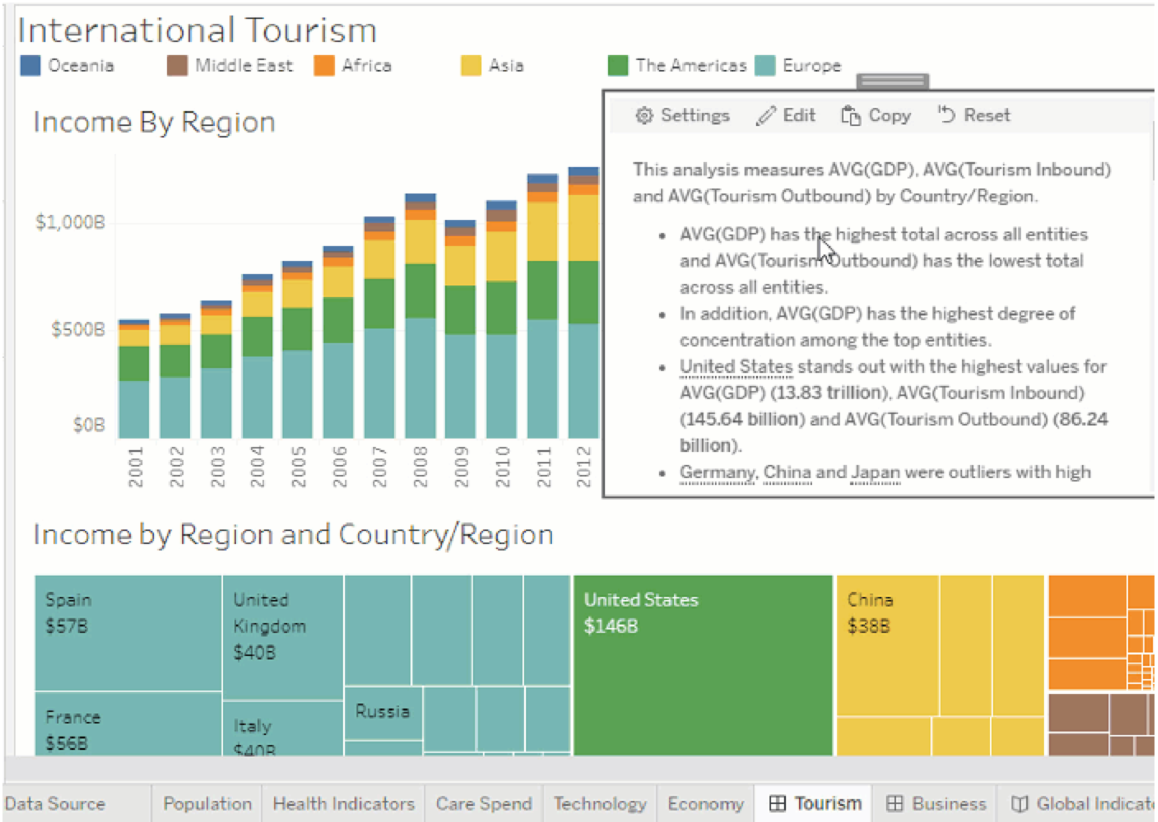
Set metric drivers

For measures that are composed of other subcategory measures, driver analysis can explain the impact that each measure had on the top-level value. For example, material costs and operating costs contribute to total cost.

To use metric drivers, you must have multiple measures for metric analysis. Then, you can specify the relationships between each measure.

1. Add a Tableau Data Story to a Dashboard.
2. From your dashboard, click the **Settings** icon at the top-left corner of your Data Story object.
3. In the Data Story dialog box, click the **Drivers** tab.
4. From the **Metric Drivers** section, first choose the measure that is a subcategory of another measure.
5. Then, choose the measure that is the primary category.
6. Click **Save**.

**Tip:** The verbosity setting also applies to drivers. By changing your story's verbosity setting, you can adjust the way insights are written. If you use high verbosity, then you'll see more information in parentheses. If you use low verbosity, then you'll get a more concisely written insight about your drivers. For more information, see Configure Tableau Data Story Settings: Narrative.




## Configure Tableau Data Story Settings: Narrative

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You can customize the narrative settings of your Tableau Data Story. Specifically, you can specify the verbosity and level of analytical detail in your story, and you can add terms that are unique to your data. These settings help you write a story that uses the right language and speaks to the right level of detail for your dashboard.

Set verbosity

Verbosity specifies the length and analytical detail written in your story. If you choose high, then your story has longer insights with more analytic analysis. If you choose low, then your story is more concise with fewer details.

If you allow viewers to change verbosity, then viewers of published dashboards can change the level of verbosity in the Data Story object. This is helpful when your dashboard is used by a broader audience with viewers who want varying levels of detail from your story.

Set drilldowns

A drilldown includes two dimensions, and drilldowns describe figures associated with each dimension of your dashboard.

Let's say you have a dashboard that has monthly sales by product category. Your story is configured to write about both the **Time** and **Category** dimensions. In this case, this story includes an insight for each Category that describes its performance in and across the **Time** dimension.

By setting the maximum number of drilldowns, you can control how many insights are included in your story. Drilldown insights are also ranked based on the meaning assigned to the measure characteristics. As the number of drilldowns is reduced, the lowest performing measures (measures that are assigned a Bad meaning) are eliminated.

Add dimension terms

By adding terms, you can define the way each of your measures and dimensions are labeled and referenced in your story.

1. Add a Tableau Data Story to a Dashboard.
2. From your dashboard, click the **Settings** icon at the top-left corner of your Data Story object.
3. In the Data Story dialog box, click the **Narrative** tab.
4. Expand the dimension to see how it will be written about in both singular and plural form.

5. Click **Add Term** to add another variation for your story to use to describe your dimension.
6. Click **Save**.

Your story uses (at random) the terms you've added when writing about a dimension.

Manage measure labels

Similarly to dimensions, you can manage labels used for measures in your story.

1. From the **Narrative** tab, expand the measure to see its label.
2. Enter the new label that you want used for your measure.
3. Click **Save**.

## Configure Tableau Data Story Settings: Relationships

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The **Relationships** setting allows you to assign relationships between measures in a Tableau Data Story that has multiple measures. To configure Relationships, your story must have one dimension and multiple measures. For more information, see Create Custom Measure Relationships in Your Tableau Data Story.

There are two types of relationships:

- Actual vs. Benchmark
- Current/Most Recent vs Previous Period

Use **Actual vs. Benchmark** when you want to know if you're performing above or below your performance benchmarks, for example, when performing quota reporting. This type of relationship is also helpful for identifying data points that require additional analysis because they're significantly above or below your benchmark. To use **Actual vs. Benchmark**, the measures you're comparing must have the same value type.

Use **Current/Most Recent vs. Previous Period** when you want to see if your key performance indicators (KPIs) are increasing, decreasing, or remaining consistent over time. To use **Current/Most Recent vs. Previous Period**, you must use a discrete story type. For more information, see Choose the Right Story Type for Your Tableau Data Story.

Additionally, you can use **Actual vs. Benchmark** and **Current/Most Recent vs. Previous Period** relationships simultaneously. Measures in your viz that aren't part of the configured relationships are written about in separate paragraphs.

Create Actual vs. Benchmark relationship for continuous or discrete stories

Use the **Actual vs. Benchmark** relationship when one measure is a benchmark for other measures. For example, you could compare actual sales to a sales target, so your story writes insights about whether you outperformed or underperformed your goal. When you use this type of relationship, the story removes unnecessary content and focuses on what's most important–comparing a metric to its associated benchmark.

1. Add a Tableau Data Story to a Dashboard.
2. From your dashboard, click the **Settings** icon at the top-left corner of your Data Story object.
3. In the Data Story dialog box, click the **Relationships** tab.
4. Check the box for **Actual vs. Benchmark**.
5. First, select the measure that is the benchmark.
6. Then, select the measure that you want to compare against the benchmark.
7. Click **Save**.

Create Current/Most Recent vs. Previous Period relationship

Use the **Current/Most Recent vs. Previous Period** relationship to compare the performance of two measures over a period. For example, you could compare two products to see which product generated the most revenue over the last year.

1. Add a Tableau Data Story to a Dashboard.
2. From your dashboard, click the **Settings** icon at the top-left corner of your Data Story object.
3. In the Data Story dialog box, click the **Relationships** tab.
4. Check the box for **Current/Most Recent vs. Previous Period**.
5. First select the measure for the previous period.
6. Then, select the measure for the current period.
7. Enter the label for the period that you’re measuring, for example, year.
8. Choose the number of periods to measure.
9. Click **Save**.

# Customize Your Tableau Data Story

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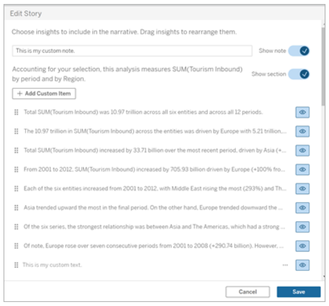
You can use custom language, tailored to your audience, to supplement your Tableau Data Stories with insights specific to your business. Identify the analytics and data from the Data Story that matters most to your audience, and use your own language to create the most impactful story. As with the overall Tableau Data Story, data and variables used in custom content are dynamic, adjusting along with the dashboard.

## Add your own insights

1. In your **Data Story**, click **Edit** to open the Edit dialog box.
2. Find the section you want to write about and click **Add Custom Item.**




3. Enter your custom text in the field that appears.
4. Click **Save**.

## Add headers and footers

You can insert custom text at the top and bottom of your **Data Story**. With headers and footers, you can add your own qualitative analysis to stories, include additional explanations of data trends, or append legal and privacy disclaimers.

1. In your **Data Story**, click **Edit** to open the Edit dialog box.
2. Click the **Show note** switch.
3. Enter your custom note.


4. Click **Save**.

Your note now shows at the top or bottom of your **Data Story**.

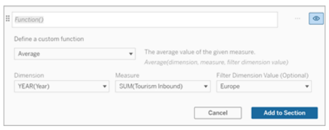
## Add functions

Using a function in your Data Story is a great way to customize your story and find the insights that are most important to you and your business.

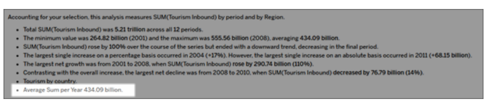
For example, if you want to know the average sum of tourism revenue over a period, select Average as your function and then designate the measure as SUM(Tourism Inbound). This returns the average sum of inbound tourism.

1. In your **Data Story**, click **Edit** to open the Edit dialog box.
2. Click the menu in the right side of the box and select **Add Function**.

3. Select a Data Story Function and fill in the required fields.



4. Click **Add to Section**.
5. Click **Save**.



The custom content now shows in your Data Story.

## Add conditions

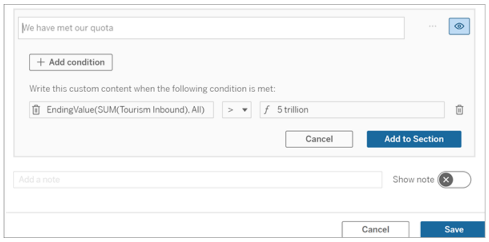
For each custom sentence you write, you can add a condition that determines whether the sentence renders in your **Data Story**. If the condition is met, the custom sentence appears in your story. If the condition isn't met, the custom sentence doesn't appear.

You can apply multiple conditions to each custom sentence, and the conditions can be combined using the **Any** or **All** buttons within the Add a condition dialog box.

Conditional statements are most often used with numerical comparisons, but the function also supports string matching using the equal (=) or not equal (!=) symbols.

1. In your Data Story, click **Edit** to open the Edit dialog box.
2. Enter your custom sentence.

3. Click the menu on the right side of the box and select **Add Condition**.
4. Define the custom function to be used to inform the conditional logic. In this example, the sentence "We have met our quota" shows if the Sum of Tourism Inbound is greater than 5 trillion.



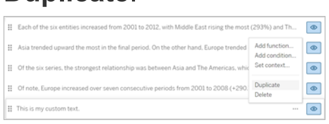

5. Click **Add to Section**.
6. Click **Save**.

The custom sentence now appears in your Data Story only if the conditions are met.

## Duplicate custom content

You can easily duplicate custom content added to your Data Story, making it easier to build different variations of a sentence. We recommend copying a fully built custom sentence when applying thresholds, building in language variation, and creating different logical variations.

1. In your Data Story, click **Edit** to open the Edit dialog box.
2. Create a custom sentence, complete with functions and conditions, if desired.
3. In the completed sentence box, Click the menu in the right side of the box and select **Duplicate**.



4. Click into your duplicated sentence, update as desired, and click **Add to Section**.
5. Click **Save**.

When you copy a sentence, all functions and conditional statements also copy over. The copied bullet appears directly below the original bullet in the same section.

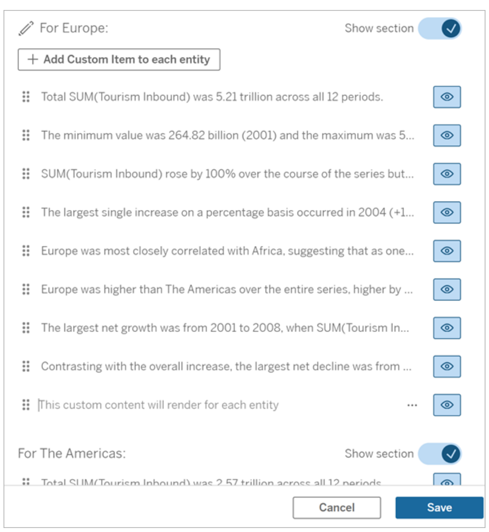
**Note**: Copied bullets can only be added to the section that the original bullet is in.

## Add custom content in drilldown sections

For stories that have two dimensions, each section after the first section is called a drilldown section. Drilldown sections focus on an individual primary dimension entity (i.e. The Americas in the following example).

Because the drilldown sections have the same content structure, custom content added in the first section (i.e., Europe) are applied to each additional section (i.e., The Americas). You can only create or edit content in the first drilldown section.

1. In your Data Story, click **Edit** to open the Edit dialog box.
2. In the first drilldown section, click **Add Custom Item** to each entity.
3. Enter your custom content.
4. Click **Save**.



Custom content in drilldown sections already has a context variable called Current Category value (dynamic). This creates a dimension value option called Current Category value (dynamic) which always represents the section that the drilldown section is about.

**Tip:** To create content that only appears in a single specific drilldown section, you can use conditional logic to ensure it only writes where appropriate.

## Customize Your Tableau Data Story: Context Variables

**Important changes for Tableau Data Stories**

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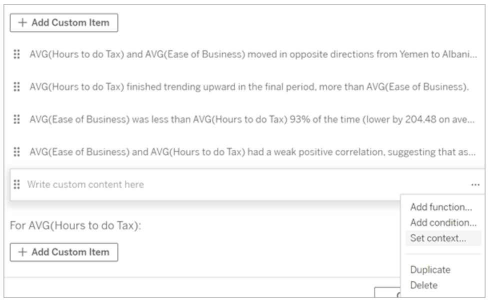
Context variables are functions that can be referenced by other functions. In other words, you can use context variables to nest functions within other functions.

After you define your context variable, it appears as a function that you can use when adding new functions to your Tableau Data Story.

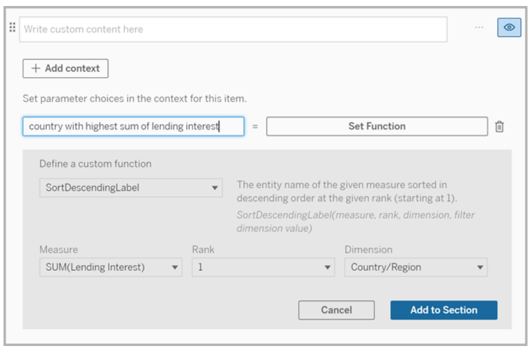
> **Note:** You can have multiple context variables set for each custom sentence, but you must define each context variable separately for each piece of custom content.

Set a context variable

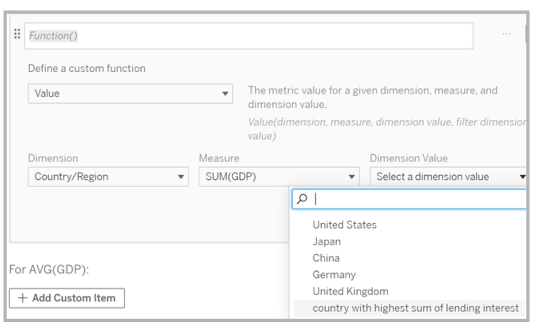
1. In your **Data Story**, click **Edit** to open the Edit dialog box.
2. Click **Add Custom Item.**
3. Click the menu in the right side of your custom content box and select **Set context**.




4. Click **Add context**.
5. Name the context variable and click **Set Function**.
6. Define your custom function and choose a dimension.




7. Click **Add to Section.**
8. Click back into the sentence where you set your context variable.
9. Follow the steps to Add functions.




Now, your context variable is listed as an option in the **Dimension Value** drop-down list when adding your function.

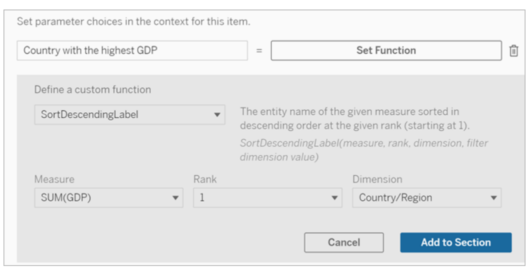
When to use a context variable: reference two or more measures

Let’s say that you want to refer to two or more measures in one analytical sentence in your **Data Story**. Without a context variable, we can write a sentence for only one measure at a time. But if we use a context variable, we can reference more than one measure in one sentence.

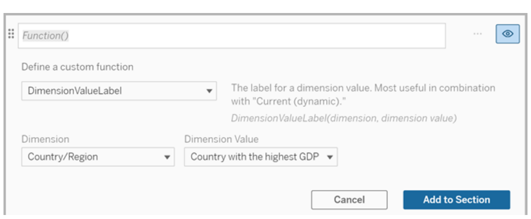
To reference two or more measures with a context variable, your **Data Story** must have:

- 1 dimension
- 2 or more measures

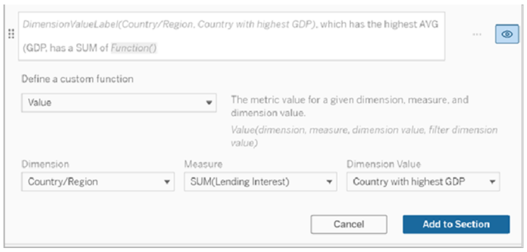
1. In your **Data Story**, click **Edit** to open the Edit dialog box.
2. Click **Add Custom Item**.
3. Click the menu in the right side of your custom content box and select **Set context**.
4. Click **Add context**.
5. Name the context variable and click **Set Function.**
6. Define your custom function and choose a dimension.
7. Click **Add to Section**.




8. Click back into the sentence where you set your context variable.
9. Add your first function and fill in the required fields. In this example, we selected **DimensionValueLabel**, and then chose Country/Region from **Dimension**, and then country with the highest GDP (our context variable) from **Dimension Value**.

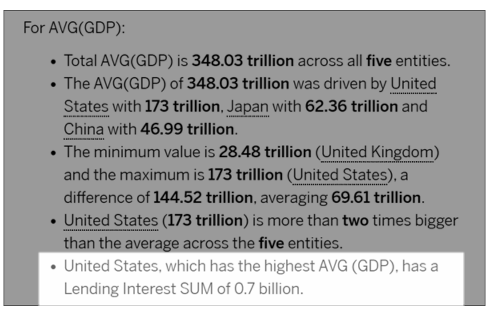


10. Click **Add to Section**.
11. Add your second function and fill in the required fields. In this example, we selected **Value**, and then chose Country/Region from **Dimension**, SUM(Lending Interest) from **Measure**, and country with the highest GDP (our context variable) from **Dimension Value**.




12. Click **Add to Section.**
13. Click **Save.**

Your **Data Story** writes a sentence that gives us insight into a secondary measure (Lending Interest) for the country that we're interested in (the country with the highest GDP).



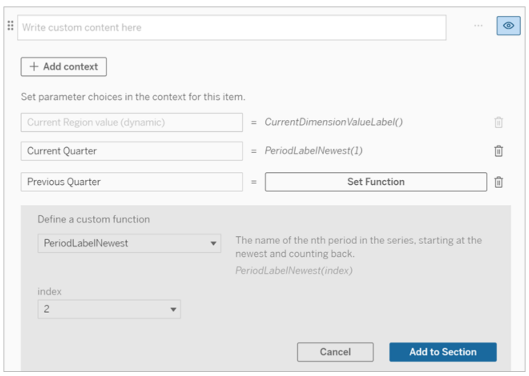

When to use a context variable: period-over-period analysis

A context variable is helpful when you want to analyze performance over two different periods in your **Data Story**. You can create a custom sentence that writes about a measure displayed in your drilldown section and compares the measure against different periods, such as year over year or month over month.

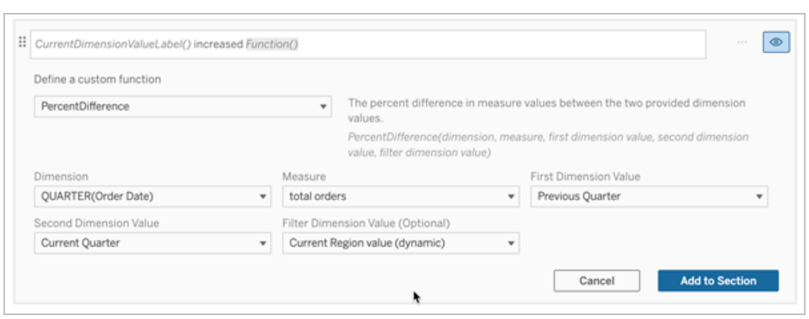
To set up a period-over-period analysis, your Data Story must have:

- 2 dimensions: 1 time period dimension (primary) and 1 non-time period dimension (secondary)
- 1–3 measures

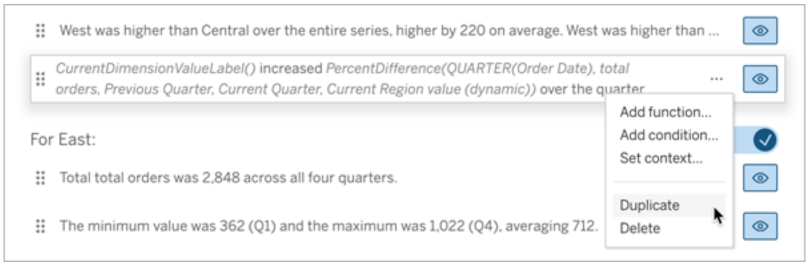
1. Create your **Data Story**.
2. In the Fields dialog box, make sure your time period dimension is ordered first and click **Next**.
3. In the Story dialog box, select **Continuous** and click **Done**.
4. Open the Edit dialog box, and select **Add Custom Item** in the first drilldown area.
5. Create two context variables that represent your time periods. For example, "Current Quarter" and "Previous Quarter."



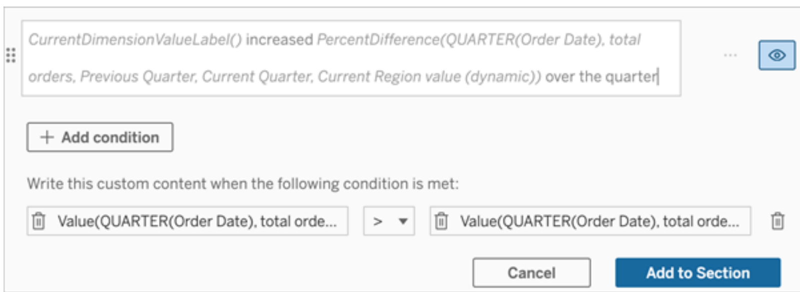

6. Create an *increased* sentence by adding custom language and functions. The content of this sentence results in "[CurrentDimensionValueLabel] increased [X%] over the quarter."
7. Type in the function followed by the word "increased" in the custom text box.
8. Add the function that returns the percent change of your measurement during your time period.



9. Click **Add to Section**.
10. Duplicate custom content and create a *decreased* version by replacing the word "increased" with "decreased." The functions stay the same.




11. Add conditions for each sentence so that only one is written, depending on the data.




12. For the *increased* sentence, set conditions in line with the following example:

    Left Argument = Value function

    Dimension = Quarter(OrderDate). Select your time period dimension

    Measure = SUM(Total Orders). Select the measure you used for the calculation

    Dimension Value = Current Quarter. One of the context variables

    Filter Dimension Value = Current Region value (dynamic). This is the preset context variable

    Middle Argument = > (greater than)

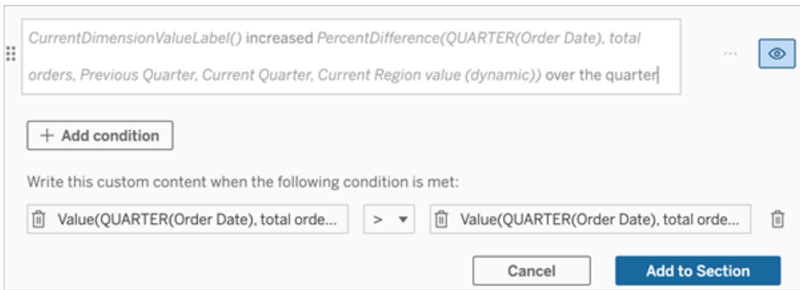
    Right Argument = Value function

Dimension= Quarter(OrderDate). Select your time period dimension

Measure = Total(Total Orders). Select the measure you used for the calculation

Dimension Value = Previous Quarter. One of the context variables

Filter Dimension Value = Current Region value (dynamic). This is the preset context variable




13. For the *decreased* sentence, set the same conditions, but replace the > (greater than) sign with the < (less than) sign. The right and left arguments remain the same.
14. Click **Save**, and your **Data Story** writes a sentence that includes the insights from analyzing the two time periods.

## Customize Your Tableau Data Story: Functions

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If you’d like to customize your Tableau Data Story with a function, it helps to know what functions you can use, what each function does, and what dimensions and measures you’ll need for each function.

Learn how to Add functions to your Data Story.

Click a letter to see functions that begin with that letter. If no functions start with that letter, the functions that start with the next letter in the alphabet are shown. You can also press Ctrl+F (Command-F on a Mac) to open a search box that you can use to search the page for a specific function.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

## Average

Description: The average value of the given measure.

Syntax: Average(dimension, measure, filterDimensionValue)

## Count

Description: The number of dimension values within a given dimension.

Syntax: Count(dimension)

## Difference

Description: The difference in measure values between the two provided dimension values.

Syntax: Difference(dimension, measure, firstDimensionValue, secondDimensionValue, filterDimensionValue)

## DifferenceFromMean

Description: The difference between the mean and the measure value for the given dimension value.

Syntax: DifferenceFromMean(dimension, measure, firstDimensionValue, filterDimensionValue)

## Direction

Description: Language describing the direction (e.g., increase or decrease) between measure values for the two provided dimension values.

Syntax: Direction(dimension, measure, firstDimensionValue, secondDimensionValue, filterDimensionValue, phrase)

## Ending Label

Description: The name of the last period in the series.

Syntax: Label(measure)

## EndingValue

Description: The value at the last period in the series for the given measure.

Syntax: EndingValue(measure, filterDimensionValue)

## Label

Description: The label for the given measure.

Syntax: Label(measure)

## LargestNegativeChangeDifference

Description: The value of the largest negative period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestNegativeChangeDifference(measure, filterDimensionValue)

## LargestNegativeChangeEndingLabel

Description: The name of the ending period for the largest negative period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestNegativeChangeEndingLabel(measure, filterDimensionValue)

## LargestNegativeChangeEndingValue

Description: The ending value of the largest negative period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestNegativeChangeEndingValue(measure, filterDimensionValue)

## LargestNegativeChangePercentDifference

Description: The percent change of the largest negative period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestNegativeChangePercentDifference(measure, filterDimensionValue)

## LargestNegativeChangeStartingLabel

Description: The name of the starting period for the largest negative period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestNegativeChangeStartingLabel(measure, filterDimensionValue)

## LargestNegativeChangeStartingValue

Description: The starting value of the largest negative period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestNegativeChangeStartingValue(measure, filterDimensionValue)

## LargestNegativePercentChangeDifference

Description: The value of the largest negative period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestNegativePercentChangeDifference(measure, filterDimensionValue)

## LargestNegativePercentChangeEndingLabel

Description: The name of the ending period for the largest negative period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestNegativePercentChangeEndingLabel(measure, filterDimensionValue)

## LargestNegativePercentChangeEndingValue

Description: The ending value of the largest negative period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestNegativePercentChangeEndingValue(measure, filterDimensionValue)

## LargestNegativePercentChangePercentDifference

Description: The percent change of the largest negative period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestNegativePercentChangePercentDifference(measure, filterDimensionValue)

## LargestNegativePercentChangeStartingLabel

Description: The name of the starting period for the largest negative period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestNegativePercentChangeStartingLabel(measure, filterDimensionValue)

## LargestNegativePercentChangeStartingValue

Description: The starting value of the largest negative period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestNegativePercentChangeStartingValue(measure, filterDimensionValue)

## LargestPositiveChangeDifference

Description: The value of the largest positive period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestPositiveChangeDifference(measure, filterDimensionValue)

## LargestPositiveChangeEndingLabel

Description: The name of the ending period for the largest positive period-over-period difference, on a absolute basis, in the given series.

Syntax: LargestPositiveChangeEndingLabel(measure, filterDimensionValue)

## LargestPositiveChangeEndingValue

Description: The ending value of the largest positive period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestPositiveChangeEndingValue(measure, filterDimensionValue)

## LargestPositiveChangePercentDifference

Description: The percent change of the largest positive period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestPositiveChangePercentDifference(measure, filterDimensionValue)

## LargestPositiveChangeStartingLabel

Description: The name of the starting period for the largest positive period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestPositiveChangeStartingLabel(measure, filterDimensionValue)

## LargestPositiveChangeStartingValue

Description: The starting value of the largest positive period-over-period difference, on an absolute basis, in the given series.

Syntax: LargestPositiveChangeStartingValue(measure, filterDimensionValue)

## LargestPositivePercentChangeDifference

Description: The value of the largest positive period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestPositivePercentChangeDifference(measure, filterDimensionValue)

## LargestPositivePercentChangeEndingLabel

Description: The name of the ending period for the largest positive period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestPositivePercentChangeEndingLabel(measure, filterDimensionValue)

## LargestPositivePercentChangeEndingValue

Description: The ending value of the largest positive period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestPositivePercentChangeEndingValue(measure, filterDimensionValue)

## LargestPositivePercentChangePercentDifference

Description: The percent change of the largest positive period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestPositivePercentChangePercentDifference(measure, filterDimensionValue)

## LargestPositivePercentChangeStartingLabel

Description: The name of the starting period for the largest positive period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestPositivePercentChangeStartingLabel(measure, filterDimensionValue)

## LargestPositivePercentChangeStartingValue

Description: The starting value of the largest positive period-over-period difference, on a percentage basis, in the given series.

Syntax: LargestPositivePercentChangeStartingValue(measure, filterDimensionValue)

## LongestStreakDifference

Description: The difference over the longest streak of consecutive increases or decreases for the given series.

Syntax: LongestStreakDifference(measure, filterDimensionValue)

## LongestStreakDirection

Description: The direction (positive or negative) of the longest streak of consecutive increases or decreases for the given series.

Syntax: LongestStreakDirection(measure, filterDimensionValue)

## LongestStreakEndingLabel

Description: The name of the ending period for the longest streak of consecutive increases or decreases for the given series.

Syntax: LongestStreakEndingLabel(measure, filterDimensionValue)

## LongestStreakEndingValue

Description: The ending value of the longest streak of consecutive increases or decreases for the given series.

Syntax: LongestStreakEndingValue(measure, filterDimensionValue)

## LongestStreakLength

Description: The largest number of periods of consecutive increase or decrease for the given series.

Syntax: LongestStreakLength(measure, filterDimensionValue)

## LongestStreakPercentDifference

Description: The percent difference over the longest streak of consecutive increases or decreases for the given series.

Syntax: LongestStreakPercentDifference(measure, filterDimensionValue)

## LongestStreakStartingLabel

Description: The name of the starting period for the longest streak of consecutive increases or decreases for the given series.

Syntax: LongestStreakStartingLabel(measure, filterDimensionValue)

## LongestStreakStartingValue

Description: The starting value of the longest streak of consecutive increases or decreases for the given series.

Syntax: LongestStreakStartingValue(measure, filterDimensionValue)

## MaxLabel

Description: The name of the entity with the maximum value for the given measure.

Syntax: MaxLabel(dimension, measure, filterDimensionValue)

## MaxValue

Description: The maximum value for the given measure.

Syntax: MaxValue(measure)

## Median

Description: The median value for the given measure.

Syntax: Median(dimension, measure, filterDimensionValue)

## MinLabel

Description: The name of the entity with the minimum value for the given measure. Syntax: MinLabel(dimension, measure, filterDimensionValue)

## MinValue

Description: The minimum value for the given measure.

Syntax: MinValue(dimension, measure, filterDimensionValue)

## PercentDifference

Description: The percent difference in measure values between the two provided dimension values.

Syntax: PercentDifference(dimension, measure, firstDimensionValue, secondDimensionValue, filterDimensionValue)

## PercentOfWhole

Description: The percent in measure values for a given dimension value over the total measure values for that dimension.

Syntax: PercentOfWhole(dimension, measure, dimensionvalue, filterDimensionValue)

## PeriodLabel

Description: The name of the nth period in the series, starting at 1.

Syntax: PeriodLabel(index)

## PeriodLabelNewest

Description: The name of the nth period in the series, starting at the newest and counting back.

Syntax: PeriodLabelNewest(index)

## PeriodValue

Description: The value of the given measure at the nth period in the series, starting at 1.

Syntax: PeriodValue(measure, index, filterDimensionValue)

## PeriodValueNewest

Description: The value of the given measure at the nth period in the series, starting at the newest and counting back.

Syntax: PeriodValueNewest(measure, index)

## Range

Description: The difference between the maximum and minimum values for the given measure.

Syntax: Range(dimension, measure, filterDimensionValue)

## SortAscendingLabel

Description: The entity name of the given measure sorted in descending order at the given rank (starting at 1).

Syntax: SortAscendingLabel(measure, rank, dimension, filterDimensionValue)

## SortAscendingValue

Description: The value of the given measure sorted in ascending order at the given rank (starting at 1).

Syntax: SortAscendingValue(measure, rank, dimension, filterDimensionValue)

## SortDescendingLabel

Description: The entity name of the given measure sorted in descending order at the given rank (starting at 1).

Syntax: SortDescendingLabel(measure, rank, dimension, filterDimensionValue)

### SortDescendingValue

Description: The value of the given measure sorted in descending order at the given rank (starting at 1).

Syntax: SortDescendingValue(measure, rank, dimension, filterDimensionValue)

### StartingLabel

Description: The name of the first period in the series.

Syntax: StartingLabel()

### StartingValue

Description: The value at the first period in the series for the given measure.

Syntax: StartingValue(measure, filterDimensionValue)

### StartToFinishDifference

Description: The difference between the values for the first and last periods in the given series.

Syntax: StartToFinishDifference(measure, filterDimensionValue)

### StartToFinishPercentDifference

Description: The percent difference between the values for the first and last periods in the given series.

Syntax: StartToFinishPercentDifference(measure, filterDimensionValue)

### StdDev

Description: The standard deviation value for the given measure.

Syntax: StdDev(dimension, measure, filterDimensionValue)

### Sum

Description: The sum of measure values for the two provided dimension values.

Syntax: Sum(dimension, measure, firstDimensionValue, secondDimensionValue, filterDimensionValue)

### Total

Description: The sum total value for the given measure.

Syntax: Total(dimension, measure, filterDimensionValue)

### Value

Description: The metric value for a given dimension, measure, and dimension value.

Syntax: Value(dimension, measure, dimension value, filterDimensionValue)

### Z-Score

Description: The z-score for the given measure.

Syntax: Z-Score(dimension, measure, firstDimensionValue, filterDimensionValue)

## Customize Your Tableau Data Story: Hide and Reorder Content

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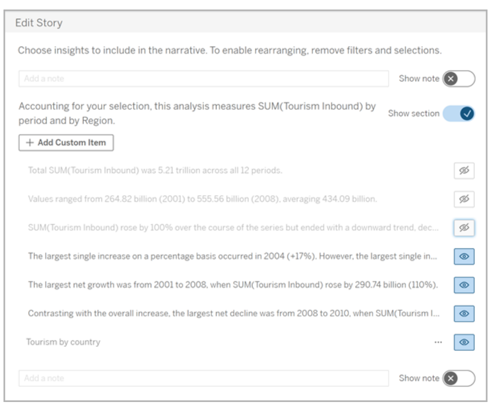
Customize your Tableau Data Story with the content that is most important to you and your audience by hiding or reordering content within your story.

## Hide content and sections

1. Create your **Data Story** and click **Edit** to open the Edit dialog box.
2. Set sections to show or hide by clicking the **Show section** switch to the on or off position.
3. Hover over the blue box to the right of each individual sentence, and click the box to show or hide from view.
4. Click **Save**.

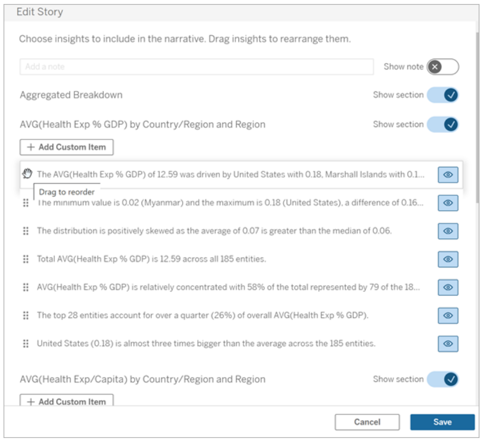



Now, only the sentences and sections that are set to **Show** appear in your Data Story.

## Reorder content within a section

1. Create your **Data Story** and click **Edit** to open the Edit dialog box.
2. Hover over the left-side menu of the content you want to reorder. Your cursor turns into a hand icon.
3. Click the item with your cursor and drag it anywhere within the same section.

4. Click **Save**.




Now, the sentences appear in your **Data Story** in the order that you set them to.

**Note:** Currently, content can only be moved within the same section. Moving entire sections isn't yet supported.

## Add More Data to Your Tableau Data Story

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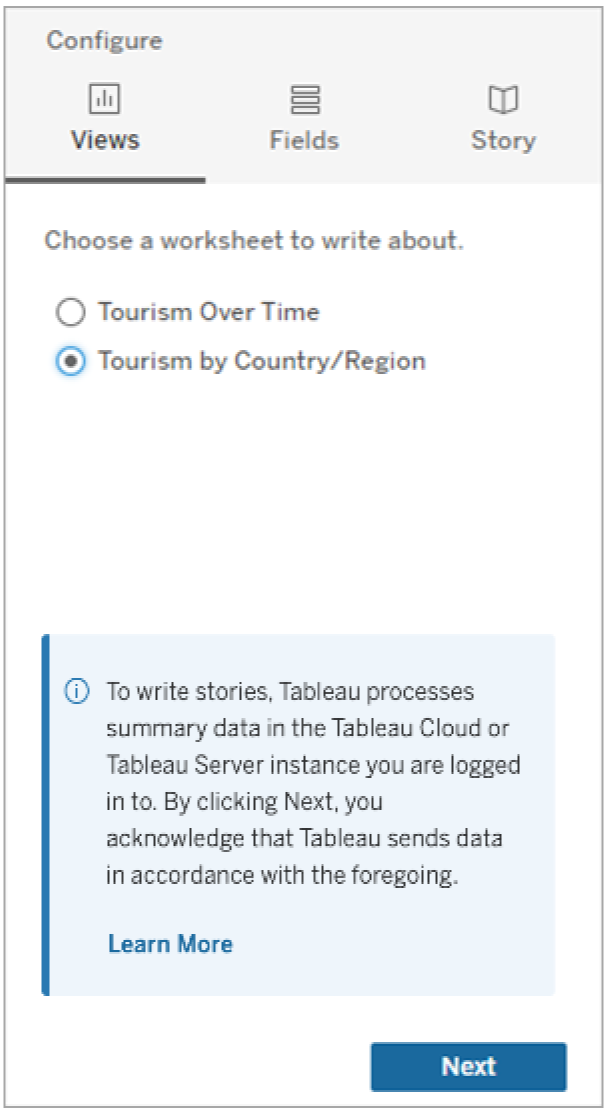
Data Stories currently supports stories with two dimensions and one measure, or one dimension and up to 10 measures. If you'd like to write about data that you don't need to show on your dashboard, then use a hidden sheet to simplify your dashboard. If you'd like to add more than two dimensions to your story, then concatenate dimensions or create multiple data stories and stack them.

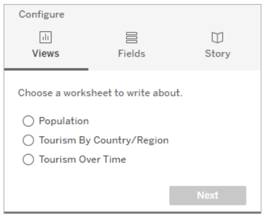
## Use a hidden sheet

If you have data that you want to include in a Tableau Data Story and don't need to show all the data that drove the insight, you can use a hidden sheet to bring additional measures and dimensions into your story without cluttering the dashboard.

1. Drag the **Data Story** object to your dashboard to see which worksheets you can write about in the Data Story dialog box. In this example, there are two worksheets available to write about.

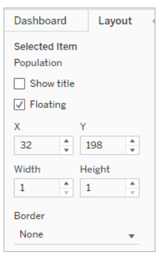


2. Bring in another data source, such as "Population," by navigating to the left-hand menu, selecting **Floating**, and dragging that sheet onto your dashboard.




The Data Story dialog box updates with the new available data source.

3. Click into **Layout** and adjust the size to 1 x 1 to hide the sheet but keep the underlying data in your story.



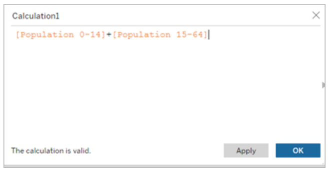

You can now configure your stories using this hidden sheet.

**Note:** You may need to deselect additional legend elements to keep the sheet hidden.

## Concatenate dimensions

If your data contains three dimensions and one measure and is a **Discrete Story**, you can concatenate (link together) two of those dimensions by creating a calculated field.

1. From the worksheet you want to use in your story, click **Analysis** and select **Create Calculated Field**.
2. Name the calculated field and use the following formula to create your calculation, using the + sign to join the dimensions.
   [Dimension 1] + [Dimension 2]




**Tip:** Drag your dimensions into the **Calculated Field** box and place them in the formula.

3. Click **OK**.
4. Drag your new calculated field into the **Detail** pane to make it accessible in your data story.

### Stack multiple data stories

Write about more measures and dimensions by creating multiple **Data Stories** and stacking them vertically or horizontally on your dashboard.

For example, if you wanted to create a story about actual revenue vs benchmark revenue, you could create two different stories—one with the actual revenue and the first benchmark, and another with the actual revenue and the second benchmark—and compare them.

## Add a Pop-Up Tableau Data Story to Your Dashboard

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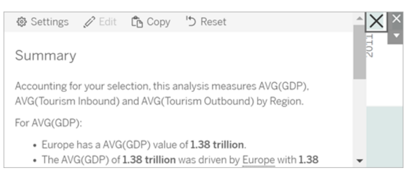
You can place a Tableau Data Story in a pop-up window that allows your users to open a story, read it, and then close it when they're done. This is a great way to save space being used by already-established dashboards or to reduce the amount of clutter and information on a dashboard.

1. Add a Tableau Data Story to a Dashboard.
2. Set the container to **Floating** by clicking the menu and selecting **Floating**.

**Tip:** Another way to set the container to **Floating** is by holding the shift key while dragging the container onto your dashboard.

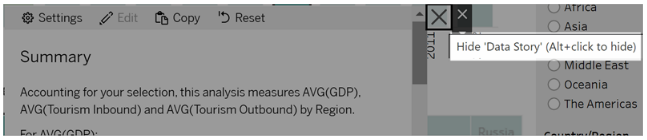
3. Navigate to the **Layout** tab in the left-hand column and set the background color to white.


4. Click the menu that is associated with your floating container to show its settings, and select **Add Show/Hide** Button. This creates an "X" icon that allows you to show or hide your story.




**Note:** If your story is selected, then your button is partially obscured by the sidebar options that are part of the Data Story object. Click anywhere outside of the story to reveal the button.

5. Hover over the "X" icon to show instructions for opening or closing the story. In this example, you're being prompted to press the Alt key at the same time you click the "X" icon.




6. Collapse the story by clicking the "X" icon at the same time as pressing the key indicated in your prompt.

The story collapses, but the menu remains on the dashboard so that the user can expand the story when needed. You can move your collapsible, floating story around your dashboard as desired.

## Create Custom Measure Relationships in Your Tableau Data Story

**Important changes for Tableau Data Stories**

Tableau Data Stories will be retired in Tableau Desktop, Tableau Cloud, and Tableau Server in January of 2025 (2025.1). With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see How Tableau Pulse powered by Tableau AI is Reimagining the Data Experience.

You can create a relationship story in your Tableau Data Story to see how data compares to another set of data. To build a relationship story, you must have at least two measures and one dimension. Data that you'd like to compare is often grouped into one column of data named something such as "Year" or "Month," with values such as "2022" or "March."

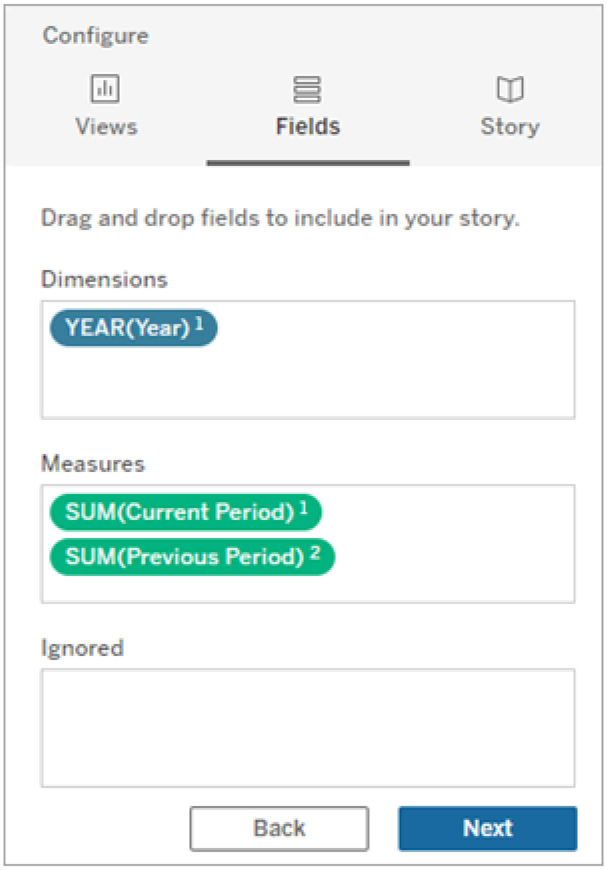
You can Create a Simple Calculated Field to separate "2022" from "2021" (or March from February), so that you can compare the two time periods in a relationship story.

1. Start in the sheet that you want to use in your **Data Story**.
2. Click **Analysis**, and select **Create a Calculated Field**.
3. Create a calculated field such as "Current Period."

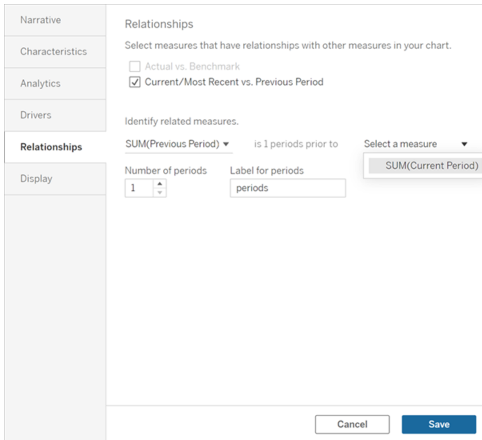

**Tip:** Follow the structure of the calculated field shown here, but substitute your own dimension or measure names (orange text).

4. Create a calculated field such as "Previous Period."


5. Drag the new measures onto the **Detail** mark.
6. From your dashboard, click the story and add the two new measures into your **Data Story**.




7. From your dashboard, click the **Settings** icon at the top-left corner of your Data Story object.
8. In the Data Story dialog box, click the **Relationships** tab.
9. Set up a relationship story with the two custom measures.




10. Click **Save**.

Your story now writes sentences that compare the custom measures.

# Refresh Parameters in a Tableau Data Story

**Important changes for Tableau Data Stories**

Tableau Data Stories will be retired in Tableau Desktop, Tableau Cloud, and Tableau Server in January of 2025 (2025.1). With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see How Tableau Pulse powered by Tableau AI is Reimagining the Data Experience.

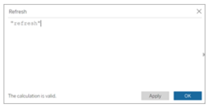
If you’ve added a parameter to your dashboard and are using Data Stories, you’ll notice that clicking the parameter refreshes your visualization, but not the story. This happens because the parameter doesn’t refresh the underlying data like a filter does.

To refresh your Tableau Data Story with the parameter data, add a "refresh" button to your dashboard that updates your story to align with your parameter.

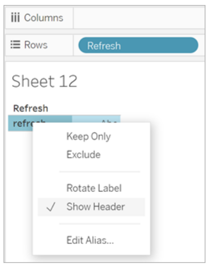
1. Create a new sheet in your workbook.
2. Create a **Calculated Field** in the new sheet with the following info:

    Name: Refresh

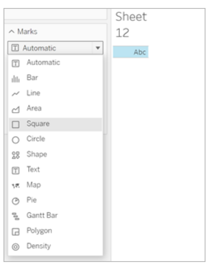
Contents: "refresh"



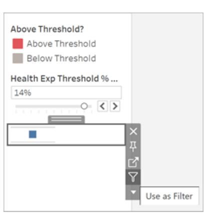
3. Click **OK**, and then drag the new calculated field (Refresh) onto your new sheet.
4. Right-click the field and click **Show Header** to hide the header.




5. Choose a shape for your button.




6. Return to your dashboard and drag the sheet containing the refresh button onto your dashboard next to the parameter.
7. Hover over the button, select **More Options,** and click **Title** to hide the title.
8. Hover over the button and click **Use as Filter**.




9. Adjust your parameter and then click on the new refresh button. The button updates your story to align with the parameter.

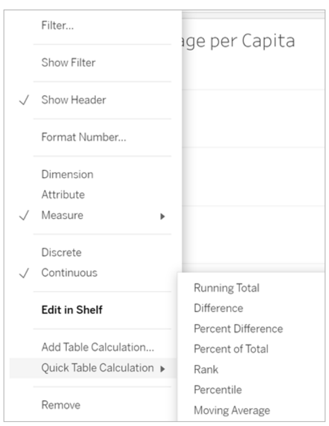
# Use a Table Calculation in a Tableau Data Story

**Important changes for Tableau Data Stories**

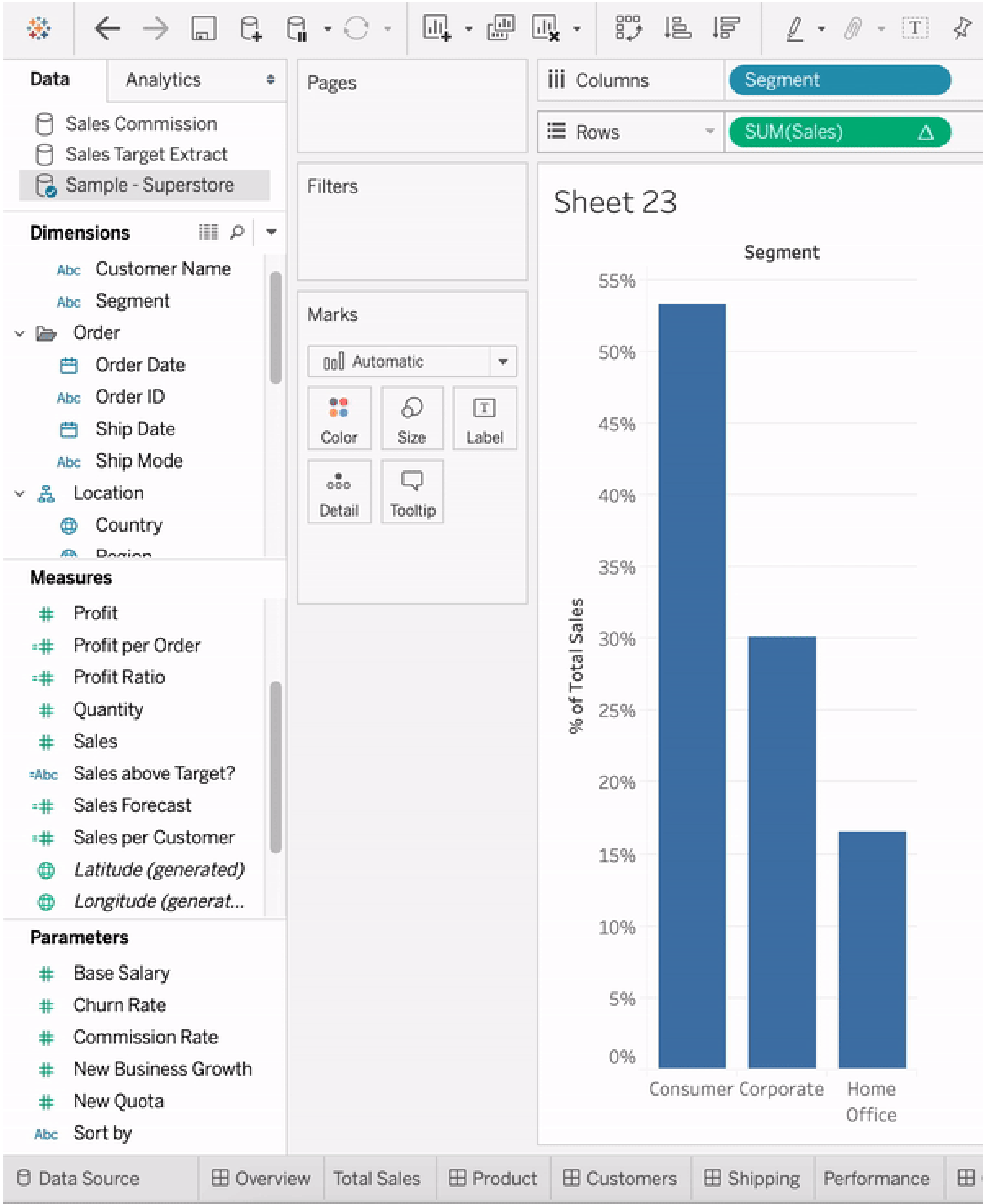
Tableau Data Stories will be retired in Tableau Desktop, Tableau Cloud, and Tableau Server in January of 2025 (2025.1). With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see How Tableau Pulse powered by Tableau AI is Reimagining the Data Experience.

You can use a **Table Calculation** as a measure in a Tableau Data Story in addition to the measure that you used to create the table calculation.

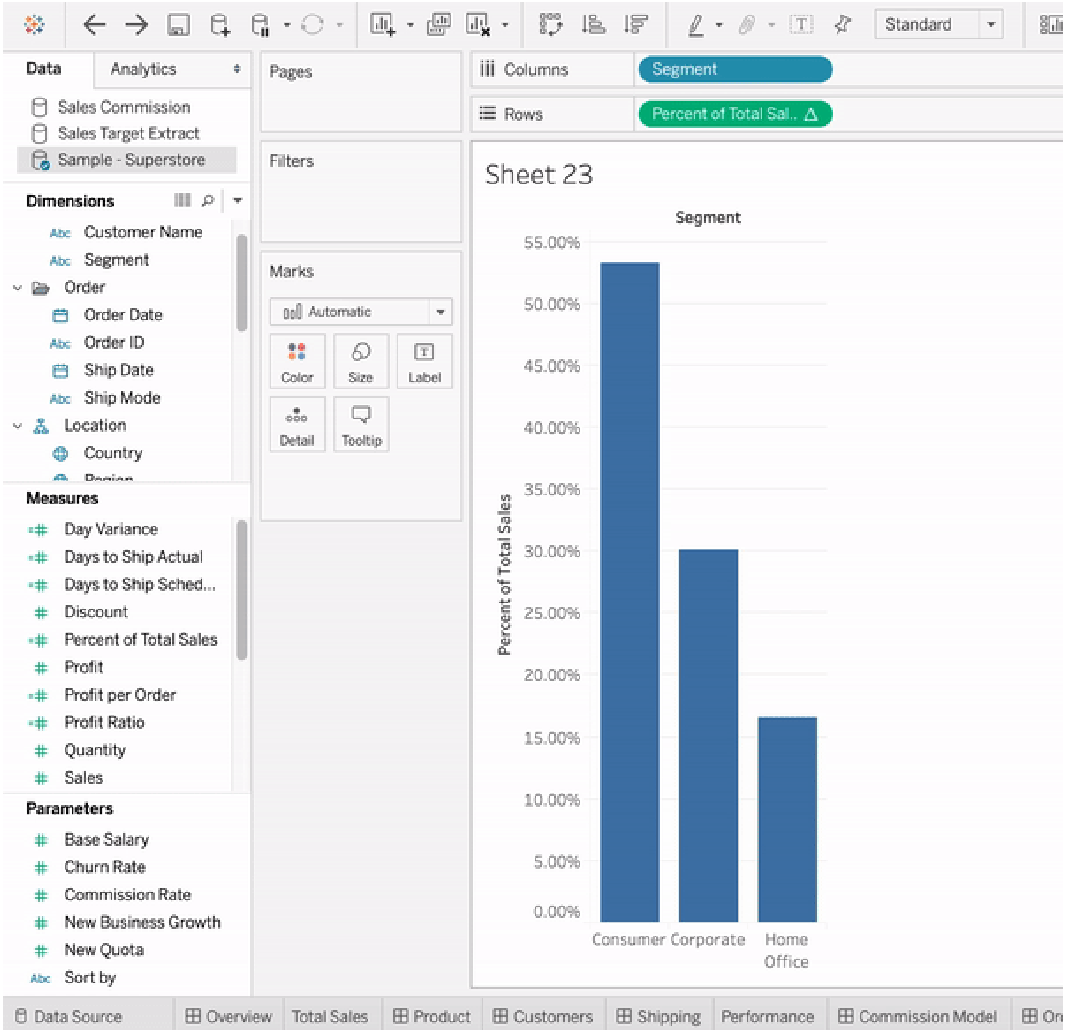
1. From the **Marks** card, click the right side of your field to open a menu, and click **Quick Table Calculation.**




2. After you create your table calculation, drag it to **Measures** in the **Data** pane and rename it.



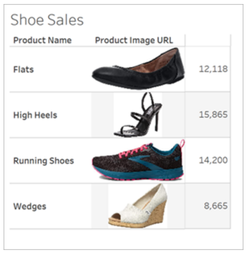

3. Drag your original measure (e.g., Sales) back to the **Rows** shelf, and then drag your new calculation (e.g., Sum of Sales) into the **Tooltip.** Your visualization may remain the same, but you now have access to the new measure.




4. Go to your dashboard and drag the **Data Story** object onto the dashboard. Both measures appear when creating your story.

# Add Web Images Dynamically to Worksheets

At Tableau, we know that images are a powerful tool when analyzing data. Imagine that you're looking at a viz of monthly shoe sales. The data is telling you that you sold more high heels than wedges, but you can't picture the difference in the two types of shoe. That's where Image Role comes in. You can dynamically add web images to your worksheets and use them in your headers to add visual detail.




## Prepare your data source

Image Role can be assigned to discrete dimension fields that contain URLs that point to web images. To prepare your data, be sure that your image fields meet the requirements set by Tableau to be assigned an image role:

- Make sure your URLs navigate to .png, .jpeg, .jpg, .svg, .webp, .jfif, .ico, or .gif image files.
- Verify that each URL begins with http or https. If a transport protocol isn't included, Tableau assumes https.
- Optimize the number of images used in your data set. Usually, you can load up to 500 images per field.
- Ensure that each image file is smaller than 200 kb.

**Note:** If you're using Tableau 23.1 or earlier, your URLs must navigate to image files with .jpg, .jpeg, or .png file extensions.

In Tableau 23.2 and later, .gif files are supported, but .gif *animations* will only show on Tableau Cloud and Tableau Server with a client-side render. In Tableau Desktop and Tableau Server with a server-side render, the .gif file will show as a static image.

Depending on the complexity of your viz, Tableau may default to a server-side render, which limits the number of images to 100 per field. To learn more about complexity settings and server-side rendering, see Configure Client-Side Rendering.

### Example data set:

| Product Name | Product Image URL | Product Sales |
| --- | --- | --- |
| Flats | https://img.example.com/flats.png | 12,118 |
| High Heels | https://img.example.com/highheels.png | 15,865 |
| Running Shoes | https://img.example.com/runningshoes.png | 14,200 |
| Wedges | https://img.example.com/wedges.png | 8,665 |

## Assign an image role to your URLs

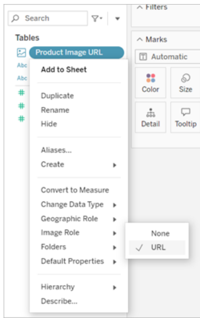
After you've connected to your data source, you can assign an Image Role to your URLs from either the Data Source page or on the Data pane in a worksheet.

### From the Data Source page:

1. Locate the column that has image URLs.
2. Right-click (control click on Mac) the icon on the top left of the column and select **Image Role** > **URL**.
   The icon changes to an image icon, and your images are ready to use.

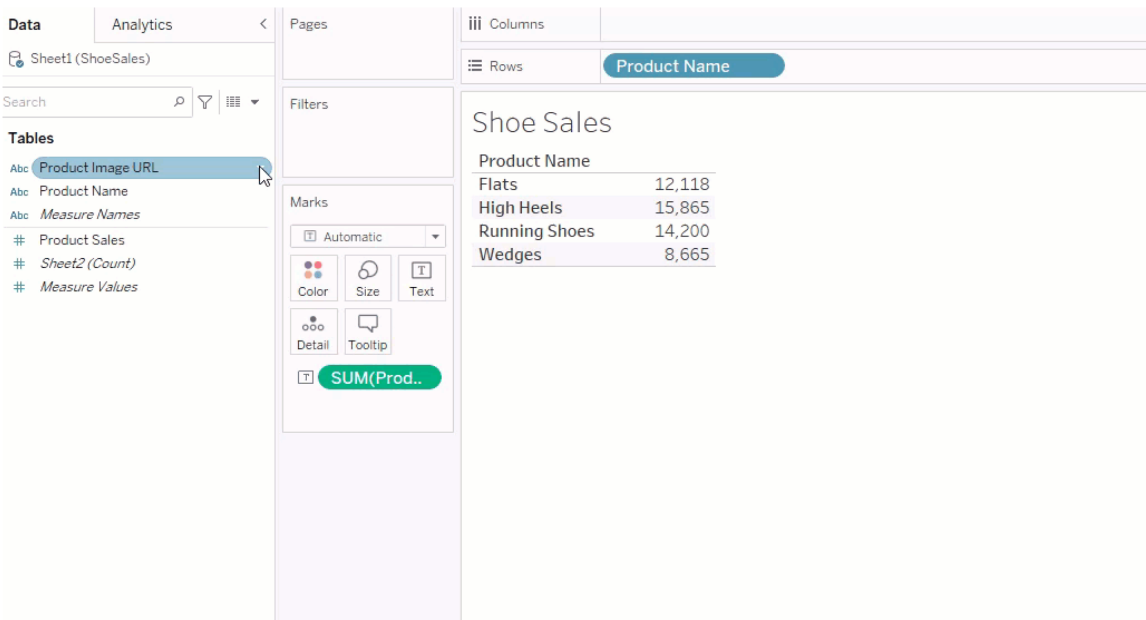
### From a worksheet:

1. Open a new worksheet.
2. Locate a discrete dimension field that has image URLs.
3. Right-click (control click on Mac) the dimension field and select **Image Role** > **URL**.
   The icon changes to an image icon, and your images are ready to use.




## Add images to your visualizations

From your worksheet, drag the Image Role field onto the Rows or Columns shelf. You can now see images along with their associated data on your viz.




## Share your visualizations

You can export your workbooks with images and share them. Be sure that the images used in your vizzes are available to be viewed by everyone you share your vizzes with. For example, if you're using images that are hosted on an internal server behind a firewall, be sure that everyone you share the viz with has sufficient permissions to access the images. In this example, users who view the viz while connected to the same server shouldn't have any issues seeing the images. But users who export the viz to a pdf on a Tableau Cloud server may not be able to see the images.

If you export your workbook and your viewer attempts to open it in Tableau 2022.3 or earlier, your viewer won't be able to see the images.

> **Note:** It's a best practice to always align an Image Role field with a text description to make the content accessible for screen readers and other accessibility software.

## Troubleshoot image connections

Sometimes images won't display if you exceed the number of images allowed per field, have large image files on a complex viz, or are viewing the viz on a mobile device. This section helps you troubleshoot those errors.

### None of the images are displaying in my viz

## There are too many images in the viz

Depending on the complexity of your viz, you can typically load 500 images per field. If you have a complex viz, it may default to server-side rendering. With server-side rendering, you can load 100 images per field.

If you get an error message that there are too many images in the viz, filter out images and try again.

## Tableau couldn't access the images

If you receive broken image icons instead of your images, first confirm that you have sufficient permissions to view the images (or if, for example, they're behind a firewall). Tableau must be able to access the images, and the images can't require a separate authentication to view them.

If you're sure that you have permission to view the images and they're within the size requirements, check that web images are enabled on your settings page.

In Tableau Desktop:

1. From your workbook, click **Help** in the toolbar.
2. Select **Settings and Performance** > **Set Dashboard Web View Security**.
3. Make sure that **Enable Web Page Objects and Web Images** is checked.

In Tableau Cloud:

1. From the home page, click **Settings**.
2. Under general, scroll down and locate **Web Page Objects and Web Images**.
3. Make sure that **Enable Web Page Objects and Web Images** is checked.

### Some of the images aren't displaying in my viz

## The image file is too large

Each image file must be smaller than 200 kb to render. Check your image file size and try again.

## You're using an earlier version of Tableau

If you’re using Tableau 23.1 or earlier, only .png, .jpeg, and .jpg image files are supported. Upgrade your version of Tableau or use a supported file type for the version of Tableau you're using.

## The image URL must begin with http or https

Each image URL must begin with either http or https. Tableau doesn't currently support FTP/SMTP calls. Verify your URL format and try again.

## The image file must be a URL

An Image Role can be assigned to only URLs that navigate to .png, .jpeg, or .jpg, .svg, .webp, .jfif, .ico, .bmp, or .gif image files. Verify your URL format and try again.

## The image file type isn’t supported

An Image Role can be assigned to only URLs that navigate to .png, .jpeg, or .jpg, .svg, .webp, .jfif, .ico, .bmp, or .gif image files. Verify your URL format and try again.

If you’re using Tableau 23.1 or earlier, only .png, .jpeg, and .jpg image files are supported. Upgrade your version of Tableau or use a supported file type for the version of Tableau you're using.
In Tableau 23.2 and later, .gif files are supported, but .gif *animations* will only show on Tableau Cloud and Tableau Server with a client-side render. In Tableau Desktop and Tableau Server with a server-side render, the .gif file will show as a static image.

## The image file contains bad characters

An Image Role can't be assigned to URLs that have the following characters:

```
< > & \ ^ '
```

or the following character sequences:

```
.. \\. \r \n \t
```

Verify that your URL doesn't contain any of these characters or character sequences and try again.

### The images aren't displaying outside of my worksheet

## The images aren't displaying in Viz in Tooltip

Viz in Tooltip is processed with server-side rendering, which allows you to load up to 100 images per field. Verify that you have fewer than 100 images per field and try again.

For more about server and client-side rendering, see Configure Client-Side Rendering.

For more about using Viz in Tooltip, see Create Views in Tooltips (Viz in Tooltip).

## The images aren't displaying in View in Thumbnail

View Thumbnail is processed with server-side rendering, which allows you to load up to 100 images per field. Verify that you have fewer than 100 images per field and try again.

For more about server and client-side rendering, see Configure Client-Side Rendering.

## The images aren't displaying when I export my workbook

All exports and export-related features are processed with server-side rendering, which allows you to load up to 100 images per field. Verify that you have fewer than 100 images per field and try again.

## The images aren't displaying on a mobile device

Mobile devices have a lower complexity threshold than computers, so the processing is completed through server-side rendering, which allows you to load up to 100 images per field.

Verify that you have fewer than 100 images per field and try again.

You can change the complexity settings on your mobile device. For more info on complexity thresholds, see Configure the complexity threshold for computers and mobile devices.

# Connect to Published Data Sources in Web Authoring

The steps below describe how to connect to published data sources when you're signed in to Tableau Server or Tableau Cloud. For details on how to edit workbooks and view on the web, see Build Views on the Web and Using Tableau on the Web.

For information about how to connect to a published data source from Tableau Desktop, see Tableau Server or Tableau Cloud in the Connector Example reference in this help system.

## Connect to a published data source in the web authoring envir-onment

You can connect to data if you have permissions to create and edit views.

1. While you’re signed in to your Tableau Server or Tableau Cloud site, select a view to edit.

2. In editing mode, click the **New Data Source** icon .

3. In the **Connect to Data** dialog box, search for and select a published data source, and then click **Connect**.

You can also connect to a published data source when you're creating a new workbook directly on Tableau Server or Tableau Cloud.

1. When you're signed in to your site, navigate to the **Explore** page and select **All Data Sources**.

2. In the list of data sources, select the check box next to the one you want to use, and then click **Actions** and select **New Workbook**.

# Set Credentials for Accessing Your Published Data

When you publish a workbook to Tableau Cloud or Tableau Server, you can publish the data source it connects to as part of the workbook (*embedded* into the workbook), or as a separate, standalone data source. In addition, if the data source you're publishing requires authentication, you can customize how credentials are obtained.

The type of authentication to your data source is independent of how people sign in to your Tableau Cloud or Tableau Server site. For example, to give people direct access to the data in a workbook, you would embed a database user's credentials into the data source's connection. But anyone viewing the workbook would still need to be able to sign in to the site on Tableau Cloud or Tableau Server to open your workbook.

This topic describes how to set authentication on data connections as part of the publishing process.

> **Note:** This topic doesn't apply to connections to that don't require authentication, such as text files or Excel files.

## Set the authentication type

For many types of connection you can embed a database user's name and password, or use single sign-on (SSO). Specific exceptions are described later in this topic.

The following steps describe how to set authentication as part of publishing a data source or workbook. You can do this for each connection in the data source.

1. In the Publish Workbook dialog box, go to the **Data Sources** area, which lists the workbook's connections, and select **Edit**.
2. In the **Manage Data Sources** popup, after you decide whether to publish the data source separately or as part of the workbook, select an authentication type for each

connection in the data source. The available authentication types depend on the connection type, and they can include one or more of the following:

- **Prompt user**: Users must enter their own database credentials to access the published data when the view or workbook loads.
- **Embedded password**: The credentials you used to connect to the data will be saved with the connection and used by everyone who accesses the data source or workbook you publish.
- **Server run as account**: A single Kerberos service account is used to authenticate the user. On Windows this is the account that Tableau Server runs as. On Linux it can be any Kerberos account.
- **Viewer credentials**: The viewer’s credentials are passed through to the database using SSO (usually Kerberos).
- **Impersonate with embedded account** or **Impersonate with server Run As service account**: Impersonation using embedded credentials connects with the embedded credentials and then switches to the viewer’s identity (only for databases that support this). Impersonation using the Run As service account is similar but first, connects with the Kerberos service account before switching to the viewer’s identity.
- **Refresh not enabled** or **Allow refresh access**: These options appear when you publish an extract of cloud data such as from Salesforce, and database credentials are needed to access the underlying data. **Allow refresh access** embeds the credentials in the connection, so that you can set up refreshes of that extract on a regular schedule.

**Important:** How you want to keep extracted data fresh is also a factor:

- If you want to set up an automatic refresh schedule, you must embed the password in the connection.
- If you’re publishing a cloud data connection to Tableau Cloud, the publishing steps alert you if you must add Tableau Cloud to the data provider’s authorized list.
- You can’t publish an extract that’s created from a Kerberos-delegated, row-level-secure data source.

Dropbox, OneDrive connections

For Dropbox and OneDrive, when you publish a data source or workbook and select **Embedded password**, Tableau creates a saved credential and embeds it in the data source or workbook.

Workbook connections to Tableau data sources

When you publish a workbook that connects to a Tableau Cloud or Tableau Server data source, rather than setting the credentials to access the underlying data, you set whether the workbook can access the published data source it connects to. Regardless of the original data type, the choice for server data sources is always **Embedded password** or **Prompt users**.

If you select to prompt users, a user who opens the workbook must have **View** and **Connect** permissions on the data source to see the data. If you select embed password, users can see the information in the workbook even if they don’t have View or Connect permissions.

Virtual connections

As of Tableau Cloud and Tableau Server 2022.3 and Tableau Desktop Current, when you publish Tableau content like a data source or workbook that uses a virtual connection and select **Embed password** or **Embed credentials**, the viewer of the content will have your permissions to connect to and query the virtual connection. However, any data policies associated with the virtual connection are always evaluated using the viewer’s identity–not yours.

For example, you publish a workbook that uses a virtual connection. To let viewers of the workbook connect to and query data by way of the virtual connection, you embed your permissions to connect to and query the virtual connection. Then, any data policies associated with the virtual connection prevent the viewers of the workbook from accessing any sensitive data.

When evaluating whether the tables in a virtual connection can be viewed and accessed, the identity of the content creator is used. However, when evaluating any data policies associated with the tables in a virtual connection, the viewer’s identity is used. And the content creator can only ever embed connect permissions to the virtual connection–not edit permissions.

If you choose not to embed permissions, then only users with permissions to access the workbook or data source and with connect permissions to the virtual connection can access the workbook or data source.

The embed password and embed credentials options for virtual connections don’t work in Tableau Cloud 2022.2, Tableau Server 2022.1, and Tableau Desktop 2022.3 and earlier. If you select these options before you upgrade to 2022.3 (for Tableau Cloud and Tableau

Server) or Current (for Tableau Desktop), the options will work as expected after you upgrade. Then, you're able to embed your permissions for querying a virtual connection.

## See also

- If you publish to Tableau Server, see Edit Connections in the Tableau Server Help.
- If you publish to Tableau Cloud and the workbook connects to Salesforce, Google Analytics, Google Sheets, Google BigQuery, OneDrive, Dropbox, and QuickBooks Online data, see Refresh Data Using Saved Credentials in the Tableau Cloud Help.
- If you're a Tableau Server administrator looking for more information about authentication, see the Tableau Server help topics, "Authentication" (Windows | Linux) and "Data Connection Authentication" (Windows | Linux).

# Edit a Published Data Source

Imagine that you've published a data source, and your team is using the data source across a number of workbooks. This is a good start, but you have some changes in mind that will make your data source great. Before you implement these changes, you want to see how your proposed changes look in Tableau. And most importantly, you need to test your changes to ensure they won't negatively impact any existing workbooks that use the data source.

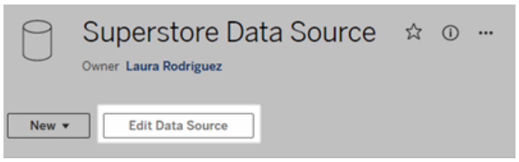
Editing a published data source allows you to test changes and make improvements to your data source while maintaining it as a single source of data.

**Note**: Only users with a site role of Creator can edit publish data sources in the browser.

## Edit and test changes

Whether you're creating a new published data source or editing an existing published data source, you can create joins and edit the schema from the Data Source page without leaving your browser. Then use the Scratchpad to test your changes, create folders, organize hierarchies, and rename fields and aliases before publishing your data source. While editing your data source, you'll have all the same features and functionality that you have when authoring in Tableau Cloud. For more information, see Web Authoring and Tableau Desktop Feature Comparison.

To edit a published data source:

1. From the Start or Explore page, navigate to the data source you want to edit.
2. Click **Edit Data Source**.


3. Click the **Data Source** page to make joins or edit the schema.
4. Click the **Scratchpad** sheet.
5. From the **Data** pane, create folders, organize hierarchies, rename fields and their aliases, or update metadata that are saved with the published data source.
6. Drag and drop fields onto the scratchpad to make sure your changes are working as expected.
7. Click **Publish**.

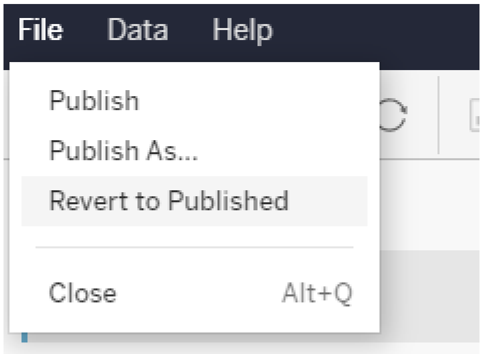
Just like you can with workbooks, you can also **Publish As** if you want to make a copy of the data source.

**Note:** Personal Spaces don't support published data sources.

## Roll back changes

To revert to the last version of the published data source:

1. Navigate to the data source that you want to revert.
2. Click **File**.
3. Choose **Revert to Published**.




This reverts to the latest published version of that data source.

## Understand supported connections

Editing published data sources doesn’t support:

- Tableau Bridge connectors in Tableau Cloud.
- Data sources that use embedded passwords in Tableau Cloud and Tableau Server.

Also, the Data Source page isn’t available for published data source connection types that aren’t supported, including but not limited to .hyper file types. To see which connection types are supported, see Creators: Connect to Data on the Web.

## Learn about permissions

To edit a published data source, you’ll need a Creator license that has Save or Save As permissions for data sources in the respective folder. For more information, see Permissions.

## Edit data sources published by a flow

If you make edits to a data source that was published by a flow, the changes will be overwritten during the next scheduled flow. Instead, edit the data source in the flow. For more information, see Publish a Flow to Tableau Server or Tableau Cloud.

# Use Dynamic Axis Ranges

It's key that your users understand the range represented in a viz so that they can correctly analyze the data. Especially when analyzing multiple vizzes in a dashboard or multiple worksheets at the same time, it can be easy for users to misinterpret data when the range of the axes is different between vizzes. For example, when two bar charts appear next to each other, the bars in both charts might appear to be equivalent sizes. However, the axes might have very different ranges, making the charts misleading.

To help users understand the range of the axis, in 2023.3 and later, authors can use Dynamic Axis Ranges to set the minimum and maximum values of an axis range by using numeric parameters or date parameters. Then, as users navigate across vizzes, the axes update synchronously. This makes it easier for your users to analyze data across vizzes easily and accurately. And by limiting the range of the data, you can view a subset of data without filtering the underlying data or impacting the moving average of your data.

Dynamic Axis Ranges can also be used to extend or shorten the range of an axis without filtering out the underlying data. This is ideal for showing progress against a goal or showing a moving average.

## Supported field types

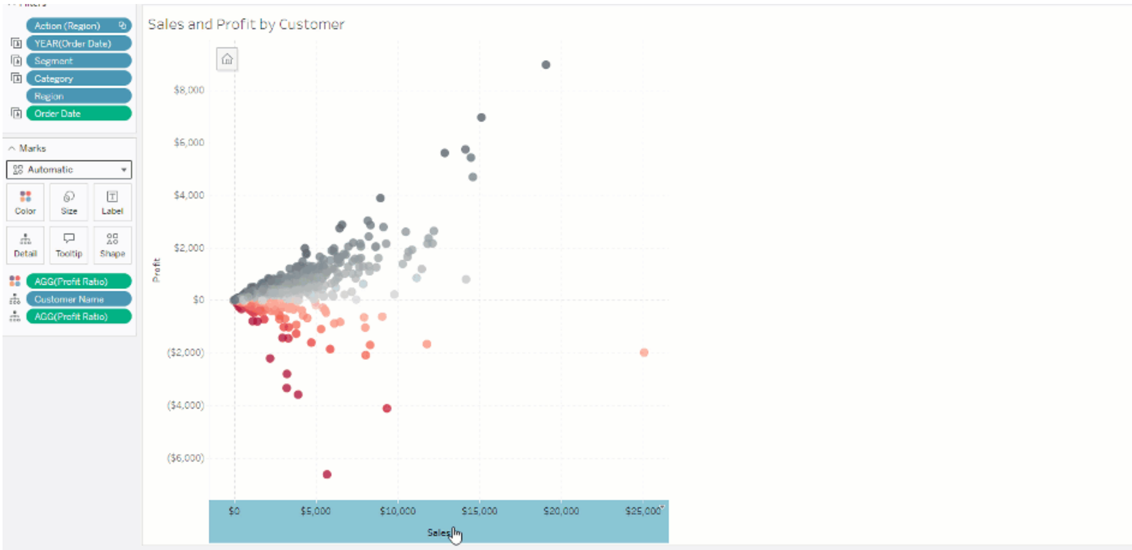
Dynamic Axis Ranges support any parameter that is compatible with the selected continuous axis, for example:

- Numeric parameters
- Temporal parameters (date or dateTime)

## Configure a dynamic axis range

1. From a Tableau sheet, create a parameter for your axis.
2. Right-click the axis, and choose **Edit Axis**.
3. For the Range, choose **Custom**. Then, select the parameter that you created for either the start or end axis extent.
4. Close the dialog box.

5. If you're using multiple sheets on a dashboard, repeat these steps for the axes across the different sheets.



## Understand limitations and edge cases

Dynamic Axis Ranges aren't updated within Stories. If the parameter used for the axis is deleted, then the most recent parameter value remains as the axis extent. The next time you edit the axis, an error message will prompt you to choose a new parameter to be used.

# Use Dynamic Axis Titles

Tableau's flexibility empowers authors to quickly analyze different data sets and visualize data differently for deeper analysis. But with that flexibility, comes the responsibility to communicate accurately the data that is used in a viz. For example, it's critical to communicate the units of measure that change based on a parameter value. Imagine that you're looking at a viz of the weather that shows a forecast of 25 degrees. In Fahrenheit, that forecast might be a great ski trip. But in Celsius, that forecast might call for a trip to the beach.

As an author, you can use Dynamic Axis Titles to update the axis title based on the value of a parameter or a single-value field (for example, an LOD calculation). If you use swap parameters, the axis titles update to match the data being used.

## Supported field types

To be used as a Dynamic Axis Title, fields must be:

- A single-valued and a fixed LOD calculation
- A parameter
- A constant calculated field
- A top 1 set

## Configure a dynamic axis title

1. From a Tableau sheet, drag a continuous field onto a shelf.
2. Double-click the axis to open the **Edit Axis** dialog.
3. Under the **Axis Titles** section, choose the field you want to use for your axis title from the list.
4. Close the **Edit Axis** dialog.

For a more complex use case, first follow the steps in Example: Swap Measures Using Parameters. Then, follow these steps:

1. Double-click the X axis to open the **Edit Axis** dialog.
2. Under the **Axis Titles** section, select **Parameter**, and then choose the Placeholder 2 selector.
3. Close the **Edit Axis** dialog.
4. Repeat these steps for the Y axis using Placeholder 1.

Now, when the parameters are changed, the axes titles update to reflect the data being displayed.

## Understand limitations and edge cases

Dynamic axis titles are cleared when the viz type is changed using Show Me. Also if you use subtitles, then the subtitle appears after the Dynamic Axis Title, just as it does for custom titles. Automatic subtitles are populated only when you have a continuous date value axis that is filtered to a single year with at least two time periods. The dynamic axis title functionality doesn't work when using the worksheet in a story (a sequence of visualizations that work together to convey information).

# Use Dynamic Zone Visibility

Dashboard space is valuable, especially when you want to progressively reveal insights about data. With Dynamic Zone Visibility, you can hide or reveal zones (tiled or floating dashboard elements) based on the value of a field or parameter. As you interact, zones on your dashboard appear or disappear. The result is a dynamic dashboard that doesn't compromise your desired layout.

While you can show or hide objects by clicking a button on a dashboard, Dynamic Zone Visibility allows you to show and hide objects automatically. This is ideal for dashboards that are used by different user groups. For example, you might want to show different user groups different zones when they visit your dashboard.

And you can use Dynamic Zone Visibility with Parameter Actions. For example, when a user clicks a mark on a viz, a previously hidden zone appears. This is ideal for complex dashboards because it allows you to choose when deeper levels of data are revealed.

## Supported field types

To be used for Dynamic Zone Visibility, a field or parameter must be:

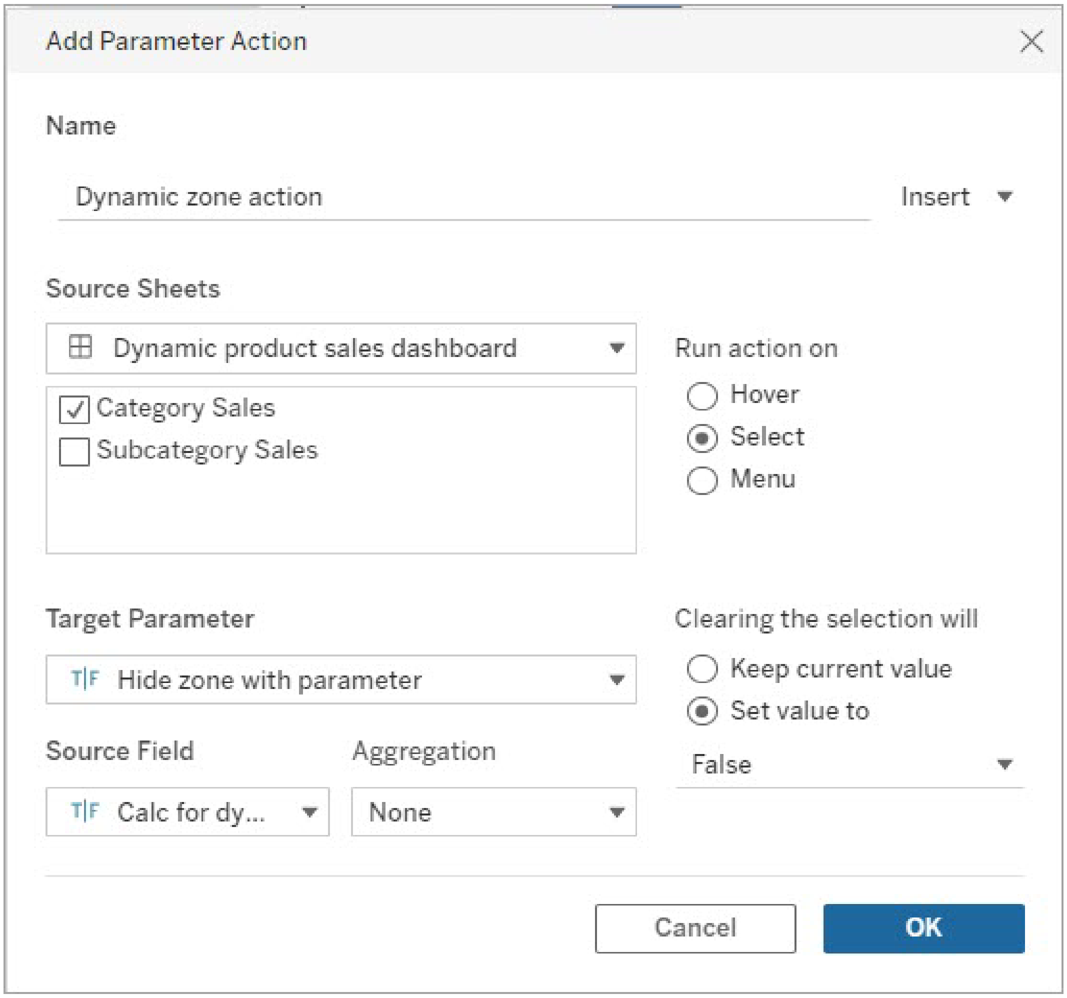
- Boolean.
- Single value.
- Independent of the viz, meaning the field returns a constant value independent of the structure of the viz, such as a fixed level of detail (LOD) calculation.

## Configure a dynamic dashboard zone

The following example has two sheets that use Superstore data: the first sheet has a bar chart with Sales by Category, and the second sheet has a bar chart with Sales by Sub-Category. By using Dynamic Zone Visibility, the second sheet is visible only after a mark is clicked in the Sales by Category zone. This example relies on a boolean calculated field, which is used as the source field for a parameter action. For the calculation to be used as the source field for the parameter action, the calculation must be added to the marks card.

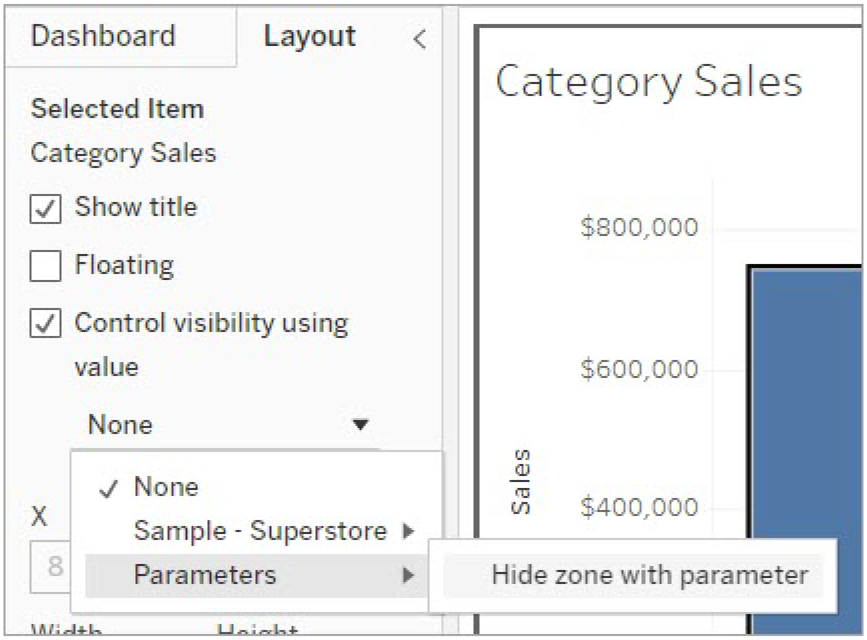
1. From the Sales by Category sheet, create a parameter. In this example, the parameter **Data type** must be set to **Boolean**.
2. From the Sales by Category sheet, create a calculated field. This example uses the following calculation: `True`
3. On the Sales by Category sheet, drag the calculation that you created to **Details** on the marks card.
4. Create a dashboard.
5. Drag the sheet that you always want to be visible onto your dashboard. In our example, we want Sales by Category to be visible.
6. From your dashboard, click the Sales by Category zone (dashboard object). Then, from the Worksheet menu on your dashboard, create a parameter action. This example uses the following **Change Parameter** action:
   The source sheet is set to use the dashboard you created and the Category Sales sheet.
   The **Target Parameter** is the parameter you created.

The **Source Field** is the calculation you created.

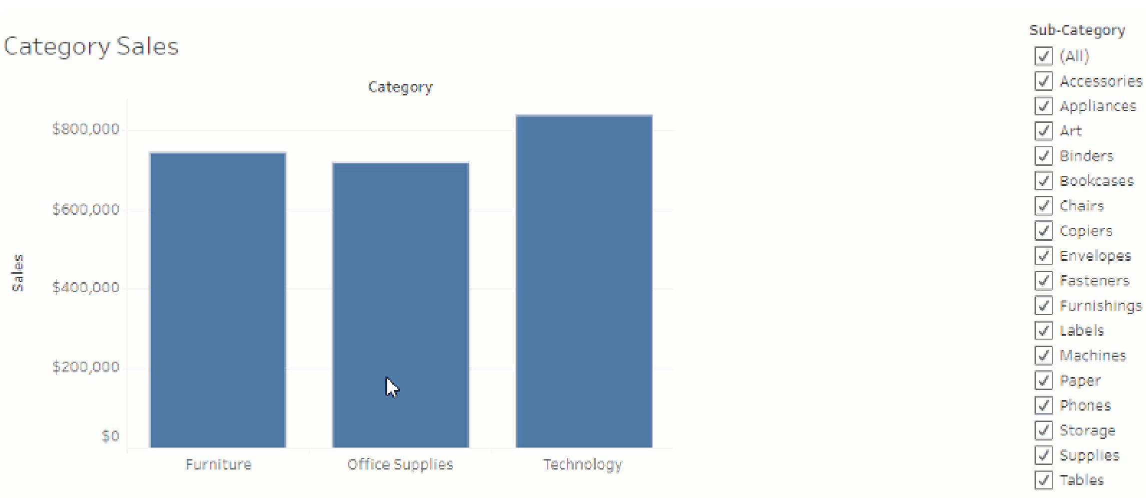



7. Drag the Sales by Sub-Category worksheet onto your dashboard.
8. Click the Sales by Category zone. From the upper right corner, click the dropdown arrow and select **Use as Filter**.
9. Click the Sales by Sub-Category zone, and then click the **Layout** tab.
10. Check the box for **Control visibility using value**.
11. From the dropdown, choose the parameter you created to control zone visibility.

**Note:** If the option to Control visibility using value doesn't contain the field you want to use, be sure that the field is a supported field type.




Now, when you click a category mark in the Sales by Category zone, the Sales by Sub-Category zone appears in your dashboard.




# Explore Dashboards with Data Guide

Have you ever discovered a new Tableau dashboard and wondered what data means or how to use it? Or, have you ever published a new dashboard and wished that you could include instructions about how to use your dashboard?

Data Guide provides helpful information about a dashboard and insights about the data behind it. Data Guide allows dashboard creators to provide more explanatory context for end users–like descriptions and links to resources–directly in the dashboard. And Data Guide automatically surfaces insights powered by Explain Data to help users find outliers and learn about explanations for a mark. Explain the Viz (powered by Explain Data) identifies outlier measures and potential key drivers behind them.

These contextually relevant details can help dashboard users navigate and use new dashboards more easily, allowing users to find insights faster, trust that they're looking at the right data, provide context for data, and establish confidence in their understanding of the viz.

## Customize Data Guide as an author

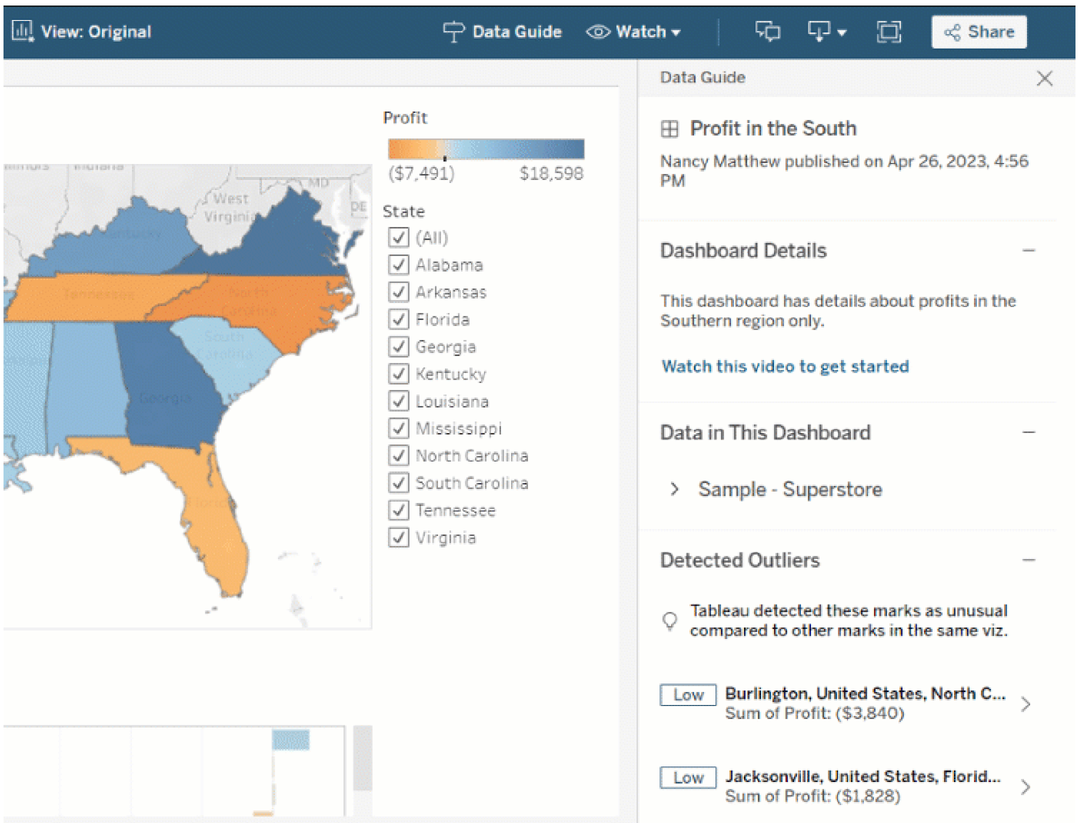
1. From your dashboard, choose the **Edit** button.
2. Choose **Data Guide** in the toolbar.
3. In the Data Guide pane, type a description to help your end users understand the purpose of your dashboard.
4. Select **Add link**, and enter a descriptive label for your link text and the URL.
5. Choose **OK**.
6. Select a viz (a sheet in the dashboard). Data Guide updates automatically so you can add a description and resources that are relevant to each viz in your dashboard.
7. Type a description, and add links relevant to the viz.
8. Choose **OK**.

**Tip:** To use Data Guide to write custom alt text to improve the accessibility of your vizzes, see Show more text and make it helpful.

## Explore Data Guide as a dashboard user

1. From the dashboard, choose **Data Guide** in the toolbar.
2. Read the description of the dashboard and explore resources provided by the dashboard author.
3. Expand **Data in This Dashboard** and **Detected Outliers** to learn more about the underlying data used in the dashboard.
4. Select a viz (an object in the dashboard).

5. Read the description of the viz and explore resources provided by the dashboard author.
6. Expand **Data Summary** and **Detected Outliers** to learn more about data in that viz.
7. Select a mark or multiple marks, such as a bar on a chart or a region on a map, to see information about **Data in This Mark** and **Applied Filters**. Select a single mark to see possible **Explanations** for its value.



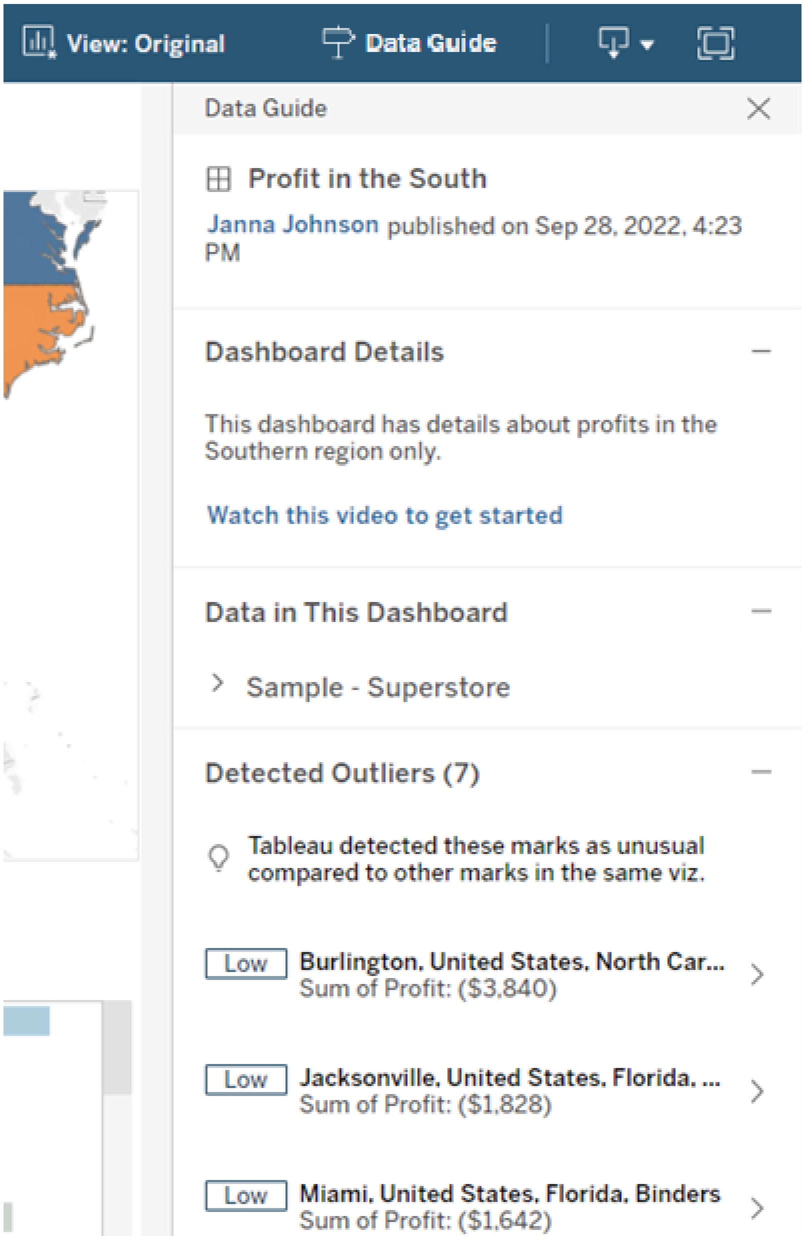

## Explore Data Guide at different levels

By default, Data Guide is closed when you open a workbook. And you can open Data Guide in the toolbar. At the top of the Data Guide pane, you see the name of the dashboard or viz that you selected. As a dashboard author, you can write descriptions for both the dashboard and for individual vizzes that make up your dashboard.

## Understand dashboard-level details

At the dashboard level, Data Guide:

- Displays the dashboard’s name, author, and last published date.
- Can include a description written by the dashboard author and links to related resources, such as videos or wiki pages.
- Lists the data sources used by the dashboard and details about the data, such as which dimensions and measures are used.
- Reveals detected outliers in the dashboard that are identified by Explain Data. For more information, see Get Started with Explain Data.

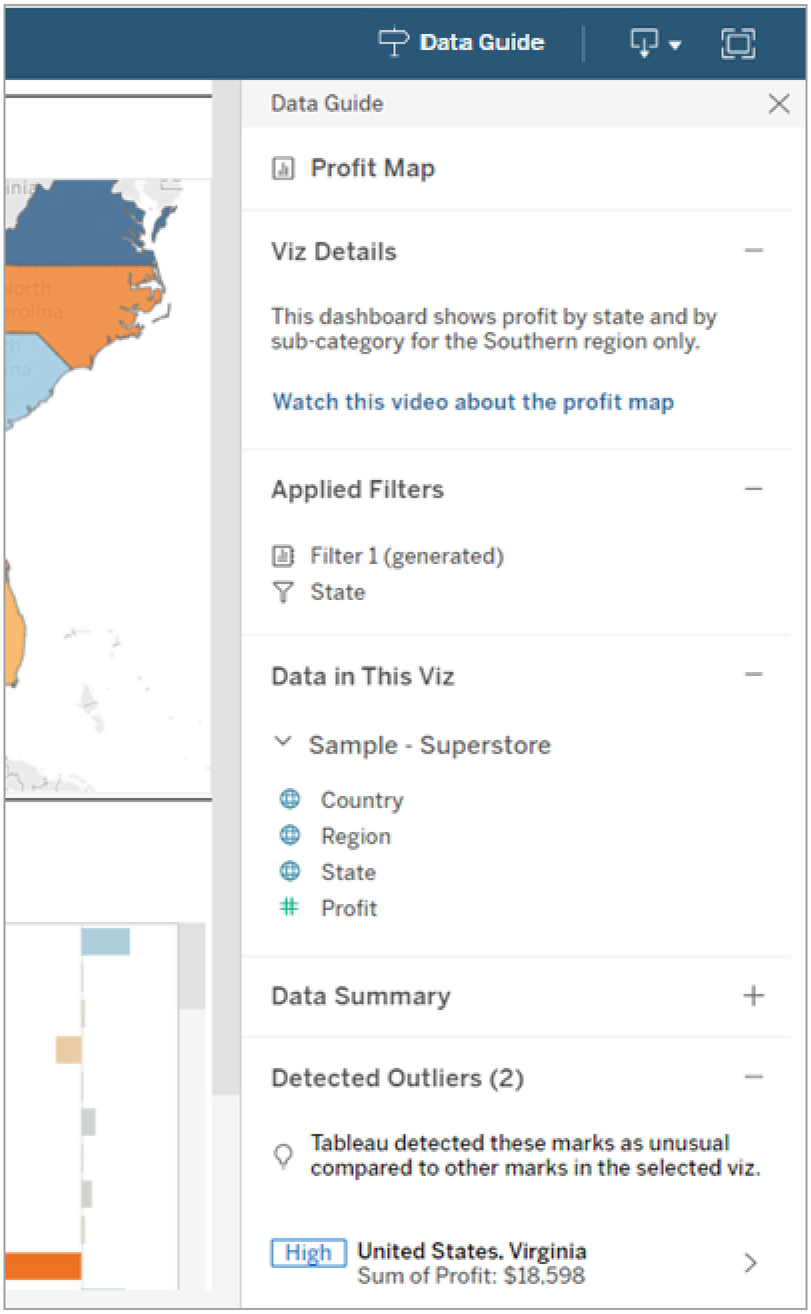



## Understand viz-level details

When a user selects a specific viz (dashboard object), Data Guide:

- Displays the viz's name.
- Can include a description written by the dashboard author and links to related resources, such as videos or wiki pages.

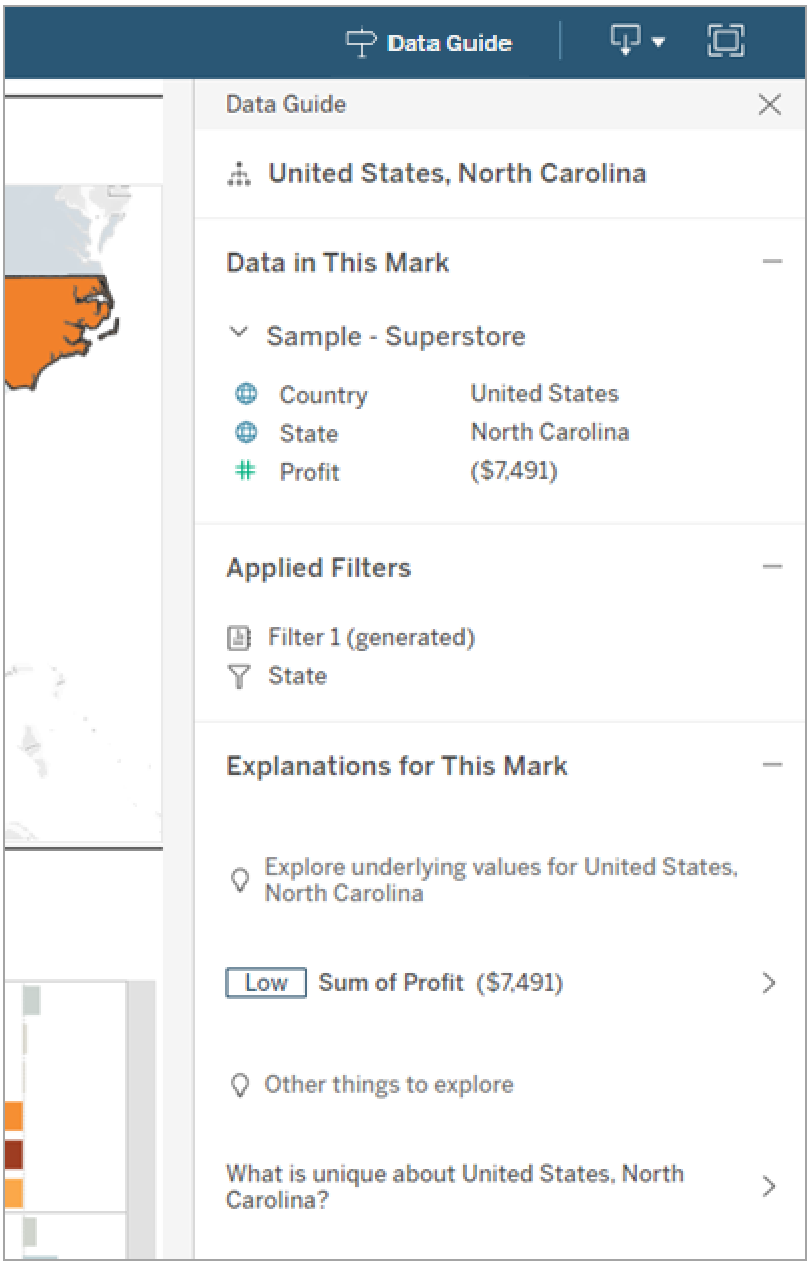
- Lists the data sources used by the dashboard, including the dimensions and measures used.
- Lists applied filters and data used in the viz, so you can identify how the data is being influenced by filters that users interact with. Only filters that a user can change are shown.
- Has a summary of the data used in the viz, including the number of data points and sorting details.
- Reveals detected outliers in the viz that are identified by Explain Data. For more information, see Get Started with Explain Data.




## Understand mark-level details

When a user selects a mark (or marks) such as region on a map, Data Guide:

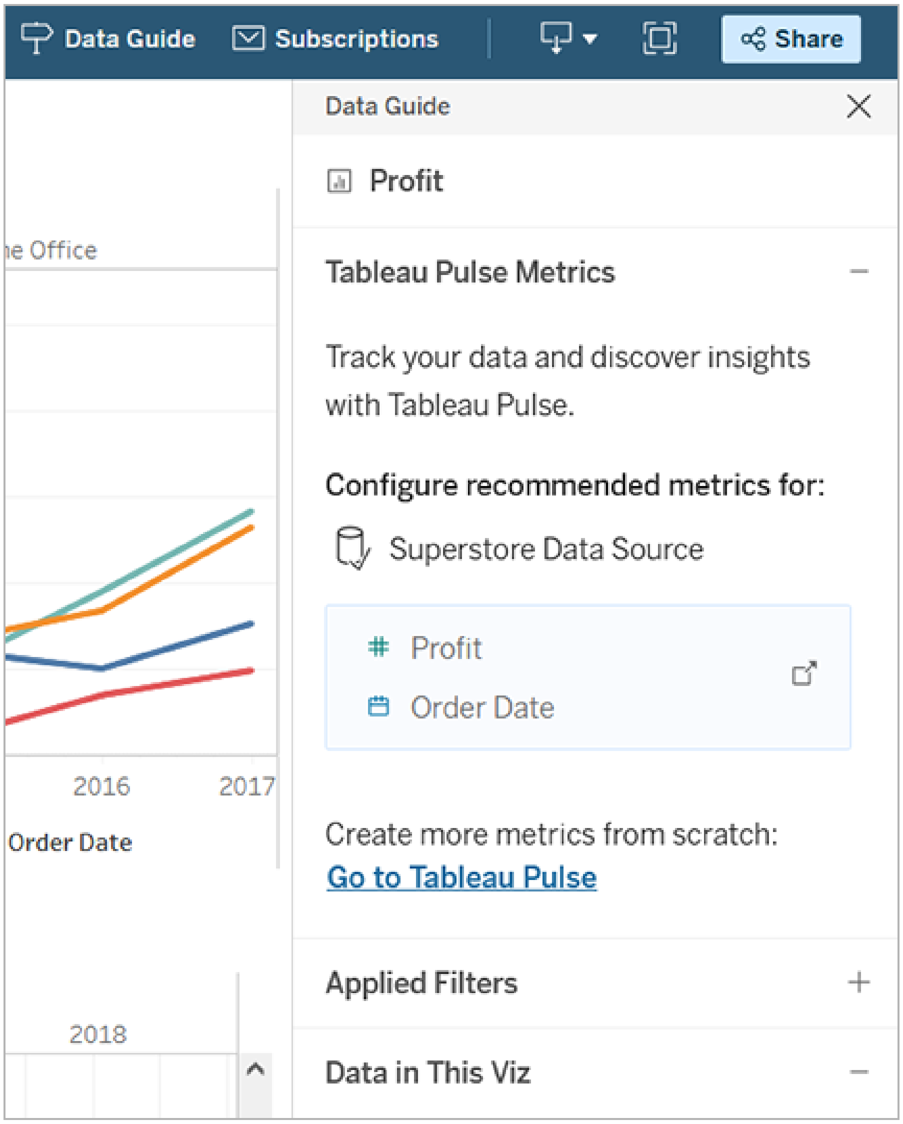
- Displays the name of the mark.
- Lists applied filters and data used in the viz, so you know what's included and what's excluded.
- Reveals detected outliers in the viz that are identified by Explain Data. For more information, see Get Started with Explain Data.



## Get Tableau Pulse metric recommendations

In Tableau Cloud, when a user selects a viz, Data Guide shows recommended metrics based on the fields used in that viz. Users can select a recommendation to continue configuring it in Tableau Pulse. For more information, see Create Metrics with Tableau Pulse.

If there are no fields that can be recommended, but the data source used by the viz is a published data source, users can select the data source to connect to in Tableau Pulse. If Data Guide can't recommend metrics, fields, or a data source, users can still open Tableau Pulse to create metrics from scratch.




## Control Data Guide visibility

By default, Data Guide is closed when you open a workbook. When you open or close Data Guide, it remains in this state for all workbooks on the site. In 2023.1 or later, a site administrator can hide Data Guide for all users. This removes the Data Guide button from the Tableau toolbar on all workbooks on the site. To hide Data Guide:

1. From the left pane, choose **Settings**.
2. From the **General** tab, scroll to **Availability of Data Guide**.

3. Choose **Hide**.
4. Choose **Save**.

# Autosave Workbooks

In Tableau Cloud, Autosave saves the edits that you make to a new or existing workbook while you work.

## How does Autosave work?

As soon as you start making changes to a new or existing workbook, we'll start to autosave the changes to a private draft version of your workbook. When you're ready to share your changes with others, use **Publish** to replace the last published revision with your draft.

> **Note:** Autosave doesn't automatically save every type of change, such as specific types of assets. In these cases, you'll see a notification that you must **Publish** your workbook to save your edits.

### Workbook file size

Autosave is available for workbooks that are smaller than 5MB. You must **Publish** to manually save changes for larger workbook files.

### What if multiple users edit the same workbook?

When more than one user works on the same workbook, each user's edits are associated with and saved to their own private draft. When you begin to edit a workbook, you'll receive a notification if the version you're working from has a published revision from another user. You're then offered a choice to either discard your draft and edit the current revision or to resume editing your private draft.

**Warning:** You won't receive a notification if another user publishes a revision after you've begun your edits to your private draft. If another user publishes their draft before you publish your version, your changes will overwrite theirs.

You can check the workbook **Revision History** to see when the workbook was last published. From the revision history, you can choose to **Preview** a revision, or **Restore** a previous revision. For more information, see Work with Content Revisions.

If you choose to discard your draft to edit the current revision, the draft and associated asset files that were uploaded are deleted. To retain assets and edits that you made in your private draft, you can manually incorporate the edits of other users into your private draft. Then, publish the workbook with both sets of changes.

## Permissions requirement

Autosave is available to Creators and Explorers (can publish) with web editing capabilities at the workbook level. If a user has web editing capabilities at the view level only, Autosave won’t be turned on.

# Spell Check (Tableau Cloud and Tableau Server Only)

As of Tableau 2024.2, you can use your web browser's built-in spell check functionality to identify spelling errors and find correct spelling suggestions on your text content on the following rich text authoring components in Tableau:

- Tooltips
- Captions
- Worksheet Titles
- Dashboard Titles
- Dashboard Descriptions
- Legend Titles
- Filter Control Titles
- Parameter Control Titles
- Annotations

- Highlighter Control Titles
- Pages Control Titles
- Story Titles
- Story Descriptions
- Mark Labels
- Viz Alt Text
- Field Comments
- Edit Groups and Alias Dialog

When entering text in these rich authoring components, words that are identified as a possible spelling error will be flagged. For example, if you're using Google Chrome or Safari, the words are underlined with a red, squiggly line. You can right-click the word and see a list of spelling suggestions from your web browser.

Spell check isn't currently supported for Tableau attributes, such as creating custom field names using SQL elements.

As this feature is powered by your web browser, there may be slight variations in the appearance and spelling recommendations provided by the browser. If your text is being flagged incorrectly, you can add words to your web browser's local word library.

The web browser that you're using determines whether the feature is turned on and which languages are supported. If you'd like to turn off spell check you can do it through your web browser's spell check settings.

To see if your browser and language are supported, see the following table.

## Supported browsers and languages

| | **Google Chrome**<br><br>(Basic and Enhanced spell check options) | **Safari** | **Firefox**<br><br>(Dictionary add on needed) | **Microsoft Edge**<br><br>(Basic and Enhanced spell check options) |
|---|---|---|---|---|
| English (US) | Yes | Yes | Yes | Yes |

| | | | | |
|---|---|---|---|---|
| English (UK) | Yes | Yes | Yes | Yes |
| French (France) | Yes | Yes | Yes | Yes |
| French (Canada) | No | Yes | No | No (Basic)<br><br>Yes (Enhanced) |
| German | Yes | Yes | Yes | Yes |
| Italian | Yes | Yes | Yes | Yes |
| Spanish | Yes | Yes | Yes | Yes |
| Brazilian Portuguese | Yes | Yes | Yes | Yes |
| Swedish | Yes | Yes | Yes | Yes |
| Japanese | No | Yes (Kana and Romaji) | No | No |
| Korean | Yes | Yes (2-Set) | Yes | Yes |
| Traditional Chinese | No | Yes | No | No |
| Simplified Chinese | No | Yes | No | No |
| Thai | No | No | No | No (Basic)<br><br>Yes (Enhanced) |

# Use Relationships for Multi-table Data Analysis

Tables that you drag into this canvas use relationships. Relationships are a flexible way to combine data for multi-table analysis in Tableau.

Think of a relationship as a contract between two tables. When you are building a viz with fields from these tables, Tableau brings in data from these tables using that contract to build a query with the appropriate joins.

We recommend using relationships as your first approach to combining your data because it makes data preparation and analysis easier and more intuitive. Use joins only when you absolutely need to. Learn more about the basics of creating relationships in this 5-minute video.

> **Note**: The interface for editing relationships shown in this video differs slightly from the current release but has the same functionality.

Learn more about how relationships work in these Tableau blog posts:

- Relationships, part 1: Introducing new data modeling in Tableau
- Relationships, part 2: Tips and tricks
- Relationships, part 3: Asking questions across multiple related tables

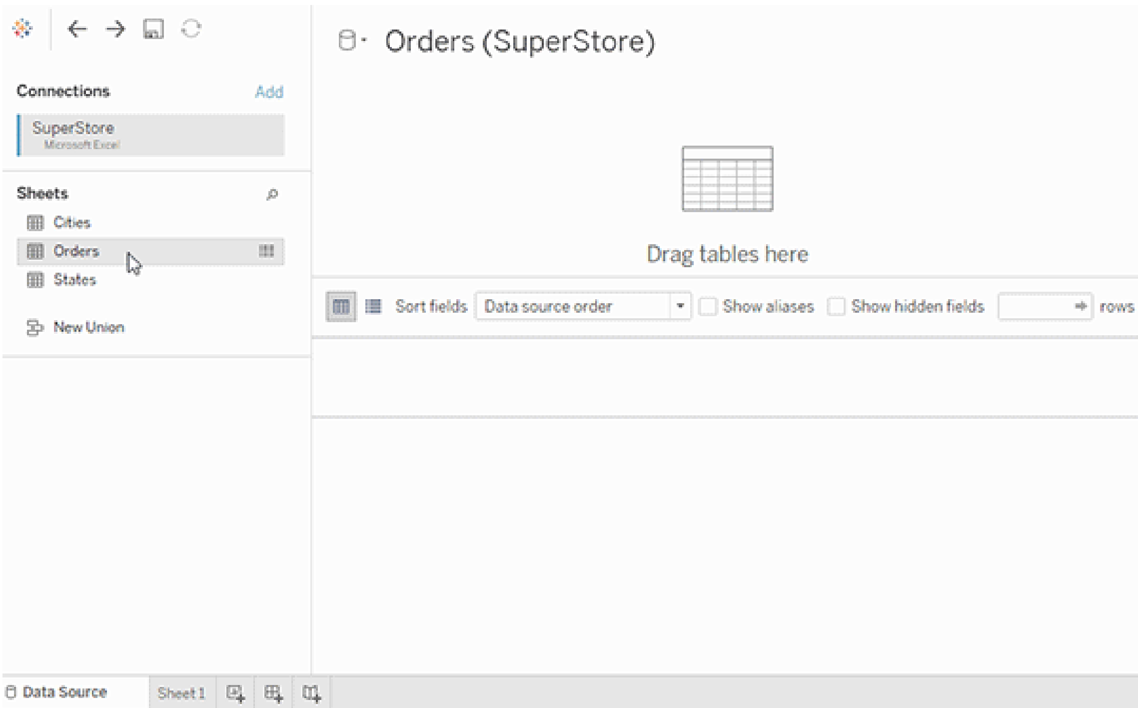
Also see video podcasts on relationships from Action Analytics, such as Why did Tableau Invent Relationships? Click "Video Podcast" in the Library to see more.

In Tableau version 2024.2 and later, the Tableau data model supports multi-fact analysis and shared dimensions through multi-fact relationships. For more information, see About Multi-fact Relationship Data Models, When to Use a Multi-fact Relationship Model, and Build a Multi-fact Relationship Data Model.

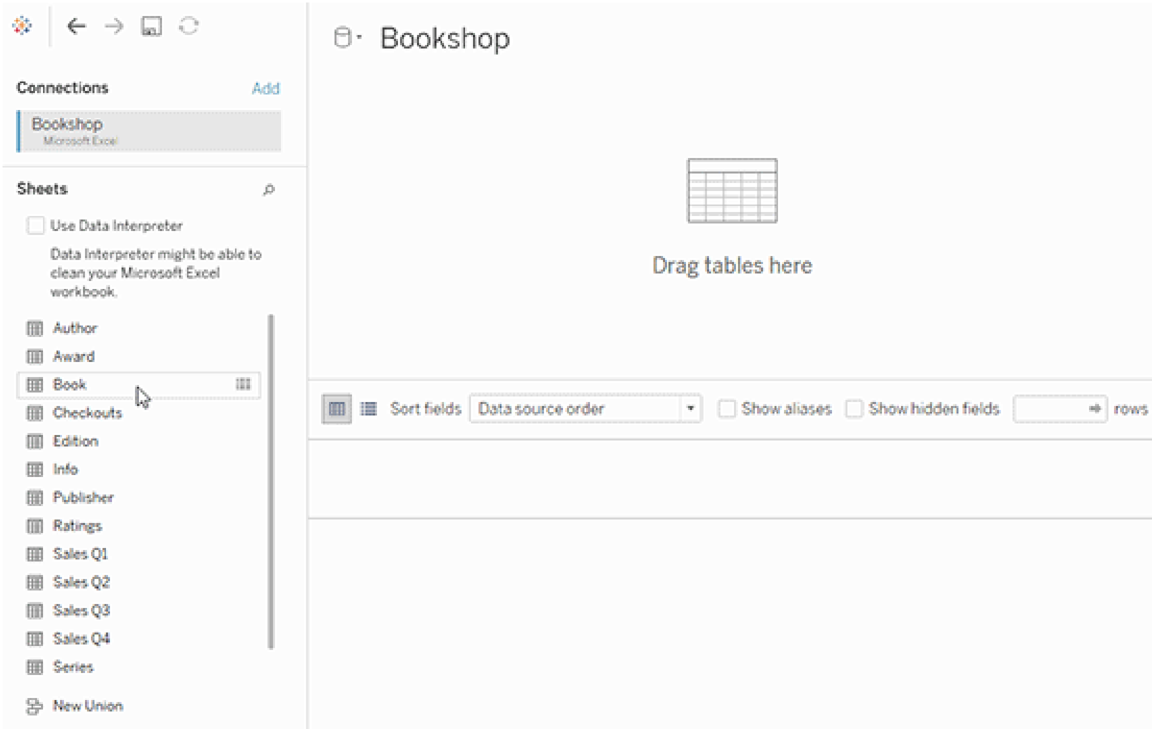
## Are you building a new data source and workbook?

Drag a table to the Data Source page canvas to start building your data source.

A data source can be made of a single table that contains all of the dimension and measure fields you need for analysis...




Or, you can create a multi-table data source by dragging out more tables and defining their relationships...




Watch this 1-minute video about getting started with using relationships.

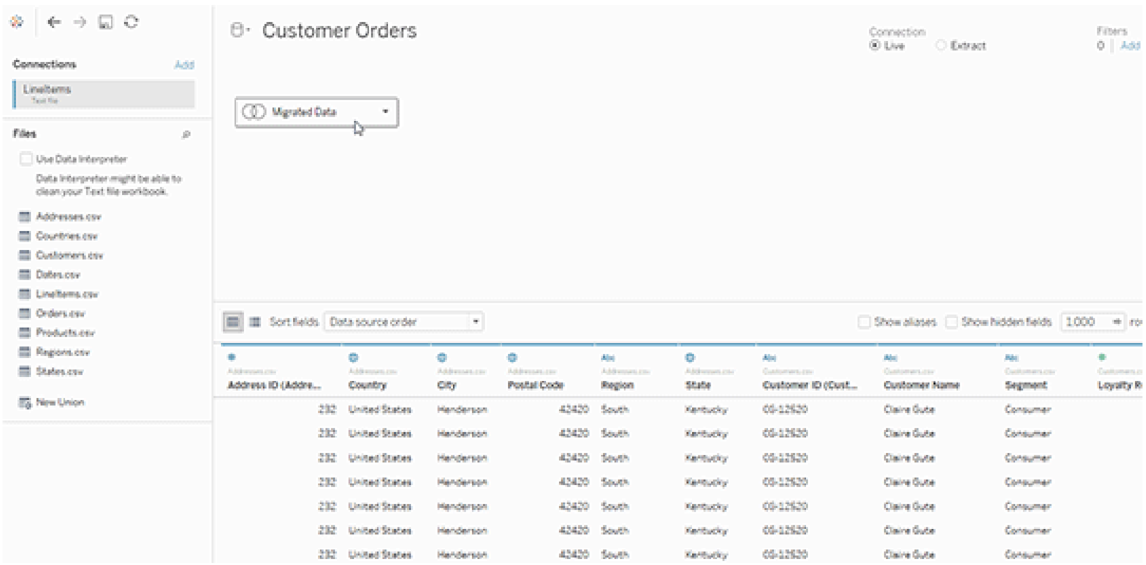
> **Note**: The interface for editing relationships shown in this video differs slightly from the current release but has the same functionality.

For more information about using relationships, see Relate Your Data, How Relationships Differ from Joins, The Tableau Data Model, and Create and define relationships.

For more information on changes to data sources and analysis in Tableau 2020.2 and later, see What's Changed with Data Sources and Analysis and Questions about Relationships, the Data Model, and Data Sources.

## Are you opening an older workbook or data source?

When you open a pre-2020.2 workbook or data source in 2020.2, your data source will appear as a single logical table in the canvas, with the name "Migrated Data" or the original table name. Your data is preserved and you can continue to use the workbook as you did before.




To see the physical tables that make up the single logical table, double-click that logical table to open it in the physical layer. You will see its underlying physical tables, including joins and unions.

For more information on changes to data sources and analysis in Tableau 2020.2 and later, see What's Changed with Data Sources and Analysis and Questions about Relationships, the Data Model, and Data Sources.

## The Tableau Data Model

Every data source that you create in Tableau has a data model. You can think of a data model as a diagram that tells Tableau how it should query data in the connected database tables.

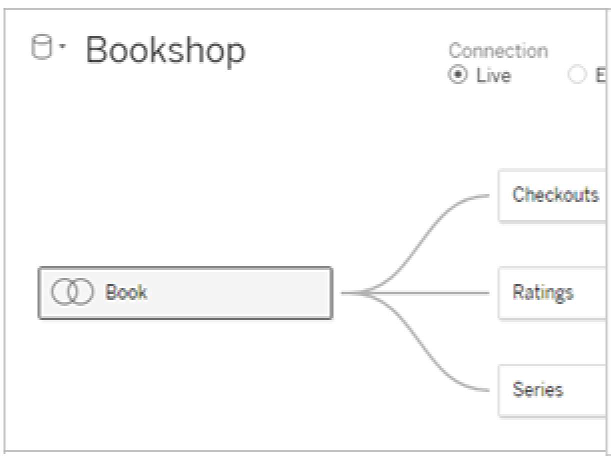
The tables that you add to the canvas in the **Data Source** page create the structure of the data model. A data model can be simple, such as a single table. Or it can be more complex, with multiple tables that use different combinations of relationships, joins, and unions.

The data model has two layers:

- The default view that you first see in the Data Source page canvas is the *logical layer* of the data source. You combine data in the logical layer using relationships (or noodles). Think of this layer as the Relationships canvas in the Data Source page. For more information, see Use Relationships for Multi-table Data Analysis.
- The next layer is the *physical layer*. You combine data between tables at the physical layer using joins and unions. Each logical table contains at least one physical table in this layer. Think of the physical layer as the Join/Union canvas in the Data Source page. Double-click a logical table to view or add joins and unions.

**Logical Layer**

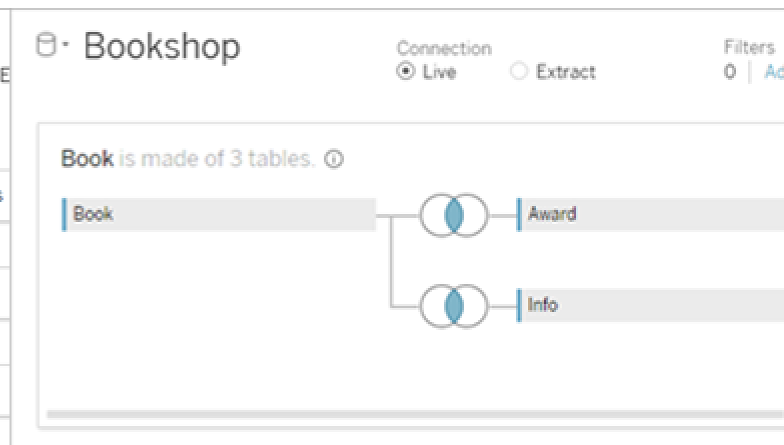
Noodles = Relationships




The top-level view of a data source with multiple, related tables. This is the logical layer. Logical tables can be combined using relationships (noodles). They don't use join types. They act like containers for physical tables.

**Physical Layer**

Venn diagram = Joins




Double-click a logical table to open it and see its physical tables. Physical tables can be combined using joins or unions. In this example, the Book logical table is made of three, joined physical tables (Book, Award, Info).

| Logical Layer | Physical Layer |
|---|---|
| Relationships canvas in the Data Source page | Join/Union canvas in the Data Source page |
| Tables that you drag here are called logical tables | Tables that you drag here are called physical tables |
| Logical tables can be related to other logical tables | Physical tables can be joined or unioned to other physical tables |
| Logical tables are like containers for physical tables | Double-click a logical table to see its physical tables |
| Level of detail is at the row level of the logical table | Level of detail is at the row level of merged physical tables |
| Logical tables remain distinct (normalized), not merged in the data source | Physical tables are merged into a single, flat table that defines the logical table |

## Layers of the data model

The top-level view that you see of a data source is the logical layer of the data model. You can also think of it as the Relationships canvas, because you combine tables here using relationships instead of joins.

When you combine data from multiple tables, each table that you drag to the canvas in the logical layer must have a relationship to another table. You do not need to specify join types for relationships; during analysis Tableau automatically selects the appropriate join types based on the fields and context of analysis in the worksheet.

The physical layer of the data model is where you can combine data using joins and unions. You can only use pivots in this canvas. You can think of it as the Join/Union canvas. In previous versions of Tableau, the physical layer was the only layer in the data model. Each logical table can contain one or more physical tables.

**Important**: You can still create single-table data sources in Tableau that use joins and unions. The behavior of single-table analysis in Tableau has not changed. Your upgraded workbooks will work the same as they did before 2020.2.

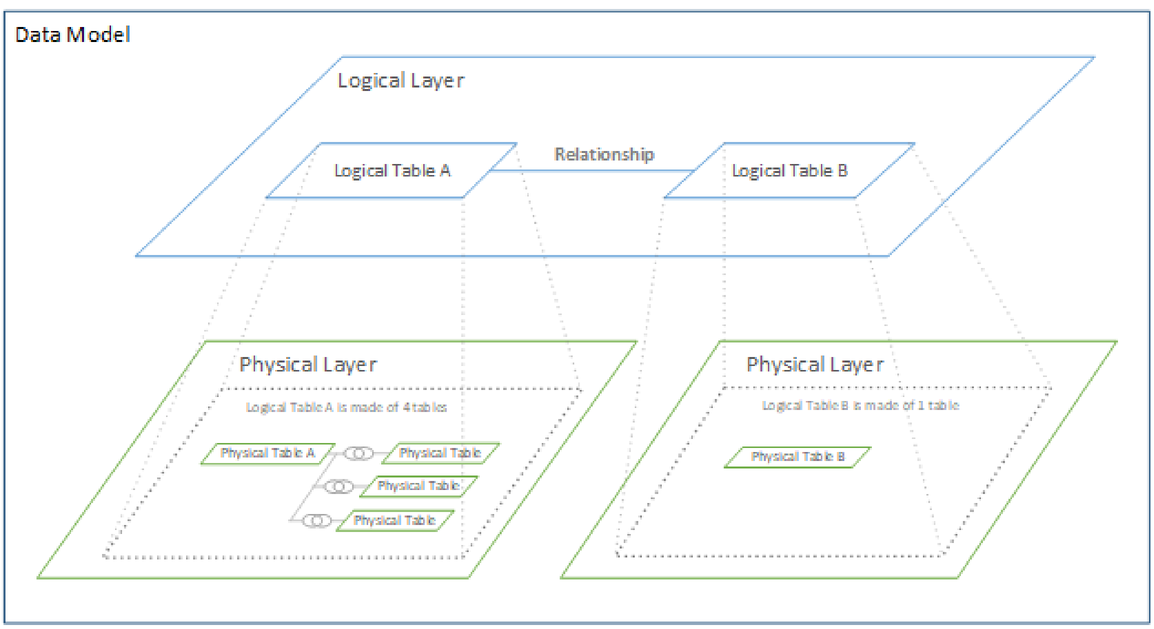
**Learn more**: For related information on combining data using relationships, also see these topics and blog posts:

- How Relationships Differ from Joins
- Use Relationships for Multi-table Data Analysis
- Relate Your Data
- Relationships, part 1: Introducing new data modeling in Tableau
- Relationships, part 2: Tips and tricks
- Relationships, part 3: Asking questions across multiple related tables

Also see video podcasts on relationships from Action Analytics, such as Why did Tableau Invent Relationships? Click "Video Podcast" in the Library to see more.

## Understanding the data model

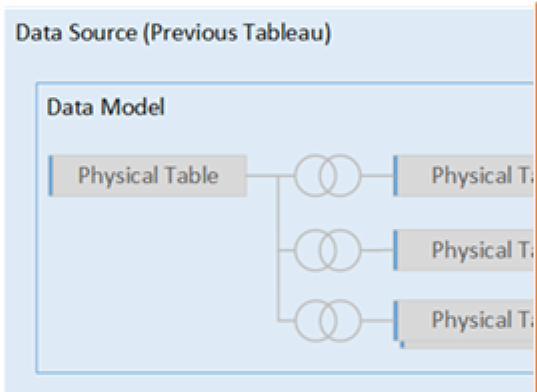
In previous versions of Tableau (pre-2020.2), the data model had a physical layer only. In Tableau 2020.2 and later, the data model has the logical (semantic) layer and a physical layer. This gives you more options for combining data using schemas to fit your analysis.



In Tableau 2020.2 and later, a logical layer has been added in the data source. Each logical table contains physical tables in a physical layer.

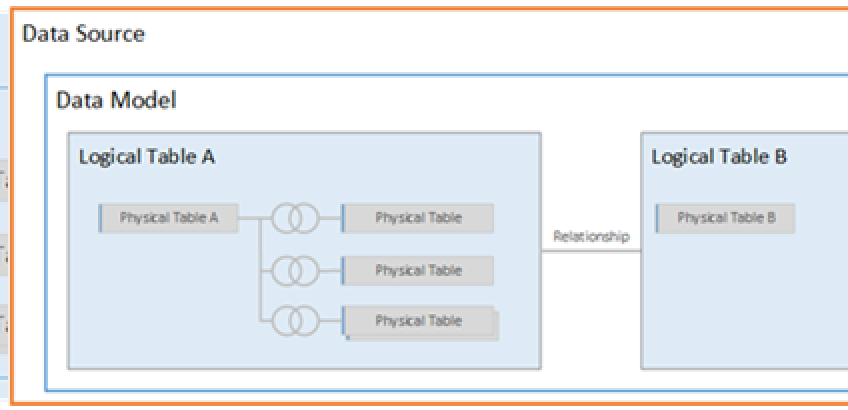
In earlier versions of Tableau (pre-2020.2), the data model in your data source consisted of a single, physical layer where you could specify joins and unions. Tables added to the physical layer (joined or unioned) create a single, flattened table (denormalized) for analysis.

**Previous versions**




In versions of Tableau before 2020.2, the data model has only the physical layer

**2020.2 and later**




In 2020.2 and later, the data model has two layers: the logical layer and the physical layer

In Tableau 2020.2 and later, the data model in your data source includes a new semantic layer above the physical layer—called the logical layer—where you can add multiple tables and relate them to each other. Tables at the logical layer are not merged in the data source, they remain distinct (normalized), and maintain their native level of detail.

Logical tables act like containers for merged physical tables. A logical table can contain a single, physical table. Or it can contain multiple physical tables merged together through joins or unions.

## Build a new model

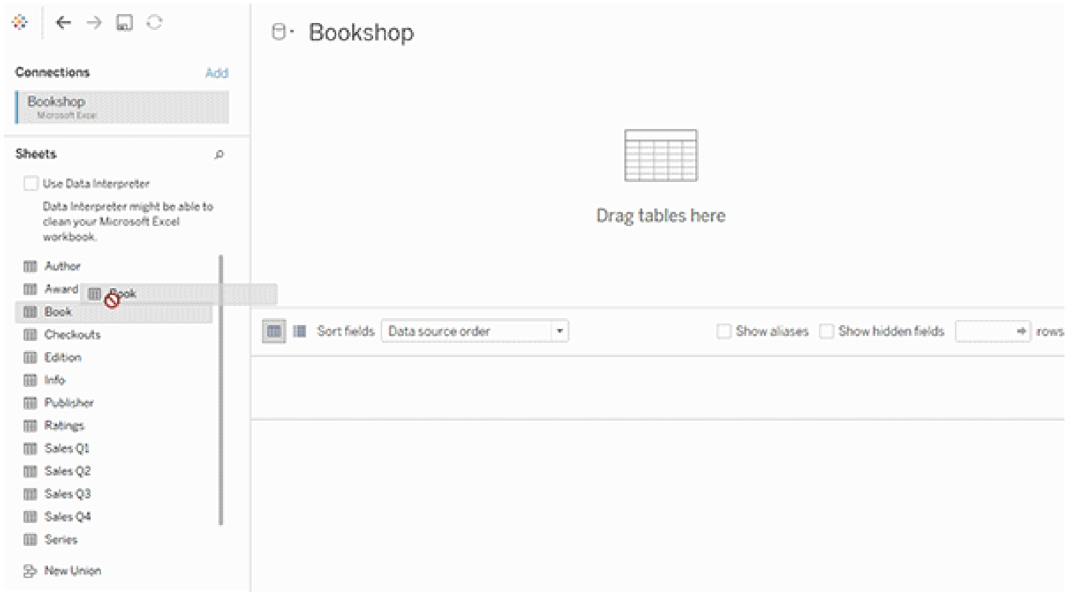
When you add one or more tables to the logical layer, you are essentially building the data model for your data source. A data source can be made of a single, logical table, or you can drag multiple tables to the canvas to create a more complex model.

- The first table that you drag to the canvas becomes the root table for the data model in your data source.
- After you drag out the root table, you can drag out additional tables in any order. You will need to consider which tables should be related to each other, and the matching field pairs that you define for each relationship.
- If you are creating a star schema, it can be helpful to drag the fact table out first, and then relate dimension tables to that table.
- Deleting a table in the canvas automatically deletes its related descendants as well. If you delete the root table, all other tables in the model are also removed.
- Each relationship must be made of at least one matched pair of fields. Add multiple field pairs to create a compound relationship. Matched pairs must have the same data type. Changing the data type in the Data Source page does not change this requirement. Tableau will still use the data type in the underlying database for queries.
- Relationships can be based on calculated fields.
- You can specify how fields used in the relationships should be compared by using operators when you define the relationship.

For more information about relationships, see Create and define relationships in Relate Your Data.

Multi-table model

- To create a multi-table model, drag tables to the logical layer of the Data Source page canvas.




Tables that you drag to the logical layer of the Data Source page canvas must be related to each other. When you drag additional tables to the logical layer canvas, Tableau automatically attempts to create the relationship based on existing key constraints and matching fields to define the relationship. If it can't determine the matching fields, you will need to select them.

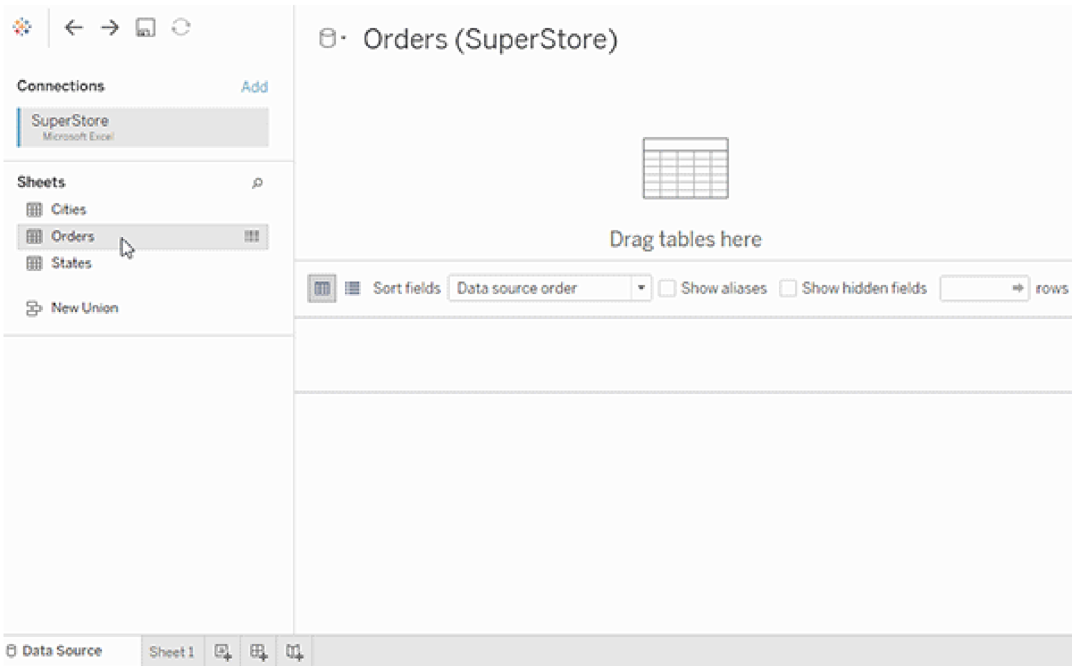
If no constraints are detected, a **Many-to-many** relationship is created and referential integrity is set to **Some records match**. These default settings are a safe choice and provide the most a lot of flexibility for your data source. The default settings support full outer joins and optimize queries by aggregating table data before forming joins during analysis. All column and row data from each table becomes available for analysis.

You can add more data inside any logical table by double-clicking the table. This opens the physical layer of the Data Source page canvas. If you need to use joins or unions, you can drag the tables you want to join or union into the physical layer canvas. The physical tables are merged in their logical table.

Follow the steps in Create and define relationships to combine multiple tables.

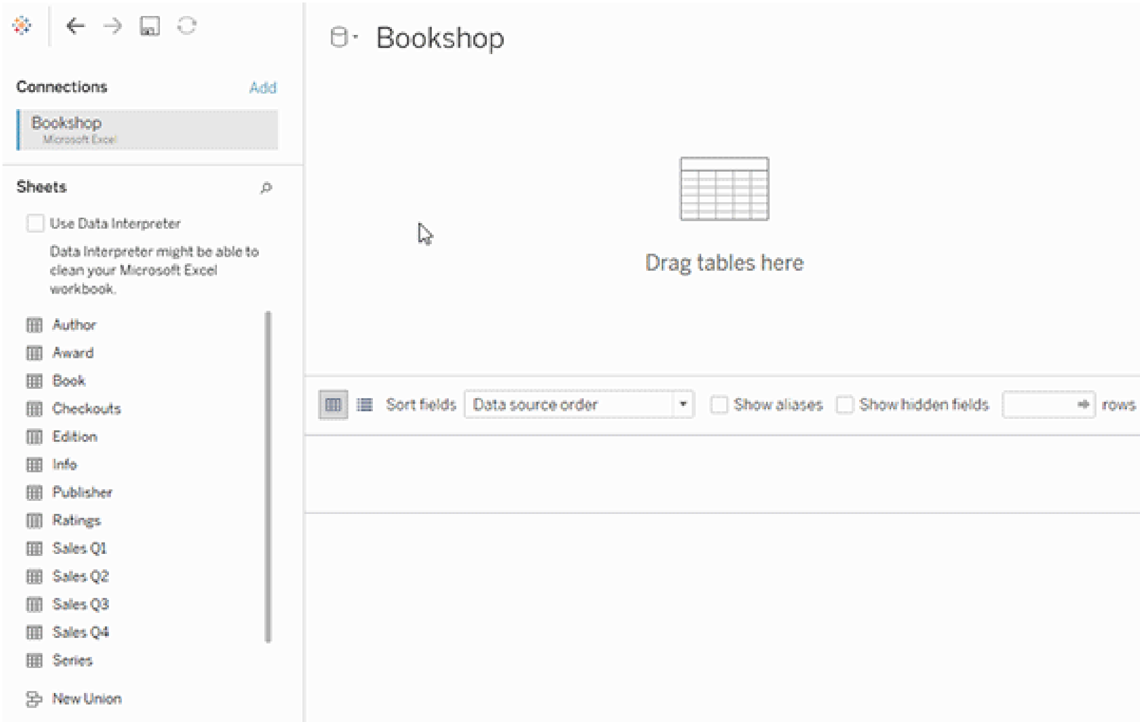
Single-table model

- To create a single-table model, drag a table into the logical layer canvas of the Data Source page. You can then use the fields from that table in the Data pane for analysis.




Single-table model that contains other tables

You can add more data inside the single, logical table by double-clicking the table. This opens the physical layer of the Data Source page canvas. If you need to use joins or unions, you can drag the tables you want to join or union into the physical layer canvas. The physical tables are merged in their logical table.




This example shows the Book table in the Relationships canvas (logical layer) of the data source. Double-clicking the Book logical table opens the Join/Union canvas (physical layer).

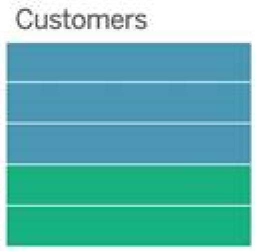
In this example, the joins merge the Award and Info tables with the Book table. In this case, the join between Book and Award will be one-to-many, at the level of detail of awards. This would duplicate measure values for Book and Info. To avoid duplication, you could relate Award and Info to Book instead of joining them inside of the Book logical table.

## Supported data model schemas

The data modeling capabilities in Tableau (version 2020.2 and later) are designed to make analysis over common multi-table data scenarios—including star and snowflake data models—easy. The following types of models are supported in Tableau data sources.

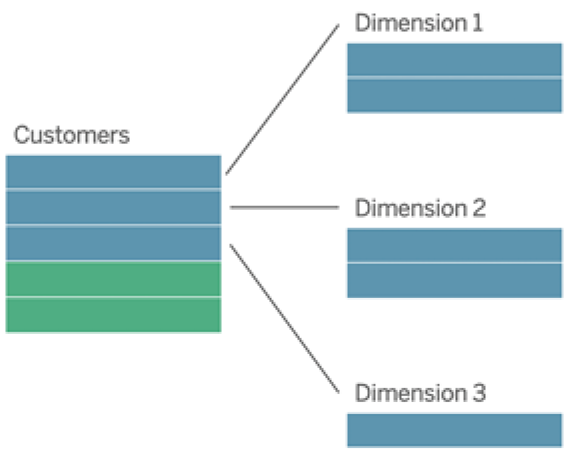
Single-table

Analysis over a single logical table that contains a mixture of dimensions and measures works just as in Tableau pre-2020.2. You can build a logical table using a combination of joins, unions, custom SQL, and so on.




Star and snowflake

In enterprise data warehouses, it is common to have data structured in star or snowflake schemas where measures are contained in a central fact table and dimensions are stored separately in independent dimension tables. This organization of data supports many common analysis flows including rollup and drill down.




These models can be directly represented with relationships in the data modeling capabilities available in Tableau 2020.2 and later.

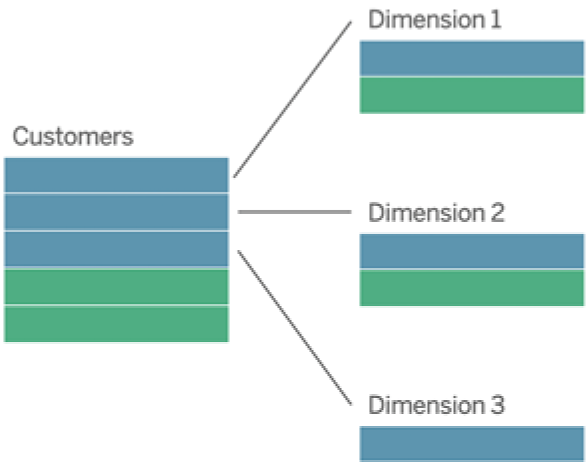
Drag the fact table into the model first and then relate the dimension tables to the fact table (in a star schema) or to other dimension tables (in a snowflake).

Typically, in a well-modeled star or snowflake schema, the relationships between the fact table and the dimension tables will be many-to-one. If this information is encoded in your data warehouse, Tableau will automatically use this to set the relationship's Performance Options. If not, you can set this information yourself. For more information, see Optimize Relationship Queries Using Performance Options.

In a well-modeled star or snowflake schema, every row in the fact table will have a matching entry in each of the dimension tables. If this is true and captured in your data warehouse integrity constraints, Tableau will automatically use this information to set the referential integrity setting in Performance Options. If some fact table rows do not have a matching row in a dimension table (sometimes called "late-arriving dimensions" or "early-arriving facts"), Tableau will default to retaining all rows when computing measures, but may drop values when showing dimension headers. For more information, see Optimize Relationship Queries Using Performance Options.

Star and snowflake with measures in more than one table

In some star or snowflake schemas, all the measures for your analysis are contained in the fact table. However, it is often true that additional measures of interest may be related to the dimension tables in your analysis. Even if the dimension tables do not contain measures, it is common in analysis to want to count or otherwise aggregate dimension values. In these cases, the distinction between fact tables and dimension tables is less clear. To create clarity when viewing your data model, we recommended adding the finest grain table to the data source canvas first, and then relating all other tables to that first table.




If you were to join these tables together into a single logical table, the measures in the dimension tables would be replicated, resulting in distorted aggregates unless you took precautions to deduplicate the values using LOD calculations or COUNT DISTINCT. However, if you instead create relationships between these tables, Tableau will aggregate measures before performing joins, avoiding the problem of unnecessary duplication. This relieves you of the need to carefully track the level of detail of your measures.

Multi-fact analysis

In version 2024.2 and later, Tableau's data modeling capabilities support multi-fact analysis through the use of multi-fact relationships. For in-depth information on how to create multi-fact relationships data models, see:

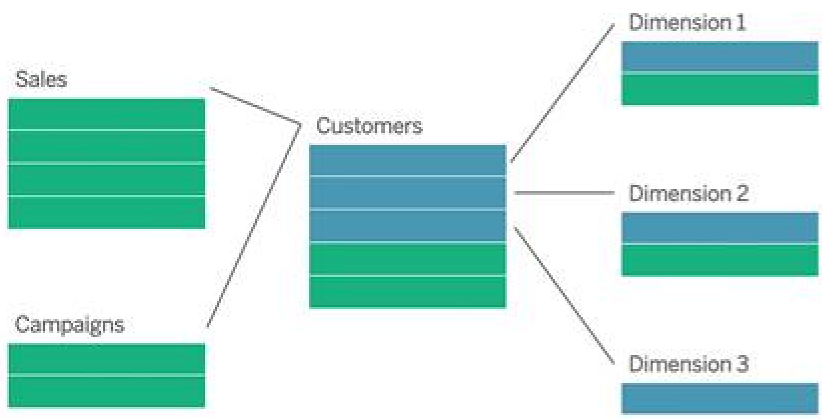
- About Multi-fact Relationship Data Models
- When to Use a Multi-fact Relationship Model
- Build a Multi-fact Relationship Data Model

A multi-fact relationship model—a data model with multiple base tables—permits unrelated tables in the model when shared tables also exist in the model. During analysis, fields from a shared table "stitch" together otherwise unrelated tables of data based on the shared dimensions they have in common (such as happening in the same place or at the same time). All the benefits of relationships are maintained, including the retention of each table's grain, or native level of detail.

Similar to a single base table data model, Tableau determines the best join type to use behind the scenes based on the structure of the viz. But in a multi-fact relationship model, the join options are expanded to include outer and cross joins to handle different levels of relatedness. For more information, see About Multi-fact Relationship Data Models.

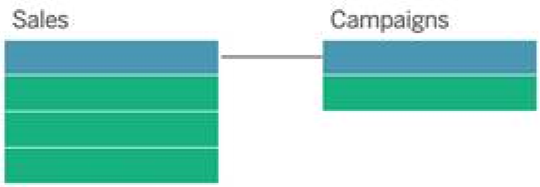
**Note**: In versions 2020.2 through 2024.1, you can add fact tables (containing measures) to star and snowflake models only if they are related to a single dimension table.

For example, you can bring two or more fact tables together to analyze a shared dimension, such as in Customer 360-like analyses. These fact tables can be at a different level of detail than the dimension table, or from each other. They can also have a many-to-many relationship with the dimension table. In these scenarios, Tableau will ensure that values are not replicated before aggregation.




If you don’t have a shared dimension table that relates your fact tables, you can sometimes dynamically build one using custom SQL or by using joins or unions of other dimension tables.

Two fact tables can be related directly to each other on a common dimension. This type of analysis works best when one of the fact tables contains a superset of the common dimension.




There are various scenarios that may indicate you should build a multi-fact relationship model with multiple base tables rather than a single base table data source:

- **Circular relationships**. Circular relationships are not supported. If you're trying to build a data source with a cycle, use multi-fact relationships and make the downstream table another base table instead.
- **Conformed dimensions** and **Contextual OR relationships**. If you have a series of tables that are related on the same sets of relationship clauses (such as date and location), those dimensions should be pulled out and made into shared tables instead.
  - This is especially useful because multiple relationship clauses must all be true (logically, an AND) for the tables to be related for those records.
  - If, instead, you want to analyze records where one may be true at a time (a contextual OR), this flexibility is provided by setting up a data model with shared dimension tables instead.
- **Equivalent blends**. If you're using a blend but want to have an equivalent blend without primary and secondary data sources, build a data model that combines the data sources from the blend with their linking fields in a shared table or tables.

## Requirements for relationships in a data model

- When relating tables, the fields that define the relationships must have the same data type. Changing the data type in the Data Source page does not change this requirement. Tableau will still use the data type in the underlying database for queries.
- You can't define relationships based on geographic fields.
- Circular relationships aren't supported in the data model.
- You can't define relationships between published data sources.

Factors that limit the benefits of using related tables

- Dirty data in tables (i.e. tables that weren't created with a well-structured model in mind and contain a mix of measures and dimensions in multiple tables) can make multi-table analysis more complex.
- Using data source filters will limit Tableau's ability to do join culling in the data. Join culling is a term for how Tableau simplifies queries by removing unnecessary joins.
- Tables with a lot of unmatched values across relationships.
- In versions 2020.2 through 2024.1: Interrelating multiple fact tables with multiple dimension tables (attempting to model shared or conformed dimensions). In version 2024.2 and later, you can use multi-fact relationships to address these cases.

## How Relationships Differ from Joins

Relationships are a dynamic, flexible way to combine data from multiple tables for analysis. You don’t define join types for relationships, so you won’t see a Venn diagram when you create them.

Think of a relationship as a contract between two tables. When you are building a viz with fields from these tables, Tableau brings in data from these tables using that contract to build a query with the appropriate joins.

- **No up-front join type**. You only need to select matching fields to define a relationship (no join types). Tableau first attempts to create the relationship based on existing key constraints and matching field names. You can then check to ensure they are the fields you want to use, or add more field pairs to better define how the tables should be related.
- **Automatic and context-aware**. Relationships defer joins to the time and context of analysis. Tableau automatically selects join types based on the fields being used in the visualization. During analysis, Tableau adjusts join types intelligently and preserves the native level of detail in your data. You can see aggregations at the level of detail of the fields in your viz rather than having to think about the underlying joins. You don't need to use LOD expressions such as FIXED to deduplicate data in related tables.
- **Flexible**. Relationships can be many-to-many and support full outer joins. When you combine tables using relationships, it’s like creating a custom, flexible data source for every viz, all in a single data source for the workbook. Because Tableau queries only

tables that are needed based on fields and filters in a viz, you can build a data source that can be used for a variety of analytic flows.

For more information, see Relate Your Data and Don’t Be Scared of Relationships.

**Joins are still available as an option for combining your data**. Double-click a logical table to go to the join canvas. For more information, see Where did joins go?

**Watch a video**: For an introduction to using relationships in Tableau, see this 5-minute video.

**Note**: The interface for editing relationships shown in this video might differ slightly from the current release but has the same functionality.

Also see video podcasts on relationships from Action Analytics, such as Why did Tableau Invent Relationships? Click "Video Podcast" in the Library to see more.

For related information about how relationship queries work, see these Tableau blog posts:

- Relationships, part 1: Introducing new data modeling in Tableau
- Relationships, part 2: Tips and tricks
- Relationships, part 3: Asking questions across multiple related tables

## Characteristics of relationships and joins

Relationships are a dynamic, flexible way to combine data from multiple tables for analysis. We recommend using relationships as your first approach to combining your data because it makes data preparation and analysis easier and more intuitive. Use joins only when you absolutely need to.

Here are some advantages to using relationships to combine tables:

- Make your data source easier to define, change, and reuse.
- Make it easier to analyze data across multiple tables at the correct level of detail (LOD).
- Do not require the use of LOD expressions or LOD calculations for analysis at different levels of detail.
- Only query data from tables with fields used in the current viz.

Relationships

- Are displayed as flexible noodles between logical tables
- Require you to select matching fields between two logical tables
- Do not require you to select join types
- Make all row and column data from related tables potentially available in the data source
- Maintain each table's level of detail in the data source and during analysis
- Create independent domains at multiple levels of detail. Tables aren't merged together in the data source.
- During analysis, create the appropriate joins automatically, based on the fields in use.
- Do not duplicate aggregate values (when Performance Options are set to Many-to-Many)
- Keep unmatched measure values (when Performance Options are set to Some Records Match)

Joins

Joins are a more static way to combine data. Joins must be defined between physical tables up front, before analysis, and can’t be changed without impacting all sheets using that data source. Joined tables are always merged into a single table. As a result, sometimes joined data is missing unmatched values, or duplicates aggregated values.

- Are displayed with Venn diagram icons between physical tables
- Require you to select join types and join clauses
- Joined physical tables are merged into a single logical table with a fixed combination of data
- May drop unmatched measure values
- May duplicate aggregate values when fields are at different levels of detail
- Support scenarios that require a single table of data, such as extract filters and aggregation

## Requirements for using relationships

- When relating tables, the fields that define the relationships must have the same data type. Changing the data type in the Data Source page does not change this requirement. Tableau will still use the data type in the underlying database for queries.
- You can't define relationships based on geographic fields.

- Circular relationships aren't supported in the data model.
- You can't define relationships between published data sources.

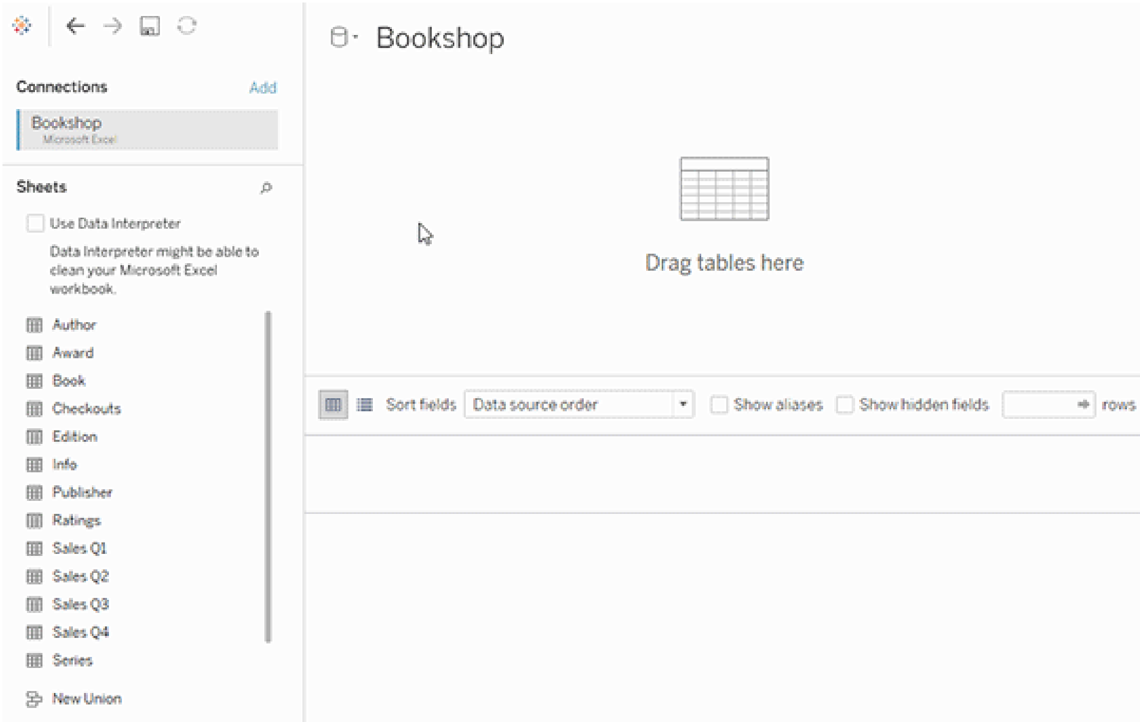
Factors that limit the benefits of using related tables

- Dirty data in tables (i.e. tables that weren't created with a well-structured model in mind and contain a mix of measures and dimensions in multiple tables) can make multi-table analysis more complex.
- Using data source filters will limit Tableau's ability to do join culling in the data. Join culling is a term for how Tableau simplifies queries by removing unnecessary joins.
- Tables with a lot of unmatched values across relationships.
- In versions 2020.2 through 2024.1: Interrelating multiple fact tables with multiple dimension tables (attempting to model shared or conformed dimensions). In version 2024.2 and later, you can use multi-fact relationships to address these cases. For more information, see Multi-fact analysis with relationships and About Multi-fact Relationship Data Models.

## Where did joins go?

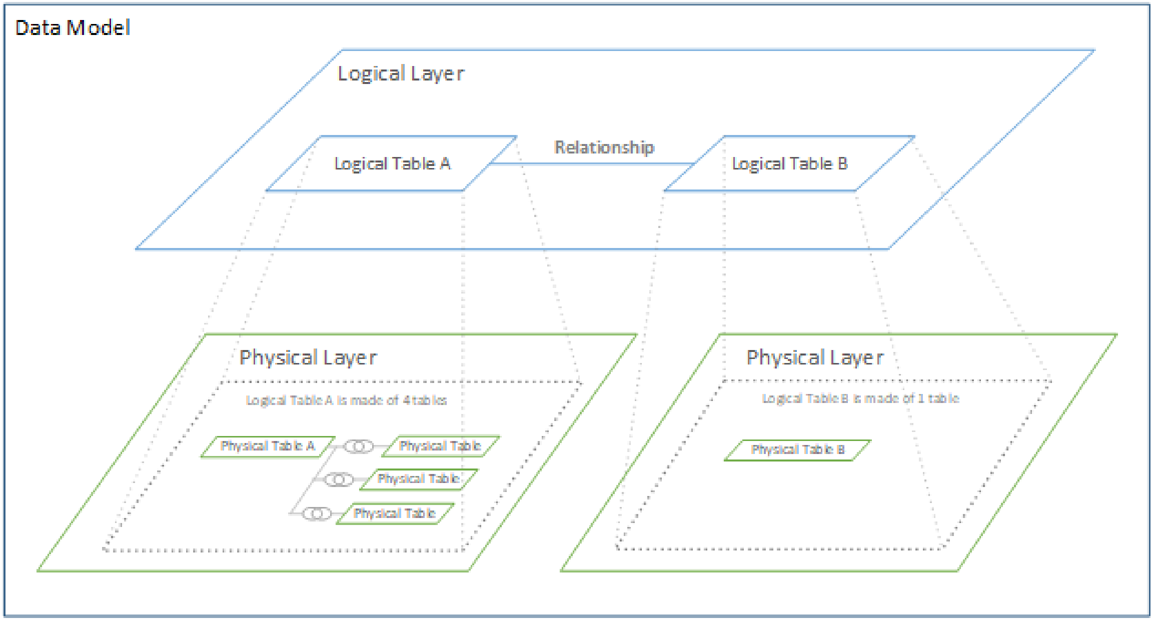
You can still specify joins between tables in the physical layer of a data source. Double-click a logical table to go to the Join/Union canvas in the physical layer and add joins or unions.

Every top-level, logical table contains at least one physical table. Open a logical table to view, edit, or create joins between its physical tables. Right-click a logical table, and then click **Open**. Or, just double-click the table to open it.




When you create a data source, it has two layers. The top-level layer is the logical layer of the data source. You combine data between tables in the logical layer using relationships.

The next layer is the physical layer of the data source. You combine data between tables at the physical layer using joins. For more information, see Logical and physical tables in the data model.



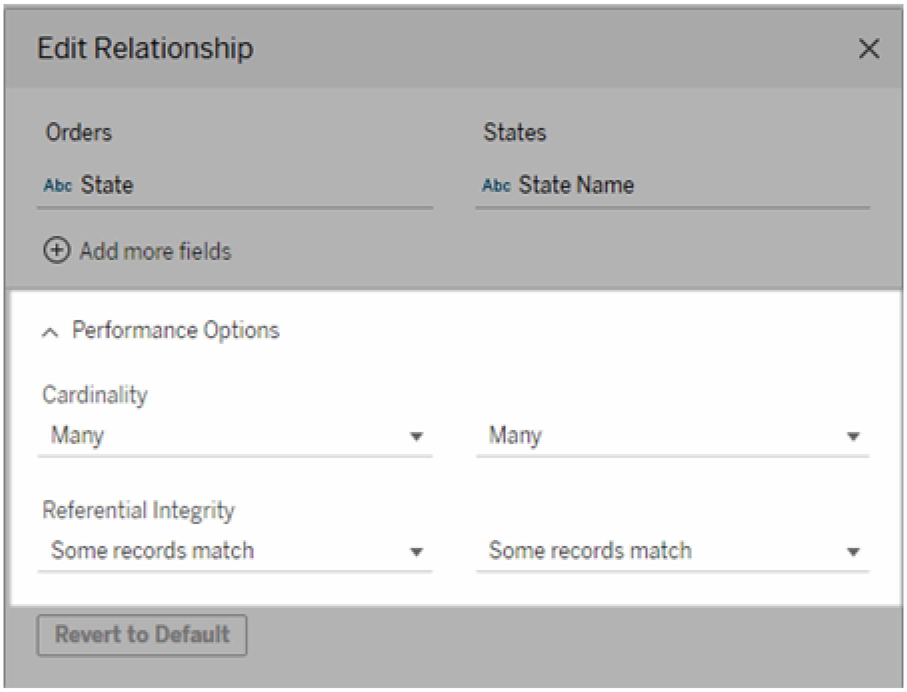

## Optimize Relationship Queries Using Performance Options

Performance Options are optional settings that define the cardinality (uniqueness) and referential integrity (matching records) between the two tables in a relationship. These settings help Tableau optimize queries during analysis.

- **If you aren't sure what to choose**, use the recommended default settings indicated by Tableau. Using the defaults is safe and will automatically generate correct aggregations and joins during analysis. If you don't know the cardinality or referential integrity, you don't need to change these settings.
- **If you know the shape of your data**, you can optionally change these settings to represent uniqueness and matching between the records in the two tables.

In many analytical scenarios, using the default settings for a relationship will give you all of the data you need for analysis. In some scenarios, you might want to adjust the Performance Options settings to describe your data more accurately. For more details about using relationships to combine and analyze data, see Relate Your Data and this Tableau blog post: Relationships, part 1: Introducing new data modeling in Tableau.

## What the Cardinality and Referential Integrity settings mean




### Cardinality options

Cardinality settings determine if Tableau aggregates table data before or after automatically joining the data during analysis.

- Select **Many** if the field values aren't unique, or you don't know. Tableau will aggregate the relevant data before forming joins during analysis.
- Select **One** if field values are unique. During analysis, the relevant data will be joined before aggregation. Setting this option correctly optimizes queries in the workbook when the field values in the relationship are unique. However, selecting **One** when field values aren’t unique can result in duplicate aggregate values being shown in the view.

**Note**: Selecting **One** treats records as if each key value is unique and there is at most only one row with a null value.

### Referential Integrity options

Referential Integrity settings determine the type of join used to get the dimension values for a measure during analysis.

- Select **Some Records Match** if some values in the field don't have a match in the other table, or you don't know. During analysis, Tableau uses outer joins to get dimensions values for a measure. All measure values will be shown in the view, even unmatched measures.
- Select **All Records Match** if values in the field are guaranteed to have a match in the other table. This setting generates fewer and simpler joins during analysis, and optimizes queries. You might see inconsistent results during analysis (unmatched values removed or missing in view) if there are unmatched values in this table.

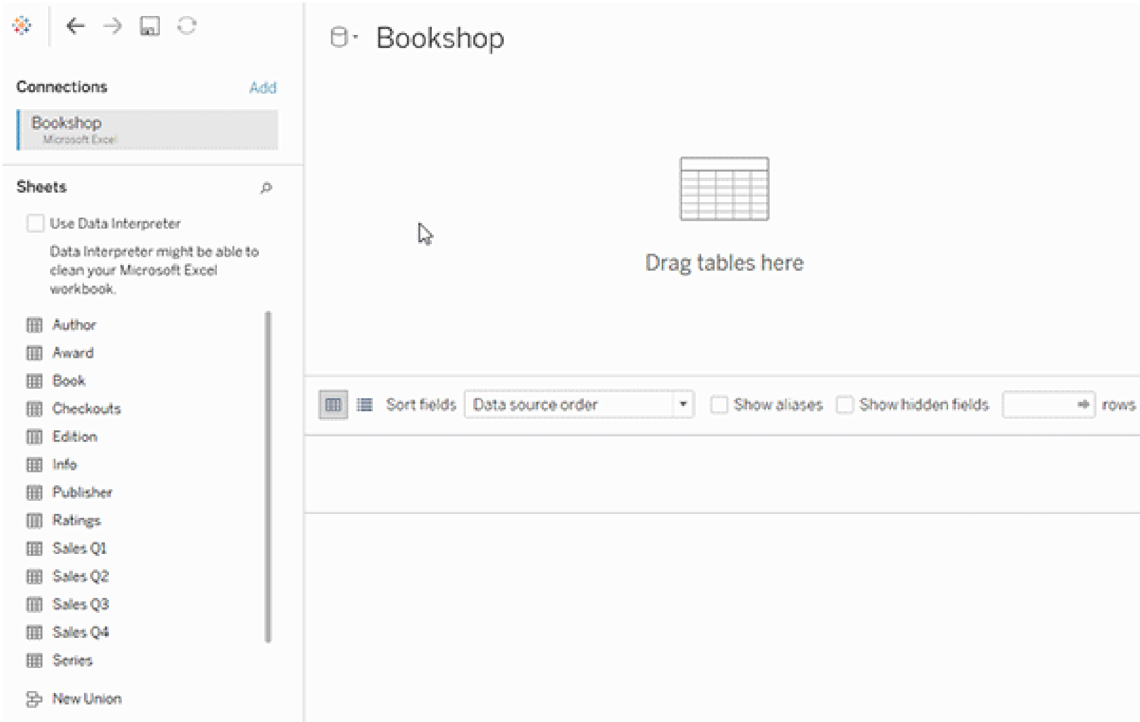
**Notes**: Selecting **All Records Match** treats records as if no null values exist in the fields used for the relationship. During analysis, Tableau will use inner joins to get dimension values for a measure. By default, Tableau will never join null keys.

For more information about Cardinality and Referential integrity as concepts, see Cardinality and Referential Integrity.

## Where did joins go?

You can still specify joins between tables in the physical layer of a data source. Double-click a logical table to go to the join canvas.

Every top-level, logical table contains at least one physical table. Open a logical table to view, edit, or create joins between its physical tables. Right-click a logical table, and then click **Open**. Or, just double-click the table to open it.

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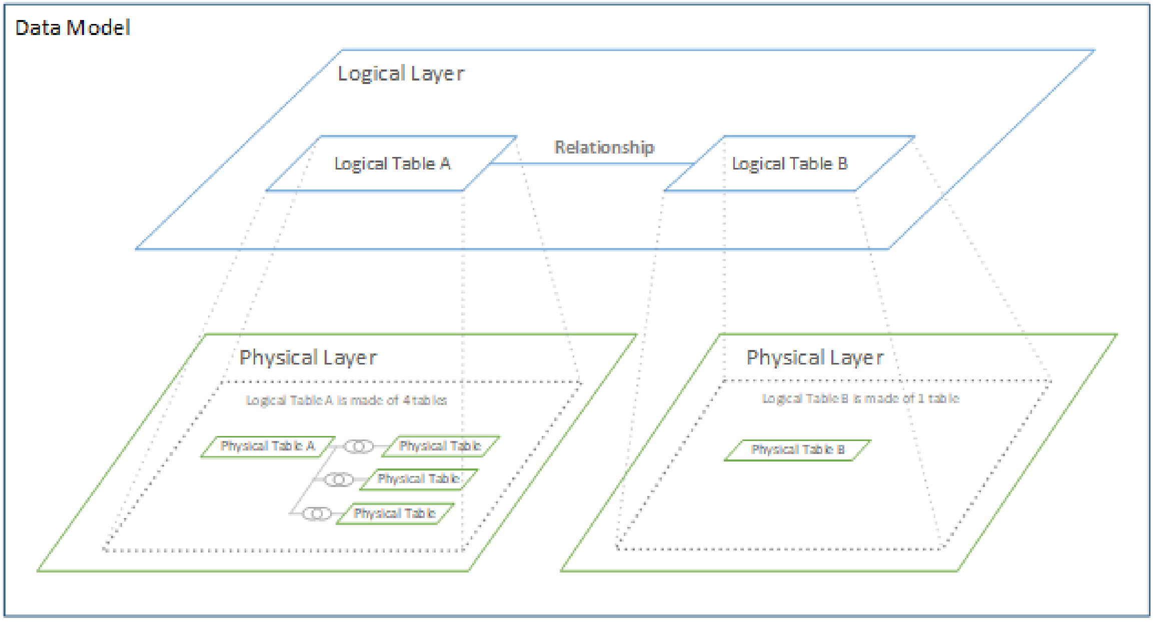



## Tips on using Performance Options

If you know the shape of your data, you can use the optional settings in Performance Options to establish the cardinality of the tables to each other (one-to-one, one-to-many, many-to-many) and indicate referential integrity (values from one table will always have match in the other table).

Instead of thinking of the settings in Performance Options as “yes” and “no”, think of them as “yes” and “I don’t know”. If you are sure that a table's values are unique, select **One**. If you are sure that each record in one table matches one or more records in the other table, select **All Records Match**. Otherwise, leave the default settings as they are.

If you aren't sure about the shape of your data, use the default settings. When Tableau can't detect these settings in your data, the default settings are:

- Cardinality: Many-to-Many
- Referential integrity: Some Records Match

If Tableau detects key relationships or referential integrity in your data, those settings will be used and indicated as "detected".

To reapply the default settings, click **Revert to Default**.

Terms defined

*Cardinality* refers to the uniqueness of data contained in a field (column) or combination of fields. When the tables you want to analyze contain many rows of data, queries can be slow (and performance of the overall data source is affected) so we recommend choosing a method for combining data based on the cardinality of the related columns between tables.

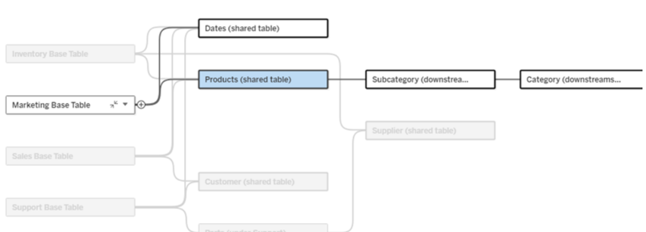
- Low cardinality: When related columns have a lot of repeated data. For example, a table called Products might contain a Category column that contains three values: Furniture, Office Supplies, and Technology.
- High cardinality: When related columns have highly unique data. For example, a table called Orders might contain an Order ID column that contains a unique value for every order of product.

*Referential integrity* means that one table will always have a matching row in the other table. For example, a Sales table will always have a matching row in the Product Catalog table.

## About Multi-fact Relationship Data Models

Multi-fact relationships let you build data sources with more than one *base table*. Using multiple base tables in your data model allows you to perform multi-fact analysis in Tableau.

By establishing *trees* of tables, rooted in a base table, you can model data structures with different conceptual domains and use their shared characteristics to connect them. This type of analysis is often referred to as multi-fact analysis, conformed dimensions, or shared dimensions. In Tableau, we call this a multi-fact relationship data model because you use relationships to build it. A multi-fact relationship data model always contains multiple base tables. Base tables are the left-most tables in the data model. For guidance on how to determine which tables to use as base tables, see When to Use a Multi-fact Relationship Model.



A multiple base table data model with one base table's tree highlighted.

## Levels of relatedness

Data models with multiple base tables have a lot of flexibility to how pieces of data can relate—or not relate—to each other.

> **Note**: Relatedness at any level is only relevant in data models with multiple base tables. Prior to multi-fact relationship data models, either everything was related (within a single data source) or nothing was (blending across multiple data sources).

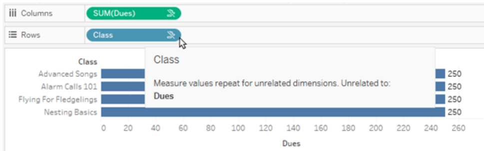
### Relatedness in the data model

Tables are related, unrelated, or shared based on the structure of the data model. In a data source, the relatedness of tables is a constant. As a brief overview:

- *Related tables* are in the same tree.
  - Prior to 2024.2, all data sources were single base table data sources consisting of a single tree, and in a single base table data source all tables are related.
- *Unrelated tables* are in different trees. Base tables are always unrelated to each other. Tables that are downstream of exactly one base table are also unrelated to tables in other trees.
- *Shared tables* have multiple incoming relationships and belong to more than one tree.
  - Tables downstream from a table with multiple incoming relationships are also considered shared.

### Relatedness during analysis

Fields can be related, unrelated, not yet related, ambiguously related, or they can act as stitching fields. The relatedness among a group of fields is determined on a sheet-by-sheet basis based on the structure of the data model, what fields are actively in use (that is, on the shelves as pills), and if those fields are dimensions or measures.




To make a visualization with fields from multiple tables, Tableau has to perform joins behind the scenes to compute the values. The type of join used depends on the relatedness of the fields. As a brief overview:

- When *related fields* are used in a viz, dimensions are inner joined and measure values are broken down by the dimensions.
  - It's a little more complicated than that—additional joins might be needed behind the scenes to ensure that no measure values are dropped. But in a dimension-only viz, related dimensions are inner joined and that's the main concept here.
  - This is the same behavior as single-base table models.
- When *unrelated fields* are used in a viz, dimensions are cross joined. Measure values are table scoped (that is, aggregated locally to a single value for their entire table) and repeated.
  - It's also possible for fields to be *not yet related* or *ambiguously* related, which means that for the combination of active fields, there is more than one way for the relationships between their tables to be resolved. If Tableau encounters uncertainty, it treats the fields as unrelated.
- When fields are *stitched* based on a shared field, dimensions are outer joined. Measure values are aggregated at the level of whatever dimension they can be broken down by and might be repeated.
  - *Stitching dimensions* are similar to linking fields in data blending. Results are calculated for each pair of related fields, then the unrelated values are stitched together across the shared values of the dimension shared between them.

All of these concepts and definitions are discussed in more detail later in this topic.

## An aside on dimensions and measures

In Tableau, *measures* are *aggregations*—they're aggregated up to the *granularity* set by the *dimensions* in the view. The value of a measure therefore depends on the context of the dimensions. For example, "number of cereal boxes" depends on if we mean the total inventory or the number of boxes per brand.

*Dimensions* are usually categorical fields, such as country or brand. In Tableau, dimensions set the granularity, or the *level of detail*, of the view. We typically want to group our data into marks by some combination of categories. What dimensions we use to build the view determines how many marks we have.

When a measure is used without dimensions, it's said to be *table scoped*. This means its value is the fully aggregated value for the entire table. As soon as we use a dimension such as brand in the viz, the measure is broken down more granularly. The total number of cereal boxes is now per brand.

*Aggregation* refers to how the data is combined. Tableau's default aggregation is SUM. You can change the aggregation to other options, including: average, median, count distinct, minimum, and so on. *Granularity* refers to how detailed or broken down the measure is—which is controlled by the dimensions. Unless the granularity of the measure is row level (aka disaggregated), its value must be aggregated.

Example

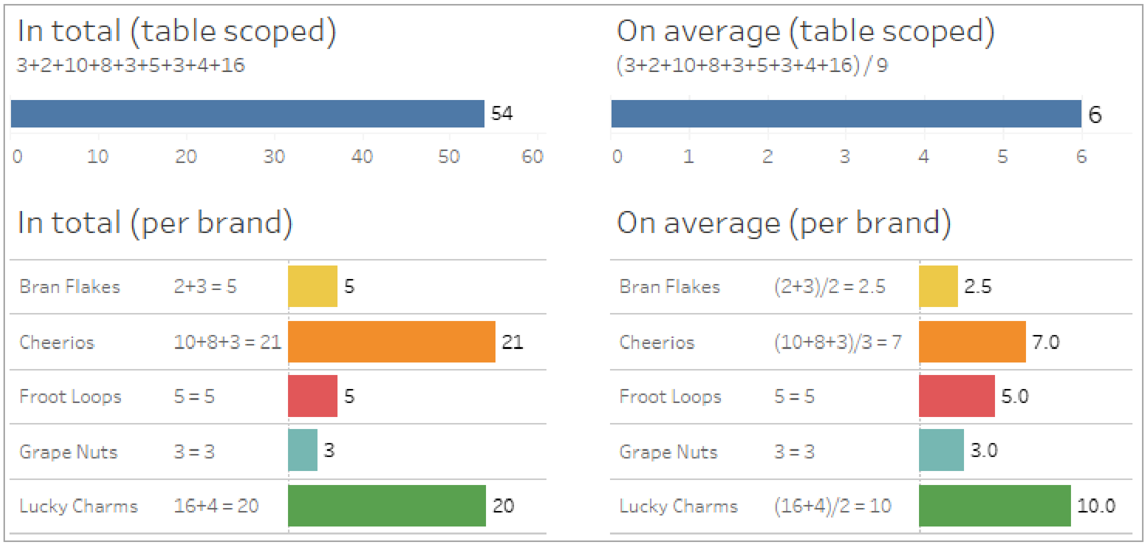
Raw data

| | Mini | Normal | ValuePak |
|---|---|---|---|
| Bran Flakes | | 3 | 2 |
| Cheerios | 10 | 8 | 3 |
| Froot Loops | | 5 | |
| Grape Nuts | | 3 | |
| Lucky Charms | | 4 | 16 |

What's the value of "number of boxes of cereal?"

Well, it depends on the aggregation type and the granularity as set by the dimensions.

- Aggregations:
  - Sum (or total)
  - Average
- Granularity:
  - Table scoped / fully aggregated (the blue bars in the example)
  - Broken down by the **Brand** dimension (the colored bars in the example)

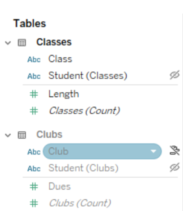



## Field-level relatedness indicators

There are several visual clues that can help you understand the degree of relatedness for fields you're using in an analysis.

Relatedness indicators on a worksheet

- **Unrelated icon**: Tableau uses an unrelated icon to indicate not everything in the view is related. If you see an unrelated icon on a pill in the view or in the Data pane, you can hover over the icon to get more information.
  - The related icon indicates that field is stitching together unrelated fields.
- **Light gray field names**: Field names are displayed in light gray text in the Data pane when they're not related to *any* fields in use on shelves. You can still use these fields for analysis in that viz, but unrelated fields are evaluated differently in analysis than fields that are related. On hover, these fields also display an unrelated icon.

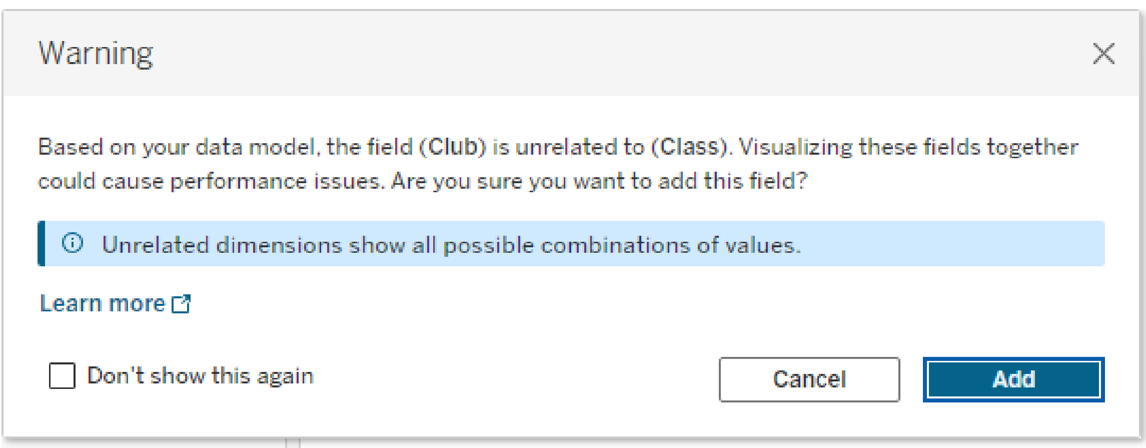


> **Note**: In previous versions of Tableau, light gray field names indicated that the fields were hidden and **Show hidden fields** was selected. Hidden fields, when shown, are now indicated with a clickable eye icon .

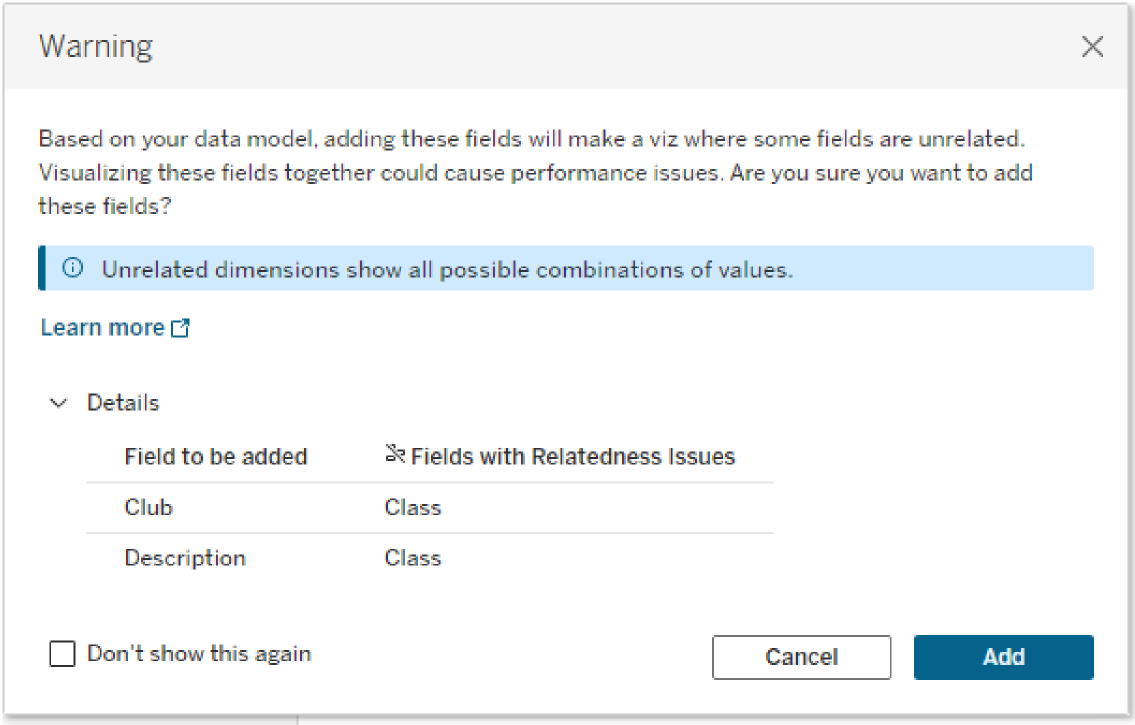
Relatedness warning dialog

When unrelated fields are used together in a viz, Tableau shows a warning dialog to let you know that the fields aren't related. This warning appears each time you add an unrelated field to prevent accidental cross joins that might impact performance.

- If you want to use unrelated fields without stitching, click **Add** to continue adding the field to the viz.
- If you want to stitch unrelated fields, a best practice is to bring out the stitching field before an otherwise unrelated field. The dialog won't show if the stitching field is already in use. See How joins are used for each level of relatedness for more information about how stitching prevents cross joins.




When multiple fields are being added or are already present in the view, the **Details** area appears in the dialog. Expand it to see more information about the relatedness of all the fields in use and identify where the unrelatedness issue is coming from.



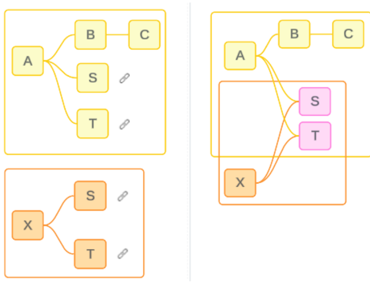

To stop the warning message from appearing at all, select the option **Don't show this again**. You can always re-enable these warning messages again by turning them back on:

- In Tableau Desktop, open the **Help** menu > **Settings and Performance** > **Reset Ignored Messages**.
- In a browser, clear your cached data. For example in Chrome, open the **3 dots menu** > **Delete Browsing Data...** > Choose "**Cached images and files**" > **Delete data**.

## Table-level relatedness in the data model

In a data model with multiple base tables, each base table defines a set of tables that are related and form a conceptual *tree*. These trees must be connected by at least one shared table to ensure the overall data source is a single entity.

What might previously have been two data sources that could be blended using linking fields can now be a single data source with two trees, connected by the shared tables that contain those common fields.

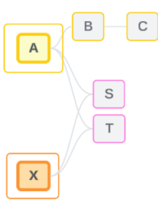
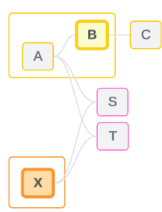


**Tip**:How tables are related in the data model impacts how their fields can be related in the analysis. It can be useful to refer back to the Data Source tab during analysis to see how a table fits into the overall data model.

Let's walk through what tables are related, unrelated, or shared using this example data source. There are two trees, one established by base Table A and one by base Table B.

Unrelated tables

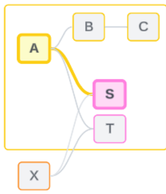
Base tables are fundamentally unrelated. Similarly, any tables that exist solely in a single tree are unrelated to tables in other trees.

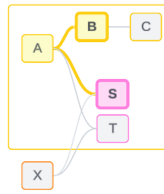
| Table A and Table X are unrelated | Table B and Table X are unrelated |
|---|---|
|  |  |

Related tables

Tables in the same tree are considered related.

| Table A and Table S are related | Table B and Table S are related (through Table A) |
|---|---|

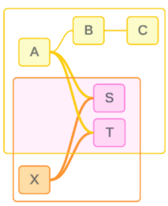



Shared tables

Shared tables have multiple incoming relationships. These tables belong to multiple trees and are shared across them.

Table S and Table T are shared.




## Field-level relatedness in the analysis

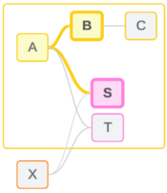
Relatedness between fields is determined on a sheet-by-sheet basis based on the structure of the data model, what fields are actively in use (that is, what fields are in the viz as pills on shelves), and if those fields are dimensions or measures. How field relatedness impact the results of a viz is covered in the next section.

Let's walk through some scenarios using the same example data source. Each field's name indicates which table it is from, such as FieldB from Table B. Fields can be dimensions or measures unless otherwise noted.

Related fields

At a high level, fields are related when Tableau can clearly determine how to evaluate them together based on a relationship path within a single tree.

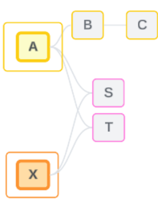
For example, FieldB (from Table B) and FieldS (from Table S) are related.




Unrelated fields

At a high level, fields are unrelated in any case when they're not related. This could be because the fields are from unrelated tables, such as using fields from two base tables. In this case, fields from different base tables are fundamentally unrelated.

For example, FieldA and FieldX are unrelated.



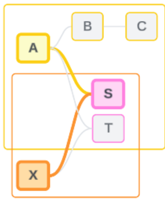

Or fields can be treated as unrelated for a point in time—such as in ambiguous or not yet related cases. For the most part, you can rely on relatedness indicators to alert you when fields are unrelated in the context of a viz.

Stitching dimension

Stitching is how Tableau evaluates fields from unrelated tables in a multi-fact data model during analysis. In a viz, using a dimension from a shared table stitches together otherwise unrelated fields and allows them to be evaluated simultaneously in the same viz. Think of this as juxtaposing results from two trees together based on a dimension they share.

For example, if a viz is built with FieldA and FieldX, these two fields are unrelated. Adding DimensionS introduces a stitching field.

- FieldA and DimensionS are evaluated together.
- FieldX and DimensionS are evaluated together.
- Those intermediate results are brought together based on the values of DimensionS.
- FieldA and FieldX are now stitched.




**Tip**: A best practice is to use a stitching field in the viz before bringing out an unrelated field. For example, drag out DimensionS first, or FieldA then DimensionS then FieldX, instead of FieldA then FieldX then DimensionS. Adding the stitching field first ensures that Tableau is always aware of how to evaluate the relationships and avoids potential performance issues from evaluating unrelated dimensions together with cross joins.

Stitching requires a dimension from a shared table to be active in the viz. Fields placed on the Filters shelf or on the Tooltip property of the Marks card aren't considered active for the purposes of stitching.

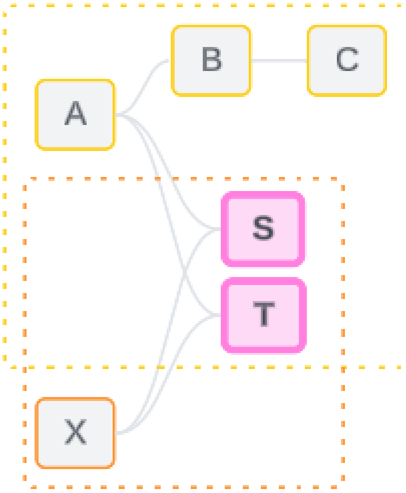
Not yet related fields

Fields can also have multiple ways they could be related but aren't yet. This happens when there's more than one possible relationship between two shared tables (or downstream shared tables).

Consider FieldS and FieldT. Their tables are related to each other both through the tree defined by base Table A and through the tree defined by base Table X.

In a viz with just FieldS and FieldT, there's no information about which tree should be used to relate them. Without additional information Tableau can't evaluate whether to relate these fields through Base Table A's tree or Base Table B's tree.

FieldS and FieldT are treated as unrelated although there are multiple potential relationships.




These could-be-but-aren't-yet-related fields are evaluated as unrelated because Tableau can't clearly determine their relationship path. Unlike truly unrelated fields which can only be stitched, not yet related fields can be resolved and the fields can be directly related.

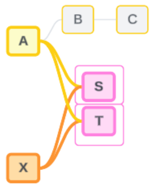
Ambiguously related fields

Fields can also be ambiguously related. This happens when there is more than one active possible relationship between shared tables (or downstream shared tables). Unlike not yet related fields, which can be thought of as hypo-related or under related, ambiguously related fields are hyper-related or over related.

Consider FieldS and FieldT. Their tables are related to each other both through the tree defined by base Table A and through the tree defined by base Table X.

In a viz with FieldA, Field X, FieldS, and FieldT, there's too much information to decide which tree should be used to relate them. Without trimming the information, Tableau can't evaluate whether to relate these fields through Base Table A's tree or Base Table B's tree.

FieldS and FieldT are treated as unrelated although there are multiple active relationships.

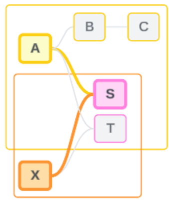



These ambiguously related fields are evaluated as unrelated because Tableau can't clearly determine their relationship path. Unlike truly unrelated fields which can only be stitched, ambiguously related fields can be resolved and the fields can be directly related.

Measure from a shared table

When a dimension is used from a shared table, it stitches together fields from its unrelated upstream tables. Measure can't stitch, however, and the value of a measure depends on its related dimensions.

In a viz with DimensionA and DimensionX, these two dimensions are unrelated. If MeasureS is brought out from Table S, it is unrelated to the combination DimensionA and DimensionX together. Although it could be related to either one independently, it can't be simultaneously related to both of them in the same viz.




A shared measure can be considered a type of ambiguity or over relatedness and is resolved the same way.

Resolve unclear relationships between fields

Whenever there is uncertainty about how to relate fields, Tableau won't make an arbitrary decision and instead treats them as unrelated. It's often better to relate these fields by clarifying the uncertainty around which tree to use.

Resolving not yet related fields is done by adding a field to establish which tree to use. Resolving ambiguously related fields is done by removing fields to establish which tree to use.

*Example:*

**Resolving not yet related**: add a field

- In a viz of FieldS and FieldT, adding a field from Table A, B, or C to the viz makes Base Table A's tree active and resolves the desired path between FieldS and FieldT.
- Alternatively, using a field from Table X resolves the desired path between FieldS and FieldT to Base Table X's tree.

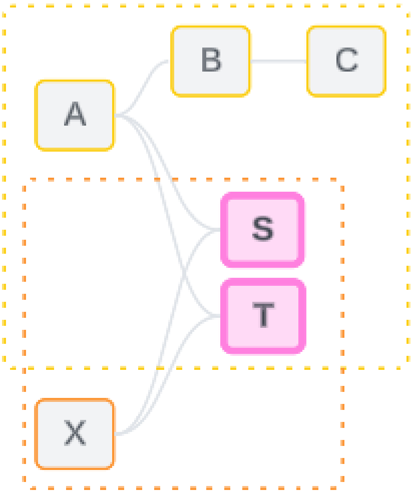
**Resolving ambiguously related**: remove a field or fields

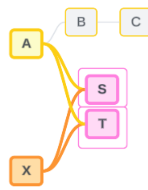
- In a viz of FieldA, FieldX, FieldS, and FieldT, removing FieldX makes only Base Table A's tree active and resolves the desired path between FieldS and FieldT.
- Alternatively, removing FieldA resolves the desired path between FieldS and FieldT through Base Table X's tree.

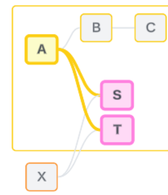
**Resolving a shared measure**: remove a field or fields

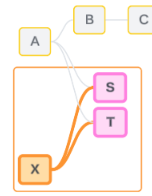
- In a viz of DimensionA, DimensionX, and MeasureS, removing DimensionX makes only Base Table A's tree active and resolves the desired path between DimensionA and MeasureS.
- Alternatively, removing DimensionA resolves the desired path between DimensionX and MeasureS through Base Table X's tree.

| **Not yet related** | **Ambiguously related** | **Relatedness resolved to a single tree** | |
|---|---|---|---|
| | | Related through base Table A | Related through base Table X |



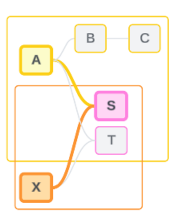
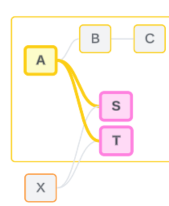




Resolving uncertainty is similar to using a FIXED Level of Detail (LOD) expression. In a FIXED LOD expression, you tell Tableau what level of detail to aggregate to by defining the dimension declaration. Uncertainty is resolved by changing the structure of the viz to make only one tree active, thus telling Tableau what relationship paths it can consider to perform the analysis.

Stitching vs resolving uncertainty

Both stitching and resolving uncertainty are ways of dealing with unrelatedness, but they have different outcomes:

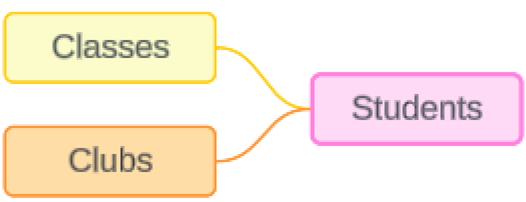
| Stitching | Resolving uncertainty |
|---|---|
|  |  |
| Unrelated FieldA and FieldX stitched by DimensionS | FieldS and FieldT evaluated through the tree defined by base Table A |
| Juxtaposes unrelated fields based on | Narrows down which relationship path to use |

| | |
|---|---|
| shared attributes | when there are multiple options (ambiguity or a shared measure), or establishes a relationship path when there wasn't one (not yet related). |
| Uses multiple base table logic to calculate results | Uses single base table logic to calculate results |
| Analysis involves unrelated tables | Analysis involves shared tables |

## How joins are used for each level of relatedness

After the field-level relatedness has been determined, Tableau has to evaluate the results to create the actual visualization. The queries used to calculate the values shown in a viz rely on joins. Whether fields are related, unrelated, or stitched has a different impact on what joins are performed. Remember, ambiguously related and not yet related fields are treated as unrelated in this context.

To explain relatedness and joins, this section covers tables and their fields, plus the values in those fields. Consider the following data model with two base tables, Classes and Clubs, and a shared table, Students.




| Classes | Clubs | Students |
|---|---|---|

Classes
7 rows 3 fields

| Abc Classes Class | Abc Classes Stud |
|---|---|
| Nesting Basics | Robi |
| Advanced Songs | Spar |
| Flying For Fledgelings | Robi |
| Nesting Basics | Spar |
| Advanced Songs | Finc |
| Nesting Basics | Finc |
| Alarm Calls 101 | |

Clubs
7 rows 3 fields

| Abc Clubs Club | Abc Clubs Student ... | |
|---|---|---|
| Photography | Finch | |
| Travel | Cardinal | |
| Juggling | Sparrow | |
| Art | Finch | |
| Art | Cardinal | |
| Art | Sparrow | 10 |
| First Aid | Robin | 0 |

Students
5 rows 3 fields

| Abc Students Bus Rider | Abc Students Student | # Students Age |
|---|---|---|
| yes | Finch | 3 |
| yes | Cardinal | 4 |
| no | Sparrow | 6 |
| yes | Robin | 3 |
| no | Jay | 8 |

Fields:

- **Class**, a dimension with values of Nesting Basics, Advanced Songs, Flying for Fledglings, and Alarm Calls 101
- **Length**, a measure
- **Student**, a dimension used to relate to the Student table

Fields:

- **Club**, a dimension with values of Photography, Travel, Juggling, Art, and First Aid
- **Dues**, a measure
- **Student**, a dimension used to relate to the Student table

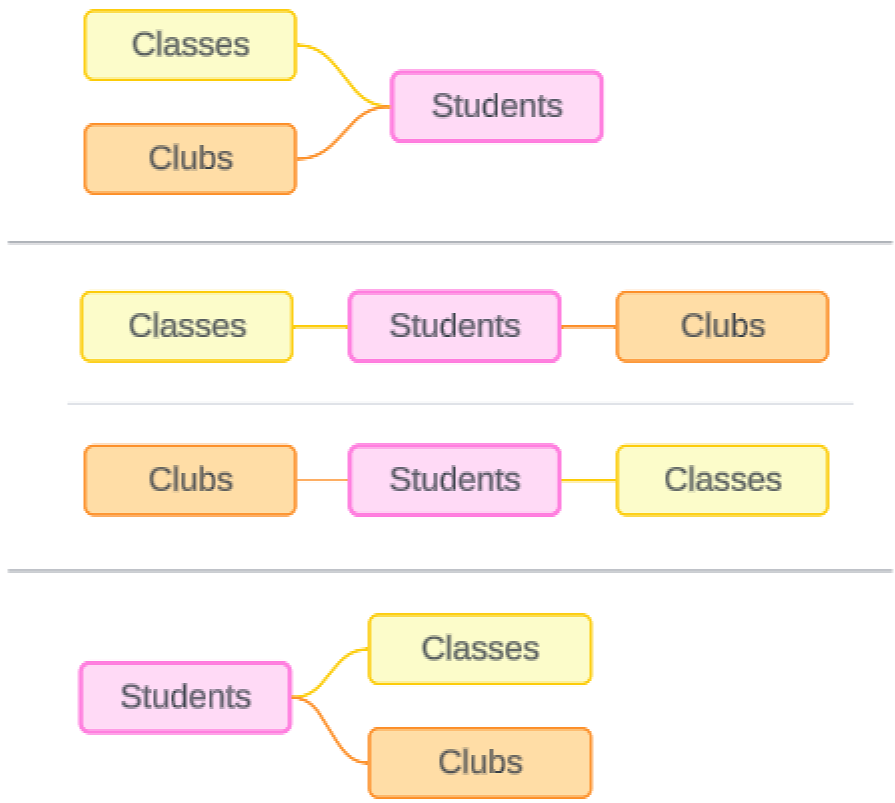
Fields:

- **Bus Rider**, a dimension with values of yes or no
- **Student**, a dimension with values of Finch, Cardinal, Sparrow, Robin, and Jay. Used to relate to the other two tables
- **Age**, a measure

This very simple model illustrates how the high-level join logic is calculated for multi-fact relationship data models. For more information about the basics of joins used in single base table data models built on relationships, see How Analysis Works for Multi-table Data Sources that Use Relationships.

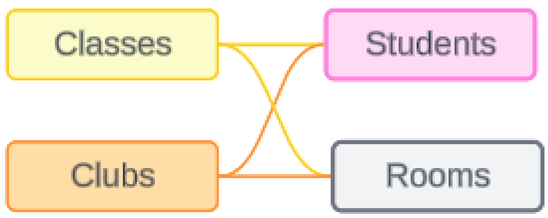
## Should this example be a data model with multiple base tables?

For this three table data model, it might be tempting to set it up as a single base table model, as Classes-Students-Clubs or Clubs-Students-Classes, or with Students as a base table. As a rule, multi-fact relationship data models are intended for specific kinds of data schemas or analysis scenarios. If your data model has characteristics that are best suited to a multi-fact relationship data model, set it up that way to keep your base tables conceptually unrelated. However, if your data doesn't require this type of structure, a single base table model can be simpler to use.



Models that could be built for these three tables: (1) Classes and Clubs as base tables with Students as a shared table, (2) linearly, starting with either Classes or Clubs, and (3) Students as a single base table with Classes and Clubs as downstream tables.

In this particular instance, there's nothing about these tables, the data, or the model that truly requires multiple base tables. We're using this model as an example to keep it simple so the focus can be on the join logic. Or you could imagine that there's another related table, Rooms, that we're simply ignoring to avoid over complicating the discussion.



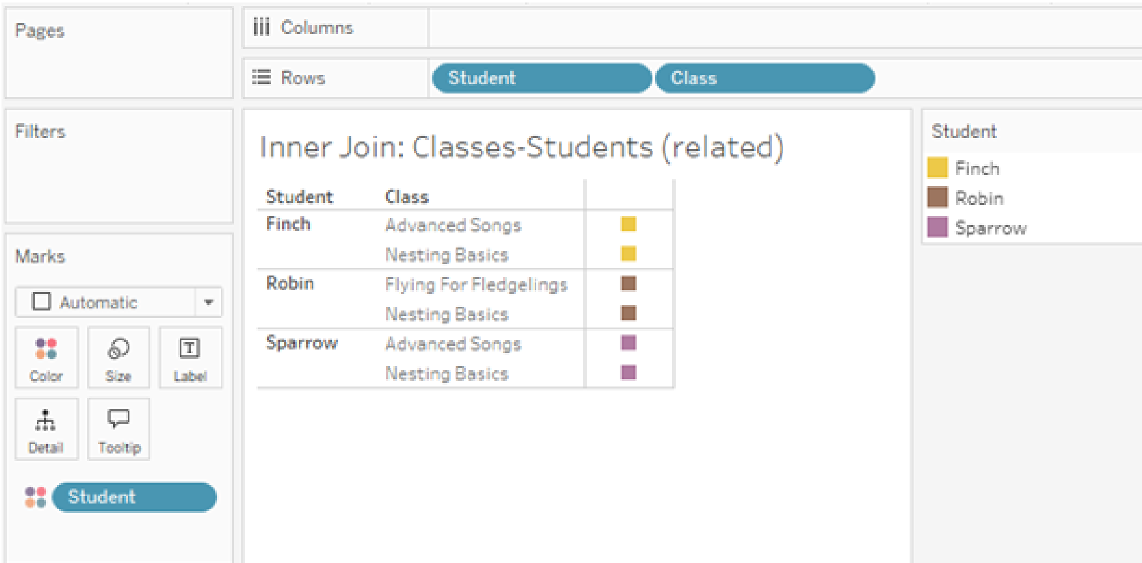

As a best practice, however, only use a multi-fact relationship model when your data requires it.

Related dimensions use inner joins

Related dimensions are inner joined. Inner joins drop any dimension values that aren't shared across both tables.

- Tableau uses additional logic to ensure measure values aren't lost. This section uses only dimensions to demonstrate the basics of how Tableau applies inner joins to related dimensions.

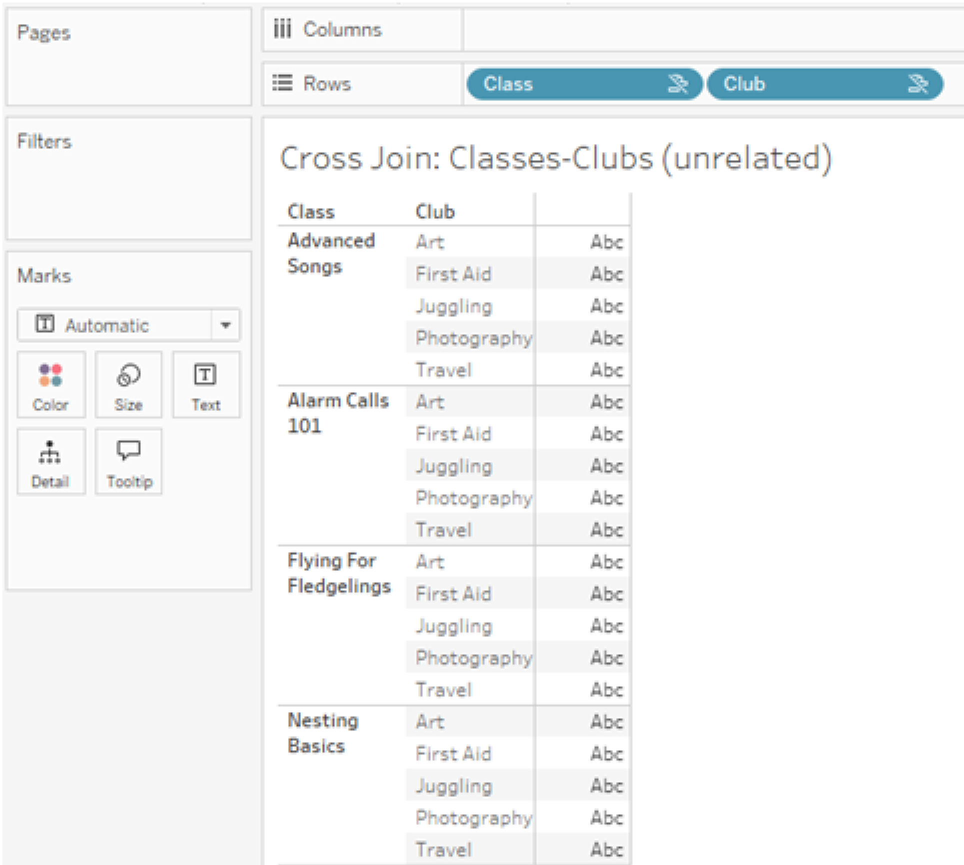
The following example shows how related dimensions only return rows that are present in the data. No students are in the Alarm Calls 101 class, so it's not present in the results. Cardinal and Jay aren't in any classes, so they're not present in the results.




Unrelated dimensions use cross joins

Unrelated dimensions—on their own, without a stitching dimension—are cross joined.

In a cross join, every value from one dimension is combined with every value from the other dimension, even if a resulting combination doesn't actually exist in the data. In this example, the cross join adds a row for each possible combination of Class and Club.




It's important to recognize when a cross join is occurring in your analysis. Although there’s a row for Advanced Songs + First Aid in the results table for the cross join, no students are actually in this combination of activities (we'll see proof of this in the stitching example in the next section).

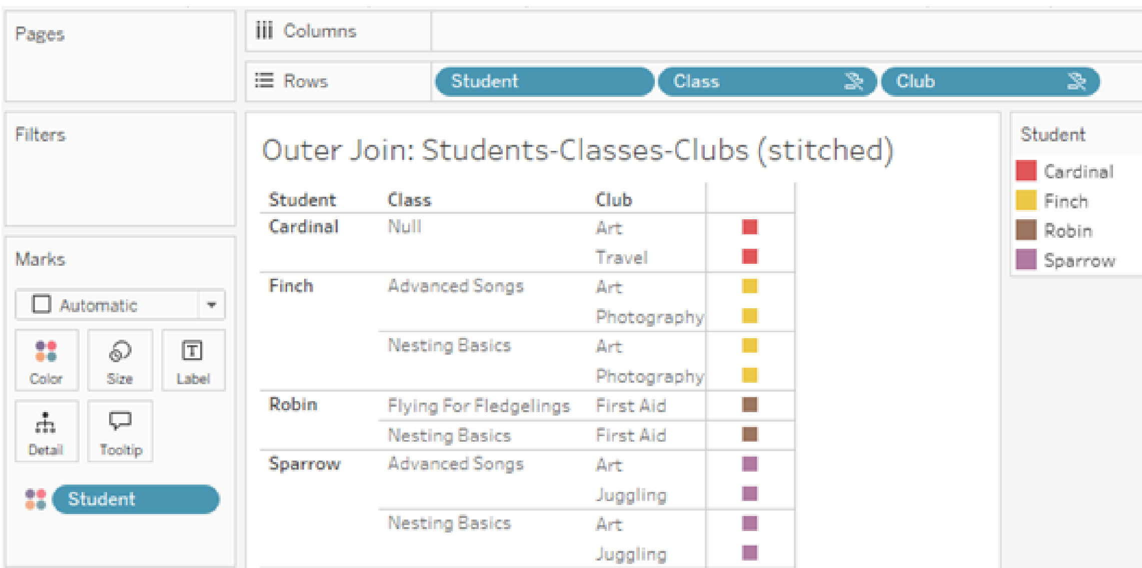
Why is it important to recognize that not all cross join results are based in the data? Imagine you were trying to build a schedule for classes and clubs so there were no conflicts for any students. There aren't any students in Advanced Songs and First Aid, so you could ignore this result and schedule that class and club simultaneously. The cross join doesn't represent combinations of values that actually exist in the data.

Additionally, cross joins when there is high cardinality (a large number of unique values) can impact performance. Imagine cross joining every phone number with every email address in your contacts. That would be a huge explosion of combinations and a potentially costly operation.

Stitched dimensions use outer joins

Unrelated dimensions—in the presence of a stitching dimension—are outer joined.

In this example, both the Classes table and Clubs table are related to the shared Students table but not to each other, so the fields Class and Club are unrelated. Adding the Student dimension lets Tableau know which values from Class and which values from Club should be juxtaposed in the analysis. We call this outer join behavior *stitching*.



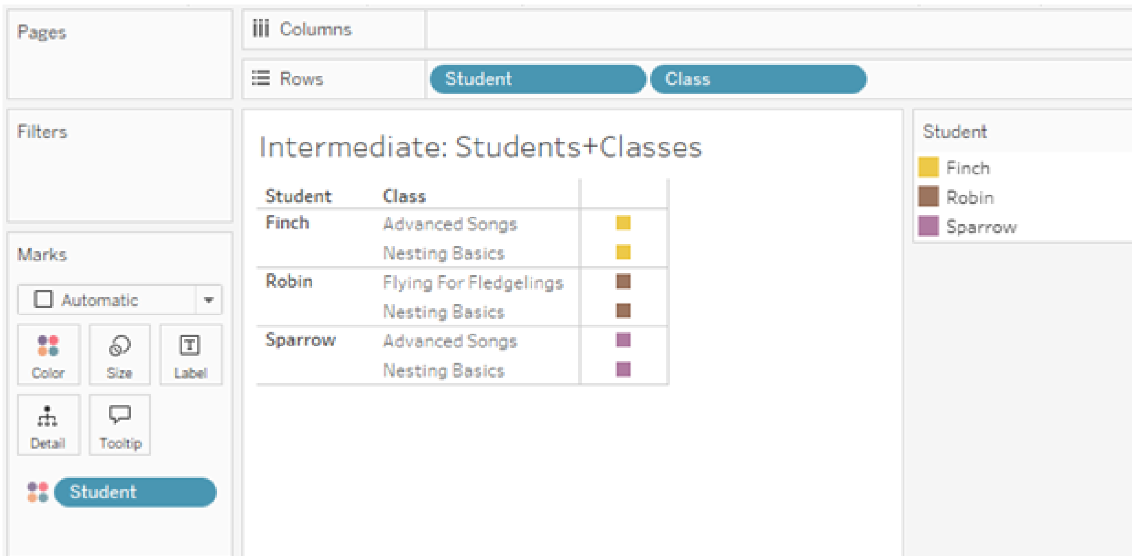

Stitching is similar to data blending in that there are intermediate results that are brought back together for the overall results. Unlike blending, however, stitching is an outer join, not a left join, and doesn't drop values from either side. There's no concept of primary or secondary data sources when it's all one data source, so both of the unrelated fields are given equal precedence.

Intermediate results are outer joined

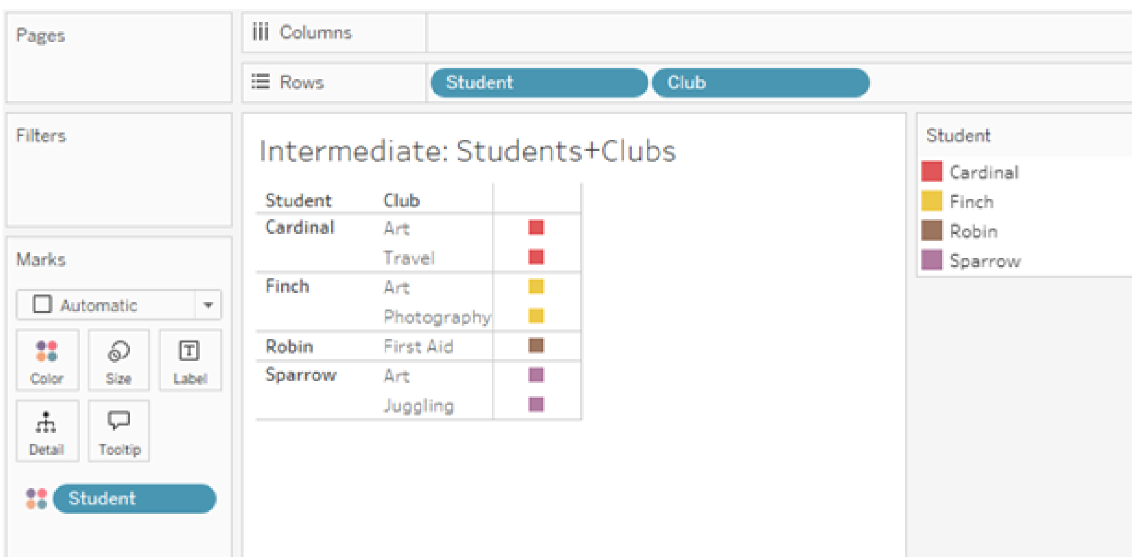
What goes into the outer join for stitched fields? An intermediate inner join is computed for each of the unrelated fields and the stitching field in turn, then those intermediate results are outer joined based on the values of the stitching dimension.

***Example***

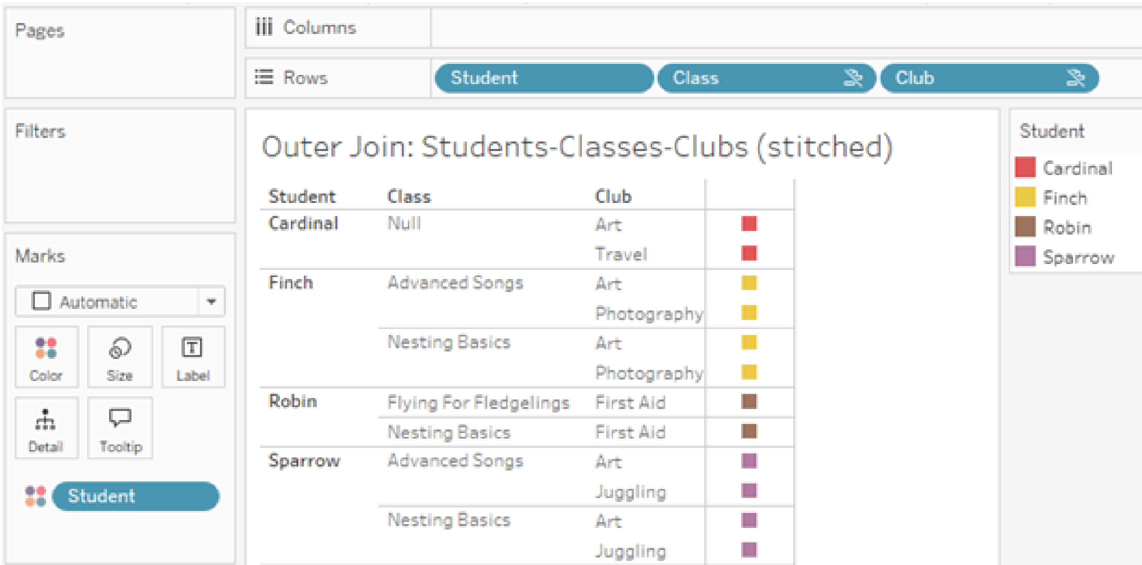
An inner join for Student and Class...




...and an inner join for Student and Club...




...are then outer joined on Student.




Additional joins to retain measures

In addition to the join logic for dimensions, measures can introduce additional joins. When relationships were first introduced in Tableau, one of the core principles was that measure values aren't lost. This is also maintained in multi-fact relationship data models.

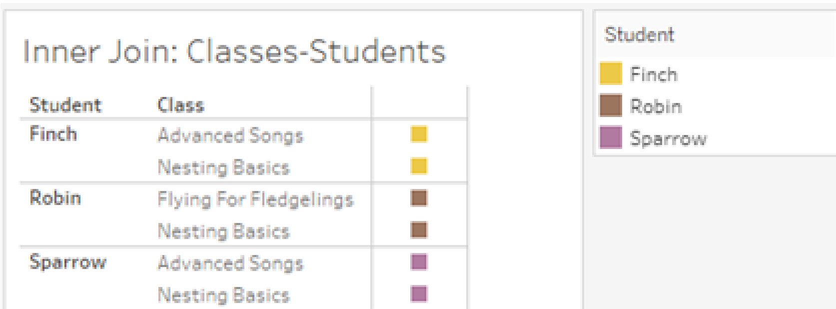
The essential details are:

- Measure values are broken down only by related dimensions.
- Measure values repeat for unrelated dimensions.
- Dimension values that would be dropped in dimension-only vizzes may be returned if there are relevant measure values associated with them.

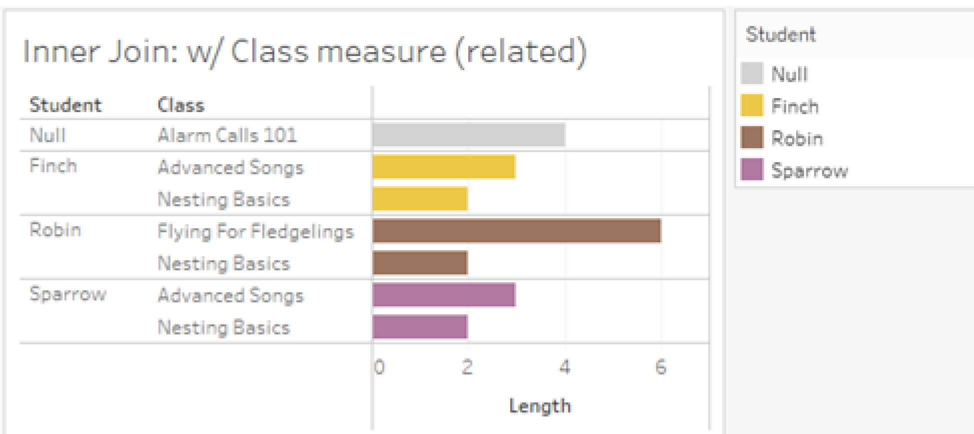
**Note**: Remember that measures are aggregations—they're computed at the level of detail (the granularity) set by the combination of dimensions in the viz. This is referred to as a measure being *broken down* by a dimension. When a measure is used without any dimensions, it is said to be *table scoped*. This means the measure's value is the fully aggregated value. As soon as we use a dimension in the viz, the measure is broken down more granularly based on the dimension values. The value of a measure in an analysis therefore depends on the context of the dimensions.

Related measures

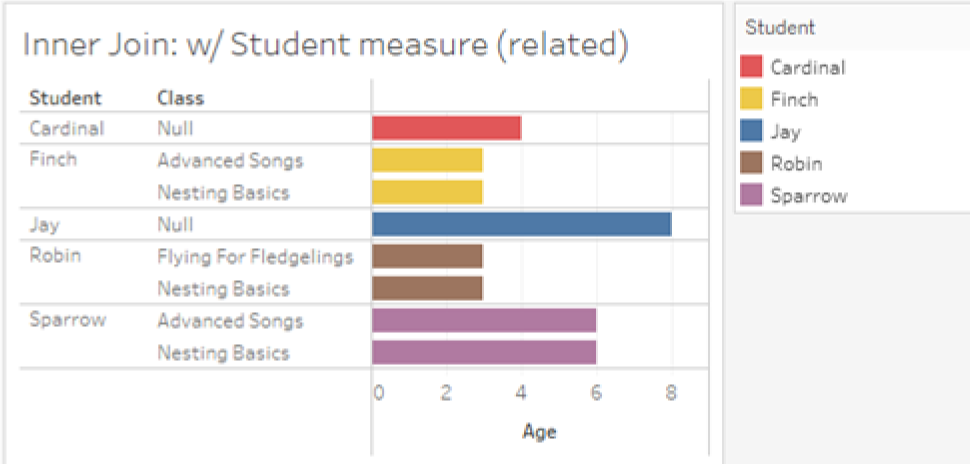
Consider the subset of dimension values that are returned for an inner join on the related dimensions **Student** and **Class.** There are three student values, Finch, Robin, and Sparrow; and three class values, Advanced Songs, Nesting Basics, and Flying for Fledgelings.




If we add the **Length** measure from the Class table, we see that all four classes are shown and there's a null for Student. Every class **Length** is displayed, at the level of **Class**.




If we instead add the **Age** measure from the Student table, we see that all five students are shown and there are two nulls for Class. The results preserve every student, even if they're not in a class. Every student **Age** is displayed, at the level of **Student**.



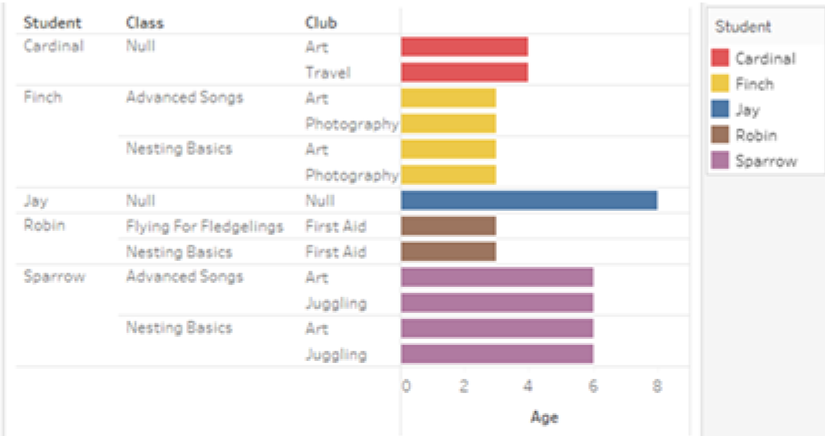

Unrelated measures

Measure values are repeated for unrelated dimension values.

If we look at the **Length** measure from the Classes table and the unrelated **Club** dimension, the measure is table scoped and repeated across all the dimension values of **Club**.


In the presence of a stitching dimension, measures can be both broken down and repeated.

Here, the measure **Age** is from the Students table and is broken down to the level of student. Each time a student is repeated based on the dimensions for **Class** and **Club**, the **Age** value is repeated.




## Troubleshooting

Considerations when working with multi-fact relationship data models

### Per table extract filters

All extract filters for a multi-fact relationship data model extract are per-table (not pervasive). Because of this, filtering results may be different between live and extract connection.

### Row level calculations

Row level calculations can only refer to fields which share the same upstream base table. That is, row level calculations can't be performed across trees.

### Combined Fields

All fields in a combined field must share an upstream table. That is, you can't create a combined field using fields that are in different trees.

### Sets

Sets can only be created with a definition that involves fields that share the same upstream base table. However, in a viz, the option to Add to Set may be available from a mark when that mark is defined by fields unrelated to the fields used to define the set. If you choose Add to Set, Tableau will add only the related fields to the set definition. This is different from the behavior for Add to Set in single base table data sources, when Add to Set adds everything that defines the mark.

**Validate INCLUDE level of detail expressions**

INCLUDE LOD expressions can't be evaluated across unrelated fields. Because relatedness between fields is evaluated on a sheet-by-sheet basis, it's possible to have a valid LOD expression in the Data pane or calculation editor that becomes invalid in the context of a specific viz (in the presence of an unrelated dimension). When this happens, the LOD pill will turn red. You can update the LOD expression to remove unrelated field conflicts, change the structure of the viz, or remove the LOD expression from the viz.

**Updating Published Data Sources**

As a best practice, create a copy of an existing published data source if you plan to modify it to become a multi-fact relationship data model when not all of its connected workbooks need the new data model. Don't update the existing version of the data source unless all its workbooks need the new tables. Publish the modified data source as a new data source and create new workbooks from it. This will prevent the existing workbooks from being converted to use VDS instead of data server when they don't need the functionality, preventing the potential for a performance hit.

Resolved issues

| Resolved Issue | Fixed as of |
| --- | --- |
| **Extracts**<br><br>*Local data source (in a workbook):* Attempting to extract a multi-fact relationship data source will give a "No such table" error.<br><br>*Published data source:* Extracting a published multi-fact relationship data source appears to succeed, but field values can be swapped. | • Tableau Cloud: Resolved as of mid July updates. This also applies to public.tableau.com.<br>• Tableau Desktop: Resolved as of maintenance release 2024.2.1 released July 24th, 2024<br>• Tableau Server: Resolved as of maintenance release |

| | |
|---|---|
| **EXCLUDE Level of Detail expressions**<br><br>Only INCLUDE LODs should be validated in the presence of unrelated fields. However, EXCLUDE LODs may also be incorrectly marked as not valid in the same conditions.<br><br>**Nested user calculations**<br><br>Nested user calculations are not available in published data sources with a multi-fact relationship data model. | 2024.2.1 released July 24th, 2024<br><br>If you still see these issues in Tableau Desktop or Tableau Server, upgrade to a version from July 24th, 2024 or later. |

Known issues in 2024.2

**Relatedness indicators with multiple Marks cards**

When a viz is built with multiple measures on the Rows shelf or on the Columns shelf, each measure gets its own Marks card. The logic used to determine relatedness indicators (the unrelated icon, the text in tooltips, and the relatedness warning dialog) may not give expected results depending on which Marks card is open. The viz itself, however, is correctly computed based on the relatedness of each pair of fields. There is a planned fix for this behavior.

**BatchQueryProcessor**

BatchQueryProcessor must be enabled to support multi-fact relationship data models. This is expected behavior with no currently planned fix.

**Tableau Pulse**

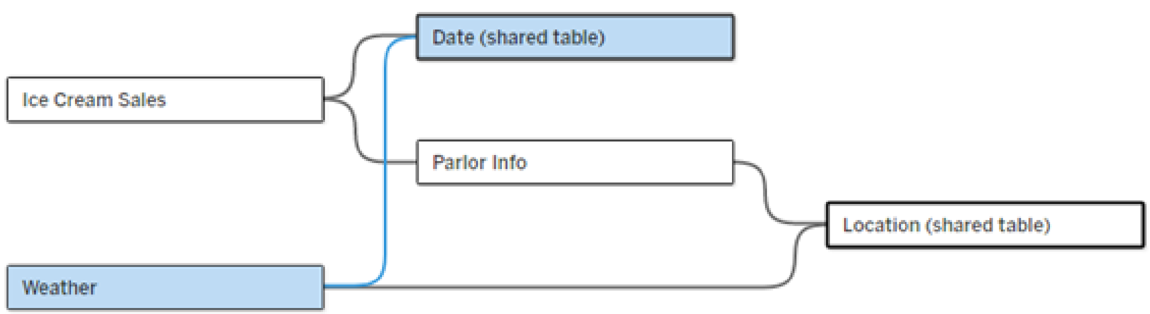
Pulse may not work with multi-fact relationship data models. You may be prevented from creating a metric definition, or any metrics that are created may be blank. This is not expected behavior but there is no currently planned fix yet.

# When to Use a Multi-fact Relationship Model

A multi-fact relationship model is a data model that lets you add unrelated tables in a single data source and then uses related fields during visual analysis to essentially stitch the tables together based on the context. Unlike blending, the data exists within a single data source—the concepts of primary and secondary data sources don't apply and no data is dropped from left joins. Unlike a single table data model, multiple base tables maintain their own context regarding tables shared between them. A multi-fact relationship data model gives you more options for performing multi-fact analysis in Tableau.

Imagine you want to analyze how weather and ice cream sales trend together. Weather and ice cream sales both happen at specific times and specific places, but there's no direct connection between ice cream sales and weather. These are unrelated pieces of data that both relate to the shared concepts of date and location.

This question lends itself to creating a multi-fact relationship model. Ice Cream Sales and Weather each can be added as a base table and related on Date and Location, which are shared tables.




A multiple base table data model, with two unrelated tables (Ice Cream Sales and Weather) and two shared tables (Date and Location). There is an intermediate table, Parlor Info, between Ice Cream Sales and Location.

Why did we build the capability to model unrelated tables?

Analysis often involves bringing together tables of data that don't even have a direct relationship to each other but that both relate to the same, common information (such as date or location). A multi-fact relationship model supports loose semantic coupling by introducing the concept of degrees of relatedness and the ability to build a data model with multiple, unrelated base tables.

- Semantic coupling is a term used to describe how tightly combined data is. A *join* or a *union* is a tight semantic coupling; they bring multiple tables together into a new physical table that then acts as a single table. A *relationship* is a looser coupling between tables that ties tables together logically, maintaining their distinct status as separate tables. Even further along the semantic coupling spectrum is *data blending*, where results from separate data sources are visually combined based on elements shared between both them. A *multi-fact relationship model* is closer to the blending end of the spectrum, but within a single data source instead of across data sources.

A multi-fact relationship model—a data model with multiple base tables—permits unrelated tables in the model as long as shared tables exist in the model, too. During analysis, fields from a shared table "stitch" together otherwise unrelated tables of data based on the shared dimensions they have in common (such as happening in the same place or at the same time). All the benefits of relationships are maintained, including the retention of each table's grain, or native level of detail.

Similar to a single base table data model, Tableau determines the best join type to use behind the scenes based on the structure of the viz. But in a multi-fact relationship model, the join options are expanded to include outer and cross joins to handle different levels of relatedness. For more information, see About Multi-fact Relationship Data Models.

Where did the name come from?

Multi-fact relationships get their name from multi-fact analysis. In a data warehouse model, data is stored in a central fact table surrounded by dimension tables. In this context, *fact* refers to measurements or metrics, which are numeric fields of data that capture facts about the data—Tableau's measures. Dimension tables contain attributes about these facts.

Schemas based on fact tables are often structured as a star or snowflake, depending on how the dimension tables are organized. When analysis needs to be performed across fact tables, this is called multi-fact analysis. Analysis is done in the context of the common dimension tables, known as shared dimensions or conformed dimensions. In Tableau you build these data models using relationships, so we've named this suite of capabilities multi-fact relationships.

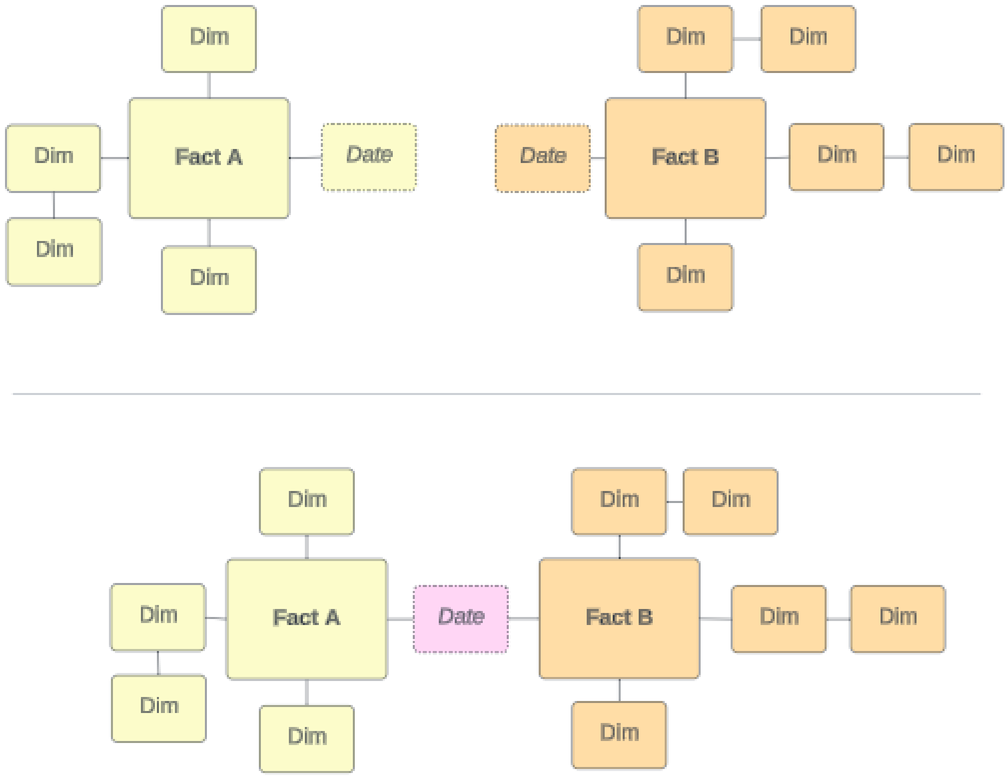
## When to use multi-fact relationship data models

If your data consists of tables that are all related to each other, you can stick with single base table data sources built with relationships. A multi-fact relationship model is called for when your data spans different concepts, either in the form of multiple fact tables, or different unrelated contexts.

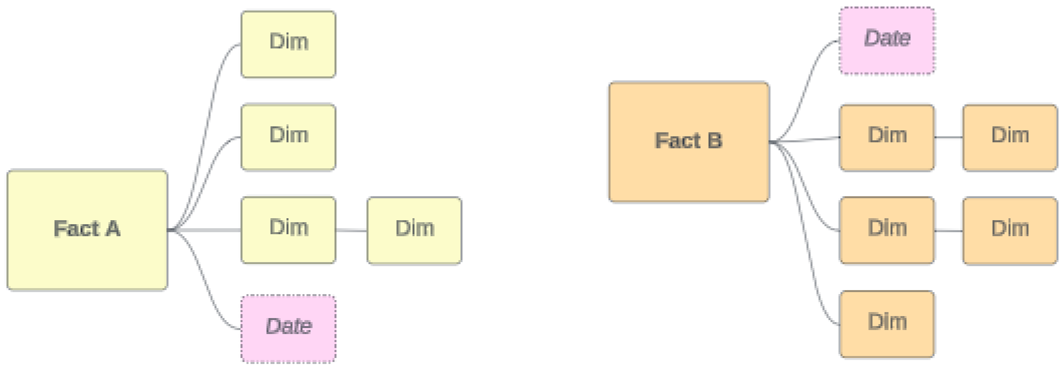
Whenever possible, build your data sources with a single base table. In a single base table data model every table is related and there is no need to consider degrees of relatedness. Only use multi-fact relationships when that data model structure is called for.

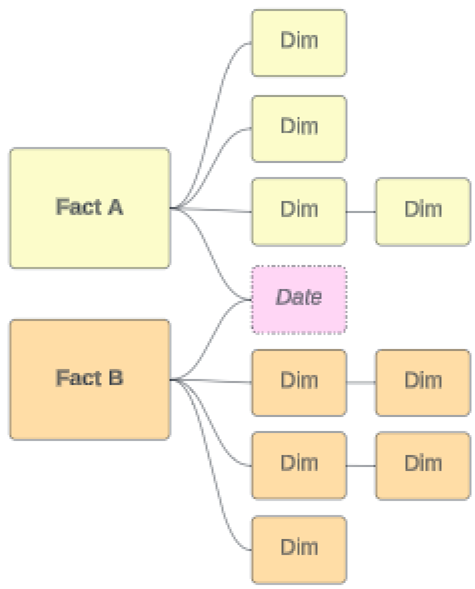
### Multi-fact analysis

Multi-fact analysis is a core use case for multi-fact relationships in Tableau. In this example, Fact A and Fact B share a table Date.




To model this in Tableau, the fact tables become base tables and multiple incoming relationships are established for their shared dimension table.




Other scenarios

Multi-fact relationship data models aren't just for multi-fact analysis, however. Tableau doesn't require a strict definition of fact or dimension tables. Any table can be a base table (although it should suit the characteristics of base tables). Some scenarios that indicate a multiple base table data source might be helpful include:

- **Moving through stages**, such as base tables for applications, transcripts, and alumni events for a shared student table.

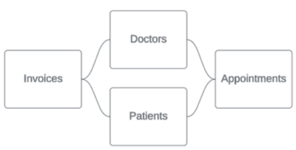
- **Different contexts for the same events**, such as base tables for the events of medical appointments and billing invoices, with shared tables to set the context to doctors or patients.
- **Different domains that may correlate,** such as scenarios that would previously be best handled with data blending, like ice cream sales and weather correlated through the shared tables of date and location.

Learn more about when multi-fact relationships are useful in this Tableau blog post: When and How to Use Multi-fact Relationships in Tableau.

## Identify the base tables

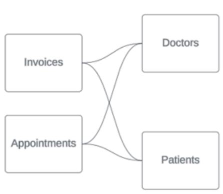
In a multi-fact relationship model, directionality matters. That is to say, which tables are the base tables along the left side of the model and which tables are shared downstream impacts how the relationships are evaluated to return the analytical results.

Consider a conceptual bow tie of invoices, appointments, doctors, and patients:

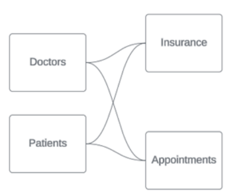



The correct way to build the data model in Tableau is with Invoices and Appointments as the base tables, and with Doctors and Patients as the shared tables (not with Doctors and Patients as the base tables).

**Correct**: Invoices and Appointments as the base tables




**Incorrect**: Doctors and Patients as the base tables



Conceptually, a patient (or doctor) is the entity that stitches together the event of an appointment and the event of an invoice.

If your data model is backwards (such as with Doctors and Patients as the base tables instead of Appointments and Invoices), the outer join stitching behavior won't be as useful. Your analysis might show a lot of table scoped measures and ambiguity. If you find yourself with ambiguously related fields that you weren't expecting , reevaluate the tables you are using as base tables and see if your data model needs to be reversed.

Characteristics of base tables and shared tables

If you're performing multi-fact analysis, the fact tables become the base tables and any shared dimension tables are shared tables. Tableau doesn't require a strict adherence to fact and dimension table characteristics. However, there are certain attributes that can help you identify which tables should be base tables and which should be shared tables.

| **Base table** | **Shared table** |
|---|---|
| Fact tables in a data warehouse schema | Shared or conformed dimension tables in a data warehouse schema |
| Specific to the context or analysis | Consistent concept across various contexts |
| (flight information, energy usage) | (date, location) |
| Measure heavy | Primarily dimensions |
| More frequently updated/transactional | More stable/durable |
| (medical appointments, prescriptions, vitals) | (doctor, patient) |
| Has foreign key fields | Has primary key fields |
| Event based | Entity based |
| (class schedule, grade on an assign- | (student, classroom) |

ment)

Note that if there are intermediate tables between a base table and a shared table, you can swap which one is the base table without fundamentally altering the data model. (Such as Parlor Info and Ice Cream Sales in the first example.) What matters is which tables are upstream of the shared tables and which are shared.

Try an additional base table instead

There are various scenarios that may indicate you should build a multi-fact relationship model with multiple base tables rather than a single base table data source:

- If you're trying to build a data source with a cycle, the downstream table should be another base table instead.
- If you have a series of tables that are related on the same sets of relationship clauses (such as date and location), those dimensions should be pulled out and made into shared tables instead.
  - This is especially useful because multiple relationship clauses must all be true (logically, an AND) for the tables to be related for those records.
  - If, instead, you want to analyze records where one may be true at a time (a contextual OR), this flexibility is provided by setting up a data model with shared dimension tables instead.
- If you're using a blend but want to have an equivalent blend without primary and secondary data sources, build a data model which combines the data sources from the blend with their linking fields in a shared table or tables.

## Build a Multi-fact Relationship Data Model

Analysis often involves bringing together tables of data that don't have a direct relationship to each other yet both relate to the same, common information such as date or location. This type of analysis is sometimes referred to as multi-fact analysis with shared dimensions.

To perform this kind of analysis in Tableau, you need to create a data source that uses multiple base tables connected by shared tables.

- *Base tables* are the left-most tables in the data model on the Data Source tab. For guidance on how to determine which tables to use as base tables, see When to Use a Multi-fact Relationship Model.
- *Shared tables* are downstream tables with multiple incoming relationships. These tables contain fields that can be used to stitch together unrelated fields during analysis in a viz. Date and Location are examples of commonly shared tables.

## Build the model

Building a multi-fact relationship data model is essentially the same as creating any other data source that uses relationships, but with two additional pieces: additional base tables and multiple incoming relationships to shared tables.

1. Connect to your data. You can use multiple data connections if your tables aren't all in the same database.
2. Drag a table onto the canvas to create the first base table.
3. Drag another table from the left pane to the **New Base Table** drop area.

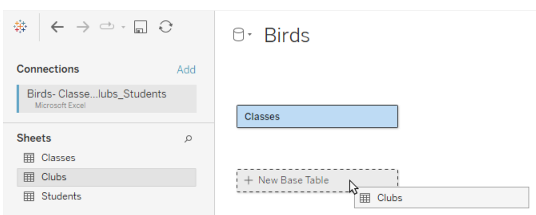
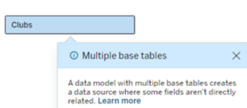
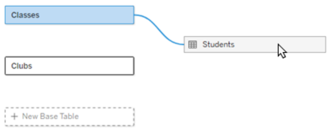


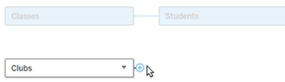

Tableau shows a warning that you're building a data model with multiple base tables. We recommend that you only set up a multiple base table model if your data needs it. Otherwise, use a single base table model to avoid the complexities that come with a multiple base table model.



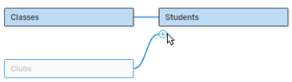

4. Drag another field to the canvas and relate it to one of the base tables. Configure each relationship if necessary.




5. Hover over the not-yet-related base table to display a plus sign (affectionately known as a "meatball").




6. Drag the plus sign icon to the shared table to create a new incoming relationship (also known as a "noodle").



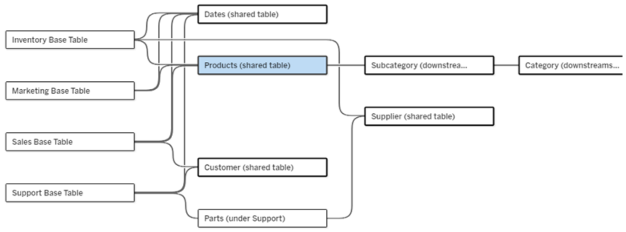

7. *Optional:* Continue adding downstream tables and base tables. Click and drag the plus sign icon to build shared tables as needed.

> **Note**: Rather than starting with the base tables, you can also build a single base table model first and add additional base tables later.

## Explore the model

A data model with multiple base tables is built with relationships, but not all tables are related to each other to the same degree. Each base table defines a *tree*, which contains every table related to that base table, either directly related or downstream from a related table. Shared tables exist in multiple trees. For more information about degrees of relatedness, see About Multi-fact Relationship Data Models.

When you view a model with multiple base tables, there are various options for exploring and managing the data model. These options are especially useful when a data model is complex.




An example of a complex data model with four base tables, multiple shared tables, and downstream tables that are both shared and unshared between the base tables.

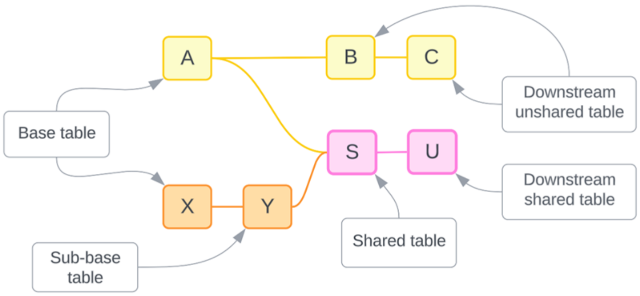
2024.2 introduced some new layout details for the data model. In a multi-fact relationship data model, relationships bundle together to help track how many incoming relationships a table has, and shared tables (and downstream shared tables) have a bolder outline than tables that aren't shared.

Terminology

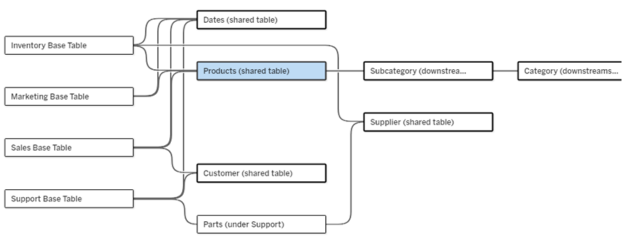
Tables in a multiple base table data model have specific roles. Base tables and shared tables are the only tables that must exist in a multi-fact relationship data model. (Without more than one base table, it's not a multi-fact relationship data model. Without a shared table connecting the base tables, it's not a valid data model.)

Because of the often complex nature of these models, it's useful to have a shared terminology for discussing other types of tables by how they fit into the data model.

- *Base tables* are on the far left and have no incoming relationships.
  - In the example, Inventory, Marketing, Sales, and Support are base tables.
- *Sub-base tables* are between a base table and a shared table.
  - In the example, Parts is a sub-base table.
- *Shared tables* have more than one incoming relationship.
  - In the example, Products, Dates, Customer, and Supplier are shared tables.
- *Downstream shared tables* have exactly one incoming relationship and have a shared table somewhere upstream of them.
  - In the example, Subcategory and Category are downstream shared tables.
- *Downstream unshared tables* have exactly one incoming relationship and have no shared tables upstream of them.
  - In the example, there are no downstream unshared tables.



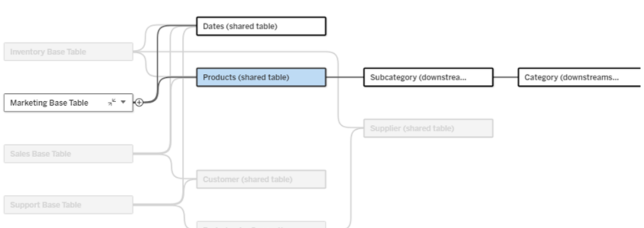

## Test your understanding: identify the types of tables in the example data source




- **Base tables**: Inventory, Marketing, Sales, and Support
- **Sub-base table:** Parts
- **Shared tables:** Products, Dates, Customer, and Supplier
- **Downstream shared tables:** Subcategory and Category
- **Downstream unshared tables:** none

Identify a relationship tree

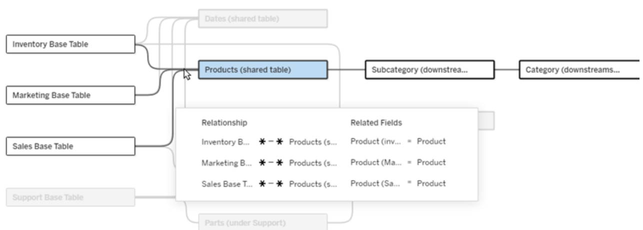
Hover over a table to highlight the tables it's related to. Tableau emphasizes the tree for that table and deemphasizes unrelated tables.



The Marketing base table tree consists of two shared tables, Dates and Products, and downstream shared tables Subcategory and Category.

View relationship details

Hover over a relationship or bundle of relationships to see the details in a tooltip.




The incoming relationships to the Products table include three individual relationships to the Inventory, Marketing, and Sales base tables.

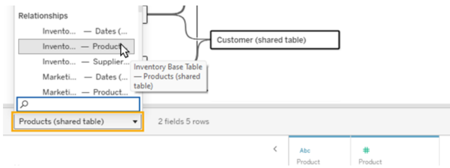
Select a relationship

When a relationship is selected, it is highlighted in blue in the data model canvas and its details appear in the Table Details pane below the data model canvas. The Table Details pane is where you can inspect or modify the relationship clause.

There are multiple ways to select a relationship:

- Click a relationship line (noodle) in the canvas. Every relationship has a clickable zone that selects just that noodle.
- Right-click or control-click a table in the canvas to open its menu. Select the **Select Relationship** option and choose which table's relationship you want.
- Click a bundle of relationships in the canvas to bring up a persistent tooltip (hovering over a bundle brings up the tooltip, you have to click to make it persist). Then select a row in the tooltip details to highlight that relationship in the model.
- Open the menu in the toolbar of the Table Details pane and select the desired relationship. You can also use this menu to select a specific table to see its preview in the

pane.




Swap with base table

Intermediate tables in a relationship between a base table and shared tables give you the option to swap the downstream table with the base table. This is purely a visual change to aid with conceptual understanding and doesn't change the structure of the data model.

Right-click or control-click a downstream table and select **Swap with base table (table name)**. The swap option is also only present on the downstream table and not the base table.

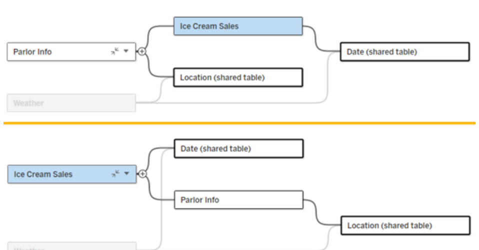
The swap option is not available for tables which would alter the data model if swapped, such as shared tables or downstream shared tables. Only downstream unshared tables or sub-base tables can be swapped with base tables.

*Example*

In this example, the **Parlor Info** and the **Ice Cream Sales** tables can be swapped without changing the data model's fundamental structure. No other tables can be swapped.

- Ice Cream Sales is related to both Parlor Info and the shared Date table.
- Parlor Info is related to both Ice Cream Sales and the shared Location table.
- Weather is related to both the shared tables of Date and Location.

These two models are conceptually equivalent:



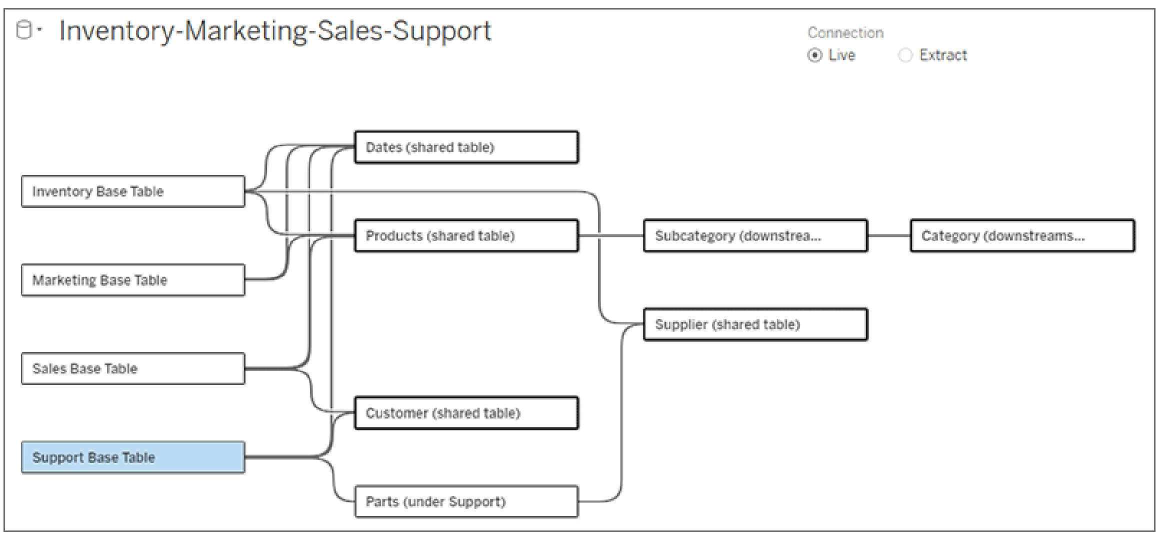
Collapse a base table

You can also collapse a relationship path, or tree, to just its base table to temporarily simplify the view of the data model.

Click the Collapse or Expand buttons on a base table to collapse or expand its entire tree. Alternatively, right-click or ctrl-click on a downstream table and select **Collapse this path** or **Collapse other paths**. This option is not available on shared tables or tables downstream of shared tables.

Collapsing a tree to its base table is purely visual and won't trigger the Unrelated Tables alert. A collapsed path is indicated by a base table with a stacked table and an Expand button. Collapsing affects all tables and relationships that are relevant only to that tree, so tables that are shared with an uncollapsed path are not hidden.

Use the Expand button to re-open the base table and everything in the tree.




## Troubleshooting

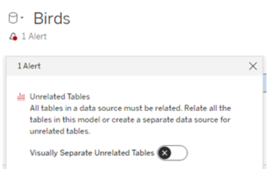
Create a single data source

All tables must be related to the entire data source in some way. If there are any tables that aren't related to the overall data model, an alert appears. The alert remains until no tables or trees are fully separate from the rest of the data model. When the alert is active, the data source can't be published and you can't use the data source in an analysis.

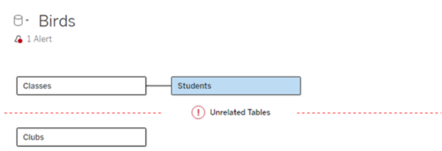
You can open the alert and set Visually Separate Unrelated Tables to identify which tables triggered the alert. This option is useful when you have a complex model and need to identify which table or tables aren't yet related to the rest of the data model.

*Example*

In the steps under Build a model, an alert displays in Step 4 before a relationship is added to connect the second base table.

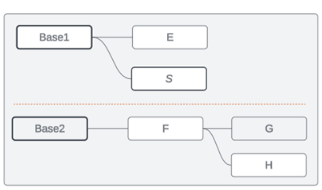



Setting **Visually Separate Unrelated Tables** to On moves the table **Clubs** underneath the **Unrelated Tables** line. Relating **Clubs** to **Students** resolves the alert.

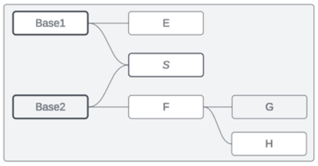



### Resolve a cycle

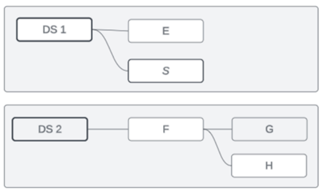
Even if some tables aren't directly related to each other, the entire data model must be a cohesive whole. In this example, each base table defines a tree but there is no shared table connecting them. This isn't a valid model for analysis.




The two groups of related tables need to be combined via a shared table...




...or the data model needs to be created as two separate data sources.

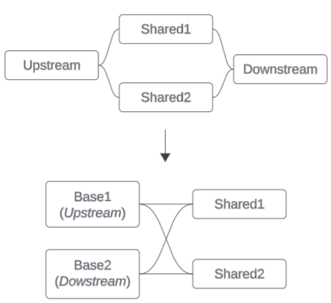



Data model restrictions

Some relationship paths between tables are not supported in a multi-base table model. If you're unable to drop the meatball when you attempt to create a second incoming relationship on a table, make sure the structure you're trying to create is supported in Tableau. Examples of unsupported models include:

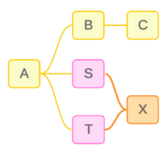
Cycles

Cycles—where there's more than one relationship path from an upstream table to the same downstream table—are not supported. This unsupported structure is sometimes called a bowtie. To model this kind of relationship between tables in Tableau, use multiple base tables instead of a bowtie by converting the downstream table to another base table.

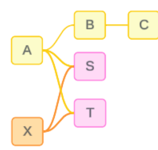



The data model must be a *directed acyclical graph*. This means every incoming relationship to a table must be traceable upstream to a different base table.

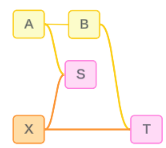
**Not supported**. Table X has two incoming relationships that are both from tables downstream from Base Table A




**Supported**. Tables S and T both have multiple incoming relationships, but each one is from a different base table.

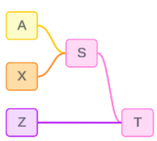



**Supported**. Although it may visually look like there's a cycle, the incoming relationships for both Table S and Table T can be traced back to different base tables.




Nested shared tables

Nested shared tables are not supported. Any tables downstream from a shared table (a table with multiple incoming relationships) can only have one incoming relationship.




Not supported. Table T is downstream from a shared table and can't receive an additional incoming relationship.

## Understand Tooltips for Multi-fact Relationship Data Models

> **Note**: For single table data sources or single-base table data sources, all the tables are related. Everything on this page refers to multiple base table data sources.

### Field-level relatedness

Data models with multiple base tables have a lot of flexibility in how the tables can relate—or not relate—to each other. The relatedness of the *tables* is a constant based on the data model. However, the relatedness of *fields* in a viz depends on what fields are active (that is, what fields are in use on the worksheet shelves as pills). At the level of a single viz, Tableau evaluates active fields in pairs to determine how they relate to each other.

An unrelated icon on a field means it's unrelated to at least one other field in the viz. This icon can appear in a pill on a shelf or in the Data pane. (In some instances, there may be a related icon.) Hovering over the icon opens a tooltip with more information. There are different messages for different types of field relatedness:

- Unrelated dimension-dimension pair
- Unrelated dimension-measure pair
- Stitching dimension
- Measure from a shared table
- Unrelated filter pair

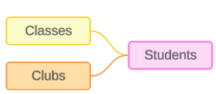
The messages also varies slightly depending on whether the field is in use on a shelf or in the Data pane.

- **On a shelf**: The tooltip for pills on shelves provides information about how the fields in the viz are related to each other and what impact that has on how Tableau computed the results.
- **In the Data pane**: The tooltip for fields in the data pane provides information about what *would* happen if that field were added to the viz. Fields in the Data pane can also be de-emphasized with light gray text if they don't related to any fields in the viz.

**Tip**: In Tableau, aggregated dimensions—such as ATTR(dimension) or MIN(dimension)—act like measures.

Know your data model

Whenever you're working with a data model that contains multi-fact relationships, it's useful to refer to the model regularly on the Data Source page. The examples in this topic are based on a data model with two base tables, Classes and Clubs, and two shared tables, Students and Rooms.



### Classes

Classes
7 rows 3 fields

| Abc Classes Class | Abc Classes Student (Classes) | # Classes Length |
|---|---|---|
| Nesting Basics | Robin | 2 |
| Advanced Songs | Sparrow | 3 |
| Flying For Fledgelings | Robin | 6 |
| Nesting Basics | Sparrow | 2 |
| Advanced Songs | Finch | 3 |
| Nesting Basics | Finch | 2 |
| Alarm Calls 101 | *Null* | 4 |

Fields:

- **Class**, a dimension with values of Nesting Basics, Advanced Songs, Flying for Fledglings, and Alarm Calls 101
- **Length**, a measure
- **Student**, a dimension used to relate to the Students table

### Clubs

Clubs
7 rows 3 fields

| Abc Clubs Club | Abc Clubs Student (Clubs) | # Clubs Dues |
|---|---|---|
| Photography | Finch | 50 |
| Travel | Cardinal | 90 |
| Juggling | Sparrow | 80 |
| Art | Finch | 10 |
| Art | Cardinal | 10 |
| Art | Sparrow | 10 |
| First Aid | Robin | 0 |

Fields:

- **Club**, a dimension with values of Photography, Travel, Juggling, Art, and First Aid
- **Dues**, a measure
- **Student**, a dimension used to relate to the Students table

### Students

Students
5 rows 3 fields

| Abc Students Bus Rider | Abc Students Student | # Students Age |
|---|---|---|
| yes | Finch | 3 |
| yes | Cardinal | 4 |
| no | Sparrow | 6 |
| yes | Robin | 3 |
| no | Jay | 8 |

Fields:

- **Bus Rider**, a dimension with values of yes or no
- **Student**, a dimension with values of Finch, Cardinal, Sparrow, Robin, and Jay. Used to relate to the base tables
- **Age**, a measure

## Unrelated dimension-dimension pair

Unrelated dimensions are cross joined, which can result in combinations of dimension members across the headers that do not reflect actual combinations of data in the underlying tables.

The message for an unrelated dimension-dimension pair is:

- **On a shelf**: `Unrelated dimensions show all possible combinations of values. Unrelated to: <list of dimensions>`
- **In the Data pane**: `If used, this dimension will show all possible combinations of values with unrelated dimensions: <list of dimensions>`

- **Grayed out in the Data pane**: This dimension isn't related to any dimensions in the viz. If used, it will show all possible combinations of values with other unrelated dimensions.

Cross joins can be expensive operations that negatively impact performance. Because of this, Tableau also displays a Relatedness warning dialog if you add an unrelated dimension to the viz.

## Stitching dimensions

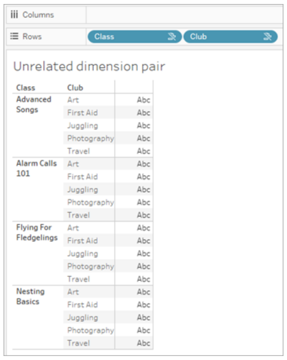
Although there are analytically relevant reasons to visualize unrelated dimensions alone, a common "happy path" for analysis with multiple base tables is to use a stitching dimension in addition. In the presence of a stitching dimension, the unrelated dimensions are no longer cross joined but are outer joined instead. Outer joins may still introduce nulls, but the dimension member headers are trimmed down from every possible combination to combinations that are relevant to at least one side of the outer join. They also don't have the same potential for performance impacts as cross joins. If there are no other relatedness issues that would call for an unrelated icon, a stitching dimension shows a related icon instead.

The message for a stitching dimension is:

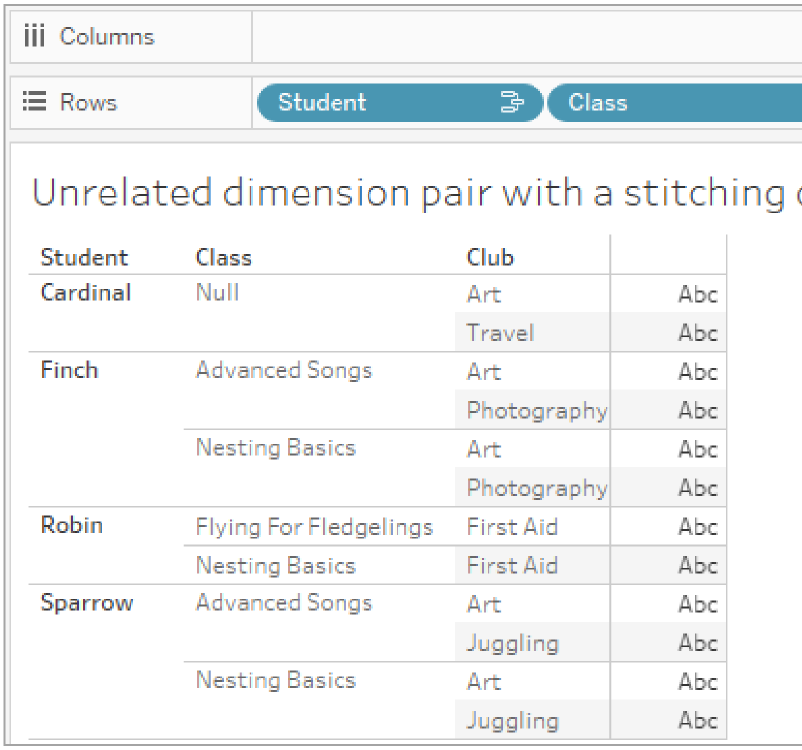
- **On a shelf**: This dimension stitches together the following fields: <list of fields>
- **In the Data pane**: If used, this dimension will stitch together the following fields: <list of fields>
- **Grayed out in the Data pane**: doesn't apply, stitching only occurs in a viz

Comparing unrelated dimensions with stitched dimensions

| Unrelated: Cross join | Stitched: Outer join of intermediate inner joins |
|---|---|




A viz showing a cross join of Class and Club with rows for every combination of Advanced Songs/Alarm Calls 101/Flying for Fledglings/Nesting Basics with Art/First Aid/Juggling/Photography.




A viz showing the results of an outer join of the Student-Class inner join and the Student-Club inner join. Not all combinations of classes and clubs are represented, and there are rows for students and clubs without a class.

### An aside on how measure values are computed

When a measure isn't related to a dimension, it can't be broken down by that dimension's members (that is, you can't break down the average class length per club when clubs don't have a class length). Instead, the measure will be aggregated at a different level than the dimension member's headers in the view.

## Terminology for dimensions and measures

In Tableau, *measures* are *aggregations*—they're aggregated up to the *granularity* set by the *dimensions* in the view. The value of a measure therefore depends on the context of the dimensions. For example, "number of cereal boxes" depends on if we mean the total inventory or the number of boxes per brand.

*Dimensions* are usually categorical fields, such as country or brand. In Tableau, dimensions set the granularity, or the *level of detail*, of the view. We typically want to group our data into marks by some combination of categories. What dimensions we use to build the view determines how many marks we have.

*Aggregation* refers to how the data is combined. Tableau's default aggregation is SUM. You can change the aggregation to other options, including: average, median, count distinct, minimum, and so on. *Granularity* refers to how detailed or broken down the measure is—which is controlled by the related dimensions. Unless the granularity of the measure is row level (aka disaggregated), its value must be aggregated.

Example

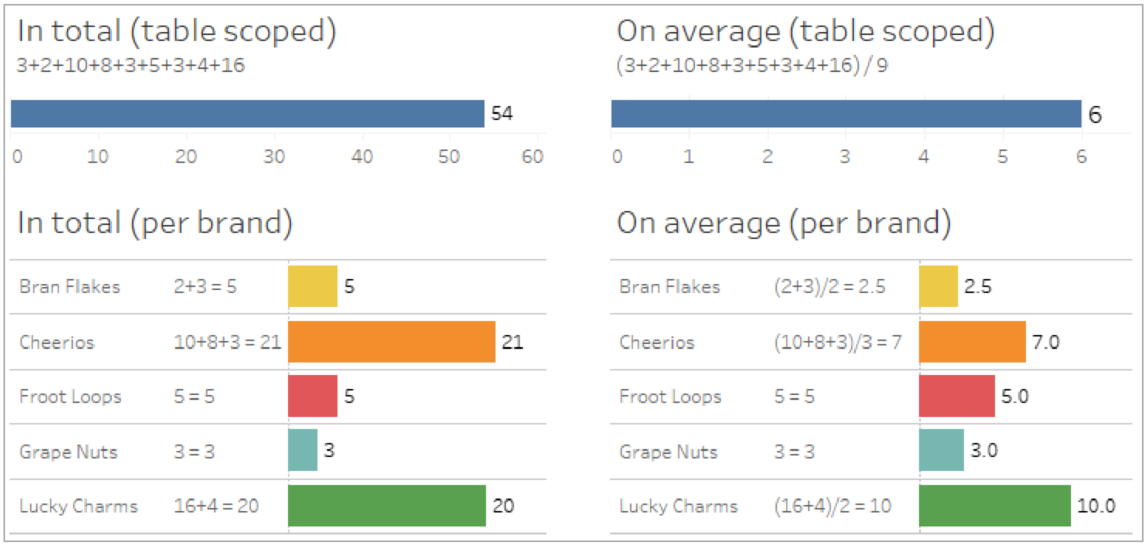
Raw data

| | Mini | Normal | ValuePak |
|---|---|---|---|
| Bran Flakes | | 3 | 2 |
| Cheerios | 10 | 8 | 3 |
| Froot Loops | | 5 | |
| Grape Nuts | | 3 | |
| Lucky Charms | | 4 | 16 |

**What's the value of "number of boxes of cereal"?**

Well, it depends on the aggregation type and the granularity as set by the dimensions.

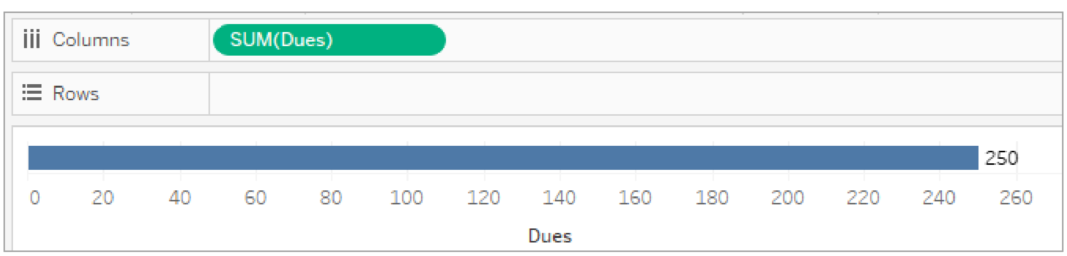
- Aggregations:
  - Sum (or total)
  - Average
- Granularity:
  - Table scoped / fully aggregated (the blue bars in the example)
  - Broken down by the **Brand** dimension (the colored bars in the example)



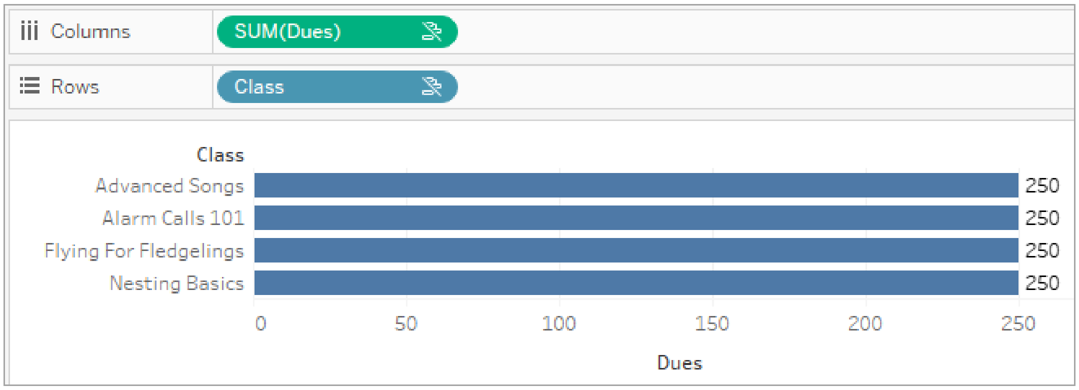

The value of a measure trails the dimension members

A measure's value is determined by the dimensions it is related to. A measure without a related dimension is table scoped. A measure with a related dimension is broken down by the related dimension's members (that is, the value of the measure is computed for each dimension member). If a related dimension's members are repeated due to the presence of an unrelated dimension, the measure's values are repeated based on its dimension members.

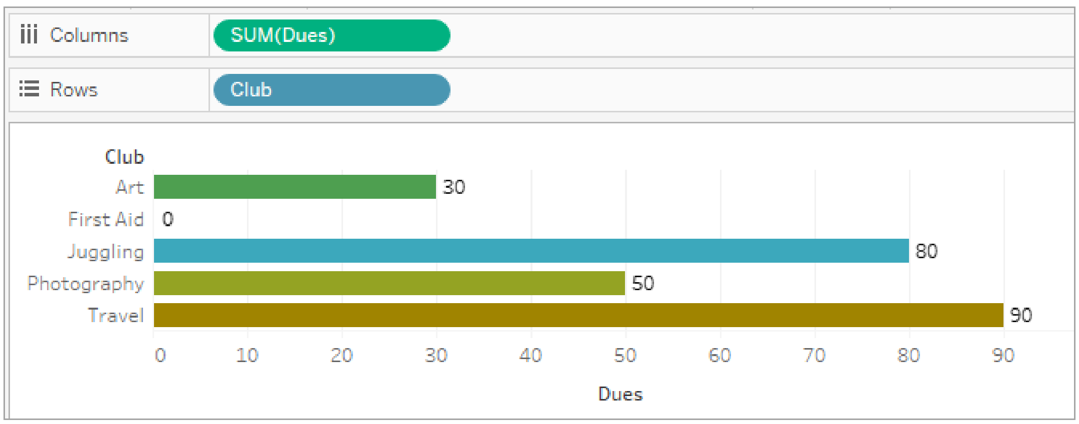
1. A measure without a dimension is table scoped to its overall value.



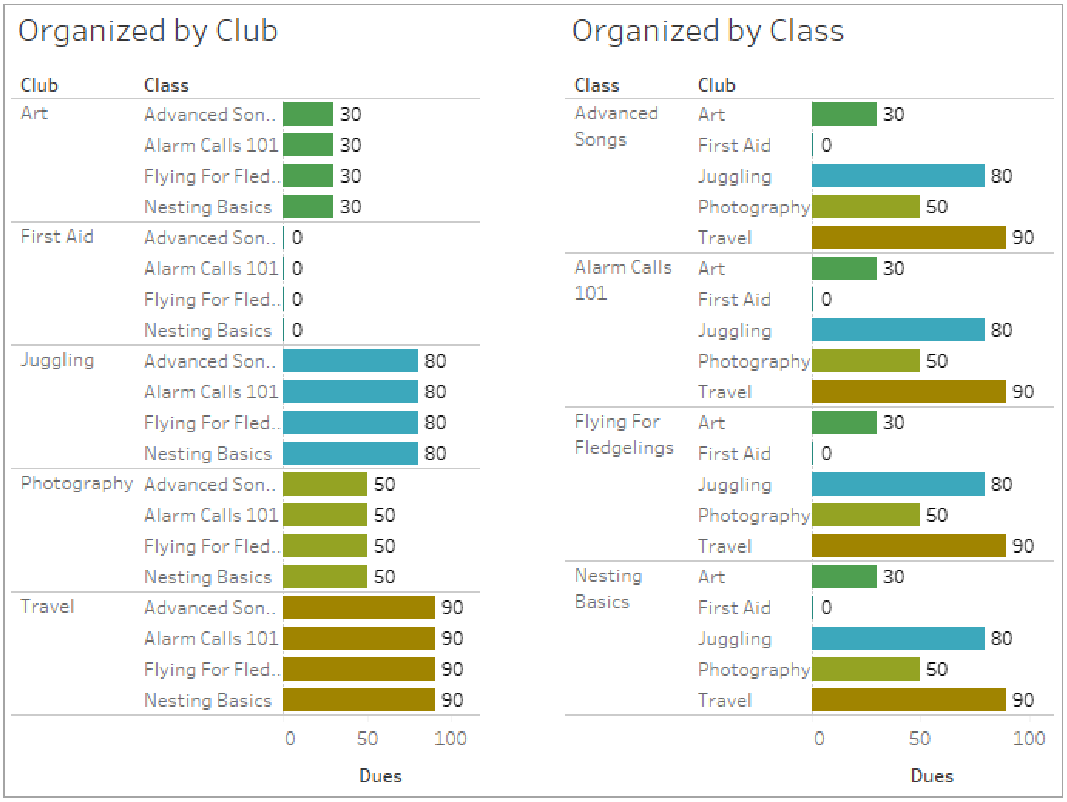

2. A measure, in the presence of an unrelated dimension alone, is table scoped and repeated for the unrelated dimension's members.




3. A measure in the presence of related dimension is broken down more granularly and its value is computed per member of the related dimension.




4. A measure, in the presence of an unrelated dimension and a related dimension, is broken down by the dimension it's related to. Wherever those related dimension members are repeated for unrelated dimensions, the measure value trails along with its related dimension member.




Because dues are per club, the value of dues for each club is repeated every time that club is repeated.

## Unrelated dimension-measure pair

The message for the measure is:

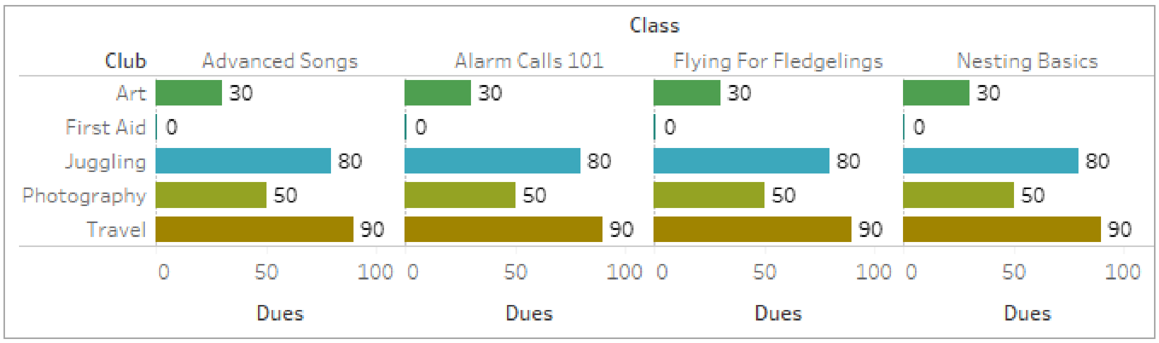
- **On a shelf**: `This measure can't be broken down by unrelated dimensions: <list of dimensions>.`
- **In the Data pane**: `If used, this measure won't be broken down by unrelated dimensions: <list of dimensions>`
- **Grayed out in the Data pane**: `This measure isn't related to any dimensions in the viz. If used, it won't be broken down.`

The message for the dimension is:

- **On a shelf**: `This dimension can't break down unrelated measures: <list of measures>`

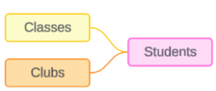
- **In the Data pane**: `If used, this dimension won't break down unrelated measures: <list of measures>`
- **Grayed out in the Data pane**: `This dimension isn't related to any measures in the viz. If used, it won't break down measure values.`

The result in a viz is a repeated value for the measure across the unrelated dimension's values. This behavior is similar to when an LOD expression is used to set the level of aggregation for a measure at a different level of detail from the native granularity of the viz. An unrelated dimension is essentially EXCLUDED from the computation of the measure's aggregated value.




## Measure from a shared table

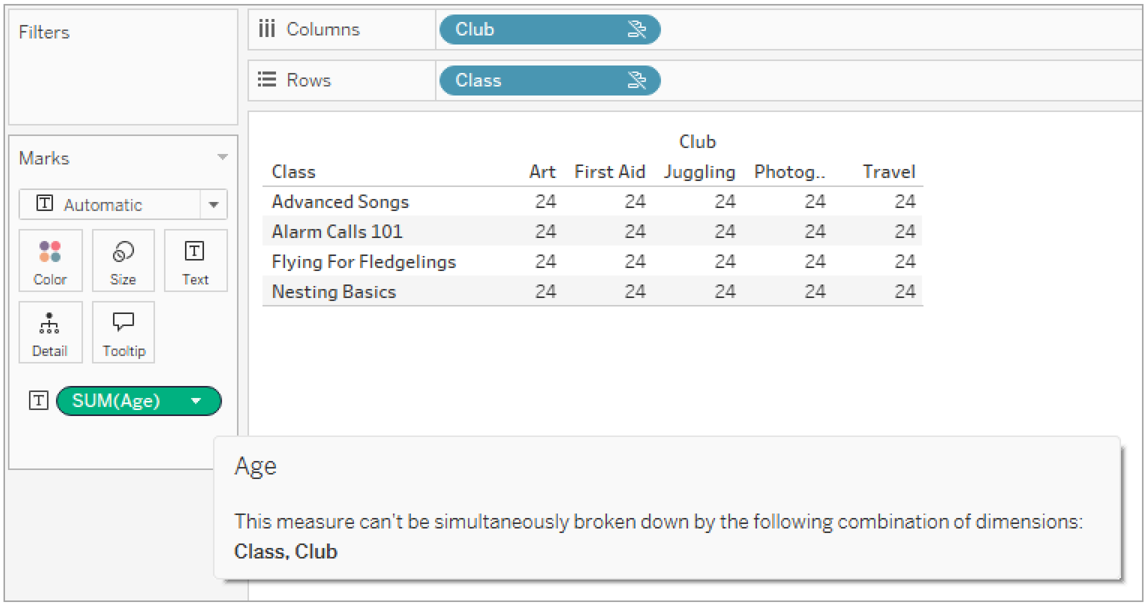
When a dimension from a shared table (like Students) is used, it stitches together the dimensions from otherwise unrelated tables (such as Classes and Clubs). But what if instead of a dimension, you use a measure from the Students table instead?




Measures can't stitch. Additionally, their value is determined by their related dimensions. In a case where there are unrelated dimensions visualized together, the measure can't be broken down by those dimensions simultaneously. In this case, we treat the measure as unrelated to the combination of dimensions even though it would be related to either dimension individually.

The message for a measure shared across unrelated dimensions is:

- **On a shelf**: `This measure can't be simultaneously broken down by the following combination of dimensions: <list of dimensions>`
- **In the Data pane**: `If used, this measure won't be broken down by the following combination of dimensions in the viz: <list of dimensions>`




To resolve this and prevent the measure from being table scoped, the unrelated dimensions could be stitched or one or more dimensions could be removed until there is a clear relationship path for aggregating the measure.

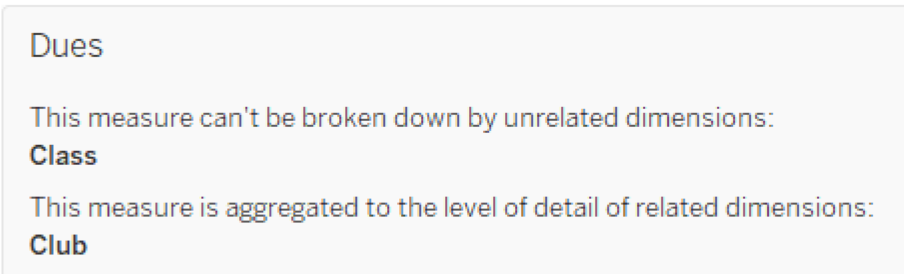
## Related measure

When a measure is related to some dimensions in the viz but not others, the measure may have an additional message in the tooltip that explains what dimensions it is related to. This can help explain how the measure is aggregated. This message only appears when the measure is also unrelated to a dimension in the viz. Otherwise, it's standard behavior that the measure is aggregated to the level of detail of its related measures.

- **On a shelf**: `This measure is aggregated to the level of detail of related dimensions: <dimensions in the viz this measure is related to>`

- **In the Data pane**: `If used, this measure will be aggregated to the level of detail of related dimensions: <dimensions in the viz this measure is related to>`

This message is intended to help identify which dimension or dimensions are considered when the measure value is computed. In the example of clubs and dues and classes, the tooltip for the measure clarifies the value is aggregated at the level of detail of Club and repeated for the dimension Classes.




## Filters

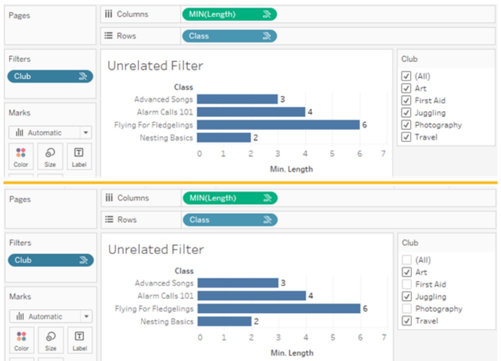
Relatedness is also evaluated for fields on the filter shelf compared to fields otherwise active in the viz.

An icon and tooltip appears when a filter is unrelated to at least one field in the viz. Both the filter field and field in the viz have a tooltip.

The message for an unrelated filter is:

- **On the filter shelf**: `This filter doesn't apply to unrelated fields: <fields>`
- **In the viz**: `This field isn't filtered by unrelated filters: <fields>`
- **In the Data pane**: `If used, this field will be ignored by unrelated filters: <fields>`

The behavior of filters also depends on their relatedness to other fields in the viz. A filter doesn't impact the values of fields it isn't related to. Unless the filter is set to no values (excluding everything or including nothing), the viz will remain unchanged for any fields that aren't related to the filter. However, deselecting every option in the filter will return a blank viz.




Two screenshots of viz with an unrelated filter, showing that deselecting options in the interactive filter control doesn't impact the viz

Related fields are filtered as expected. In a more complex viz with a combination of related and unrelated fields (such as in a stitching context), the filter will only impact values that are related to the filter field.

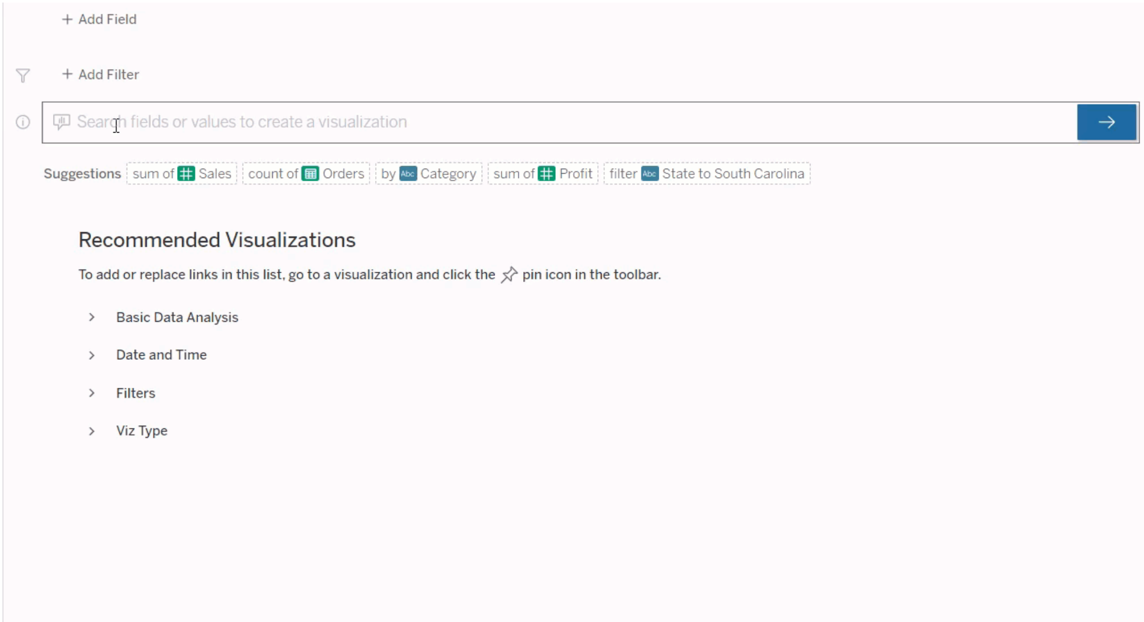
# Automatically Build Views with Ask Data

**Important changes for Ask Data and Metrics**

Tableau's Ask Data and Metrics features were retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see *How Tableau AI and Tableau Pulse are reimagining the data experience.*

Ask Data lets you type a question in common language and instantly get a response right in Tableau. Answers come in the form of automatic data visualizations, with no need to manually drag-and-drop fields or understand the nuances of your data's structure.

Ask Data lets you ask sophisticated questions naturally, with support for key analytical concepts such as time series and spatial analysis, and an understanding of conversational phrases such as "last year" and "most popular."

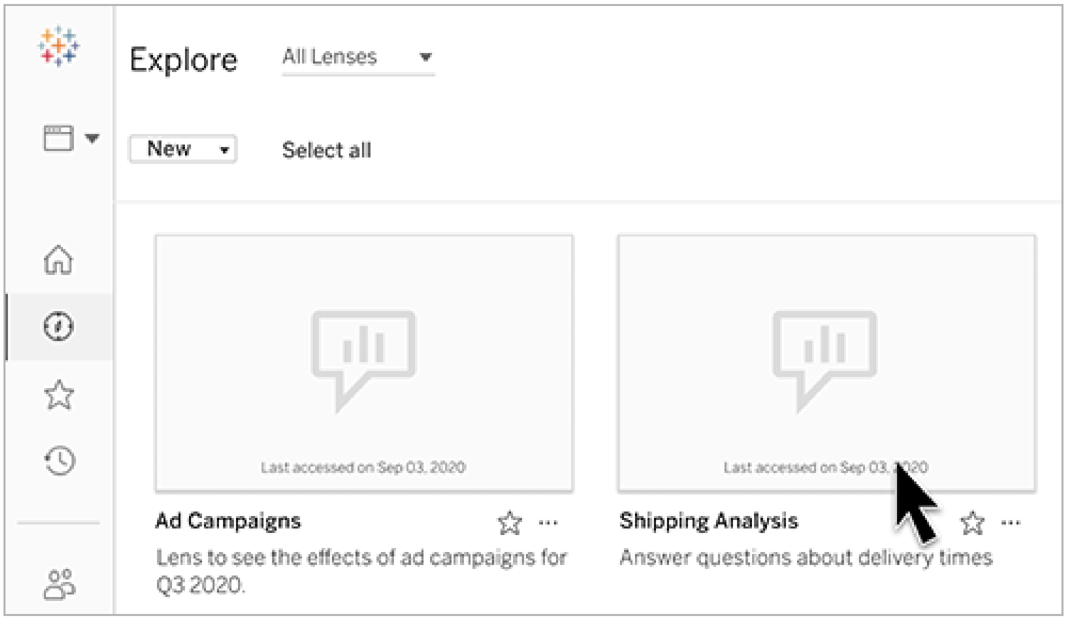



## Navigating to Ask Data lenses

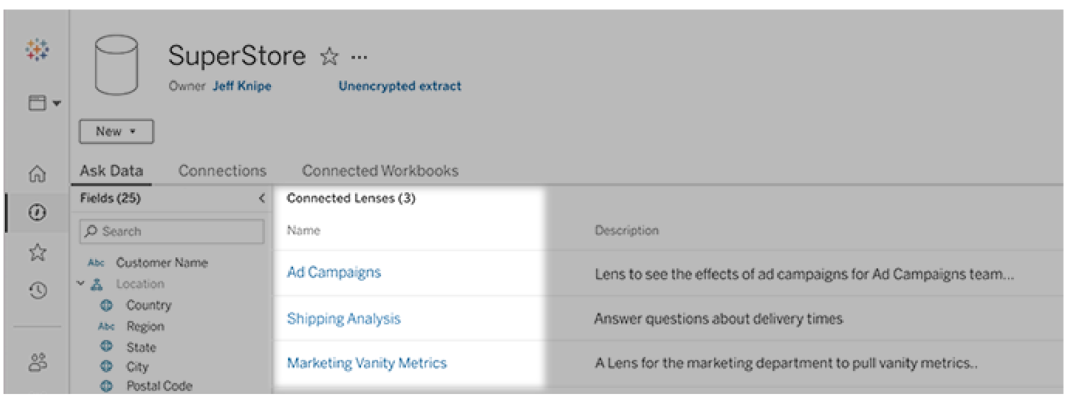
Before you can query a data source with Ask Data, a Tableau author must first create a lens that specifies the subset of data fields the lens uses.

In Tableau, here are all the places where you can access an Ask Data lens:

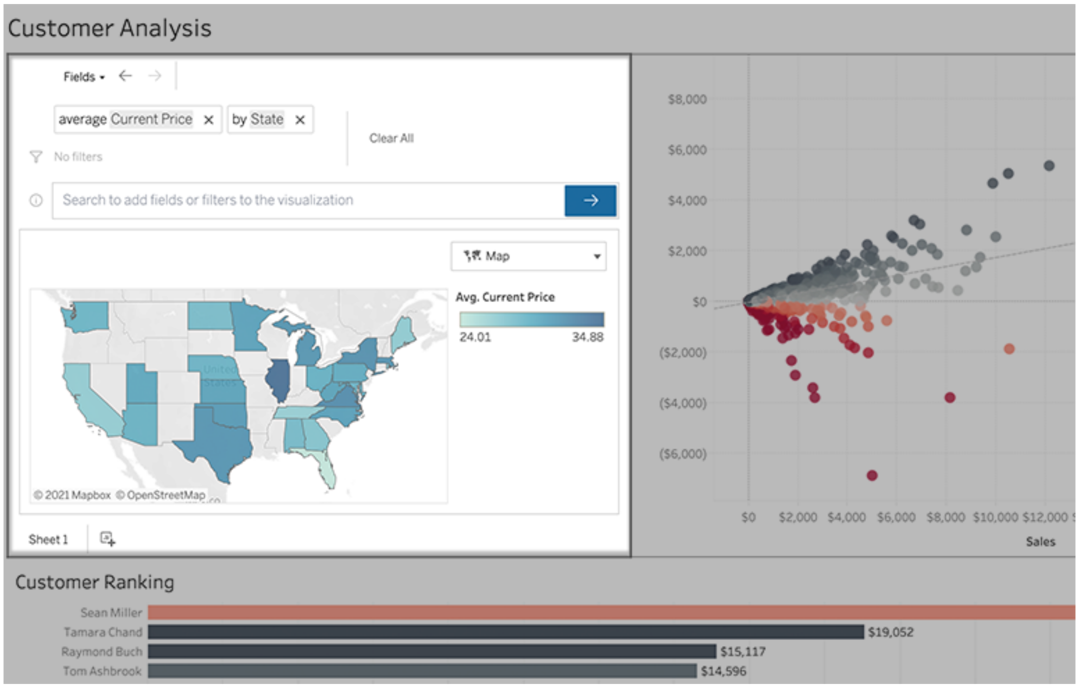
- On the All Lenses page at the top level of your Tableau Cloud or Tableau Server site.




- On the Ask Data tab for a data source for which lenses have been created.



- In an Ask Data object on a dashboard.

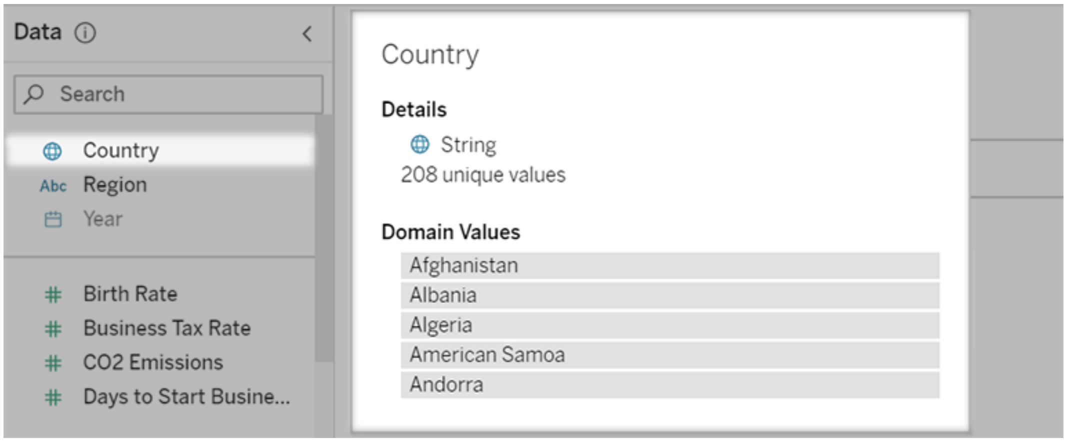



# Ask Data from a lens page or dashboard object

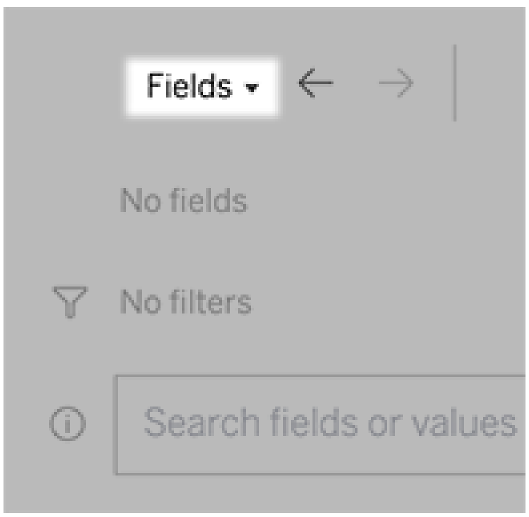
## Navigate to a lens and learn more about its data

1. Navigate to a lens via the All Lenses page for your Tableau site, the Ask Data tab for a data source, or an Ask Data object on a dashboard.
2. (Optional) Under **Recommended Visualizations**, click an entry to quickly see visualizations the lens author has created for your organization.

   If the recommendations don't address your current data analysis needs, build a query to create your own question.
3. In the Data pane at left, briefly hover over each field to learn more about the data it contains.

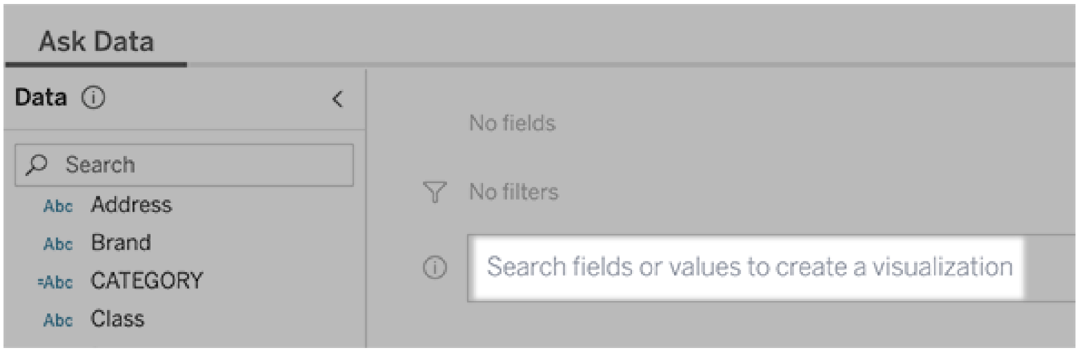



In a narrower dashboard object, the Data pane may be hidden, but you can see the same information by clicking the **Fields** drop-down menu.

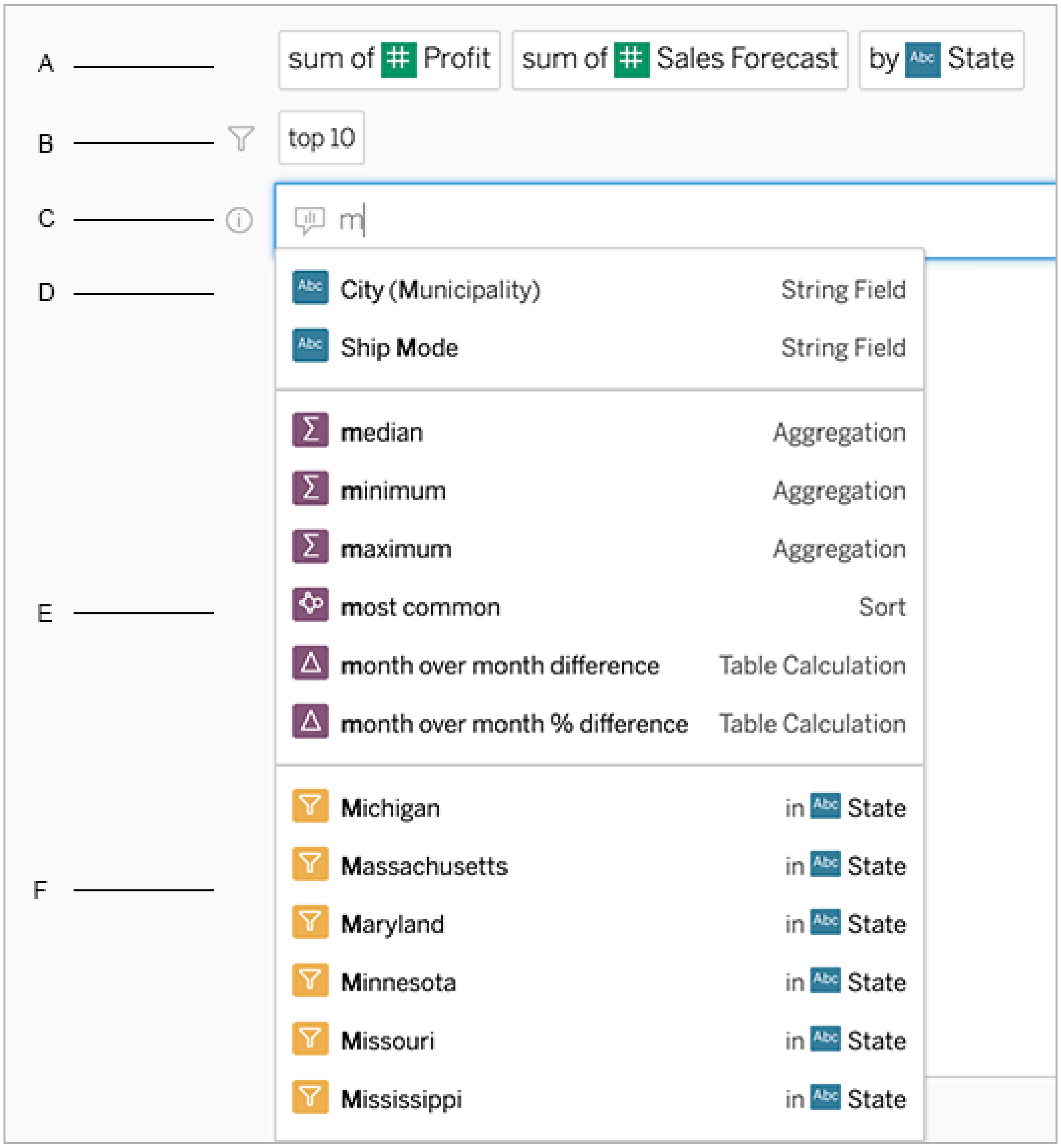


## Build queries by entering text

1. Type in the box reading **Search fields or values to create a visualization**.




2. As you type, Ask Data searches data fields, functions, and string values and displays results in a drop-down list. Click items in the list to add them to your current entry, shown above the search box. To automatically create a viz using the current entry, press **Enter** at any time.



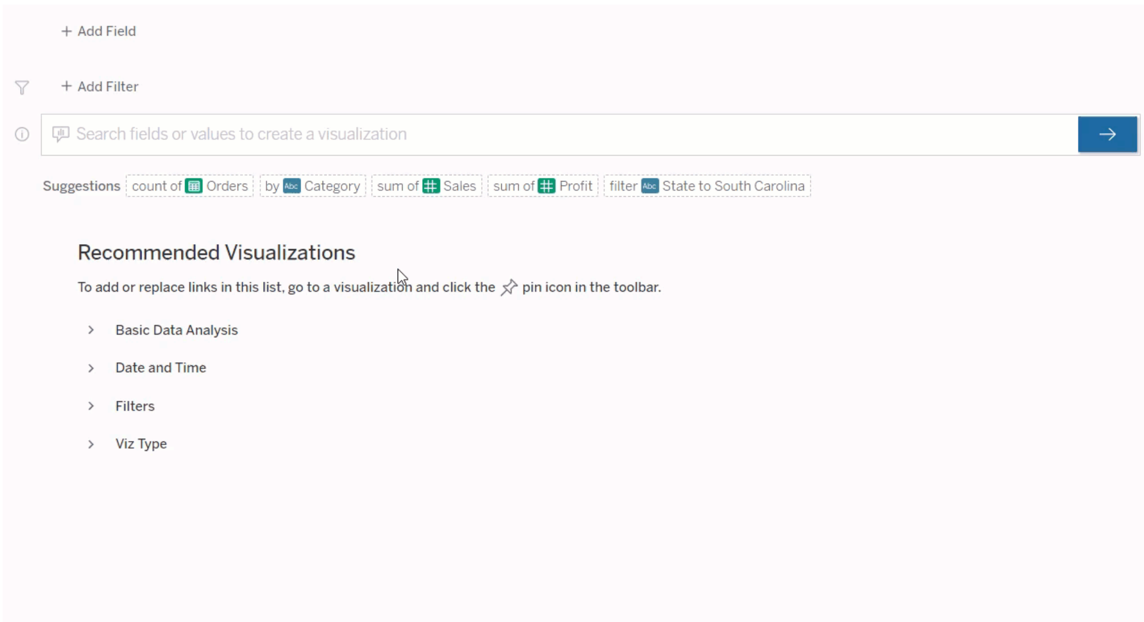

Modifying a query by searching for fields and analytical functions

A. Current entry B. Current filters C. Search box D. Returned fields E. Returned analytical functions F. Returned field values

## Build queries by adding suggested phrases

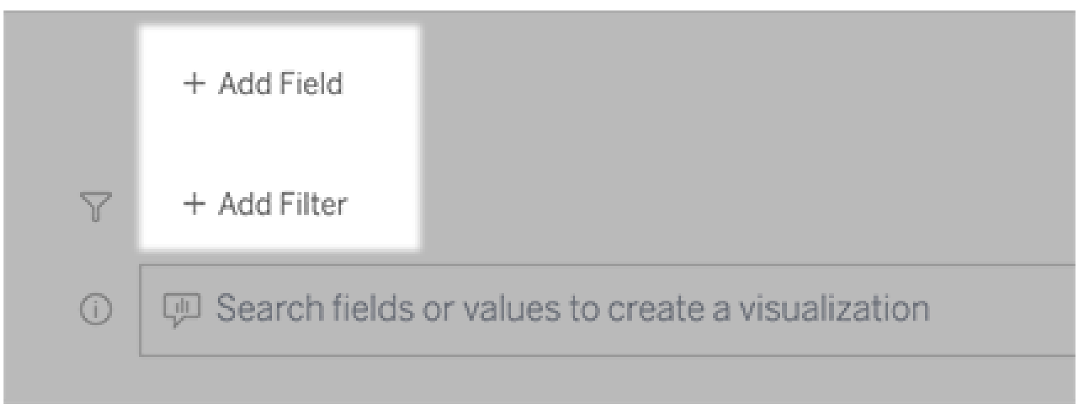
Tableau will suggest phrases based on the most common queries asked in your lens and by others in your organization. When you open your lens, you'll notice suggestions that will help you get quick answers to common questions.

You can add these suggestions to your query by clicking them. As you add phrases to your query, the suggestions dynamically update with more relevant phrases. The view automatically builds with each selection.

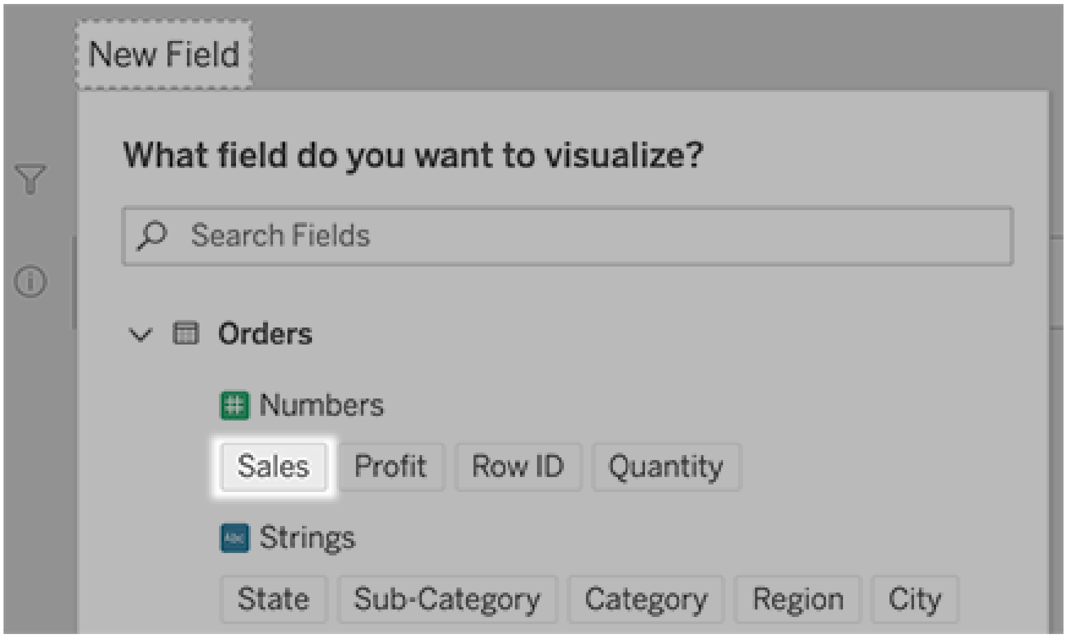



## Build queries by adding fields and filters

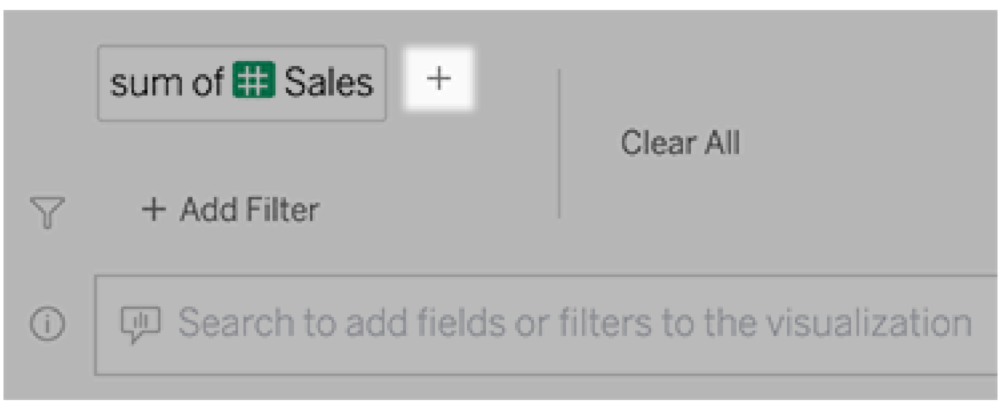
1. Click **Add Field** or **Add Filter**.



2. Click the desired field. (To narrow down a long list, first type in the **Search Fields** box.)

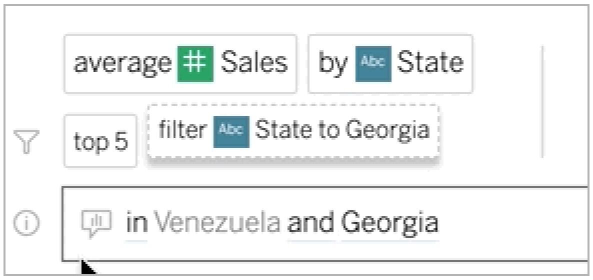



3. Set any sub-options, such as aggregation type for a numeric field, or grouping for string and date fields.
4. To add more fields or filters, click the plus sign.




## See how elements of your query are applied

To see how elements of your query are applied, hover over them in the text box or the interpretation above it. Words that aren't used are grayed out, helping you rephrase your query in a way that's clearer to Ask Data.



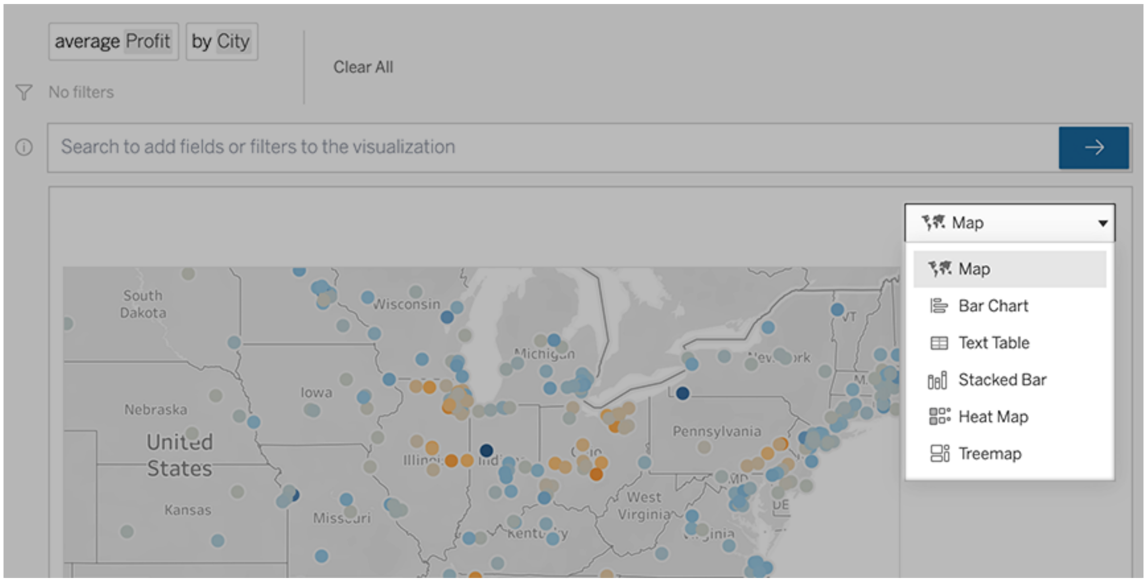

## Rephrase your question

You can rephrase questions by clicking options, data fields, and filters in the user interface.

### Change the viz type

If the default viz doesn't fully reveal your data, click the menu at upper right, and choose from these supported viz types:

- Bar Chart
- Gantt Bar
- Heat Map
- Histogram
- Line Chart
- Map
- Pie Chart
- Scatter
- Stacked Bar Chart
- Text Table
- Treemap



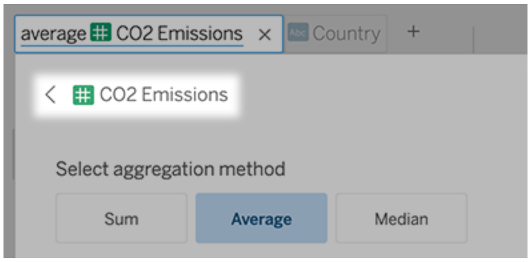

**Note:** To automatically create certain viz types, Ask Data sometimes adds fields such as "Number of Records" to your entries.

## Change fields, filters, and displayed data

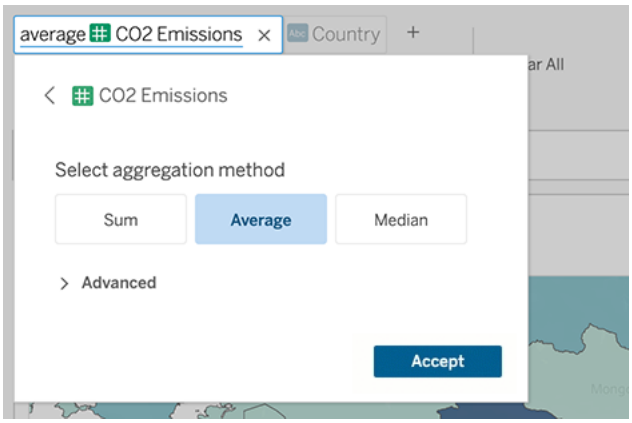
Ask Data gives you several ways to fine-tune how field values are displayed.

- To switch the fields used for the vertical and horizontal axes, click the Swap Axes button  to the left of the viz selection menu:

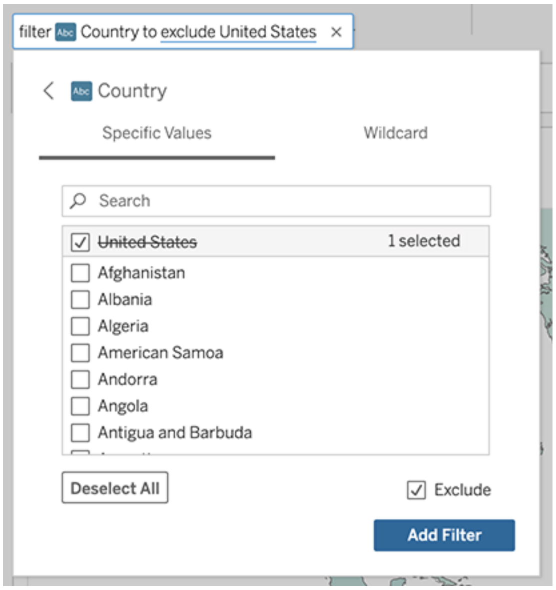

- To change a field, first click it in your query entry, and then click the field name below. (To change fields used in difference calculations, see Compare differences over time.)



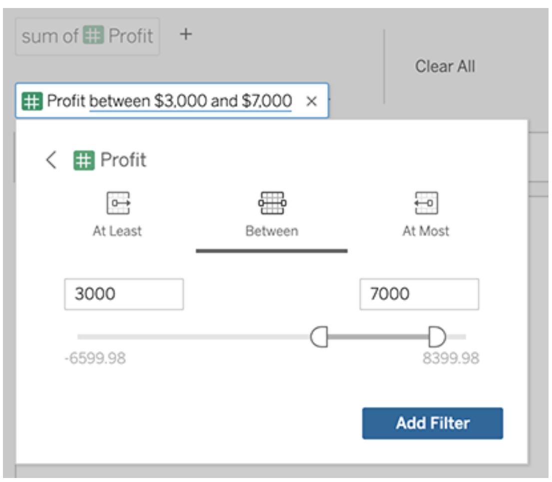

- To change a field's aggregation or grouping type (for example, from average to sum), click the field name in the text box, and then choose a different aggregation or grouping.




- For categorical filters, click values (for example, "exclude United States" in the example below) to change specific values or enter wildcard parameters.




- To adjust a numeric range, click words such as "high" or "cheap."




- To delete a field or filter, hover over it and click the **X**.

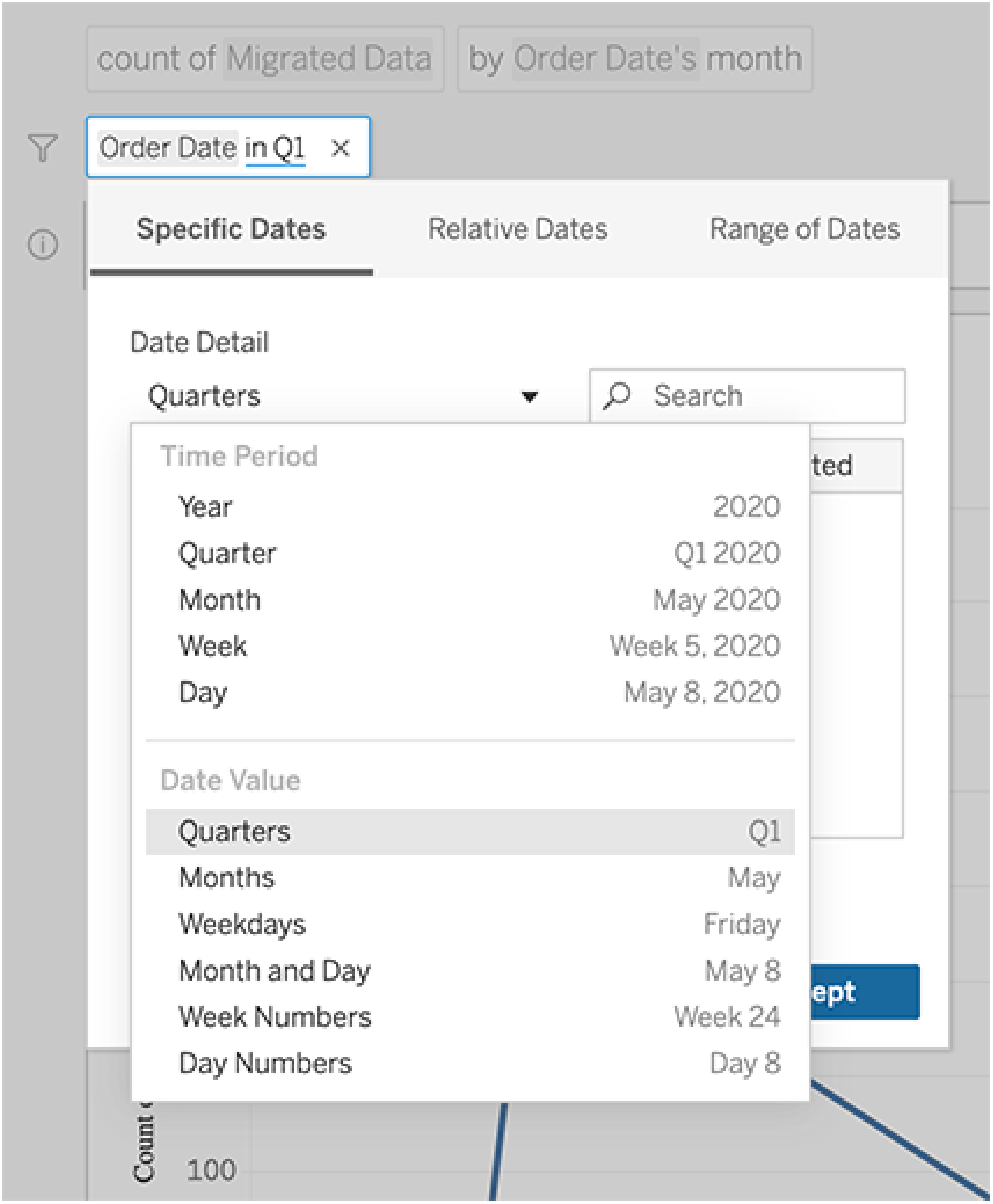
## Adjust date filters

To adjust a date filter, click words such as "last" or "previous." Then click one of the following:

- **Specific Dates** to enter a specific time period or date value
- **Relative Dates** to show a date range relative to the present day
- **Range of Dates** to enter specific start and end points

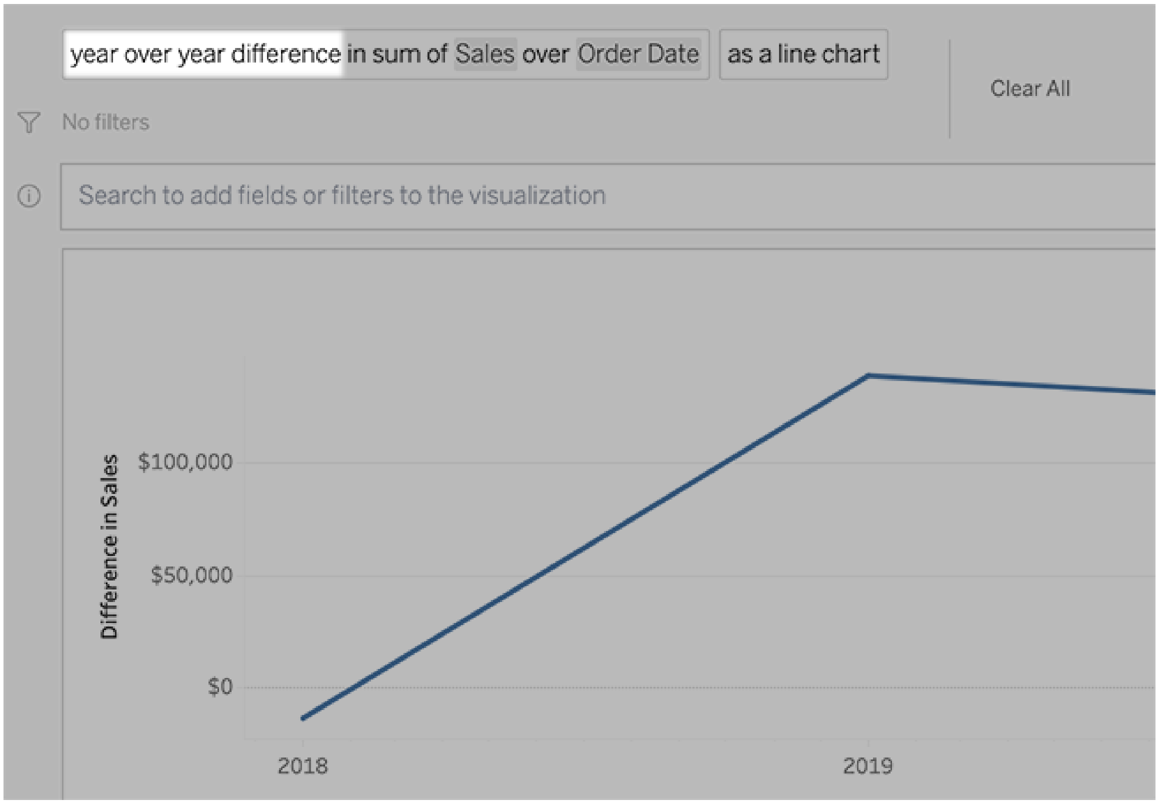
**Specific Dates** offers some unique options in the **Date Detail** menu:

- **Time Period** options show a single continuous date range
- **Date Value** options show ranges that can repeat in multiple time periods. For example, to see combined sales performance for Q1 across multiple years, under Date Value, you would choose Quarters.

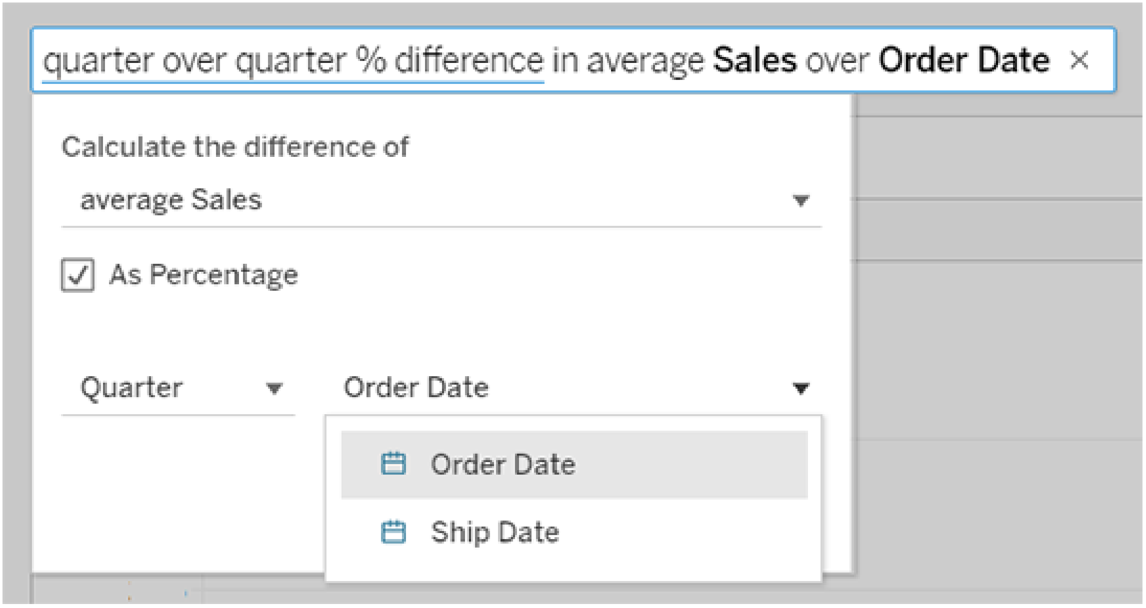

count of Migrated Data
by Order Date's month
Order Date in Q1
Specific Dates
Relative Dates
Range of Dates
Date Detail
Quarters
Search
Time Period
Year 2020
Quarter Q1 2020
Month May 2020
Week Week 5, 2020
Day May 8, 2020
Date Value
Quarters Q1
Months May
Weekdays Friday
Month and Day May 8
Week Numbers Week 24
Day Numbers Day 8
100

## Compare differences over time

Ask Data lets you compare time periods with phrases such as "year over year" or "quarter over quarter." The results appear as difference or percent difference table calculations in workbooks you save from Ask Data.




In the text box, click a difference calculation to choose other fields, aggregation methods, and time periods.




## Apply simple calculations

Ask Data supports simple calculations between two measures, which you can apply using these symbols:

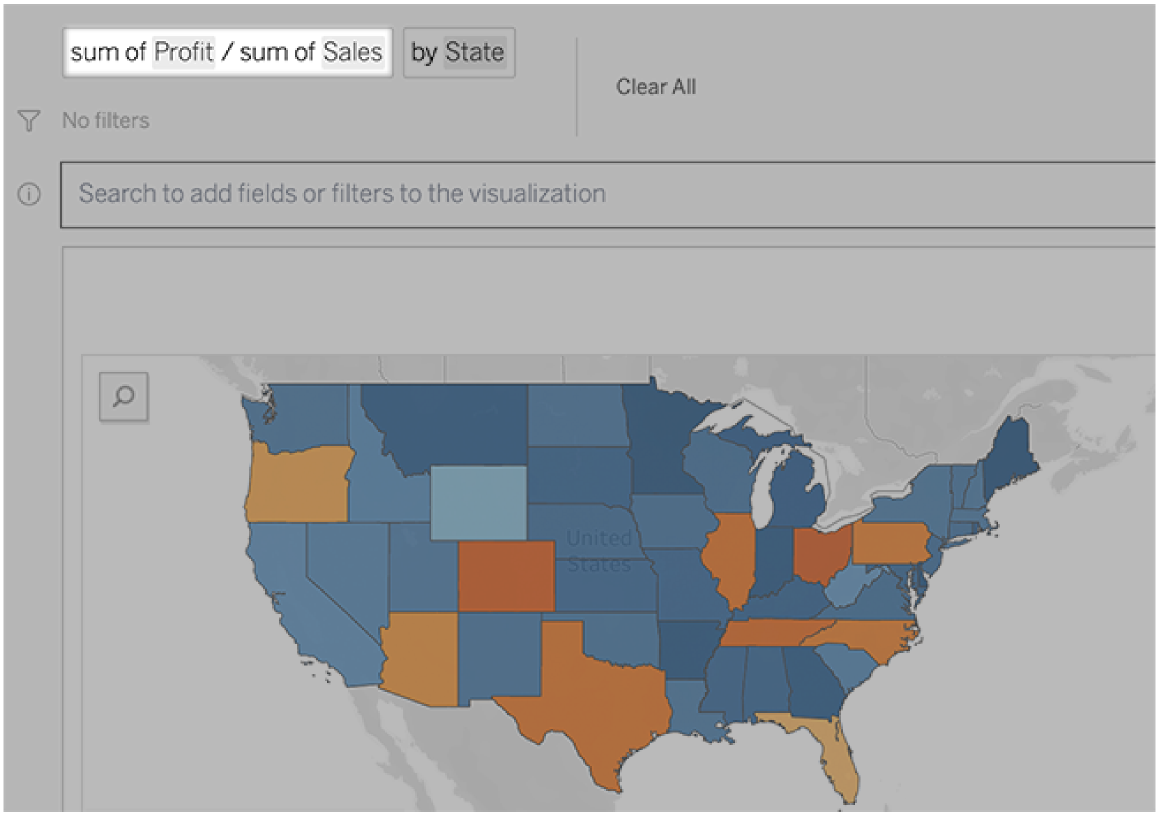
**+** sums the measures

**-** produces the difference between them

***** multiplies

**/** divides

In workbooks you save from Ask Data, these calculations don't become calculated fields but instead ad hoc calculations on the Columns, Rows, or Marks shelves.

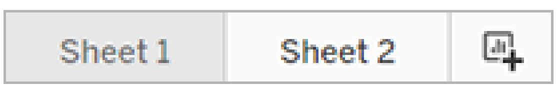



## Add sheets with other vizzes

To quickly create multiple different vizzes from a lens, add sheets in Ask Data.

At the bottom of the web page, do any of the following:

- Click the **Add Sheet** icon to the right of named sheets.




- Right-click a sheet name, and choose either **Duplicate** or **Delete**.

  (To rename sheets from Ask Data, you need to save them in a new workbook.)

## Share Ask Data vizzes via email, Slack, or a link

You can quickly share Ask Data vizzes with anyone who has access to a lens.

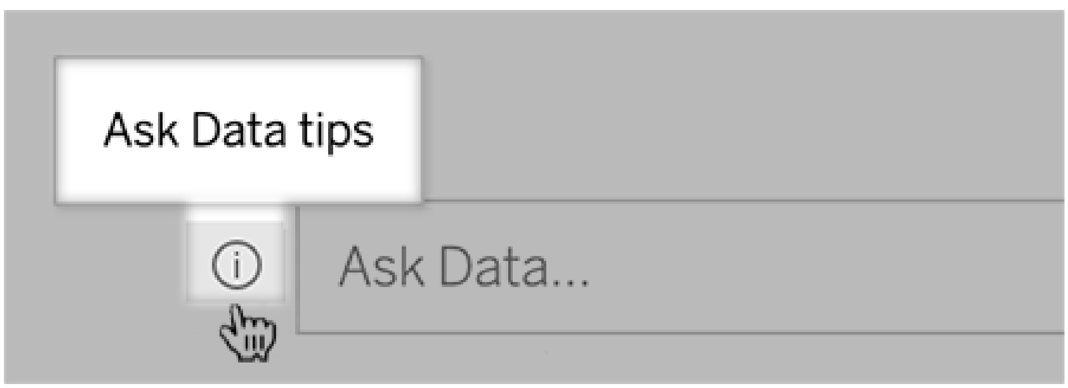
1. In the upper right corner of the browser, click the Share icon.


2. Do either of the following:
   - To share the viz via email or Slack, enter specific user names in the text box. (Email and Slack integration must previously be configured by your Tableau administrator.)
   - To copy a URL you can paste into custom emails and other messages, click **Copy Link**.

## Send feedback to the lens owner

If you have questions about the structure of a lens or how best to use it with Ask Data, you can send feedback directly to the author. (This option is enabled by default, but lens authors may disable it.)

1. To the left of the query box for Ask Data, click the **Ask Data tips** icon.




2. At the bottom of the tips dialog, click **Contact the Lens Author**.

## Tips for successful queries

As you structure questions for Ask Data, apply these tips to get better results.

- **Use keywords** — For example, instead of "I want to see all the countries that these airports are in, try "by airport and country."
- **Use exact wording for field names and values** — For example, if your lens includes Airport Code, Airport Name, and Airport Region fields, specify those by name.
- **See a ranked list** — Ask Data maps terms such as "best" and "worst" to Top 1 and Bottom 1, respectively. If you want to see broader rankings, use "high" and "low" instead. For example, enter "houses with low sale prices."
- **Query table calculations** — In query expressions for table calculation fields, note that you can't filter, limit, or include "year over year difference."
- **Surround unusually long values with quotation marks** — To analyze long field values that contain line returns, tabs, or more than ten words, surround them with quotation marks. To improve performance, Ask Data doesn't index fields of that length, or anything beyond the first 200,000 unique field values.

## Create Lenses that Focus Ask Data for Specific Audiences

**Important changes for Ask Data and Metrics**

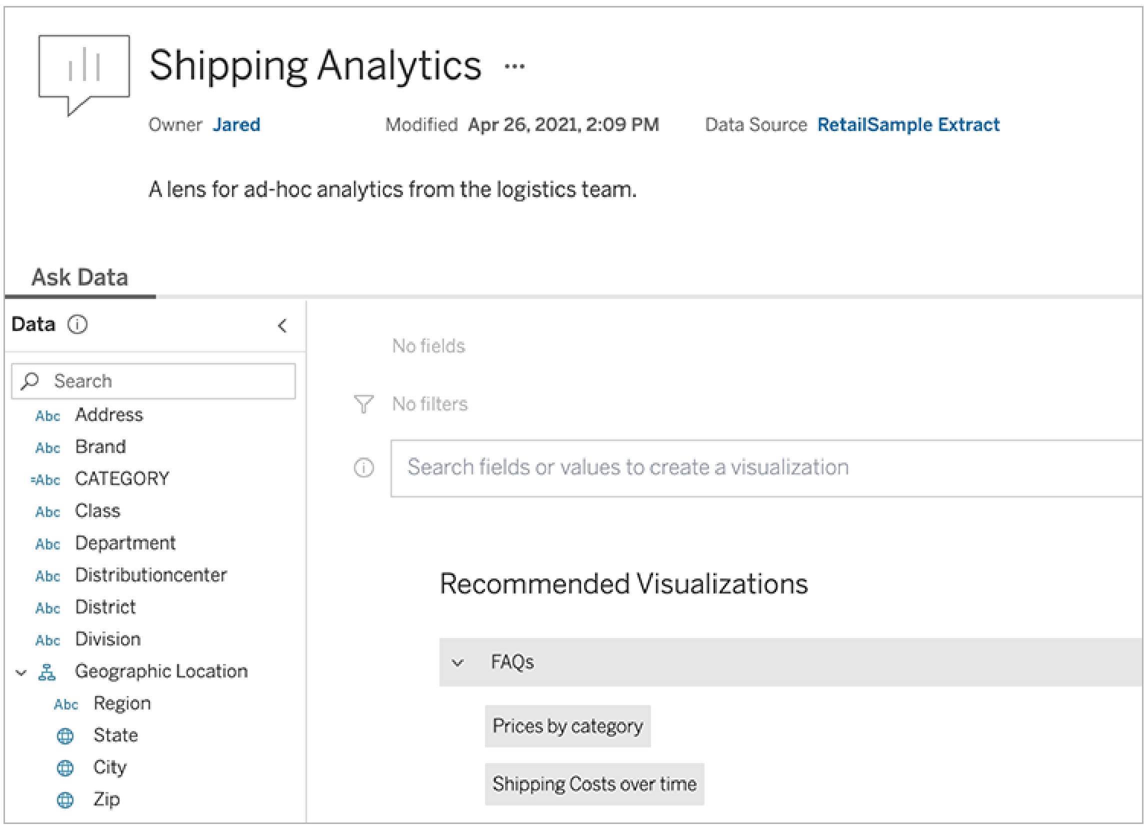
Tableau's Ask Data and Metrics features were retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see *How Tableau AI and Tableau Pulse are reimagining the data experience.*

Most people don't need information from an entire data source but instead want data visualizations relevant to their job function, like sales, marketing, or support. To optimize Ask Data for different audiences like these, Tableau authors create separate Ask Data *lenses*, which query a selected subset of fields. For the selected fields, authors can specify synonyms for field names and values, reflecting terms the lens audience uses in common language (for example, "SF" for "San Francisco"). Lens authors then customize the recommended visualizations that appear below the Ask Data query box, which provide answers to users with a single click.

**Note:** Ask Data lenses can be created only for data sources published separately to a Tableau site. Lenses can't be created for data sources embedded in workbooks or those with a virtual connection.

## Create or configure a lens page on your Tableau site

On your Tableau site, each lens has a separate page where users can query Ask Data and authors can configure lens fields, synonyms, and suggested questions.

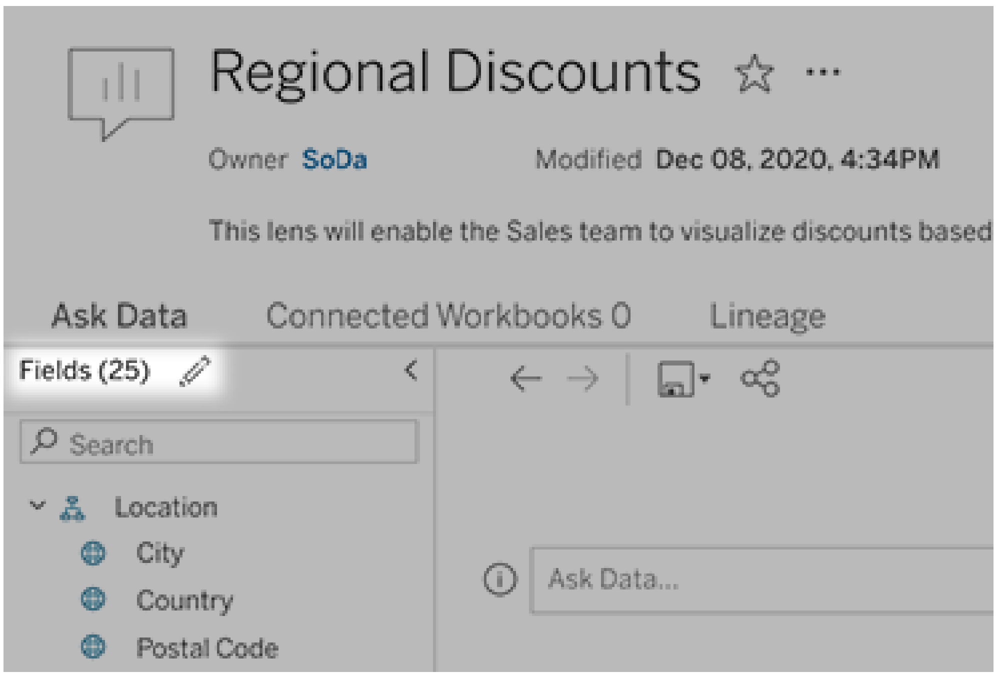



A lens page on a Tableau site

1. To create a lens page on your Tableau site, go to a data source page, and choose **New** > **Ask Data Lens**.

   To configure an existing lens, go to the lens page on your site. (From an Ask Data object in a dashboard, you can click the pop-up menu in the upper corner and choose **Go to Lens Page**.)

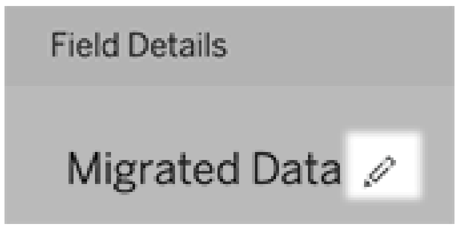
2. If you're creating a new lens, enter a name, description, and project location, and then click **Publish Lens**.
3. At the top of the Fields pane at left, click the pencil icon. Then select the relevant fields for lens users, and click **Save**.




4. At left, hover over individual tables or fields, and click the pencil icon:


Then do any of the following:

- Provide a more representative name by clicking the pencil icon to the right.



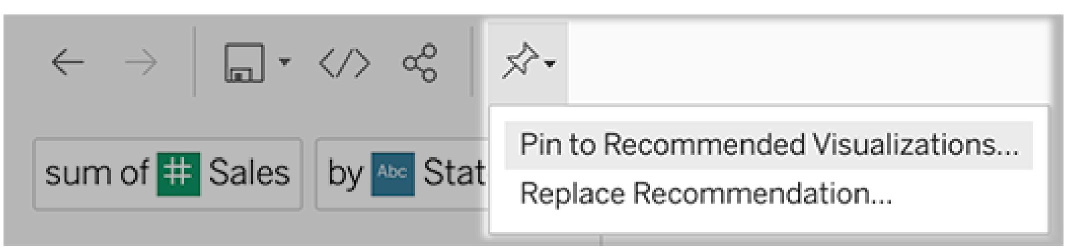

- Add common synonyms for field names and values that lens users may enter in their queries.
- Edit descriptions that appear when users hover over fields.

## Change the list of recommended visualizations

To address common queries from lens users, you can customize the recommended visualizations that appear below the query box.

Add or replace a recommended visualization

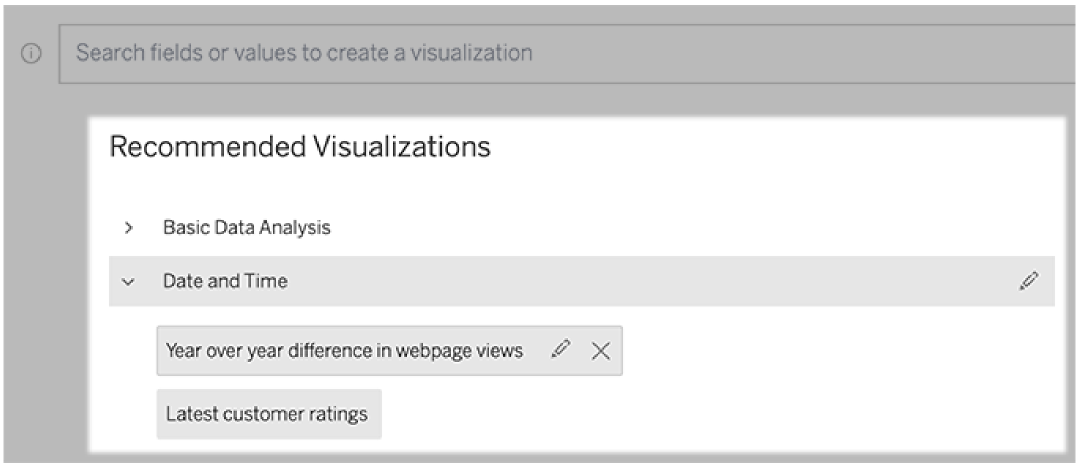
1. Enter a query into the text box, and press Enter or Return.
2. After the visualization appears, from the pin icon in the toolbar, choose either **Pin to Recommended Visualizations** or **Replace Recommendation**.



3. For a new recommendation, enter a name, and choose the section in which you want it to appear. For a replacement recommendation, choose the existing one you want to overwrite.

Edit section titles and recommendation names, or delete recommendations

- To edit a section title, click the pencil icon  to the right of the title.
- To change the name of a recommendation, hover over it and click the pencil icon . To delete a recommendation, click the X.

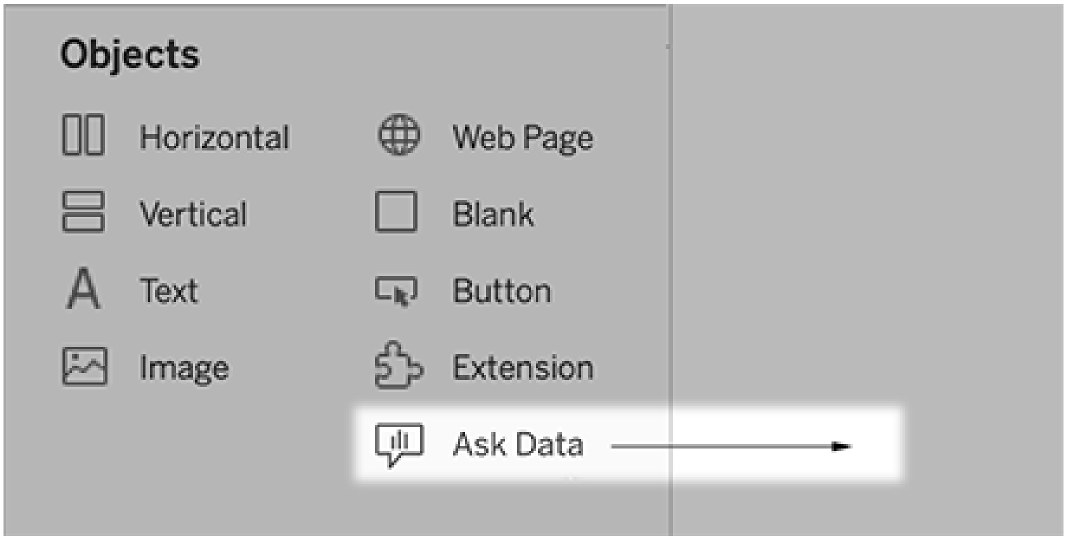



## Add an Ask Data lens to a dashboard

On a dashboard, you can add an Ask Data object that lets users query a published data source via a lens on your Tableau site.

1. While editing a dashboard in Tableau Cloud or Tableau Server, drag the Ask Data object to the canvas.

> **Note:** In Tableau Desktop, you can also drag an Ask Data object to the canvas for placement purposes. But to select a lens, you will need publish to Tableau Cloud or Tableau Server and edit the object there.

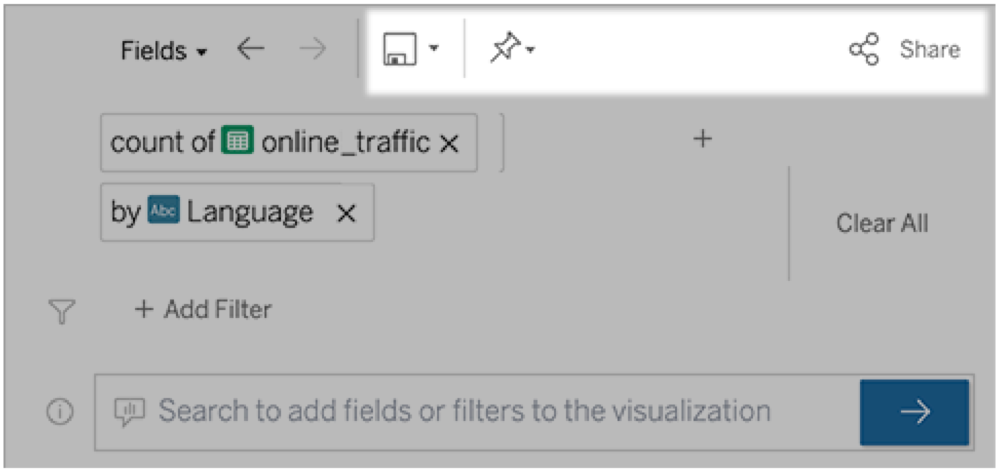
2. 


3. Select a published data source previously connected to the workbook.
4. To use an existing lens, select it, and click **Use Lens**.

   Or, to create a new lens, do one of the following:

   - If there are no lenses for the data source, click **Go to Data Source Page**.
   - If lenses already exist, click the data source name at the bottom of the dialog.
5. (New lenses only) Complete the steps in Create or configure a lens page on your Tableau site.
6. Under **Toolbar Options for Lens Users**, select the buttons you want available to users.
   - **Add Visualization to Pins** lets users add to the Recommended Visualizations list, which appears just below the query box.
   - **Publish as Workbook** lets users save visualizations as workbook sheets to their Tableau site.
   - **Share Visualization** lets users share via email, Slack, or a link.

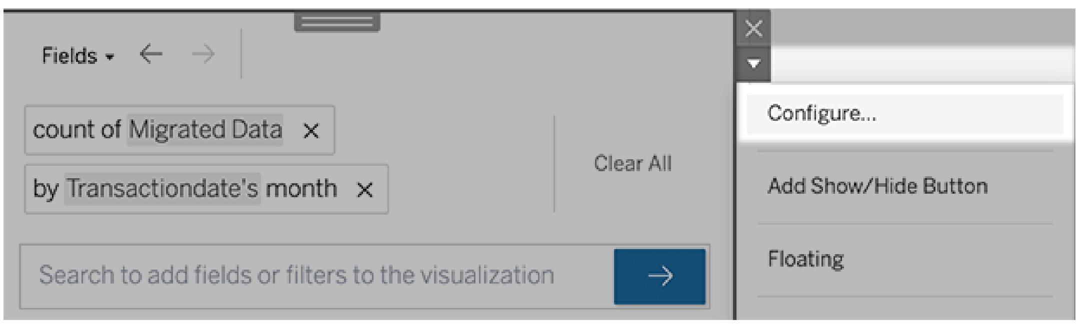
     In the lens, the publish (save icon), pin, and share options appear in the upper right corner:




7. (New lenses only) After you finish creating the lens, return to the Lens object in your dashboard, and click **Refresh**. Then select the new lens, and click **Use Lens**.

## Apply a different lens to an Ask Data dashboard object

1. From the pop-up menu at the top of the object, choose **Configure**.




2. Go to Add an Ask Data lens to a dashboard, and repeat steps 2 onward.

## Change a lens name, description, or project location

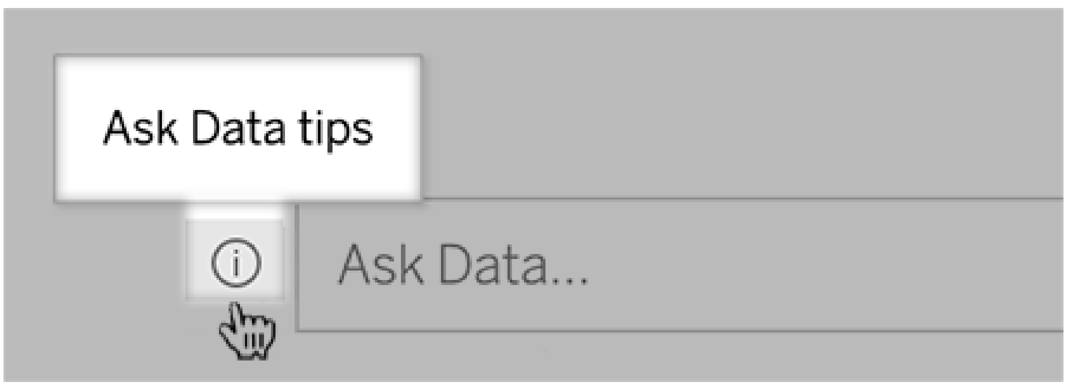
1. Navigate to the lens page on Tableau Cloud or Tableau Server.
2. To the right of the lens name at the top of the page, click the three dots (...), and choose **Edit Workbook**.
3. Click **Edit Lens Details**.

## See how people use Ask Data with a lens

For data source owners and lens authors, Ask Data provides a dashboard that reveals the most popular queries and fields, the number of visualization results that users clicked, and other helpful information. Filters let you narrow data down to specific users and time ranges. These stats help you further optimize a lens to increase the success of your users.

> **Note:** If you use Tableau Server, you can access this data in the Tableau Server Repository to create custom dashboards.

1. In Tableau Server or Tableau Cloud, navigate to a lens page.
2. To the left of the Ask Data text box, click the "Ask Data tips" icon.



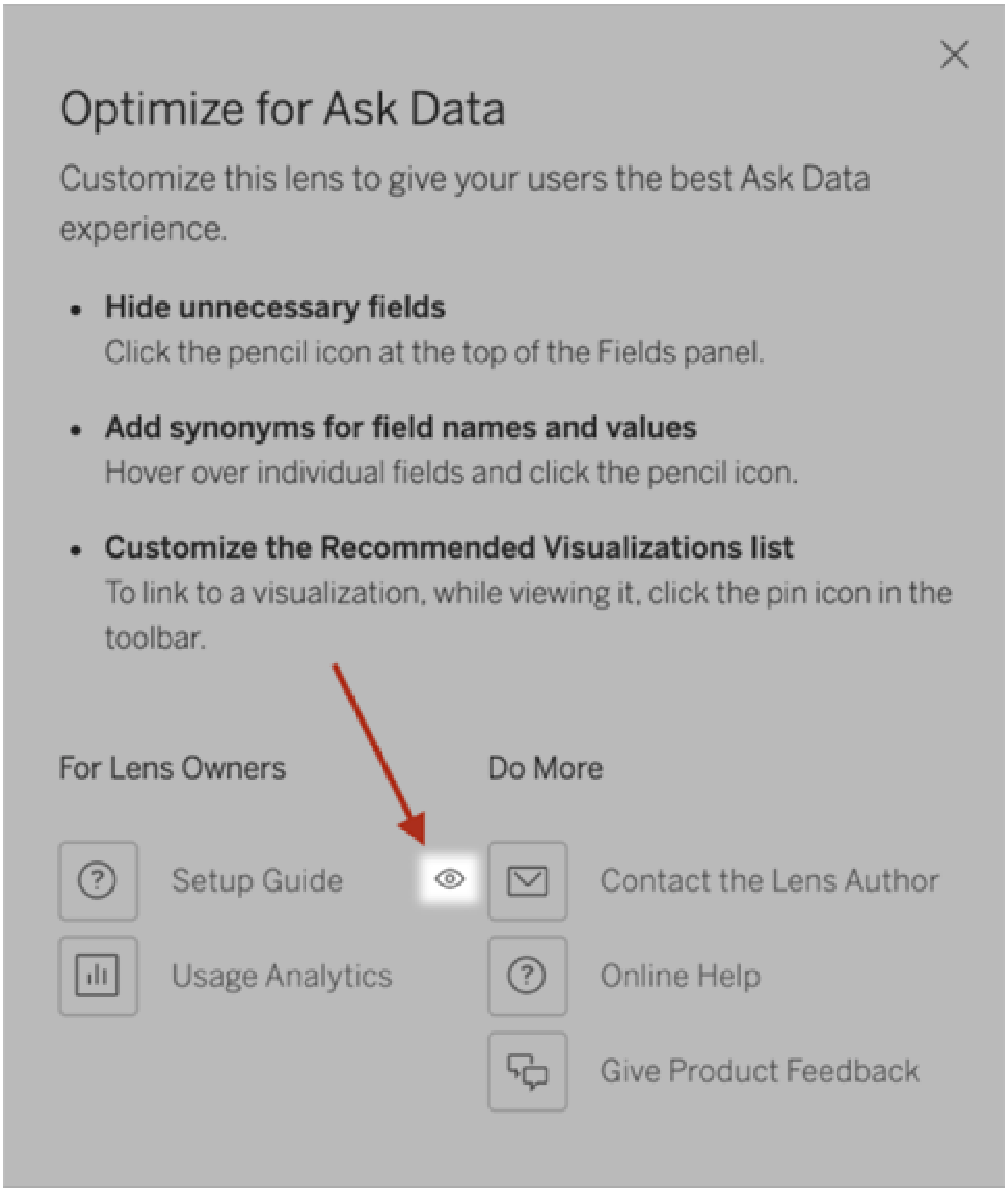

3. In the lower-left corner of the tips dialog, click **Usage Analytics**.

## Let users email you questions about a lens

As a lens owner, you can allow users to email you with questions about data structure, expected results, and more. This option is on by default, but you can turn it off using the steps below.

1. In Tableau Server or Tableau Cloud, navigate to a lens page.
2. To the left of the Ask Data text box, click the "i" shown above in See how people use Ask Data with a lens.
3. At the bottom of the tips dialog, click the eye icon next to "Contact the Lens Author" to

enable or disable feedback.




## Permissions for publishing and viewing lenses

For Ask Data objects in dashboards, no change to permissions should be required: by default, existing workbook authors can create lenses, and existing dashboard audiences can view them. But for reference, here's a detailed outline of required lens permissions for both dashboards and direct access via a data source page.

To create and publish a lens, a user needs:

- The Creator or Explorer user role
- Lens Creation permission for the data source (inherited by default from the Connect permission)
- Write permission for the parent project to which the lens is published

To access and interact with a published lens, a user needs:

- The Viewer role or above
- Connect permission for the data source
- View permission for the lens

> **Note:** By default, lens permissions like View reflect a project's permissions for workbooks. If Tableau administrators want to change default lens permissions, they can do so either individually for each project, or in bulk using the permissions API.

## Disable or Enable Ask Data for a Site

**Important changes for Ask Data and Metrics**

Tableau's Ask Data and Metrics features were retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see *How Tableau AI and Tableau Pulse are reimagining the data experience.*

Ask Data is enabled for sites by default, but Tableau administrators may disable it.

1. Go to the **General** site settings.
2. (Tableau Server only) In the **Web Authoring** section, select **Let users edit workbooks in their browser**.

3. In the **Availability of Ask Data** section, choose from these options:

    - **Enabled** enables creation of Ask Data lenses for all published data sources.
    - **Disabled** hides Ask Data throughout the site, while preserving information about previously created lenses so they can be restored if Ask Data is re-enabled.

# Optimize Data for Ask Data

**Important changes for Ask Data and Metrics**

Tableau's Ask Data and Metrics features were retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. With advances in natural language technologies, we're developing an improved interface that will make it easier to ask questions of your data and stay on top of changes. For more information, see *How Tableau AI and Tableau Pulse are reimagining the data experience.*

If you manage and publish data sources, here are some tips to help make users of Ask Data more successful. By spending a little extra time on this process, you'll open up data analysis to a wider range of people at your organization, helping them independently answer questions and gain deeper insights.

## Optimize data in Ask Data

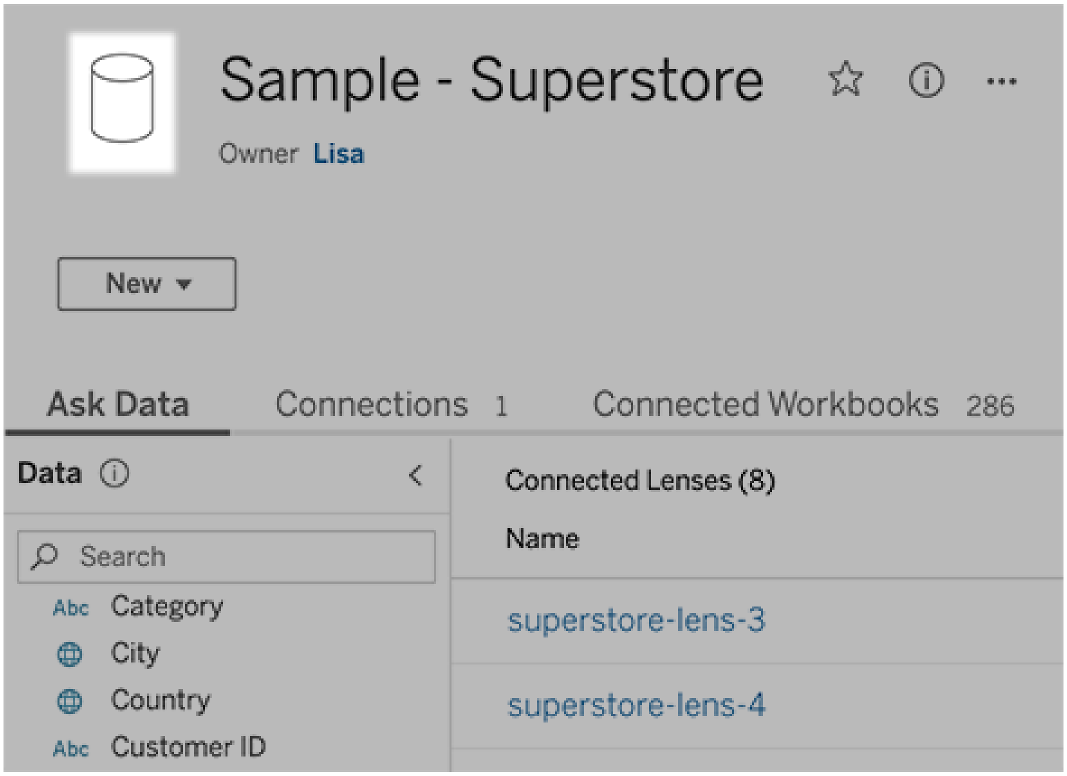
In the Data pane on the left of the Ask Data interface, data source owners can add synonyms for fields and exclude irrelevant values.

Changing settings at the data source or lens level

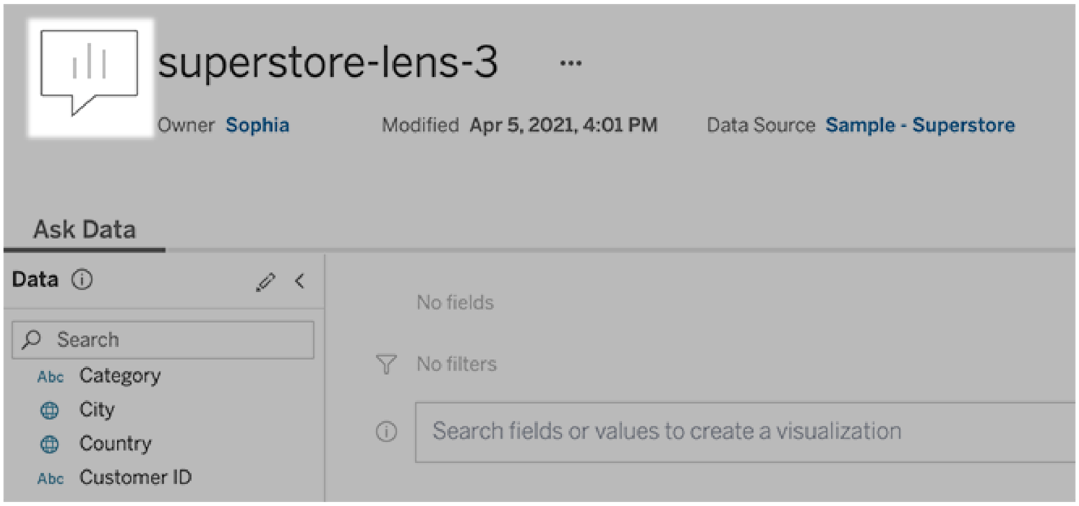
When changing settings in the Data pane for Ask Data, pay close attention to whether you're at the data source or lens level. (For more information, see Create Lenses that Focus Ask Data for Specific Audiences.)

- At the data source level, you'll see the cylindrical data source icon in the upper left corner. Here, changes you make in the Data pane will apply by default to all subsequently created lenses.

**Note:** For extracts, two cylinders will appear.




- For an individual lens, you'll see the quotation icon in the upper left corner. Here, changes you make in the Data pane will apply to this lens alone.




Add synonyms for field names and values

People may not use the same terminology found in your data source, so data source owners and Tableau administrators can add synonyms for specific data field names and values. Synonyms you enter are available throughout your organization, making data analysis quicker and easier for everyone.

Exclude values of specific fields from search results

To improve the usability of search results in Ask Data, you can exclude the values of specific fields from indexing. Though Ask Data doesn't add non-indexed values to search results, the values still appear in visualization results when relevant. For example, if you don't index values from a "Product" field because they add unnecessary detail to search results, Ask Data can still display values such as "iPhone 12" in resulting data visualizations. And users can manually add non-indexed values to queries by surrounding them with quotation marks (for example, "Sales for Product containing "iPhone 12"").

**Note:** This field-level setting is ignored if the value indexing setting for the data source is set to Disabled. Field names and related synonyms are always indexed.

1. Go to the Ask Data tab for a data source or individual lens.
2. Hover over a data source field at left, and click the **Edit Field Details** icon (the pencil).


3. Deselect **Index field values.**

   Either click the text box that appears to reindex the data source now, or let it reindex based on its regular indexing schedule.

## Optimize data sources

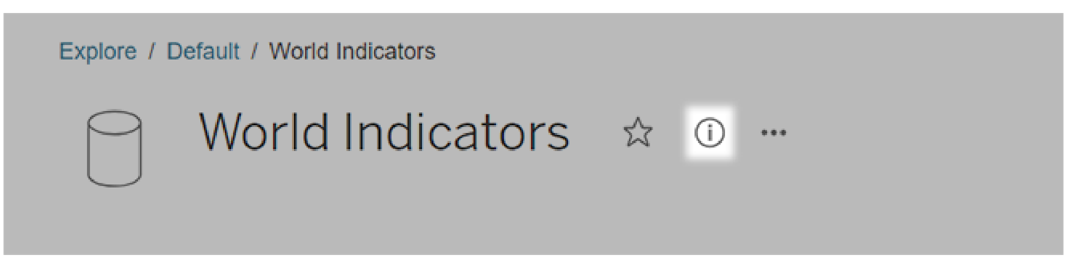
To create the best experience for Ask Data users, optimize the original data source.

> **Note:** Ask Data doesn't support multidimensional cube data sources, or non-relational data sources like Google Analytics, or data sources with a virtual connection.

### Optimize indexing for Ask Data

Data source owners can change how often field values are indexed for Ask Data, optimizing system performance.

1. At the top of a data source page, click the Details icon:



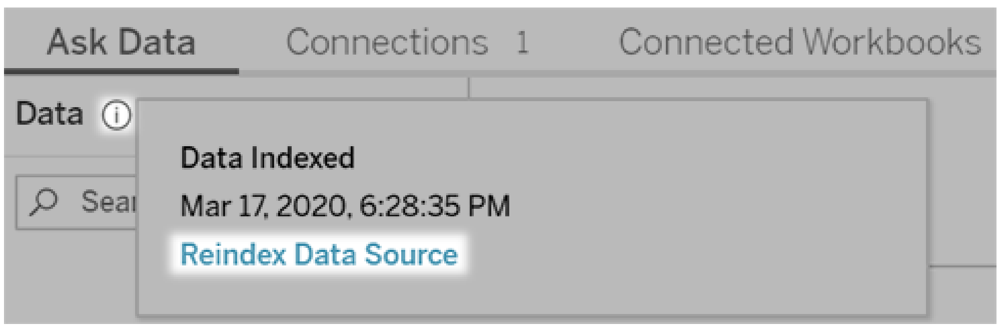

2. In the Ask Data section, click **Edit**.

3. Choose an indexing option for field values:

    - **Automatic** checks for changes every 24 hours and analyzes the data source if it is live, has had an extract refreshed, or has been republished. Choose this option for a data source frequently used with Ask Data, so it will be ready before users query it.

    - **Manual** analyzes the data source only when Tableau creators manually trigger indexing on the data source page. Choose this option if the data source changes frequently but users query it with Ask Data only occasionally.

      To trigger manual indexing, go to the data source page, click the circled "i" in the Data pane at left, and then click **Reindex Data Source**.

    - **Disabled** analyzes only field names, not values.

4. Click **Save**

Use data extracts for faster performance

For improved performance and support for large data sets, use Ask Data with published extracts rather than live data sources. For more information, see Create an extract.

Ensure that users can access the data source

To use Ask Data, users must have permission to connect to the individual data source. If a data source has row-level permissions, those permissions also apply to Ask Data, which won't recognize secure values or make related statistical recommendations.

Be aware of unsupported data source features

Ask Data supports all Tableau data source features except the following. If your data source contains these, Ask Data users won't be able to query related fields.

- Sets
- Combined fields
- Parameters

Anticipate user questions

Anticipate the kinds of questions your users will ask, and then optimize your data source for those questions using these techniques:

- Clean and shape data in Tableau Prep or a similar tool.
- Join data to include all fields users may have questions about in one table, improving performance.
- Add calculated fields that answer common user questions.
- Create bins with appropriate sizes for quantitative variables that users are likely to want to see as a histogram or another binned form.

Simplify the data

To make data easier to understand by both users and Ask Data, simplify the data source as much as possible during the data prep process.

1. Remove any unnecessary fields to improve performance.
2. Give each field a unique and meaningful name.
   - For example, if there are five field names that start with “Sales …”, better distinguish them so Ask Data can properly interpret the term “sales”.
   - Rename “Number of records” to something more meaningful. For example, use “Number of earthquakes” in a data source where each record is an earthquake.
   - Avoid field names that are numbers, dates, or boolean (“true” or “false”) values.
   - Avoid names which resemble analytical expressions such as “Sales in 2015” or “Average Products Sold”.
3. Create meaningful aliases for field values, reflecting terms people would use in conversation.

Set appropriate field defaults

To help Ask Data analyze data correctly, ensure that default field settings reflect the content of each field.

- Set data types for text, time, date, geographic, and other values.
- Assign the proper data role: dimension or measure, continuous or discrete.
- For each measure, assign appropriate default settings in Tableau Desktop, such as color, sort order, number format (percentage, currency, etc.), and aggregation function. For example, SUM may be appropriate for “Sales”, but AVERAGE might be a better default for “Test Score”.

> **Tip:** It's particularly helpful to set a default comment for each field, because these comments appear as informative descriptions when users hover over fields in Ask Data.

Create hierarchies for geographic and categorical fields

For time data, Tableau automatically creates hierarchies, which let users quickly drill up and down in vizzes (for example, from day to week to month). For geographic and categorical data, however, we recommend that you create custom hierarchies to help Ask Data produce visualizations that reflect the relationships between fields. Be aware that Ask Data won't show the hierarchies in the data pane.

Ask Data doesn't index hierarchy names, only names of fields within hierarchies. For example, if a geographic hierarchy named “Location” contains “Country” and “City” fields, users should enter “Country” and “City” in their questions for Ask Data.

# Discover Insights Faster with Explain Data

Explain Data in the Data Guide helps you to inspect, uncover, and dig deeper into the marks in a viz as you explore your data. You can use Explain Data to analyze dashboards, sheets, or selected marks for possible outliers and correlations in the underlying data. Explain Data builds statistical models and proposes possible explanations for individual marks in a viz, including potentially related data from the data source that isn't used in the current view.

For information on running Explain Data and exploring explanations, see Get Started with Explain Data.

**Note**: This topic describes how Explain Data works in Tableau 2021.2 and later versions. If you have a previous version of Tableau, read this topic in version 2021.1 of Explain Data help.

As you build different views, use Explain Data as a jumping-off point to help you explore your data more deeply and ask better questions. For more information, see How Explain Data helps to augment your analysis. For information on what characteristics make a data source more interesting for use with Explain Data, see Requirements and Considerations for Using Explain Data.

## Access to Explain Data

Explain Data is enabled by default at the site level. Server administrators (Tableau Server) and site administrators (Tableau Cloud) can control whether Explain Data is available for a site. For more information, Disable or Enable Explain Data for a Site.

Authors who can edit workbooks and have the Run Explain Data permission capability for a workbook can run Explain Data in editing mode. All users with the Run Explain Data capability can run Explain Data in viewing mode in Tableau Cloud and Tableau Server.

When allowed by site administrators, explanations can be shared in viewing mode via email or Slack with other Tableau Cloud and Tableau Server users. For more information, see Configure Tableau to allow users to share explanations via email and Slack.

Authors can use Explain Data Settings to control which explanation types are displayed in the Data Guide pane.

For information on controlling access to Explain Data, explanation types, and fields, see Control Access to Explain Data.

## How Explain Data helps to augment your analysis

Explain Data is a tool that uncovers and describes relationships in your data. It can't tell you what is causing the relationships or how to interpret the data. **You are the expert on your data.** Your domain knowledge and intuition are key in helping you decide what characteristics might be interesting to explore further using different views. For related information, see How Explain Data Works and Requirements and Considerations for Using Explain Data.

For more information on how Explain Data works and how to use Explain Data to augment your analysis, see these Tableau Conference presentations:

- From Analyst to Statistician: Explain Data in Practice (1 hour)
- Leveraging Explain Data (45 minutes)

## Get Started with Explain Data

Use Explain Data in your flow of analysis as you are exploring the marks in a viz. Explain Data runs automatically when the Data Guide pane is open and updates based on the current selection (dashboard, sheet, or mark).

**Use Explain Data**

- Run Explain Data on a dashboard, sheet, or mark
- Drill into explanations
- View analyzed fields
- Terms and concepts in explanations
- Explanation Types

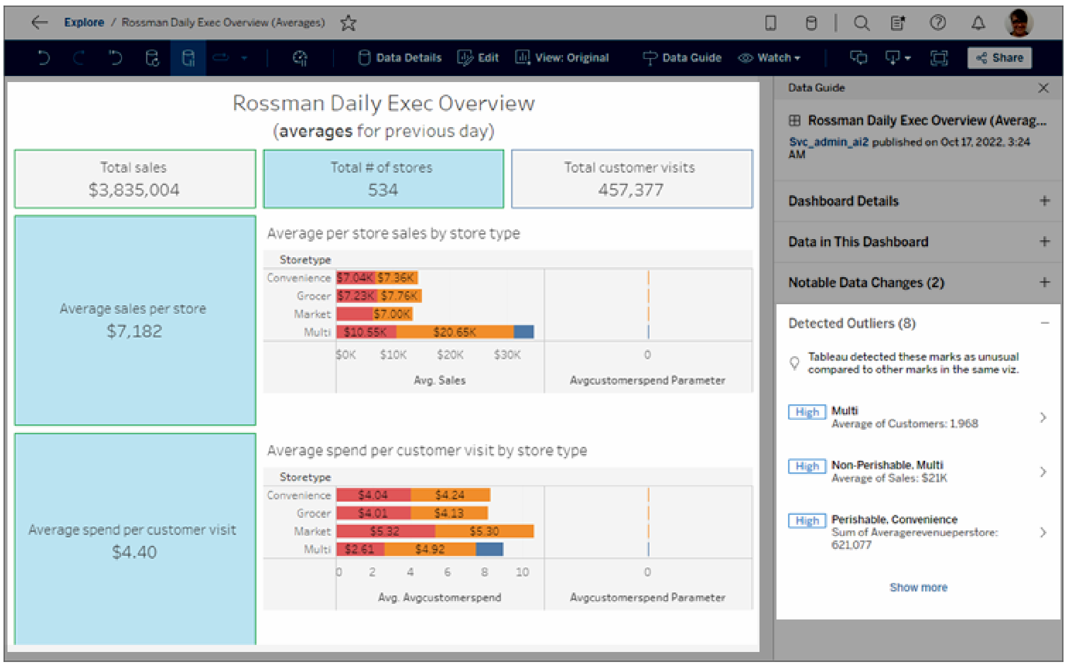
**Author Workbooks and Control Access**

- Requirements and Considerations for Using Explain Data
- Change Explain Data Settings (Authors-only)
- Control Access to Explain Data
- Disable or Enable Explain Data for a Site
- How Explain Data Works

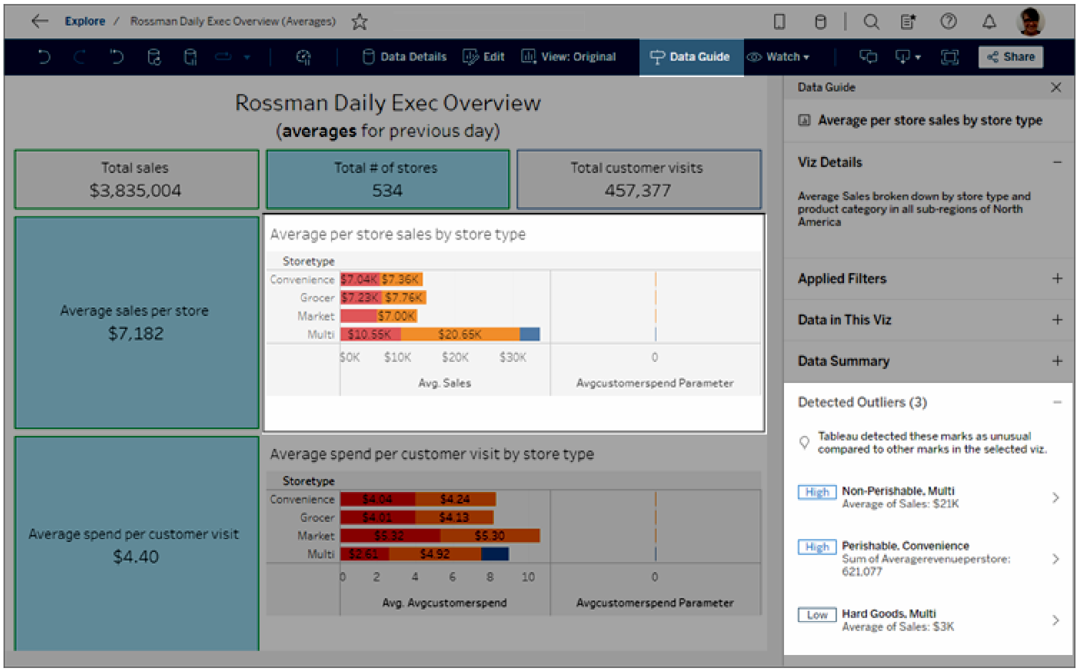
## Run Explain Data on a dashboard, sheet, or mark

These are the basic steps to run Explain Data in Tableau Desktop, Tableau Cloud, and Tableau Server:

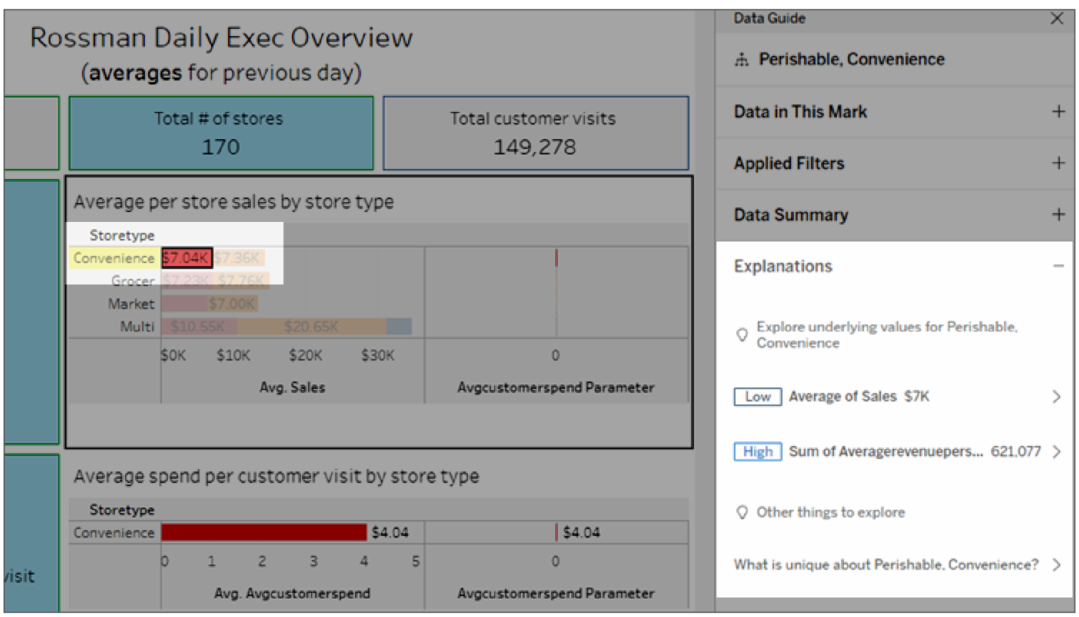
1. Open a dashboard or sheet in a workbook.
2. In the view toolbar, select **Data Guide** to open the Data Guide pane.
3. If you open a dashboard, Explain Data will analyze it for outliers.




If you select a sheet in the dashboard, Explain Data analyzes the marks in that sheet for outliers.

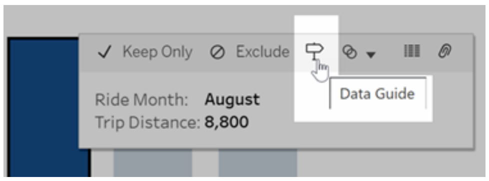



If you select a mark in the dashboard, Explain Data specifically analyzes that mark for explanations.

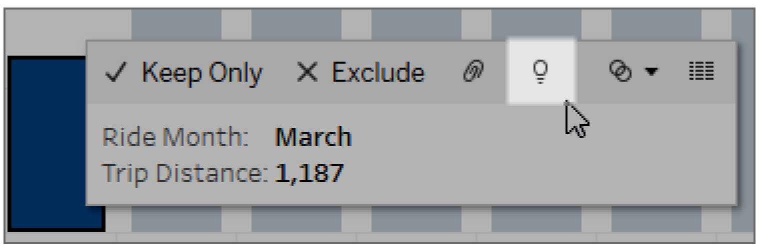



The marks that are being explained are highlighted in the viz as you select corresponding explanations.

Optionally, you can select a mark in a viz, hover the cursor over the mark. In the tooltip menu, select **Data Guide**.




In Tableau Public, select the lightbulb in the tooltip menu to run Explain Data.




Possible explanations for the value of the analyzed mark are displayed in the Data Guide pane. Select different explanation names to expand the details and start exploring.

Explain Data permissions required for seeing explanations

If you see Detected Outliers with a note to contact the owner of the viz, it is because you need permission to see these types of explanations. Select the owner name to go to their Tableau content page with their email address. Contact the owner to ask them to give you Explain Data permissions for the workbook or view.

If you are the owner of the workbook, for more information on setting permissions, see Control who can use Explain Data and what they can see.

Tips for using Explain Data

- Multiple marks can't be selected for comparison with each other.
- The view must contain marks that are aggregated using SUM, AVG, COUNT, COUNTD, or AGG (a calculated field).
- When Explain Data cannot analyze the type of mark selected, a message is displayed to indicate why. For more information, see Situations where Explain Data is not available.
- The data you analyze must be drawn from a single, primary data source. Explain Data does not work with blended or cube data sources.
- For information on what characteristics make a data source more interesting for use with Explain Data, see Requirements and Considerations for Using Explain Data.

## Drill into explanations

1. In the Data Guide pane, select an explanation name to see more details.

   Select an explanation to expand or contract its details.

2. Scroll to see more explanation details.

3. Hover over charts in the explanations to see details on different data points. Select the **Open** icon to see a larger version of the visualization.

   Creators or Explorers who open the view for editing can select the **Open** icon to open the visualization as a new worksheet and explore the data further.

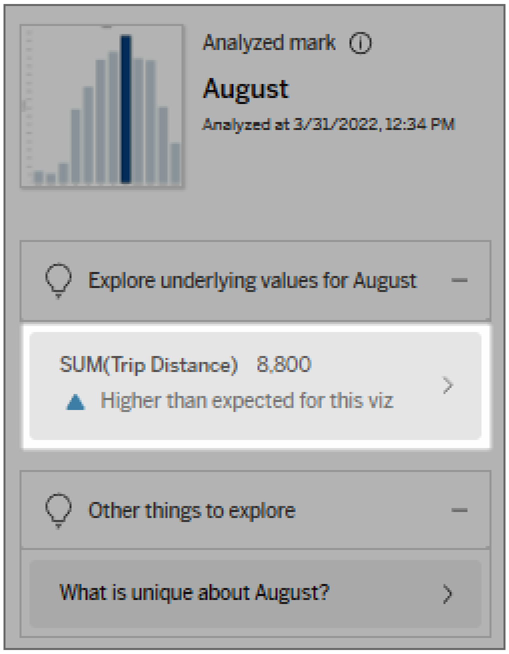
   > **Note**: Creators and Explorers who have editing permissions can also control Explain Data Settings. For more information, see Control Access to Explain Data.

4. Hover over a Help icon ⓘ to see tooltip help for an explanation. Select the Help icon ⓘ to keep the tooltip open. Select a **Learn More** link to open the related help topic.

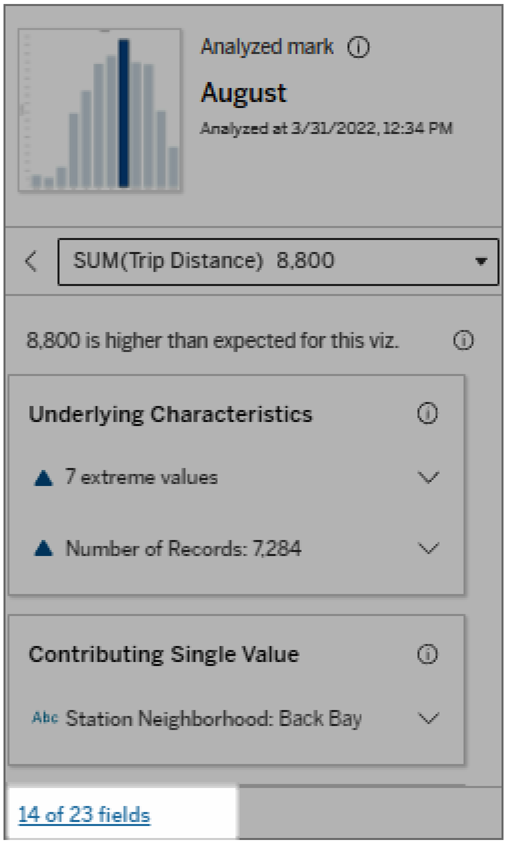
## View analyzed fields

1. Run Explain Data on a dashboard, sheet, or mark.

2. In the Data Guide pane, under **Explore underlying values for**, select a target measure name.



3. Select the *number-of-fields* link at the bottom of the pane.




Authors have the option to open Explain Data Settings to control which fields are included in the analysis. For more information, see Change fields used for statistical analysis.

## Terms and concepts in explanations

The following terms and concepts appear frequently in explanations. You may find it helpful to become acquainted with their meaning in the context of using Explain Data.

# What is a mark?

A mark is a selectable data point that summarizes some underlying record values in your data. A mark can be made of a single record or multiple records aggregated together. Marks in

Tableau can be displayed in many different ways such as lines, shapes, bars, and cell text.

Tableau gets the records that make up the mark based on the intersection of the fields in the view.

The **analyzed mark** refers to a mark in a dashboard or sheet that was analyzed by Explain Data.

For more information on marks, see Marks.

## What does expected mean?

The expected value for a mark is the median value in the expected range of values in the underlying data in your viz. The expected range is the range of values between the 15th and 85th percentile that the statistical model predicts for the analyzed mark. Tableau determines the expected range each time it runs a statistical analysis on a selected mark.

If an expected value summary says the mark is *lower than expected* or *higher than expected*, it means the aggregated mark value is outside the range of values that a statistical model is predicting for the mark. If an expected value summary says the mark is *slightly lower* or *slightly higher* than expected or *within the range of natural variation*, it means the aggregated mark value is within the range of predicted mark values, but is lower or higher than the median.

For more information, see What is an expected range?

## What are dimensions and measures?

Each column name in a database is a field. For example, Product Name and Sales are each fields. In Tableau, fields like Product Name that categorize data are called dimensions; fields with quantifiable data like Sales are called measures. Tableau aggregates measures by default when you drag them into a view.

Some explanations describe how the underlying record values and the aggregations of those values may be contributing to the value of the analyzed mark. Other explanations may mention the distribution of values across a dimension for the analyzed mark.

When you run Explain Data on mark, the analysis considers dimensions and measures in the data source that aren't represented in the view. These fields are referred to as unvisualized dimensions and unvisualized measures.

For more information on dimensions and measures, see Dimensions and Measures.

## What is an aggregate or aggregation?

An aggregate is a value that is a summary or total. Tableau automatically applies aggregations such as SUM or AVG whenever you drag a measure onto Rows, Columns, a Marks card option, or the view. For example, measures are displayed as SUM(Sales) or AVG(Sales) to indicate how the measure is being aggregated.

To use Explain Data, your visualization must use a measure that is aggregated with SUM, AVG, COUNT, COUNTD, or AGG.

For more information about aggregation, see Data Aggregation in Tableau.

## What is a record value?

A record is a row in a database table. A row contains values that correspond to each field. In this example, Category, Product Name, and Sales are fields (or columns). Furniture, Floor Lamp, and $96 are the values.

| Category | Product Name | Sales |
| --- | --- | --- |
| Furniture | Floor Lamp | $96.00 |

## What is a distribution?

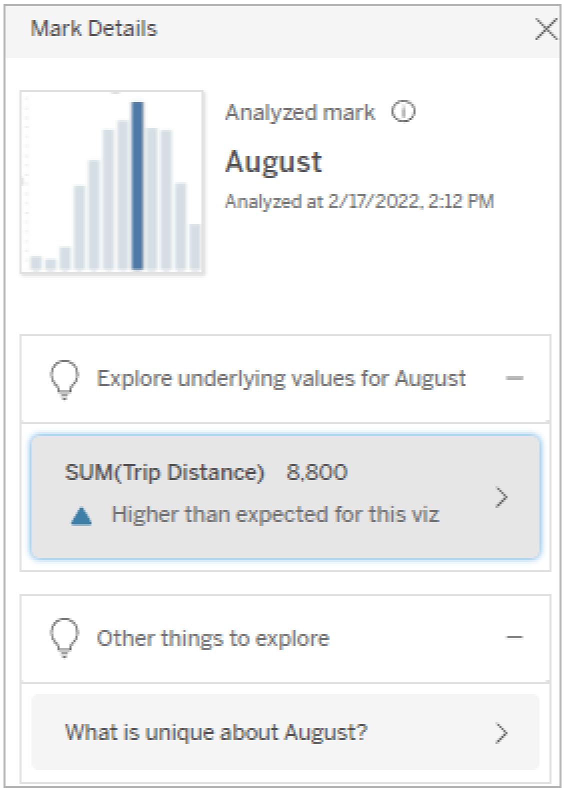
A distribution is a list of all the possible values (or intervals) of the data. It also indicates how often each value occurs (frequency of occurrence).

# Explanation Types in Explain Data

Each time you select a new mark in a viz or dashboard and run Explain Data, Tableau runs a new statistical analysis considering that mark and the underlying data in the workbook. Possible explanations are displayed in expandable sections for the Data Guide pane. For information about how Explain Data analyzes and evaluates explanations, see How Explain Data Works.

## Explore underlying values

This section lists explanations for each measure that can be explained (referred to as *target measures*). Each explanation listed here describes a relationship with the values of the target measure that are tested on the analyzed mark. Use your real-world, practical understanding of the data to determine if the relationships found by Explain Data are meaningful and worth exploring.




In this example, Trip Distance is the target measure

### Underlying Characteristics

These explanations describe how underlying records of the marks in the view may be contributing to the aggregated value of the measure being explained. Mark attributes can include Extreme Values, Null Values, Number of Records, or the Average Value of the mark.

> **Note**: For definitions of common terms used in explanations, see Terms and concepts in explanations.

#### Extreme Values

This explanation type indicates if one or more records have values that are significantly higher or lower than most records. If the explanation is supported by a model, it indicates the extreme value is affecting the target measure of the analyzed mark.

When a mark has extreme values, it doesn't automatically mean it has outliers or that you should exclude those records from the view. That choice is up to you depending on your analysis. The explanation is simply pointing out an extreme value in the mark. For example, it could reveal a mistyped value in a record where a banana cost 10 dollars instead of 10 cents. Or, it could reveal that a particular sales person had a great quarter.

**Note**: This explanation must be enabled by the author to be visible in viewing mode for a published workbook. For more information, see Control Access to Explain Data.

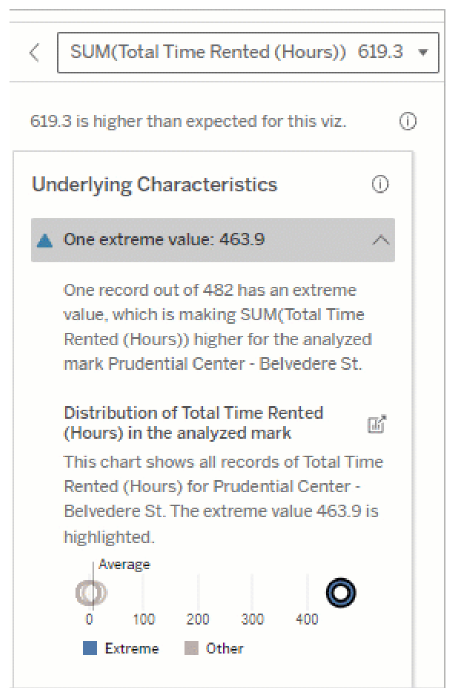
**This explanation shows:**

- The number of underlying records in the analyzed mark.
- The extreme value or values contributing to the value of the target measure.
- The distribution of values in the mark.
- The record details that correspond to each distribution value.

**Exploration options:**

- Hover over a circle in the chart to see its corresponding value.
- Select the left or right arrow below the details list to scroll through record details.
- If available, select **View Full Data**, and then select the **Full Data** tab to see all records in a table.
- Select the **Open** icon to see a larger version of the visualization.

**Next steps for analysis:**




In this example, a single extreme value of 463 hours rented is contributing to the higher than expected sum of Total Time Rented of 613 hours.

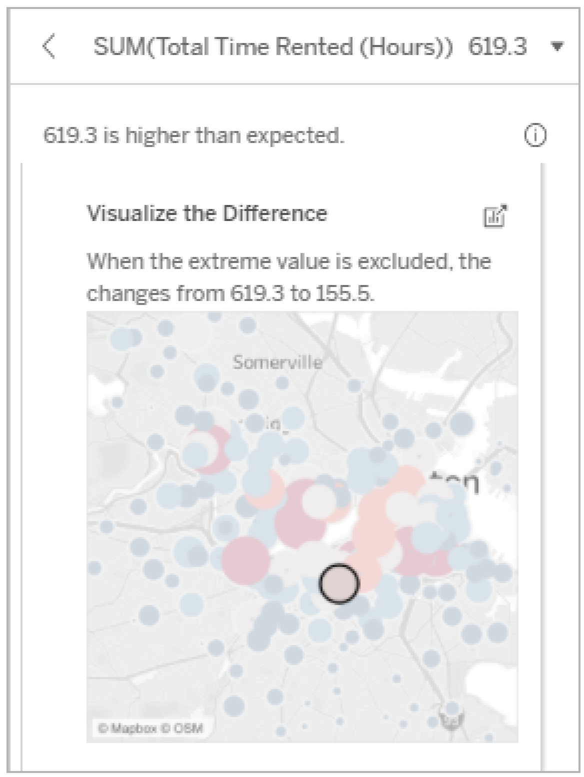
- If the number of records is low, examine these values compared to the extreme value.
- If the extreme value is significantly higher or lower than the other record values, exclude it and consider how it changes the value of the analyzed mark.
- When considering the data with and without the extreme value, use this as an opportunity to apply your practical knowledge about the data.

A likely reason for this high value could be that someone forgot to dock the bike when they returned it. In this case, the author might want to exclude this value for future analysis.

Visualize the Difference

**This section shows:**

- How the analyzed mark value changes when the extreme value is excluded.



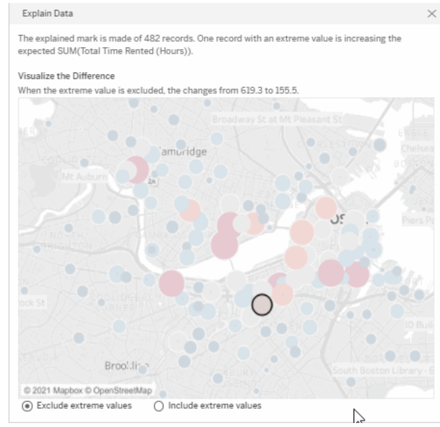

**Exploration options:**

- Select the **Open** icon to see a larger

version of the visualization.
- Explore the difference with and without the extreme value (or values).
- Authors can open the view as a new sheet and apply a filter to exclude the extreme value.

**Next steps for analysis:**

- If the extreme value is significantly higher or lower than the other record values, exclude it and see how it changes the value of the analyzed mark.
- When considering the data with and without the extreme value, use this as an opportunity to apply your practical knowledge about the data.



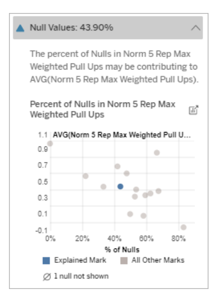

In this example, when the extreme value of 483 is excluded, the analyzed mark is no longer high compared to other marks in the view. Other marks now stand out. The author might want to explore the other marks to consider why these other locations have higher hours for bike rentals.

## Null Values

The Null Values explanation type calls out situations where there is a higher than expected amount of missing data in a mark. It indicates the fraction of target measure values that are null and how the null values might be contributing to the aggregate value of that measure.

**This explanation shows:**

- The percent of values that are null in the target measure for the analyzed mark (blue circle).




**Exploration options:**

- Hover over each circle in the scatter

plot to see its details.

- Scroll to see more of the chart.
- Select the **Open** icon to see a larger version of the visualization.

In this example, the percent of null values in the target measure is shown as a blue circle.

**Next steps for analysis:**

- Optionally exclude null values in the mark for further analysis.

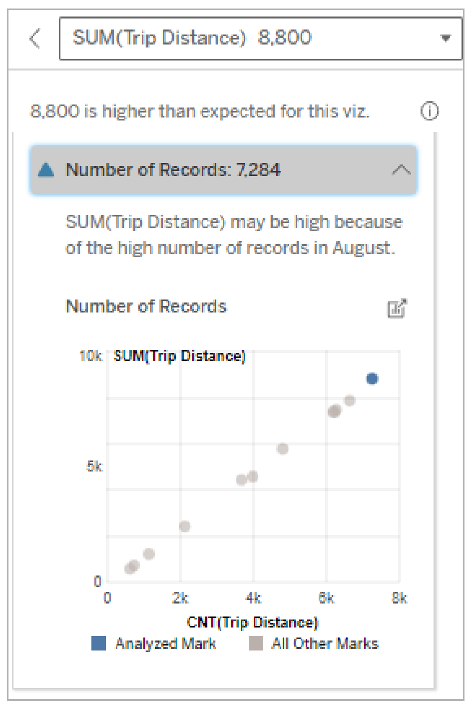
Number of Records

This explanation type describes when the count of the underlying records is correlated to the sum. The analysis found a relationship between the number of records that are being aggregated in a mark and the mark's actual value.

While this might seem obvious, this explanation type helps you explore whether the mark's value is being affected by the magnitude of the values in its records or simply because of the number of records in the analyzed mark.

**This explanation shows:**

- The number of records in the target measure for the analyzed mark (dark blue bar).
- The number of records in the target measure for other marks in the source visualization (light blue bar).




**Exploration options:**

- Hover over each bar to see its details.
- Scroll to see more of the chart.
- Select the **Open** icon to see a larger version of the visualization.

**Next steps for analysis:**

- Compare whether the individual values of records are low or high, or the number of records in the analyzed mark is low or high.
- Authors, if you are surprised by a high number of records, you might need to normalize the data.

In this example, the number of records for Trip Distance is listed for each value of Ride Month, which is a dimension in the original visualization. August has the highest total trip distance value.

You might explore whether August has the highest value for trip distance because more rides occurred in August, or if it has the highest trip distance because some rides were longer.

Average Value of Mark

This explanation type describes when the average of a measure is correlated to the sum. Compare whether the average value is low or high, or the number of records is low or high.

**This explanation shows:**

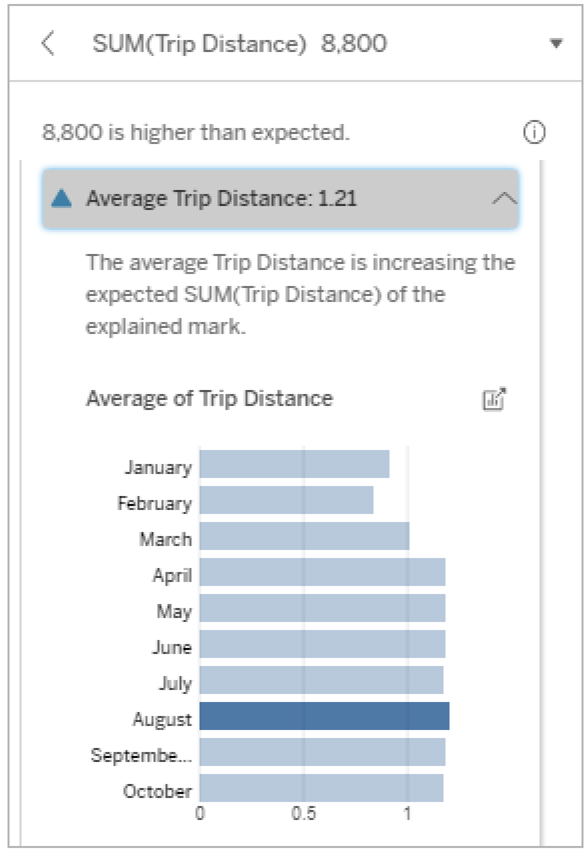
- The average of the target measure for each value of a dimension used in the source visualization.

**Exploration options:**

- Hover over each bar to see its details.
- Scroll to see more of the chart.
- Select the **Open** icon to see a larger version of the visualization.

**Next steps for analysis:**

- Compare whether the average value is low or high, or the number of records is low or high. For example, are profits high because you sold a lot of items or because you sold expensive items?
- Try to figure out why the analyzed mark has a significantly higher or lower average value.




In this example, the average trip distance for August is not significantly higher or lower than most months. This suggests that trip distance is higher for August because there were more rides in August, rather than from people taking longer rides.

## Contributing Single Value

Use this explanation to understand the composition of the record values that make up the analyzed mark.

This explanation type identifies when a single value in an unvisualized dimension may be contributing to the aggregate value of the analyzed mark. An unvisualized dimension is a dimension that exists in the data source, but isn't currently being used in the view.

This explanation indicates when every underlying record of a dimension has the same value, or when a dimension value stands out because either many or few of the records have the same single value for the analyzed mark.

**Note**: For definitions of common terms used in explanations, see Terms and concepts in explanations.

**This explanation shows:**

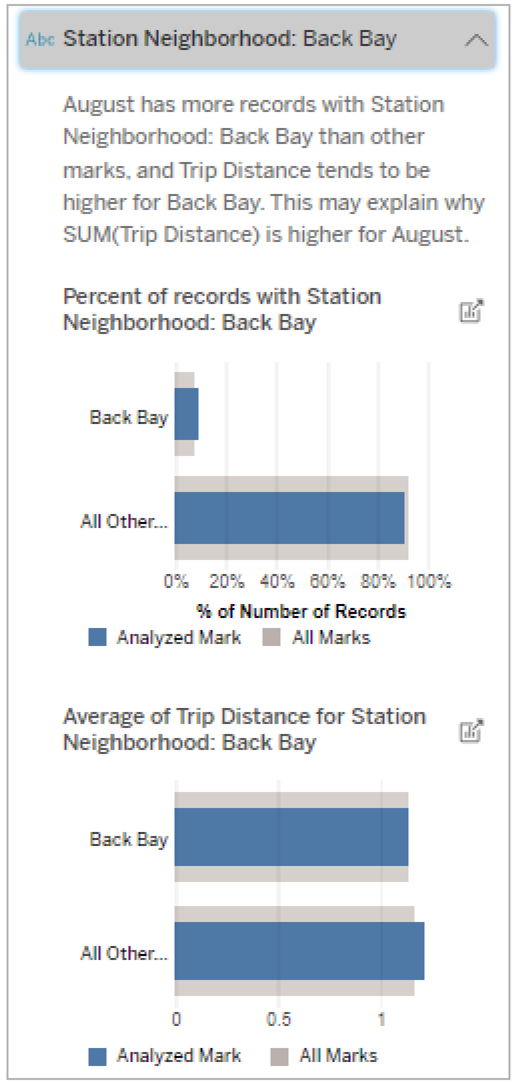
- The percent of the number of records for a single value of a dimension for the analyzed mark (blue bar) versus all marks (gray bar) in the source visualization.
- The percent of the number of records for all other values of a dimension for the analyzed mark (blue bar) versus all marks (gray bar) in the source visualization.
- The average of the target measure for the single value of a dimension in the analyzed mark (blue bar) versus all marks (gray bar).
- The average of the target measure for all other values of a dimension for the analyzed mark (blue bar) versus all marks (gray bar) in the source visualization.

**Exploration options:**

- Hover over each bar to see its details.
- Select the **Open** icon to see a larger version of the visualization.

**Next steps for analysis:**

- Use this explanation to understand the composition of the record values that make up the analyzed mark.
- Authors might want to create a new visualization to explore any unvisualized dimension surfaced in this explanation.




In this example, the statistical analysis has exposed that many of the rides come from the station neighborhood of Back Bay. Note that Station Neighborhood is an unvisualized dimension that has some relationship to Trip Distance in the underlying data for the source visualization.

Top Contributors

Use this explanation to see the values that make up the largest fraction of the analyzed mark.

For a COUNT aggregation, the top contributors show dimension values with the most records. For SUM, this explanation shows dimension values with the largest partial sum.

Contributing Dimensions

Use this explanation to understand the composition of the record values that make up the analyzed mark.

This explanation type shows that the distribution of an unvisualized dimension may be contributing to the aggregate value of the analyzed mark. This type of explanation is used for target measure sums, counts, and averages. An unvisualized dimension is a dimension that exists in the data source, but isn't currently being used in the view.

> **Note**: For definitions of common terms used in explanations, see Terms and concepts in explanations.

**This explanation shows:**

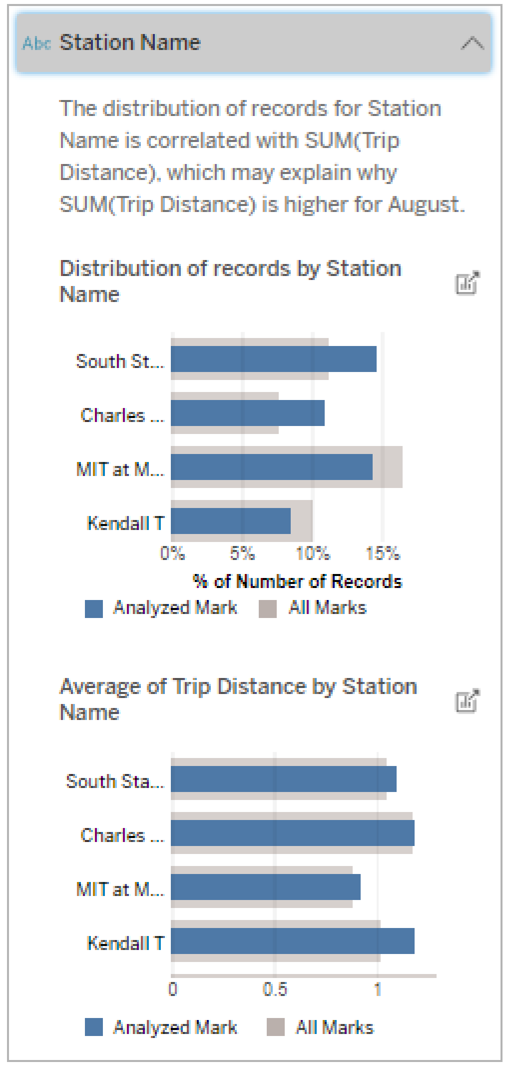
- The percent of the number of records for all values of a dimension for the analyzed mark (blue bar) versus all values of a dimension for all marks (gray bar) in the source visualization.
- The average of the target measure for all values of a dimension for the analyzed mark (blue bar) all values of a dimension for all marks (gray bar).

**Exploration options:**

- Hover over each bar to see its details.
- Scroll to see more of the chart.
- Select the **Open** icon to see a larger version of the visualization.

**Next steps for analysis:**

- Use this explanation to understand the composition of the record values that make up the analyzed mark.
- Authors might want to create a new visualization to explore any unvisualized dimensions surfaced in this explanation.




In this example, the statistical analysis has exposed that more rides were taken from South Station and MIT and fewer rides were taken from Charles Circle and Kendall, compared to rides taken for marks overall.

Note that Station Name is an unvisualized dimension that has some relationship to Trip Distance in the underlying data for the source visualization.

Contributing Measures

This explanation type shows that the average of an unvisualized measure may be contributing to the aggregate value of the analyzed mark. An unvisualized measure is a measure that exists in the data source, but isn't currently being used in the view.

This explanation can reveal a linear or quadratic relationship between the unvisualized measure and the target measure.

**Note**: For definitions of common terms used in explanations, see Terms and concepts in explanations.

**This explanation shows:**

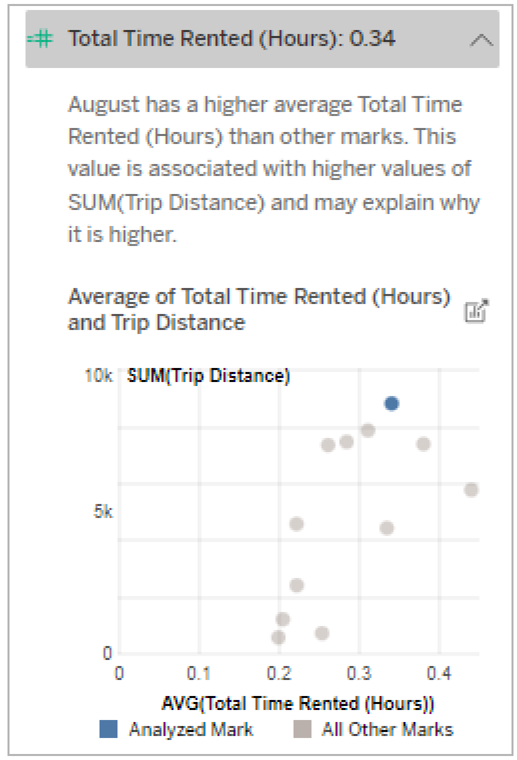
- The relationship between the sum of the target measure and the average of an unvisualized measure for the analyzed mark (blue circle) and all marks (gray circles) in the view.
- If the sum of the target measure is high or low because the average value of the unvisualized measure is high or low.

**Exploration options:**

- Hover over each circle to see its details.
- Select the **Open** icon to see a larger version of the visualization.

**Next steps for analysis:**

- Authors might want to create a new visualization to explore any unvisualized measures surfaced in this explanation.




In this example, one possible reason why trip distance is high is because the average total time rented is also high.

## Other things to explore

This section provides possible reasons why the analyzed mark is unique or unusual. These explanations:

- Do not explain why the value of this mark is what it is.
- Are not related in any way to the value of the measures in the source visualization.
- Do not take any target measures into account.

Other Dimensions of Interest

Use this explanation to understand the composition of the record values that make up the analyzed mark.

The distribution of an unvisualized dimension in the analyzed mark is unusual compared to the distribution of values for all other marks in the view. An unvisualized dimension is a dimension that exists in the data source, but isn't currently being used in the view.

**Note**: For definitions of common terms used in explanations, see Terms and concepts in explanations.

**This explanation shows:**

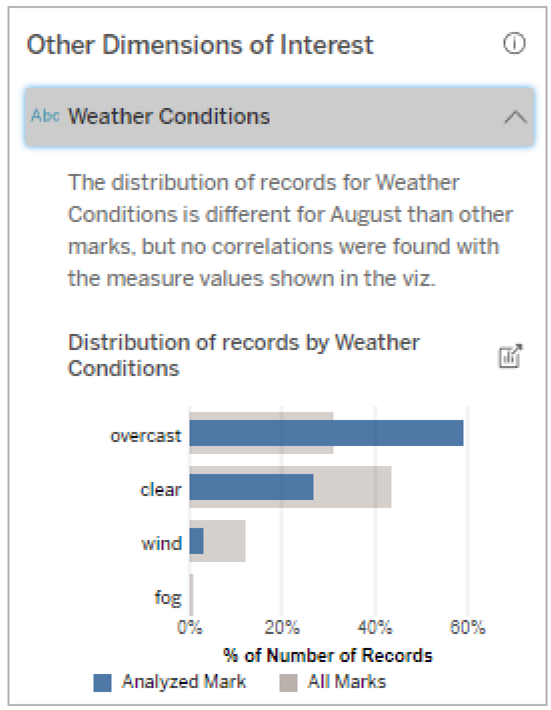
- The percent of the number of records for all values of a dimension for the analyzed mark (blue bar) versus all values of a dimension for all marks (gray bar) in the source visualization.

**Exploration options:**

- Hover over each bar to see its details.
- Scroll to see more of the chart.
- Select the **Open** icon to see a larger version of the visualization.

**Next steps for analysis:**

- Use this explanation to understand the composition of the record values that make up the analyzed mark.
- Authors might want to create a new visualization to explore any unvisualized dimensions surfaced in this explanation.



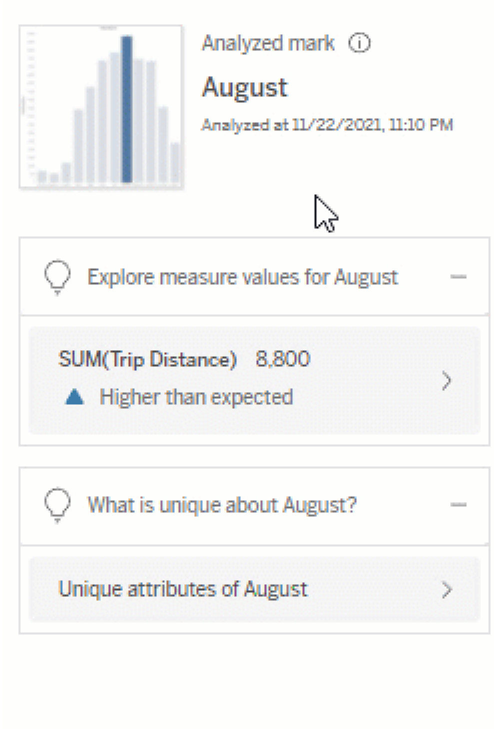

In this example, a high percentage of records are associated with overcast weather. Because the data is about bike rentals in Boston, and the analyzed mark is Trip Distance for

August, we can assume that the weather is typically warm and humid. People might have rented bikes more often on overcast days to avoid the heat. It's also possible there were more overcast days in August.

## Analyzed Fields in Explain Data

Explain Data runs a statistical analysis on a dashboard or sheet to find marks that are outliers, or specifically on a mark you select. The analysis also considers possibly related data points from the data source that aren't represented in the current view.

Explain Data might not include every column from the data source in the analysis. In many cases, certain types of fields will be automatically excluded from the analysis. For more information, see Fields excluded by default.

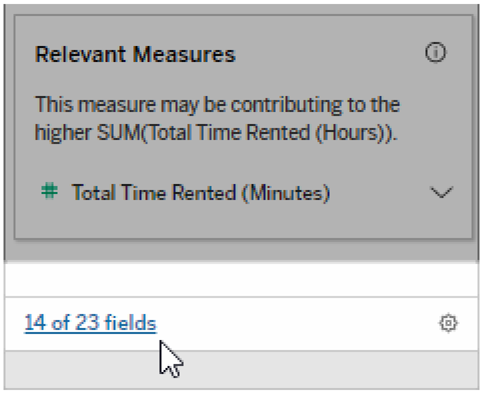



> **Note**: Dimensions with more than 500 unique values won't be considered for analysis (unless allowed by the author in Explain Data Settings).

All users can view information on which fields are included or excluded in the current analysis. Creators and Explorers who have editing permissions can edit the fields used by Explain Data for statistical analysis.

## View fields analyzed by Explain Data

When you expand an explanation for a measure that is contributing to the value of the mark, a link that indicates the number of fields considered in the analysis is displayed at the bottom of the Data Guide pane.

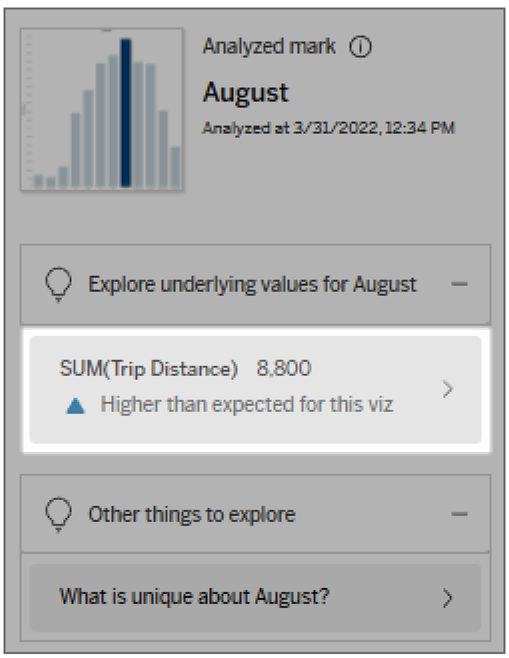



Click the link to see the list of fields included in or excluded from the current statistical analysis.

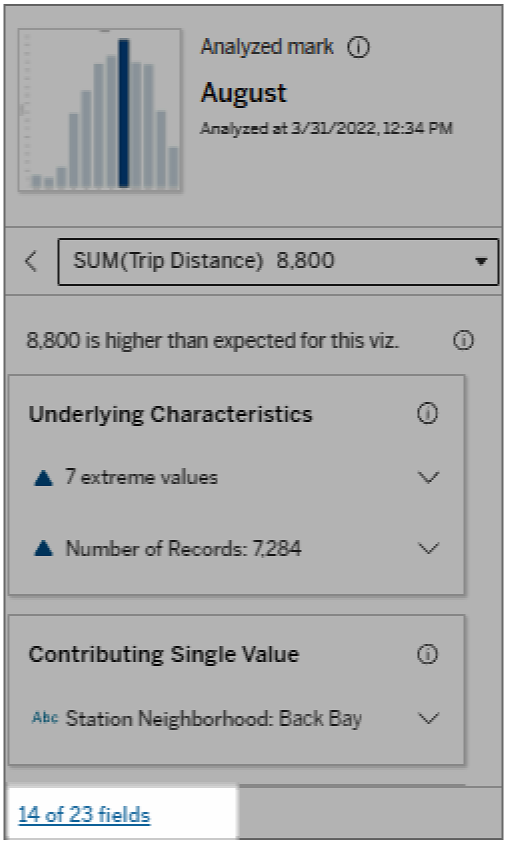
When a data source contains more than 1000 unvisualized dimensions or measures, you might see an alert asking if you want Explain Data to consider more fields. Click **Explain All** to run an analysis that includes more fields. The analysis may take longer to complete.

To view fields used by Explain Data for statistical analysis

1. Run Explain Data on dashboard, sheet, or mark.
2. In the Data Guide pane, under **Contributing to the value of**, click a measure name.

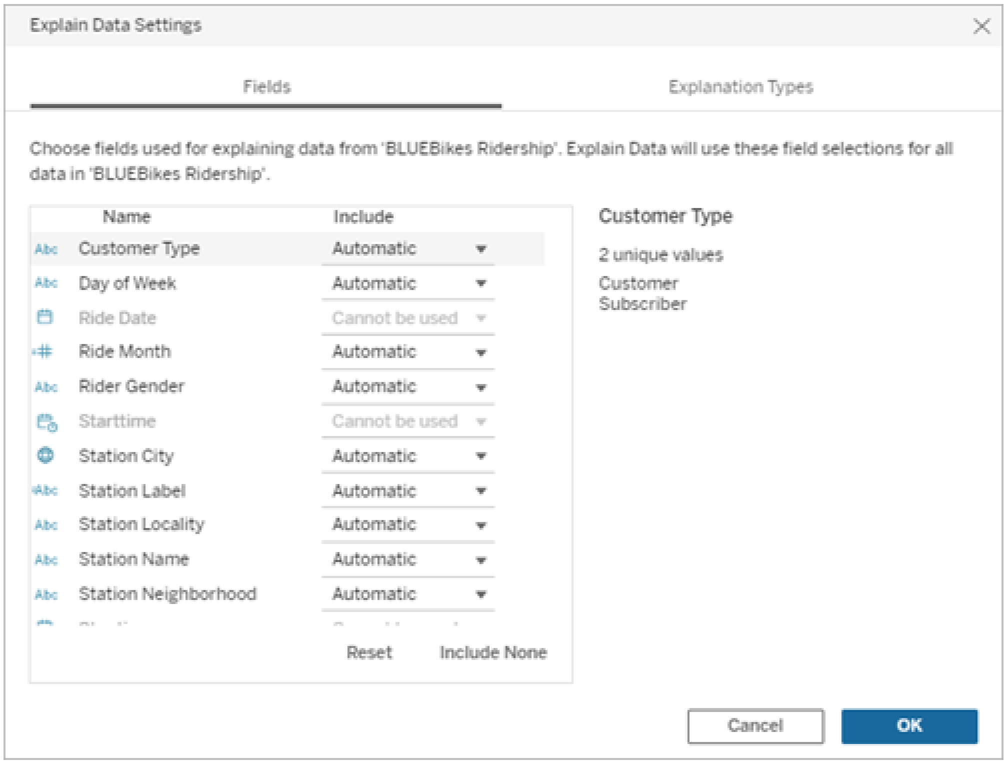


3. Click the *number-of-fields* link at the bottom of the pane.




## Change fields used for statistical analysis

Creators and Explorers who have editing permissions can select fields to be included or excluded from the statistical analysis in the Fields tab of the Explain Data Settings dialog box.

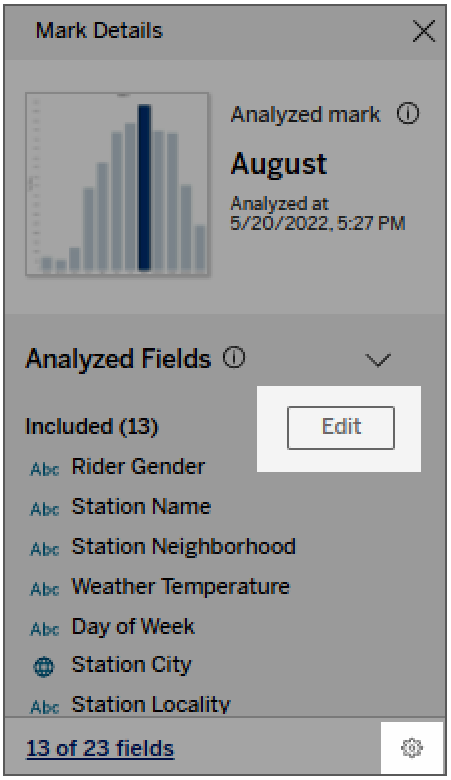



When a data source contains dimensions with a large number of unique values (up to 500), those fields won't be considered for analysis.

To edit the fields used by Explain Data for statistical analysis

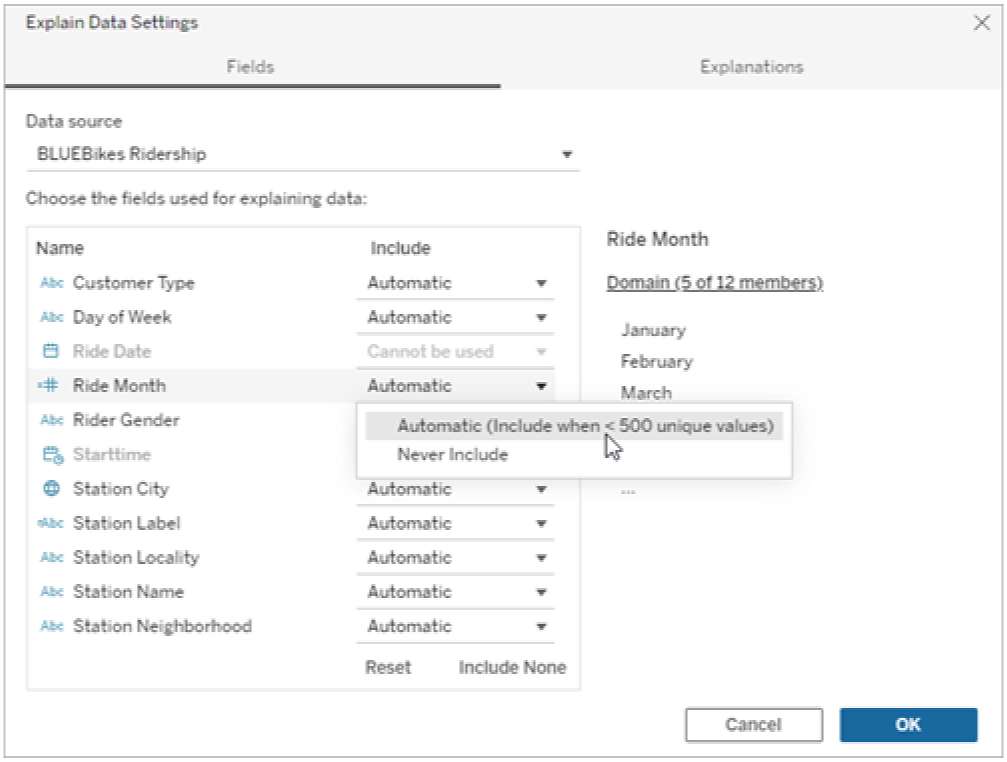
Settings for analyzed fields are applied at the data source level.

1. Run Explain Data on a mark when editing a view.
2. In the Data Guide pane, click the settings icon at the bottom of the pane. Or, click the **Edit** button in the Analyzed Fields view (how to open analyzed fields).




3. In the Explain Data Settings dialog box, click the **Fields** tab.
4. Click a drop-down arrow next to a field name, select **Automatic** or **Never Include**, and then click **OK**.

   Note that fields must have less than 500 unique values to be included in the analysis.




## Fields excluded by default

| Fields excluded by default | Reasons for exclusion |
|---|---|
| All unvisualized measures when there are more than 1,000 measures in the data source.<br><br>All unvisualized dimensions when there are more than 1,000 dimensions in the data source. | Computing explanations for more than 1000 unvisualized measures or dimensions can take longer to compute, sometimes several minutes. These fields are excluded by default for initial analysis, but you can choose to include them for further analysis.<br><br>In this situation, you might see an alert asking if you want Explain Data to consider more fields. Click the alert link to get more information. Click **Explain All** to run an analysis that includes more fields. |

| Fields excluded by default | Reasons for exclusion |
|---|---|
| Fields that use geometry, latitude, or longitude | Geometry, latitude, or longitude by themselves can never be explanations. It is highly likely that an explanation that calls out the latitude or the longitude as an explanation is due to a spurious correlation and not a probable explanation. |
| Dimensions with high cardinality (dimensions with > 500 members) | High cardinality dimensions take longer to compute. Dimensions with more than 500 unique values will not be considered for analysis. |
| Groups, bins, or sets | Not currently supported. |
| Table calculations | Table calculations cannot be analyzed when table calculations are at a different level of detail than the view. |
| Unvisualized measures that can't be averaged | Unvisualized measures that can't be averaged include measures that are calculated fields where the calculation expression includes aggregations (display as AGG() fields when added to the sheet). |
| Discrete measures and continuous dimensions | Not currently supported. |
| Hidden fields | Not available. |
| Calculated fields with errors | No values present to analyze. |

## Requirements and Considerations for Using Explain Data

Explain Data is always available to authors in Tableau Desktop.

For Tableau Cloud and Tableau Server: When Explain Data is enabled for a site, Creators and Explorers with the appropriate permissions can run Explain Data when editing a workbook. All users with the appropriate permissions can run Explain Data in viewing mode in published workbooks. For more information, see Control Access to Explain Data.

## What makes a viz a good candidate for Explain Data

Explain Data works best on visualizations that require deeper exploration and analysis, rather than infographic-style, descriptive vizzes that communicate summarized data.

- Row-level data is necessary for Explain Data to create models of your data and generate explanations. Vizzes with underlying, row-level data, where relationships might exist in unvisualized fields are good candidates for running Explain Data.
- Vizzes based on pre-aggregated data without access to row-level data are not ideal for the statistical analysis performed by Explain Data.

## What data works best for Explain Data

When you are using Explain Data in a worksheet, remember that Explain Data works with:

- **Single marks only**—Explain Data analyzes single marks. Multiple mark analysis is not supported.

- **Aggregated data**—The view must contain one or more measures that are aggregated using SUM, AVG, COUNT, or COUNTD. At least one dimension must also be present in the view.

- **Single data sources only**—The data must be drawn from a single, primary data source. Explain Data does not work with blended or cube data sources.

When preparing a data source for a workbook, keep the following considerations in mind if you plan to use Explain Data during analysis.

- Use a data source with underlying data that is sufficiently wide. An ideal data set has at least 10-20 columns in addition to one (or more) aggregated measures to be explained.
- Give columns (fields) names that are easy to understand.
- Eliminate redundant columns and data prep artifacts. For more information, see Change fields used for statistical analysis.

- Don't discard unvisualized columns in the data source. Explain Data considers fields in the underlying data when is analyzes a mark.
- Low cardinality dimensions work better. The explanation of a categorical dimension is easier to interpret if its cardinality is not too high (< 20 categories). Dimensions with more than 500 unique values will not be considered for analysis.
- Don't pre-aggregate data as a general rule. But if the data source is massive, consider pre-aggregating the data to an appropriate level of detail.
- Use extracts over live data sources. Extracts run faster than live data sources. With live data sources, the process of creating explanations can create many queries (roughly one query per each candidate explanation), which can result in explanations taking longer to be generated.

## Situations where Explain Data is not available

Sometimes Explain Data will not be available for a selected mark, depending on the characteristics of the data source or the view. If Explain Data cannot analyze the selected mark, the Explain Data icon and context menu command will not be available.

| | |
|---|---|
| Explain Data can't be run in views that use: | • Map coordinate filters<br>• Blended data sources<br>• Data sources with parameters<br>• Data sources that don't support COUNTD or COUNT(DISTINCT ...) syntax, such as Access.<br>• Filters on aggregate measures<br>• Disaggregated measures |
| Explain Data can't be run if you select: | • Multiple marks<br>• Axis<br>• Legend<br>• Grand total<br>• Trend line or reference line<br>• A mark in a view that contains a very low number of marks |
| Explain Data can't be run when the measure to be used for an explan- | • Isn't aggregated using SUM, AVG, COUNT, COUNTD |

| | |
|---|---|
| ation: | • Is a table calculation<br>• Is used in measure values |
| Explain Data can't offer explanations for a dimension when it is: | • A calculated field<br>• A parameter<br>• Used in Measure Names and Measure Values<br>• A field with more than 500 unique values. Dimensions with more than 500 unique values will not be considered for analysis. |

## Control Access to Explain Data

Your access to Explain Data will vary depending on your site role and content permissions. Explain Data is always available to authors in Tableau Desktop. Authors with appropriate permissions can run Explain Data in editing mode in Tableau Cloud and Tableau Server.

Authors can also control whether Explain Data is available in viewing mode in published workbooks and which explanation types are displayed.

Be aware that Explain Data can surface values from dimensions and measures in the data source that aren't represented in the view. As an author, you should run Explain Data and test the resulting explanations to make sure that sensitive data isn't being exposed in your published workbooks.

### Who can access Explain Data

Explain Data is enabled by default at the site level. Server administrators (Tableau Server) and site administrators (Tableau Cloud) can control whether Explain Data is available for a site. For more information, Disable or Enable Explain Data for a Site.

| Mode | Who Can Access |
|---|---|
| **Viewing mode** | Tableau **Viewers**, **Explorers**, and **Creators** who have the Run Explain Data permission capability can run and explore Explain Data explanations in viewing mode. |

| Mode | Who Can Access |
| --- | --- |
| **Editing mode** | Tableau **Creators** can run Explain Data when editing a view in Tableau Desktop, Tableau Cloud, or Tableau Server. **Explorers** who have the Run Explain Data permission capability and editing permissions can run Explain Data when editing a workbook in Tableau Cloud or Tableau Server.<br><br>Creators and Explorers who have editing permissions can open new worksheets for further analysis.<br><br>They also can use Explain Data Settings to control who can use Explain Data and what they can see. |

## Control who can use Explain Data and what they can see

A combination of settings must be enabled to make Explain Data available in editing mode and viewing mode in Tableau Cloud and Tableau Server.

Editing mode

Requirements for authors to run Explain Data or edit Explain Data settings in editing mode:

- Site setting: **Availability of Explain Data** set to **Enable**. Enabled by default.
- Site role: Creator, Explorer (can publish)
- Permissions: **Run Explain Data** capability set to **Allowed**. Unspecified by default. If you open a workbook (Tableau version 2022.1 or earlier) that used this permission in Tableau version 2022.2 or later, you will need to reset the Run Explain Data capability to Allowed.

**Note:** The **Download Full Data** capability for a Creator or Explorer (can publish) controls whether they see the View Full Data option in Extreme Values explanations. Viewers are always denied the Download Full Data capability. However, all users can see record-level details when the Extreme Values explanation type is enabled in Explain Data settings.

Creators and Explorers with editing permissions and the Run Explain Data permission capability can access **Explain Data Settings**, which provide options for controlling:

- The explanation types that are displayed in the Data Guide pane.
- The fields that are included in, or excluded from statistical analysis.

These options are set for the entire workbook and can only be set in the Explain Data Settings dialog box.

Viewing mode

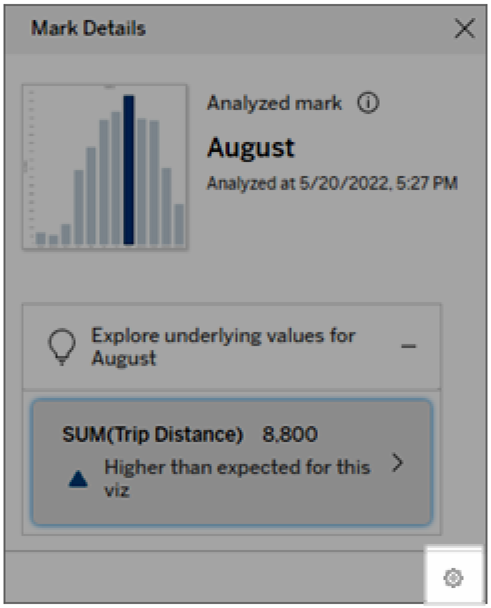
Requirements for all users to run Explain Data in viewing mode:

- Site setting: **Availability of Explain Data** set to **Enable**. Enabled by default.
- Site role: Creator, Explorer, or Viewer
- Permissions: **Run Explain Data** capability set to **Allowed**. Unspecified by default. If you open a workbook (Tableau version 2022.1 or earlier) that used this permission in Tableau version 2022.2 or later, you will need to reset the Run Explain Data capability to Allowed.

**Note**: To see explanations of Detected Outliers in the Data Guide, users of a viz must have the Explain Data permission allowed for the workbook or view. The owner of the workbook will need to open the permissions settings for this workbook in Tableau Server or Tableau Cloud and allow the Explain Data permission to that user.

Open the Explain Data Settings dialog box

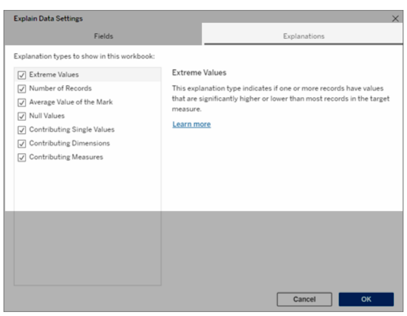
1. From the **Analysis** menu, choose **Explain Data Settings**. Or, in the Data Guide pane, click the settings icon (bottom right).




Include or exclude explanation types displayed by Explain Data

Creators and Explorers who have editing permissions can choose to exclude (or include) explanation types displayed for all workbook users.

1. In the Explain Data Settings dialog box, click the **Explanation Types** tab.



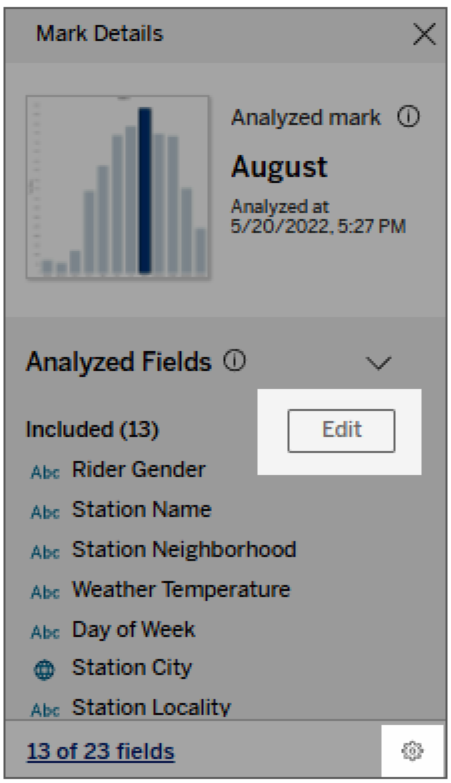

2. In the list of explanation types, select or clear an explanation type.
3. Click **OK**.

Test the setting by saving and closing the published workbook, and then opening a view from the workbook in viewing mode. Select a mark that typically has Extreme Value explanations, and then run Explain Data to check the explanation results.

Include or exclude fields used for statistical analysis

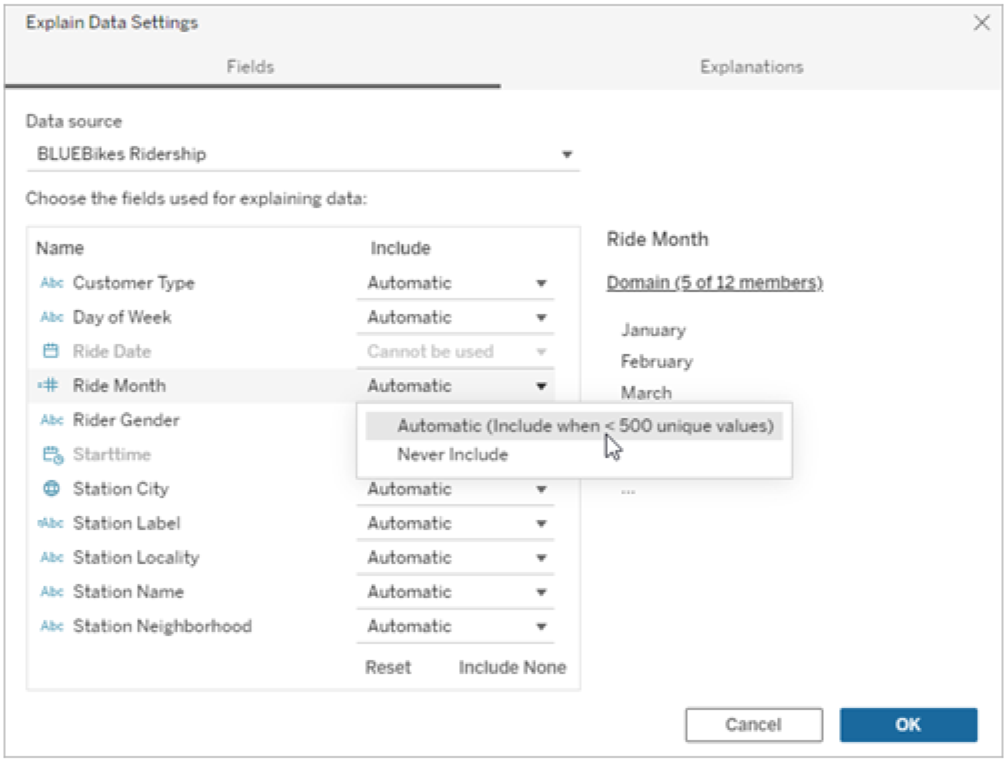
Creators or Explorers who have editing permissions can choose to exclude (or include) fields that are eligible for analysis.

1. In the Data Guide pane (bottom right), choose the settings icon. Or, choose the **Edit** button in the Analyzed Fields view.




2. In the Explain Data Settings dialog box, click the **Fields** tab.
3. In the list of fields under **Include**, click the drop-down arrow and select **Automatic** to include an eligible field every time Explain Data runs for that workbook.

   Note that fields must have less than 500 unique values to be included in the analysis.




Select **Never Include** to explicitly exclude the field.
Select **Include None** to run a statistical analysis on the data without considering fields.
Select **Reset** to return to the default settings.

4. Click **OK**.

Test the setting by saving the published workbook. Select a mark, and then run Explain Data to check the explanation results.

## Configure Tableau to allow users to share explanations via email and Slack

Tableau administrators can control whether explanations can be shared in viewing mode via email or Slack to other Tableau users.

Follow these steps to allow notifications and sharing via email and Slack in Tableau Cloud or Tableau Server:

1. Click **Settings**.
2. On the General tab, scroll down to **Manage Notifications**.
3. For Collaboration, select **Share** for **On Tableau**, **Email**, and **Slack**.

To share explanations via Slack, the Tableau app must be set up for your Slack workspace. Sharing explanations with Slack is enabled by default in Tableau Cloud.

In Tableau Server, an administrator will need to set up the Tableau app for Slack. For more information, see Integrate Tableau with a Slack Workspace.

## How Explain Data Works

Use Explain Data as an incremental, jumping-off point for further exploration of your data. The possible explanations that it generates help you to see the different values that make up or relate to an analyzed mark in a view. It can tell you about the characteristics of the data points in the data source, and how the data might be related (correlations) using statistical modeling. These explanations give you another tool for inspecting your data and finding interesting clues about what to explore next.

**Note**: Explain Data is a tool that uncovers and describes relationships in your data. It can't tell you what is causing the relationships or how to interpret the data. **You are the expert on your data.** Your domain knowledge and intuition is key in helping you decide what characteristics might be interesting to explore further using different views.

For related information on how Explain Data works, and how to use Explain Data to augment your analysis, see these Tableau Conference presentations:

- From Analyst to Statistician: Explain Data in Practice (1 hour)
- Leveraging Explain Data (45 minutes)

### What Explain Data is (and isn't)

Explain Data is:

- A tool and a workflow that leverages your domain expertise.
- A tool that surfaces relationships in your data and recommends where to look next.

- A tool and a workflow that helps expedite data analysis and make data analysis more accessible to a broader range of users.

Explain Data is not:

- A statistical testing tool.
- A tool to prove or disprove hypotheses.
- A tool that is giving you an answer or telling you anything about causality in your data.

When running Explain Data on marks, keep the following points in mind:

- **Consider the shape, size, and cardinality of your data**. While Explain Data can be used with smaller data sets, it requires data that is sufficiently wide and contains enough marks (granularity) to be able to create a model.

- **Don't assume causality**. Correlation is not causation. Explanations are based on models of the data, but are not causal explanations.

  A correlation means that a relationship exists between some data variables, say A and B. You can't tell just from seeing that relationship in the data that A is causing B, or B is causing A, or if something more complicated is actually going on. The data patterns are exactly the same in each of those cases and an algorithm can't tell the difference between each case. Just because two variables seem to change together doesn't necessarily mean that one causes the other to change. A third factor could be causing them both to change, or it may be a coincidence and there might not be any causal relationship at all.

  However, you might have outside knowledge that is not in the data that helps you to identify what's going on. A common type of outside knowledge would be a situation where the data was gathered in an experiment. If you know that B was chosen by flipping a coin, any consistent pattern of difference in A (that isn't just random noise) must be caused by B. For a longer, more in-depth description of these concepts, see the article Causal inference in economics and marketing by Hal Varian.

## How explanations are analyzed and evaluated

Explain Data runs a statistical analysis on a dashboard or sheet to find marks that are outliers, or specifically on a mark you select. The analysis also considers possibly related data points from the data source that aren't represented in the current view.

Explain Data first predicts the value of a mark using only the data that is present in the visualization. Next, data that is in the data source (but not in the current view) is considered and added to the model. The model determines the range of predicted mark values, which is within one standard deviation of the predicted value.

### What is an expected range?

The expected value for a mark is the median value in the expected range of values in the underlying data in your viz. The expected range is the range of values between the 15th and 85th percentile that the statistical model predicts for the analyzed mark. Tableau determines the expected range each time it runs a statistical analysis on a selected mark.

Possible explanations are evaluated on their explanatory power using statistical modeling. For each explanation, Tableau compares the expected value with the actual value.

| value | Description |
|---|---|
| **Higher than expected / Lower than expected** | If an expected value summary says the mark is *lower than expected* or *higher than expected*, it means the aggregated mark value is outside the range of values that a statistical model is predicting for the mark. If an expected value summary says the mark is *slightly lower* or *slightly higher* than expected, or *within the range of natural variation*, it means the aggregated mark value is within the range of predicted mark values, but is lower or higher than the median. |
| **Expected Value** | If a mark has an expected value, it means its value falls within the expected range of values that a statistical model is predicting for the mark. |
| **Random Variation** | When the analyzed mark has a low number of records, there may |

| value | Description |
| --- | --- |
| | not be enough data available for Explain Data to form a statistically significant explanation. If the mark's value is outside the expected range, Explain Data can't determine whether this unexpected value is being caused by random variation or by a meaningful difference in the underlying records. |
| **No Explanation** | When the analyzed mark value is outside of the expected range and it does not fit a statistical model used for Explain Data, no explanations are generated. |

Models used for analysis

Explain Data builds models of the data in a view to predict the value of a mark and then determines whether a mark is higher or lower than expected given the model. Next, it considers additional information, like adding additional columns from the data source to the view, or flagging record-level outliers, as potential explanations. For each potential explanation, Explain Data fits a new model, and evaluates how unexpected the mark is given the new information. Explanations are scored by trading off complexity (how much information is added from the data source) against the amount of variability that needs to be explained. Better explanations are simpler than the variation they explain.

| Explanation type | Evaluation |
| --- | --- |
| **Extreme values** | Extreme values are aggregated marks that are outliers, based on a model of the visualized marks. The selected mark is considered to contain an extreme value if a record value is in the tails of the distribution of the expected values for the data.<br><br>An extreme value is determined by comparing the aggregate mark with and without the extreme value. If the mark becomes less surprising by removing a value, then it receives a higher score. |

| Explanation type | Evaluation |
|---|---|
| | When a mark has extreme values, it doesn't automatically mean it has outliers, or that you should exclude those records from the view. That choice is up to you depending on your analysis. The explanation is simply pointing out an interesting extreme value in the mark. For example, it could reveal a mistyped value in a record where a banana cost 10 dollars instead of 10 cents. Or, it could reveal that a particular sales person had a great quarter. |
| **Number of records** | The number of records explanation models the aggregate sum in terms of the aggregate count; average value of records models it in terms of the aggregate average. The better the model explains the sum, the higher the score.<br><br>This explanation describes whether the sum is interesting because the count is high or low, or because the average is high or low. |
| **Average value of the mark** | This type of explanation is used for aggregate marks that are sums. It explains whether the mark is consistent with the other marks because in terms of its aggregate count or average, noting the relation SUM(X) = COUNT(X) * AVG(X).<br><br>This explanation describes whether the sum is interesting because the count is high or low, or because the average is high or low. |
| **Contributing Dimensions** | This explanation models the target measure of the analyzed mark in terms of the breakdown among categories of the unvisualized dimension. The analysis balances the complexity of the model with how well the mark is explained.<br><br>An *unvisualized dimension* is a dimension that exists in the data source, but isn't currently being used in the view. This type of explanation is used for sums, counts and averages. |

| Explanation type | Evaluation |
|---|---|
| | The model for unvisualized dimensions is created by splitting out marks according to the categorical values of the explaining column, and then building a model with the value that includes all of the data points in the source visualization. For each row, the model attempts to recover each of the individual components that made each mark. The analysis indicates whether the model predicts the mark better when components corresponding to the unvisualized dimension are modeled and then added up, versus using a model where the values of the unvisualized dimension are not known.<br><br>Aggregate dimension explanations explore how well mark values can be explained without any conditioning. Then, the model conditions on values for each column that is a potential explanation. Conditioning on the distribution of an explanatory column should result in a better prediction. |
| **Contributing Measures** | This explanation models the mark in terms of this unvisualized measure, aggregated to its mean across the visualized dimensions. An *unvisualized measure* is a measure that exists in the data source, but isn't currently being used in the view.<br><br>A Contributing Measures explanation can reveal a linear or quadratic relationship between the unvisualized measure and the target measure. |

## Disable or Enable Explain Data for a Site

Explain Data is enabled for sites by default, but Tableau administrators may disable it.

1. Go to the **General** site settings.
2. (Tableau Server only) In the **Web Authoring** section, select **Let users edit workbooks in their browser**.

3. In the **Availability of Explain Data** section, select from these options:

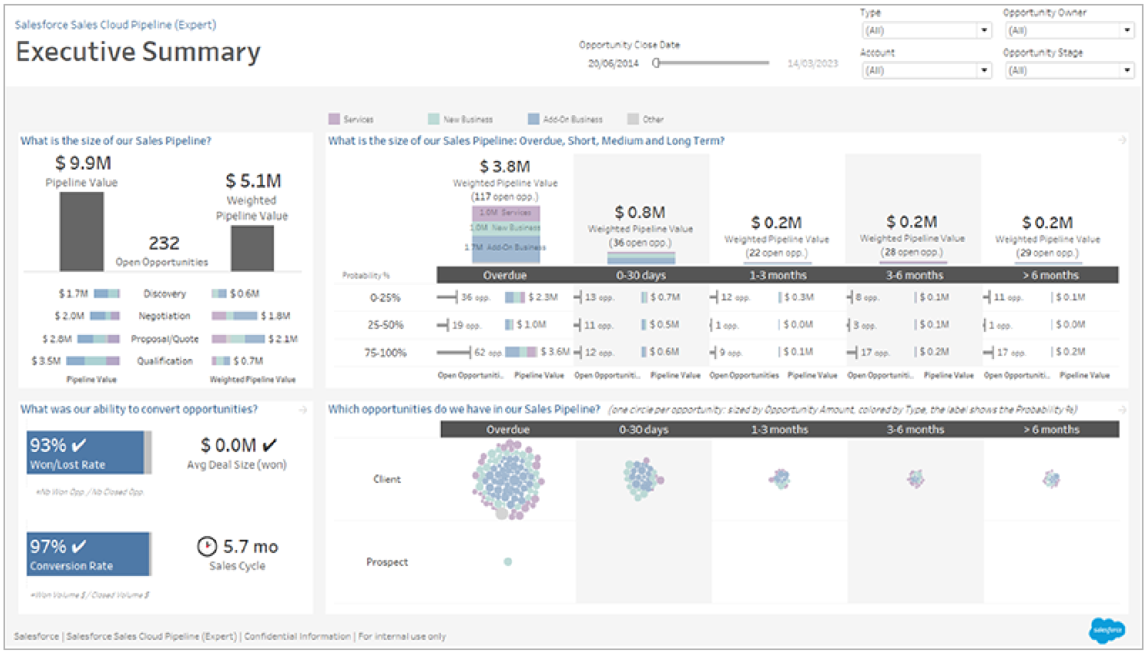
   - **Enable** lets Creators and Explorers with the appropriate permissions run Explain Data in editing mode. Lets all users with appropriate permissions run Explain Data when it is enabled for viewing mode.
   - **Disable** prevents all users from running Explain Data or accessing Explain Data settings in workbooks.

4. In Tableau Cloud and Tableau Server 2023.3 or later, to use Explain Data:

   - In the **Availability of Data Guide** section, select **Show**. For more information about Data Guide, see Explore Dashboards with Data Guide.

# Use Accelerators to Quickly Visualize Data

Tableau Accelerators are pre-built dashboards designed to help you get a jumpstart on data analysis. Tailored to specific industries and enterprise applications, Accelerators are built with sample data that you can swap out for your own data, allowing you to discover insights with minimal setup.




Salesforce Sales Cloud Pipeline Accelerator

# Where to find Accelerators

You can access the complete set of Accelerators on the Tableau Exchange and in Tableau Desktop. Additionally, select Accelerators are available to use when you create a workbook in Tableau Cloud.

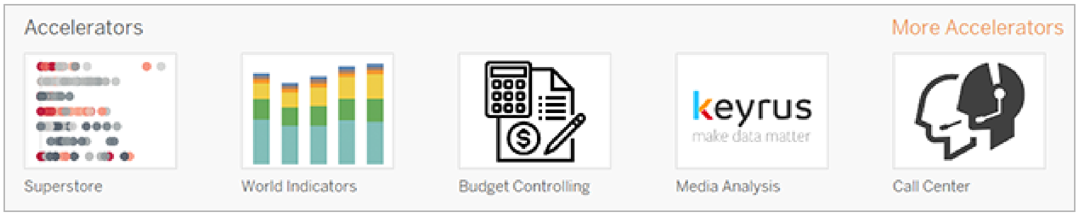
## On the Tableau Exchange website

1. Visit the Accelerators page on the Tableau Exchange website. You can filter to find Accelerators based on the industry they are applicable to and the type of data they connect to.
2. Sign in to the Tableau Exchange website. If you don't have an account, create one.
3. When you find an Accelerator you want to use, select **Download** to get the TWBX file.

   Because Accelerators are simply packaged workbooks, you can open the downloaded file in Tableau Desktop or upload it to your site on Tableau Cloud or Tableau Server. For information about uploading workbooks, see Upload Workbooks to a Tableau Site.

## In Tableau Desktop

1. On the Start Page in Tableau Desktop, select **More Accelerators**.

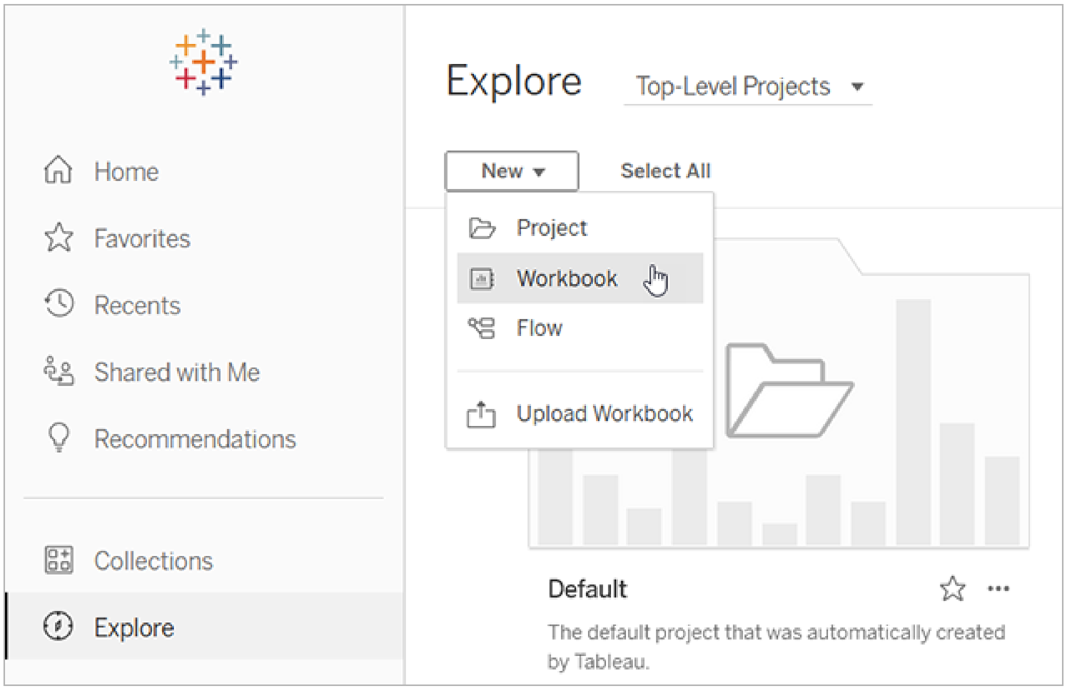



2. The Accelerators in this list are the same as those shown on the Tableau Exchange website, with the added convenience that you can open the Accelerators without leaving Tableau Desktop.
3. When you find an Accelerator you want to use, select **Open** to start working with it.

## In Tableau Cloud

A limited number of Accelerators are available for you to use when you create a workbook in Tableau Cloud. These Accelerators connect to cloud-based data like Salesforce, ServiceNow ITSM, LinkedIn Sales Navigator, Marketo, and Oracle Eloqua.

1. If you're a Creator in Tableau Cloud, navigate to the Home or Explore page, then select the **New** button and select **Workbook**.




> **Note**: Site administrators can also access Accelerators from the Home page, under the section labeled Accelerators.

2. At the top of the Connect to Data window, select **Accelerator** to browse the Accelerators available to connect to on Tableau Cloud.

You can upload Accelerators from the Tableau Exchange to Tableau Cloud and use them as you would in Tableau Desktop. However, you will need to follow the Tableau Desktop instructions to get your data into the Accelerator instead of the Tableau Cloud instructions.

## Use an accelerator from the Tableau Exchange

Follow the instructions in this section to use an Accelerator that you have downloaded from the Tableau Exchange website or opened from within Tableau Desktop. For instructions on using Accelerators when you create a workbook in Tableau Cloud, see Use an Accelerator directly in Tableau Cloud.

## Add your data to the Accelerator in Tableau Desktop

Use the data mapper

Data mapping was introduced for a limited number of Accelerators in Tableau Desktop in 2023.1.

Starting in 2023.2, the data mapper now:

- Saves your selections, if you close it, so that you can pick up where you left off
- Allows you to switch between different connected data sources
- Supports a larger number of Accelerators

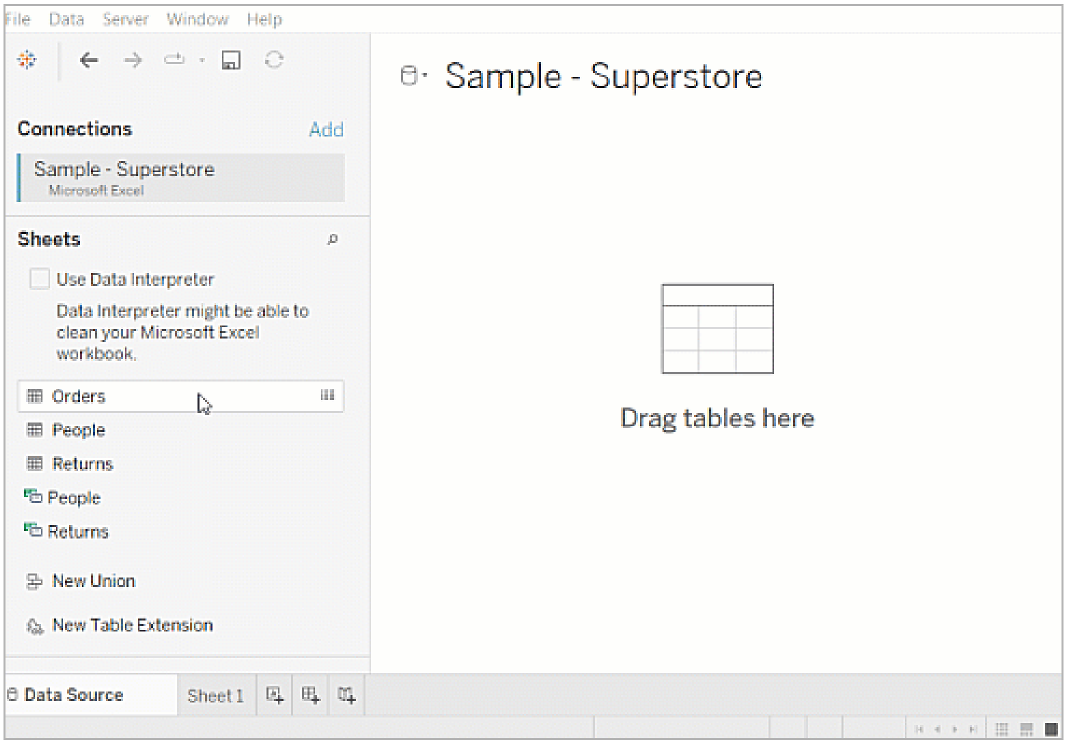
The data mapper helps you connect to data and map the fields in your data to those required for the Accelerator. If the Accelerator you have downloaded supports the data mapper, a prompt will appear to help you get started. To find Accelerators that support the data mapper, select the filter **Data Mapping enabled** on the Tableau Exchange website.

For Accelerators that don't support the data mapper, follow the instructions to Manually add your data.

1. When you open an Accelerator, the data mapper opens. Select **Get Started**.

   If you close the data mapper, you can reopen it at any time by selecting **Open Data Mapper** from the Data menu.

2. If you’ve already connected to data, select the data source to use for mapping. Otherwise, select **Connect to Data**, then select the file or cloud-based data to use with the Accelerator.
3. For unpublished data sources with more than one table, you must add data to the canvas so that Tableau can access the fields. If you see a prompt to set up your data, drag one or more tables or sheets to the data source canvas. The data you add will be available to map to the Accelerator.

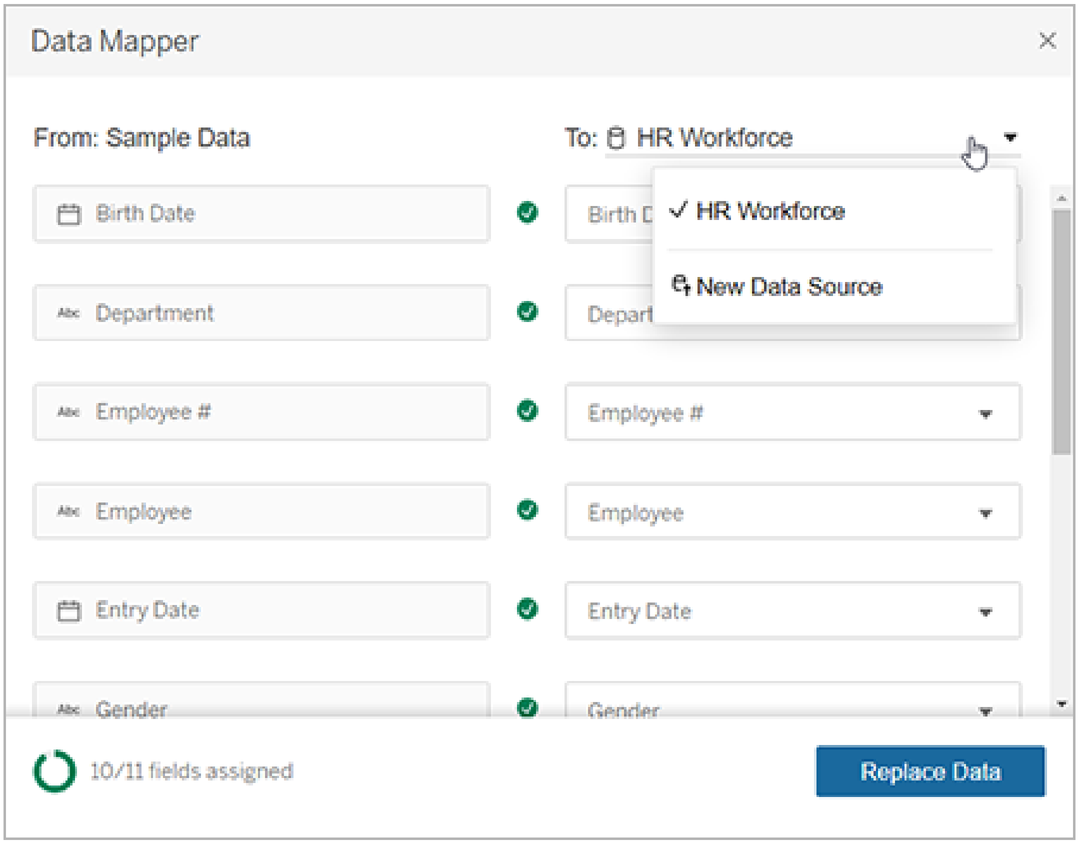



For more information about building a data source, see Use Relationships for Multi-table Data Analysis.

4. After you add your data, your fields appear in the **To** column on the data mapper. For each Accelerator field, select a field of the same data type from your data. Mouse over fields to see details about them.

   If you notice that a field in your data is marked as the wrong type, change the data type so that it can be mapped. To learn how, see Data Types.

   If you want to switch the data source you're using for data mapping, select the data source name after **To**, then select any other data sources you have connected, or select **New Data Source**. Switching the data source clears any selections you have made.




5. The indicator in the lower left of the data mapper shows how many fields you have assigned. After you complete your assignments, select **Replace Data**.

   Any fields you leave unmapped will cause the dashboards that use those fields to break. This is because all sample data is removed from the Accelerator when you replace the data.

6. Your data replaces the sample data in the Accelerator. Before you close the data mapper, check the dashboards to make sure that the data was mapped as you expected. If you notice issues with the data, select **Make Changes** to return to the assignment screen. Make your adjustments, then replace the data again.

Starting in Tableau Desktop 2023.2, if you want to make adjustments after you've closed the data mapper, select **Data** > **Open Data Mapper** to refine your selections. In Tableau Desktop 2023.1, the selections you made don’t persist, and if you reopen the data mapper, you’ll need to repeat the process of adding a data source and making assignments for each field.

Manually add your data

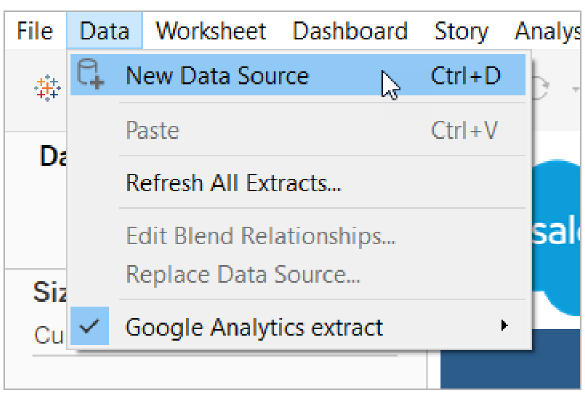
There are two methods by which you can add your data to the Accelerator: replace the data source with a new data source (method 1) or add a new connection to the existing data source (method 2).

| Method 1 | Method 2 |
| --- | --- |
| Works with data sources that have more than one table. | Data sources must have only one physical table. |
| Allows you to change field names in Tableau Desktop to match the Accelerator. | Doesn’t allow you to change field names in Tableau Desktop, which means that the field names in your data source must match the fields in the Accelerator. |
| Doesn't preserve the folder structure in the Accelerator. | Preserves the folder structure, which keeps the fields used by the Accelerator organized. |

Method 1: Replace the data source

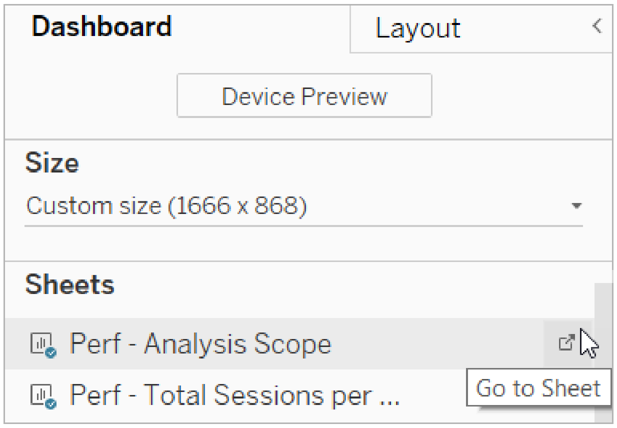
Use this method if you're adding a data source with multiple tables.

1. With the Accelerator open in Tableau Desktop, select **Data** > **New Data Source**.



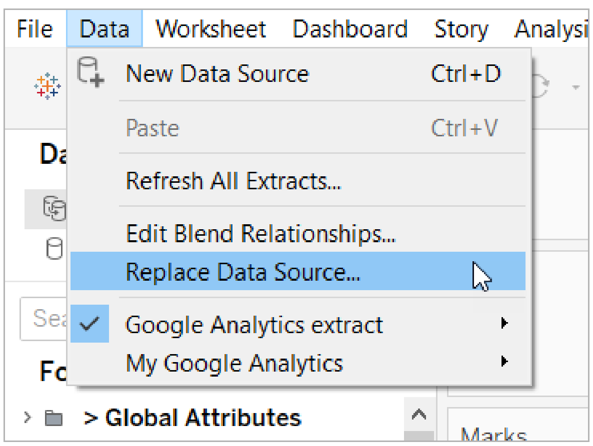

2. Connect to the data you want to use. For more information, see Connect to Your Data. If you're using a Salesforce Accelerator, make sure your account has API access to your Salesforce instance.
3. On the Data Source tab, drag tables onto the canvas to build your new data source. For more information, see Use Relationships for Multi-table Data Analysis.

4. Navigate to a dashboard, then select the Go to Sheet icon for one of the sheets listed.

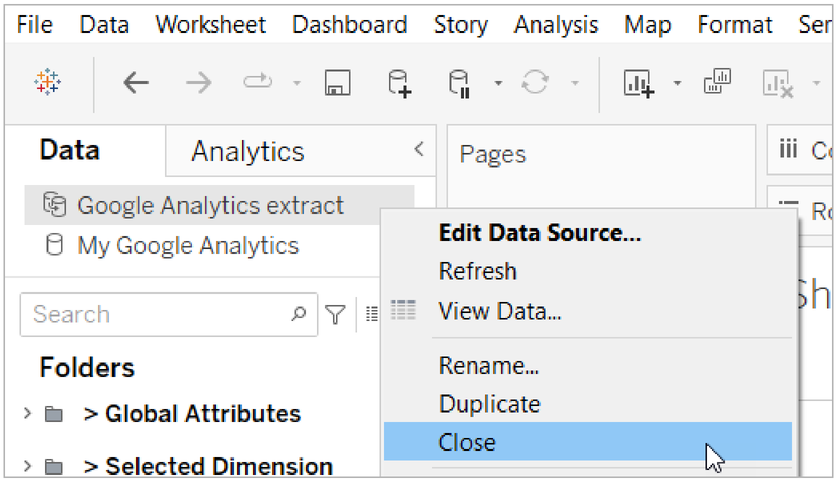



You can only replace data from a worksheet, not from a dashboard or story tab. For more information about the types of sheets in a workbook, see Workbooks and Sheets.

5. Select **Data** > **Replace Data Source**. For more information, see Replace Data Sources.



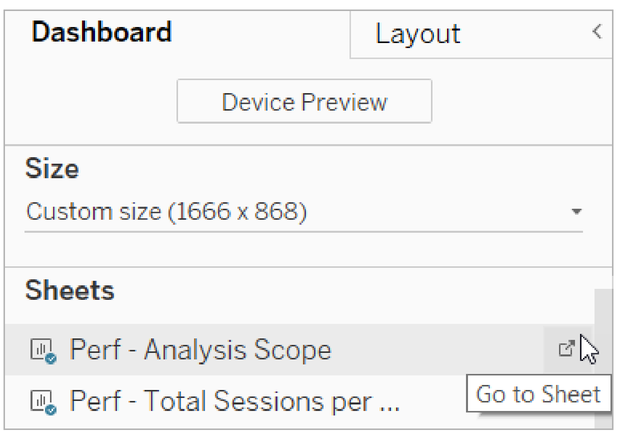

6. Under **Replacement**, select the data source you added, then select **OK**.
7. In the Data pane, right-click the original data source, then select **Close**. For more information, see Close Data Sources.



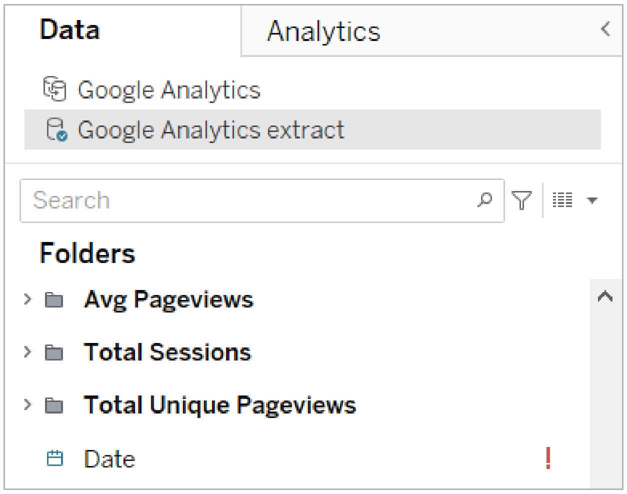

Fix broken references

If the new data source doesn't have the same field names as the original, parts of the Accelerator will be blank. Replace the broken references so that they use the correct fields from your new data source.

1. Navigate to a dashboard, then select the Go to Sheet icon for one of the sheets listed.




2. In the Data pane, identify the required fields for the Accelerator. The Accelerator page on the Tableau Exchange should list these fields in the description section.
3. Replace the field references for any fields that are marked with a red exclamation point.

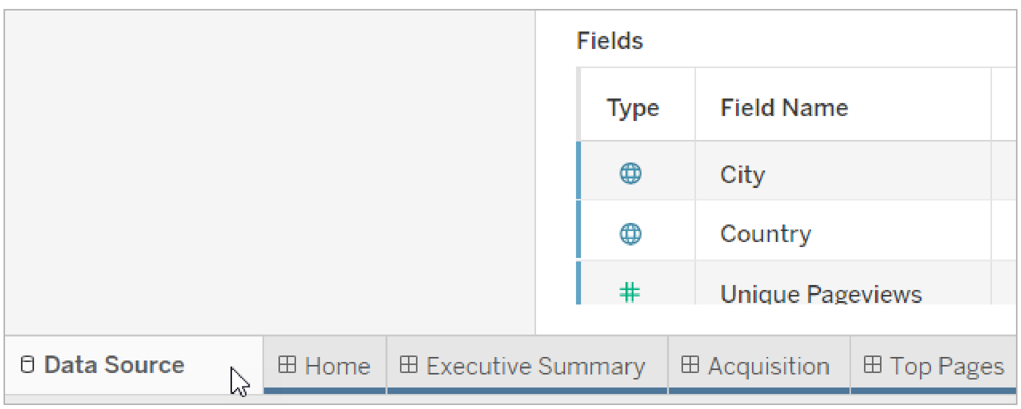



For more information, see Replace Field References.

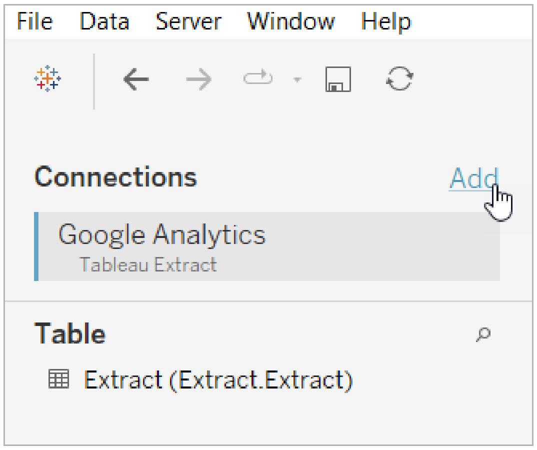
Method 2: Edit the data source

Use this method if you have a data source with only one physical table that can directly replace the physical table in the Accelerator.

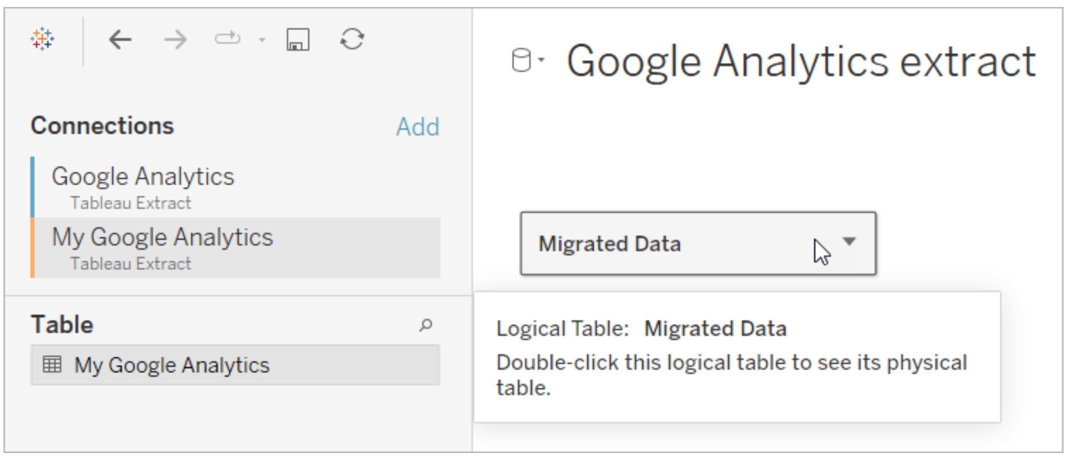
1. With the Accelerator open in Tableau Desktop, select the **Data Source** tab.



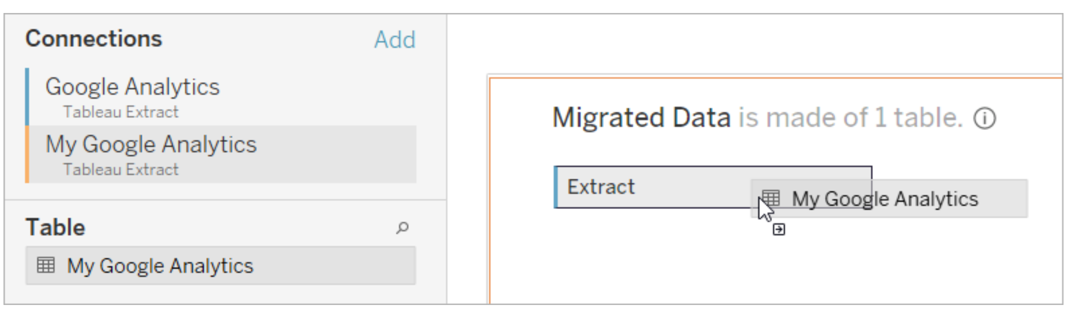

2. Next to Connections, select **Add**. Connect to the data you want to use. For more information, see Connect to Your Data.



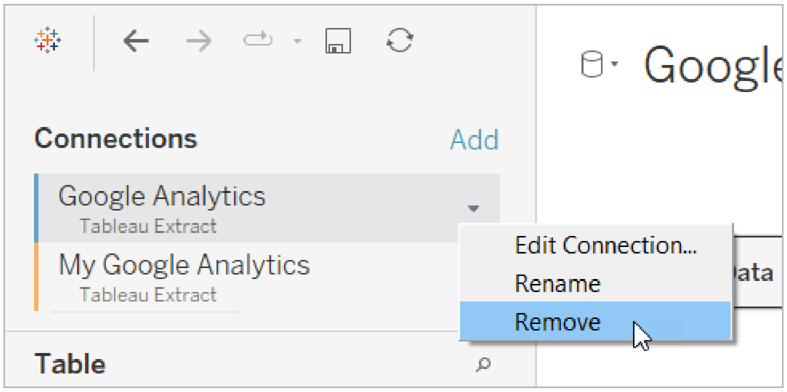

3. On the data source canvas, double-click the logical table to open the physical table. For information about logical and physical tables, see Layers of the data model.




4. Drag the table from the data source you added and drop it onto the existing physical table to replace the sample data. Your data source must be only one physical table.



5. Under connections, right-click the connection for the sample data, then select **Remove**.




## Use an Accelerator directly in Tableau Cloud

A limited number of Accelerators are available for you to use when you create a workbook in Tableau Cloud. These Accelerators prompt you to connect directly to a cloud-based data source, rather than requiring you to add data manually.

1. On Tableau Cloud, create a new workbook.
2. At the top of the Connect to Data window, select **Accelerator**.
3. From the list of pre-built designs, find an option that reflects the data source and business metrics you need, and select **Use Dashboard**.
4. To quickly see how a workbook looks with sample data, select **Continue without signing in**. Or select **Continue** to create a workbook with your data.
5. Specify a name and containing project for the workbook.
6. If you chose to create a workbook with your data, connect to your data source. While Tableau prepares an extract of your data, sample data appears so you can explore the layout.

**Note:** If you download an Accelerator from the Tableau Exchange with the intention of uploading it to Tableau Cloud, you will need to replace the data by following the instructions under Use an accelerator from the Tableau Exchange.

## Change permissions to share Accelerators with colleagues

To avoid exposure of confidential data, workbooks for Accelerators are visible only to authors and administrators by default. To share a Accelerator with your colleagues, follow these steps:

1. In Tableau Cloud, navigate to the workbook for the Accelerator.
2. On the workbook, select **Actions** > **Permissions**.
3. Give **View** permissions to any user or group you want to see the dashboard. For more information, see Edit Permissions in Tableau Cloud Help.

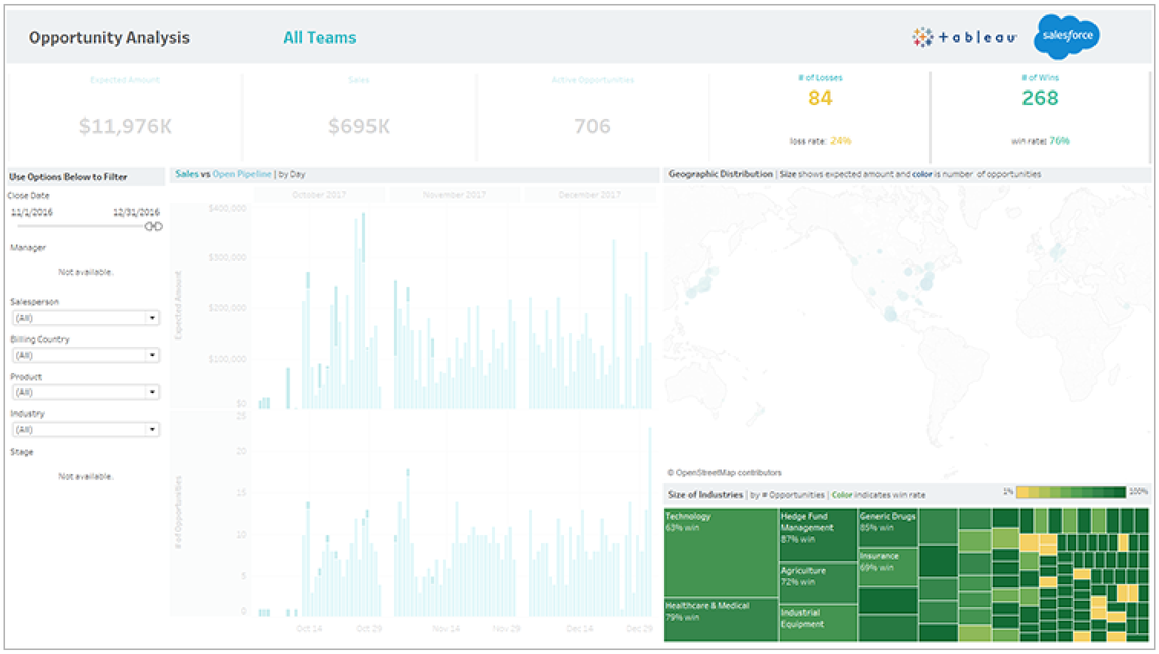
## Replace sample data with your data

If you chose to use sample data in a dashboard, you can replace it with your data at any time.

1. In Tableau Cloud, navigate to the workbook for the Accelerator.
2. On the **Data Sources** tab, select the data source. From the Actions menu, choose **Edit Connection**.
3. For authentication, select **Embedded credentials in the connection**, and either choose an existing user account or add a new one. Then select **Save**.
4. On the **Refresh Schedules** tab, select the schedule. From the Actions menu, select **Run Now**.

## Fix grayed-out views by replacing field names

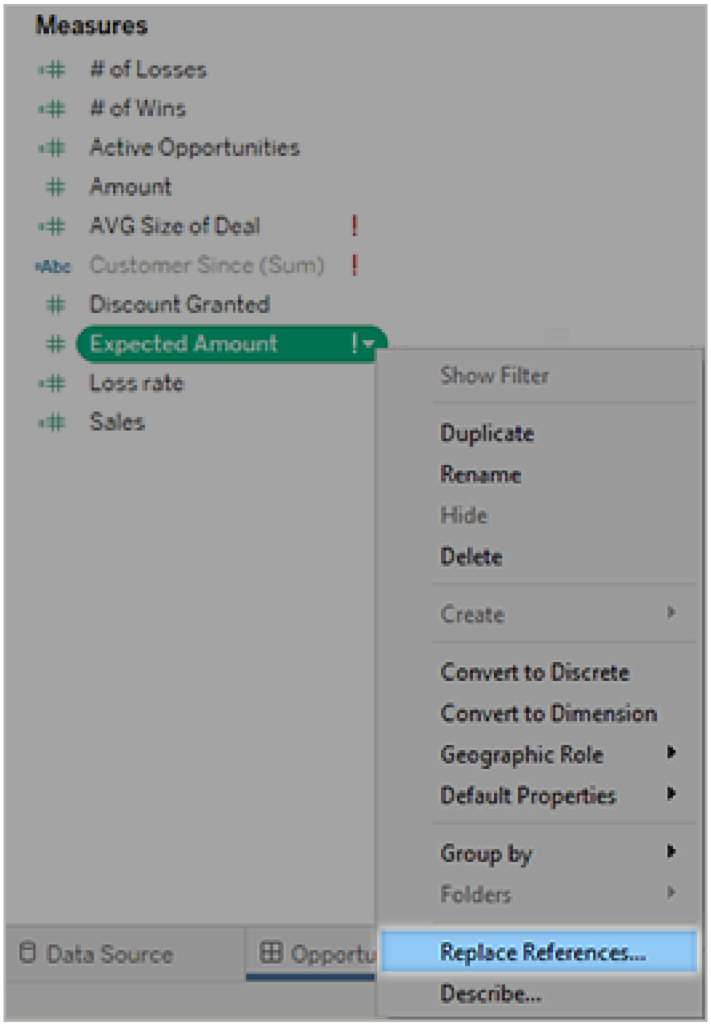
If your organization has customized the data structure for a cloud-based system, you may need to match those changes in Accelerators after your data loads in them. For example, if your organization has renamed the Salesforce “Account” field to “Customer”, you'll need to make a corresponding change in Accelerators to avoid grayed-out views like this:




Replace the field references to fix the broken fields.

1. On the dashboard, select **Edit**.
2. Navigate directly to the grayed-out sheet.
3. In the Data pane at left, look for red exclamation points (!) next to field names, which indicate that your organization uses different names.
4. Right-click each of those fields, and select **Replace References**. Then select the cor-

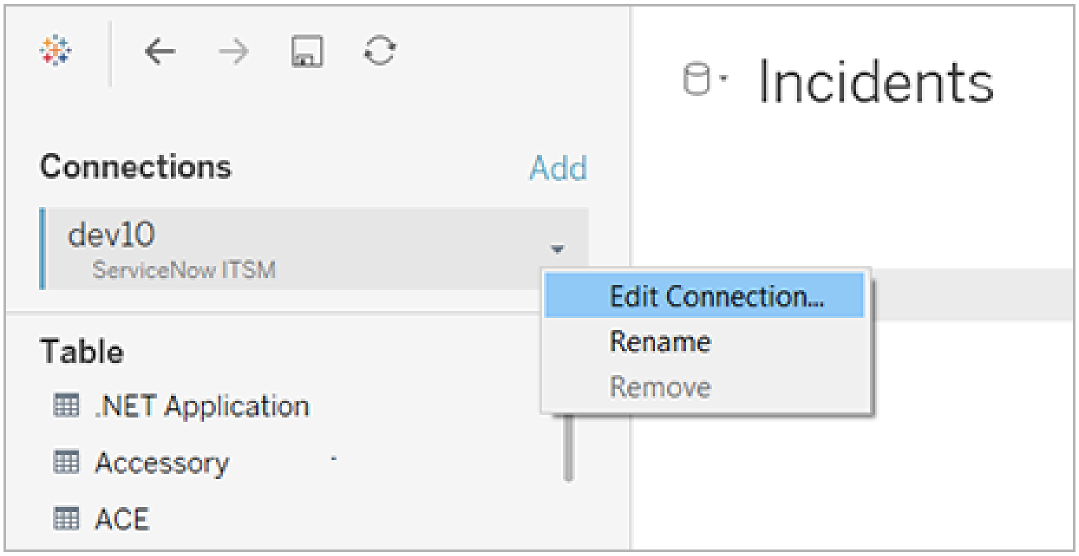
rect field name from the list.




## Fix empty dashboards by changing default date ranges

If a dashboard looks completely empty, the likely cause is a default date range that doesn't correspond to the dates in your source data.

1. Download the workbook, then open it in Tableau Desktop.
2. Select the **Data Source** tab.
3. In the upper-left corner, select the arrow next to the data source name, and select **Edit Connection**. Then sign in.




4. Specify a date range that reflects the dates in your data, then select **Connect**.
5. Choose **Server** > **Publish Data Source** to update extracts of the data on Tableau Cloud.

# Use Dashboard Extensions

Extensions let you add unique features to dashboards or directly integrate them with applications outside Tableau. Adding extensions is easy; you incorporate them into dashboard layouts just like other dashboard objects.

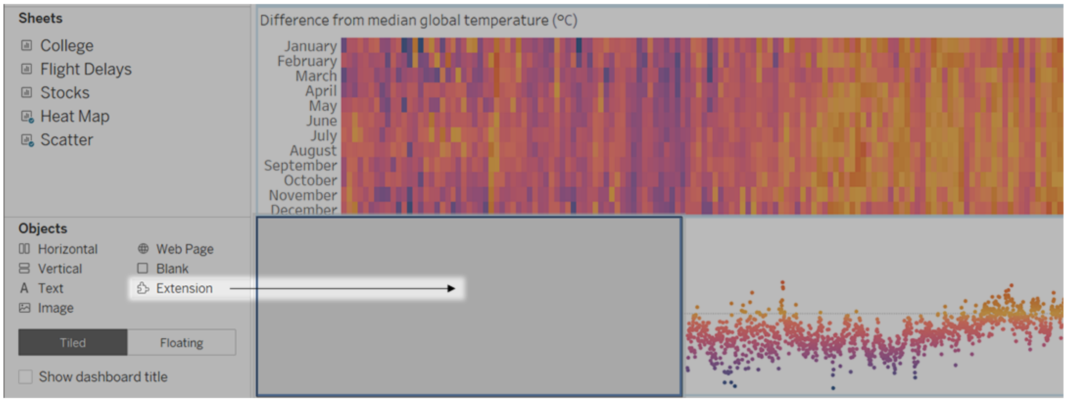
Extensions expand dashboard functionality with the help of web applications created by third-party developers. If you're a developer and want to create your own extensions, see the Tableau Extensions API documentation on GitHub.

**Note**: Tableau administrators can turn off dashboard extensions for Tableau Desktop, Tableau Server, and Tableau Cloud.

# Add an extension to a dashboard

1. In a Tableau workbook, open a dashboard sheet.

2. From the **Objects** section, drag **Extension** to the dashboard.




3. In the “Add an Extension” dialog box, do either of the following:

   - Search for and select an extension.
   - Click **Access Local Extensions**, and navigate to a .trex file you previously downloaded.

4. If prompted, allow or deny the dashboard extension access to data in the workbook. For more information, see Data security, Network-enabled, and Sandboxed extensions.

   If you allow access, follow any on screen instructions for configuring the extension.

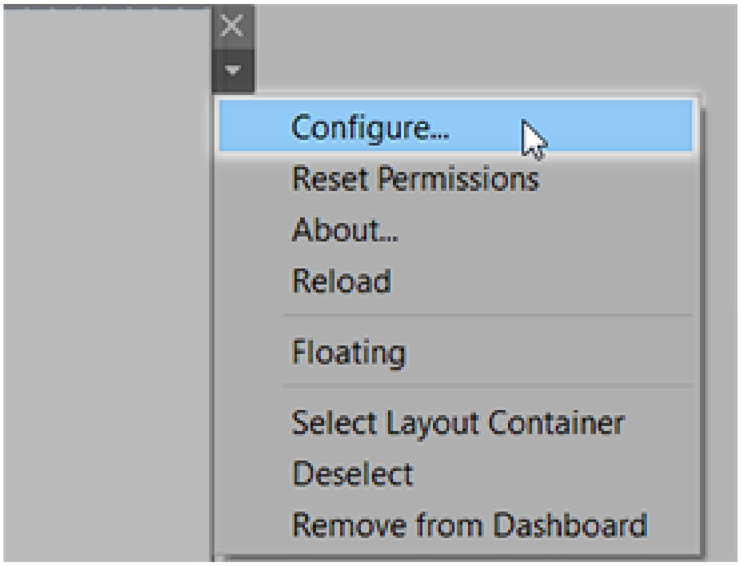
   **Note:** If you're using Tableau Server or Tableau Cloud, Extension objects will appear blank in prints, PDFs, and images of dashboards (including images in subscription emails).

## Configure a dashboard extension

Some dashboard extensions provide configuration options that let you customize features.

1. Select the extension in the dashboard, and from the drop-down menu in the upper-right corner, choose **Configure**.

2. Follow the on-screen instructions to configure the extension.




## Reload a dashboard extension

If a dashboard extension becomes unresponsive, you might need to reload it, which is similar to refreshing a web page in a browser.

1. Select the extension in the dashboard, and from the drop-down menu in the upper-right corner, choose **Reload**.

   The dashboard extension is refreshed and set to its original state.

2. If reloading the extension fails to return it to a useable state, try removing it from the dashboard and adding it again.

# Data security, Network-enabled, and Sandboxed extensions

Dashboard extensions are web applications that come in two forms:

- *Network-enabled extensions* run on web servers located outside of your local network.
- *Sandboxed extensions* run in a protected environment without access to any other resource or service on the web.

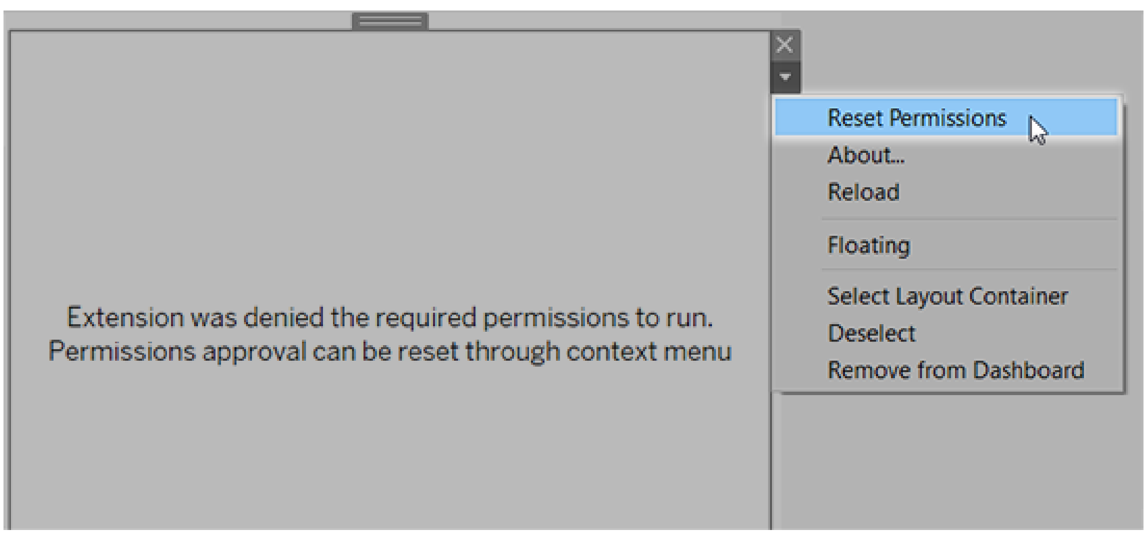
Before adding a Network-enabled extension or viewing a dashboard with one, be certain that you trust the website that hosts it. By default, dashboard extensions use the HTTPS protocol, which guarantees an encrypted channel for sending and receiving data, and ensures some privacy and security.

For more information about data security when using dashboard extensions, see Extension Security - Best Practices for Deployment.

## Allow or deny data access to a Network-enabled extension

Depending on how an extension is designed, it can access either visible data in a view, or full underlying data, table and field names from data sources, and information about data source connections. When you add an extension, or view a dashboard with one, you're given an opportunity to allow or deny the extension to run and access this data.

If you're viewing a dashboard with an extension that requires full data access, and that access has been denied, a message appears in place of the extension. If you trust the extension and want to use it, you can reset permissions and allow the extension to run.



1. Select the extension in the dashboard, and from the drop-down menu in the upper-right corner, choose **Reset Permissions**.

2. Click either **Allow** to let the extension run and access data, or **Deny** to prevent the extension from running.

### Ensure that JavaScript is enabled in Tableau Desktop

Dashboard extensions interact with data using the Tableau Extensions API library, a JavaScript library. If you want to use extensions, be sure that JavaScript is enabled in the dashboard security settings:

Choose **Help** > **Settings and Performance** > **Set Dashboard Web View Security** > **Enable JavaScript**.

## Ensure that extensions run on Tableau Cloud or Tableau Server

You can add extensions to workbooks you publish from Tableau Desktop or directly in the web-authoring mode of Tableau Cloud and Tableau Server. A Tableau administrator must allow extensions to run on a site and add Network-enabled extensions to a safe list. Administrators should only allow extensions that you have tested and trust.

If you want to use a dashboard extension on Tableau Cloud or Tableau Server, direct your administrator to Manage Dashboard Extensions in Tableau Cloud or Manage Dashboard Extensions in Tableau Server.

### Supported web browsers for Sandboxed extensions

Sandboxed extensions run in all browsers supported Tableau Server and Tableau Cloud except Internet Explorer 11.

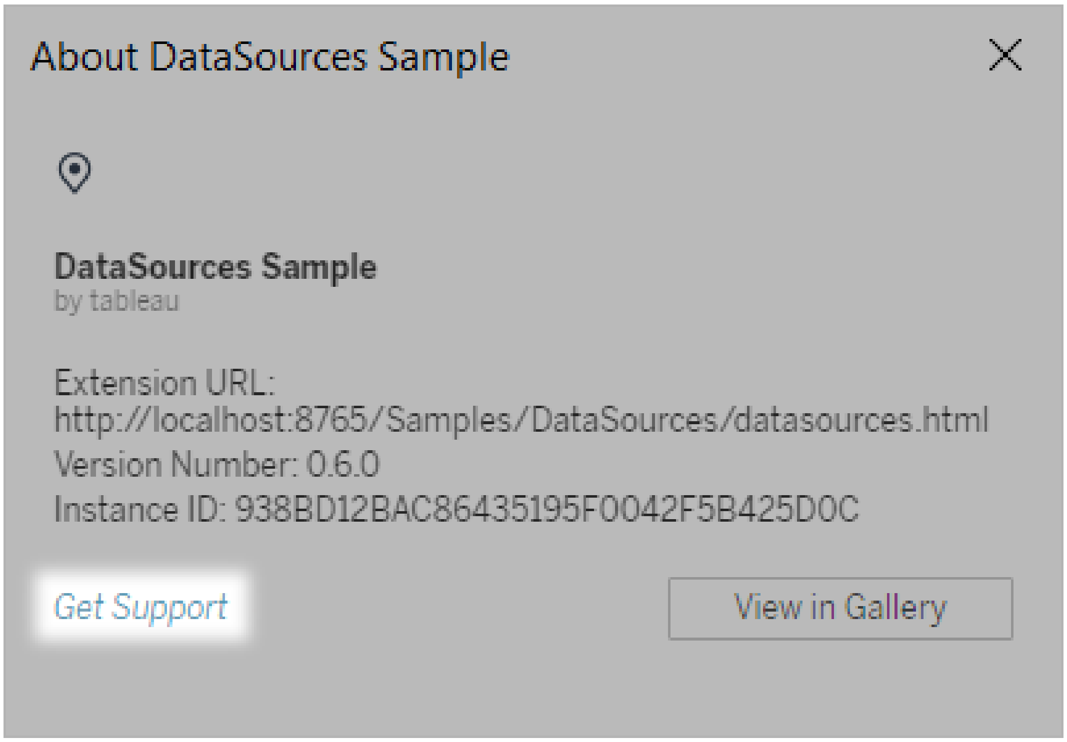
### Supported versions of Tableau Server for Sandboxed extensions

You can use Sandboxed extensions in Tableau Server 2019.4 and later.

## Get support for dashboard extensions

To get help for an extension, you'll need to contact the developer or company who created it.

1. Select the extension in the dashboard, and from the drop-down menu in the upper-right corner, choose **About.**
2. Click **Get Support** to go to the support page of the extension developer.




**Note:** Tableau doesn't provide support for extensions or for other programs that interface with the Extensions API. However, you can submit questions and ask for help in the Tableau developer community.

# Add Viz Extensions to Your Worksheet

Viz Extensions are web applications that can extend the native visual capabilities of Tableau. Viz Extensions give users the ability to interact with custom viz types on their worksheets.

Tableau Extensions expand worksheet functionality with the help of web applications created by Tableau, Tableau Partners, and third-party developers in our community. If you're a developer and want to create your own extensions, see the Tableau Extensions API documentation on GitHub.

A Viz Extension is similar to a dashboard extension in that it's a web application that is hosted on the Tableau Exchange. It's different from a dashboard extension in that you add it to a worksheet while building the viz, rather than adding it to a dashboard as an object.

## Add a Viz Extension to a worksheet

There are two ways to add a Viz Extension to your worksheet via the Marks card. If you've already downloaded it through the Tableau Exchange, you can add it as a local file. Or you can download it from the Tableau Exchange in the flow of authoring your Viz.

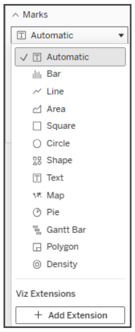
### Add a Viz Extension as a local file

If you've already selected and downloaded a Viz Extension from the Tableau Exchange, it will be saved on your computer as a .trex file.

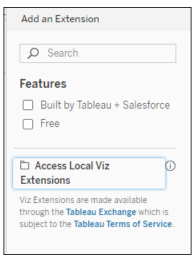
1. Open a Tableau workbook and connect to your data source.

2. In a worksheet, on the Marks card, expand the Mark type dropdown menu.

3. Under Viz Extensions, select **Add Extension**.




4. In the Add an Extension dialog box that appears, select **Access Local Viz Extensions**.




5. Navigate to and open the saved .trex file.

6. If prompted, allow or deny the Viz Extension access to data in the workbook.

The Viz Extension loads in the view, and the mark type changes to the name of the Viz Extension.

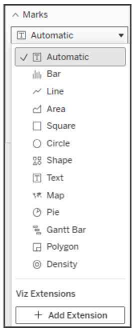
## Add a Viz Extension while authoring your viz

If you haven't already selected and downloaded a Viz Extension, you can do so in the flow of authoring a viz.

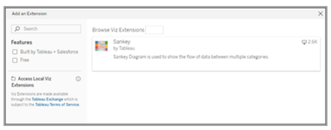
1. Open a Tableau workbook and connect to your data source.

2. In a worksheet, on the Marks card, expand the Mark type dropdown menu.

3. Under Viz Extensions, select **Add Extension**.

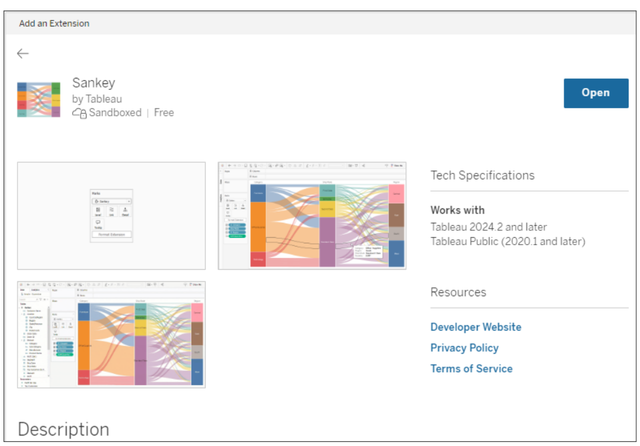



4. In the Add an Extension dialog box that appears, select the Viz Extension that you'd like to load onto your worksheet. In this example, we're loading a Sankey diagram built by Tableau.

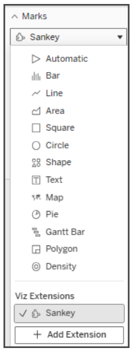


5. If prompted, allow or deny the Viz Extension access to data in the workbook. For more information, see Data security, Network-enabled, and Sandboxed extensions.

6. Select **Open**.




The Viz Extension loads in the view, and the mark type changes to the name of the Viz Extension.




## Use the Marks card to encode your marks

Drag fields onto the encoding boxes on the Marks card to build the viz. The Mark encoding boxes and formatting options are determined by the developer. Check the extension description on the Tableau Exchange for information on the Viz Extension you're loading.

To follow along with the Sankey extension, follow these encoding instructions:

The Sankey extension is built to use extension-specific encoding for **Levels** and **Links**. These can be used with the built-in Marks encoding boxes Tooltip and Details to build the Sankey on the worksheet.

- **Level** - Sankey levels represent the categorical dimensions that are related by the Sankey. In this extension, you can include up to 5 discrete dimensions as Levels.
- **Link** - Sankey links connect the categories across the Sankey. This encoding will size the width of each link based on a numeric measure.

## Ensure that extensions are allowed on Tableau Cloud

If you're not able to add a Viz Extension, check to see if extensions have been allowed on your site. A Tableau administrator must allow extensions to run on a site and add Network-enabled extensions to an allow list. Administrators should only allow extensions that you have tested and trust.

To learn more about adding Network-enabled extensions to an allow list, see Tableau Help: Change the default settings for a site.

### Data security, Network-enabled, and Sandboxed extensions

Extensions are web applications that come in two forms:

- *Network-enabled extensions* run on web servers located outside of your local network.
- *Sandboxed extensions* run in a protected environment without access to any other resource or service on the web.

Before adding a Network-enabled extension, be certain that you trust the website that hosts it. By default, extensions use the HTTPS protocol, which guarantees an encrypted channel for sending and receiving data, and ensures some privacy and security.

For more information about data security when using extensions, see Extension Security - Best Practices for Deployment.

### Allow or deny data access to a Network-enabled extension

Depending on how an extension is designed, it can access either visible data in a view, or full underlying data, table and field names from data sources, and information about data source connections. When you add an extension, you're given an opportunity to allow or deny the extension to run and access this data.

### Reset data access for your extension

If you need to reset the data access permissions for your extension, you can simply reload the extension by selecting Add Extension on the Marks card, and then re-adding the extension to the worksheet. These steps kick off the process to allow or deny access to the extension.

## Ensure that JavaScript is enabled in Tableau Desktop

Viz extensions interact with data using the Tableau Extensions API library, a JavaScript library. If you want to use extensions, be sure that JavaScript is enabled in the security settings:

Choose **Help** > **Settings and Performance** > **Set Dashboard Web View Security** > **Enable JavaScript**.

## Get support for Viz Extensions

To get help for an extension, you'll need to contact the developer or company who created it through the Tableau Exchange.

> **Note:** Tableau doesn't provide support for extensions or for other programs that interface with the Extensions API. However, you can submit questions and ask for help in the Tableau developer community.

# Integrate External Actions

> **Note:** External Actions in Tableau rely on functionality provided by Salesforce Flow. The feature sends your selected data to Salesforce Flow, which runs on separate Salesforce infrastructure. Use of Salesforce Flow and other Salesforce products and services is subject to your agreement with Salesforce.

After seeing and understanding your data in Tableau, what's next? Typically, taking action from data insights involves pivoting from one application to another, often copying and pasting data and losing context along the way. With the Tableau External Actions feature, you can create and interact with data-driven workflows directly from Tableau dashboards and automate your next steps using Salesforce Flow.

## About Salesforce Flow

If you're not familiar with Salesforce Flow, it's a no-code tool that provides time-saving process automations. A flow is a component of Salesforce Flow that collects data and performs actions in your Salesforce org. There are several flow types available in Salesforce Flow, but External Actions workflows in Tableau are only compatible with autolaunched flows.

**Note:** To learn more about flows, check out Build Flows with Flow Builder on Trailhead.

## How External Actions work


When an External Actions workflow is configured for a viz on a Tableau dashboard, a customized button appears on the corresponding viz in an unavailable (grayed out) state. When you select a relevant mark on the viz (1), the button becomes available. Then, when you click the button (2), data from the selected mark is sent directly to a flow that was built and configured in Salesforce Flow (3).

As the author of an External Actions workflow, you determine:

- Which flow the data is sent to
- Which dashboard the data comes from
- The text and appearance of the dashboard button that triggers the workflow

**Note:** You can add multiple External Actions workflows to a dashboard, but each of the corresponding flows must be deployed in the same Salesforce org.

## Ways to use External Actions workflows

There are endless ways to use External Actions workflows to automate existing processes in your organization. For example, think of the effort saved by a workflow that lets accounting team members send customer invoices directly from the same dashboard they use to track unpaid orders. Or maybe you're looking for ways to streamline your support team's case management. A workflow that lets support team members escalate cases directly from the dashboard they use to track cases could be a significant time-saver. External Actions workflows help keep users in the flow of work, and enables your organization to benefit from increased efficiencies.

When you create an External Actions workflow, you're essentially building a bridge that connects any type of data source in Tableau with a flow at Salesforce. Your data source doesn't need to be connected to a Salesforce database because the workflow itself creates that connection. This is particularly useful when there are multiple groups using separate data sources to complete different steps of the same process.

For example, think about the different teams and tools involved when a customer places an order at an ecommerce site. Ecommerce sales reps might use Salesforce to track the sale while supply chain managers use a supply chain management tool to deduct the purchased item from overall product inventory. Support teams that help the customer troubleshoot any issues that arise when they receive their product might be logged in Salesforce or analyzed in a Tableau dashboard. With an External Actions workflow, you can connect all of this data from each of these teams to streamline processes and even automate some of the existing steps.

## Best practices for External Actions workflow authors

**Important:** Dashboard authors using the External Actions feature to connect dashboard data with flows built in Salesforce Flow should closely collaborate with the Salesforce admins and architects who created the flows.

Flows built in Salesforce Flow are sophisticated business automation programs. Although your organization can greatly benefit from these automations, it's important to understand how flows work before deploying External Actions workflows that use them. Be sure to complete the Salesforce Flow training on Trailhead and review the Flows documentation. Consider Flow Best Practices in your design, and keep Flow Limits and Considerations in mind.

**Note:** There are several flow types available in Salesforce Flow, but External Actions workflows are only compatible with autolaunched flows.

External Actions workflows must be carefully implemented to align with the architectural constraints of flows built in Salesforce Flow. Flows are powerful, but they can also be resource-intensive and complex. There are potential licensing, execution throttling, and concurrency issues to consider, and database read/write limits that must be evaluated and tested.

There are also important security considerations related to flows. Users with the Manage Flows permission can view and change all data and resources in the corresponding Salesforce org. Users with the Run Flows permission can run nearly any active flow in the Salesforce org. To restrict access to only those users who require it (such as dashboard authors and workflow users), your Salesforce admin can enable the override default behavior setting for a flow. For more information, see How Does Flow Security Work?

Dashboard authors who are creating External Actions workflows should communicate with their Salesforce admins before implementing workflows to prevent undesired results.

## Create a workflow

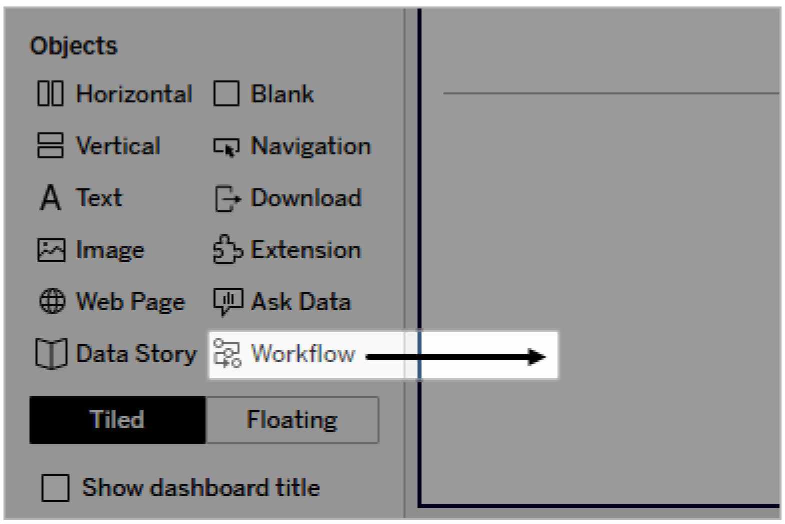
Before creating an External Actions workflow, dashboard authors should collaborate with their Salesforce admins to find or create a flow that meets their needs. For example, perhaps your goal is to help your accounting team send invoices directly from an unpaid orders dashboard. To accomplish this goal, you need a flow that can retrieve the customer contact information and order details from the dashboard and populate the invoices.

After you decide which flow to use, the next step is identifying a dashboard to connect it to. It's likely that your users are already interacting with an existing dashboard that would work well. However, if necessary, you can create a new dashboard.

With the right flow and the right dashboard in mind, it's time to think about the compatibility of the data types in the dashboard with the flow's required input fields (known as variables). For example, your unpaid orders dashboard must contain a viz with all of the relevant order details needed to send customer invoices. These details might include information such as order date, customer name and contact information, item descriptions and amounts, and payment amount due.

When your dashboard contains all of the required components, add the Workflow object:

1. In a Tableau workbook, open an existing dashboard or create a new one.
2. From the **Objects** section of the **Dashboard** pane, drag **Workflow** to a viz in the dashboard.




3. When prompted, enter your log-in credentials for the Salesforce org associated with your flow.

> **Note:** When users access the dashboard where you set up your workflow, they must enter their Salesforce credentials. If their Salesforce credentials expire while viewing the dashboard, they're prompted to reauthenticate.

4. Click **Configure Workflow**.
5. In the **Add Workflow** dialog, search for a flow by flow name or flow author.
6. Select a flow to view its details, including the required inputs (Salesforce variables) it needs from the viz. Click **Back** to select a different flow, or click **Next** to continue.
7. From the **Select Sheet** drop-down, select a sheet (worksheet, dashboard, or story) that contains the marks your users will select and send to the flow.

   > **Note:** Be sure to select a sheet that has marks with the encoded fields you want to map to the flow's required inputs. For example, if you want to map the `forecast_revenue` variable in the flow to the `SUM(Sales)` field in Tableau, you must select a sheet with marks that are encoded with the `Sum(Sales)` field.

8. Click **Next**.
9. For each of the flow's required inputs (Salesforce variables), select an appropriate field from the Tableau sheet you chose in the Select Sheet step.

   > **Note:** For each input, the data type of the Salesforce variable and Tableau field must match.

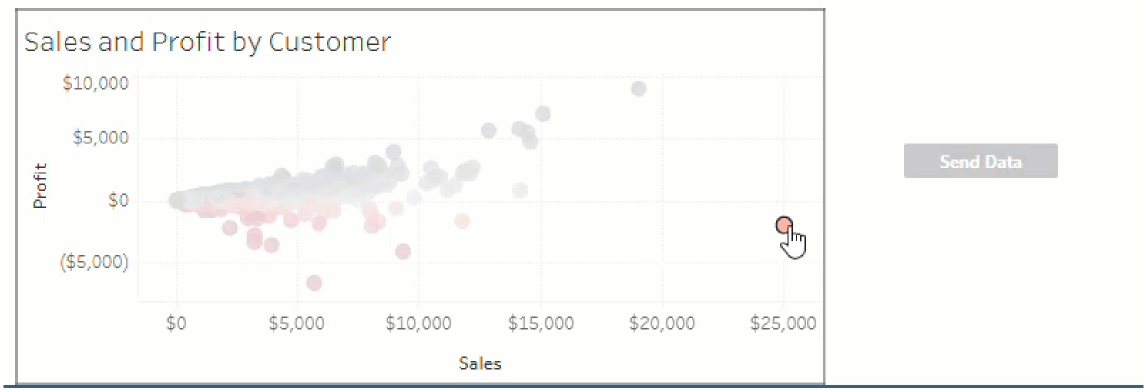
10. Click **Next**.
11. Configure the appearance of the button that users click to trigger the External Actions workflow. Specify a button title, background color, and border color. Check the preview to confirm the button's appearance.

    > **Note:** Remember that users must select a mark from the viz that you chose in the **Select Sheet** step. Until a mark is selected, the button isn't available. Consider adding guiding text to the dashboard so users know exactly what viz to interact with and what will happen when they click the button.

12. Click **Done** to create the workflow and add the corresponding button to the viz in the dashboard.

## Use a workflow

To get started as a workflow user, open the dashboard where your dashboard author has added a workflow. You can confirm that a workflow is available if a workflow button displays. The dashboard author customizes the name and format of the button, and it should clearly indicate the action triggered when you click it (such as "Send Data" or "Update Record"). Select a relevant mark from a viz in the dashboard, and then click the button to start the workflow.




Clicking the workflow button triggers the transmission of data, and the mark you select determines what data is sent. For that reason, the button is unavailable (grayed out) until you select a mark. If you've selected a mark but the button is still unavailable, verify that you've selected a mark on a valid viz for the workflow. If you aren't sure which vizzes are valid, check with the dashboard author.

Depending on their configuration, some workflows might be long-running operations that don't complete immediately. If you're unable to determine whether the workflow you selected is working as expected, check with the dashboard author or your Salesforce admin.

## Troubleshoot a workflow

For help resolving issues with an External Actions workflow, see the following troubleshooting guidance.

## Access issues

- **For dashboard authors using Tableau Desktop:** If the Workflow object doesn't appear in the Objects section of the Dashboard pane, confirm that you're signed in to a Tableau Server or Tableau Cloud site. If you aren't signed in, you won't be able to access the Workflow extension.
- **For dashboard authors:** If the Workflow object doesn't appear in the Objects section of the Dashboard pane, check with your Tableau admin to ensure that the extension is turned on.
- **For all users:**
  - If your Salesforce admin hasn't created a connected app, the External Actions feature won't work. Ask your Salesforce admin to create a connected app in Salesforce for Tableau Server.
  - If you're unable to click a workflow button that displays on a dashboard, confirm that you've selected a mark on a valid viz for the workflow. If you aren't sure which vizzes are valid, check with the dashboard author.

## Authentication issues

- **For Tableau Cloud or Tableau Server users:** Refresh the dashboard in your browser.
- **For all users:** Confirm that you've signed in to the Salesforce org where the External Actions workflow was added. If necessary, check with your dashboard author to confirm the correct Salesforce org.

## Error messages

| Error Message | Explanation and Resolution |
|---|---|
| Workflow is turned off on this site. For more information, contact your Tableau administrator. | Your Tableau admin has turned off the Workflow dashboard extension for your site, so it isn't available for your use. Contact your Tableau admin to discuss turning on access to the extension. |
| Workflow isn't supported by Tableau Reader | The Workflow dashboard extension and External Actions feature can only be used to send data to a flow using Tableau Cloud, Tableau Desktop, or Tableau Server versions 2022.3 and later. |
| Flow contains one or more | The selected flow requires a data type input that isn't available |

| Error Message | Explanation and Resolution |
|---|---|
| unsupported data types. Go back to select a different flow, or contact your Salesforce Flow administrator to remove unsupported data types from this flow. | in Tableau dashboards, or is otherwise incompatible with External Actions workflows. Select a different flow if a suitable alternative exists, or check with your Salesforce admin for next steps. |
| One or more data type mismatches exist in the mapping of input fields. | The data type for one or more of the dashboard values mapped to the input variable fields aren’t identical.<br><br>For example, the flow might require a numeric variable for Revenue, but the mapped value from the dashboard was a text string. Depending on your scenario, you have two options to fix this. You can change the data type of the Revenue field in Tableau from a text string to a numerical value. Or, you edit the workflow configuration to map a different field from the dashboard that has a numerical data type. |
| Unable to submit data to Salesforce Flow. | An unknown error occurred while the External Actions workflow attempted to send data from the dashboard to the flow. Contact your dashboard author to troubleshoot. |
| Error occurred: <exception code>. Contact your Salesforce Flow administrator. | The flow interview (running instance of the flow) failed. Share the exception code with your Salesforce admin so they can find the corresponding error email and troubleshoot accordingly. |
| Workflow failed. Contact your Salesforce Flow administrator. | The data from the selected mark in the dashboard was sent to the flow, but there was an issue in translating that data to the flow. Contact your Salesforce admin to troubleshoot. |
| Unable to submit data to flow. Contact your workflow author. | The data from the selected mark in the dashboard wasn't sent to the flow. Contact your dashboard author to troubleshoot. |

### Flow issues

- Some flows run asynchronously, so you may not immediately know whether a flow that’s part of an External Actions workflow ran successfully. At times, a flow might fail and rollback changes without immediately providing detailed feedback. However, when a flow fails, a detailed error email is sent to the workflow user, dashboard author, and Salesforce admin. Workflow users should contact their dashboard authors when they receive a flow error email. Dashboard authors and Salesforce admins can then work together to troubleshoot and resolve the error. For more information on troubleshooting flow issues, see Troubleshoot Flows.

### Licensing issues

- **For dashboard authors:** On the Tableau side, no special permissions are required to add a workflow to a dashboard (as long as External Actions are enabled for the site). On the Salesforce side, you’ll need the Manage Flows permission added to your Salesforce profile.
- **For workflow users:** On the Tableau side, any user who can access a dashboard with a workflow can run it. From the Salesforce side, you’ll need the Run Flows permission added to your Salesforce profile.

## Turn External Actions On or Off

In Tableau 2022.3 and later, the External Actions feature is turned on by default. For more information on how Tableau admins can configure org-wide access to Tableau External Actions, see Configure External Actions Workflow Integration.

# Format Animations

Animate visualizations to better highlight changing patterns in your data, reveal spikes and outliers, and see how data points cluster and separate.

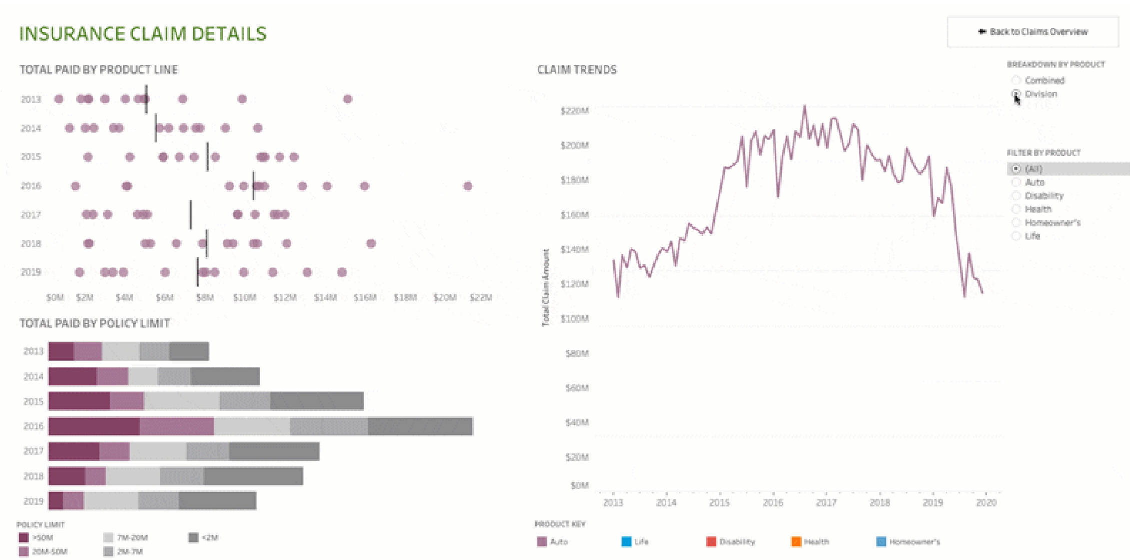
Animations visually transition between filter, sort, and zoom settings, different pages, and changes to filter, parameter, and set actions. As visualizations animate in response to these changes, viewers can more clearly see how data differs, helping them make better informed decisions.

# Understanding simultaneous and sequential animations

When you author animations, you can choose between two different styles: simultaneous or sequential. Here are examples of each type.

## Simultaneous animations

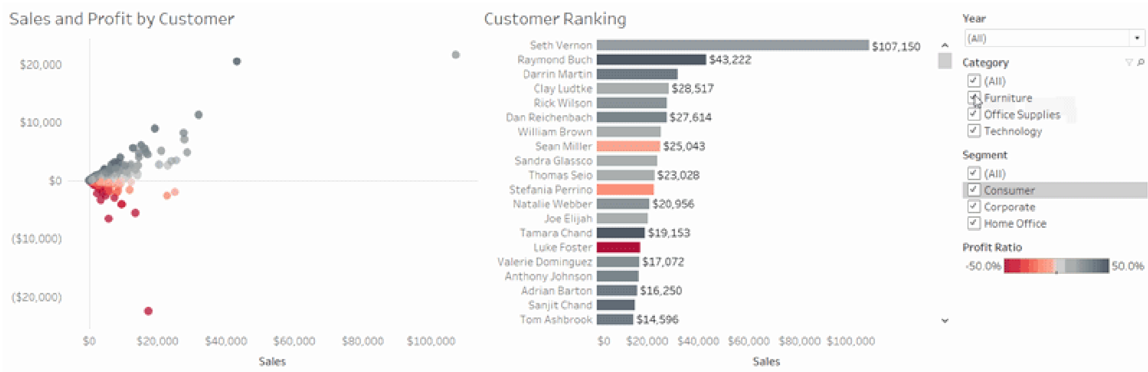
The default simultaneous animations are faster and work well when showing value changes in simpler charts and dashboards.




Click the image above to replay the animation.

## Sequential animations

Sequential animations take more time but make complex changes clearer by presenting them step-by-step.



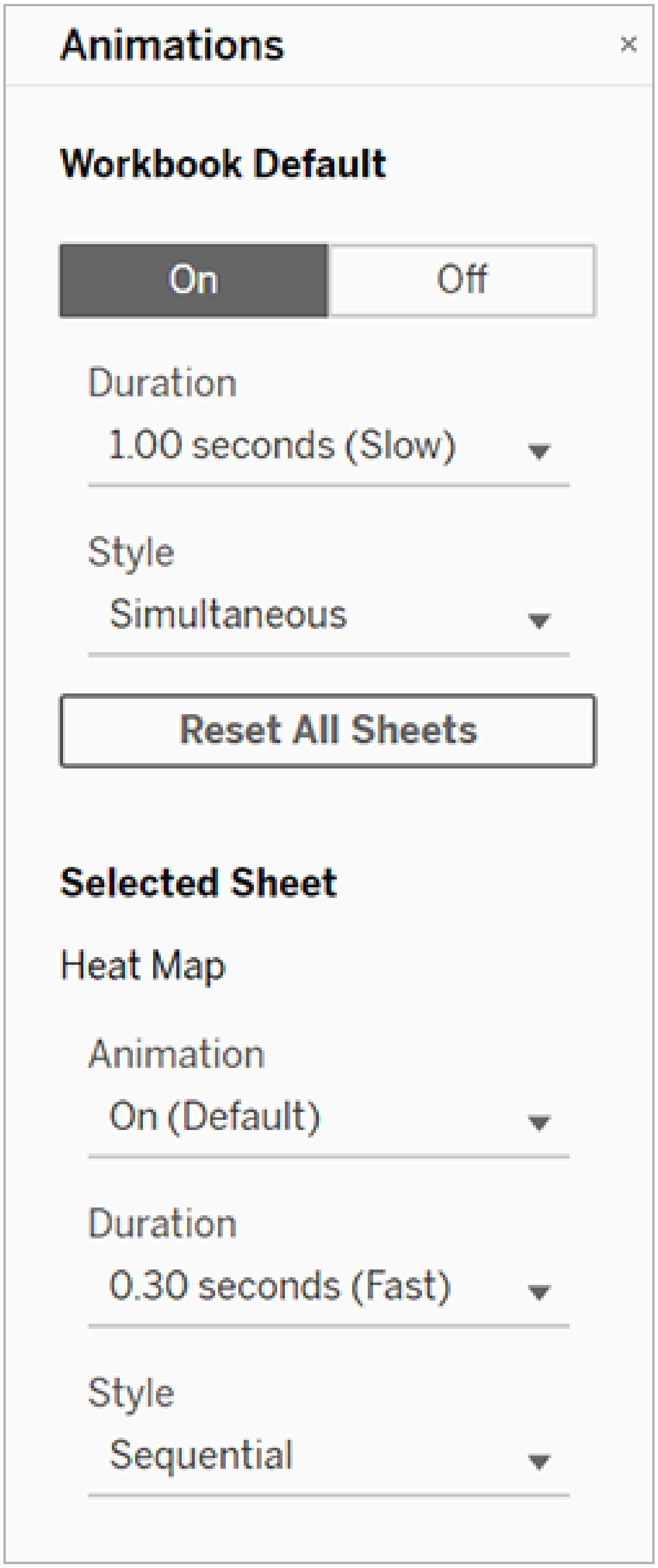

Click the image above to replay the animation.

## Animate visualizations in a workbook

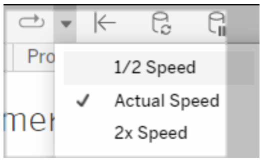
When you create a new workbook, Tableau enables animations for your viz by default. You can turn animations on or off at the user and workbook level.

1. Choose **Format** > **Animations**.
2. If you want to animate every sheet, under **Workbook Default**, click **On**. Then do the following:
   - For **Duration**, choose a preset, or specify a custom duration of up to 10 seconds.
   - For **Style**, choose **Simultaneous** to play all animations at once or **Sequential** to fade out marks, move and sort them, and then fade them in.
3. To override workbook defaults for a particular sheet, change the settings under **Selected Sheet**.

> **Note:** In the Selected Sheet section, “(Default)” indicates a setting that automatically reflects the related Workbook Default setting.


Animations
×
Workbook Default
On
Off
Duration
1.00 seconds (Slow)
Style
Simultaneous
Reset All Sheets
Selected Sheet
Heat Map
Animation
On (Default)
Duration
0.30 seconds (Fast)
Style
Sequential

To replay an animation, click the **Replay** button in the toolbar. From the **Replay** button, you can also choose the speed at which the animation replays: actual speed, 2x speed, or 1/2 speed.




## Reset animation settings for a workbook

You can reset animations to return an entire workbook to the default animation settings. Be aware that this turns animations off by default.

1. Choose **Format** > **Animations**.
2. In the middle of the **Animations** pane, click **Reset All Sheets**.

## Completely disable all animations

When you create a new workbook, animations are enabled by default. If you find animations distracting while viewing vizzes, you can completely disable them so they never play. (This isn't a system-wide setting; each user needs to apply it separately.)

- In Tableau Desktop, choose **Help** > **Settings and Performance**, and deselect **Enable Animations**.
- In Tableau Cloud or Tableau Server, click your profile image or initials in the top right corner of the browser, and choose **My Account Settings**. Then scroll down to the bottom of the page, deselect **Enable animations**, and click **Save Changes**.

**Note:** When animations are disabled, you can still choose **Format** > **Animations** in authoring mode and adjust settings—but they will have no effect.

## Format decimals for axes animations

If the number of decimal places for a measure is set to the default, then the number of decimals shown during the axis animation might fluctuate during the axes animation. To avoid this, format the number of decimal places displayed for a measure. For more information, see Format Numbers and Null Values.

## Why animations won't play

### Server rendering

Animations won't play if a viz is server-rendered. To ensure that vizzes render on a client computer or mobile device, use these techniques:

- If you're a viz author, reduce viz complexity.
- If you're a Tableau Server administrator, increase the complexity threshold for client-side rendering.

**Note:** On computers with lower processing power, animations may appear choppy, but users can continue to interact with vizzes without any delays in responsiveness.

### Unsupported browsers and features

Animations are supported by all web browsers except Internet Explorer.

The following Tableau features don't animate:

- Maps, polygons, and density marks in web browsers
- Pie and text marks
- Headers
- Forecasts, trends, and reference lines
- Page history trails (If a viz includes these, turn off animations to avoid unexpected behavior.)

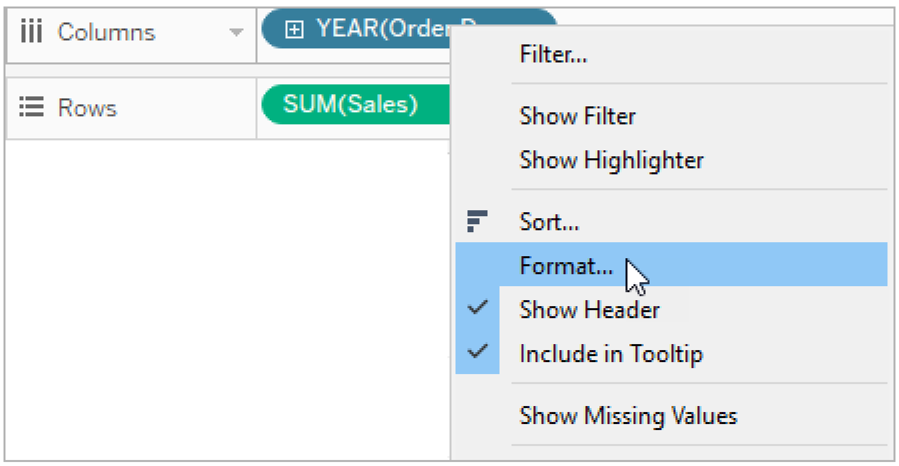
# Custom Date Formats

This article discusses using the custom date format field to format dates in a view. For an overview of how Tableau works with dates, see Dates and Times, or Changing Date Levels. For setting date properties for a **data source**, see Date Properties for a Data Source.

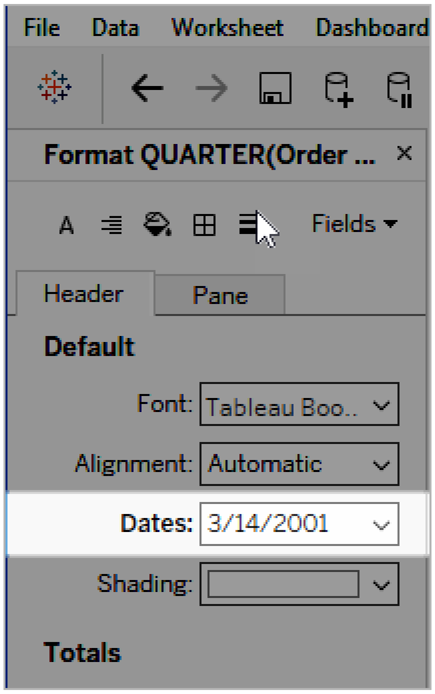
## How to find the custom date format field

### Format a date field in a view (Tableau Desktop)

To format a date field in the view in Tableau Desktop, right-click (Control-click on a Mac) the field and choose **Format**.



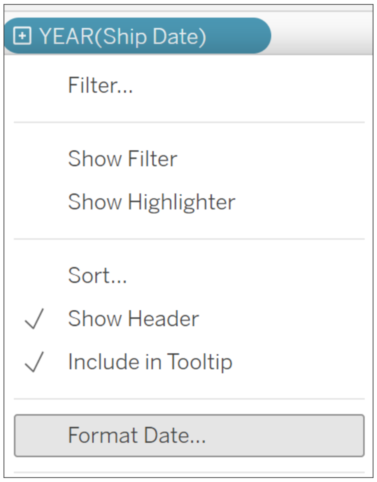

This opens the **Format** panel to the left of your view. Select the **Dates** field.




When you format dates, Tableau presents a list of available formats. Usually, the last item in the list is **Custom**. You can specify a custom date using format symbols listed in the Supported date format symbols table, either alone or in combination.

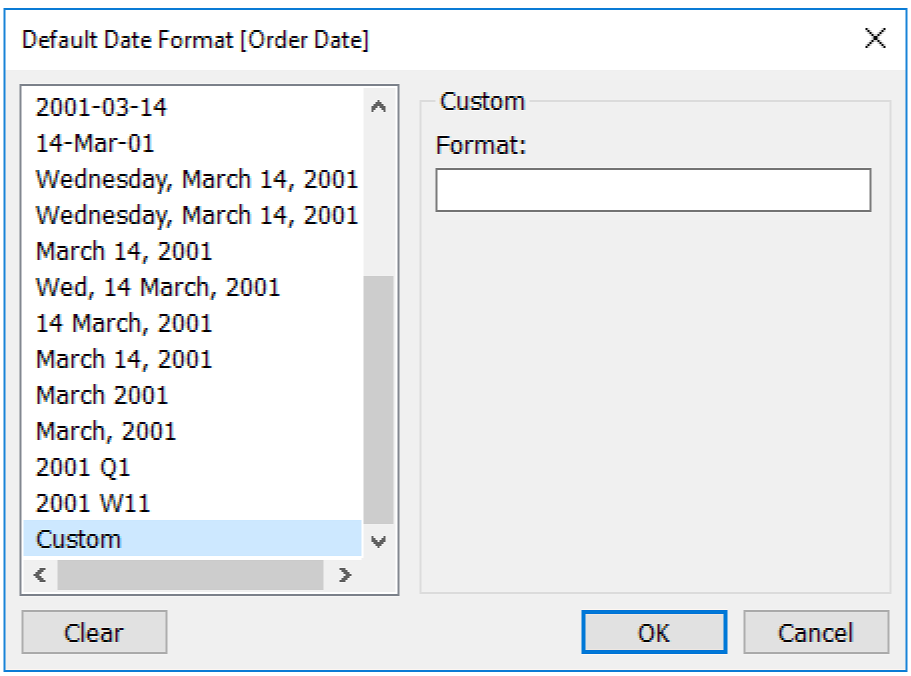
## Format a date field in a view (Tableau Cloud and Tableau Server)

To format a date field in the view in Tableau Cloud and Tableau Server, right-click (Control-click on a Mac) the field and choose **Format Date.**




## Format a date field in the Data pane (Tableau Desktop only)

To format a date field in the **Data** pane, right-click the field and choose **Default Properties** > **Date Format**.



The date formats in the table are supported when your workbook is connected to a Tableau extract or has a live connection to a data source that also supports the date format. (Refer to your data source's documentation to verify that the date format you want is supported.)

Tableau retrieves date formats from the data source. Tableau Server can also retrieve date formats from the Run As user account on the server that's running Tableau Server.

**Note:** The following date formats might not be the same as those used with the Type Conversion function. See Convert Strings to Date Fields for more information.

## Supported date format symbols

Use the following symbols to construct a custom date format.

| Symbol | Description |
|---|---|
| (:) | Time separator. In some locales, a different character is used to represent the time separator. The time separator separates hours, minutes, and seconds when time values are formatted. The actual character used as the time separator in formatted output is determined by your system settings. |
| (/) | Date separator. In some locales, a different character is used to represent the date separator. The date separator separates the day, month, and year when date values are formatted. The actual character used as the date separator in formatted output is determined by your system settings. |
| c | Display the date as `ddddd` and display the time as `ttttt`, in that order. Display only date information if there's no fractional part to the date serial number; display only time information if there's no integer portion. |
| d | Display the day as a number without a leading zero (1-31). |
| dd | Display the day as a number with a leading zero (01-31). |
| ddd | Display the day as an abbreviation (Sun, Sat). |

| | |
|---|---|
| dddd | Display the day as a full name (Sunday, Saturday). |
| ddddd | Display the date as a complete date (including day, month, and year), formatted according to your system's short date format setting. The default short date format is `m/d/yy`. |
| dddddd | Display a date serial number as a complete date (including day, month, and year) formatted according to the long date setting recognized by your system. The default long date format is `mmmm dd, yyyy`. |
| aaaa | The same as dddd, only it's the localized version of the string. |
| w | Display the day of the week as a number (1 for Sunday through 7 for Saturday). |
| ww | Display the week of the year as a number (1-54). |
| M | Display the month as a number without a leading zero (1 12). If `m` immediately follows `h` or `hh`, the minute rather than the month is displayed. |
| MM | Display the month as a number with a leading zero (01-12). If `m` immediately follows `h` or `hh`, the minute rather than the month is displayed. |
| MMM | Display the month as an abbreviation (Jan-Dec). |
| MMMM | Display the month as a full month name (January-December). |
| MMMMM | Display the month as a single letter abbreviation (J-D) |
| oooo | The same as MMMM, but localized. |
| q | Display the quarter of the year as a number (1- 4). |
| y | Display the day of the year as a number (1-366). |
| yy | Display the year as a 2-digit number (00-99). |
| yyyy | Display the year as a 4-digit number (100-9999). |
| h | Display the hour as a number without leading zeros (0-23). |
| Hh | Display the hour as a number with leading zeros (00-23). |
| N | Display the minute as a number without leading zeros (0 59). |

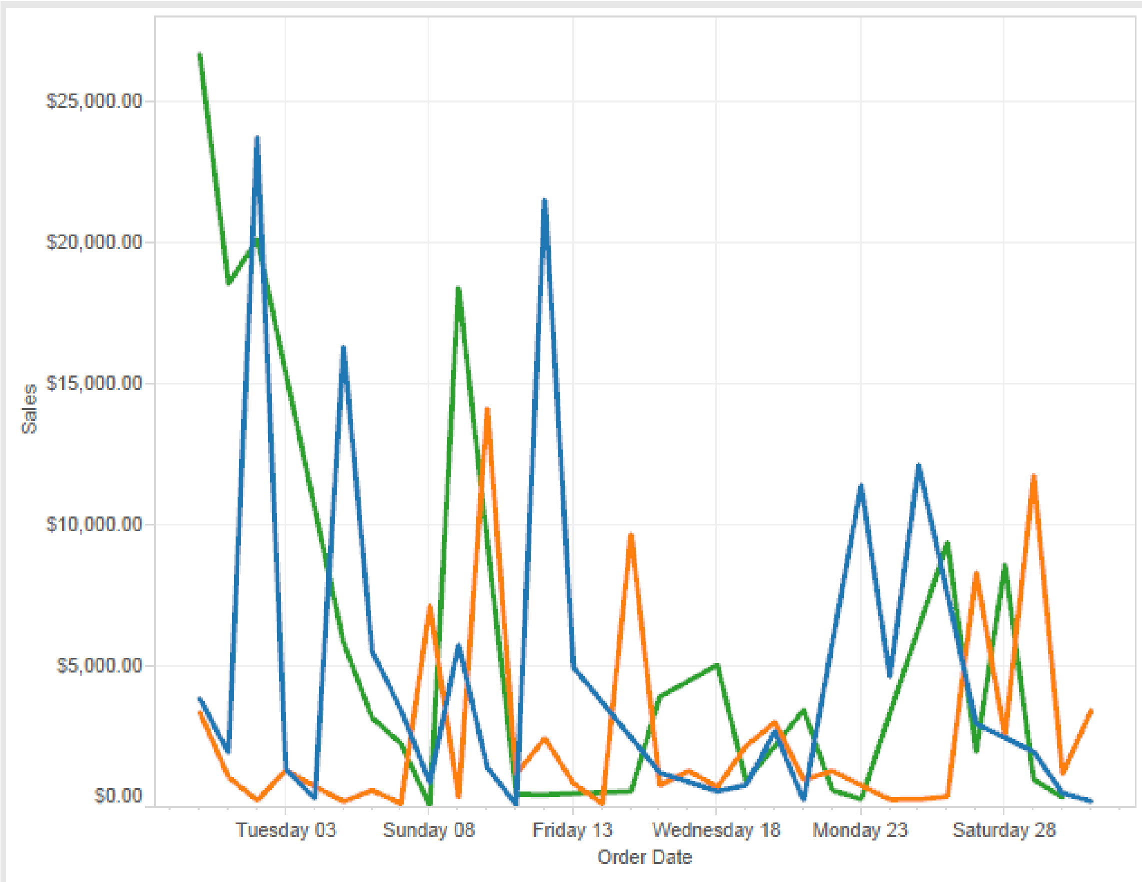
| | |
|---|---|
| Nn | Display the minute as a number with leading zeros (00 59). |
| S | Display the second as a number without leading zeros (0 59). |
| Ss | Display the second as a number with leading zeros (00 59). |
| 000 | Display milliseconds. Use a period character as a separator before specifying milliseconds. |
| t t t t t | Display a time as a complete time (including hour, minute, and second), formatted using the time separator defined by the time format recognized by your system. A leading zero is displayed if the leading zero option is selected and the time is before 10:00 A.M. or P.M. The default time format is `h:mm:ss`. |
| AM/PM | Use the 12-hour clock and display an uppercase AM with any hour before noon; display an uppercase PM with any hour between noon and 11:59 P.M. |
| am/pm | Use the 12-hour clock and display a lowercase AM with any hour before noon; display a lowercase PM with any hour between noon and 11:59 P.M. |
| A/P | Use the 12-hour clock and display an uppercase A with any hour before noon; display an uppercase P with any hour between noon and 11:59 P.M. |
| a/p | Use the 12-hour clock and display a lowercase A with any hour before noon; display a lowercase P with any hour between noon and 11:59 P.M. |
| AMPM | Use the 12-hour clock and display the AM string literal as defined by your system with any hour before noon; display the PM string literal as defined by your system with any hour between noon and 11:59 P.M. AMPM can be either uppercase or lowercase, but the case of the string displayed matches the string as defined by your system settings. The default format is AM/PM. |

## Custom date format examples

Any of the date format symbols in the table above can be used alone or in combination.

Specifying a custom format yyyy-MM-dd HH:mm:ss.000 would produce dates in the format 2015-05-10 11:22:16.543. Such a format might be appropriate for scientific data.

Specifying a custom format DDDD DD would produce dates that show the Weekday and the Day, as shown below.




Specifying a custom format `yy-mm-dd (dddd)` would produce dates in the format **18-01-04 (Thursday)**.

Specifying a custom format `"Q"1 YYYY` would produce dates that show **Q1 2018**.

## Support for Japanese era-based date formats

Tableau supports Japanese emperor-era-based date (Wareki) formats. Here’s how to apply an era-based date format to a field in your view:

1. Set your workbook locale to Japanese.

2. Right-click the field in the view for which you want to set a date format.

3. Choose **Format**.

4. In the **Format** pane, from the **Dates** drop-down list, select a format.

If the format that you want isn't listed, you can construct your own date format. To do this, choose **Custom format** in the **Dates** box, then type your format using the Tableau date placeholders. The following era-based year placeholders are available:

| Symbol | Description |
|---|---|
| g | Short era name (such as H for the Heisei era). |
| gg | Era name (such as 平成). |
| ggg | Long era name (for Japanese, this is the same as the regular era name). |
| e | Era-based year, such as 1 for the first year of an era. |
| ee | Era-based year, such as 01 for the first year of an era. If there's only one digit, then the era-based year will have a zero added to the front. |

If your workbook locale isn't Japanese, you can create a custom date format, then insert the language code !ja_JP! in front of your format, so that it looks like this:

```
!ja_JP! gg ee"年"mm"月"dd"日"
```

The language code forces the date to be treated as if it's a Japanese date.

Era-based dates aren't fully supported by the Tableau Server browser view. In particular, if you publish a workbook that contains an interactive filter, the e and g placeholders won't be filled in:

To avoid this issue, don’t show era-based dates in interactive filters if your workbook will be viewed in a browser.

## Using literal text in a date format

You may want your date format to include some words or phrases, such as **Fiscal Quarter q of yyyy**. However, if you type that text directly into the Tableau format box, it may treat the letters like date parts:

| Quarter of Order Date |
|---|
| Fi01/1/2010al 1uarter 1 of 2010 |
| Fi04/1/2010al 2uarter 2 of 2010 |
| Fi07/1/2010al 3uarter 3 of 2010 |
| Fi010/1/2010al 4uarter 4 of 2010 |

To prevent Tableau from doing this, put double quotes around the letters and words that shouldn’t be treated as date parts: `"Fiscal Quarter" q "of" yyyy`.

If you want a literal quote inside of a quoted section, insert this code: `"\""`. For example, the format `"Fiscal "\"" Quarter"` would be formatted as **Fiscal " Quarter**.

## Format syntax in DATEPARSE function for extract data sources

If you're using the DATEPARSE function in an extract, use the syntax defined by the Unicode Consortium.

The following table lists the field types that can be represented in the format parameter of the DATEPARSE function. Click the field type to get information about the symbols, field patterns, examples, and descriptions from the Unicode Consortium website.

| Unit of time | Notes |
|---|---|
| Era | n/a |
| Year | All symbols are supported in .hyper extracts except for "U".<br><br>**Notes:**<br><br>• Negative values denote a year before Christ (BC). For example, `DATEPARSE('y','-10')` returns the first January of 11BC and `DATEPARSE('y','-0')` returns the first January of 1BC.<br><br>• When working with the calendar year "y", the pattern "yy" requests the two low-order digits of the year. For numbers < 70, the DATEPARSE function returns the year 2000+x. For numbers >=70, the DATEPARSE function returns the year 1900+x.<br><br>• When working with "Y" in "ISO week date" based calendars, the year transition occurs on a week boundary and may differ from the calendar year transition. The "Y" designation is used in conjunction with pattern character "w" in ISO year-week calendar. The ISO week date system is effectively a leap week calendar system that is part of the ISO 8601 date and time standard. Similar to "y", negative values for "Y" denote a year before Christ (BC). |
| Month | All symbols are supported in .hyper extracts except for "l".<br><br>**Notes:**<br><br>• The month designations are used in conjunction with "d" for the day number. |

| Unit of time | Notes |
|---|---|
| | • In contrast to ICU, .hyper extracts allow values 1–12. Other values cause an error. |
| Week | All symbols are supported in .hyper extracts except for "W".<br><br>**Notes:**<br><br>• When working with "w", in contrast to ICU, .hyper extracts allow only valid weeks. A year has 52 or 53 weeks (ISO 8601). The DATEPARSE function validates the input. For example, an error occurs for the 53rd week of 2016 because the 53rd week doesn't exist for 2016.<br><br>• When working with "W", ICU doesn't support this designation, but it's useful for dates like 1st Monday of September. |
| Day | **Notes:**<br><br>• When working with "d", in contrast to ICU, .hyper extracts only allow valid day numbers. For example, an error occurs for the 31st of February.<br><br>• When working with "D", in contrast to ICU, .hyper extracts only allow valid day numbers. For example, an error occurs for the 366th day of 2017. |
| Hour | Only "h" and "H" symbols are supported in .hyper extracts.<br><br>**Notes:** |

| Unit of time | Notes |
|---|---|
| | • When working with "h", .hyper extract don't allow negative values for this field. Negative values cause an error.<br>• When working with "H", .hyper extracts don't allow negative values for this field. Negative values cause an error. |
| Minute | **Note:** In contrast to ICU, .hyper extracts don't allow negative values for this field. Negative values will cause an error. |
| Second | **Notes:**<br>• In contrast to ICU, .hyper extracts don't allow negative values for this field. Negative values will cause an error.<br>• When working with "S", `DATEPARSE('ss.SSSS', '12.3456')` returns 1990-01-01 00:00:12:3456 AD. |
| Quarter | **Note:** In contrast to ICU, .hyper extracts only allow values 1–4. All other values cause an error. |
| Weekday | **Notes:**<br>• When working with "e" and "ee", in contrast to ICU, .hyper extracts only allow values 1–7. All other values cause an error.<br>• When working with "c..cc", in contrast to ICU, .hyper extracts only allow values 1–7. All other values cause an error. |

| Unit of time | Notes |
|---|---|
| Period | n/a |

# Format Numbers and Null Values

You can specify the format for numeric values that display in your viz, including measures, dimensions, parameters, calculated fields, and axis labels. When specifying a number format, you can select from a set of standard formats, such as number, currency, scientific, and percentage. You can also define a custom number format with the option to include special characters.

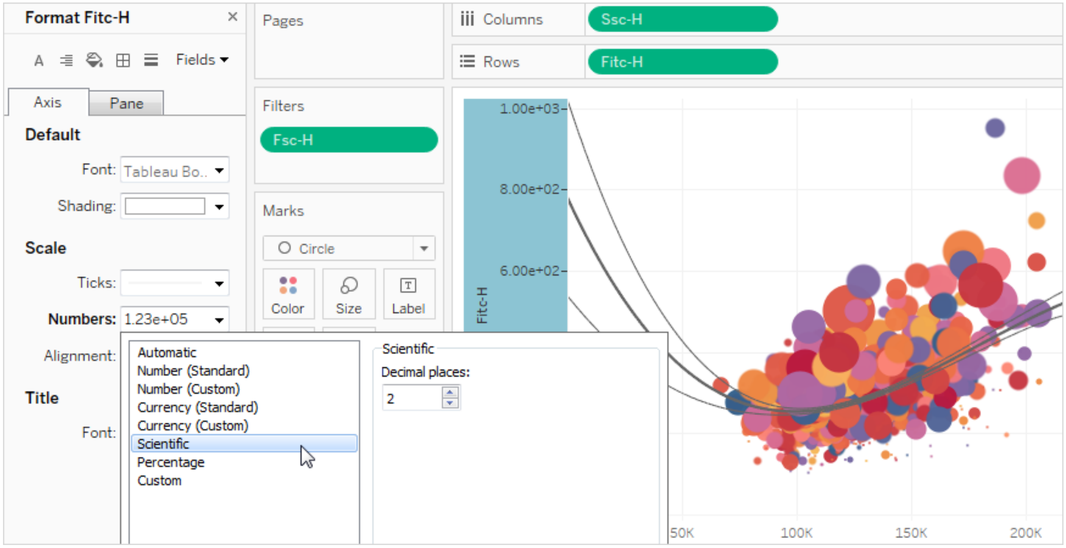
When a measure contains null values, you can use formatting to handle the null values in a different way, such as replacing nulls with zeros or hiding them.

## For Tableau Desktop

### Specify a number format

1. Right-click (control-click on Mac) a number in the view and select **Format**.
2. In the **Format** pane, click the **Numbers** drop-down menu.
3. Select a number format.

   Some formats require additional settings. For example, if you select **Scientific**, you must also specify the number of decimal places.




Here are the number formats and associated options available in Tableau.

| NUMBER FORMAT | FORMAT OPTIONS |
|---|---|
| **Automatic**: format is automatically selected based on either the format specified by the data source or the data contained in the field. | None. |
| **Number (Standard)**: format is based on locale selected. | **Locale**: number format changes based on the geographical location selected. |
| **Number (Custom)**: format is customized to your choice. | **Decimal Places**: the number of decimal places to display.<br><br>**Negative Values**: how negative values are displayed.<br><br>**Units**: the number is displayed using the specified units. For example, if the number is 20,000 and the units are thousands, the number |

| | |
|---|---|
| | will be displayed as 20K.<br><br>**Prefix/Suffix**: characters that precede and follow each displayed number.<br><br>**Include thousands separators**: whether the number shows separators every thousand (example: 100,000 vs. 100000). |
| **Currency (Standard)**: format and currency symbol is based on locale selected. | **Locale**: currency format based on the geographical location selected. |
| **Currency (Custom)**: format and currency symbol is customized to your choice. | **Decimal Places**: the number of decimal places to display.<br><br>**Negative Values**: how negative values are displayed.<br><br>**Units**: the number is displayed using the specified units. For example, if the number is 20,000 and the units are thousands, the number is displayed as 20K.<br><br>**Prefix/Suffix**: characters that precede and follow each displayed number.<br><br>**Include thousands separators**: whether the number shows separators every thousand (example: 100,000 vs. 100000). |
| **Scientific**: numbers are displayed in scientific notation. | **Decimal**: the number of decimal places to display. |
| **Percentage**: numbers are displayed as | **Decimal**: the number of decimal places to dis- |

| | |
|---|---|
| a percentage with the percent symbol. The value of 1 is interpreted as 100% and 0 as 0% | play. |
| **Custom**: format is based entirely on what is specified in the format options. | **Custom**: type in the format you want to use, including special characters (optional). See "Define a custom number format" in this topic for details. |

## Define a custom number format

To apply a custom number format in your viz:

1. Right-click (control-click on Mac) a number in the view and select **Format**.
2. In the **Format** pane, click the **Numbers** drop-down menu and select **Custom**.
3. In the **Format** field, define your formatting preferences using the following syntax: Positive number format;Negative number format;Zero values.

When defining your number format code, keep in mind that:

- You can specify the formatting for up to three types of numbers in the following order: positive numbers, negative numbers, and zeros.
- Each number type must be separated by a semicolon (;).
- If you specify only one number type, the format for that type is used for all numbers.
- If you specify two number types, the format for the first type is applied to positive numbers and zeros, while the format for the second type is applied to negative numbers.
- If you skip types in your number format code, you must include a semicolon (;) for each of the missing types.

### Custom number format examples

Refer to the following table for examples of commonly used custom number format codes that you can use in your viz.

The syntax has three portions: <positive number format>;<negative number format>;<zero format> separated by semicolons.

| USE CASE | NUMBER CODE SYNTAX | EXAMPLE OUTPUT |
|---|---|---|
| Show only positive values | #,##; ;<br><br>(note a blank space after the 2nd and 3rd semicolon) | Positive values: 1,234<br>Negative values: (only the blank space displays)<br>Zero values: (only the blank space displays) |
| Show only negative values | ;-#,##; | Positive values: (nothing displays)<br>Negative values: -1,234<br>Zero values: (nothing displays) |
| Show only zero values | ;;0; | Positive values: (nothing displays)<br>Negative values: (nothing displays)<br>Zero values: 0 |
| Hide zero values | #,###;-#,###;; | Positive values: 1,234<br>Negative values: -1,234<br>Zero values: (nothing displays) |
| Show negative values in parentheses | #,###;(#,###);; | Positive values: 1,234<br>Negative values: (1,234)<br>Zero values: (nothing displays) |
| Add a character prefix to a value | $#,###.##;-$#,###.##;$0; | Positive values: $1,234.56<br>Negative values: -$1,234.56<br>Zero values: $0 |
| Add a character suffix to a value | #%;-#%;0%; | Positive values: 12%<br>Negative values: -34%<br>Zero values: 0% |

| | | |
|---|---|---|
| Add text descriptors | "$"#,#" Surplus";"$"-##" Short-age"; "$"0; | Positive values: $1,234 Surplus<br>Negative values: $-1,234 Shortage<br>Zero values: $0 |

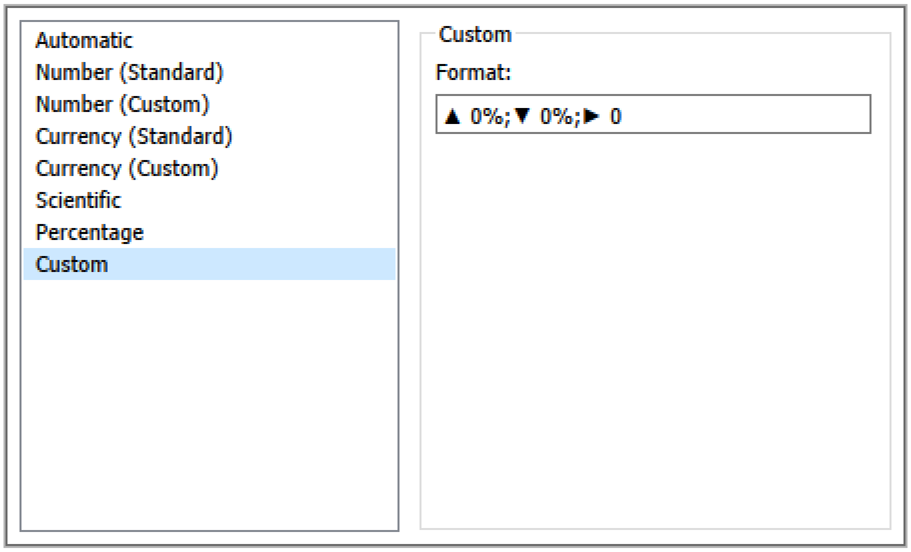
There are several ways to customize your number format to meet your needs. For more code guidance and examples, see Review guidelines for customizing a number format in the Microsoft Knowledge Base.

**Note:** There are slight deviations between the options described by Microsoft and those available in Tableau. For example, custom number formats that align text within columns aren't relevant in Tableau. Additionally, custom number formats to color code text aren't applicable because you can apply color to text using the Marks card. (For more information on applying color, see Control the Appearance of Marks in the View.) Be sure to only use custom number formats that apply in Tableau.

Include special characters in a custom number format

One of the benefits of custom number formatting is the ability to include special characters or symbols. Symbols can make it easier to quickly understand comparisons between measures and calculations in your viz.

For example, let’s say you want to show a month-over-month comparison of profits for three of your company’s top-selling products. Rather than using the standard label to show that the profit for these products changed +5%, -2%, and 0% label from last month, you can set the custom number format as follows to show these changes as ▲5%,▼2%, and ►0.




## Set the default number format for a field

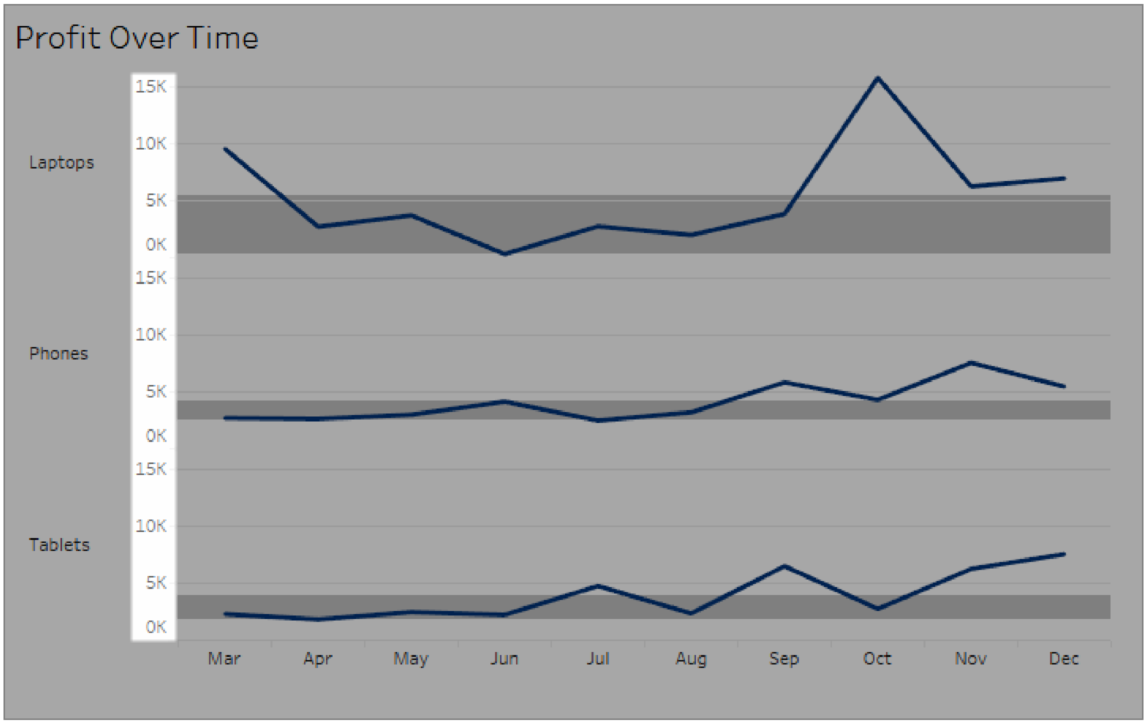
Right-click (control-click on Mac) the field in the **Data** pane and select **Default Properties** > **Number Format**.

In the subsequent dialog box, specify a number format to be used whenever the field is added to the view. The default number format is saved with the workbook. It's also exported when you export the connection information.

**Note:** Formatting numbers using the **Format** pane overrides any number formatting applied elsewhere.

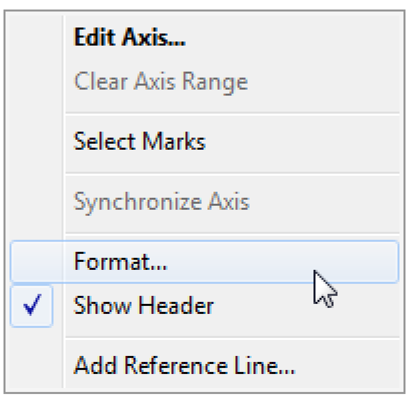
## Format a measure as currency

The view in the following image shows profit over time. Notice that the profit figures on the vertical axis aren't formatted as currency.



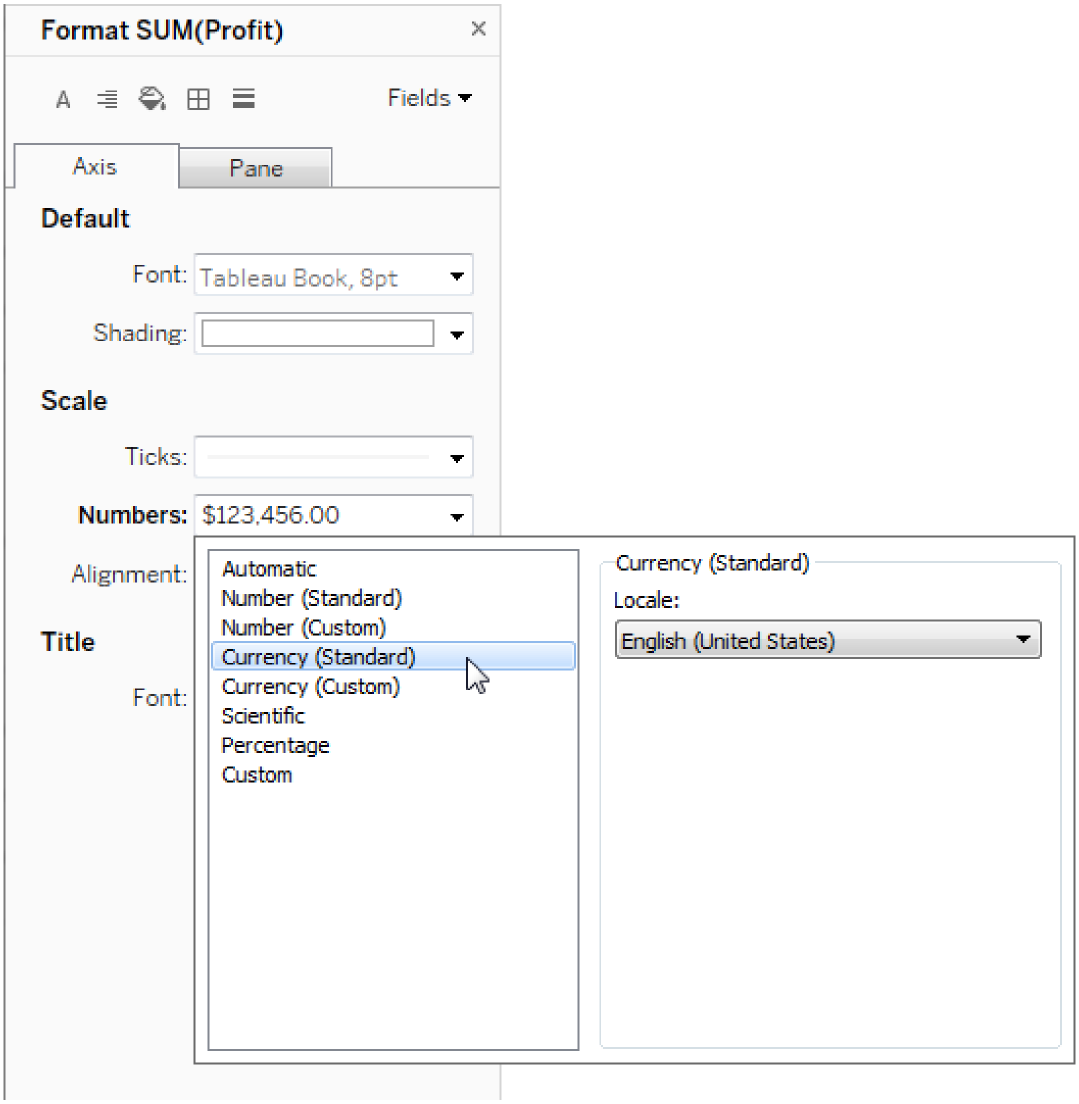

**To format the numbers as currency:**

1. Right-click the **Profit** axis and choose **Format**.




2. On the **Axis** tab in the **Format** pane, under **Scale**, select the **Numbers** drop-down list, and then select one of the following:

   **Currency (Standard)** to add a dollar sign and two decimal places to the figures.




**Currency (Custom)** to specify the number of decimal places, how to show negative values, the units, whether to include a prefix or suffix, and whether to include a separator character.

## Use locale to specify number formats

By default, Tableau uses your computer's locale and language settings to format numbers. But you can explicitly set a different locale in the **Format** pane.

The following steps show how to set Swiss German currency, using the same view as in the previous section.

1. Right-click the **Profit** axis and select **Format**.
2. On the **Axis** tab, under **Scale**, select the **Numbers** drop-down list and then select **Currency (Standard)**.
3. In the **Locale** drop-down list, items appear in a **Language (Country)** format. For this example, select **German (Switzerland)**. The view updates to show the sales figures as Swiss Francs, formatted for the German language.

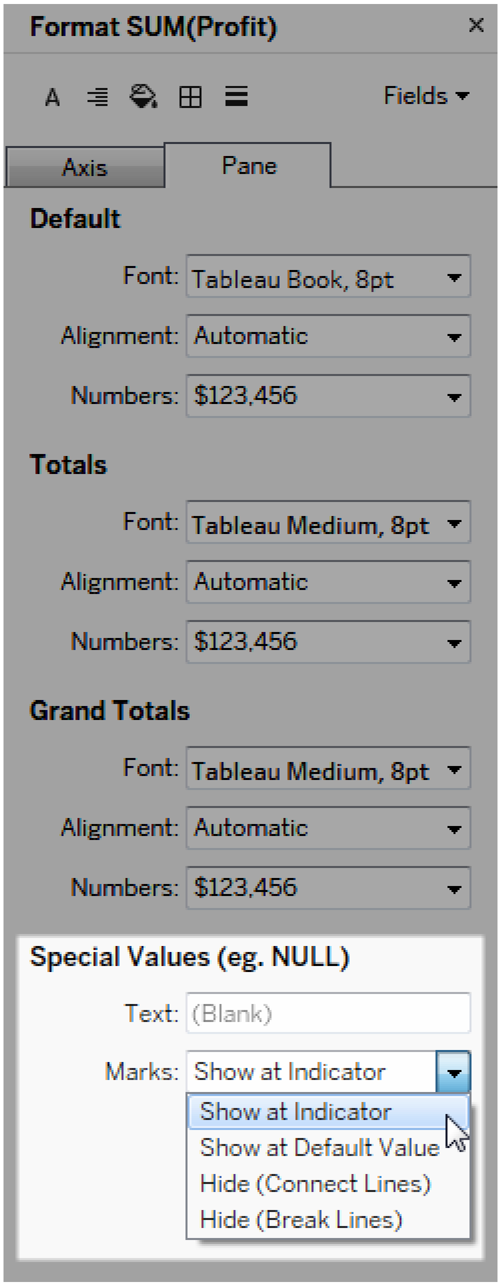
**Tip:** You can change the default currency setting so that every time you drag the **Profit** measure to a view it uses the settings you want. In the **Data** pane, right-click **Profit** (or other monetary measure), and select **Default Properties** > **Number Format**. Then format the field as shown above.

## Format null values

When a measure contains null values, they're usually plotted in a view as zero. However, sometimes that changes the view and you'd rather just suppress null values altogether. You can format each measure to handle null values in a unique way.

**To format null values for a specific field:**

1. Right-click the field in the view that has the null value (Control-click on a Mac) and choose **Format**.
2. Go to the **Pane** tab.
3. In the **Special Values** area, specify whether to show the null value using an indicator in the lower right corner of the view, plot it at a default value (such as zero for number fields), hide the value but connect the line, or hide and break the line to indicate that a null value exists.




4. If you specify text in the **Text** field, it appears in the view for a null value when mark labels are turned on. See Show and Hide Mark Labels.

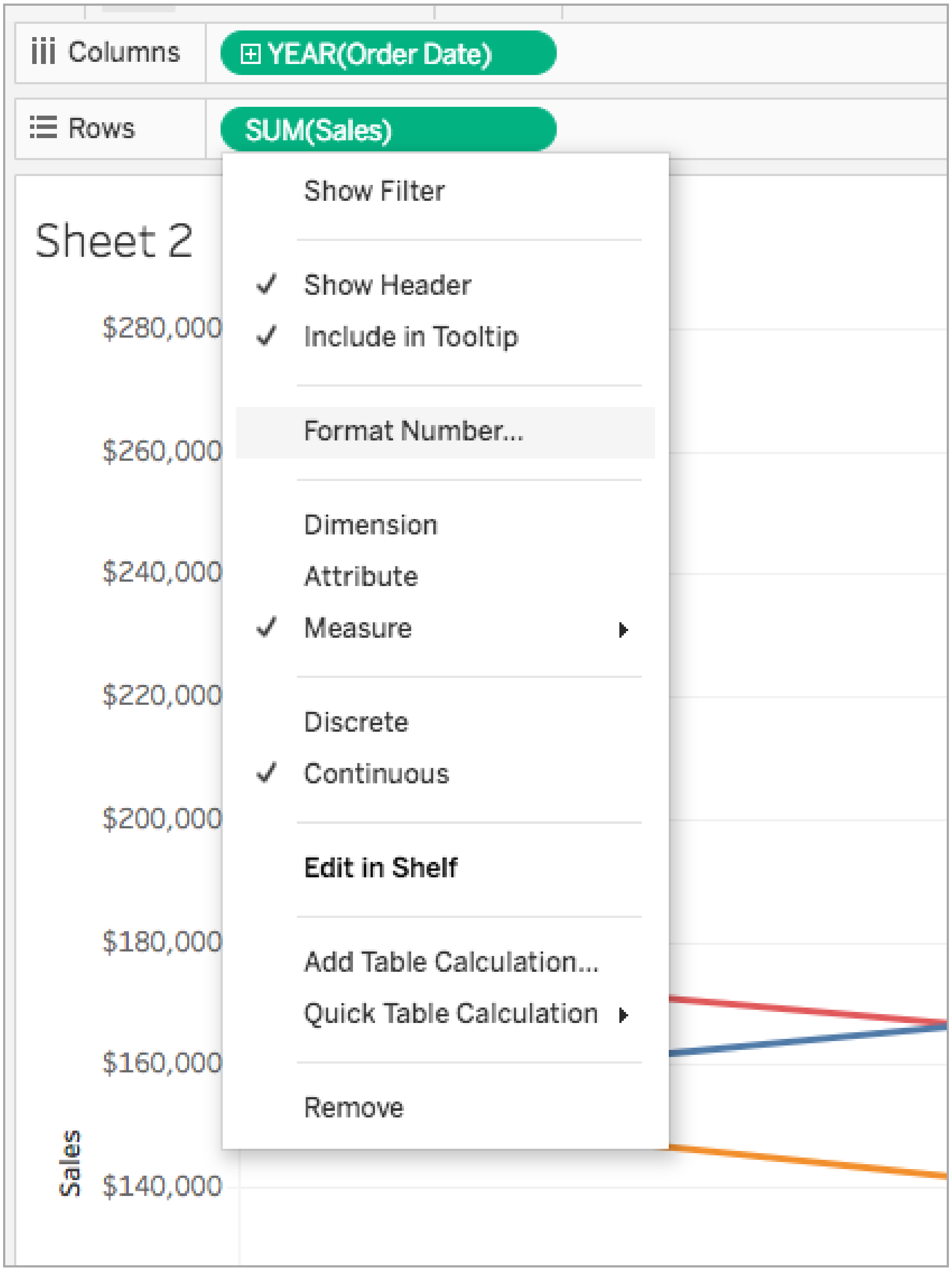
**Note**: The Special Values area isn't available for dimensions or discrete measures.

# For Tableau Server or Tableau Cloud

## Specify a number format

When authoring a view on the web, you can specify the number format for a field used in the view.

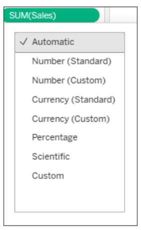
1. In web editing mode, right-click a measure in the view and select **Format Number**.



2. In the dialog box that appears, select a number format.

   Some formats provide additional settings. For example, if you select **Currency**, you can also specify the number of decimal places, as well as the units, and whether or not to include separators, such as commas.

   In this example, Sales is formatted as a Currency with zero decimal places and thousand (k) units. Sales numbers in the view update with these settings. Labels and tooltips update as well.


   Here are the number formats and associated options available in Tableau.

| NUMBER FORMAT | FORMAT OPTIONS |
|---|---|
| **Automatic**: format is automatically selected based on either the format specified by the data source or the data contained in the field. | None. |
| **Number (Custom)**: format is customized to your choice. | **Decimal Places**: the number of decimal places to display.<br>**Units**: the number is displayed using the specified units. For example, if the number is 20,000 and the units are thousands, the number is displayed as 20K.<br>**Include separators**: whether the number |

| | |
|---|---|
| | shows separators every thousand (example: 100,000 vs. 100000). |
| **Currency (Custom)**: format and currency symbol is customized to your choice. | **Decimal Places**: the number of decimal places to display.<br><br>**Units**: the number is displayed using the specified units. For example, if the number is 20,000 and the units are thousands, the number is displayed as 20K.<br><br>**Include separators**: whether the number shows separators every thousand (example: 100,000 vs. 100000). |
| **Percentage (Custom)**: numbers are displayed as a percentage with the percent symbol. The value of 1 is interpreted as 100% and 0 as 0% | **Decimal Places**: the number of decimal places to display. |
| **Scientific (Custom)**: numbers are displayed in scientific notation. | **Decimal Places**: the number of decimal places to display. |

# Navigate Visualizations with Assistive Technology

Starting in Tableau version 24.3, you can navigate Marks on all online visualization types on Tableau Cloud using a keyboard and other assistive technologies.

Note: Viz navigation isn't currently supported for server-rendered visualizations. To learn more about server and client-side rendering, see Configure Client-Side Rendering.

## Navigate marks in a visualization

1. To activate the experience, navigate to a visualization and press **Enter**.
2. Select **Enter** again to navigate the Marks.
3. Use the **Arrow** keys to navigate between headers, columns, and rows.

   If your visualization has a dual axis, or if it's a scatter plot or map, an additional navigation affordance appears. Use the Arrow keys to move the focus to a group of marks and select Enter to navigate the marks in the group.
4. To navigate out of the text table, press **Esc.**

Note: Prior to entering mark-level navigation, you can use the Arrow keys to navigate different areas of the view, such as the header and axis.

## Navigate marks in the View Data pane

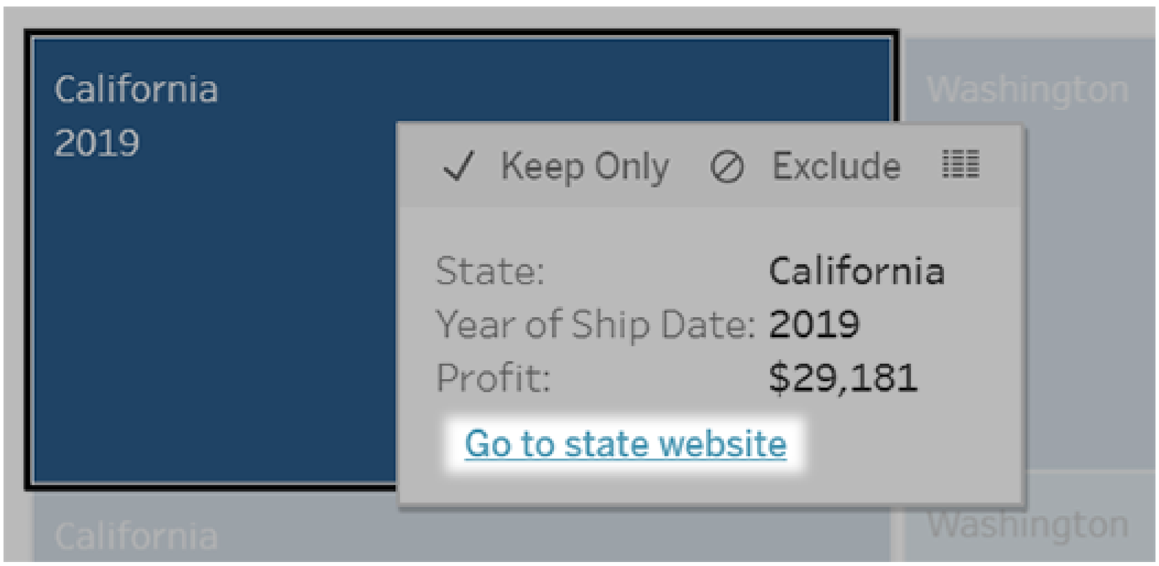
1. To open the View Data pane, move your focus to the viz and press **Shift + Enter**.
2. Use the **Arrow** keys to navigate between headers, columns, and rows.
3. To close the View Data pane, press **ALT + F4** (Windows) or **Cmd + W** (Mac OS).

To learn more about keyboard navigation on Tableau, see Keyboard Accessibility for Tableau Views.

# URL Actions

A URL action is a hyperlink that points to a web page, file, or other web-based resource outside of Tableau. You can use URL actions to create an email or link to additional information about your data. To customize links based on your data, you can automatically enter field values as parameters in URLs.

**Tip:** URL actions can also open in a web page object in a dashboard. See Actions and Dashboards to learn more.



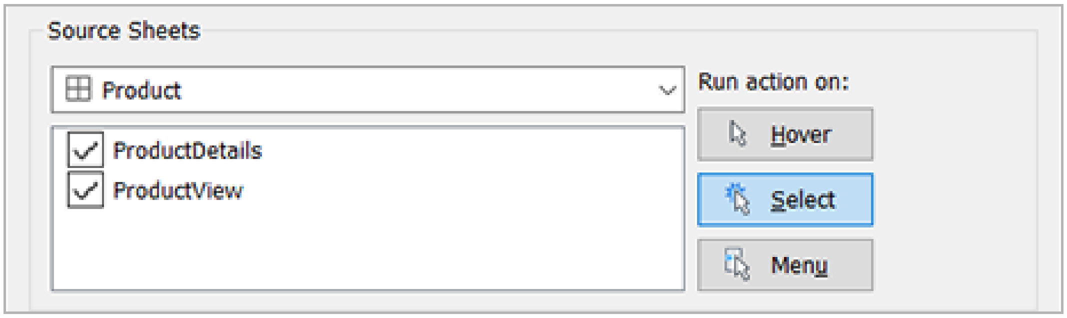

A URL action run from a tooltip menu. The link reflects the action name, not the target URL.

## Open a web page with a URL action

1. On a worksheet, select **Worksheet** > **Actions**. From a dashboard, select **Dashboard** > **Actions**.
2. In the Actions dialog box, click **Add Action** and then select **Go to URL**.
3. In the next dialog box, enter a name for the action. To enter field variables in the name, click the **Insert** menu to the right of the **Name** box.

> **Note:** Give the action a descriptive name, because the link text in the tooltip is the name of the action, not the URL. For example, when linking to more product details, a good name could be "Show More Details".

4. Use the drop-down list to select a source sheet or data source. If you select a data source or dashboard you can select individual sheets within it.




5. Select how users will run the action.

| If you choose this option... | The action is run when the user... |
|---|---|
| **Hover** | Mouses over a mark in the view. This option works best for highlight actions within a dashboard. |
| **Select** | Clicks a mark in the view. This option works well for all types of actions. |
| **Menu** | Right-clicks (control-clicks on Mac) a selected mark in the view, then clicks an option in a tooltip (menu). This option works particularly well for URL actions. |

6. For URL Target, specify where the link will open:
   - **New Tab if No Web Page Object Exists** — Ensures that the URL opens in a browser on sheets that lack web page objects. This is a good choice when Source Sheets is set to All or a data source.
   - **New Browser Tab** — Opens in the default browser.

- **Web Page Object** — (Available only for dashboards with Web Page objects) Opens in the web page object you select.


> **Note**: For New Tab options, the first time the action is run it opens a new tab. After that, the action will open in the same tab instead of opening additional ones.

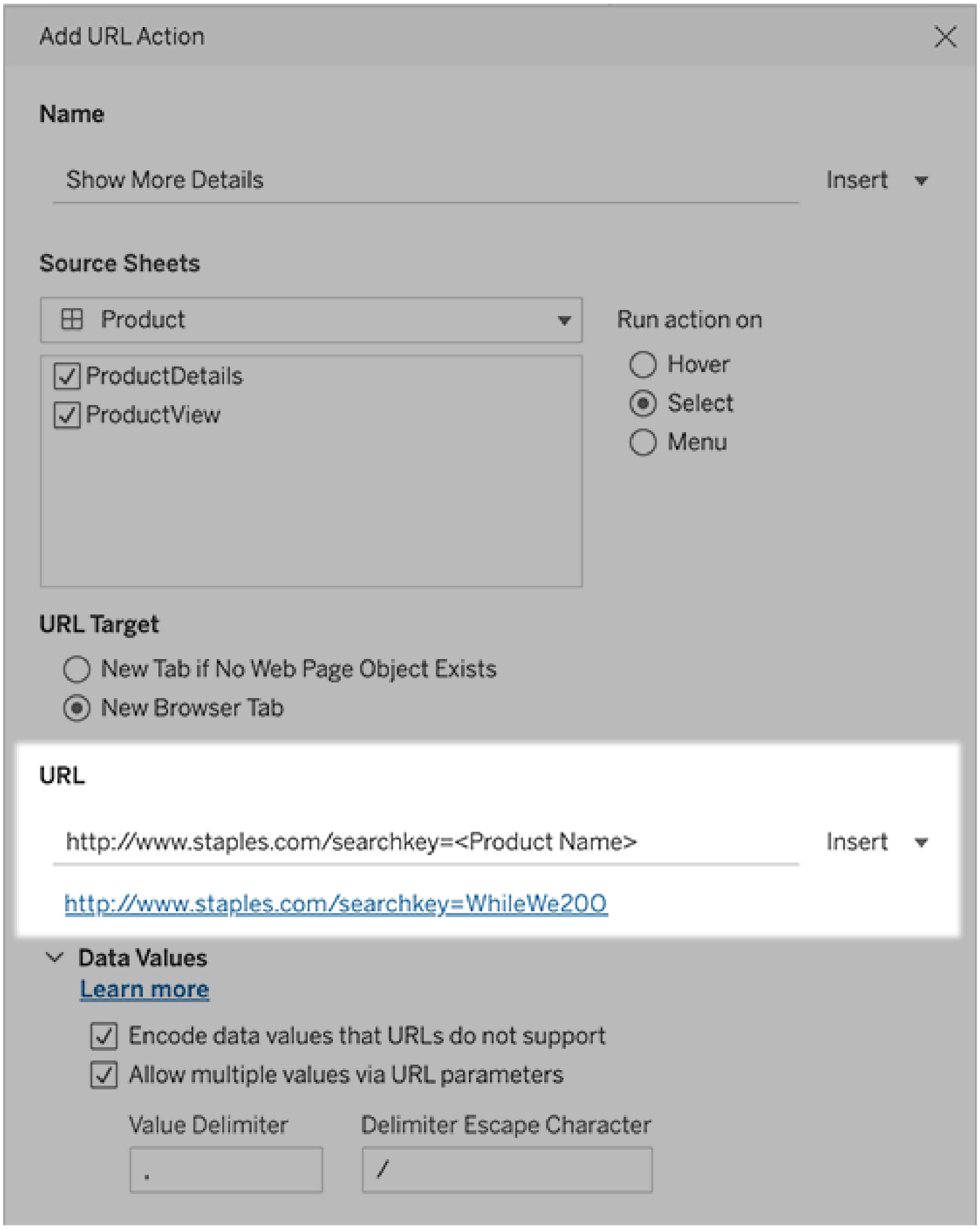
7. Enter a URL
   - The URL should start with one of the following prefixes:`http`, `https`, `ftp`, `mailto`, `news`, `gopher`, `tsc`, `tsl`, `sms`, or `tel`

> **Note**: If no prefix is entered, `http://` is automatically appended to the beginning and the URL action will work in Tableau Desktop. However, if a URL action with no prefix is published to Tableau Server or Tableau Cloud, it will fail in the browser. Always provide a fully qualified URL for actions if the dashboard will be published.

> **Note**: You can specify an ftp address only if the dashboard doesn't contain a web object. If a web object exists, the ftp address won't load.

   - Tableau Desktop also supports local paths like `C:\Example folder-\example.txt`, as well as file URL actions.

- To enter field and filter values as dynamic values in the URL, click the **Insert** menu to the right of the URL. Be aware that any referenced fields must be used in the view. For details, see Using field and filter values in URLs.



Below the URL you enter is a hyperlinked example you can click for testing.

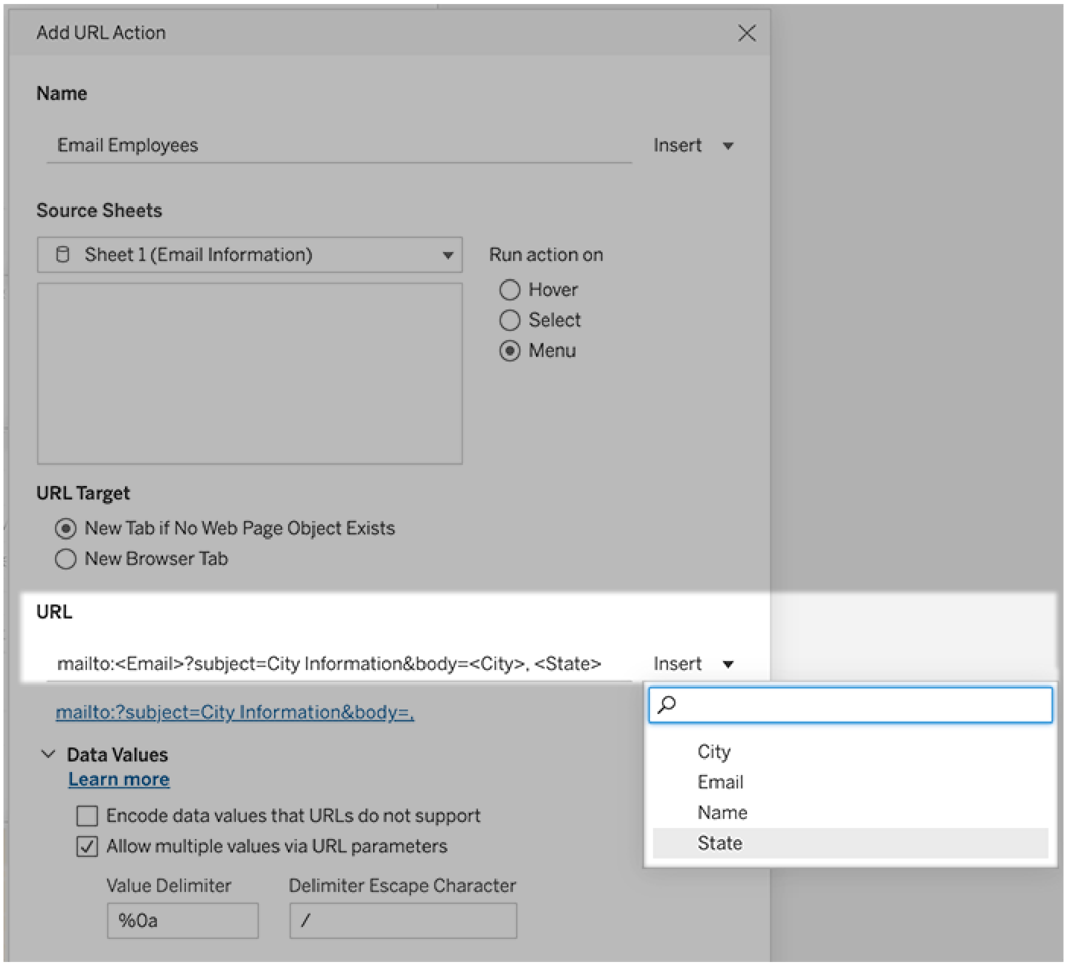
8. (Optional) In the Data Values section, select any of the following options:
   - **Encode Data Values that URLs Do Not Support** — Select this option if your data contains values with characters that browsers don't allow in URLs. For example, if one of your data values contains an ampersand, such as “Sales & Finance,” the ampersand must be translated into characters that your browser understands.
   - **Allow Multiple Values via URL Parameters** — Select this option if you are linking to a web page that can receive lists of values via parameters in the URL. For example, say you select several products in a view and you want to see each product’s details hosted on a webpage. If the server can load multiple product details based on a list of identifiers (product ID or product name), you could use multi-select to send the list of identifiers as parameters.

     When you allow multiple values, you must also define the delimiter escape character, which is the character that separates each item in the list (for example, a comma). You must also define the Delimiter Escape, which is used if the delimiter character is used in a data value.

## Create an email with a URL action

1. On a worksheet, select **Worksheet** > **Actions**. From a dashboard, select **Dashboard** > **Actions**.
2. In the Actions dialog box, click **Add Action**, and select **Go to URL**.
3. In the Source Sheets drop-down list, select the sheet that contains the field with the email addresses you want to send to.
4. In the URL box, do the following:
   - Type **mailto:**, and click the **Insert** menu at right to select the data field that contains email addresses.
   - Type **?subject=**, and enter text for the Subject line.
   - Type **&body=**, and click the **Insert** menu at right to select the fields of information that you want to include in the body of the email.

   In the example below, the “Email” field contains the email addresses, the subject is “City Information”, and the body text of the email consists of the city and state data that is associated with the email address.




:

5. (Optional) Display data from your workbook in the body of your email as a vertical list instead of the default horizontal list. For example, suppose you have a horizontal list of cities, such as Chicago, Paris, Barcelona, which you would rather display vertically, like this:

   Chicago

   Paris

   Barcelona

   To make the list vertical, in the Data Values section, do the following:

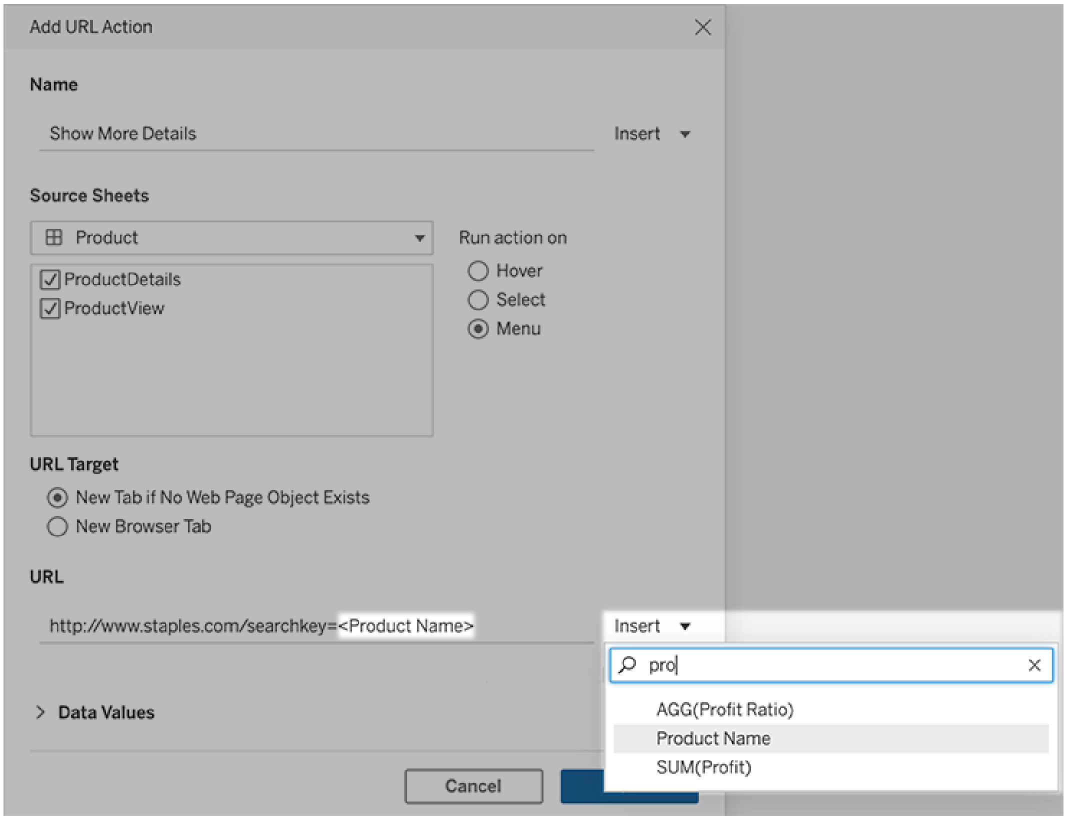
- Deselect **Encode Data Values that URLs Do Not Support**
- Select **Allow Multiple Values via URL Parameters**.
- Type **%0a** in the **Value Delimiter** text box to add line breaks between each item in the list. (These are the URL-encoded characters for a line break.)

## Using field and filter values in URLs

When users trigger URL actions from selected marks, Tableau can send field, filter, and parameter values as variables in the URL. For example, if a URL action links to a mapping website, you could insert the address field to automatically open the currently selected address on the website.

1. In the Edit URL Action dialog box, begin typing the URL for the link.
2. Place the cursor where you want to insert a field, parameter, or filter value.
3. Click the **Insert** menu to the right of the text box and select the field, parameter, or filter you want to insert. The variable appears within angle brackets. You can continue adding as many variables as you need.

> **Note:** Any referenced fields must be used in the view. Otherwise, the link won't display in the viz, even if it functions when you click Test Link.




## Including aggregated fields

The list of available fields includes only non-aggregated fields. To use aggregated field values as link parameters, first create a related calculated field, and add that field to the view. (If you don't need the calculated field in the visualization, drag it to Detail on the Marks card.)

## Inserting parameter values

When inserting parameter values, URL actions send the Display As value by default. To instead send the actual value, add the characters ~na after the parameter name.

For example, say you have a parameter that includes IP addresses, with Actual Value strings such as 10.1.1.195 and Display As strings with more friendly values such as Computer A (10.1.1.195). To send the actual value, you'd revise the parameter in the URL to look like this: http://<IPAddress~na>/page.htm.

# Create a Subscription to a View or Workbook

Subscriptions email you an image or PDF snapshot of a view or workbook at regular intervals—without requiring you to sign in to Tableau Cloud.

**Note**: If Tableau Catalog is turned on for a site, administrators can determine whether subscription emails include relevant upstream data quality warnings. Tableau Catalog is available as part of the Data Management offering. For more information, see About Tableau Catalog.

## Tableau Cloud SMTP addresses

To ensure subscription emails are delivered successfully, confirm that security software and policies in your company allow emails from `@cloudmail.tableau.com` and IP addresses 54.240.86.205 and 54.240.86.204. Subscriptions that cannot be delivered may return rejection errors to Tableau and temporarily block the recipient.

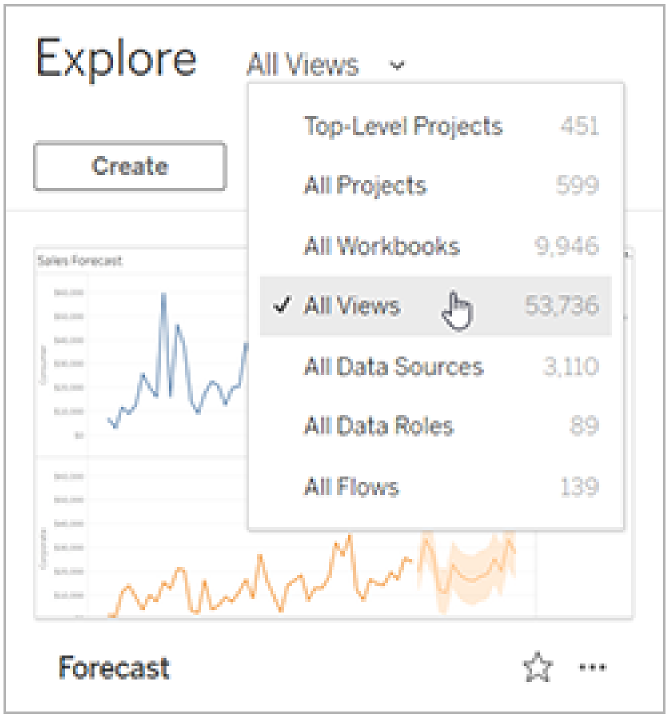
This information applies to subscriptions sent using the default Tableau email server. To verify if your Tableau site uses a custom SMTP server, check with your site administrator. If a custom SMTP server is used, confirm that your company allows emails sent from the specified email and domain values.

## Set up a subscription for yourself or others

When you open a view in Tableau Cloud, if you see a subscription icon () in the toolbar, you can subscribe to that view or to the entire workbook. You can subscribe other users who have permission to view the content if you own a workbook, if you are a project leader with an appropriate site role, or if you are an administrator.

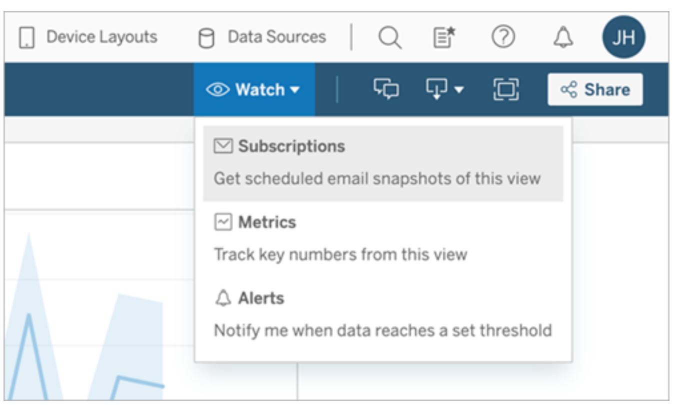
> **Note:** Data refresh-initiated subscription emails are not supported for views or workbooks that rely on data sources that use Bridge to keep data fresh.

1. From the Explore section of your site, select **All Workbooks** or **All Views**, or open the project that contains the view you want to subscribe to.




2. Open a view either directly, or after opening the containing workbook.

3. On the view toolbar, select **Watch** > **Subscriptions**.



4. Add the Tableau users or groups you want to receive the subscription. To receive a subscription, users must have the View and Download Image/PDF permissions.

   If you own the workbook, select **Subscribe me**.

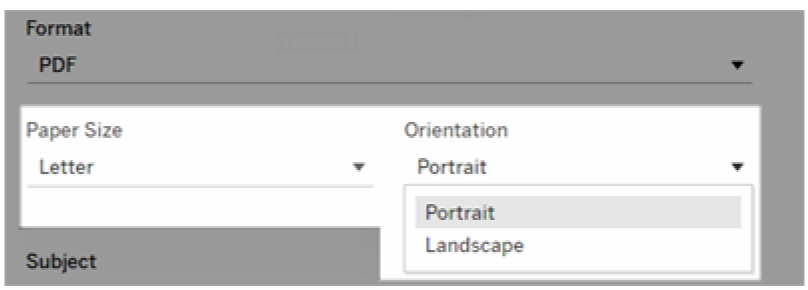
   **Notes:**

   - When you subscribe a group, each user is added individually at the time the subscription is created. If more users are added to the group later, you must re-subscribe the group for those new users to receive the subscription. Likewise, users later removed from the group will not have their subscriptions removed automatically unless their permissions to the subscribed view are removed.
   - You can't subscribe a group set.

5. Choose whether subscription emails include the current view or the entire workbook. If the view contains data only when high-priority information exists, select **Don't send if view is empty**.

6. Choose the format for your snapshot: as a PNG image, a PDF attachment, or both.

   - If PDFs, choose the paper size and orientation you'd like to receive.



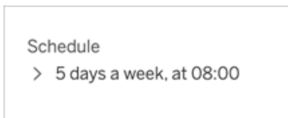

7. To clarify subscription emails, customize the subject line, and add a message.

   **Note:** To update the subscription message, you must unsubscribe from the existing subscription and create a new subscription with a different message. For more information, see Update or unsubscribe from a subscription.

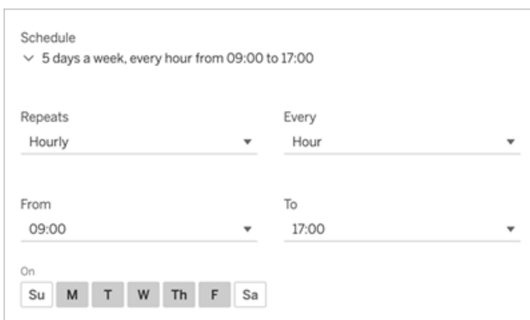
8. When the workbook uses one data extract on a published connection, you can pick a frequency:

    - **When Data Refreshes**: Sends only when data in the view or workbook is refreshed by running refresh schedules.
    - **On Selected Schedule**: Pick a schedule for the subscription.

9. If frequency is not set to When Data Refreshes, click the drop-down arrow to the left of the current settings to pick a schedule:

    Then specify a custom schedule that sends subscription emails whenever you wish. (The precise delivery time may vary if server load is high.)

    To change the time zone, click the Time Zone link it to go to your account settings page.

10. Click **Subscribe**.

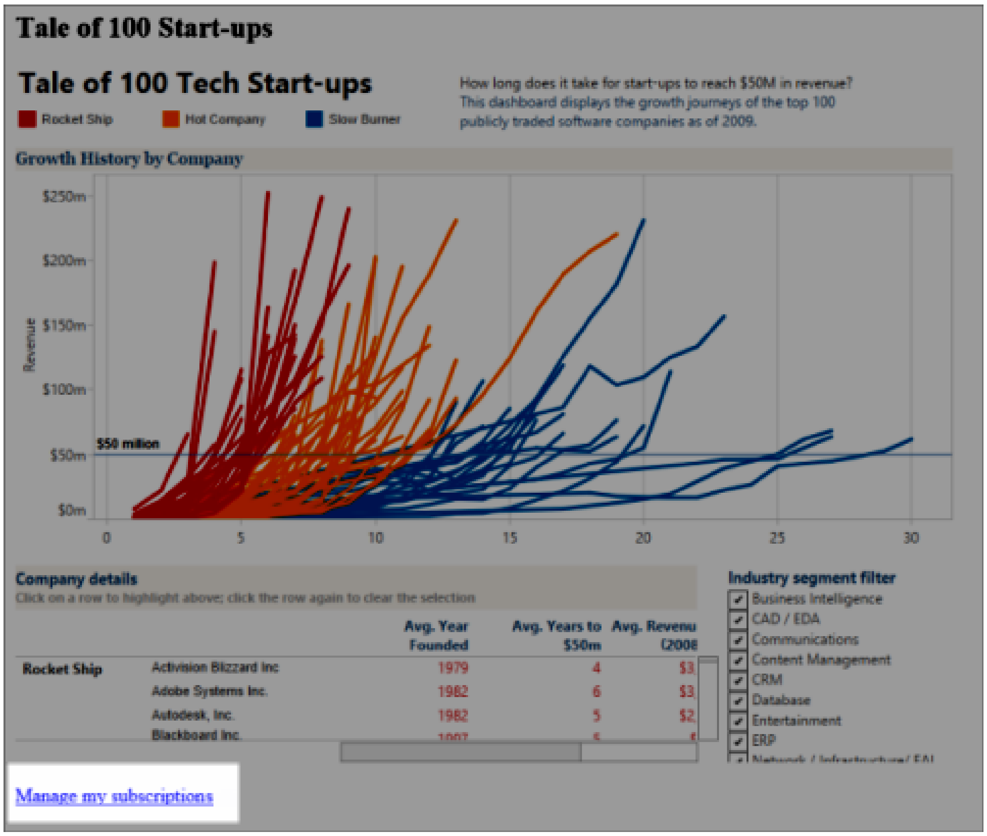
When you receive a subscription email, you can select the image (or the link in the message body for PDF subscriptions) to be taken to the view or workbook in Tableau Cloud.

# Update or unsubscribe from a subscription

You can unsubscribe from an existing subscription, or make changes to a subscription’s format, schedule, subject, or empty view mode.

1. Access your Tableau Cloud account settings by doing one of the following:

    - Click **Manage my subscriptions** at the bottom of a subscription email.




    - Sign in to Tableau Cloud. At the top of the page, select your user icon, and then select **My Content**.


2. Click **Subscriptions**.

3. Select the check box next to the view you want to unsubscribe from, click **Actions**, and then click **Unsubscribe**, or select the subscription option you'd like to change.

## Resume or delete suspended subscriptions

Sometimes, subscriptions fail because of an issue with the workbook or a problem loading the view. If a subscription fails more than five times, you'll receive a notification email that your subscription has been suspended. There are a few ways to resume a suspended subscription if you're a subscription owner or administrator:

- From the My Content area of Tableau web pages, an icon appears in the Last update column to indicate that the subscription is suspended. Select **...** > **Resume Subscription** to resume.
- From the Subscriptions tab of the affected workbook, an icon appears in the last update column to indicate that the subscription is suspended. Select **...** > **Resume Subscription** to resume.

You'll receive an email notification when the subscription is working again.

## See also

Change subscription settings in the Tableau Desktop and Web Authoring Help.

Project-level administration in the Tableau Cloud Help, to learn which site roles allow full Project Leader capabilities.

# View Acceleration

Administrators and workbook owners who have Creator or Explorer licenses can accelerate workbooks. Administrators can suspend individual views or turn off acceleration for their site. View Acceleration loads views faster by precomputing and fetching the workbook's data in a background process. There are two potential bottlenecks when loading a view:

1. Querying (fetching data from the data source).
2. Rendering (creating the visuals, such as drawing shapes or rendering a map).

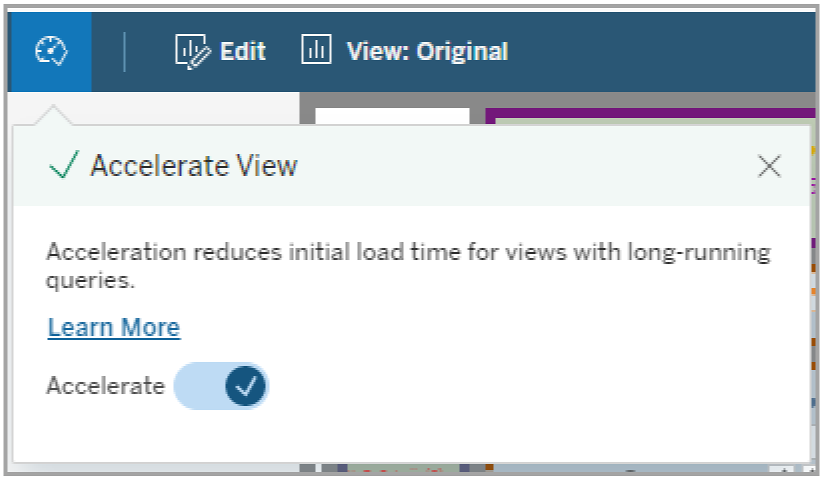
The time it takes to load a workbook depends on the combined time it takes to do these two steps. However, not all views can be accelerated. View Acceleration improves the performance of the first step (querying). If the view is loading slowly for reasons other than querying, View Acceleration won't improve the workbook's performance.

When users create custom views on top of an accelerated view, the ten most used custom views are precomputed automatically. These accelerated custom views don’t count against the view limit. Custom views that haven’t been accessed in the last 14 days won’t be accelerated. If you directly accelerate a custom view, both the original view and the custom view are accelerated.

## Accelerate your view

1. Sign in to a site on Tableau Cloud or Tableau Server.
2. From the Home or Explore page, navigate to the view you want to accelerate.

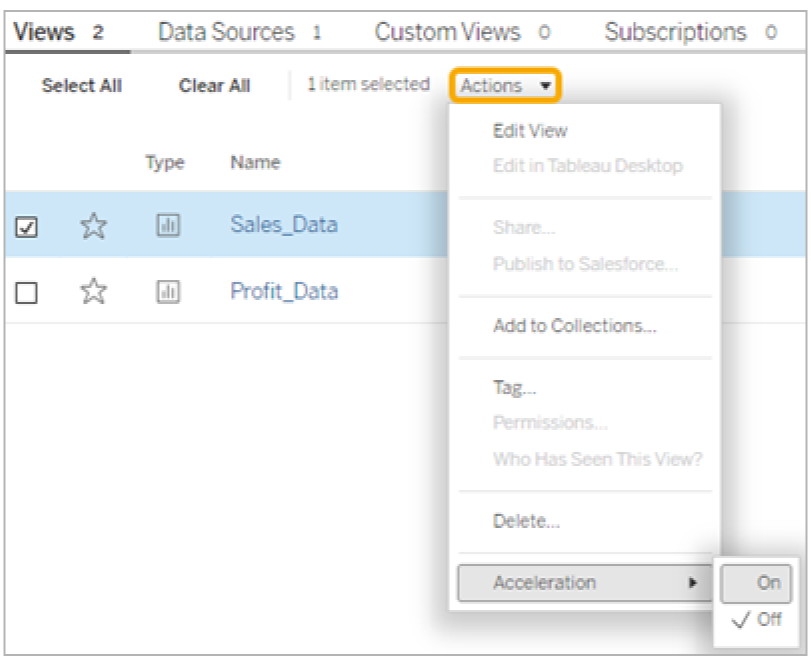
3. Choose the **Accelerate** icon, and select the switch to **Accelerate**.




**Note:** Toggling the **Accelerate** switch off prevents users from accelerating a view, but it doesn't remove the acceleration option from the view.

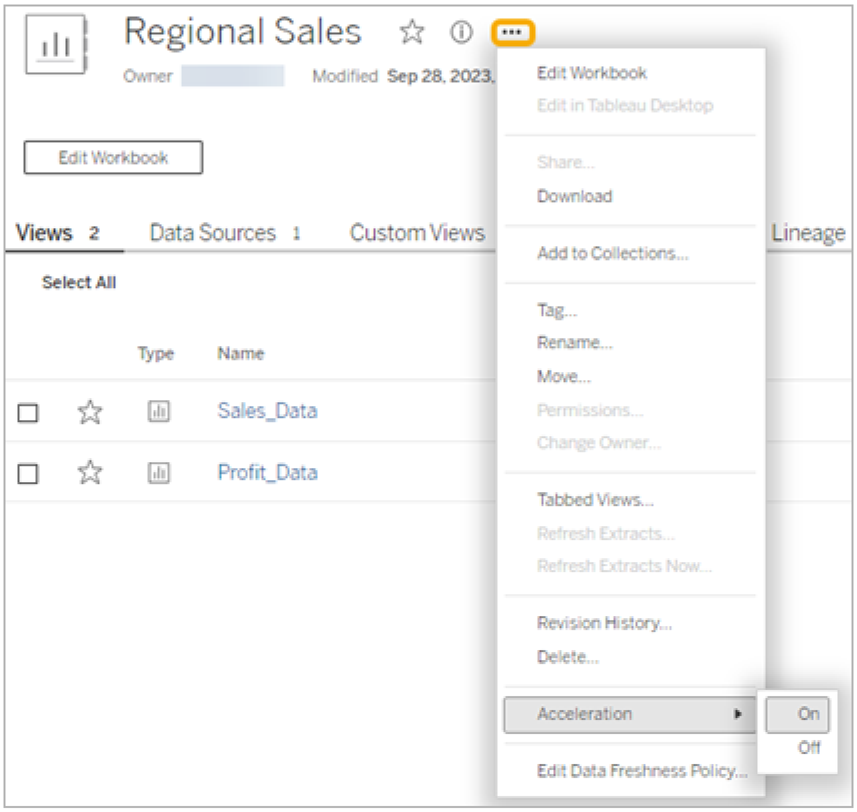
You can also accelerate views from the workbook page in one of three ways:

1. Select the desired view and choose **Acceleration** > **On** from the **Actions** menu.



2. Select the **More options**(...) menu for the desired view and choose **Acceleration** > **On**.

3. To accelerate all views in the workbook, choose **Acceleration** > **On** from the **More options (...)** menu.




**Note:** View Acceleration isn't available in Tableau Desktop.

# Understand why View Acceleration is unavailable, suspended, or ineffective

## View Acceleration is unavailable

There are a few scenarios in which acceleration isn’t available for a view.

| Issue | Resolution |
|---|---|
| The view doesn't have historical data for the time required to execute queries. | Every time a view loads, it takes a few minutes for the viz data to be available. For a newly created view, load the view and wait a few minutes before trying to accelerate it. |
| The historical time taken to execute queries for the view is less than 2 seconds. | Acceleration isn’t supported for such views because acceleration won’t significantly improve the performance of the view. |
| The view doesn’t have embedded credentials. | To precompute the data, Tableau needs to automatically connect to the data source in the background without any user interaction. As a result, View Acceleration is only supported for workbooks with embedded connection credentials. |
| The view has user-based functions, or the view has a data source with user-based functions. | Currently, Tableau doesn't support accelerating such views. Examples of user-based functions are USERDOMAIN() and USERNAME(). |
| The view’s owner is inactive. | To precompute the data, the owner must be an active user. Tableau doesn’t support accelerating a view if its owner is inactive. Contact your Tableau admin to change the ownership to an active user. |
| The view’s data freshness policy is less than 2 hours. | Cost can be high for accelerating views that are refreshed so frequently, and Tableau doesn’t want to overload your site performance. For more information, see Set a Data Freshness Policy. |

| | |
|---|---|
| The site has reached the limit for the number of views that can be accelerated. | For more information, see View Acceleration capacity. |

## View Acceleration is suspended

There are a few scenarios in which acceleration is suspended.

| Issue | Resolution |
|---|---|
| The view's acceleration was suspended by the site admin. | Contact your admin to re-enable acceleration for your view. |
| There are background acceleration jobs running to precompute the data for the view. | If the jobs fail regularly, the view is auto suspended. The jobs may fail if:<br>• A view's credentials have expired. Contact your Tableau admin to update the credentials.<br>• The owner of the view becomes inactive. Contact your Tableau admin to transfer the ownership.<br>• The view's data source was deleted. Contact the view's owner to update the data source.<br>• The job to precompute the data takes too long and times out. View Acceleration has a maximum runtime of 30 minutes. Contact the view's owner to optimize the workbook. |

## View Acceleration is ineffective

View Acceleration reduces the time it takes to execute queries of a view. If the time taken to execute queries isn't the bottleneck for the viz load time, you won't notice a significant improvement in performance during a viz load. Likewise, a view usually has many queries. You can't accelerate queries with transient functions, such as now() or using relative date filters. If a view has a long-running query with transient functions, you won't notice an improvement in performance during a viz load.

## Refresh accelerated views

### Event based refresh of accelerated views

In workbooks that have an extract, all accelerated views are refreshed when the extract refresh completes. When a workbook is republished or renamed, all accelerated views in the workbook are refreshed.

### Schedule based refresh of accelerated views

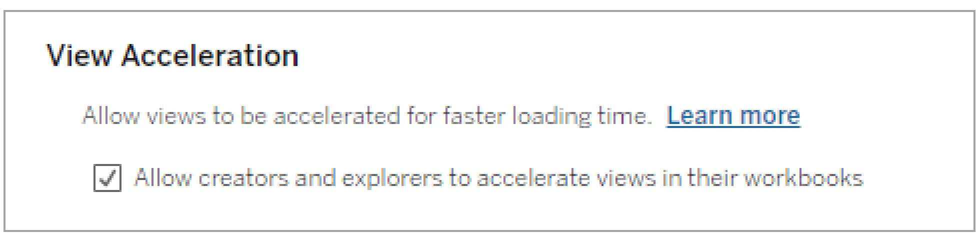
Schedules for refreshing accelerated views can only be configured if a workbook has at least one live data source.

Accelerated views for workbooks utilizing live data sources are refreshed based on the workbook's data freshness policies. If there isn't a schedule set for refreshing the data, the default data freshness policy is used. For more information, see Edit a workbook data freshness policy.

## Manage View Acceleration on your site

By default, View Acceleration is allowed.

1. Sign in to your site on Tableau Cloud.
2. From the left pane, choose **Settings**.
3. From the **General** tab, scroll to the **View Acceleration** section.
4. Select the check box to allow creators and explorers to accelerate views in their workbooks. Clear the check box to turn off View Acceleration for the site.

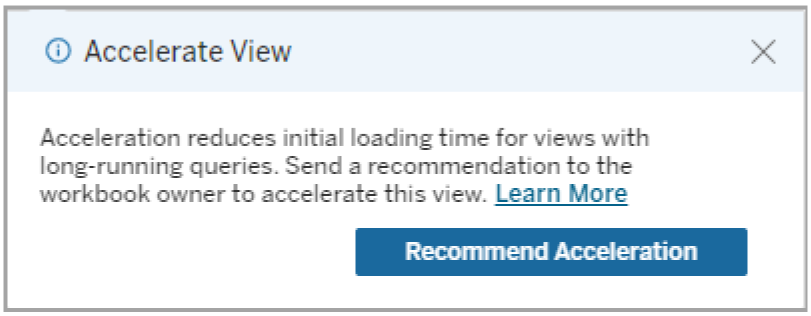



**Note:** Clearing the check box prevents users from accelerating views in their workbooks, but it doesn't remove the acceleration option from their views.

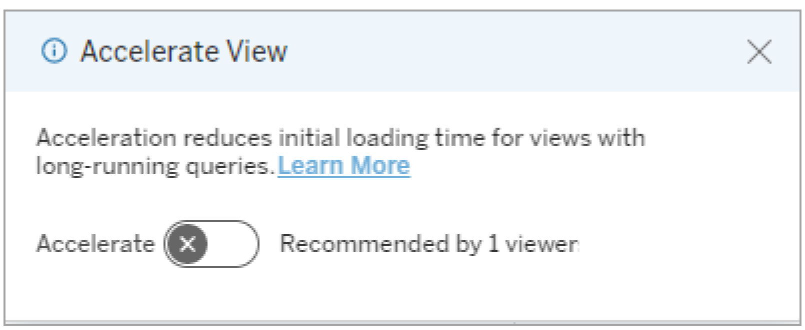
## Accelerate recommended views

Based on a workbook's query time and usage, Tableau sometimes recommends acceleration to improve the performance of slower and more popular views and dashboards. If acceleration is available for a view, users can recommend acceleration for a view once every 30 days.

When a user visits a view, they'll see the option to Recommend Acceleration to the site admin or workbook owner.




When the site admin or workbook owner visits the same view, they'll see the option to accelerate the view, and they'll see how many users have recommended acceleration.




### Manage Views recommended for acceleration

As a site admin, you can see when Tableau has recommended acceleration for a view:

1. Sign in to your Tableau site.
2. From the left pane, choose **Tasks**.

3. From the **Acceleration status** column, check for views with a **Recommended** status. You can also use the **Filter** in the right-side pane to filter for views with a **Recommended** status.

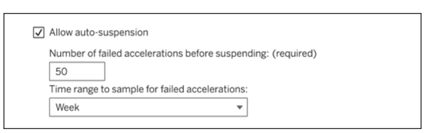
Personalized recommendations for acceleration as a workbook owner or admin:

1. Sign in to your Tableau site.
2. From the top-right of the page, choose the account menu icon.
3. Select **My Content**.
4. Select the **Performance** tab.
5. From the **Actions** column, choose **Accelerate**.

## Automatically suspend acceleration to save resources

To conserve resources, administrators can automatically suspend acceleration for views that are consistently failing. Administrators can set a threshold for the number of times an acceleration task can fail per day, week, or month before the acceleration is automatically suspended.

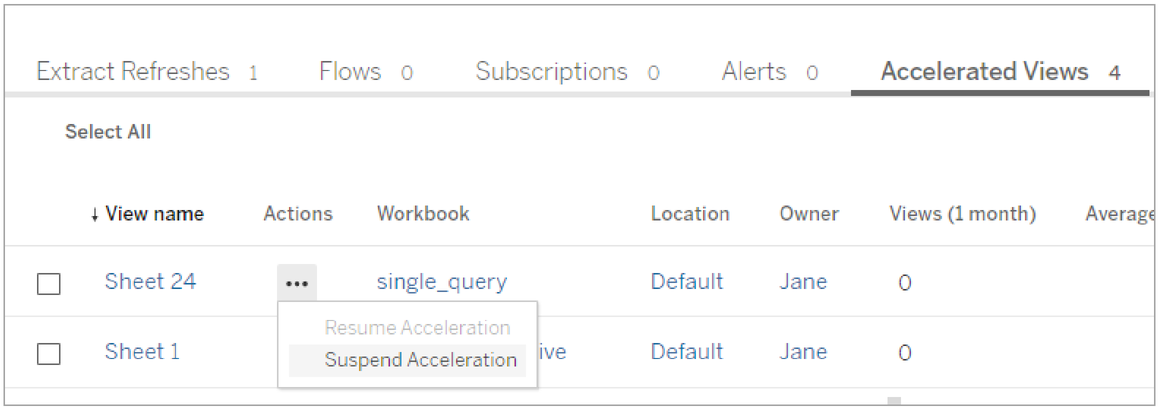
1. Sign in to your Tableau site.
2. From the left pane, choose **Settings**.
3. From the **General** tab, scroll to the **View Acceleration** section.
4. Under **Automatically suspend accelerated views to save resources**, check **Allow auto-suspension**.
5. Enter the number of failed accelerations that occur in a time period before the view acceleration is suspended.
6. Select the time range to sample: day, week, or month.
   For example, if you enter 25 as the number and Week as the time period, the view's acceleration will be suspended if the view fails more than 25 times in a 7-day period.
7. Choose **Save**.




## View and manage accelerated workbooks

1. Sign in to your Tableau site.
2. From the left pane, choose **Tasks**.

3. Select the **Accelerated Views** tab.
4. Choose the **Actions** menu (...) to Resume or Suspend Acceleration for the selected view or views.




## Manage View Acceleration notifications

Administrators can manage whether to receive notifications for views that are automatically suspended.

1. Sign in to your Tableau site.
2. From the left pane, choose **Settings**.
3. From the **General** tab, scroll to the **Manage Notifications** section.
4. To receive notifications for views that are automatically suspended, check the box for **View Acceleration**.
5. Choose **Save**.

When views are automatically suspended, notifications are sent to site and server administrators. The notification includes information about why the view was suspended and the time that the view was suspended. Select the notification to go to the **Accelerated Views** tab of the **Tasks** page. From this page, administrators can filter the Acceleration Status to find views that were automatically suspended.

## Understand user context for precomputation

Precomputation for accelerated workbooks is performed with the user context of only one user. This user is either:

- The owner of the workbook (if there are no user filters in the workbook or data source, or if there are user filters on the data source but the data source is a published data source).
  -or-
- The user that was selected for thumbnail generation the last time the workbook was published (if there are user filters on the workbook and the data source isn't a published data source).

# Use Custom Views

A custom view is a shortcut to a specific state of interaction, such as filter selections and sorting, for a published viz. Custom views don't impact the underlying content. They're a good option if you find yourself adjusting the same filters or zooming into the same data every time you look at a viz.

Custom views aren't the same as web editing, which changes the underlying published content itself. See Edit Tableau Views on the Web.

If the custom views are specifically for filter settings, consider using embedding filter parameters in a shared URL. See Filter a published dashboard by editing the URL from The Data School.

## Notes on custom views

- A custom view doesn't modify the content it's built on.
- Deleting the original content deletes its custom views.
- If the original content is updated or republished, the custom view is also updated.

  **Tip**: Some changes to the original content can break the custom view. See Maintain Content with Custom Views for best practices on modifying content with custom views.

- If a user is removed from the site, any shared custom views they owned are also lost.
- Subscriptions and data-driven alerts based on custom views may be more fragile than those based on the original content.

> **Note**: As of the 2022.3 release, Tableau replaced user names in the custom view URL with IDs. Bookmarked URLs still work but are redirected to the new URL schema. This change is to add more company and user data protection.

## Create a custom view

Start by navigating to the individual view. Make whatever changes you want to capture in the custom view, such as selecting marks, filtering data, or changing sorts.

1. When you’re ready to save the changes you’ve made as a custom view, select **Save Custom View** from the toolbar.

   > **Note**: The **Save Custom View** button appears in the toolbar after any changes are made to the current view.

2. In the **Save Custom View** dialog, enter a name for the custom view.
3. (Optional) Select **Make it my default**.
4. (Optional) Select **Make visible to others**. This makes the custom view available to everyone who can see the original content. However, there are several instances when this option isn't available:
   - The user is a Viewer site role.
   - The site's User Visibility setting is set to Limited.
   - The permission capability Share Customized is denied on the workbook.
5. Click **Save**.

## Find a custom view

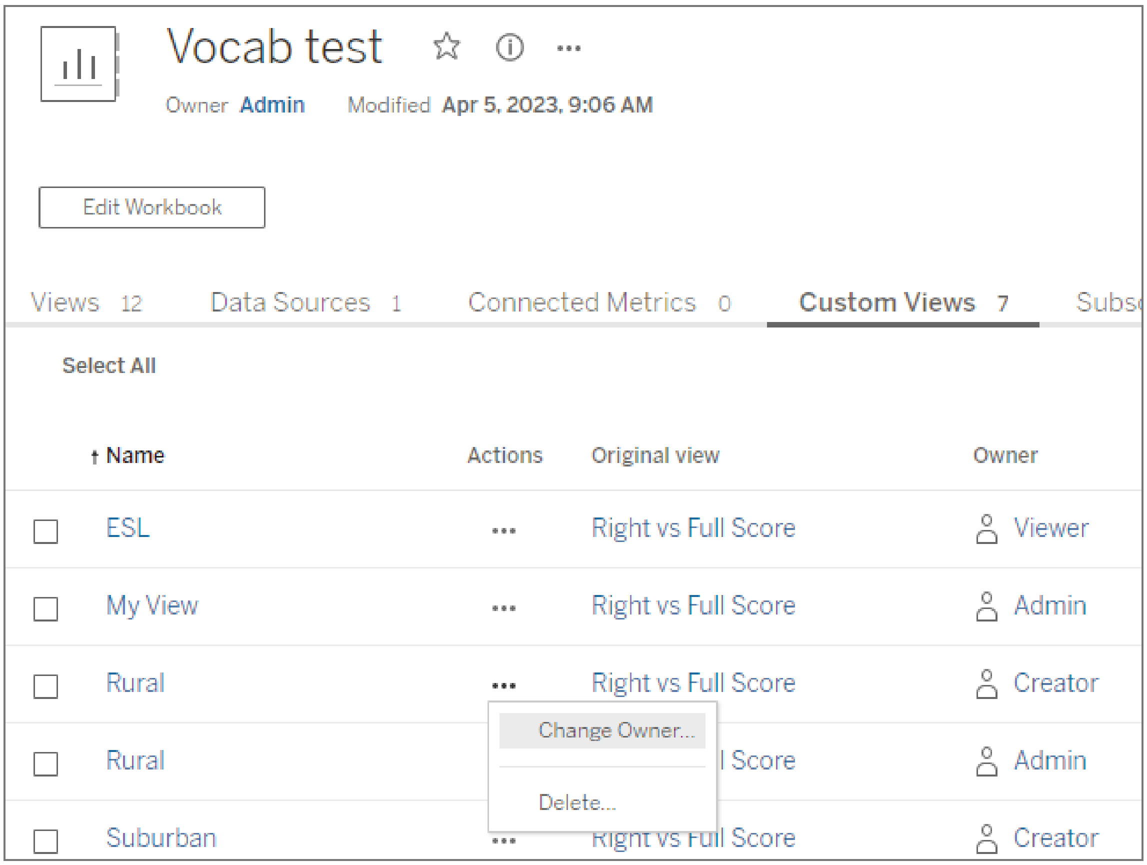
### From a view

When you're looking at a viz, you can change to a different custom view by selecting the View icon in the toolbar. If there's room in the toolbar, the name of the custom view you're looking at is shown.

Any custom views you've made, and all visible custom views made by other users, appear in the list.

### From the workbook

When you're looking at content at the workbook level, use the **Custom Views** tab to see all the available custom views for that workbook.




## Set a default custom view

After you've found or made a custom view, you make it the default you see when you open that viz.

1. Select the **View** icon in the toolbar.
2. Check the **Set this view a your default** option.
3. Close the dialog to save.

The next time you open that viz, you'll land on that custom view.

## Share a custom view

By default, custom views are private and only appear for the user who created them.

> **Note**: Users with a Viewer site role can't make custom views visible to others. However, they can share a custom view by copying and sharing the URL.

Users with a site role of Explorer or higher can set a custom view as visible to others. This setting allows anyone with access to the original content to see the custom view.

To change an existing private custom view to be visible to others (or to make a visible view private):

1. Select the **View** icon in the toolbar.
2. Toggle the eye icon to the view you want to share to the desired state.
3. Close the dialog to save.

The eye with a slash indicates the view is private to you. The eye indicates the view is visible to others.

## Delete a custom view

To delete a custom view:

1. Select the **View** icon in the toolbar.
2. Select the trash icon of the view you want to delete.
3. Confirm that you want to delete the view.

### Take care when deleting

If you're the owner of a custom view that's visible to others, remember it's deleted for everyone if you delete it.

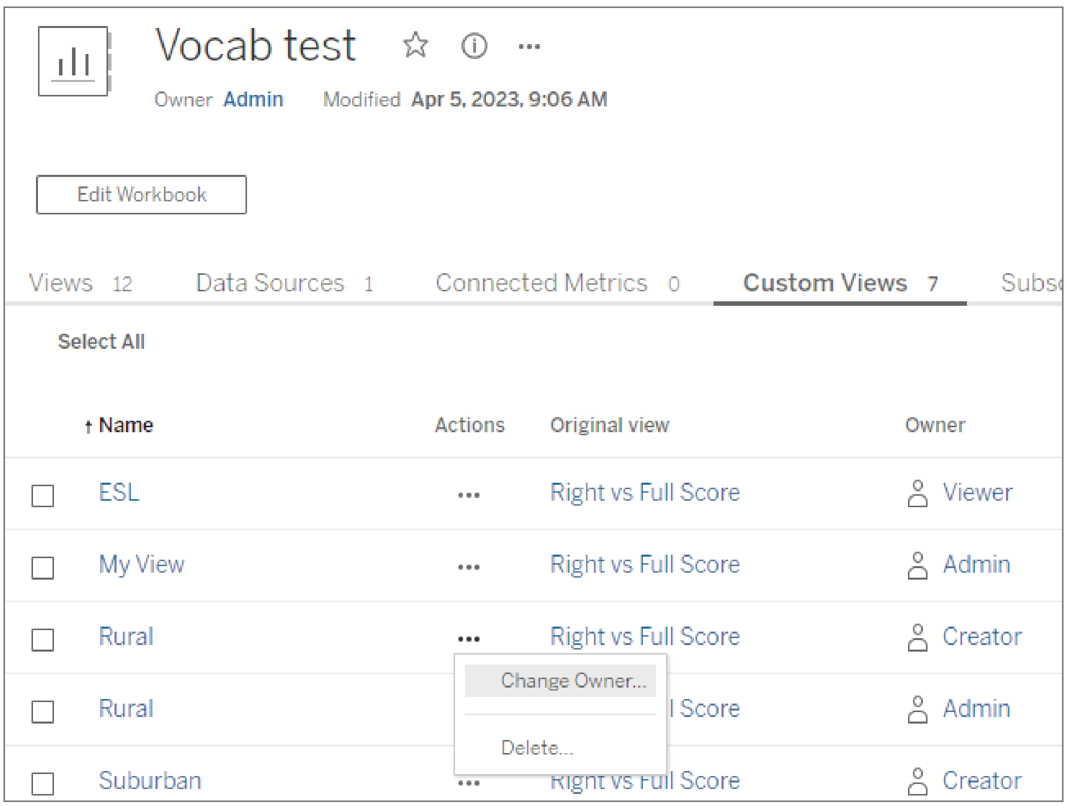
Deleting a custom view also deletes any subscriptions or data-driven alerts based on that custom view.

## Manage custom views

Administrators can change ownership for custom views and delete custom views created by other users.

Custom views can be managed for a piece of content or for a specific user.

1. Go to the Custom Views tab for the workbook or user.
2. Use the action menu to change the owner or delete the custom view.




**Tip**: It's a best practice to change ownership of any custom views belonging to a user before removing them from the site. Deleting a user also deletes their custom views, including public views others may be using.

### Safely change content with custom views

If you need to modify a view that has custom views (or the data source the view is built on), be aware that certain changes can break custom views. For more information, see Maintain Content with Custom Views.

# Publish Views to Salesforce

Bring your views from Tableau Cloud or Tableau Server right to your Salesforce ecosystem by publishing views to a CRM Analytics app or Salesforce Lightning page.

For more information, see Publish Tableau Content to CRM Analytics in Salesforce Help.

## Prerequisites

See a complete list of prerequisites in Salesforce Help, including required licenses, account setup, and permissions.

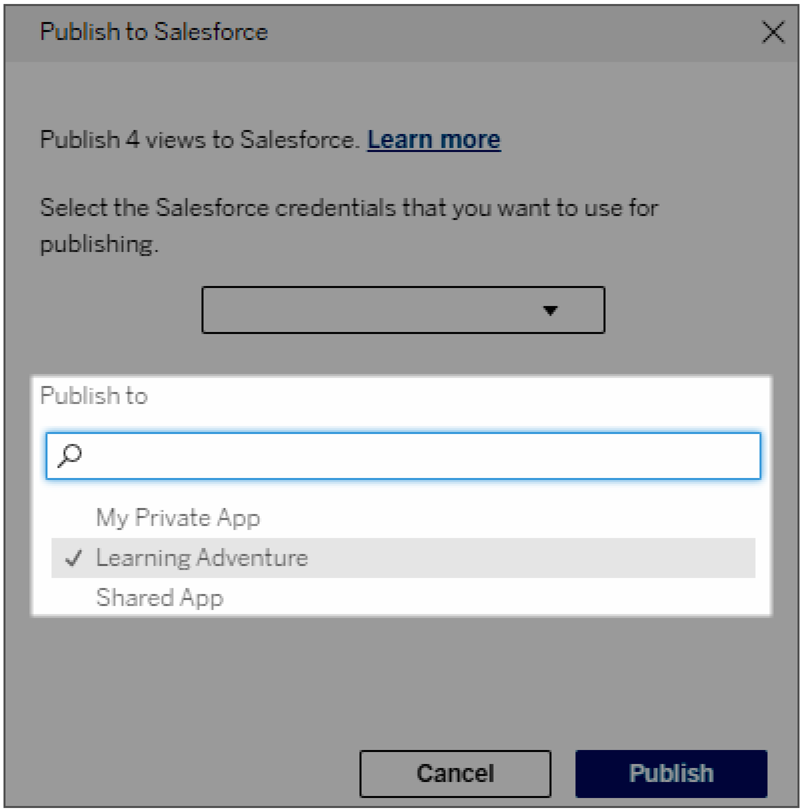
## Publish a view to Salesforce

Select one or more views, including dashboards, sheets, and stories. Then, choose a destination from a list of CRM Analytics apps that you have access to edit or manage.

1. Select the view that you want to publish to Salesforce.

   **Note**: You can select a maximum of 25 views at a time to publish to Salesforce.

2. For **Actions**, select **Publish to Salesforce**.
3. Select the Salesforce credentials that you want to use for publishing.
4. Select the destination app that you want to publish to. You can only see apps that you can edit or manage with the signed-in Salesforce user.




5. Click **Publish**.

## Who can see the published view in Salesforce?

When you publish a view to Salesforce, anyone with access to the selected CRM Analytics app or Lightning page can see that the content exists. However, only those signed in with existing Tableau permissions can see the view.

# Visual Segment Creation to Data Cloud

Segmentation enables data analysts to curate relevant portions of data from their analyses in Tableau and seamlessly transfer them to Salesforce Data Cloud. Once in Data Cloud, marketing professionals can use various platforms (such as Data Cloud for Marketing) to quickly take high-impact steps to boost marketing campaigns with ease.

# About segmentation

## Overview and examples

Segmentation that starts in Tableau provides a way for analysts to visually explore their audience (typically customers) and send data about relevant portions of the target population to Data Cloud. From Data Cloud, marketers can publish to other Salesforce clouds or platforms for further analysis and action.

To better understand the benefits of segmentation and how it works, let’s consider a likely use case. A data analyst reviewing an analysis of data about a recent marketing campaign in Tableau identifies a segment with lower engagement than the overall campaign audience. The data analyst knows this is an important subset of the overall data that the marketing team will want to address. So, the data analyst sends this low-engagement segment to Data Cloud.

From Data Cloud, a member of the marketing team (or marketer) can access the segment to get a filtered view of the campaign data related to the low-engagement group. With a focused snippet of the overall data, it’s easier for the marketer to determine the actions they need to take to improve engagement.

With an action plan in mind, the marketer publishes the segment on Salesforce Marketing Cloud or a similar platform where they created the original campaign.

In this example and similar scenarios, the data analyst benefits from the robust analysis capabilities in Tableau while efficiently handing off their findings to the marketer. The marketer benefits from accessing a targeted view of data that’s relevant to them that they can manage and send to the marketing tools they’re already using. Most importantly, the customers benefit from marketing campaigns that effectively reach them.

## Workflow

With segmentation, you can streamline the collaboration between data analysts working in Tableau and marketers working in Data Cloud and connected marketing platforms. The typical workflow looks like:

1. The data analyst uses a viz in Tableau to analyze and identify a subset of the customer data that's relevant, meaningful, and actionable to marketers.

2. The data analyst creates a segment of their audience data from their Tableau viz and sends it to Data Cloud.

3. The marketer accesses the segment from Data Cloud. From there, they create a plan for acting on the segment data, and send it to their activation target. The activation target is typically a marketing platform or tool that the marketing team uses to manage marketing campaigns, such as Data Cloud for Marketing.

4. The marketer launches the marketing campaign from the activation target, and analyzes the campaign results from their platform of choice.

### Learn more

To learn more about segmentation, check out these helpful resources:

- Segmentation (Salesforce Help) - Get a comprehensive review of segmentation and activation on Data Cloud.

- Segmentation and Activation module (Trailhead) - Learn how to create, filter, and activate marketing segments with Data Cloud.

- Segmentation Filter Examples (Salesforce Help) - For common use cases for segmentation and get inspiration for creating your own segments.

- Data Cloud and the Ethical Use of Data trailmix (Trailhead) - Learn how you can use ethical practices when building marketing segments in Data Cloud.

## Requirements for segmentation

### License requirements

To create a segment in Tableau, data analysts need a Creator license for Tableau Cloud.

To publish a segment in Data Cloud, marketers need:

- Developer, Enterprise, Performance, or Unlimited Salesforce edition
- Segmentation and Activation add-on license for Data Cloud
- Standard Data Cloud permission set and the appropriate marketing-specific permissions (see Data Cloud Standard Permission Sets for more information)
- (Recommended) Data Cloud for Marketing, for activating segments
- (Optional) The Ad Audiences add-on license for Data Cloud, for activating segments to advertising platforms

## Data requirements

### Data sources and connections

To create a segment, your data source must use a single direct connection to live data (no extracts) and your viz must use a single data source. Published data sources, multiple connections, and multiple data sources aren't supported.

### Data model configuration

When configuring your data model in Data Cloud, be sure to:

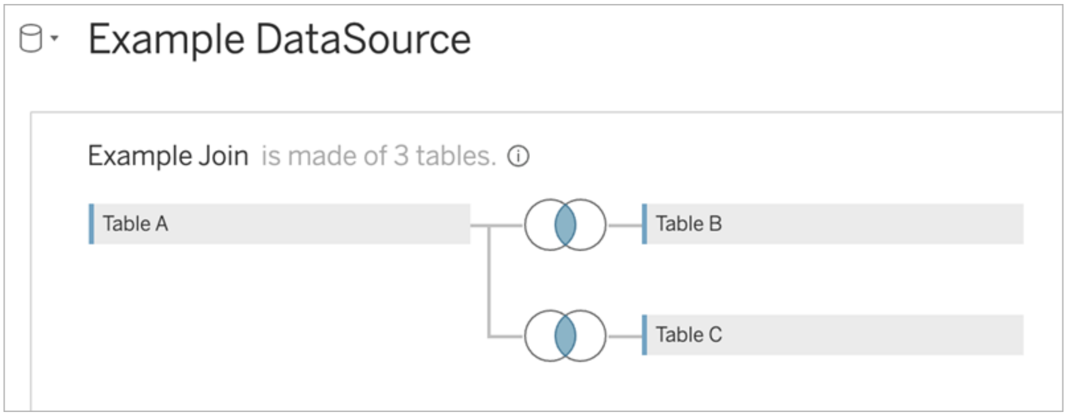
- Connect to a Profile DMO, and have the Profile DMO set as the left-most table in the Data Source tab
- Use only one primary key

When configuring your data model in Tableau, be sure to:

- Use a table that's used only one time in the data source
- Only use a single table in the logical layer (multiple logical tables aren't supported)
- Avoid including unions or custom SQL tables
- Only use joins between DMOs that match existing Data Cloud relationships

- Use linear joins between DMOs in which each object is only joined to a single object (rather than joining multiple objects to the same object)

  For example, instead of:




  Do this:


- Use join expressions that only include fields (calculations and multiple joins from a single table aren't supported) and the equals operator (other operators aren't supported)

When connecting your data model in Tableau to your data model in Data Cloud, you can recreate any necessary portions of the model using Tableau joins.

Authentication

To create segments in Tableau, you must allow Tableau to connect to Data Cloud using the Salesforce Data Cloud connector. If the Data Cloud connector isn't already configured on your Tableau site, follow these steps.

In the connected app, add the following scopes:

- Perform ANSI SQL queries on Customer Data Platform data (cdp_query_api)
- Manage Customer Data Platform profile data (cdp_profile_api)
- Manage Customer Data Platform Ingestion API data (cdp_ingest_api)
- Perform segmentation on Data Cloud data (cdp_segment_api)

User permissions requirements

To create a segment, work with your Salesforce admin to confirm that you have access to the following application programming interfaces (APIs):

- Write access for the Create Segment API
- Read access for the Data Cloud Metadata API

Field requirements

When you create a segment, use fields in your filters that are either existing database fields (rather than fields created by Tableau), or groups. Fields that are cast to other data types might cause errors.

The following types of fields aren't supported in segment filters:

- Measures with MEDIAN, PERCENTILE, or ATTR aggregations
- Table calculations
- Calculations
- Bins
- Groups based on sets, calculations, or combined fields
- Tableau-generated fields, such as:
  - Metadata fields (measure names/values)
  - Generated map-related fields (latitude and longitude)

    - Table type fields (count of object or logical table)

- Calculated insights

- Clusters

Filter requirements

When you create a segment, multiple filters are applied based on your configuration. Segment filters can include a combination of data source filters, context filters, view filters, and filters based on your viz selection.

Use quantitative filters for:

- A measure (with or without aggregation)

- A range of dates

Use categorical filters for segments with individual values selected.

The following types of filters aren’t supported in segments:

- Categorical filters with a top, wildcard, or condition filter

- Relative to current date filters with anything other than date and year for next/last N

- Relative to current date filters with anything other than date, month, and year for the current period

- Date filters with Month/Day/Year

- Date filters with date truncation

- Date filters with a datetime exact comparison to another datetime

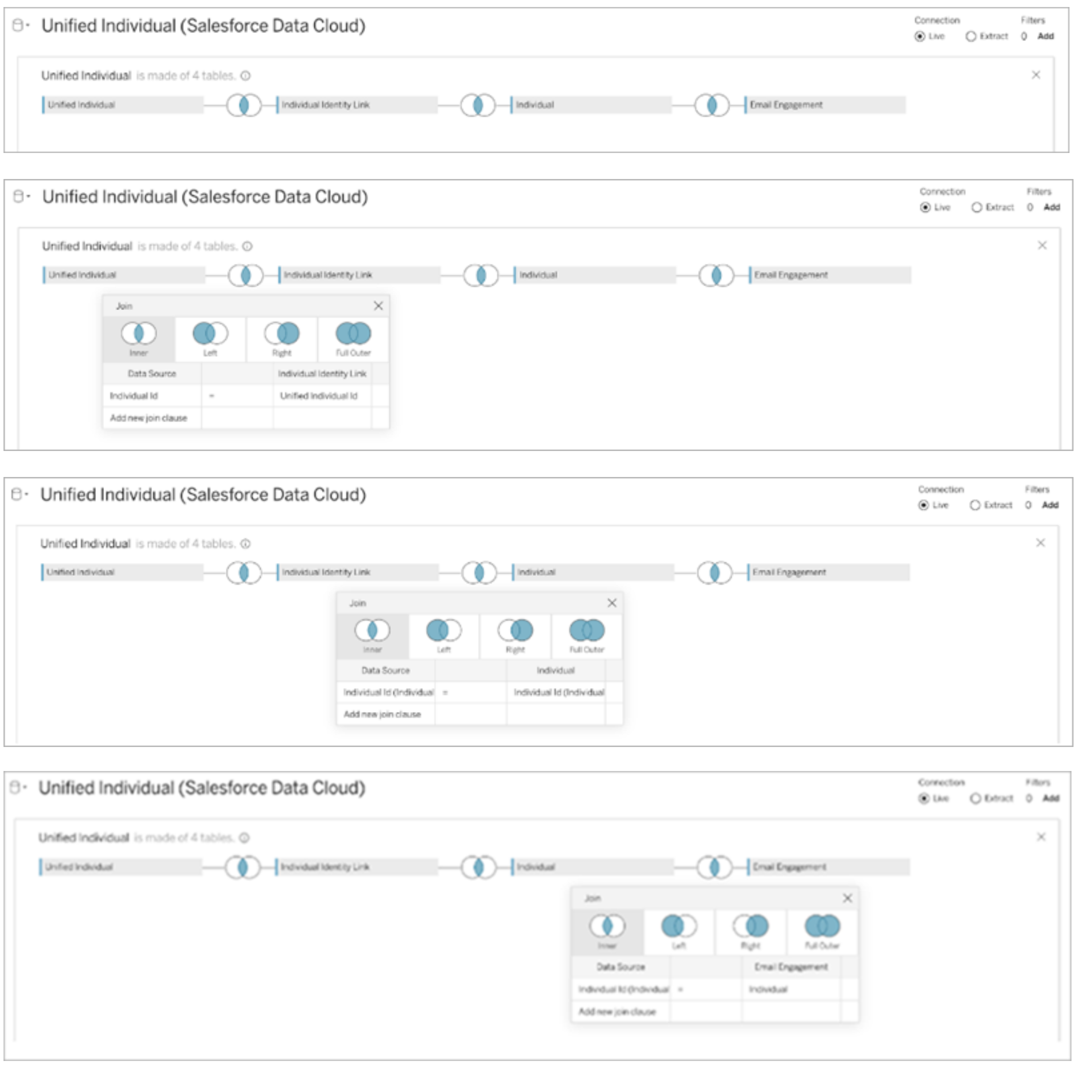
Relative date filters with a specified anchor date are supported.

## Create a segment using engagement data

To create a segment from Tableau to Data Cloud using engagement data, you must configure the correct modeling in Tableau using join clauses.

Use joins within a single logical table and join on the same field as defined in the relationships in the Data Model tab in Data Cloud.

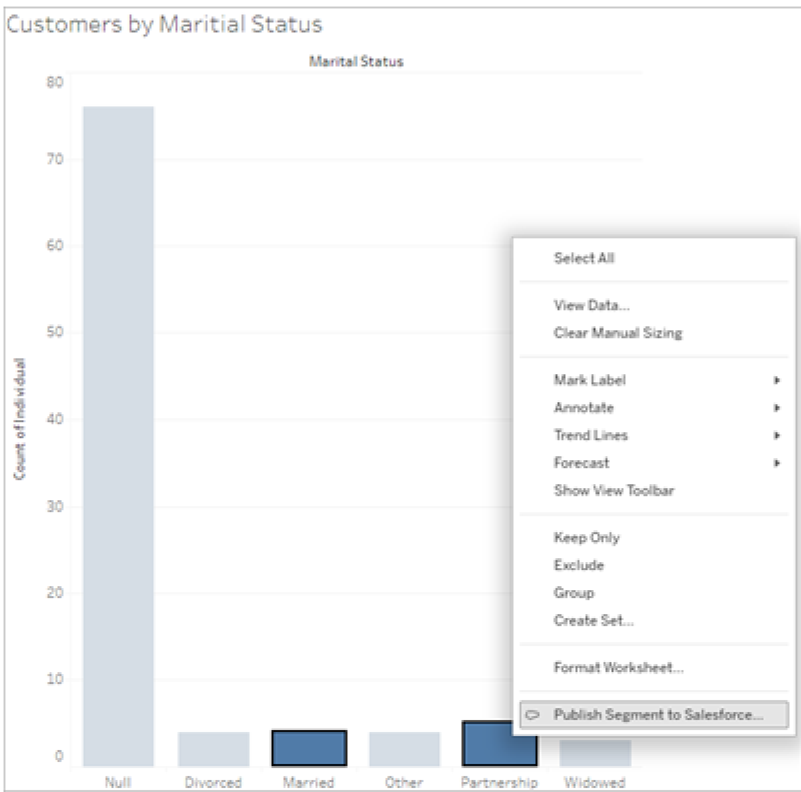
For example, to create a segment using Email Engagement data for the Unified Individual in Tableau, configure your data model and map the relationships as shown.



**Note:** This example is for illustrative purposes only. Data in your Data Cloud instance might use different relationships.

## Create a segment in Tableau

1. In Tableau, select the desired portion of the data in your viz, and then right-click and select **Publish Segment to Salesforce**.




2. Configure your segment in the **Create Segment for Data Cloud** dialog.

   **Segment name** is required. The name must start with a letter and can only contain alphanumeric characters and underscores. The name can't contain consecutive under-scores or end with an underscore, and spaces aren't allowed. In Data Cloud, the segment name displays as the name that you specify in the **Segment name** field plus a timestamp of when you create the segment.

When you add filters in the dialog, the filter field names appear under **Rules**.

You can hover over a rule to learn more about it, such as the filter or mark selection that the rule was built on. Multiple rules might filter on the same field, but learning more about a rule's origins can help you identify any duplicates.

As you add each filter, a segment population count displays. The population count represents the count of individual data points (typically customers) who meet your filter criteria. You can use the population count to verify that your segment is working as expected by confirming that the count is the same in Tableau and Data Cloud. Tableau counts all individual records in your viz, but the segment only counts distinct individuals. To see distinct individuals in a Tableau viz that matches the segment count, use the Count Distinct (COUNTD) aggregated function.

When you add rules, the **Description** is pre-populated with details about them. You can edit the description as needed, but there's a 255 character maximum. A description is optional, but it can make it easier to find the segment in Data Cloud.

3. Click **Create**. When the segment is created, a confirmation message appears with a link to view the segment in Data Cloud.


If you receive an error after clicking **Create**, confirm that you meet the requirements to publish to Data Cloud and check the status of your organization's Salesforce instance.

4. In the confirmation message, click **View in Data Cloud**.

For segments created in Tableau, you can modify the **Segment Name**, **Description**, and **Publish Schedule** in Data Cloud. To do so, click **Edit Properties**.

You can't revise a segment's rules after you publish it. Instead, you must delete the segment in Data Cloud and create a new one in Tableau.

5. From Data Cloud, your marketing team can publish the segment to the appropriate activation targets.

# Configure Tableau Lightning Web Components and Single Sign-On (SSO) with Token Authentication

Tableau Lightning web components (LWC) allow Salesforce customers to drag and drop Tableau views and Tableau Pulse metrics onto Salesforce Lightning pages.

- The Tableau View component allows you to add embedded views from Tableau Cloud or Tableau Server.
- The Tableau Pulse component allows you to add embedded Tableau Pulse metrics from Tableau Cloud.

Tableau LWC seamless authentication allows you to view Tableau content using connected app trusted tokens without signing in. Seamless authentication is optional for Tableau View LWC, and is required for Tableau Pulse LWC.

**Important**:
• Salesforce Console apps do not support the use of Tableau Lightning web components.
• Case Record pages do not support the use of Tableau Lightning web components with Chatter emails.

## Add Trusted URL

The Tableau view or Pulse URL that you want to add to your Lightning page must be added as a Trusted URL.

1. From your Salesforce app, select the gear in the top-right corner, and then select **Setup**.

2. On the left navigation pane, enter “Trusted URLs” in the **Quick Find** search bar.
3. Select the **Trusted URLs** settings page.
4. Select **New Trusted URL**.
5. Enter an **API Name** and **URL**, following the instructions on the settings page. **Note**: The URL must begin with https://
6. For CSP Context, select **All**.
7. For CSP Directives, check all boxes.
8. Select **Save**.

## Turn on seamless authentication for Tableau LWCs

Tableau View and Tableau Pulse LWCs are available in the Lightning App Builder without any configuration. However, Tableau Pulse LWC requires token authentication to function.

### Configure Salesforce settings

The following steps only need to be completed one time by a Salesforce admin:

1. From your Salesforce app, select the gear in the top-right corner, and then select **Setup**.
2. On the left navigation pane, enter “Tableau” in the **Quick Find** search bar.
3. Select the **Tableau Embedding** settings page.
4. Select the checkbox for **Turn on token-based single sign-on authentication**.

   > **Note**: This box must be checked to configure the Tableau Pulse LWC. For the Tableau View LWC, you can choose not to set up token authentication and instead sign in manually when the component loads.
   >
   > To use Tableau View LWC on Mobile, you must turn on token-based authentication and set up seamless authentication.

5. For **Select Tableau User Identity field**, set an org-level user field to authenticate the user in Tableau. You must select the Salesforce user field that corresponds with the Tableau username. The dropdown shows the field value for the current user, or null if no value is defined. If none of the user fields match the Tableau username, select an empty field (for example, Federation ID or a custom field). Then, populate the empty field with the Tableau username for your users.

> **Note**: The Tableau User Identity field setting applies to all users and doesn't need to be set on an individual basis.

6. Save your changes.
7. If you're the Tableau admin, keep the Salesforce settings **Tableau Embedding** tab open while you configure Tableau settings in the next section. If you aren't the admin, share the **Issue URL** and **JWKS URI** with your Tableau admin.

## Configure Tableau settings

In one tab, open the Tableau Embedding settings page in your Salesforce org. In another tab, go to your Tableau site and follow these instructions to set up the Connected App.

For Tableau Server, follow these steps:

1. As a Tableau Server admin, sign in to the Tableau Services Manager (TSM) web interface.
2. Navigate to **User Identity & Access**, and then select the **Authorization Server** tab.
3. Select the checkbox for **Enable OAuth access for embedded content**.
4. Enter the **Issue URL** and **JWKS URI**, which you can find on the Salesforce org Tableau Embedding settings page. Use the **Copy** button on the Salesforce org settings page to copy the Issuer URL value, and then paste it into the TSM web interface. Repeat this process for the JWKS URI value.

> **Note**: The JWKS URI field is marked as optional in the TSM web interface, however this value is required to use Tableau LWC seamless authentication.

5. Select **Save Pending Changes**.
6. Select **Pending Changes** in the upper-right corner of the page, and then select **Apply Changes and Restart** to stop and restart Tableau Server.

For more information, see Register your EAS with Tableau Server.

For Tableau Cloud, follow these steps:

1. Open the Tableau **Settings** page, and then choose the **Connected Apps** tab.
2. From the New Connected App dropdown, select **OAuth 2.0 Trust**.
3. On the Create Connected App dialog, enter the **Issue URL** and **JWKS URI**, which you can find on the Salesforce org Tableau View Embedding settings page. Use the **Copy** button on the Salesforce org settings page to copy the Issuer URL value, and then paste it into the Tableau settings page. Repeat this process for the JWKS URI value.

   **Important:** The Create Connected App dialog notes the JWKS URI field as optional, however this value is required to use Tableau LWC seamless authentication.
4. Select the checkbox for **Enable connected app**.
5. Select **Create**.

   **Note:** The Connected App is named External Authorization Server.

For more information, see Register your EAS with Tableau Cloud.

If you want to create a host mapping for this site, leave the Connected Apps tab open. You can use the URL for this page and the Copy Site ID button to populate the host mapping fields in the following section.

## Set up or edit host mapping

Follow these steps to create or edit a host mapping.

**Tip**: The Tableau User Identity field setting applies to all users and doesn't need to be set on an individual basis.

### Create a new host mapping

1. From your Salesforce app, select the gear in the top-right corner, and then select **Setup**.
2. On the left navigation pane, enter "Tableau" in the **Quick Find** search bar.
3. Select the **Tableau Embedding** settings page.
4. From the Tableau Host Mapping section, select **Create New**.

5. Fill in the host mapping details:
   a. Tableau site URL: Enter a URL for the Tableau site that you want to map. The URL should contain the site name, unless it's an on-prem installation using the Default site. **Note**: If you want to create a host mapping for this site, leave the Connected Apps tab open. You can use the URL for this page and the Copy Site ID button to populate the host mapping fields in the following section.
   b. Tableau site ID: Enter the site ID for the Tableau site that you want to map. You can use the Copy Site ID button on the Connected App settings page or on the Share dialog.
   c. Tableau site host type: Select Tableau Cloud or Tableau Server.
6. Select **Save**. Or, if you want to return to the Tableau Embedding settings page without saving, select **Cancel**.

### Edit a host mapping

You can update the site ID and host type for an existing mapping. If you need to change the site URL, delete the existing mapping, and then create a new one with the correct URL.

1. From the Salesforce app Tableau Embeddings settings page, select Edit next to an existing host mapping.
2. Edit the **Tableau site ID** or **Tableau site host type** fields as needed.
3. Select **Save**. Or, if you want to return to the Tableau Embedding settings page without saving, select **Cancel**.

## Add Tableau LWCs to a Lightning page using Lightning App Builder

Tableau LWCs are available on App, Home, and Record Lightning pages only. For more information about Lightning page types and using the Lightning App Builder, see Lightning App Builder in Salesforce Help.

> **Note:** Case Record pages do not support the use of Tableau Lightning web components with Chatter emails.

To add a Tableau View or Tableau Pulse LWC to an existing Lightning page, follow these steps:

1. Navigate to the Lightning page that you want to edit.
2. Select the gear icon in the top right.
3. Select Edit Page.
4. Proceed to the **Add a Tableau LWC to a Lightning page** section below.

To add a Tableau View or Tableau Pulse LWC to a new Lightning page, follow these steps:

1. From your Salesforce app, select the gear in the top-right corner, and then select **Setup**.
2. On the left navigation pane, enter "Lightning App Builder" in the **Quick Find** search bar.
3. Select the **Lightning App Builder** setup page.
4. Select **New**.
5. Select the page type that you want to create. Tableau LWCs are available on App, Home, and Record pages.
6. Select **Next**.
7. Enter a name and select a layout for the new page, and then select **Done**.

## Add a Tableau LWC to a Lightning page

1. From the Components list on the left side of the page, drag and drop the Tableau View or Tableau Pulse component onto the page.
2. Configure the LWC:
   - Configure a Tableau View Lightning Web Component
   - Configure a Tableau Pulse Lightning Web Component

## Save and activate the page

1. When you've finished adding and configuring a Tableau View or Tableau Pulse LWC, select **Save**.
2. If you've created a new page, you are prompted to activate the page so that it's visible to users. Select **Activate**.
3. On the **Page Settings** tab of the Activation page, enter a name, choose an icon, and select your visibility preference.
4. (Optional) On the **Lightning Experience** tab of the Activation page, you can add the page to various Lightning Experience Apps.
5. (Optional): On the **Mobile Navigation** tab of the Activation page, you can add the page to the Mobile Navigation Menu.
6. Select **Save**.

## Embed multiple Tableau views

You can embed more than one Tableau view on a Salesforce Lightning page as long as all views come from the same site. Tableau only supports a single session, and that session is specific to the site. The most recently granted session will wipe out the previous one.

To embed Tableau views from multiple sites, you must create a separate Lightning page that is site-specific.

## Tableau LWC single sign-on for Mobile

**Note:** Tableau View and Pulse LWCs are available on iOS 17.2.1+.

Consider the following best practices to prevent issues for mobile users:

- Lightning page type: Mobile users can access App Pages and Record Pages, but not Home Pages.

  **Note:** Record Pages must be associated with a specific type of record.

- If you use the same page for both desktop and mobile users, select **Activation** to verify that the Lightning page is set as the Org Default for both desktop and phone form factors.
- Consider creating separate Lightning pages for desktop and mobile to provide a tailored visual experience. The height for the Tableau View component is fixed and won’t dynamically adjust to different screen sizes.
- To add a scroll bar to a view, select **Show Toolbar** from the Tableau View component properties pane.
- For the App Page type, select **Activation**, and then select the **Lightning Experience** tab. Add your page to the LightningBolt list to make the page easier to find on mobile.
- On mobile, iOS blocks cross-site traffic by default. Open your mobile settings, select Salesforce settings, and then turn on **Allow Cross-Website Tracking**. For more information, see Enable cross-website tracking.

# Troubleshooting Tableau View LWC seamless authentication

## Verify the Salesforce and Tableau configuration

1. Verify that the **Issuer URL** and **JWKS URI** values match in both Salesforce and Tableau Settings and that JWKS URI ends with **id/keys**.
   - For Tableau Cloud, open the Salesforce Settings Tableau Embedding page in one tab. In another tab, open the Tableau Settings Connected Apps tab. On the Connected Apps tab, select **External Authorization Server**, and then select **Edit**. Verify that the **Issuer URL** and **JWKS URI** values match and that the JWKS URI ends with id/keys.
   - For Tableau Server, open the Salesforce Settings Tableau Embedding page in one tab. Then, sign in to the Tableau Services Manager (TSM) web interface, navigate to **User Identity & Access**, and then open the **Authorization Server** tab.
2. Verify Host Mapping: If you've saved a host mapping, verify that it has the correct site ID and host type.

## Verify the JWT token

In the Tableau View Lightning web component property editor, select Debug Mode to verify that the JWT token is working as expected.

1. Open the console logs and copy the token.
2. Go to the jwt.io website and paste the token into the **Encoded** field.
3. Verify the following:
   - The subject ("sub") matches the Tableau username.
   - For Tableau Cloud, the audience ("aud") is "tableau+SiteID".
     For Tableau Server, the audience ("aud") is "tableau".
   - The scope ("scp") includes both "tableau:views:embed" and "tableau:insights:embed".
   - The issuer ("iss") EAS server is accurate.

## Verify page activation

Sometimes, a user creates a Lightning page, but it hasn't been activated or assigned anywhere, so users can't find it. Select **Activation** to verify that the Lightning page is set as the

Org Default for the intended form factors.

**Tip:**When debugging, it’s helpful to drag and drop a Rich Text component onto your page. Add a brief description of the page type and the view URL that you’re trying to embed. This allows you to be sure that the page being viewed by the end user is the page that the admin is editing.

## Confirm that Tableau View LWC is working without seamless authentication (Tableau View LWC only)

1. From the Tableau View pane on your Lightning page, clear the checkbox for **Default Authentication Token**, and then save the changes.
2. If you’re signed in to Tableau in another tab, sign out. Ensure that navigating to the View URL redirects you to the Tableau sign-in page. Do not sign in.
3. Navigate to the Lightning page. The Tableau View LWC should display a **Sign in to Tableau** button.
4. Select **Sign in to Tableau**, and then enter your Tableau credentials to sign in.
   **Note**: If the view doesn’t load, this indicates a broader issue with authenticating to Tableau.

## Error: LWC component version no longer supported (Tableau View LWC only)

To resolve this error, follow these steps:

1. In the Components list, search for “Tableau”, and then drag and drop a new **Tableau View** component onto the page.
2. Copy all properties from the Tableau View pane for the old component over to the new component.
3. Select the delete icon on the old component.

## Error: To enable Tableau Pulse LWC, please reach out to your Salesforce admin to configure seamless authentication for Tableau (Tableau Pulse LWC only)

To resolve this error, follow the steps on this page to **Turn on seamless authentication for Tableau LWCs**.

## See Also

Troubleshoot Connected Apps

Register EAS to Enable SSO for Embedded Content

# Configure a Tableau View Lightning Web Component

The Tableau View Lightning web component (LWC) allows Salesforce customers to drag and drop embedded Tableau views from Tableau Cloud or Tableau Server onto Salesforce Lightning pages.

For instructions to turn on a Tableau LWC, add a trusted URL, set up seamless authentication and host mapping, and add a component to a Lightning page, see Configuring Tableau Lightning Web Components.

When you've added a Tableau View LWC to your Lightning page, configure the component fields.

| Component field | Description |
|---|---|
| URL for the Tableau view | This field is required. Enter the URL for the Tableau View that you want to embed.<br><br>To find the URL, open a new tab and find the Tableau view that you want to embed. Select **Share**, and then select **Copy Link**.<br><br>**Note**: The URL must be for a view, not a workbook. |
| Default Authentication Token | Checking this box is required if you're using seamless authentication. |

| | |
|---|---|
| Site ID | This field is required for seamless authentication if there isn't a host mapping specified for the URL used in the **Tableau view** field. If a host mapping exists for the Tableau site, the contents of this field are ignored. |
| Custom Authentication | This field accepts a single JWT for one-time testing purposes. |
| Show Tabs | Check the box if you want to show tabs. |
| Show Toolbar | Check the box if you want to show the toolbar. |
| Height | Height in pixels. |
| Custom Query Parameters | Used for static filtering of the view. Enter as FieldName=FieldValue (for example, Manufacturer=3M). |
| Debug Mode | Check the box to turn on debug mode. |
| Force refresh toggle | When troubleshooting, you can toggle this checkbox to refresh only this component instead of refreshing the whole Lightning App Builder Page or all components on the Lightning Page. |
| Set Component Visibility: Filters | Create filters for when to display the component. For example, you can filter on a specific user, permissions, or device form factor.<br><br>To add a filter:<br><br>1. Select **Add Filter**.<br>2. Choose **Select** to pick a field to filter on.<br>3. Complete your selection, and then select **Done**.<br>4. Select **Done** to save your filter.<br><br>**Important**: You must enter field names as they are defined in the data source. For example, if the data source is in English, but the data source fields are translated to Japanese for a user, the user must enter the original English field name. |

### Fields available only on Record pages

The following fields make it possible to dynamically filter on up to two fields. For example, you can filter on "Account Id" using the checkbox and "State/Province" using the advanced filters.

| Component field | Description |
|---|---|
| Filter on Record Id | Used for dynamic filtering of the view using the Record Id. The name of the field in the data source for the view must match the format “Record Type Id” and is case sensitive. For example, if the Lightning page is for Account records, the field in the view must be named “Account Id”. |
| Tableau Advanced Filter | Used for dynamic filtering using a specific field of the current record. Enter the name of the field in the data source for the view. |
| Salesforce Advanced Filter | Used for dynamic filtering using a specific field of the current record. Select the corresponding field on the Salesforce record. |

## Tableau View component troubleshooting

From the page that contains the Tableau View Lightning web component, select the gear icon, and then select **Edit Page**.

1. Click on the Tableau View Lightning web component to open the property editor.
2. Confirm that the **URL for the Tableau view** field contains a valid URL for a Tableau view (not a workbook). Open the **Share** dialog for a Tableau view, and then choose **Copy Link**.
3. The checkbox for **Default Authentication Token** must be selected.
4. Verify the **Site ID** field if no host mapping has been saved for this site. **Note**: The Site ID field is ignored if a host mapping is defined for the site.

- For Tableau Cloud, the field must be populated with the Site ID copied from the embedded Tableau view Share dialog.
- For Tableau Server, the field must be blank.

For other Tableau LWC and seamless authentication information and troubleshooting, see Configuring Tableau Lightning Web Components.

# Configure a Tableau Pulse Lightning Web Component

The Tableau Pulse Lightning web component (LWC) allows Salesforce customers to drag and drop embedded Tableau Pulse metrics from Tableau Cloud onto Salesforce Lightning pages.

For instructions to turn on a Tableau LWC, add a trusted URL, set up seamless authentication and host mapping, and add a component to a Lightning page, see Configuring Tableau Lightning Web Components.

When you've added a Tableau Pulse LWC to your Lightning page, configure the component fields.

| Component field | Description |
|---|---|
| Tableau Pulse URL | This field is required. Enter the URL for the Tableau Pulse page or metric that you want to embed. |
| Site ID | This field is required for seamless authentication if there isn't a host mapping specified for the URL used in the **Tableau Pulse URL** field. If a host mapping exists for the Tableau site, the contents of this field are ignored. |
| Height | Height in pixels. When set to the default value of 0, height adjusts automatically to best fit the selected layout. |
| Layout | Determines the size and level of detail displayed. Choose from Full, Compact, or Mini. |
| Debug Mode | Check the box to turn on debug mode. |
| Force refresh | When troubleshooting, you can toggle this checkbox to refresh only this |

| | |
|---|---|
| toggle | component instead of refreshing the whole Lightning App Builder Page or all components on the Lightning Page. |
| Set Component Visibility: Filters | Create filters for when to display the component. For example, you can filter on a specific user, permissions, or device form factor.<br><br>To add a filter:<br><br>1. Select **Add Filter**.<br>2. Choose **Select** to pick a field to filter on.<br>3. Complete your selection, and then select **Done**.<br>4. Select **Done** to save your filter.<br><br>**Important**: You must enter field names as they are defined in the data source. For example, if the data source is in English, but the data source fields are translated to Japanese for a user, the user must enter the original English field name. |

## Tableau Pulse component troubleshooting

From the page that contains the Tableau Pulse Lightning web component, select the gear icon, and then select **Edit Page**.

1. Click on the Tableau Pulse Lightning web component to open the property editor.
2. Confirm that the **Tableau Pulse URL** field contains a valid URL for a Tableau Pulse page or metric.
3. Verify that the **Site ID** field is populated with the Site ID for the Tableau site. To find the Site ID, open the Share dialog for the workbook or view from the Tableau site.

For other Tableau LWC and seamless authentication information and troubleshooting, see Configuring Tableau Lightning Web Components.

# Receive Notifications, Search, and Share Using the Tableau App for Slack

The Tableau App for Slack lets you work and collaborate right where you work in Slack. In Tableau 2023.1 or later, you can search for views and workbooks, and easily access your favorite and recently viewed Tableau content from the Tableau App for Slack. With the Tableau App for Slack, you can also see snapshots of visualizations, with links back to your Tableau site for further exploration. Some features (such as sharing and searching Tableau content from Slack) aren't yet available in Tableau Server. Currently, Tableau Server users can receive notifications.

In Tableau 2021.3 and later, you can get Tableau notifications in Slack for data-driven alerts, sharing activity, and comment mentions. If the notification contains a view or workbook you have access to, the notification will also contain a visual snapshot.

Administrators can connect their Tableau site to a Slack workspace to enable the Tableau App for Slack for their entire organization. For more information, see "Integrate Tableau with a Slack Workspace" in the Tableau Cloud or Tableau Server help.

After your Tableau admin connects your Tableau site to a Slack workspace:

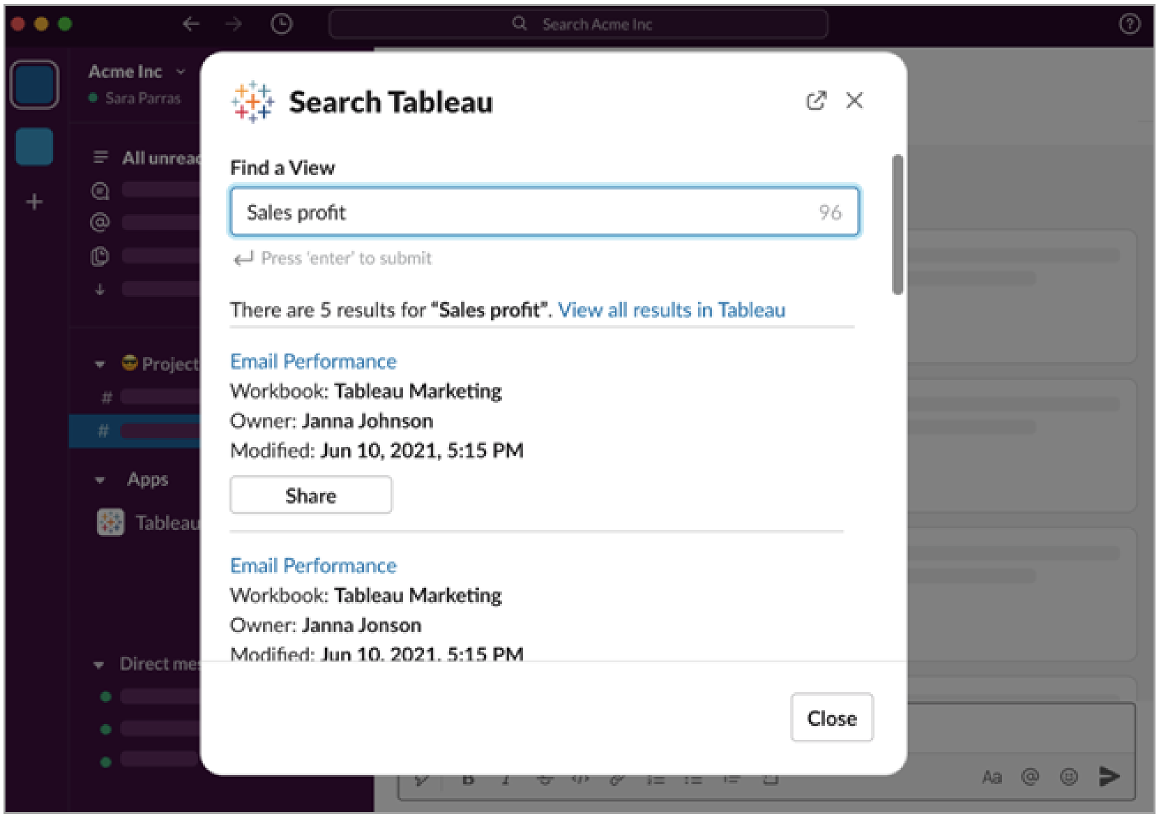
1. Add the Tableau App for Slack.
2. Select **Connect to Tableau**.
3. Log in to your Tableau site.
4. Authorize the app by choosing **Allow**.

**Note:** For information about privacy, see the Privacy Policy.

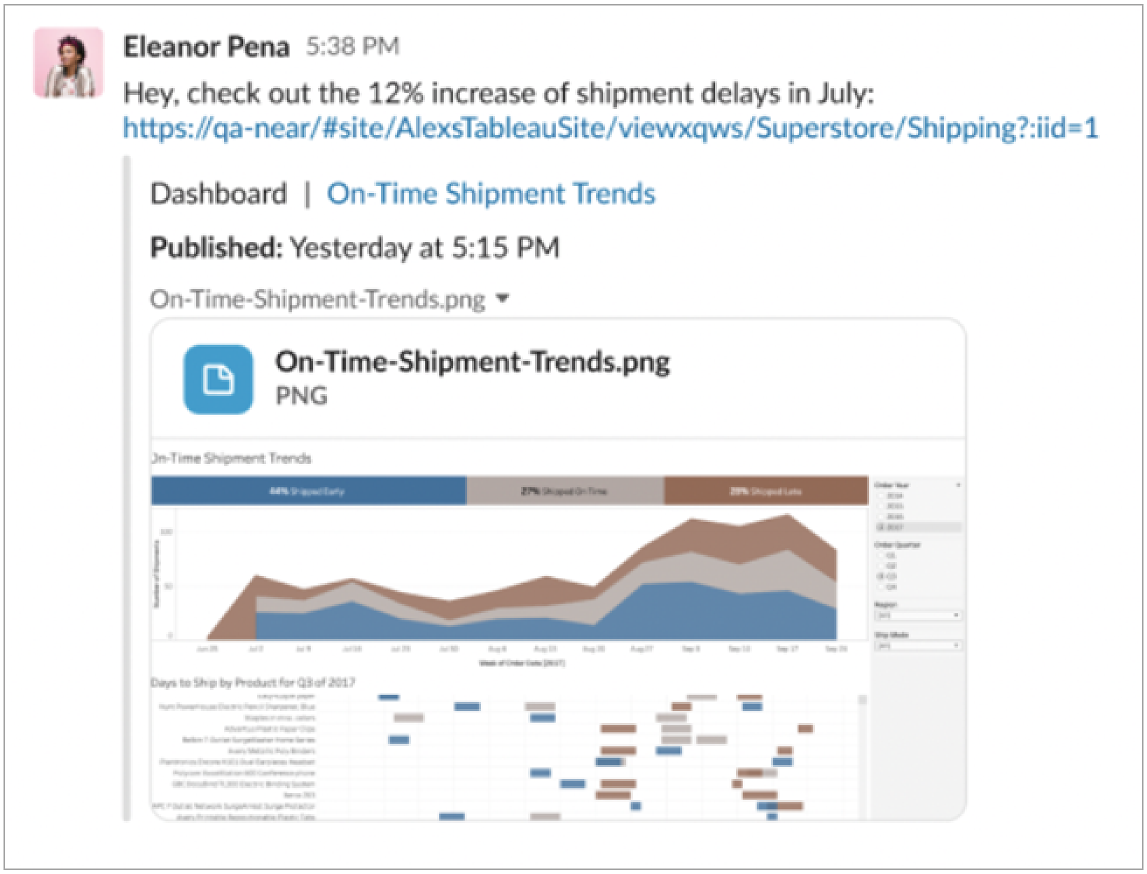
## Search, share, and access recents and favorites from Slack

From the Tableau App for Slack **Home** tab, you can search for views and workbooks on your Tableau Cloudsite.

After you’ve found the Tableau content you’re looking for, select the name of the Tableau content to open it directly in Tableau or select Share to send the content to an individual or Slack channel. You can also write a custom message to provide context about the Tableau content you’re sharing.




Choose **Share with Snapshot** to include a preview (Slack link unfurling) of the Tableau content in your message. You can share a snapshot if the Tableau content doesn't contain filters that restrict data access (for example, row-level security). The snapshot is visible to all people you share it with, regardless of their access level.



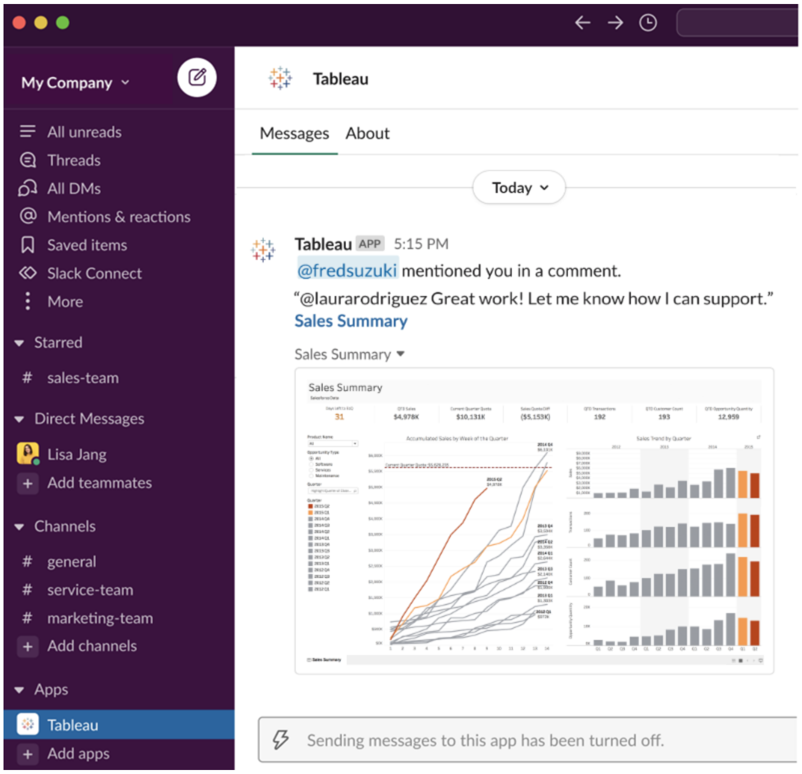

And without leaving Slack, you can access recently viewed Tableau content and your Tableau favorites. From the Tableau App for Slack **Home** tab, you see the five Tableau views or workbooks you visited most recently. You can also access five of your favorite Tableau views or workbooks.

Select the name of the Tableau view or workbook to open it directly in Tableau, or select the more actions menu (...) to share favorite or recently viewed Tableau content.

## Receive Tableau notifications in Slack

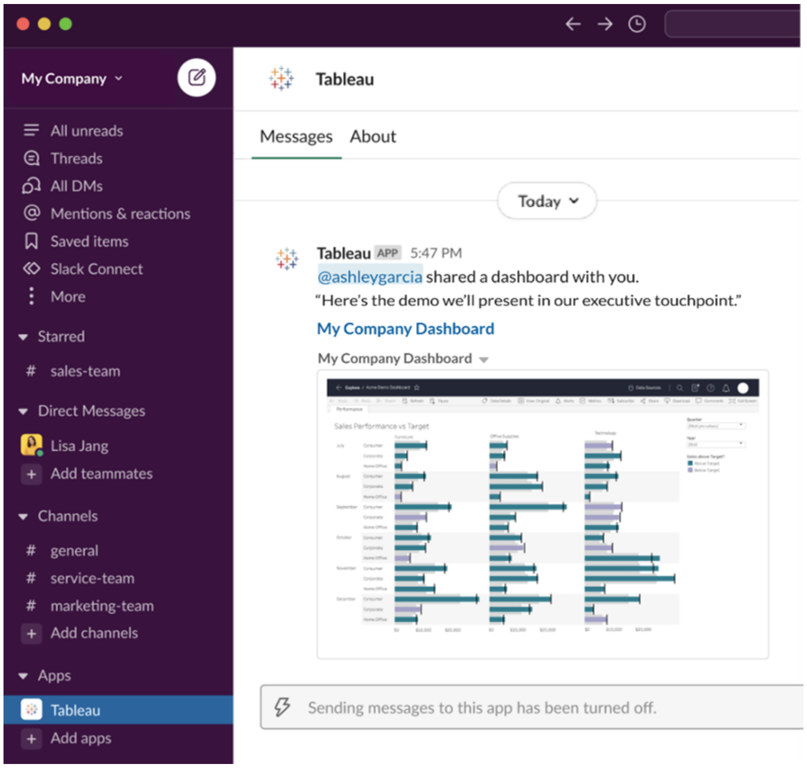
Comments

Get notified when you're @mentioned in a comment to keep the conversation going. For more information, see Comment on Views.



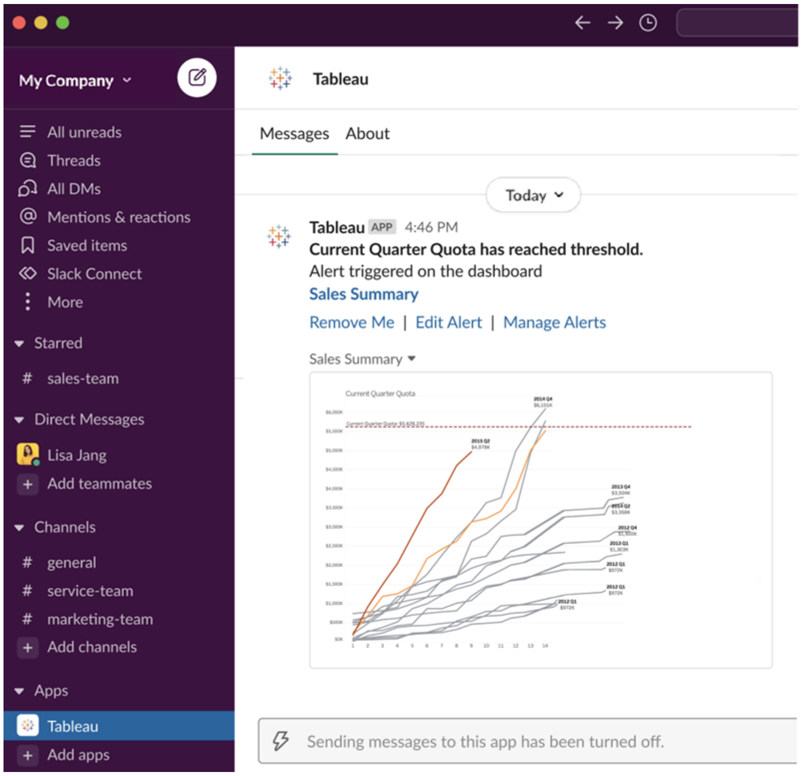

Share

See when a teammate sends a Tableau asset your way, including views, workbooks, and more. For more information about sharing, see Share Web Content.




Data-driven Alerts

You can specify a threshold for your data and get alerted when it's met. For more information, see Send Data-Driven Alerts from Tableau Cloud or Tableau Server.

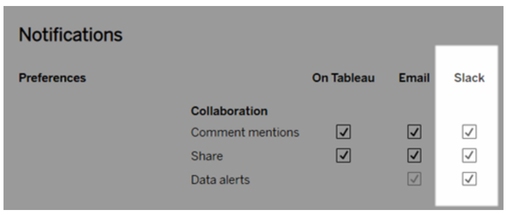



## Manage Tableau notifications for Slack

Your Tableau site admin can turn on or off all notifications across the site. Tableau admins and Slack workspace admins integrate your Tableau site with Slack, and control whether site users can receive notifications. If it's enabled and your Tableau site administrator allows notifications, all site users can receive notifications in Slack through the Tableau App for Slack. Sometimes notification preferences aren't available because the site has other settings configured that affect notifications.

To control which notifications appear in your Slack workspace, or to turn off Slack notifications, at the top of a page, click your profile image or initials, and then select **My Account Settings**.


Under Notifications, select or clear the check boxes under **Slack** for comment mentions, share, and data alerts.




Select **Save Changes**.

For more information, see **Change notification settings** in Manage Your Account Settings.

# Interact with Data in Tableau

This tutorial walks you through some of the basics of viewing and interacting with data visualizations, or views, in Tableau Server.

Tableau is a tool that lets you interact with published visualizations to explore insights, ask questions, and stay on top of your data. Here's how to get started.

## Go ahead. It's safe to click around

Tableau is built for interaction. What you do to a visualization changes how it looks for you, just for now.

Others will still see the visualization as it originally appeared. And the data used to build it stays the same, too.

## 1: What is a Tableau Site?

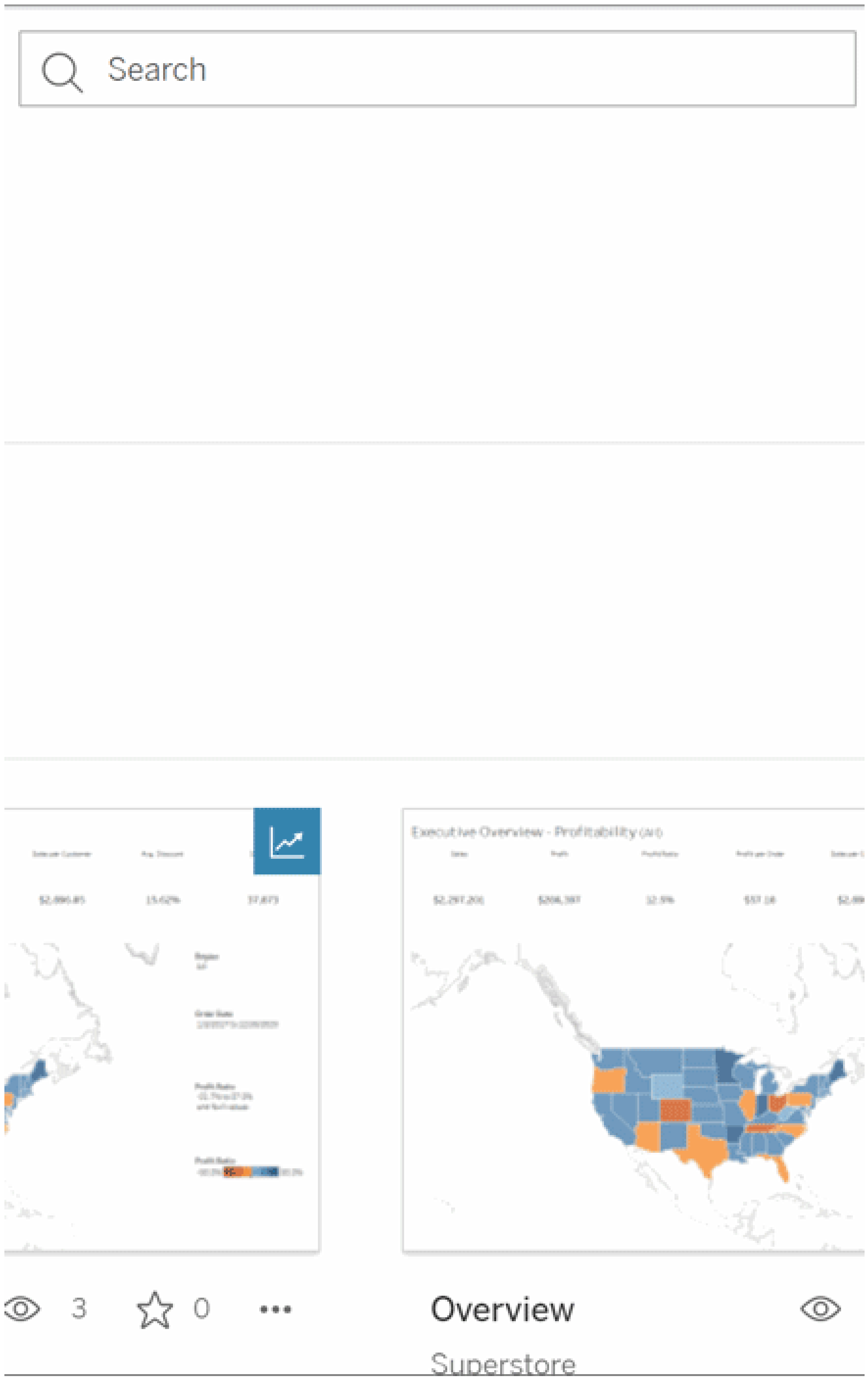
A Tableau Site is a place for your team to share data and data visualizations with each other. You can explore what they've published and made available to you.

When you sign in to your Tableau site, you'll land on the home page.


## 2: Search for a viz

Tableau calls visualizations on a site Views. Use search to find views or workbooks (a package of views in a single file).

Search results will show all the different content types relevant to your query.




You can select See All for all search results if the views in the quick search aren't what you were looking for, or use the Explore page to browse. There you'll see all the different types of content a Tableau site can host.

# 3: Interact with Content

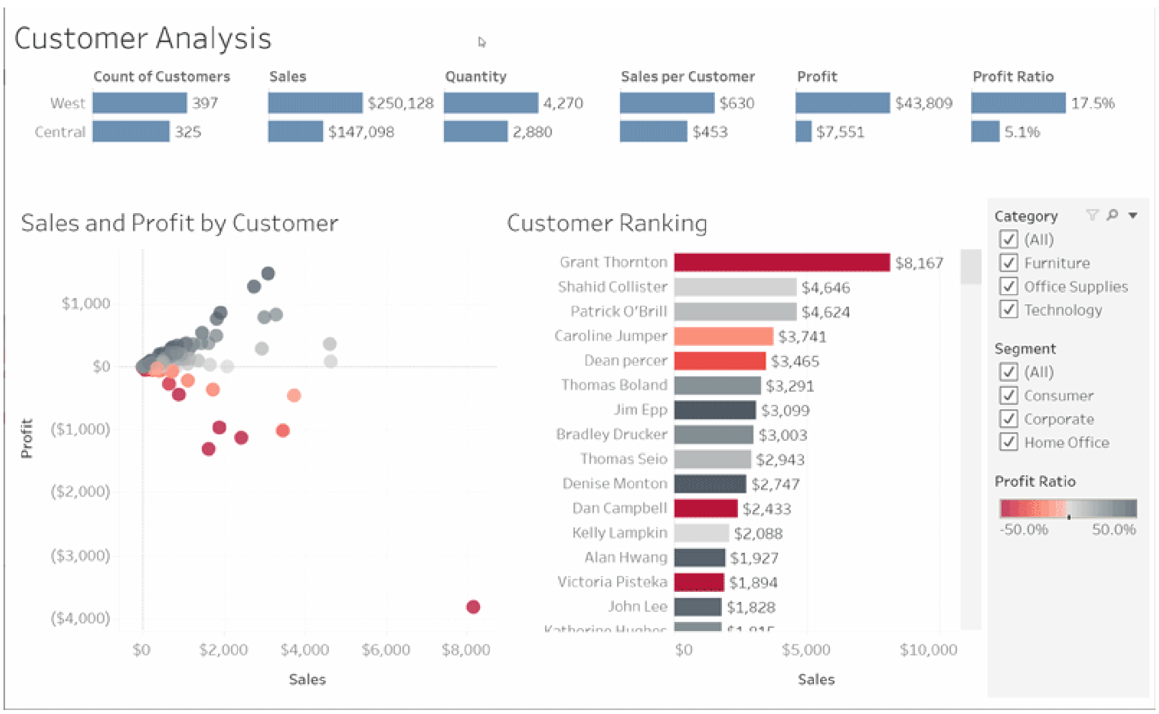
A published view is a canvas for you to interact and understand your data. Remember, you won't hurt or change the underlying data, or change what others see.

Here are some of the tools in your toolbox to find data insights.

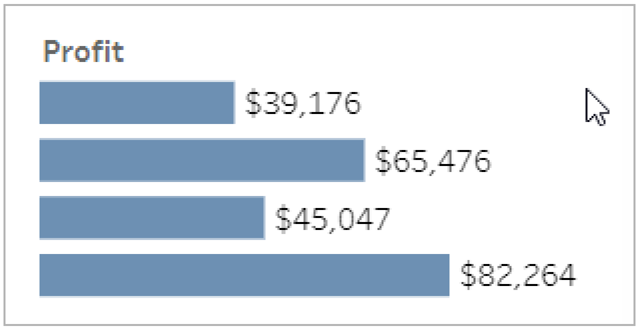
## See Details and Sort Data

Now that you know you can click on the data, let's check it out.

As you move the mouse across a view, you might see tooltips that reveal details about each data point, or mark. You can also select multiple marks.

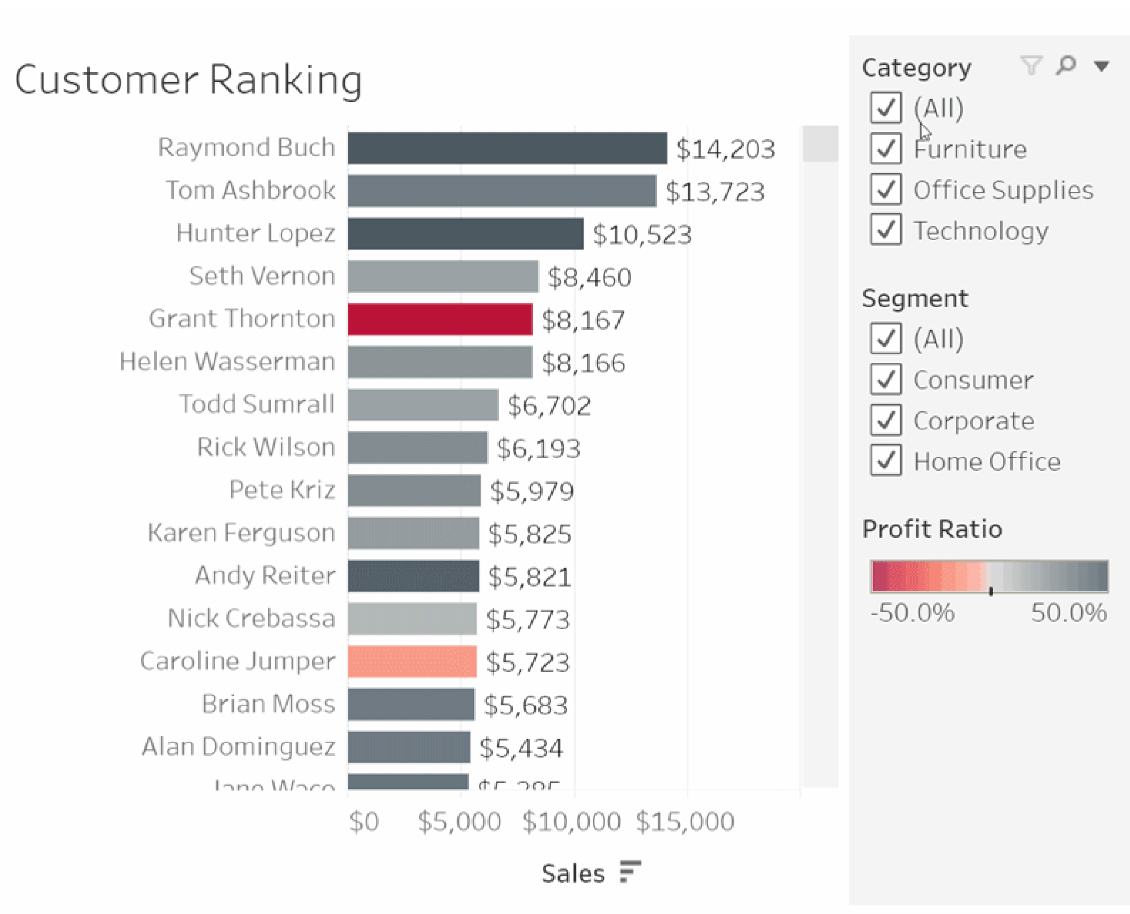



Sort tables alphabetically or numerically by hovering over a column header and clicking the sort icon.



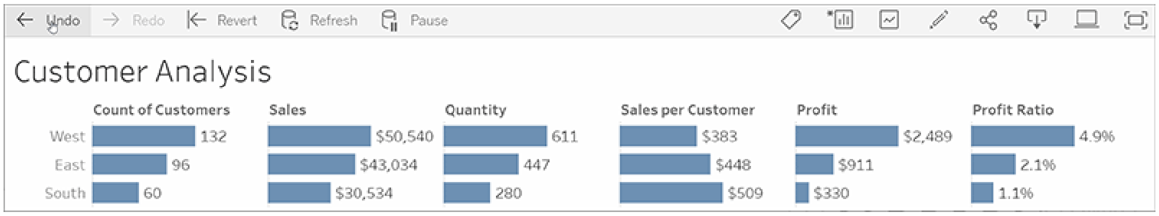

## Filter Data

Trim or limit the visible data to a specific area, date, or category.



## Undo/Revert

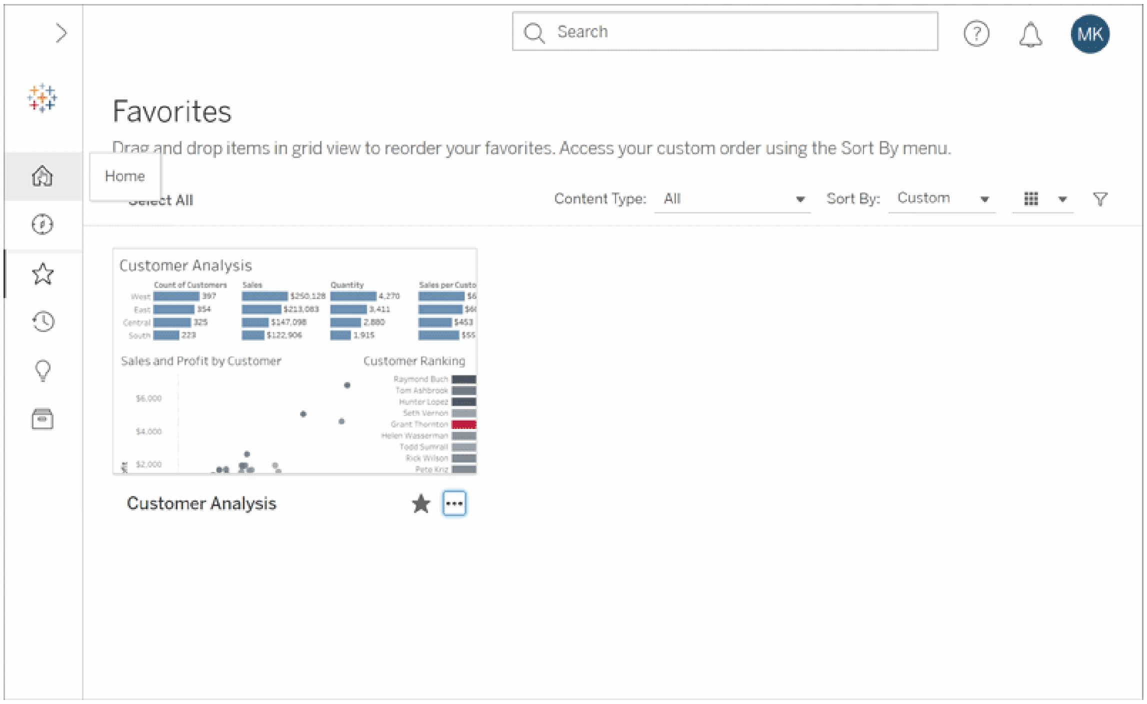
Maybe you didn't mean to exclude everything but one area. Click Undo to remove the last change, or use Revert to undo all your selections.




# 4: Keep up

This view can automatically update with new data, so you don't need to go searching for new charts to get the latest information. Keep it handy by clicking the star icon to add it to your favorites.


All favorites are added to the Favorites page in the navigation panel. And any recent dashboard or view you explored also appears in the Home page, waiting for you next time.




There’s a lot you can do in Tableau Server, and this just explored some of the basics. For more information, see What Can I Do with a Tableau Web View?

Happy exploring!

# Create and Troubleshoot Metrics (Retired)

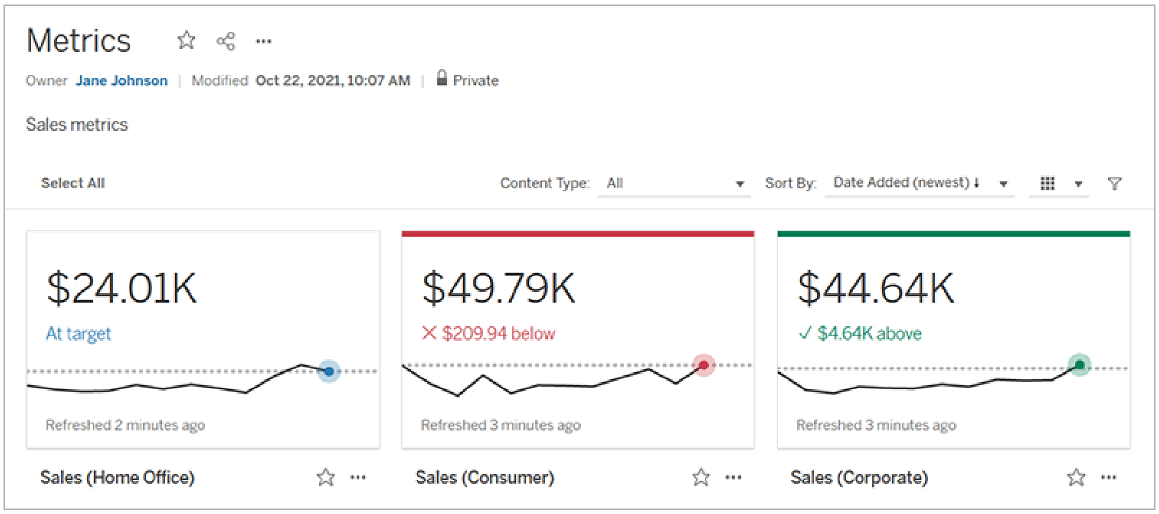
## Retirement of legacy metrics

This article is about Tableau's legacy metrics feature, which was retired in Tableau Cloud in February 2024 and in Tableau Server version 2024.2. In October 2023, Tableau retired the ability to embed legacy metrics in Tableau Cloud and in Tableau Server version 2023.3.

Tableau Pulse introduces a new way to track metrics. With Tableau Pulse, the metrics you create are used to generate insights about your data. These data insights are sent directly to users who follow the metrics, so they can learn about changes to their data in their flow of work. For more information, see Create Metrics with Tableau Pulse.

If you have legacy metrics that you want to keep, note the data source, measure, and time dimension for those metrics and recreate them in Tableau Pulse. Legacy metrics won't be automatically migrated to Tableau Pulse.

Metrics provide a fast way to stay informed about your data. Because metrics update automatically and display their current value in the grid and list view of your content, you can check all the key numbers you care about in seconds.



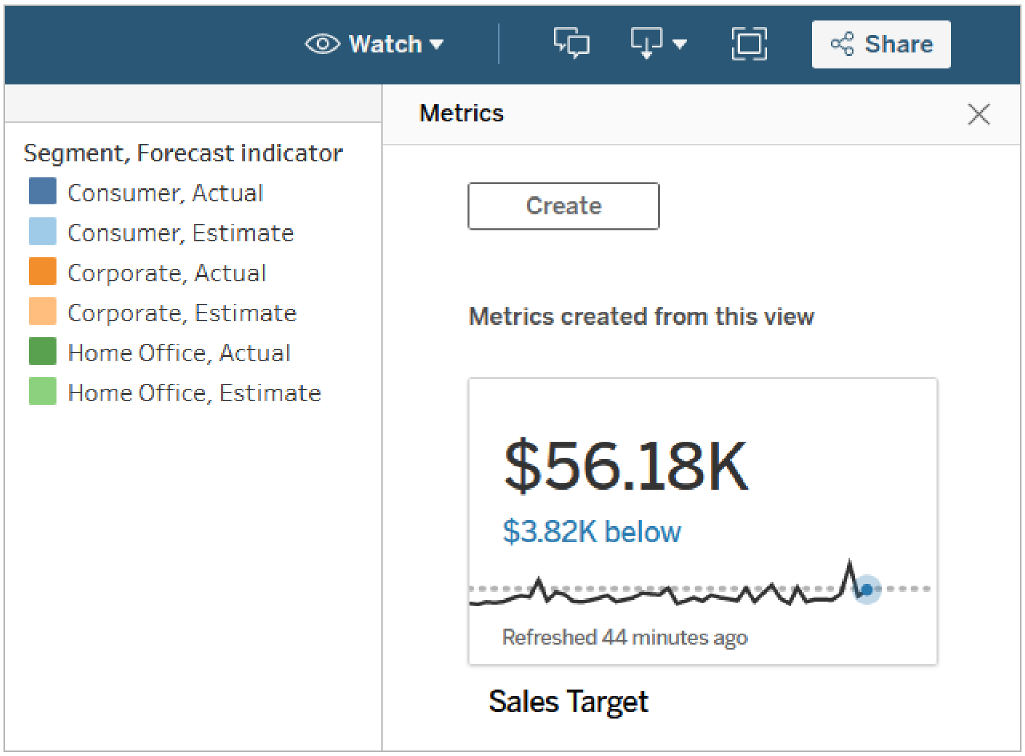

At their most basic level, metrics show the value of an aggregate measure, like the sum of sales. More complex metrics can include timelines, comparisons, and statuses that provide an easy to understand indicator of how you're performing relative to a prior point in time or a value you have defined.

If you have a set of dashboards that you regularly check, create metrics for the numbers that you want to monitor, then track them in one place by adding them to your favorites or a collection, or by creating them in the same project. That way, you don't need to load and filter the dashboards unless you want to dig deeper into your data.

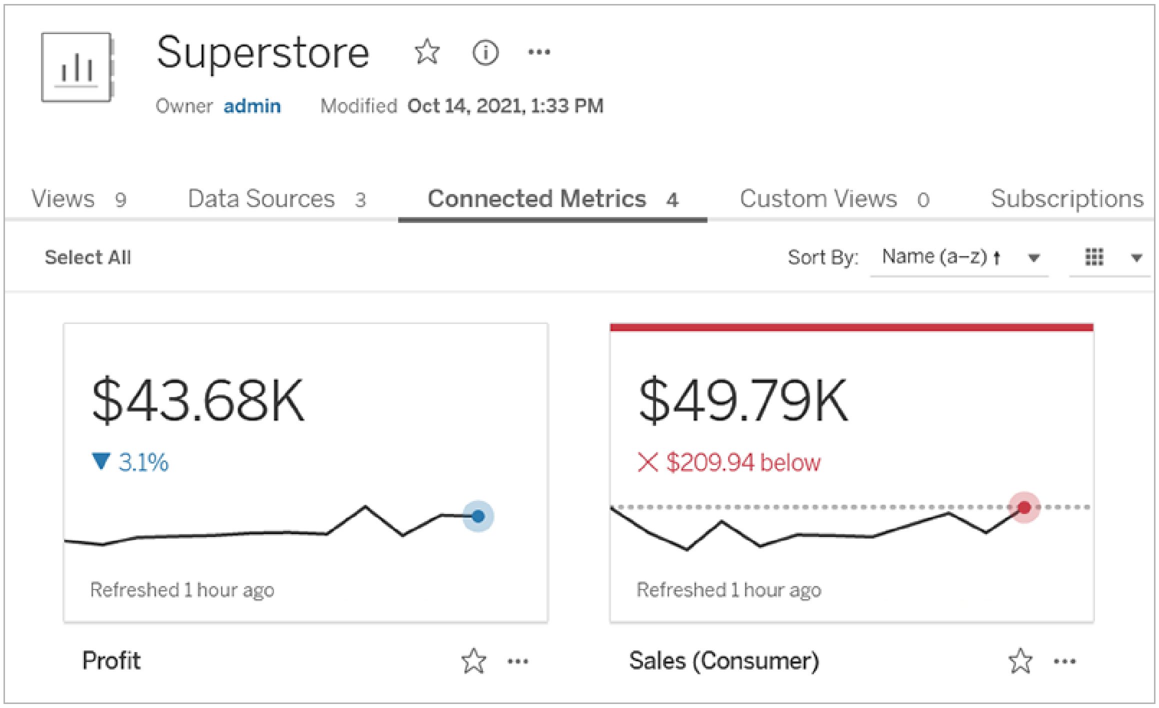
## Find metrics on your site

There are a few ways to find metrics on your Tableau site. To browse all the metrics that you have permission to view, navigate to the Explore page, then select **All Metrics** from the content type menu.

If you’re looking for metrics related to a particular view or workbook, check the connected metrics for that content. To see connected metrics for a view, open the view, then click **Watch** > **Metrics** in the view toolbar. The metrics displayed are ordered from the newest creation date to the oldest.




To see connected metrics for all the views in a workbook, navigate to the workbook, then click the **Connected Metrics** tab. You can sort these metrics using the Sort By menu.

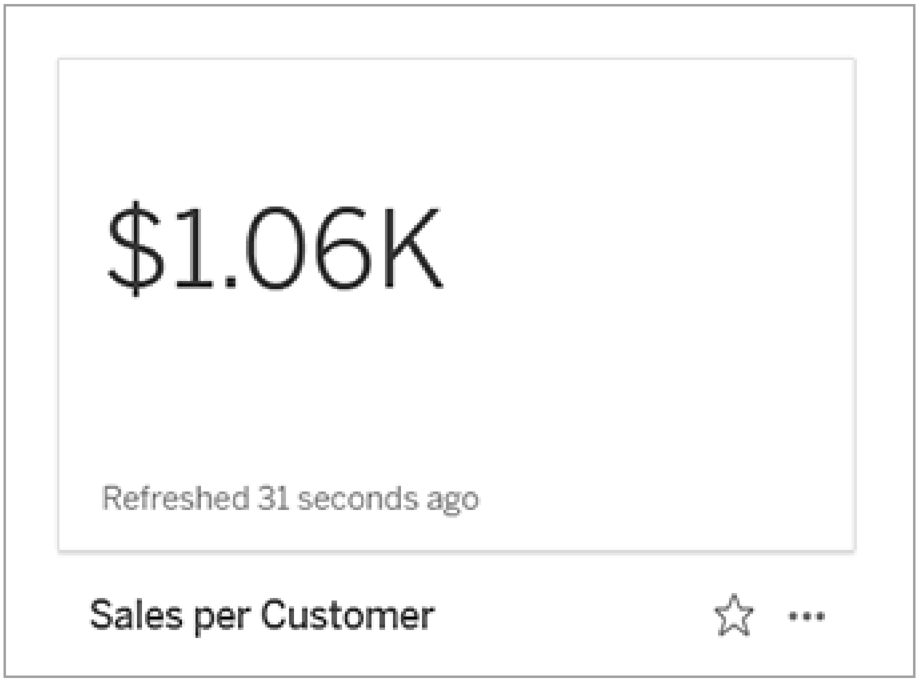



## Components of a metric

The only data required to define a metric is an aggregate measure. Metrics are created from a mark in a view, and the measure associated with that mark defines the metric. The measure must be aggregated, because an unaggregated mark will not change over time. For information about dimensions and measures in Tableau, see Dimensions and Measures, Blue and Green.

A metric can optionally be defined by a date dimension, and you can configure a comparison and a status for your metric. Each of these components will add context to the data presented on the metric card.

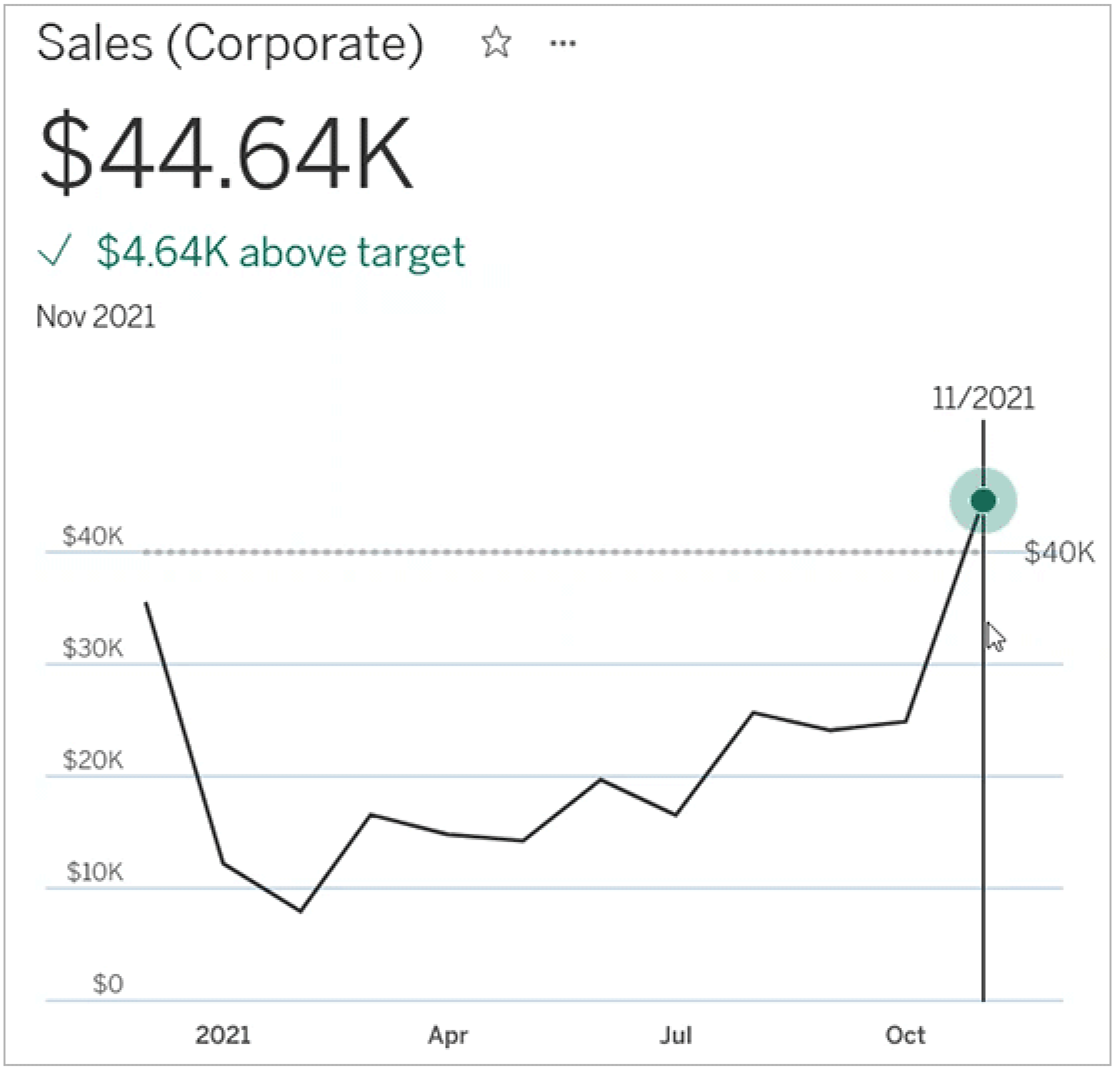
Metrics that have only a measure defining them will appear as a single number. This number will update when the data updates, but there will be no timeline on the card.




## Timeline

When you select a mark to define a metric, if the mark has a date dimension associated with it, that dimension becomes part of the metric definition. Metrics with a date dimension show a timeline, and you can configure the historical comparison for the metric. By default, the historical comparison is to the previous mark.

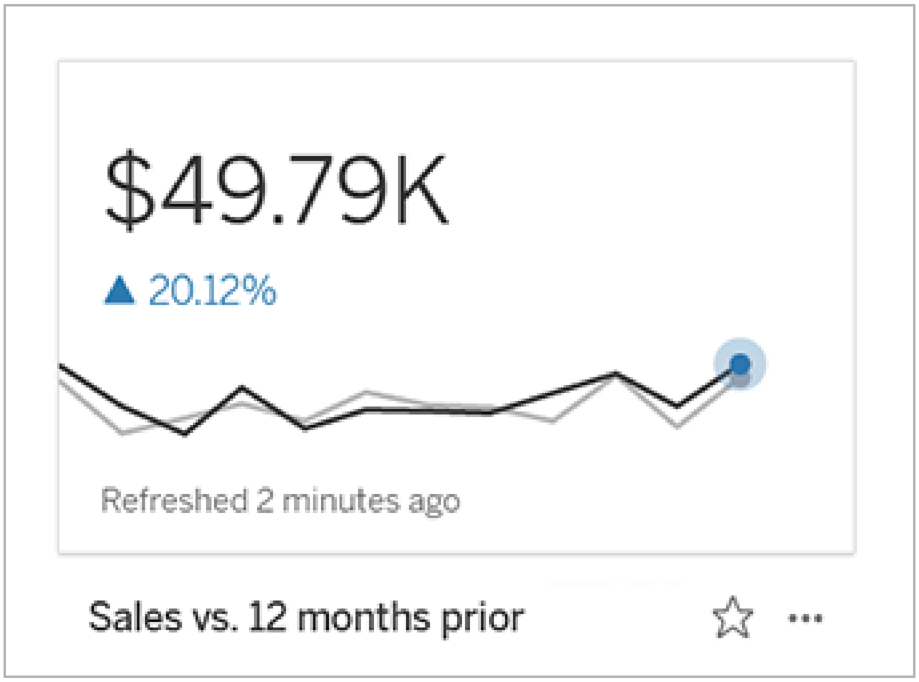
When you open a metric's details page, the timeline shows the value of the measure based on the granularity of the date dimension, for example, daily sales or monthly users. Hover over the points on the timeline to see historical values.



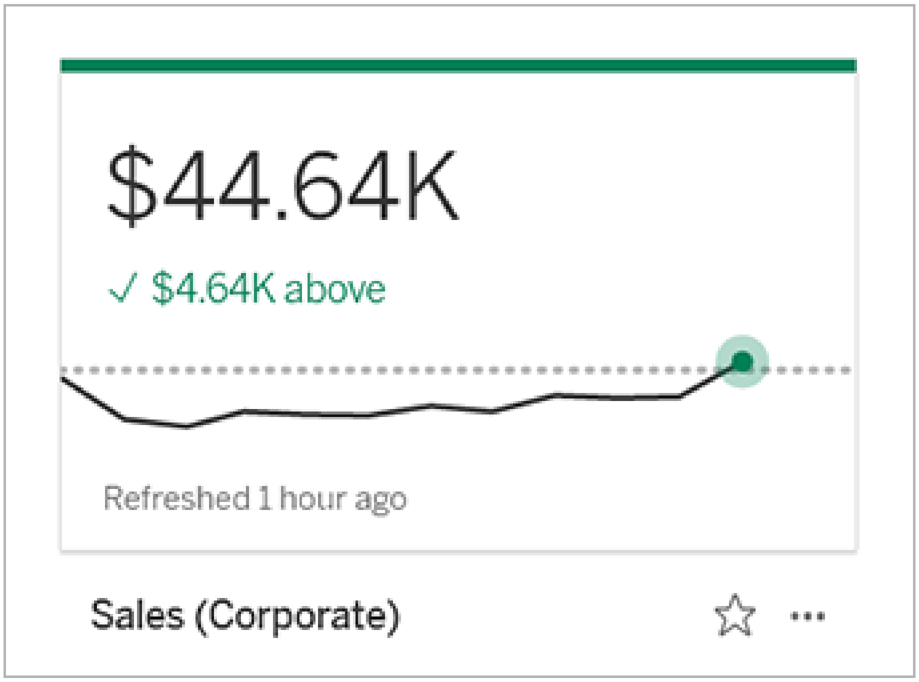

## Comparison

There are two types of comparisons that you can configure for metrics: historical comparisons and constant comparisons. You can configure a historical comparison only if a metric has a date dimension associated with it, but constant comparisons can be added for any type of metric.

A historical comparison is a relative comparison between the current value and a specified number of hours, days, or other unit of time previous. For example, you could set a comparison between the current value for monthly sales and the value from 12 months ago. Every time data is added to a metric, the historical comparison will adjust relative to the date or time of the new data.

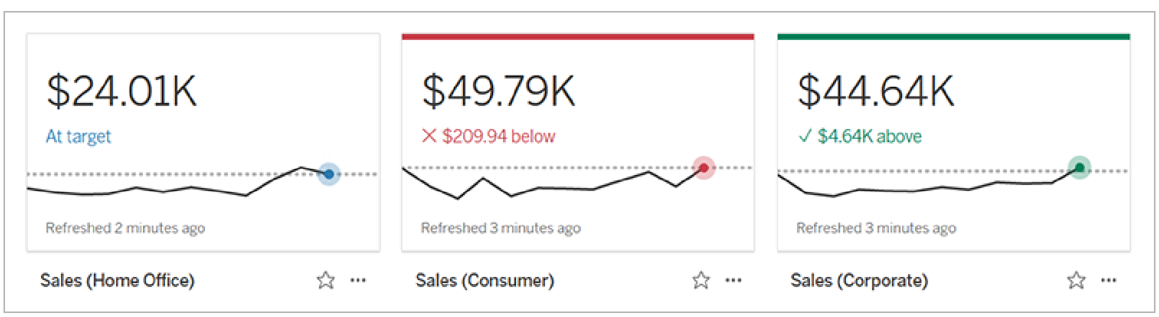



Constant comparisons are to a single value that doesn't change as new data is added. You might set a comparison to represent a threshold to stay above, for example, if you need to maintain a 90% on-time delivery rate. Or you might define a cumulative goal you are working toward, for example, a monthly sales target.




### Status

For metrics with a constant comparison, you can define whether being above, below, or at the comparison value is good, bad, or neutral. A metric with a “good” status will display a check mark next to the comparison value, and the metric card will have a green band at the top. A metric with a “bad” status will display an X next to the comparison value, and the metric card will have a red band at the top. Metrics with a “neutral” status appear the same as metrics without a status indicator; there is no icon or color applied to the card.



## Create a metric from a view

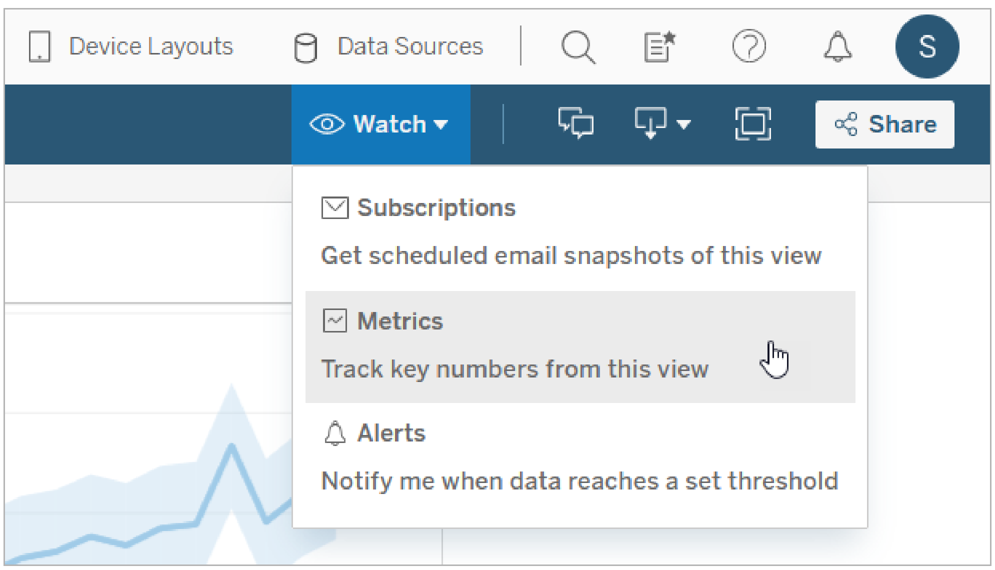
If you have a site role of Creator or Explorer (can publish), and you have the Create/Refresh Metric capability on the relevant workbook, you can create metrics on Tableau Cloud or Tableau Server.

Before you create a metric, check the connected metrics for the view to make sure that the metric you are planning to create doesn't already exist. Instead of creating a duplicate metric, open the existing metric and add it as a favorite.

### Select the mark to define your metric

1. Navigate to the view that you want to create a metric from.

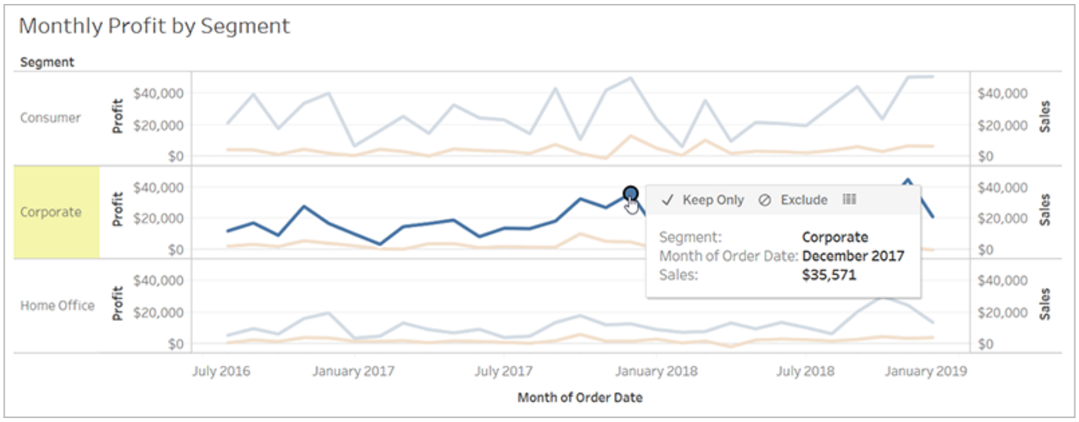
2. On the view toolbar, select **Watch** > **Metrics**.

   The metrics pane opens.

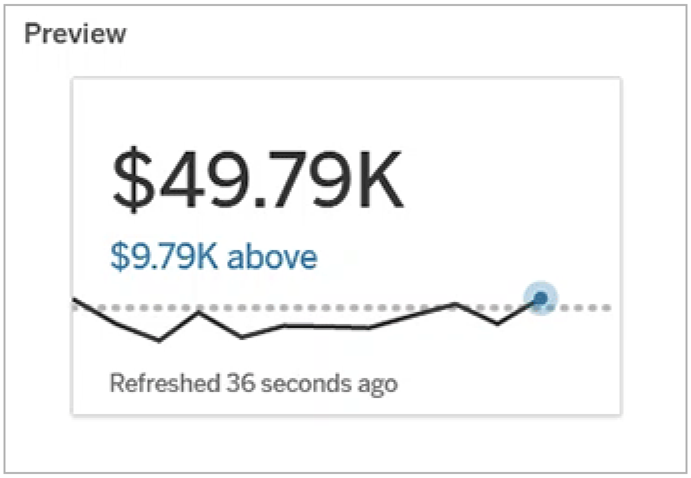
3. If the pane shows connected metrics, select the **Create** button to enter authoring mode.

4. Select a mark. If you encounter an error, see When you can't create a metric.




The measure associated with this mark defines your metric. Any filters you apply to the mark are applied to your metric. If this mark has a date dimension associated with it, that date dimension also defines your metric, and your metric will display a timeline.

The metrics pane shows a preview of your metric. The value in the preview is the most recent value for the metric, which may differ from the value of the mark you selected if it was not the most recent in the time series. The preview updates as you try different configurations.




## Describe and configure your metric

The options available to configure your metric depend on the mark you select and on the type of comparison you choose.

1. The **Name** field is pre-populated based on the mark you select. You can give the metric a different name. A metric must have a unique name within the project it belongs to.

2. Under **Description**, enter an optional message to help others understand your metric. For example, describe filters applied to the metric or indicate the data source used by the metric.

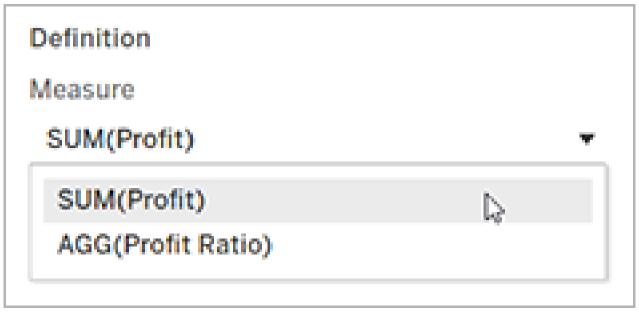
3. For the **Date Range** (only for metrics with a date dimension), select one of the default options, or set a custom range. If your metric has a large number of marks, limiting the date range can make it easier to read the timeline.

4. Select the **Comparison Type** for the metric: historical or constant.

5. For **Historical** comparisons:
   - Enter how far prior you want to compare against. The unit of time for the comparison is the same as the granularity of your data, such as hours or months.
   - Select **Show Comparison Line** to include a second line for the comparison period on the timeline.

6. For **Constant** comparisons:
   - Enter the value to compare against. Don’t include commas or symbols in this field. To enter a percentage, simply type the number without the percent sign, for example, enter 25 instead of 0.25 for a target of 25%. When you enter a valid target value, the preview updates to show how far above or below the target the current value is.
   - Set the **Status** for the comparison to indicate whether being above, at, or below the value is good, bad, or neutral. By default, the status is set to neutral. Check the metric preview to see how different statuses affect your metric.

7. Under **Definition** > **Measure**, select the measure to use for your definition from the drop-down. This option appears only if the mark you select has more than one measure associated with it.




## Finalize your metric

1. Under **Project**, select **Change Location** to choose a different project for the metric. By default, your metric will be added to the same project that the view belongs to.

   Every metric in a project must have a unique name. Because a metric's name and project are initially set based on the mark you select, you might run into a conflict when you try to save your metric, if another user has already created a metric from that mark. Either choose a different project or name for your metric or, if you want to overwrite the existing metric, see Overwrite a metric.

2. Click the **Create** button.

   A message appears with a link to the metric in the project you added it to.


3. Verify that the permissions for your metric are correct, following the guidance in Set permissions.

   By default, a metric inherits the permissions of the project it is created in. Anyone with access to your metric will be able to see the metric's data, even if they don't have permission to access the connected view or data source.

Now that you've created a metric, you can manage the metric the same way you manage other independent pieces of content on your Tableau site. Though metrics are created from a view, they exist independently of that view, unlike data driven alerts or subscriptions. You can move the metric to a different project without moving the connected view. For information about managing content on your Tableau site, see Manage Web Content.

## Overwrite a metric

Once a metric is created, you can change the name, description, and configuration of the metric, but you can't change how the metric is defined. If you want to change the data that the metric uses, you must overwrite it. In order to overwrite a metric, you need to be the metric owner or be granted the correct permission capability.

1. To overwrite a metric, create a metric with the same name in the same project as the metric you want to overwrite.

   The Overwrite Metric dialog appears.

2. Click the **Overwrite** button.

When you overwrite a metric, the metric continues to appear for those who have added it to their favorites, and any changes made to permissions for the previous metric will apply to the new metric.

## When you can't create a metric

If you select a mark on a chart that doesn't support metrics, you'll get an error message explaining why you can't create a metric. The table below summarizes these scenarios.

| Reason | Scenarios |
|---|---|
| You don't have the correct permissions. | • The workbook owner or an administrator has denied the Create/Refresh Metric capability. For more information, see Permissions. |
| You can't access the complete data. | • Row level security or user filters limit the data you can see. For more information, see Restrict Access at the Data Row Level. |
| The password for the workbook's data source is not | • The workbook prompts for a password. For more information, see Set Credentials for Accessing |

| Reason | Scenarios |
|---|---|
| embedded or is no longer valid. | Your Published Data. |
| The data isn't at the correct level of granularity. | • The data in the chart isn't aggregated. Metrics use aggregations, such as sum or average. For more information, see Data Aggregation in Tableau.<br>• There are multiple values per cell of data—a result of data blending. For more information, see Troubleshoot Data Blending. |
| The date dimension is not supported. | • The chart includes both date parts and date values. For more information, see Change Date Levels.<br>• The date dimension uses the ISO 8601 calendar rather than the standard Gregorian calendar. For more information, see ISO-8601 Week-Based Calendar.<br>• The date dimension is aggregated at the custom level of Month / Year or Month / Day / Year. For more information, see Custom Dates. |

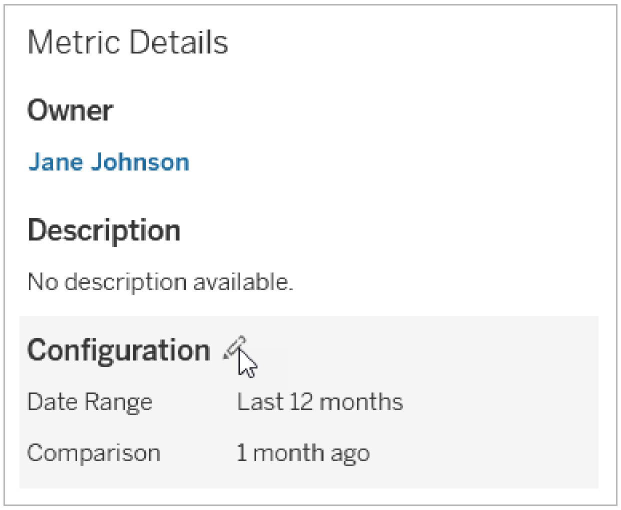
## Edit a metric's configuration

Starting in 2022.2, you can change the configuration for a metric. A metric's configuration includes the comparison, date range, and status indicator. The configuration options available depend on the type of metric. Metrics with a timeline allow you to set a historical comparison or a constant comparison. Single number metric support only a constant comparison.

A metric's configuration does not include the metric definition (the measure and date dimension that generate the metric value). If you want to change the definition, overwrite the metric with a new metric.

To edit a metric's configuration, you must have the overwrite capability for the metric.

1. Open the metric details page for the metric you want to edit.
2. Mouse over the configuration section. Click anywhere on the section to enter editing mode.




3. For a timeline metric, set the date range to display on the metric card and details.
4. Select the comparison type. For a constant comparison, set a comparison value and status. For a historical comparison, set how far prior you want to compare against and choose whether to show a comparison line on the timeline.
5. Click **Save**. Your configuration changes will appear to anyone who views the metric.

## How metrics refresh

When a metric refreshes, it checks the connected view (the view the metric was created from) for new data. A refresh doesn't necessarily update the value of a metric, because there may be no changes to the data.

Metrics refresh at a frequency either based on an extract's refresh schedule or, for live data, every 60 minutes. The time of the last refresh is displayed on the metric.

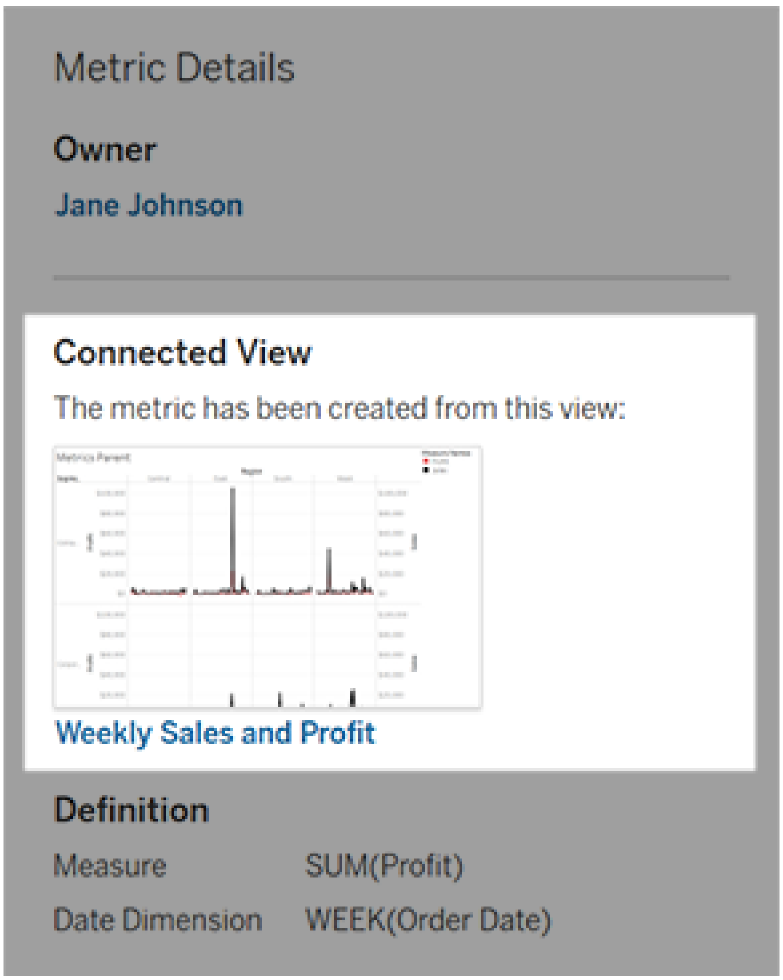
## Fix failing refreshes

If a metric isn't able to access the connected view or its underlying data, the refresh will fail. If the refresh for your metric fails, you'll receive a notification, which notes the time of the failure and the affected metric.

Metric refreshes may fail for one of the following reasons.

- The connected view was deleted or modified.
- Permissions changed for the connected view.
- The password for the data source is no longer embedded or is no longer valid.
- The metric owner doesn't have the required site role to refresh the metric. A site role of Creator or Explorer (can publish) is required.
- There was a temporary connectivity issue, which will resolve itself.

To identify the cause of the failure, look at the metric details. Make sure that the metric owner has the required site role to refresh the metric. Then inspect the **Connected View**.



### If the connected view is still listed

Open the view to investigate the cause of the failure.

If the view loads, check that the measure and (optional) date dimension that define the metric are still present in the view.

- If the view appears to be unchanged, you might no longer have permission to refresh metrics from it. The content owner or a Tableau administrator can change the Create/Refresh Metric permission capability. For more information, see Permissions.
- If the measure is no longer present, the view has been modified so the metric can't connect to the data needed to refresh. The content owner or a Tableau administrator can check the revision history and restore previous versions. For more information, see View Revision History.

If the view doesn't load, but instead prompts for a password or displays an error when connecting to the data source, the password for the data source is not embedded or is no longer valid. The content owner or a Tableau administrator can edit the data source connection to embed the password. For more information, see Edit Connections.

### If there is no connected view listed

The view was deleted or you no longer have permission to access the view. Contact your Tableau administrator for assistance.

## Resume suspended refreshes

If a refresh fails enough times, the refresh is suspended. You'll receive a notification if the refresh for your metric is suspended.

When a metric refresh is suspended, Tableau no longer attempts to get new data for the metric. Metrics with suspended refreshes continue to present historical data.

If the cause of the failure is fixed, you can resume the refresh.

1. Open the affected metric.
2. On the warning message, click **Resume refresh**.

Tableau attempts to perform the refresh. If this attempt succeeds, you'll receive a notification, and the refresh will resume on schedule. If the attempt doesn't succeed, your refresh remains suspended.

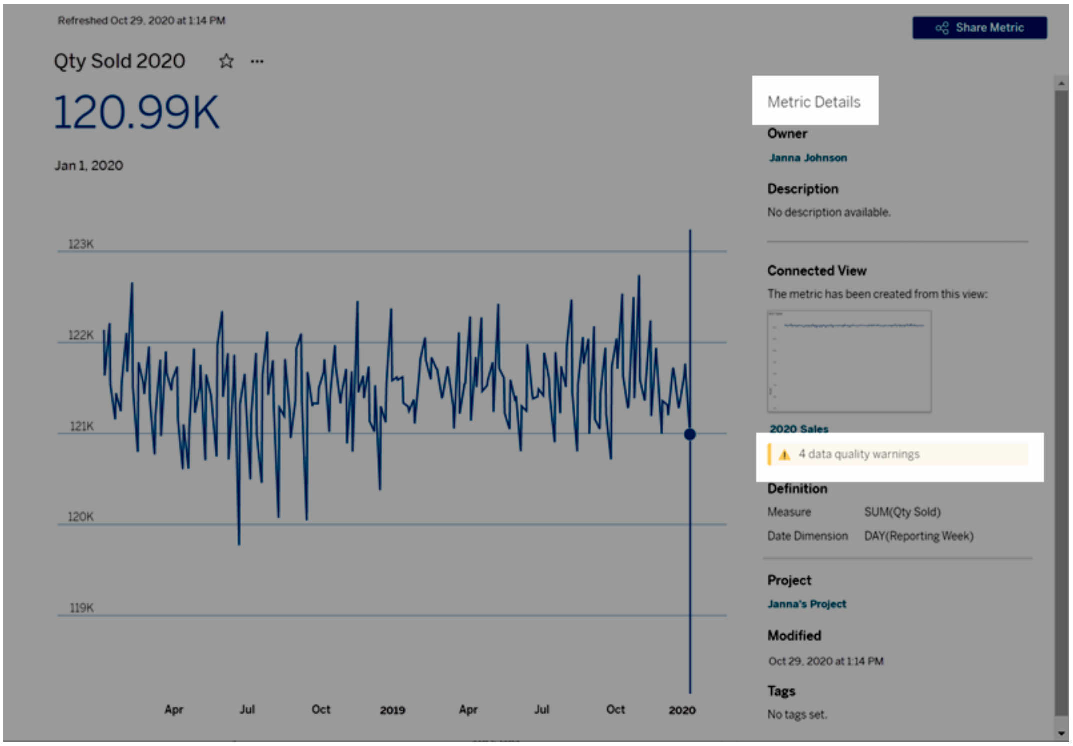
Try overwriting the metric if the connected view is still available. For more information, see Overwrite a metric. Otherwise, you can keep the metric to reference past data or delete the metric.

**Note:** If the metric refresh is suspended because you don't have the required site role for it to refresh, you won't be able to resume the refresh or delete the metric.

## Metrics appear in Tableau Catalog

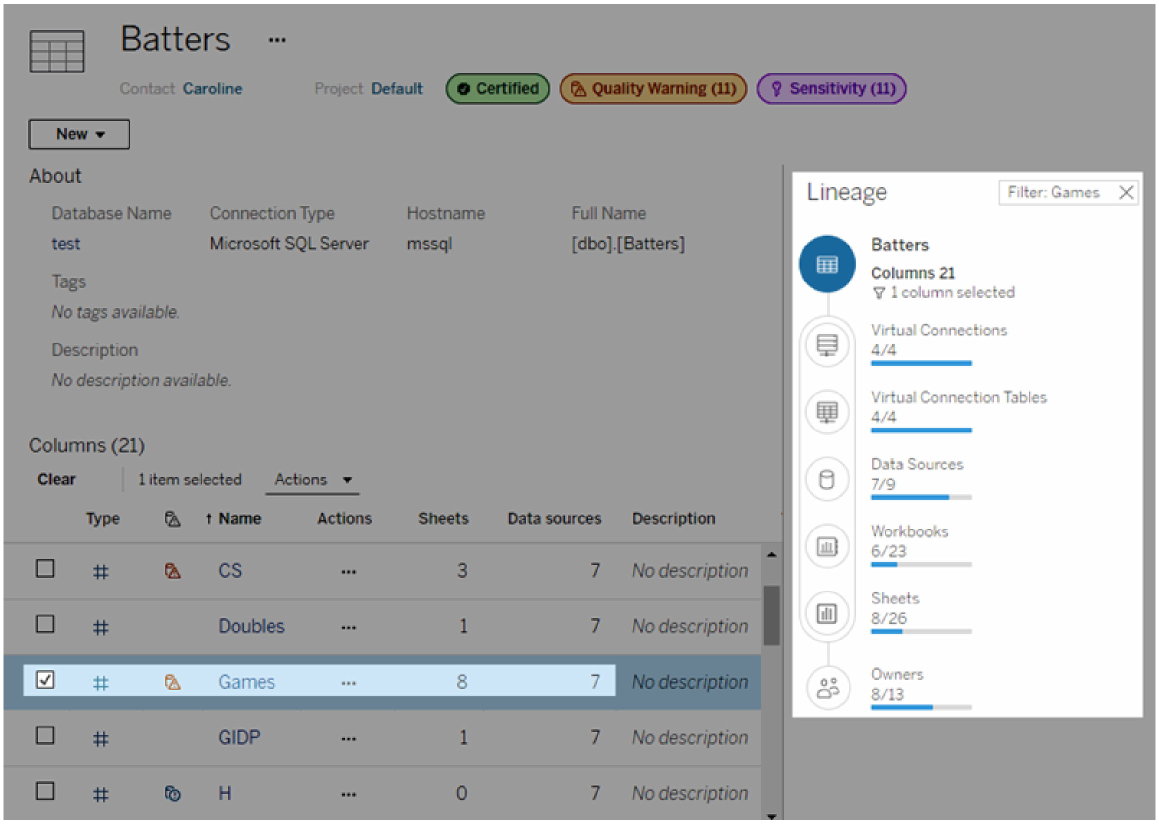
Starting in 2019.3, Tableau Catalog is available with Data Management in Tableau Cloud and Tableau Server. When the Tableau Catalog is enabled in your environment, you can see metrics in the Catalog lineage tool, and metrics affected by data quality warnings display those warnings. For more information about Tableau Catalog, see "About Tableau Catalog" in the Tableau Server or Tableau Cloud Help.

When you have metrics defined for the numbers you want to monitor, it's important to know if the data that the metrics rely on are impacted in any way. You can use Catalog in a couple of ways to know this. First, data quality warnings set on the data your metric is based on show on the metric. These warnings appear when you open a metric in Tableau Mobile, and in Tableau Server and Tableau Cloud when you hover over a metric in grid view and on the metric details page, as shown below:




For more information, see "Set a Data Quality Warning" in the Tableau Server or Tableau Cloud Help.

You can also use the lineage tool in Tableau Catalog to see the upstream sources that your metric relies on. When doing an impact analysis, you can see which metrics are affected if a certain column or a table is changed or deprecated, or if certain workbooks are removed. Including metrics in the lineage means that Catalog gives a full picture of the impact changes can have on the assets in your environment.




For more information, see "Use Lineage for Impact Analysis" in the Tableau Server or Tableau Cloud Help.

# Set a Data Freshness Policy for Query Caches and View Acceleration

## Understand data freshness for Query Caches

You’ve built your workbook, and your team loves it. But sometimes people need to click the Refresh button for the most up-to-date data to appear in the viz. You built the workbook using a live connection, so why does the data need to be refreshed? The answer is performance.

To improve performance, Tableau caches the results of queries used to fetch data, so subsequent visits can reuse and return that cached data faster. You can click the Refresh button to retrieve updated data, but this can add to potential performance costs.

To balance data performance and freshness, set a data freshness policy for your workbook. When you set a data freshness policy, your data is refreshed at the time you specify. Tableau won't visualize cached data that doesn't meet the freshness policy you've set.

## Understand data freshness for View Acceleration

With the View Acceleration feature, Tableau precomputes selected workbooks to generate views, resulting in significantly reduced load times. A precomputation schedule is created based on the data freshness policy or extract schedule that you set for the selected workbooks to provide data that is both performant and fresh.

To minimize resource consumption, the number of precomputation jobs that you can run is limited to 12 per day. For example, if your data freshness policy is set to less than two hours, the performance benefits of View Acceleration are limited to the first 12 refreshes in a day.

## Choose what's best for your workbook

Some people might not want caching so that they always have the freshest data, while other people might want large caches to reduce overhead and improve workbook performance. The first step in setting a data freshness policy is to decide what's right for your business.

Tableau Cloud refreshes cached data every 12 hours by default, and workbook owners can set data freshness policies at the workbook level.

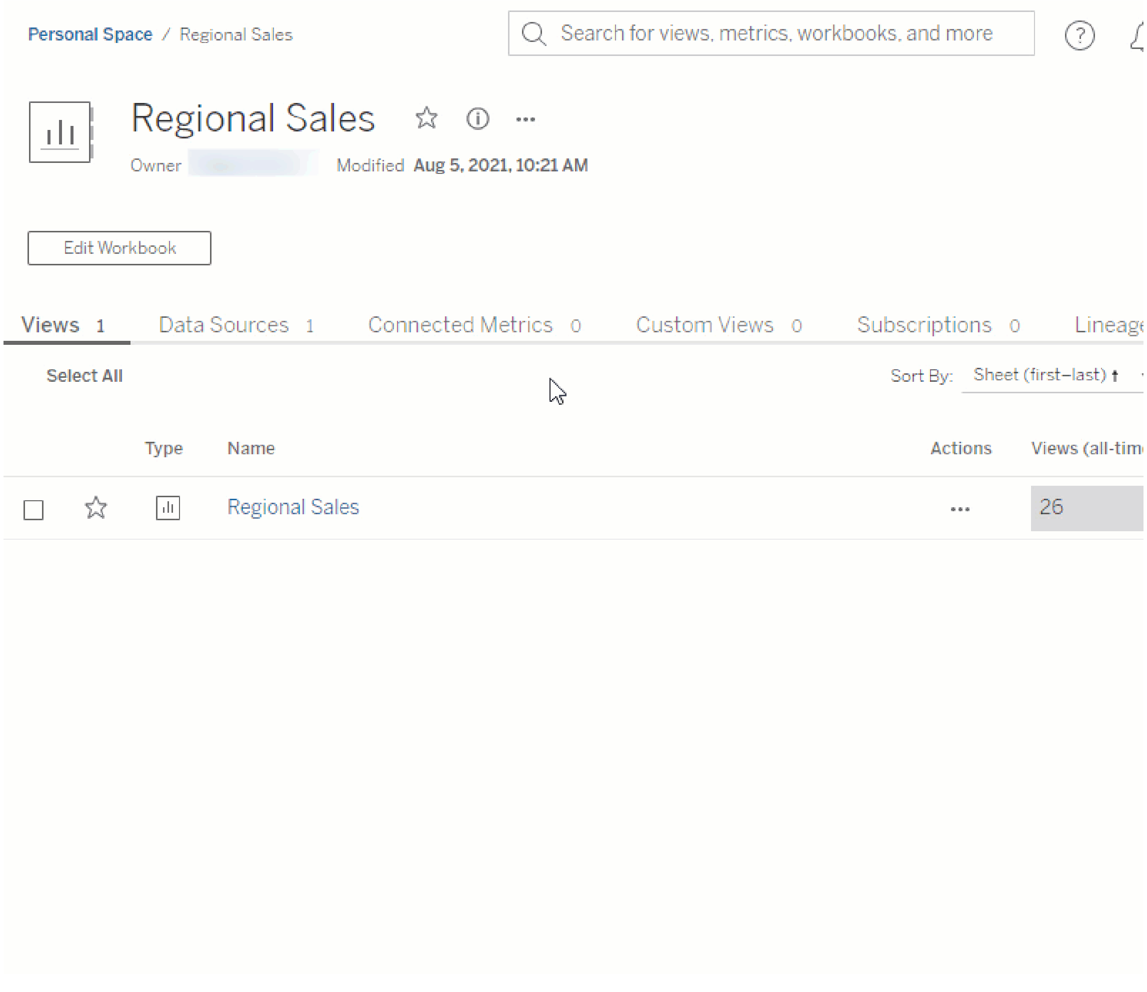
In Tableau Server, server administrators can set a default caching policy for all sites on the server, and workbook owners can set data freshness policies at the workbook level.

> **Note:** Data freshness policies aren't available in Tableau Desktop or for workbooks that use extract and file-based data sources.

## Edit a workbook data freshness policy

To edit a workbook data freshness policy, you must be the workbook owner, and the workbook must have a live connection to the data source.

1. Sign in to a site on Tableau Cloud or Tableau Server.
2. From the Home or Explore page, navigate to the workbook you want to set a policy for.
3. Click the details icon .
4. From the Workbook Details dialog, click **Edit Data Freshness Policy**.
5. Choose one of the following options:
   Site default (12 hours)
   Always live (Tableau will always get the latest data)
   Ensure data is fresh every
   Ensure data is fresh at
6. Click **OK**.




**Site default** refreshes your data every 12 hours, which is a great option if your audience regularly uses your dashboard, but doesn't need up-to-the-minute data freshness.

**Always live** provides the freshest data at all times, which can increase loading time.

**Ensure data is fresh every**... allows you to specify how often data is refreshed with the granularity of minutes, hours, days, or weeks.

**Ensure data is fresh at**... allows you to schedule the time and day for data refreshes. If you have an important meeting every Monday, Wednesday, and Friday at 09:00 AM Pacific time, then you can set your data refresh to occur at 08:45 AM every Monday, Wednesday, and Friday, so you have the freshest data when your meeting starts.

# Developer Resources

The Developer Portal on the Tableau Community is the place to go for everything related to extending and automating Tableau. There you can get access to the following:

- **JavaScript API**—Integrate Tableau views into your own web applications.
- **REST API**—Manage provisioning, permissions, and publishing on Tableau Server or Tableau Cloud via HTTP. The REST API gives you access to the functionality behind the data sources, projects, workbooks, site users, and sites. You can use this access to create custom applications or to script interactions with server resources.
- **Tableau SDK**—Use C, C++, Java, or Python to create extracts from any data and then to publish your extracts.
- **Tableau Metadata API**—Using GraphQL, you can discover and query Tableau content and related external assets and metadata. For more information, see Tableau Metadata API.
- **Web Data Connector**—Create a Tableau connection in JavaScript to almost any data that's accessible over HTTP. This can include internal web services, JSON data, XML data, REST APIs, and many other sources.
- **ODBC connector**—Create a connection using ODBC (Open Database Connectivity), which is a data-access protocol that's supported by a wide array of data sources. In Tableau Desktop, you can connect to any ODBC-compliant source using the built-in ODBC connector.

In addition to these resources, you can get complete documentation and examples, and collaborate with the Tableau developer community.

## Notes for Tableau Cloud users

- When you make REST API calls to Tableau Cloud, you need to use the URL for the instance on which your site exists. For example, **https://10ay.online.tableau.com/**

  For information, see **Specifying Resources for Tableau Cloud** under Using URIs to Specify Resources.

- Not all of the methods provided in the Tableau REST API are applicable to Tableau Cloud. For information, see the API listing by category in the API Reference.

Go to the Developer Portal

# About Tableau Pulse

With Tableau Pulse, users receive personalized data insights about metrics that they follow. These insights are sent directly to users in Slack and email digests, giving them access to the data they need in the tools they already use. If users want to learn more about their data, they can visit a metric's insights exploration page on Tableau Cloud. On that page, users can engage in guided data analysis to understand what is driving changes to their data.

Tableau Pulse is available for Tableau Cloud. To get a site ready for Tableau Pulse, a site administrator must first turn on the setting and make sure that there's appropriate data to work with. Then, users can create metric definitions, which specify the core metadata for metrics. Users create metrics based on these definitions by adjusting filter and time options to scope the data in ways that are useful for different groups of followers.

The articles here help you get started with Tableau Pulse, whether you're a Tableau administrator setting up your site, a Creator defining the metadata that metrics are based on, a Viewer exploring existing metrics, or a developer embedding metrics.

| Article | Audience | About |
|---|---|---|
| Set Up Your Site for Tableau Pulse | Site Administrators | Settings, permissions, and requirements for Tableau Pulse |
| Create Metrics with Tableau Pulse | Creators, Site Administrator Explorers, and Explorers (can publish) | Definitions and metrics and how to create them |
| Explore Metrics with Tableau Pulse | Creators, Explorers, and Viewers | The types of analysis you can do with existing metrics |
| Set Manual Goals with Tableau Pulse | Creators, Explorers, and Viewers | Goals that let you track metric progress |
| The Insights Platform and Insight Types in Tableau | Creators, Explorers, and Viewers | The insight types available in Tableau Pulse and general information about how the Insights platform works |

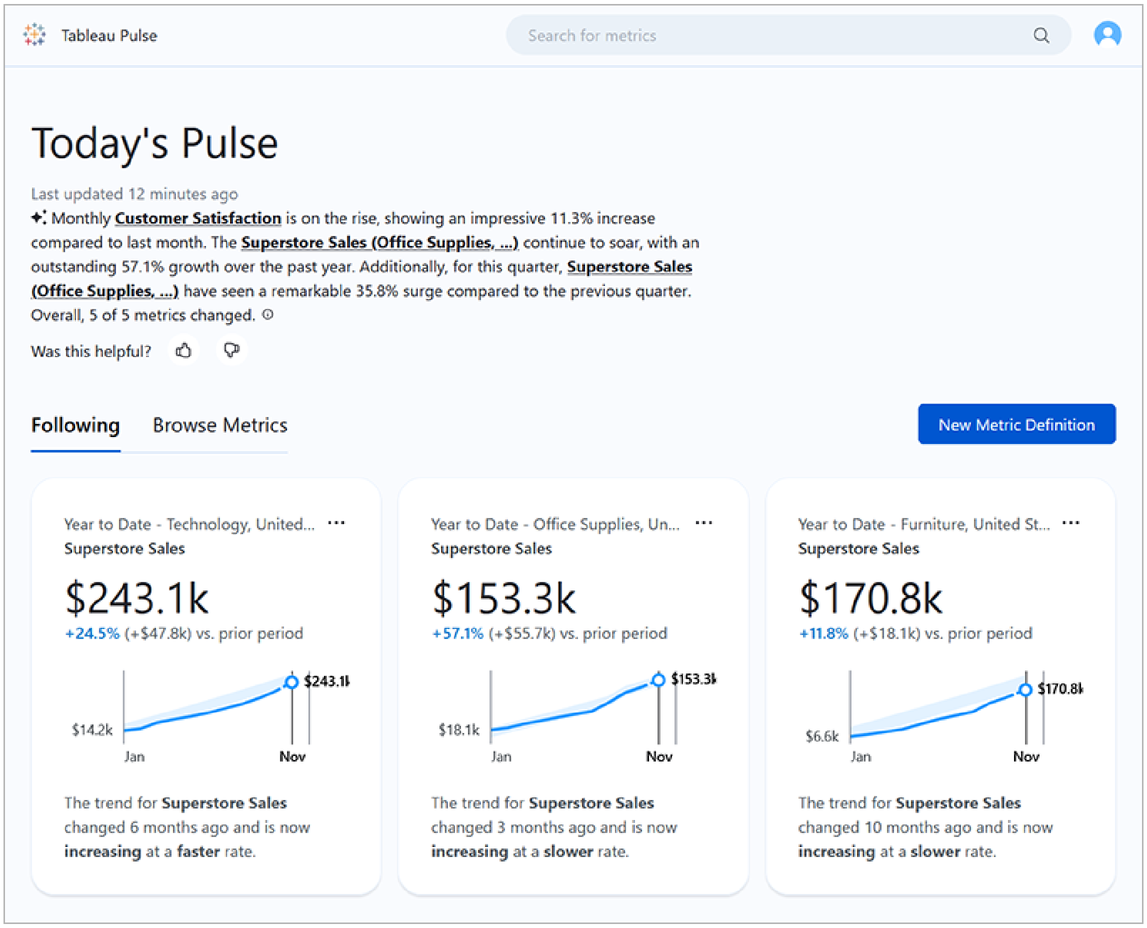
| Article | Audience | About |
|---|---|---|
| Pulse | | |
| Tableau Pulse REST API Methods | Developers | The API methods to create metrics, get metric details, generate insights, and more |
| Embed Tableau Pulse | Developers | The Tableau Embedding API web component for embedding metrics in a web page |
| Set Up the Pulse for Salesforce App | Salesforce customers | The Pulse app that Salesforce customers can purchase |
| Configure a Tableau Pulse Lightning Web Component | Salesforce customers | The Tableau Pulse Lightning web component for Salesforce Lightning pages |
| Interact with Data on Tableau Mobile | Creators, Explorers, and Viewers | Tableau Pulse on Tableau Mobile |

# Tableau Pulse release notes

Use the visualization below to explore new features in Tableau Pulse. Click on a feature to bring up the tooltip with a link to detailed documentation for that feature.


# Set Up Your Site for Tableau Pulse

Tableau Pulse provides users with personalized insights about the metrics that matter to them, directly in their flow of work. Users with a Creator, Site Administrator Explorer, or Explorer (can publish) site role can add metric definitions, and all users can follow metrics to discover insights and learn about changes to the data. For information about definitions, metrics, and how to create them, see Create Metrics with Tableau Pulse. For information about how viewers interact with metrics, see Explore Metrics with Tableau Pulse.




Users who follow metrics receive regular digests with insights about their data by email or in Slack. Tableau Pulse allows users who don't regularly access Tableau to understand their data without leaving the places they normally work. If these users want to learn more, they can visit a metric on Tableau Cloud to engage in guided, self-service data analysis and see how different factors impact their data.

## Deploy Tableau Pulse for your site

The site setting to deploy Tableau Pulse is off by default. When you deploy Tableau Pulse, you can choose to turn it on for a single group of users or for all users on your site. You might want to have a controlled roll out for Tableau Pulse and turn it on for a single group so that a subset of users can explore and evaluate it before you make it available to your entire organization. To learn how to create a user group for Tableau Pulse, see Create a Group and Add Users to It.

To deploy Tableau Pulse, visit the settings page for your site.

1. From the main Tableau Cloud navigation menu, select **Settings**.
2. Under Tableau Pulse Deployment, select **Turn on Tableau Pulse**.
3. Choose whether to turn on Tableau Pulse for all users or for a specified group.
4. If you choose to limit Tableau Pulse to a group, select the group.
5. Select **Save**.

Users without access will get a message informing them if they visit a Tableau Pulse URL. Also, if you limit Tableau Pulse to a group, that group is the only one available when you search to add followers, even if those same users are part of a different group.

## API availability of Tableau Pulse

Limiting Tableau Pulse to a specified group isn't supported at the external API level. If the site setting is turned off entirely, the API won't allow users to access Tableau Pulse. If the site setting for Tableau Pulse is on, all users will be able to access it in situations where it's being called through the API, such as in embedded scenarios, regardless of whether the setting limits it to a specified group. For more information about using the API for Tableau Pulse, see Embed Tableau Pulse and Tableau Pulse REST API Methods.

## Stop digests that persist for users without access

After you initially deploy Tableau Pulse, the services that query data sources and send metric digests continue to run whether the site setting is on or off. The site setting controls whether Tableau Pulse appears in the navigation menu and whether users are able to access the Tableau Pulse home page and individual metric pages.

Because the services for Tableau Pulse continue to run, any users who previously had access and followed metrics will receive digests for those metrics, even if you restrict access to a group that they aren't in or remove those users from the group with access to Tableau Pulse. If these users attempt to open the links to metrics that are sent in digests, they'll get a notice that they don't have access to Tableau Pulse, and they'll be unable to unfollow these metrics.

To prevent users who can't access Tableau Pulse from receiving digests, remove those users from the metrics that they follow. Do this before you turn off Tableau Pulse or limit it to a smaller set of users, so these users don't receive digests with links to metrics they can't access.

## Set up your site

As a Tableau administrator, you can help your users get the most from Tableau Pulse. Before your users get started, check that the data required for metrics is available and turn on optional features.

- Verify that there are published data sources on your site for users to create metrics from. For information about the specific data requirements for metrics, see Data source requirements for metric definitions. To make sure that users can access the data, see Understand governance for Tableau Pulse.
- Connect your Tableau site with Slack, if you want your users to receive Tableau Pulse digests in Slack. For more information, see Integrate Tableau with a Slack Workspace.
- Turn on Tableau AI, if you want your users to see personalized insights summaries. For more information, see Turn on Tableau AI.

The legacy Metrics feature was retired on Tableau Cloud in February 2024. Any legacy metrics on your site won't carry over to Tableau Pulse. If you had legacy metrics, note the data source, measure, and time dimension, then recreate them in Tableau Pulse. For more information about legacy metrics, see Create and Troubleshoot Metrics (Retired).

## Understand governance for Tableau Pulse

A combination of settings and permissions control access to Tableau Pulse and its features.

- Site settings control the ability to access Tableau Pulse and to see features that use generative AI. See Deploy Tableau Pulse for your site and Turn on Tableau AI.
- Permissions for data sources and authentication to the data itself control the ability to view metrics and create metric definitions. See Permissions for viewing metrics.
- Settings on metric definitions control who can edit or delete metric definitions and goals. See Permissions for editing metrics and goals.

## How site roles impact Tableau Pulse access

Users must have a site role of Creator, Site Administrator Explorer, or Explorer (can publish) to create, edit, or delete metric definitions in Tableau Pulse. There are no site role limitations for creating and viewing metrics, following and adding followers to metrics, or setting and editing goals for metrics. Users who have site roles that don’t allow an action won’t be able to take that action, regardless of the permissions they're granted.

## Permissions for viewing metrics

Metrics in Tableau Pulse aren’t part of the project content hierarchy in Tableau Cloud or governed by content-based permissions, meaning you can’t deny a user the ability to see an individual metric. However, by adjusting permissions on a published data source, you can control whether users can view metrics based on that data source. Also, the data that users see when viewing a metric respects row-level security applied to the data source.

To view a metric, users must have:

- The Connect and View permission capabilities for the published data source that the metric is connected to. For more information about permissions, see Permission Capabilities and Templates.
- Access to the data in the data source that the metric is connected to.

Tableau Pulse doesn’t prompt users to sign in to the database or data connection for the data source. Instead, one of the following must be true for users to access the metric data:

- The credentials for the data source are embedded. For information about embedded credentials, see Set Credentials for Accessing Your Published Data.
- The user's credentials are passed to the data source with single sign-on.
- The user’s credentials are saved for the data source. For more information, see Manage Saved Credentials for Data Connections.
- The data source doesn't require the user to authenticate to access the data.

If users try to view a metric that they don’t have the correct permissions for, they see a message that the metric doesn’t exist or that they don’t have permission to access it.

### Permissions for creating metric definitions and metrics

There is no setting to limit who can create metric definitions or metrics in Tableau Pulse. Any user with a site role of Creator, Site Administrator Explorer, or Explorer (can publish) can create metric definitions. However, to create a metric definition, users must have the same permission capabilities for the data source and access to the data that are required to view a metric. For more information, see Permissions for viewing metrics.

A new metric is created any time users filter an existing metric, if one doesn't already exist with that combination of filters. As long as users can view an existing metric, they can create new metrics by adjusting the filters. There are no site role limitations for creating metrics.

If you don't want users to be able to create metric definitions or metrics from a data source, deny the View and Connect permission capabilities for that data source. For more information, see Permission Capabilities and Templates. Denying those permission capabilities also prevents users from being able to view metrics based on that data source.

### Permissions for editing metrics and goals

You can adjust settings on a metric definition to control who can edit or delete the metric definition and who can set, edit, or delete goals for the metrics based on that definition. Note that these settings won't grant users the ability to edit a definition if their site role doesn't allow it. Tableau administrators don't need to be added as editors, because their site role gives them the ability to edit all metric definitions and goals. For more information, see Restrict definition and goal editing.

## Tableau AI in Tableau Pulse

Tableau Pulse uses Tableau AI, which is Tableau's generative artificial intelligence technology, to provide users with personalized summaries of insights for the metrics they follow. Tableau AI is used to generate the language for these summaries, but Tableau AI isn't involved in the identification of data insights, and there are checks to ensure that no numbers are changed in the insights summaries. The insights that Tableau Pulse finds are grounded in the same types of statistical modeling used to analyze data in the traditional Tableau viz authoring experience.

Tableau Pulse doesn't use your site’s data to train Tableau AI. As soon as Tableau AI processes a prompt to generate an insights summary, the prompt and the response are forgotten. Your data isn’t stored outside of Tableau, and the only data that Tableau AI collects is the voluntary feedback users can submit about their insights summaries. For more information about Tableau AI, see Einstein Generative AI for Tableau.

## Turn on Tableau AI

Tableau AI is turned off for your Tableau site by default. Turn on Tableau AI for Tableau Pulse so your users can see their personalized insights summaries and get a quick overview of important changes to their metrics. The setting for Tableau AI is independent of the setting to deploy Tableau Pulse, meaning that turning on Tableau Pulse won't turn on insights summaries for Tableau Pulse.

1. From the main Tableau Cloud navigation menu, select **Settings**.
2. Under Tableau AI, select **Tableau Pulse: Summarizes key metric insights**.
3. Select **Save**.

When you turn on Tableau AI for Tableau Pulse, users will see a notice informing them that generative AI can produce inaccurate or harmful responses. Users have the option to leave feedback about the quality of the insights summaries that they see by selecting a thumbs-up or thumbs-down rating.

## Turn off Personalized Insight Ranking

The Personalized Insight Ranking setting is turned on for your Tableau site by default. When this setting is turned on, users can provide thumbs-up or thumbs-down feedback on insights. That feedback is then used by the Tableau Pulse insights platform to further personalize and rank the types of insights it shows to a user. This setting is independent of the setting to deploy Tableau Pulse.

1. From the main Tableau Cloud navigation menu, select **Settings**.
2. Under Personalized Insight Ranking, select **Turn on (Users can submit feedback to improve the insights they receive)**.
3. Select **Save**.

When Personalized Insight Ranking is turned off, users won't be able to submit thumbs-up or thumbs-down feedback on individual insights.

## Troubleshoot metrics

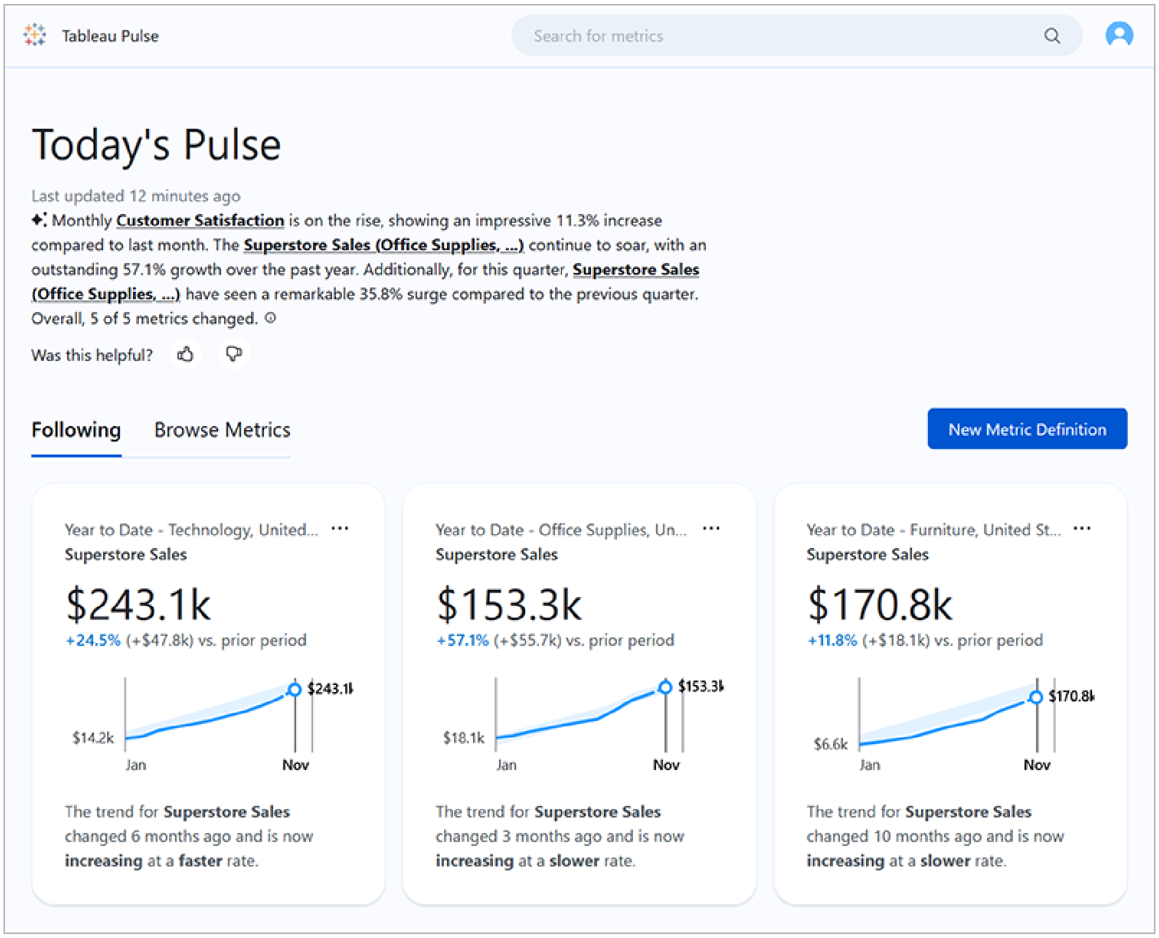
If users on your site don't see data when they create a metric definition or when they view a metric, there might be an issue with your data source. Be aware that if today’s date is the beginning of the current period for the time series, such as the first day of the month, the chart will display only that point. This isn’t an issue with your data source. New points in the time series will be added as the period progresses.

**If a user is creating a metric definition and there's no data in the preview:** Tableau Pulse presents preview data for the current period to date. If the measure selected has no recent data, the user won't see a preview on the chart. Check the data source to verify that the data is updating.

**If a user is viewing a metric that previously had data, but now there's no data:** Check to see if a field used by the metric was removed or changed in the data source. Edit the metric definition to account for this change, and the change will be reflected on all metrics based on that definition. For more information, see Edit a metric definition.

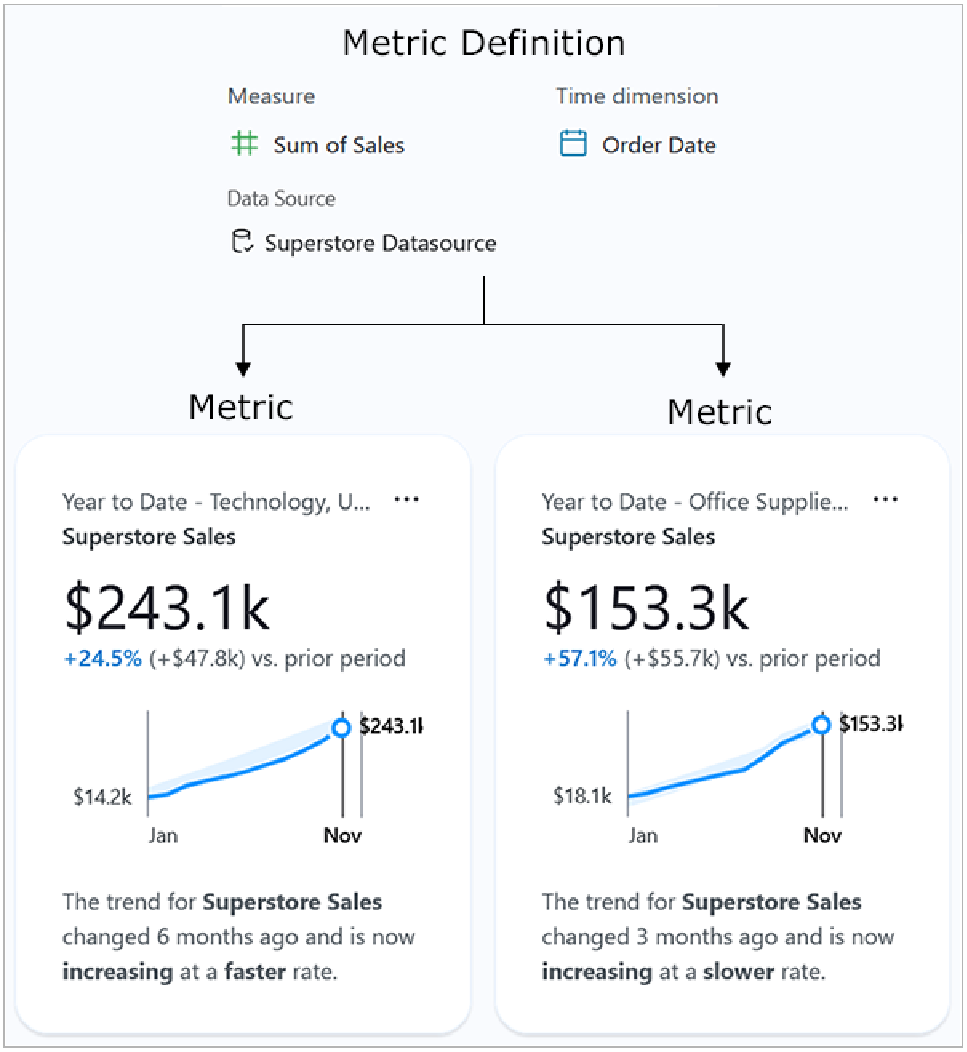
# Create Metrics with Tableau Pulse

Tableau Pulse provides insights about your data based on metrics that you define. After you create a metric, you can add members of your organization as followers, and they'll receive regular email or Slack digests about their data. This digest surfaces trends, outliers, and other changes, keeping followers up to date on the data relevant to their work. To learn more about the data, these users can investigate a metric on Tableau Cloud and see how different factors contribute to changes in the data. These insights give them the information they need to make data-driven decisions without requiring them to do complex analysis in Tableau.




## Metric definitions and metrics

Behind every metric in Tableau Pulse is a metric definition. Viewers interact with metrics. Metric definitions specify the core metadata for those metrics.




**Metric definitions** are the set of metadata that functions as the single source of truth for all the metrics based on them. Defined by a user with a Creator, Site Administrator Explorer, or Explorer (can publish) site role. The following table provides an example of the metadata captured by a metric definition.

Metric definition for Superstore Sales

| Definition field | Example value |
|---|---|
| Name | Superstore Sales |
| Measure and aggregation | Sum of Sales |

| | |
|---|---|
| Time dimension | Order Date |
| Compared to | Prior year |
| Adjustable metric filters | Region, Category |
| Number format | Currency |
| Data source goal measure | Sales Target |
| Granularity of goal measure | Daily |
| Value going up is | Favorable |

**Metrics** are the interactive objects that sit in front of a definition. Created when users adjust filters or time options, which means that there can be many metrics based on a definition. Users follow and explore metrics to get insights. The following tables provide an example of the options configured for metrics. These options are applied on top of the core value that is specified by the metric definition.

Metric for Superstore Sales - Technology

| Metric option | Example value |
|---|---|
| Time period | Quarter to date |
| Filters | Category: Technology |
| Manual goal | 80K |

Metric for Superstore Sales - Office Supplies

| Metric option | Example value |
|---|---|
| Time period | Year to date |
| Filters | Category: Office Supplies |
| Manual goal | 200K |

To get started in Tableau Pulse, you create a metric definition that captures the core value that you want to track. At its most basic level, this value is an aggregate measure tracked based on a time dimension. The definition also specifies options such as the dimensions that viewers are able to filter by, the way the value is formatted, and the types of insights displayed.

When you create this definition, Tableau automatically creates an initial metric and sends you to that metric's page. The initial metric created for a definition has no filters applied, but any time you or another member of your organization adjusts the metric filters or time options in a new way, Tableau Pulse creates an additional metric.

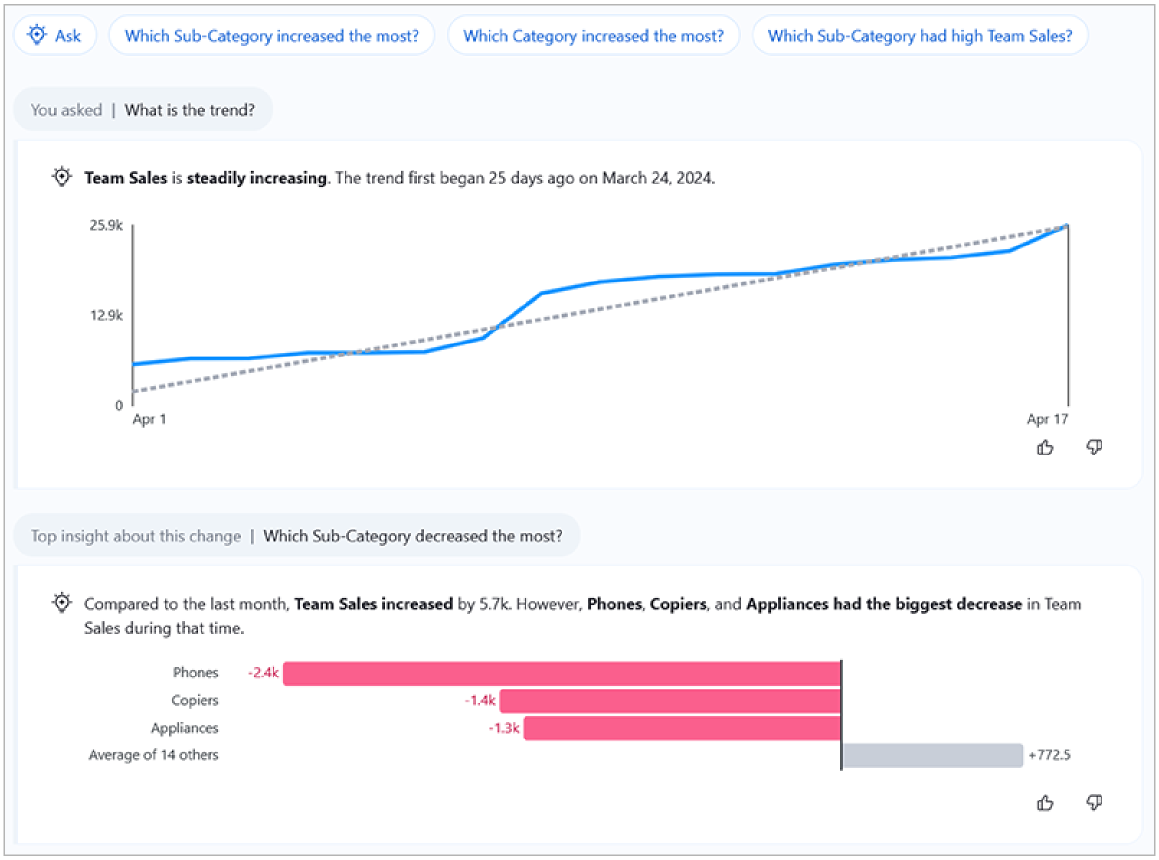
People in your organization follow metrics, not metric definitions. By following individual metrics, they get insights specific to the dimensions that matter to them. The definition exists in order to let you manage the data for metrics from a single parent object. If a field in your data source changes, you can update the definition to reflect this change, and all metrics based on that definition will also reflect the change.

Say that you're a member of a sales organization, and that organization needs to track metrics across different territories and product lines. In Tableau Pulse, you would create a metric definition that includes the core value of the sum of daily sales with adjustable metric filters for region and product line. Then, you would create metrics for each region and product line. Finally, you would add members of your organization as followers to the metrics that cover where and what they sell.

## What makes Tableau Pulse different

Tableau Pulse presents a simplified way to create metric definitions, so that with only a few selections, you can make a definition that would normally require complex calculations to build in traditional Tableau viz authoring. Members of your organization use that metric definition as a jumping off point to make metrics relevant to their needs, by slicing the data based on different dimensions or time options. Because insights about these metrics are sent directly to followers, your colleagues get the data they need in their flow of work.

With Tableau Pulse, users have an easy, self-service way to take part in guided data exploration. They can ask suggested questions to see how different dimensions affect the data. This guided exploration complements the more free-form analysis that's possible with the traditional Tableau viz authoring experience and allows users unfamiliar with Tableau analysis to understand their data.




Note that though some parts of Tableau Pulse are similar to other Tableau features, Tableau Pulse combines metrics and insights in an all-new experience. In February 2024, with the release of Tableau Pulse, Ask Data and Tableau's legacy Metrics feature were retired. Like Ask Data, Tableau Pulse lets you ask questions of your data, so you can learn the how and why behind the numbers you see. Tableau Pulse also lets you create and track metrics, like the legacy Metrics feature, but Tableau Pulse metrics don’t stand alone. These metrics are the source of insights about your data.

## Data source requirements for metric definitions

You create a metric definition by connecting to a published data source. Make sure that the data source you're working with meets the following criteria.

- It's a single published data source. You can't connect to a data source that is embedded in a workbook, and you can't connect to multiple data sources or use data blending, unless you combine the data before publishing the data source. The data source can be an extract or a live connection, and it can use a virtual connection or connect directly to the data.
- You have the Connect and View permission capabilities for the data source.
- The data source contains:
  - A measure to be aggregated as a sum, average, median, maximum, or minimum or a dimension to be aggregated as a count or count (distinct).
  - A time dimension for the metric's time series. Tableau Pulse monitors data over time, so single point-in-time values won't produce a valid metric. The granularities supported for the time series are day, week, month, quarter, and year. Data that requires a lower level of granularity (hour or minute) isn't a good fit for Tableau Pulse.
  - At least one dimension that can be used to filter the data and insights.

Tableau Pulse displays the dimension names and values that you add as filters on metrics and in insights text. These names and values in your data source should be easy for others to understand. To create the best experience for viewers, follow these recommendations so that the names and values fit with the conversational language of Tableau Pulse.

- Use title-style capitalization rather than all caps.
- Use spaces rather than hyphens or underscores to separate words.
- Don't use special characters.
- Don't use Boolean fields that appear as `true` or `false`.
- Don't use fields that consist of IDs or other indecipherable strings.

### Requirements for data source goals

There are two types of goals that you can configure in Tableau Pulse: manual goals and data source goals. Manual goals are simply a static number entered as a goal for an individual metric, so there are no data source requirements for manual goals. A data source goal is set at the definition level and uses a field in your data source to display a dynamic goal value on the metrics based on your definition. For more information about these types of goals, see Configure data source goals and Set Manual Goals with Tableau Pulse.

If you want to include a data source goal as part of a metric definition, there are additional data source considerations.

- Include the field that specifies the goal value as part of the data source that the definition connects to. Metric definitions connect to only a single data source, so you can’t connect to a separate data source for goals.
- If the goal is in a separate table from the definition value, relate the goal table and the definition value table. If you join the tables instead of relating them, the data source might end up with duplicate goal values. For information about relating data, see Use Relationships for Multi-table Data Analysis.
- If you want a finer-grained goal to display when users apply dimensional filters on metrics, include that level of granularity in your goal data. Otherwise, Tableau Pulse displays the total goal value for a dimension, even when the data is filtered to a subset of values.

## Configure the core definition

After making sure that your data source will work with Tableau Pulse, you're ready to start creating your definition. The definition editor is optimized for larger screens, so you should create your definition using a desktop or laptop computer rather than a mobile device.

To create metric definitions, you need a Creator, Site Administrator Explorer, or Explorer (can publish) site role on Tableau Cloud. If you have a Viewer site role, you can follow metrics and discover insights, but you can't create metric definitions.

1. From the Tableau Pulse home page, select **New Metric Definition**.
2. Select a data source to connect to, then select **Connect**.

   For the **Name**, enter a name that isn't in use by other metric definitions.
3. 

This name appears on all metrics based on the definition, so choose a name that's easy for others to understand.

4. For the **Description** (optional), provide brief details to help others make sense of the data.

   The description appears on the definition page. On the insights exploration page for each metric, the description shows when users select the info icon.

5. Under **Links**, add up to five links. These links appear on a metric’s Insights Exploration page.

## Restrict definition and goal editing

By default, any user with the correct site role can edit or delete a metric definition, and all users can set, edit, or delete goals for the metrics based on that definition. You can restrict these actions to specific users and groups. You don’t need to add Tableau administrators as editors, because they always have the ability to edit metric definitions and goals.

Users must be a Creator, Site Administrator Explorer, or Explorer (can publish) to be able to edit a metric definition. If you give a Viewer access to edit a definition, that user won’t be able to edit the definition, because the site role doesn’t allow it. The ability to edit goals isn't limited by site role, but goals are available only for users who have access to Tableau+.

1. Under Definition editing permissions or Goal editing permissions, select **Anyone Can Edit**.
2. Select the **Restrict editing** toggle.
3. Enter the users and groups to add as editors.
4. Select **Add**.
5. Close the Manage Editors dialog.

## Define the metric value

1. For the **Measure**, select the field to track.

   You can select a measure or a dimension, but dimensions must be aggregated as a count or count (distinct) so that they result in a measure that can be tracked.

2. For the **Aggregation**, select how Tableau Pulse should aggregate the field you're tracking.

   If you require a more complex aggregation, see Create an advanced definition (optional).

3. For **Show sparkline values to date as**, select whether you want the points on the metric chart to display as a running total or as non-cumulative values.

   The current value shown at the top of the metric will always be a running total for the period you're tracking. This setting applies to the sparkline, the overview line chart, and applicable insights.

4. For the **Definition filters** (optional), select values to limit the metric data.

   Definition filters affect the data for all metrics based on the definition and won’t be adjustable by the viewer. Fields added as definition filters change the meaning of the definition. For example, a definition filter might exclude returned orders to define net sales. If you simply want to use a field to segment the data, add an adjustable metric filter, available under the Options section. For more information, see Define metric options.

5. For the **Time dimension**, select the field to define the time series.
6. Expand the **Advanced time settings** (optional).

1. Enter a **Date offset** to change the final point in a metric’s time series to a set number of days in the past. For example, by entering an offset of 2, you adjust the final point from “Today” to “2 Days Ago.” An offset is useful if the data in your data source appears at a delay. Otherwise, your metric might not show any data for the final point in the time series.

2. For the **Minimum time granularity**, select a larger granularity if smaller units like day or week don’t make sense based on your data. This setting controls the time options available when users filter metrics. That way, users can’t select options that have no data.

For **Compared to**, drag the time comparison that you want to be the primary comparison to the top of the list.

7.

The primary time comparison is displayed in digests and insights and on the metric overview card. The secondary comparison appears in addition to the primary when a user opens a metric on Tableau Cloud to view the insights exploration page. If you don't want a secondary comparison, select the **x** to remove it.

How fiscal calendars work with metrics

If your time dimension is configured to use a fiscal calendar, Tableau Pulse uses that calendar. The metrics based on a definition with a fiscal calendar will show fiscal years and fiscal quarters on charts and insights. When you create a definition, the fiscal start month is listed under the time dimension field, if one is set. You can't adjust the fiscal calendar in Tableau Pulse. To change it, edit the data source used by the definition. For more information, see Fiscal Dates.

Support for fiscal calendars was added in February 2024. The Tableau Pulse beta didn't support fiscal calendars. If you created metrics during the beta period, and your data uses a fiscal calendar, those metrics won't automatically update to reflect the fiscal calendar. You'll need to adjust the date range to create new metrics that use the fiscal year. Then remove the followers from the metrics that used the old calendar and add them to the newly created metrics.

Create an advanced definition (optional)

If you prefer the flexibility of working in the traditional Tableau viz authoring environment, or if you need to create calculated fields, use the advanced analytics editor.

1. On the definition panel, select **Create Advanced Definition**.
2. Add fields to the measure, time dimension, and filters shelves.

   Only the fields, including calculated fields, that you add to these shelves are saved by the editor. Number format changes, granularity adjustments, or table calculations made in the advanced editor don't carry over. Instead, use the definition settings to set a minimum time granularity or change the number format.
3. Select **Apply**.

   The fields you added in the editor replace the equivalent fields in the definition panel. To edit these fields, reopen the editor. You can't edit fields configured in the advanced analytics editor in the definition panel.

## Define metric options

1. For **Adjustable metric filters**, add at least one option.

   These filter options appear on metrics and allow users to scope the data to meet their needs. Adjusting these filters creates additional metrics from a definition. The first 20 fields that you add as adjustable metric filters also determine the dimensions used to generate insights about the data. If you add more that 20 fields, those options still appear as filters, but they aren't used to generate insights or available as breakdown options.
2. For the **Number format**, you can specify custom units to show for the value, or you can set the value to display as currency or as a percentage.

## Configure data source goals

Configuring a data source goal is optional. A data source goal uses a field in your data source to display dynamic goal values on metrics, and Tableau Pulse tracks progress toward those goals. For information about structuring your data source for goals, see Requirements for data source goals.

Data source goals appear on all metrics based on a definition. The goal value is filtered by the filters applied if goal data exists for that level of granularity. If goal data doesn't exist for specific values or dimensions, Tableau Pulse displays the goal value for a higher level of detail that does have goal data. That higher-level goal value might not be a relevant goal for the filtered metric, so make sure that your data source has goal data of the appropriate granularity.

Data source goals can be set on definitions where the measure is aggregated as a sum or count. Additionally, all definition values configured with the advanced editor support data source goals.

1. On the Goals step, under **Measure**, select the field in your data source to use for the goal value. The values for this measure are aggregated as a sum based on a metric's time range.
2. Under **Time dimension**, select the field to use for the goal's time series.
3. Under **Granularity of goal measure**, select the level of detail represented by each row of the measure. Metrics with time ranges smaller than the goal granularity don't display a goal.

Data source goals inherit the definition filters from the core definition unless those filters are set in the advanced editor. If you used the advanced editor to configure the core definition, add those same filters to the goal under **Definition filters**.

### Data source goals and manual goals

A manual goal is a single target number that anyone with permission can set on individual metrics. If someone sets a manual goal on a metric, the manual goal overrides the data source goal. If the manual goal is removed, the data source goal appears again. To learn about manual goals, see Set Manual Goals with Tableau Pulse.

## Configure insights

1. Select the **Insights** tab.

   The fields under **Insight dimensions** are the same fields that you added as adjustable metric filters. Tableau Pulse uses these dimensions when monitoring your data to surface relevant insights, as shown in the insights preview.

2. For **Value going up is**, select whether the change is neutral, favorable, or unfavorable.

   This option controls the color for the change value: blue for neutral, green for favorable, and red for unfavorable. It also affects the language used in insights that refer to the change.

3. Under Insight types, select **Turn On** or select the **…** menu then select **Turn Off** to adjust the types of insights shown. Hover over the info icon for a description of each type. By default, the record-level outlier insight type is off. If you turn it on, it requires additional configuration.

   1. For the **Record identifier**, select a field in your data that has a unique value for every record, for example, Order ID.

   2. For the **Record identifier name** (optional), select a field in your data that has a name that corresponds to the record identifier, for example, Order Name.

   3. For **Singular** and **Plural** (optional), add names for the records as they should appear in insights text, for example Order and Orders.

4. Verify that the metric and insights previews look as expected, then select **Save Definition**.

Tableau Pulse creates the definition along with the initial metric based on that definition, which has no adjustable metric filters applied. You can find your definition under the Browse Metrics tab on the Tableau Pulse home page.

For an overview of insight types and the insights platform, see The Insights Platform and Insight Types in Tableau Pulse.

## Create metrics

After you create your definition, you'll be taken to the initial metric for that definition. This page is the insights exploration page for that metric. On it, you can see insights based on dimensions that you select, and you can create more metrics by adjusting filters.

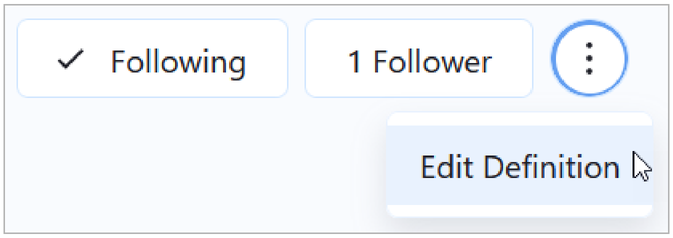
1. On a metric for your definition, select **Filter**. The filter labels become interactive.
2. Select the buttons to change the time and filter options.
3. Select the check mark button. If a metric with that combination of filters doesn't yet exist, Tableau Pulse creates one.

To learn how viewers interact with these metrics, see Explore Metrics with Tableau Pulse.

## Edit a metric definition

If your data source changes, and the metrics that are based on it break, edit the metric definition to account for these changes. Any changes that you make to the definition will affect all metrics based on it.

1. Open a metric for the definition you want to edit.
2. Select the actions menu, then select **Edit Definition**.




## How editing a definition affects metrics and goals

When you edit a definition, your changes might affect the metrics based on the definition and the goals based on those metrics.

| Changed field | Affected feature | Impact |
|---|---|---|
| Definition filters, adjustable metric filters | Metrics | If you remove an adjustable metric filter or add a definition filter that excludes a value used in a metric filter, metrics using that filter aren't deleted. Existing followers of an affected metric are able to adjust the filter and add other followers. However, users who aren't already followers can't follow that metric on their own.<br><br>To make it so users no longer see metrics that are based on eliminated filters, remove the followers from those metrics. Alternatively, if you want to get rid of all of the metrics for a definition, delete the definition. |
| Aggregation | Goals | Data source goals can be set for values that are aggregated as a sum or count. Manual goals can be set for values that are aggregated as a sum, count, or distinct count.<br><br>If you change the definition to use an unsupported aggregation, the currently configured data source goal is removed when you save the definition. Any existing manual goals are hidden for the metrics based on this definition.<br><br>If you change the definition back to use a supported aggreg- |

ation, pre-existing manual goals are restored. The data source goal isn’t restored, and you must reconfigure the goal.

## Delete a metric definition

Deleting a metric definition also deletes all of the metrics based on it.

1. On the Tableau Pulse home page, select the **Browse Metrics** tab.
2. On the metric definition that you want to delete, select the actions (**...**) menu, then select **Delete**.

## Manage followers

Followers are specific to each metric, not to the metric definition as a whole. That way, individuals in your organization receive insights about only the metrics that matter to them. Any time you create a new metric, you need to add followers. Followers don’t carry over from the previous metric that you were viewing.

### Add followers

1. Open the metric that you want to add followers to.
2. Select the **Followers** button.
3. In the search box, enter the name of the user or group that you want to add.
4. Select **Add**.

If users are added to a metric as part of a group, they won’t be able to remove themselves individually. If you want users to have control over the metrics they follow, add them as individuals.

### Remove followers

1. Open the metric that you want to remove followers from.

2. Select the **Followers** button.

3. Next to the follower's name, select **Remove**.

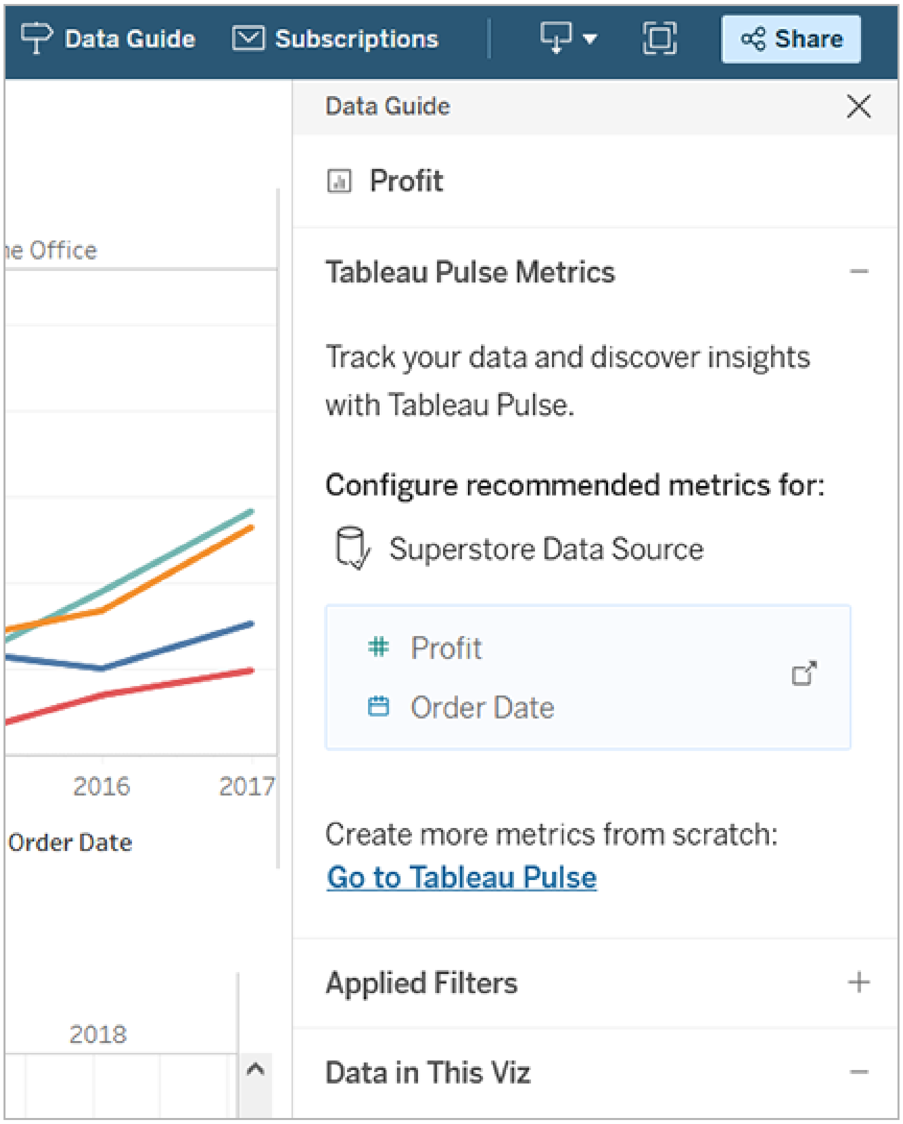
## See recommended metrics for a dashboard

To get a head start when creating a metric definition, you can create one from the list of recommended metrics shown for dashboards.

1. While viewing the dashboard that you want to create a metric definition from, select the **Data Guide** button in the toolbar.

2. On the dashboard, select the viz with the data you want to use.

   Data guide shows recommended metrics for this viz. Depending on how well the data in the viz fits the requirements for a metric, you might not see recommended metrics. If data guide can't recommend a complete metric, it might show recommended measures or dimensions or the primary data source used for you to connect to.




3. Select a recommendation to configure it in Tableau Pulse.

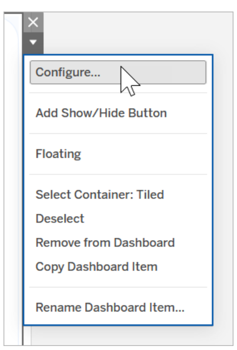
4. The recommendation is pre-populated in the Tableau Pulse definition editor. To finish setting up your definition, see Configure the core definition.

## Add metrics to a dashboard

To show metrics alongside other content in a dashboard, add the Pulse Metric object. The metrics that are available to add to a dashboard are those that connect to the same published data sources that are used by the workbook. For more information about dashboard objects, see Add dashboard objects and set their options.

1. On a dashboard, from the Objects section, drag the **Pulse Metric** object to the dashboard.
2. Select a metric definition to see the list of metrics based on that definition. If there are no metric definitions shown, create one in Tableau Pulse.
3. Select a metric.
4. For the metric display, choose whether to display the full card or a compact card.
5. To style the metric like the cards on the Tableau Pulse homepage, toggle on **Tableau Pulse Style**. Tableau Pulse style adds rounded corners and an elevated border. Without this style option, the metrics on a dashboard resemble other borderless dashboard objects.
6. To link the metric card to the Tableau Pulse Insights Exploration page, toggle on **Link to Tableau Pulse**. This link opens in a new tab.
7. Select **Add to Dashboard**.

After you've added a Pulse Metric object, you can change the metric or adjust the settings by selecting **Configure** from the object's context menu.



## Embed metrics

You can use the Embedding API to embed Tableau Pulse metrics in web pages. For more information, see Embed Tableau Pulse.

# Explore Metrics with Tableau Pulse

Tableau Pulse allows you to make data-driven decisions right in your flow of work by sending you insights about metrics that you follow. For example, if you regularly report on a metric, Tableau Pulse can send you insights about important changes to your data. With Tableau Pulse, users who have Creator, Site Administrator Explorer, or Explorer (can publish) site roles can create a metric definition that provides the metadata for all related metrics. All users can follow and interact with metrics, which use the core definition plus optional filters to scope the data for different audiences and purposes. When you follow a metric, insights about your data are delivered directly where you're working–in email or Slack.

Each digest includes contextual insights about the metrics you follow, and you can explore individual metrics for further insights. To learn more about Tableau AI, see Einstein Generative AI for Tableau.

## Get started with Tableau Pulse

1. From the Tableau Cloud home page, expand the left side pane, and choose **Pulse**.
2. From Tableau Pulse, Create Metrics with Tableau Pulse, if metrics haven't been created yet.
3. Use the **Search** bar or **Browse Metrics** tab to find existing metrics, and choose **Follow** to start receiving insights about specific metrics.
4. From the **More Actions** menu (...) of a metric card, you can manage followers, see details, or view related metrics (metrics that share a core metric definition but have different filters or time contexts).

For a detailed explanation and example of how metric definitions and metrics work, see Metric definitions and metrics.

## Explore metrics in detail, adjust the time range, or apply filters

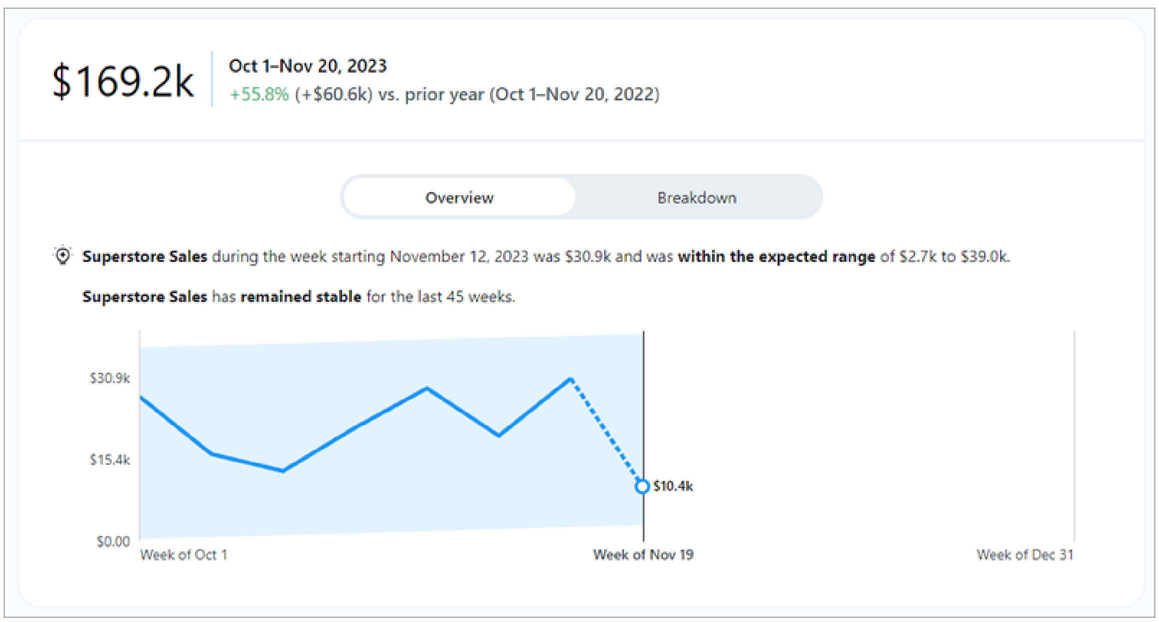
From the Insights Exploration page, you can understand the metric at a glance, including:

- The current metric value.
- The percentage change from the prior period being compared.
- Filters applied to the metric definition.
- And insights about that metric.

From the metric page, choose **Filter** to change the time period being analyzed. You can also adjust the filtered values applied to the metric.

All users can adjust filter values and follow different metrics based on the same definition. When a user follows a metric, the time period and filter selections are preserved in their home page and digests.

The **Overview** tab shows a line chart of your metric's performance, including the direction the metric is trending. Hover over different points of the line chart to see the metric's value at different points in time.




The **Breakdown** tab shows you how different values in your metric are contributing to the total value. And you can choose the dimension by which you see your metric broken down. For example, this metric displays Region by default, but you can also break down the metric by Regional Manager or Segment.

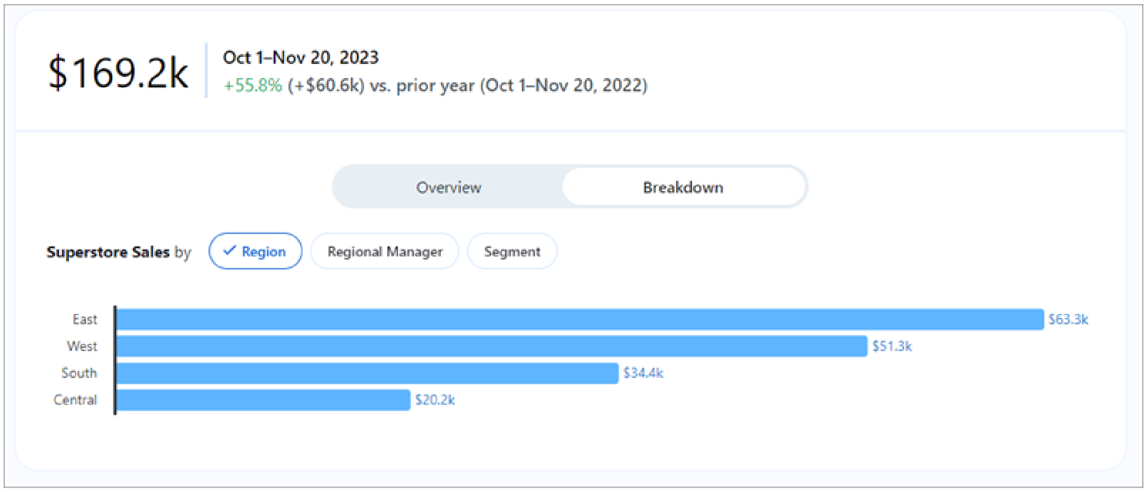
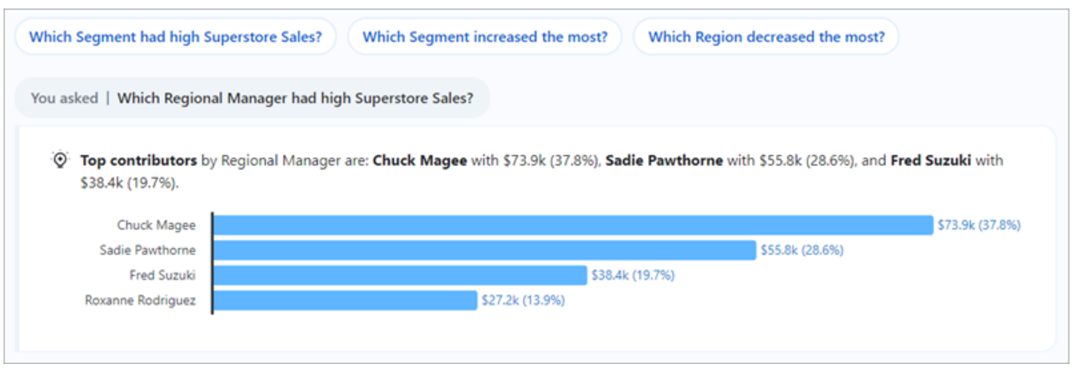



Tableau Pulse provides a path for exploring your data by surfacing questions for each insight that it detects for a metric. As you click through the suggested questions about your data, answers are revealed in easy-to-read charts with insights about the underlying data.




If you don't see an insight you are looking for, click the **Ask** button to the left of the available questions, and then enter a new question about the metric. Based on your question, Tableau Pulse will look for and rank semantic matches for insights that it detects for the same metric you're investigating. It then lists a question for each detected insight. The filter settings and data available for the metric affect the insights that Tableau Pulse can detect.

## Follow metrics

When a metric definition is created, you can follow its related metrics, i.e. versions of that core metric definition that can be created by applying adjustable filters. After you follow a metric, it appears on your Tableau Pulse homepage. You can also choose how frequently you receive Tableau Pulse digests via Slack and email. These digests include insights into important changes in your data so you can stay up to date. By default, digests are sent weekly to both Slack and email.

When you follow two or more metrics, Tableau Pulse provides an overview to help you quickly see the latest insights across your metrics of interest. When available, this insights summary appears in digests and in the Tableau Pulse home page.

> **Note:** Tableau AI must be turned on by your Tableau admin for insight summaries to be available.

To unfollow a metric, go to the metric exploration page and click Following. You can also choose the **More Actions** menu (...) from a metric card and choose **Unfollow**. If you unfollow a metric, then it no longer appears on your Tableau Pulse home page or in your digests. If you follow a metric as part of a user group, then you can't unfollow the metric. Your group(s) must be removed from the follower list, and then you can follow or unfollow metrics as an individual. And in Microsoft teams, you can interact with Tableau Pulse metrics in the embedded Tableau experience. For more information, see the GitHub documentation for the Tableau app for Microsoft Teams.

## Customize your home page and digests

Customize your Tableau Pulse home page and digests by sorting and grouping metrics. Sort metrics by time range or how recently you followed the metric. Or group metrics that share a metric definition or a data source.

To customize your Tableau Pulse home page and digests:

1. From the Tableau Pulse home page, choose **Sort by**.
2. Select how you want your metrics to be sorted, for example, grouped by metric definition.
3. Choose **Set as Default Order** to apply this to your Tableau Pulse home page, Tableau Mobile Pulse tab, Slack digest, and email digest.

## Manage your Tableau Pulse digest

1. From Tableau Pulse, choose the icon at the top-right corner, and choose **Preferences**.
2. Choose how you want to receive digests (Slack and email).
3. Choose how frequently you want to receive digests (daily, weekly, or monthly).
4. Choose **Save**.

Email and Slack digests are sent to the email address associated with your Tableau site. To receive Tableau Pulse digests in Slack, your administrator must first Integrate Tableau with a Slack Workspace. You receive Tableau Pulse digests in the Tableau App for Slack automatically. But to experience all that the Tableau App for Slack has to offer–such as searching for vizzes, sharing vizzes, and receiving notifications–you must connect the Tableau App for Slack to your Tableau site. For more information about the Tableau App for Slack, see Receive Notifications, Search, and Share Using the Tableau App for Slack.

After you follow a metric, you receive Tableau Pulse digests in Slack in the **Messages** tab of the Tableau App for Slack.

## Troubleshoot Tableau Pulse

Tableau Pulse is available on Tableau Cloud only. If you don’t have insights generated by AI in your Tableau Pulse summaries, your administrator might not have turned on these features for your site. For more information, see Set Up Your Site for Tableau Pulse.

Confirm that your preferred channels (Slack and email) are turned on to receive your Tableau Pulse digest. Email and Slack digests are sent to the email address associated with your Tableau account. If you’re not receiving your digest, check the email address associated with your account. Tableau Pulse email digests might not be formatted properly if you're using certain email clients, such as Thunderbird or older versions of Outlook.

You can also check your Tableau Pulse preferences to confirm that your digest is being sent at the desired frequency (daily, weekly, or monthly) via Slack and email. If your Tableau Pulse digest wasn't ready in time, then you can view your metrics on the Tableau Pulse homepage.

If a metric you followed is no longer in your digest or on your Tableau Pulse home page, then the metric was deleted.

# Set Manual Goals with Tableau Pulse

Tableau Pulse lets you track important metrics and receive updates right where you're working–in email or Slack. And when you set a goal in Tableau Pulse, you can track a metric's progress toward that goal.

There are two kinds of goals in Tableau Pulse: data source goals and manual goals. A data source goal is set as part of a metric definition. The data source goal uses a field from the connected data source to display a dynamic goal value on the metrics based on that definition. To learn about data source goals, see Configure data source goals.

A manual goal is set on an individual metric and is a single static number. If you set a manual goal on a metric that has a data source goal, the data source goal is hidden, and the manual goal appears instead.

When a goal is created, it's visible to anyone who views that metric. And all users can create, edit, or delete a manual goal for a metric, if they have permission. You can restrict permissions for manual goals by editing the metric definition.

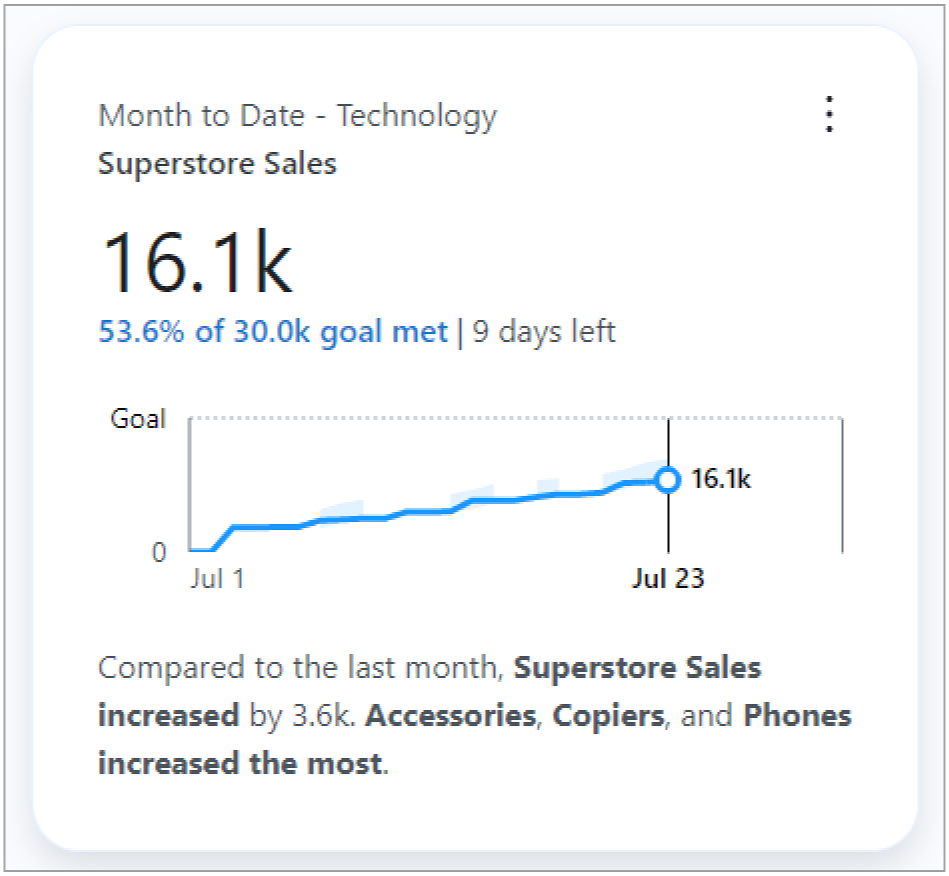
Before you set a manual goal, you must first create a metric definition. When you create a manual goal, it's based on the filters that are applied to the current metric. For example, a month-to-date metric has a monthly goal value.

## Create a manual goal

1. Click into a metric from your email or Slack digest, or from the Tableau Pulse home page.

2. From the Insights Exploration page, choose **Filter** to adjust the filter values and create a custom metric that you can follow.
3. From the top-right corner, choose the Menu icon (**...**).
4. Choose **Set Goal**.
5. Enter the goal value. You can enter positive numbers, negative numbers, or 0 as a goal value.
6. Choose **Save**.

After a manual goal is created, you'll see your progress toward that goal in your Tableau Pulse digests and on your Tableau Pulse home page.




To change the manual goal value, return to the Insights Exploration page, choose the Menu icon (**...**), and select **Edit Goal**. You can also choose **Delete Manual Goal** from this modal. Editing a goal or deleting a goal changes the goal for all users who follow that metric.

## Manage who can edit or delete a manual goal

By default, all users can create, edit, or delete a manual goal. If you have access to edit the metric definition, you can set permissions that restrict which users and groups can edit a goal. Site admins can always edit or delete the goal. To set permissions and choose who can edit a goal:

1. From your Slack digest, email digest, or the Tableau Pulse home page, click into the metric that you want to set goal permissions for.
2. This takes you to the Insights Exploration page. From the Menu icon (**...**), choose **Edit Definition**.
3. From the **Definition** tab of the left pane, under **Manual goal permissions**, choose **Anyone Can Edit**.
4. Turn on **Restrict editing**, and enter the users or groups whom you want to have access to edit the goal.
5. After you've added editors, close the **Manage Goals Editors** modal.
6. Click **Save Definition**.

## Understand limitations

You can set manual goals for only metrics that use Sum, Count, and Count Distinct. If a metric definition that uses Sum is edited to instead use Avg, then all goals for all metrics based on that definition are hidden. However, if you revert that change and return to using Sum, then the goals reappear.

If a metric definition is edited, all the metrics based on that definition are also updated. For example, if a definition is edited to use different fields or a different time period, then existing manual goals remain. And manual goals should be reviewed to confirm that the goal still measures the desired metrics over the desired period. There are several ways to see when a definition was last updated on the Insights Exploration page:

- Review the text and time stamp under the metric name.
- Click the info (i) icon next to the metric name to see when the definition was updated.
- Click **Edit Goal** to see when the definition was updated.

# The Insights Platform and Insight Types in Tableau Pulse

When you create a metric in Tableau Pulse, you also automatically get the insights that Tableau Pulse detects for each metric.

The Insights platform in Tableau Pulse detects drivers, trends, contributors, and outliers for metrics. It proactively flags and describes insights that matter using natural language and visual explanations. The top insight for each metric is displayed with the metric.

Tableau Pulse also provides a path to further explore data by surfacing questions for the insights that it detects for a metric. This guided question-and-answer experience progressively reveals insights in the context of the metric. As you and others click through the suggested questions about the data, answers are revealed in easy-to-read charts with insights about the underlying data.

For more information, see Tableau Pulse: Proactive Answers to Your Common Business Questions with Automated Insights and How Tableau Pulse approaches NLP with Q&A to empower everyone.

## Insight summaries highlight metrics of interest

When Tableau AI is turned on and you or others follow two or more metrics, Tableau Pulse provides an overview to help you quickly see the latest insights across your metrics of interest. This insights summary appears at the top of digests and in the Tableau Pulse home page.

Tableau Pulse looks across the metrics that you follow and leverages Tableau AI to summarize the most significant changes. Period Over Period Change and Unexpected Values are the insight types considered for insight summaries.

Insight summaries use a large language model (LLM) to provide a personalized overview in plain language. Tableau AI is built on the Einstein Trust Layer, meaning it enables trusted, ethical, and open AI-powered experiences without compromising data security and privacy. For more information, see Tableau AI in Tableau Pulse and Einstein Generative AI for Tableau.

## Types of insights detected by Tableau Pulse

The questions users typically ask about metrics can be grouped into well-known patterns of analysis: descriptive, diagnostic, predictive, and prescriptive.

- Descriptive questions: What happened to my Metric?
- Diagnostic questions: Why did it happen?
- Predictive questions: What is likely to happen next?
- Prescriptive questions: What actions should I take?

The Insights platform in Tableau Pulse focuses on helping users answer basic descriptive questions they have about their metrics, such as:

- How much has a metric value changed since the last period or the same period last year?
- How is a metric trending over time?
- Which members of a dimension contribute most to a metric value?
- What other dimensions are driving a metric value in a favorable direction?

Insights in Tableau Pulse can alert users to hidden changes or anomalies in Tableau Pulse Metrics so they can better diagnose issues. For example:

- Is the metric value higher or lower than normal?
- Is the metric value unusually concentrated in a few entities of a dimension?
- Has the trend of the metric changed recently?
- Are there any unusually large records or outliers that are impacting the metric value?

# Insight types in Tableau Pulse

The following insight types are used in Tableau Pulse:

| Insight Type | Description | Configurable? |
|---|---|---|
| Record-level Outliers | Shows extremely high or low values for a metric, in the context of row-level values of the metric across a period of time. | Can be turned on or off in the Insights tab in metric definition settings. Requires selection of a record identifier field. |
| Period Over Period Change | Shows how a metric has changed between two periods.<br><br>This insight is displayed as part of every metric. | Always on by default<br><br>Tableau Pulse considers the Period over Period Change insight for insight summaries. |
| Top Contributors | Shows the highest values in a dimension for a metric within a given time range.<br><br>A top contributor is a dimension member that ranks in the top N in contribution to the scoped metric's value, aggregated on a specified time range. | Always on by default<br><br>Tableau Pulse uses the Top Contributors insight in metrics for breakdowns. |
| Bottom Contributors | Shows the lowest values in a dimension for a metric within a given time range.<br><br>A bottom contributor is a dimension member that ranks in the bottom N in contribution to the scoped metric's value, aggregated | Can be turned on or off in the Insights tab in metric definition settings. |

| | | |
|---|---|---|
| | on a specified time range. | |
| Concentrated Contribution Alert (Risky Monopoly) | Shows when a small number of dimension members make up a majority (50% or more) of the contribution to a metric. | Can be turned on or off in the Insights tab in metric definition settings. |
| Top Drivers | Shows values for dimension members that changed the most in the same direction as the observed change in the metric. | Can be turned on or off in the Insights tab in metric definition settings. |
| Top Detractors | Shows values for dimension members that changed the most in the opposite direction to the observed change in the metric. | Can be turned on or off in the Insights tab in metric definition settings. |
| Unexpected Values | Shows when the value of a metric for a given time range is higher or lower than the expected range based on historic observations of the metric. | Can be turned on or off in the Insights tab in metric definition settings.<br><br>Turn this insight off to hide the text description and the expected range (blue shaded band in chart) for the Unexpected Values insight.<br><br>Tableau Pulse considers the Unexpected Values insight for insight summaries. |
| Current Trend | Shows current trends to communicate the rate of change, direction, and fluctuations for the metric value. | Can be turned on or off in the Insights tab in metric definition settings. |

| | | |
|---|---|---|
| Trend Change Alert | Shows new trends that vary significantly from the current trend. This insight communicates the rate of change, direction, and fluctuations for the metric value. | Can be turned on or off in the Insights tab in metric definition settings. |

## How Tableau Pulse generates and maintains trusted insights

Here are a few ways the Insights platform generates automated business insights users can trust:

- Tableau Pulse Insights Service starts by using standardized, deterministic statistical models to detect facts about metrics that are guaranteed to be accurate. These facts act as the ground truth when generating insights.
- Every insight that is generated is restricted to the data security context (such as RLS settings) of the user who made the request. This approach ensures users can only see the data they're authorized to see.
- Analysts can enable or disable different insights being detected for a metric so they can control what is delivered to their users.

Here's how Tableau Pulse brings it all together: the Insight platform statistical service uses the analytical context of the metric being followed or viewed to run automatic statistical analysis that generates facts about the metric. These facts answer the different questions using the user's data security context.

Insight summaries are generated using natural language grounded in statistical truths. The most relevant facts are processed by Tableau AI. These facts are used as ground truths to contextualize language generation. The resulting facts generated are bundled together and surfaced in several features throughout Tableau Pulse as insight summaries when Tableau AI is turned on for a site.

## How the Insights platform determines relevance

To reduce noise, Tableau Pulse only surfaces the most relevant, useful insights—and avoids displaying noisy or spurious findings. The Insight platform considers the following factors to ensure the insights users see are relevant and useful:

- **The analytic context for insights is based on the Tableau Pulse metric definition**. Unlike other solutions that look for insights across all columns in the data, the Insights platform restricts its analysis to the measures and dimensions referenced by the metric definition, as curated by analysts. In addition, only the filtered context of the metric user is viewing or following is considered when generating insights.

- **Insights are ranked based on impact to the metric**. Each fact detected by the Insights platform is scored based on the impact it has on the metric value. Only the facts determined to be most statistically impactful to the metric value are returned first.

- **Feedback further personalizes insights**. Users can provide thumbs-up or thumbs-down feedback on the insights they see to indicate whether the insights are useful. The Insights platform learns from this to further personalize the types of insights it shows to a user.

  **Note**: When the Personalized Insight Ranking site setting is turned on for your Tableau site, users can provide thumbs-up or thumbs-down feedback on insights. This setting is on by default. For more information, see Turn off Personalized Insight Ranking.

When applied in combination, these factors ensure that of all insights detected for a metric, only those found to be most useful are surfaced to users in Tableau Pulse.

# Set Up the Pulse for Salesforce App

The Pulse for Salesforce app integrates Tableau Pulse with your Salesforce data. With the app, your users can explore metrics about their data and get insights directly in Salesforce. For general information about Tableau Pulse metrics and insights, see About Tableau Pulse.

The app automates the process of connecting Tableau with Salesforce. To set up the app, you must complete steps in both your Salesforce org and on your Tableau site. After a connection is established between Salesforce and Tableau, the app prepares your data then creates metrics for sales, opportunities, and more. Users assigned to the correct permission set can access these metrics embedded in Salesforce.

# Complete Tableau Cloud prerequisites

## Set up your Tableau Cloud site

1. Follow the instructions in the Tableau Cloud activation email to create a site.
2. Copy your **Site Name** and **URL**, and paste them in a safe location. You'll need these to set up the Pulse for Salesforce app.

## Set the authentication type to Salesforce

1. From the navigation panel on your Tableau site, select **Settings**.
2. Select the **Authentication** tab.
3. Under Authentication types, select **Enable an additional authentication method**.
4. For Authentication, select **Salesforce**.
5. Under Default authentication type for embedded views, select **Salesforce**.

You can use the Salesforce Authenticator app for multi-factor authentication. For more information, see Multi-Factor Authentication and Tableau Cloud.

## Turn on Tableau Pulse and Tableau AI

Make sure that the site settings for Tableau Pulse and Tableau AI are turned on for your Tableau site.

1. Turn on Tableau Pulse. See Deploy Tableau Pulse for your site.
2. Turn on Tableau AI. See Turn on Tableau AI.

## Create a personal access token

1. To turn on the personal access token setting for your Tableau site, go to site settings and follow the instructions on Site settings for personal access tokens.

2. To create a token, go to your account settings and follow the instructions on Create a personal access token.
3. Copy the **Token Name** and **Secret**, and paste them in a safe location. You'll need these to set up the Pulse for Salesforce app.

### Create a connected app

A connected app allows for seamless embedding of Tableau Pulse metrics in Salesforce. For more information about connected apps, see Configure Connected Apps with Direct Trust.

1. From the navigation panel, select **Settings**.
2. Select the **Connected Apps** tab.
3. Select **New Connected App** > **Direct Trust**.
4. For Connected app name, enter a descriptive name.
5. For Access level, select **All projects**.
6. For Domain allowlist, select **All domains**.
7. Select **Create**.
8. Select **Generate New Secret**.
9. Copy the **Secret ID**, **Secret Value** (select the eye icon to reveal the value), and **Client ID**, and paste them in a safe location. You'll need these to set up the Pulse for Salesforce app.

## Install the app package in Salesforce

The Pulse for Salesforce app is a managed package that you install in your Salesforce org.

1. While signed in to your Salesforce org as a Salesforce admin, open the Pulse for Salesforce package. The link to this package was sent to you when you purchased the Pulse for Salesforce app.
2. Select **Install for Admins Only**.
3. Select **Install**.
4. On the Approve Third-Party Access dialog, select **Yes, grant access to these third party web sites**.
5. Select **Continue**. The Pulse Installation Wizard is installed in your org.

**Important:** If the language setting for your Salesforce admin account is set to a language other than English, you must temporarily change your personal language setting to English to install the app. To learn how, see Change Language in Salesforce. After you set up the app, change the language setting back to your preferred language.

# Complete Salesforce prerequisites

## Assign users to the permission set

**Tip:** While you set up the app, consider limiting the permission set to a small number of users. After you've finished customizing the app, give access to the rest of your users, then re-sync the app. For more information, see Sync access to the Tableau Pulse app.

If you need to implement row-level security to protect your data, add only admins to the permission set during setup. Salesforce access control doesn't carry over to Tableau Cloud, so the users you add have access to all the data in the metrics until you implement additional security measures.

The Pulse app creates a permission set called "Pulse for Sales Cloud" in Salesforce. Assign the permission set to the users who should have access to the app. To learn how, see Manage Permission Set Assignments.

The users you add to this permission set have access to the Tableau Pulse app when you sync the app. At a minimum, add yourself to the permission set.

## Add Tableau as a remote site URL

1. Visit your Tableau site to identify the correct URL. Your URL should look like `https://us-west-2a.online.tableau.com/#/site/my-site/home`. You'll add the part of the URL that begins with https, and ends with .com, for example: `https://us-west-2a.online.tableau.com`
2. Navigate to your Salesforce Setup page.
3. In the Quick Find box, enter `Remote Site Settings`, and then select **Remote Site Settings**. For more information, see Configure Remote Site Settings.
4. For **Remote Site Name**, enter a descriptive name.
5. For **Remote Site URL**, enter the URL that you identified in step 1.
6. For **Disable Protocol Security**, don't select the checkbox.

7. For **Active**, leave the checkbox selected.
8. Select **Save**.

### Add Tableau as a trusted URL for redirects

1. Navigate to your Salesforce Setup page.
2. In the Quick Find box, enter `Trusted URLs for Redirects`, and then select **Trusted URLs for Redirects**. For more information, see Manage Redirections to External URLs.
3. Select **New**.
4. Enter the same URL that you added as a remote site.
5. Select **Save**.

## Set up the Pulse for Salesforce app

Before you set up the app, you must install the managed package for the app in your Salesforce org. If you haven't yet installed the package, see Install the app package in Salesforce.

> **Note:** The Pulse installation wizard is available in the languages that Tableau supports. For the current list of languages, see Tech Specs for Tableau Cloud. For languages that are supported by Salesforce but aren't supported by Tableau, the wizard falls back to English.

1. In the Salesforce App Launcher, search for the **Pulse Installation Wizard** and open it.
2. Select **Get Started**.
3. Enter your Tableau site information. If you don’t have this information, see Complete Tableau Cloud prerequisites.
    1. For **Tableau Site Name**, enter the name displayed after /site/ in your Tableau Cloud URL. For the example URL `https://us-west-2a.online.tableau.com/#/site/my-site/home`, you would enter `my-site`.
    2. For **Tableau Site URL**, enter the part of the URL that begins with https and ends with .com, for example: `https://us-west-2a.online.tableau.com`
    3. For **Personal Access Token (PAT) Name**, enter the name of the token that you saved when you created the PAT. See Create a personal access token.
    4. For **Personal Access Token (PAT) Secret**, enter the secret that you saved when you created the PAT.

5. For **Data Source Refresh Time**, select the time each day when your data should refresh on Tableau Cloud. This time setting uses the time zone set on your Tableau site.
6. For **Select Cloud**, choose the cloud that the Pulse app connects to for the metric data.

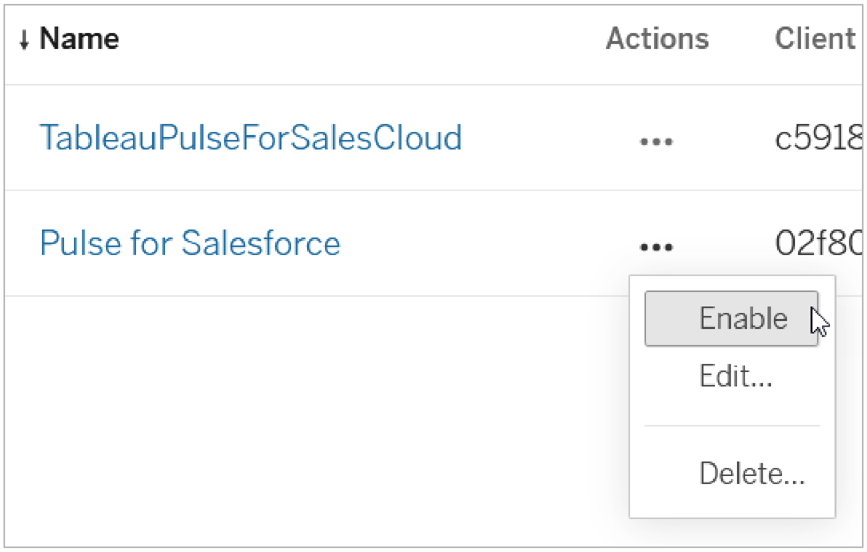
4. Select **Test Connection**. The Pulse app validates the site information you added.
5. For Sync Users, acknowledge the message about syncing users, then select **Sync Users**. The users in the “Pulse for Sales Cloud” permission set are added to your Tableau site.
6. For Create Pulse Metrics, select **Publish**. The Pulse for Salesforce app creates the data sources, flow, and metrics based on your data.
7. For Embed Your Pulse Metrics, enter the **Client ID**, **Secret ID**, and **Secret Value** that you noted when you created the connected app in Tableau. See Create a connected app.
8. For **Update Tableau Cloud Credentials**, follow the instructions under Embed credentials for your data in Tableau. Then select **Next**.
9. Select **Finish**.

## Enable connected apps in Tableau

The Pulse for Salesforce app creates a connected app, in addition to the connected app that you created under the step Create a connected app. Enable these apps so that Tableau Pulse can be embedded in Salesforce.

1. From the Tableau Cloud navigation panel, **select Settings**.
2. Select the **Connected Apps** tab.

3. For the app that you created, from the Actions (**...**) menu, select **Enable**.



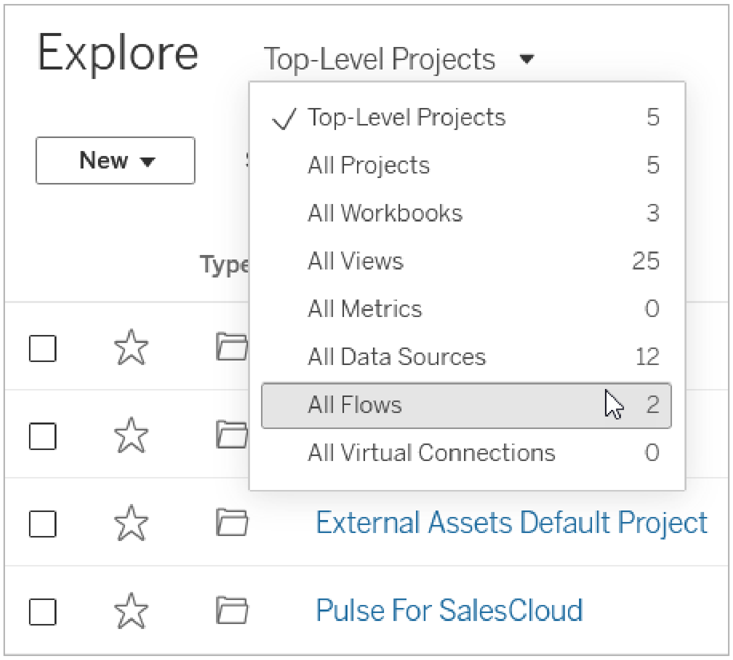

4. Also enable the connected app called “TableauPulseForSalesCloud.” This is the app that the Pulse for Salesforce app created.

## Embed credentials for your data in Tableau

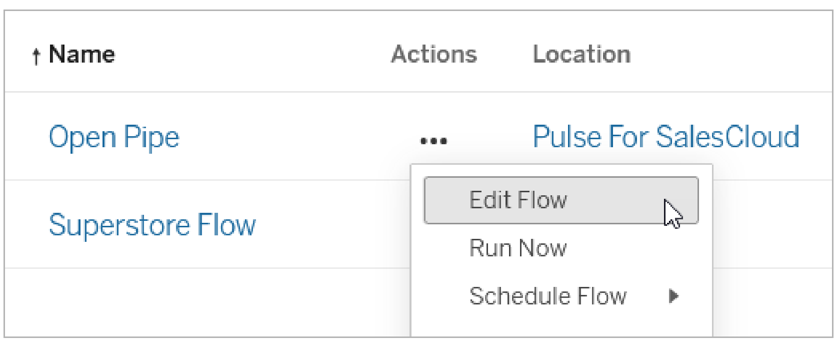
The app automatically creates Tableau data sources and a flow to get your data ready for Tableau Pulse. Embed your credentials so that Tableau can connect to your data.

## Embed credentials for the flow

1. From the Tableau Cloud navigation panel, select **Explore**.
2. In the content type menu, select **All Flows**.




3. From the Actions (**...**) menu for the flow called "Open Pipe," select **Edit Flow**.

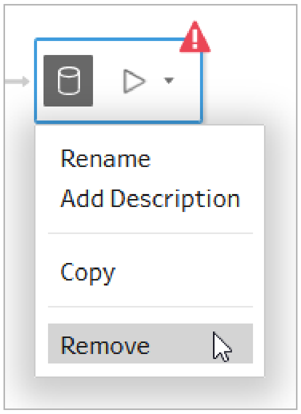



4. Under Connections, select the Salesforce connection.
5. Enter the credentials for the connection, then accept the prompt to allow access.
6. Wait as Tableau connects to your org and resolves any errors in your flow. This should take less than a minute.

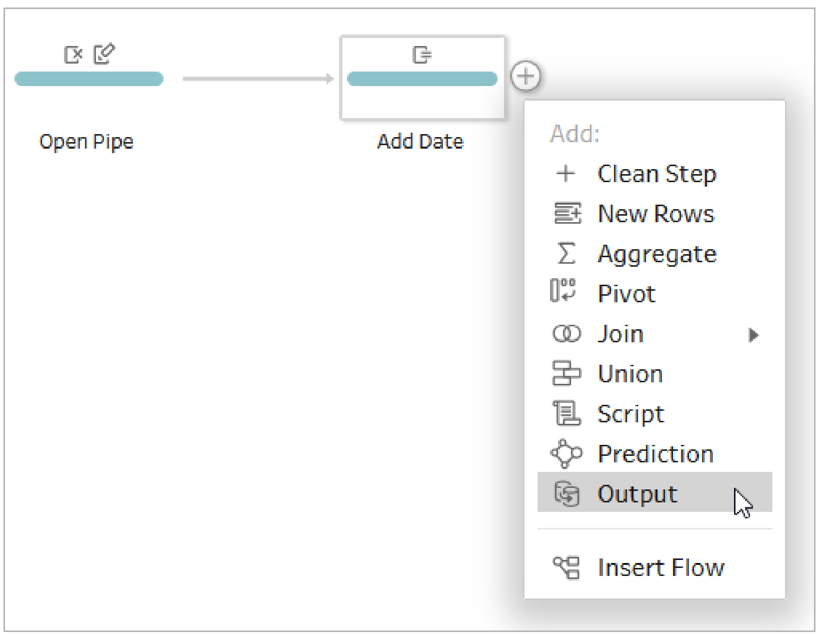
## Edit and run the flow

Edit the final step of the flow so that the output goes to the correct location for the Pulse for Salesforce app. For more information about working with flows, see Build and Organize your Flow.

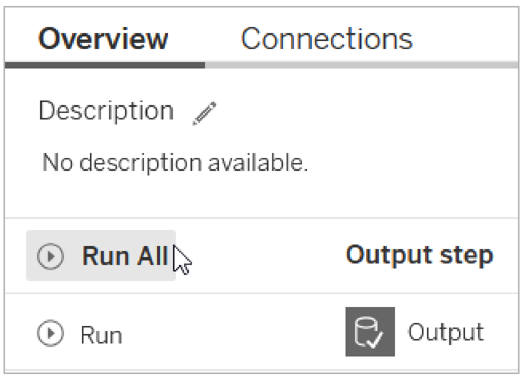
1. Right click on the Output step for the flow, then select **Remove**.




2. Select the **+** after the final step, then select **Output**.



3. For the Output step:
    1. For the Project, select **Pulse for SalesCloud**.
    2. For the Name, enter **Open Pipe Datasource**. The name of the output must be exactly that, or the metrics won't get the data they need.
    3. Under Full Refresh, select **Append to table**.
4. In the upper-right corner of the screen, select **Publish**.
5. When asked to embed credentials for every connection, check the **Embed credentials** box.
6. On the notification message, select **View Flow**.
7. On the flow page, select **Run All**.




## Embed credentials for the data source

1. From the Tableau Cloud navigation panel, select **Explore**.
2. In the content type menu, select **All Data Sources**.
3. From the Actions (...) menu for the data source called "Sales Cloud Metrics Datasource," select **Edit Connection**.
4. Select **Embed Salesforce credentials in the connection**, then select your Salesforce account.
5. Select **Save**.

## Refresh the data source extract

1. From the Actions (**...**) menu for the data source called "Sales Cloud Metrics Datasource," select **Refresh Extracts Now**.
2. Select **Full Refresh**.

## Check the app in Salesforce

The Pulse for Salesforce app automatically creates a set of metrics based on your Salesforce data.

| Metric | Description |
|---|---|
| Average Days to Close - Won | Average time it takes to win an opportunity |
| Closed Opportunities (Running Total) | Number of opportunities that are closed |
| Conversion Rate | Share of the amount of opportunities won in relation to the amount of all closed opportunities (expressed as a percentage) |
| Created Opportunities (Running Total) | Total number of opportunities |
| Open Pipe (Daily) | Sum of opportunity amount for open opportunities for today |
| Open Pipe (Weekly) | Sum of opportunity amount for open opportunities for this week |
| Pipe Gen (Running Total) | Sum of opportunity amount for open opportunities (IsClosed = false) by time dimension of Created Date |
| Total Sales | Sum of opportunity amount for won opportunities by time dimension of Close Date |
| Win Rate | Share of the number of won opportunities in relation to the number of all closed opportunities (expressed as a percentage) |

1. To make sure that the app is working as expected, in the Salesforce App Launcher, search for **Pulse**. Users who are assigned to the Pulse for Salesforce permission set can view this app in Salesforce.
2. Open the Pulse app.
3. Select a metric to open its insights exploration page.

4. Make sure that your data appears as expected. The chart might be empty if it’s the first day of the time period displayed.
5. If you initially limited the users who can access the Pulse app, after you’ve checked the metrics, add additional users to the permission set, then re-sync the app. For more information, see Control access.

# Customize the metrics

You can customize the metrics that the Pulse for Salesforce app creates by editing the metric definitions that they’re based on, and you can create additional metrics by adjusting the filters. Edits must be made on your Tableau Cloud site. You can’t edit the metric definitions through the Pulse for Salesforce app.

**Tip:** If you want to create metrics from scratch using different data, see Create Metrics with Tableau Pulse.

## Access metrics in Tableau Pulse

1. From the Tableau Cloud navigation panel, select **Tableau Pulse**.
2. Select **Browse Metrics** to see all metric definitions.
3. Select a definition to see the metrics based on that definition.

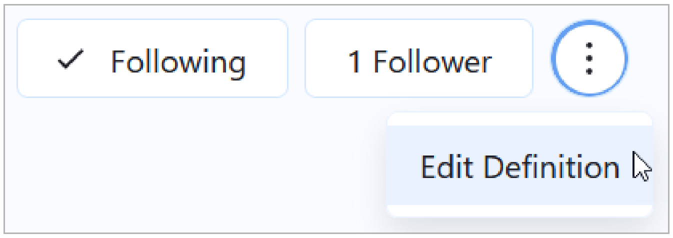
Metric definitions contain the core metadata for metrics. Edits made to a metric definition affect all metrics that are based on that definition. For more information about the relationship between metric definitions and metrics, see Metric definitions and metrics.

## Change the measure, time dimension, or definition filters

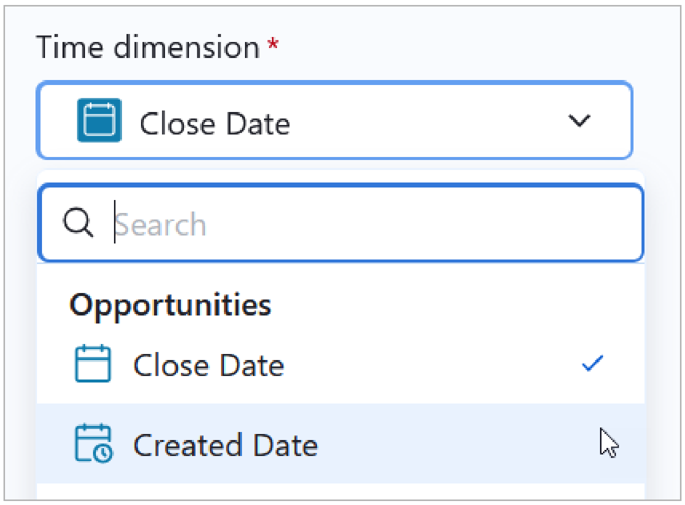
The measure and time dimension are the key components of a metric definition’s value, and definition filters are optional limits to that value. Edit the metric definition to change these fields. For more information about the key components of a metric definition, see Define the metric value.

Note that if you want to adjust the time range for a metric without changing the field used as the time dimension, you can simply filter an existing metric. For more information, see Create additional metrics.

1. In Tableau Pulse, open the metric that you want to change.
2. Select the actions (**...**) menu, then select **Edit Definition**.




3. For **Measure**, **Time dimension**, or **Definition filters**, select a different field from the data source. If you don't see the field you want to add, see Include more fields from your Salesforce data.



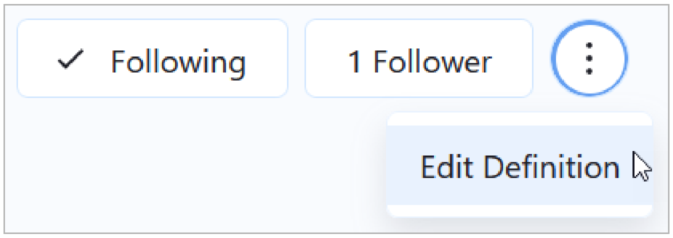

4. Select **Save Definition**.

**Tip:** If you need to combine data from multiple fields, see Create an advanced definition (optional). The advanced editor lets you create calculated fields. For more information about calculated fields, see Get Started with Calculations in Tableau.

## Change metric names

The name shown on a metric is the name of its definition. You can change this name by editing the definition.

1. In Tableau Pulse, open the metric that you want to rename.
2. Select the actions (**...**) menu, then select **Edit Definition**.

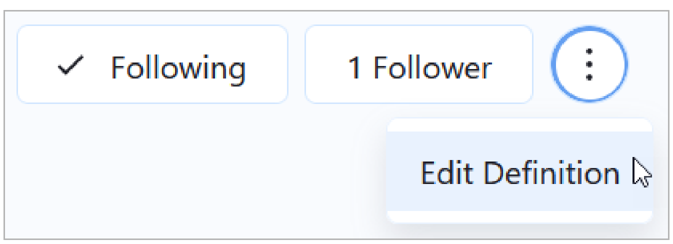



3. For **Name**, enter a new name.
4. Select **Save Definition**.

## Change insight dimensions

Insight dimensions are the fields that Tableau Pulse uses to generate insights about your data. The Pulse for Salesforce app automatically adds a set of insight dimensions to your metrics, and you can add more to look at other dimensions in your data. In addition to being used in insights, these dimensions are available as filters and in the question-and-answer experience on a metric's insights exploration page.

1. In Tableau Pulse, open the metric that you want to change.
2. Select the actions (**...**) menu, then select **Edit Definition**.

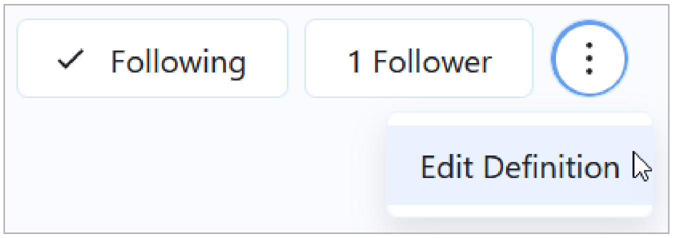



3. Under Adjustable metric filters, select **Add Filter Option**. The adjustable metric filters are used as insight dimensions.
4. Select the fields that you want to add.
5. Select **Save Definition**.

## Change currency format

By default, metrics show currency in the format of US Dollars. Adjust the currency setting to change the number format and currency symbol.

1. In Tableau Pulse, open the metric that you want to change.
2. Select the actions (**...**) menu, then select **Edit Definition**.




3. Under Number format, make sure that **Currency** is selected.
4. Under Currency, select a currency code.

## Include more fields from your Salesforce data

Each metric definition is connected to a data source, which is the link between your data and Tableau. The Pulse for Salesforce app automatically creates data sources based on your Salesforce data and uses these when creating metric definitions. If the field that you want to add as a measure or dimension isn't available when you go to edit a metric definition, edit the data source or flow to add it. After you edit the data source or flow, edit the relevant metric definitions and replace the pre-existing fields with the newly added fields.

The data source called "Sales Cloud Metrics Datasource" supplies the data for the following metrics:

- Average Days to Close - Won
- Closed Opportunities (Running Total)
- Conversion Rate
- Created Opportunities (Running Total)
- Pipe Gen (Running Total)
- Total Sales
- Win Rate

The flow called “Open Pipe” and the data source called “Open Pipe Data source” provide the data for the following metrics:

- Open Pipe (Daily)
- Open Pipe (Weekly)

The Pulse for Salesforce app brings in data from the User, Account, and Opportunity Salesforce objects. If you need data from different objects, make sure that they include equivalents for the fields in the following table.

| Salesforce object | Fields |
|---|---|
| User | Id, Name |
| Account | Id, Name, BillingState, BillingCountry, Industry |
| Opportunity | Id, AccountId, Amount, OwnerId, CreatedById |

**Tip:** If you need entirely different data from what is included in the prebuilt data source, use the Salesforce connector to create a new published data source. For more information about connecting to Salesforce data, see Salesforce CRM.

If your organization uses a platform like Snowflake to store your data, connect directly to that data platform. For more information, see Use Supported Connectors. Then create new metric definitions and metrics using that data instead.

Edit the Tableau data source to add a new Salesforce data object

If the data that you want to add is in an object that hasn’t yet been added to the data source, add it to the data canvas.

1. From the Tableau Cloud navigation panel, select **Explore**.
2. In the content type menu, select **All Data Sources**.
3. Open the data source called “Sales Cloud Metrics Datasource.”
4. Select **Edit Data Source**. For more information about editing a data source, see Edit a Published Data Source.
5. Drag the data that you want to add onto the canvas.
6. Relate or join the new object to the existing data. See Relate Your Data and Join Your

Data.

7. Select **Publish**.

Now, if you edit the metric definition, the added data appears when you go to select a field.

Edit the flow to change the filtered data

Metrics require a time dimension. For point in time data, it's necessary to use a flow to snapshot the data and create the time series. If you edit the flow to use different fields, the snapshot of that data starts when you first run the updated flow. For more information about flows, see Build and Organize your Flow.

1. From the navigation panel, select **Explore**.
2. In the content type menu, select **All Flows**.
3. Open the flow called "Open Pipe."
4. Adjust the fields filtered by the flow. For more information, see Filter Your Data.
5. Select **Publish**.
6. On the notification message, select **View Flow**.
7. On the flow page, select **Run All**.

## Create additional metrics

From a single metric definition, you can create as many metrics as there are combinations of filter options for that definition. Consider creating metrics that are specific to a particular role and adding only the relevant users or groups as followers. To learn how, see Create metrics.

You can create metrics only from fields that are included in the metric definition. To use different fields, either edit the metric definition or create a new definition.

## Add followers

You can add individual users or user groups as followers to metrics. To learn how to add followers on Tableau Cloud, see Manage followers. You can also add followers using the REST API with the Batch create subscriptions method.

Followers receive an email digest that shows how their metrics are doing. If they follow two or more metrics, they also see an insights summary highlighting notable changes to the data.

Users who are following metrics as part of a group can't individually unfollow those metrics. These users can, however, choose not to receive a digest of the metrics they follow. For more information, see Help users manage digests.

## Manage user groups

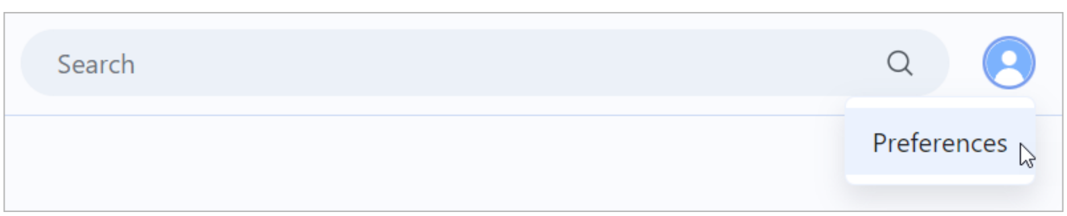
The Pulse for Salesforce app creates a Tableau user group called "Pulse for Sales Cloud." This group contains all the users that were part of the Salesforce permission set that you synced while setting up the app.

You can create a new group and add specific users to it. To learn how, see Create a Group and Add Users to It. You can also change the users in an existing group. To learn how, see Add users to a group (Groups page). Groups are useful for adding users with the same job role as followers to metrics. Groups can also be used to limit access to the data in metrics. For more information, see Control access.

## Help users manage digests

As a Tableau administrator, you can't change the digest settings for users. Users can individually opt out of receiving digests for the metrics they follow.

1. Open the Pulse app in Salesforce.
2. On a metric page, select the avatar icon at the upper-right corner, then select **Preferences**.




3. Choose whether to receive digests.
4. Choose how frequently to receive digests.
5. Select **Save**.

## Control access

Access controls to the data that have been configured in Salesforce don't carry over into Tableau Cloud. Unless you limit access to the data in Tableau Cloud, you should consider the data in the Pulse for Salesforce app accessible by all users.

### Sync access to the Tableau Pulse app

The users who you add to the Pulse for Salesforce permission set can access the app in Salesforce. Add or remove users from this permission set to limit access to the app. To learn how, see Manage Permission Set Assignments.

After you update the permissions set, open the wizard to re-sync the users with Tableau.

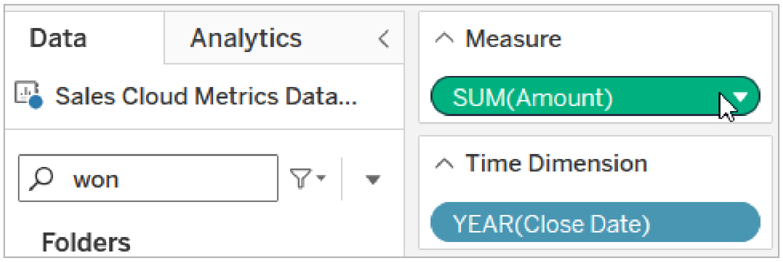
1. In the Salesforce App Launcher, search for the **Pulse Installation Wizard** and open it.
2. Select the **Sync New Users** tab.
3. Enter the same site information that you entered when setting up the app. See Set up the Pulse for Salesforce app.
4. Select **Test Connection**.
5. Acknowledge the message about syncing users, then select **Sync Users**. The users in the "Pulse for Sales Cloud" permission set are synced with the "Pulse for Sales Cloud" user group in Tableau.

### Limit access to individual metrics

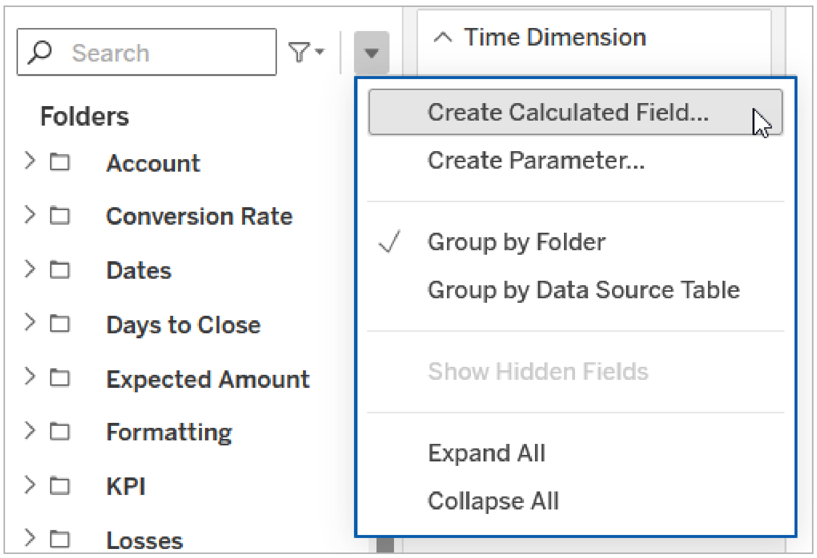
You can edit a metric definition to limit access to the data to a specific Tableau group. Before you edit the definition, create the user group that you plan to use to limit access. To learn how, see Create a Group and Add Users to It.

1. In Tableau Pulse, select the metric you want to limit access to.
2. Select the actions (**...**) menu, then select **Edit Definition**. Note the measure, aggregation, time dimension, and any definition filters.
3. Select **Create Advanced Definition**.
4. Drag the fields that you noted in step 2 to the **Measure**, **Time Dimension**, and **Filters** shelves.

5. On the measure name, select the arrow, then select the aggregation type.




6. Next to the field search box, select the arrow, then select **Create Calculated Field**.




7. In the calculation editor, enter the calculation that includes the group that you want to limit access to, replacing `GroupName` with your group's name.

```
ISMEMBEROF('GroupName')
```

8. Drag the calculated field to the **Filters** shelf.
9. For the filter, under List, select **Custom value list**.
10. Enter **True**, then select **Add**.
11. Uncheck **Include all values when empty**.
12. Select **OK** to apply the filter.
13. On the Advanced Analytics Editor, select **Apply**.
14. Select **Save Definition**.

## Implement row-level security

If you want your users to see data that's specific to them, for example, based on the organization they belong to or the region they sell in, you must implement row-level security for the data. There are a number of ways to implement row-level security for Tableau Cloud, depending on your goals and your data. For more information, see Overview of Row-Level Security Options in Tableau and Best Practices for Row Level Security with Entitlements Tables.

# About Data Management

**Important:** As of September 16, 2024, Data Management is no longer available as an independent add-on option. Data Management capabilities are only available if you previously purchased Data Management, or if you purchase certain license editions - either Tableau Enterprise (for Tableau Server or Tableau Cloud) or Tableau+ (for Tableau Cloud).

Data Management is a collection of features and capabilities that helps customers manage Tableau content and data assets in their Tableau Server or Tableau Cloud environment.

Starting in Tableau Server 2019.1, Tableau Prep Conductor is available for on-premise Tableau Server deployments, and in version 2019.3, Tableau Prep Conductor is available for Tableau Cloud deployments. You can use Tableau Prep Conductor to schedule and monitor flows.

Starting in Tableau 2019.3, Tableau Catalog is included in Data Management, making a variety of additional features available to you in the data management space. You can use Tableau Catalog to discover data, curate data assets, communicate data quality, perform impact analysis, and trace the lineage of data used in Tableau content.

Starting in Tableau 2021.4, more governance and security features are added to Data Management: virtual connections and data policies. Using the virtual connection editor, you can create:

- Virtual connections that provide a sharable central access point to data.
- Data policies to apply row-level security at the connection level.

## Data Management Features

The following table lists the features for Data Management, which include:

- Tableau Catalog
- Tableau Prep Conductor
- Virtual connections
- Data policies

## Tableau Catalog

| Feature | Description |
|---|---|
| Permissions on metadata | Tableau Catalog enables you to control who can see and manage external assets and what metadata is shown through lineage by setting permissions. |
| Expanded connect experience - data discovery | Whether you author in the web or in Tableau Desktop, you can now search for and connect to the specific databases and tables used by published data sources and workbooks on your Tableau Server or Tableau Cloud site. |
| Expanded search | Tableau Catalog expands search to include results based on columns, databases, and tables. |
| Tag external assets | You can categorize items on Tableau Server and Tableau Cloud with tags, helping users to filter external assets (databases, files, tables, and columns). |
| Certify databases and tables | Help users find trusted data that meets the standards you set by certifying databases and tables. |
| Set data quality warnings | You can set warnings to alert users to data quality issues, such as stale or deprecated data. |
| Lineage and impact analysis | The Lineage tool traces the source of your data. You can use it to analyze the impact of changes to your data, identify which users might be impacted, and email owners of a workbook, data source, or flow, or contacts for a database or table, about data-related updates. |
| Data Details | Enable users to better understand a published visualization by seeing information about the data used. |

| Feature | Description | |
|---|---|---|
| Add descriptions to assets | Help users find the data they're looking for by adding descriptions to databases, tables, and columns. | |
| Developer resources | Tableau REST API - metadata methods | Programmatically add, update, and remove external assets; and add additional metadata to Tableau content and external assets like descriptions. |
| | Tableau Metadata API | Programmatically query metadata from the content published to Tableau Server or Tableau Cloud. Programmatically update certain metadata using the metadata methods in the Tableau Server REST API.<br>**Note:** The Metadata API does not require Data Management. |
| | GraphiQL | Explore and test queries against the Metadata API schema using an interactive in-browser tool called GraphiQL.<br>**Note:** GraphiQL does not require Data Management. |

## Tableau Prep Conductor

| Feature | Description |
|---|---|
| *Schedule Flow Tasks* in the Tableau Cloud or Tableau Server help. | You can create scheduled flow tasks to run a flow at a specific time or on a recurring basis. |
| Monitor Flow Health and Performance | Set up email notifications at the site or server level when flows fail, view and resume suspended flow tasks, and view errors and alerts. |
| Administrative Views for Flows | Use Administrative Views to monitor the activities related to flows, performance history, and the disk space used at the |

| Feature | Description |
|---|---|
| | server or site level. |
| Tableau REST API - flow methods | Programmatically schedule flows. |

## Virtual connections and data policies

| Feature | Description |
|---|---|
| Create a Virtual Connection | A Tableau content type that enables you to create a shareable reusable connection to curated data. |
| Create a Data Policy for Row-Level Security | Use the virtual connection editor to create data policies with policy conditions that apply row-level security to the data at the connection level. |
| Test Row-Level Security with Preview as User | Test the data policy with Preview as user to ensure that users can see only their data. |
| Schedule Extract Refreshes for a Virtual Connection | Create an extract refresh schedule for the tables in your connection, ensuring that the data is fresh for any content that uses that virtual connection. |

# License Data Management

**Important:** As of September 16, 2024, Data Management is no longer available as an independent add-on option. Data Management capabilities are only available if you previously purchased Data Management, or if you purchase certain license editions - either

Tableau Enterprise (for Tableau Server or Tableau Cloud) or Tableau+ (for Tableau Cloud).

Data Management includes Tableau Catalog, Tableau Prep Conductor, virtual connections, and data policies and is available when you purchase Tableau Enterprise or Tableau+. Contact your account manager (or go to the Tableau pricing page) for more information.

## Tableau Prep Conductor

When you purchase Tableau Enterprise or Tableau+ licenses, Prep Conductor is automatically enabled on your Tableau Cloud site. For more information, see Enable Tableau Prep Conductor on your Tableau Cloud Site.

- At least one resource block is required to use Tableau Prep Conductor in Tableau Cloud. To learn more about resource blocks, see Resource Blocks.
- When Data Management is active and enabled, you can schedule flows in Tableau Server or Tableau Cloud and monitor flows.
- When Data Management is removed or deactivated, or if the Data Management license expires, then the ability to schedule flows is disabled.
- If your Tableau Server or Tableau Cloud license is still active and valid, you can download the flows using the Tableau Server REST API. For more information, see Flow Methods.

## Tableau Catalog

When you purchase Tableau Enterprise or Tableau+ licenses, Catalog is automatically enabled.

- When Data Management is active and enabled, you can use Tableau Catalog to discover data, curate data assets, perform impact analysis, and trace the lineage of data used in Tableau content.
- When Data Management is removed, deactivated, or the license expires, the information remains on the server. The Tableau Catalog-specific information is then only accessible using the Tableau Metadata API; it no longer appears in the product. For more information, see the Metadata API.

- When Data Management is removed, deactivated, or the license expires, the write APIs for all new Tableau Catalog information (for example, table descriptions, data quality warnings, column descriptions) are disabled. You can still read information using the Metadata API, however permissions on tables and databases can't be explicitly managed in the product.

## Virtual connections and data policies

When you purchase Tableau Enterprise or Tableau+ licenses, virtual connections and data policies are automatically enabled on your Tableau Cloud site.

After you purchase and license Data Management for Tableau, virtual connections and data policies are automatically enabled.

- When Data Management is active and enabled, you can use virtual connections to create sharable resources that provide a central access point to data. You can also create data policies that enable you to filter data for users using centralized row-level security.
- When Data Management is removed, deactivated, or the license expires, the information remains on the server but is not accessible.
- When Data Management is reactivated, the information is restored on the server and becomes accessible.

## Resource Blocks

Resource Blocks are units of compute capacity in Tableau Cloud. Resource Blocks run Tableau Prep Conductor flows. Each Resource Block can run one flow at a time so the number of flows you can run concurrently is equal to the number of Resource Blocks that you have.

When you license Data Management for Tableau Cloud, you must purchase at least one Resource Block. To purchase more Resource Blocks, contact your account manager (or go to the Tableau pricing page for more information).

# Tableau Prep Conductor

Tableau Prep Conductor enables you to leverage the scheduling and tracking functionality available in Tableau Cloud to run your flows automatically to update the flow output. Tableau

Prep Conductor is part of Data Management and must be enabled to schedule your flows to run.

> **Note**: The Data Management is only required if you plan to run flows on a schedule or set up email notifications. You do not need the Data Management license to publish flows and manually run them on the web. As a Creator, you can also create and edit flows directly on your server. For more information authoring flows on the web, see Tableau Prep on the Web.

Flows created in Tableau Prep Builder must be published to Tableau Cloud before they can be scheduled to run. Publishing flows is similar to publishing data sources and workbooks. You can package files with the flow or specify a direct connection to data sources to update the flow input as data changes. If your flow connects to databases, specify the authentication type and set credentials to access the data.

You can also publish a flow to share it with others or to continue editing it on the web. For example, publish an incomplete flow to Tableau Cloud and then open the flow on the web in Edit mode to continue working on it. You could also create a flow with only Input steps (that are properly configured) and share it with co-workers who can then download the flow to their computers and create and publish their own flows.

For flows to run they must include output steps and have no errors or incompatible features. For more information about publishing a flow, see Publish a Flow to Tableau Server or Tableau Cloud. For more information about incompatibility, see Version Compatibility with Tableau Prep.

The following table shows the flow management features that are available with and without the Data Management and Tableau Prep Conductor enabled.

| Data Management with Tableau Prep Conductor enabled | No Data Management |
| --- | --- |
| • View and monitor the details about your flow, | • View the details about your |

| | |
|---|---|
| including recent activity in the **Content** pages.<br>• Edit your flow (starting in version 2020.4).<br>• View the results of the flow runs and any errors in the **Run History** tab.<br>• Use **Administrative Views** to monitor server and site activity including a new view that tracks flow performance history.<br>• View detailed alerts for failed flow runs.<br>• Set up email notification alerts to send emails to flow owners notifying them when the flow failed to run and why.<br>For more information about setting up alerts, see Monitor Flow Health and Performance. | flow, including recent activity in the **Content** pages.<br>• Edit your flow (starting in version 2020.4).<br>• View and edit your connections on the **Connections** tab. |

## Enabling Tableau Prep Conductor on Tableau Cloud

After you purchase and license Data Management, you must enable Prep Conductor on Tableau Cloud. For more information, see Enable Tableau Prep Conductor on your Tableau Cloud Site and License Data Management

## About the Flow Workspace

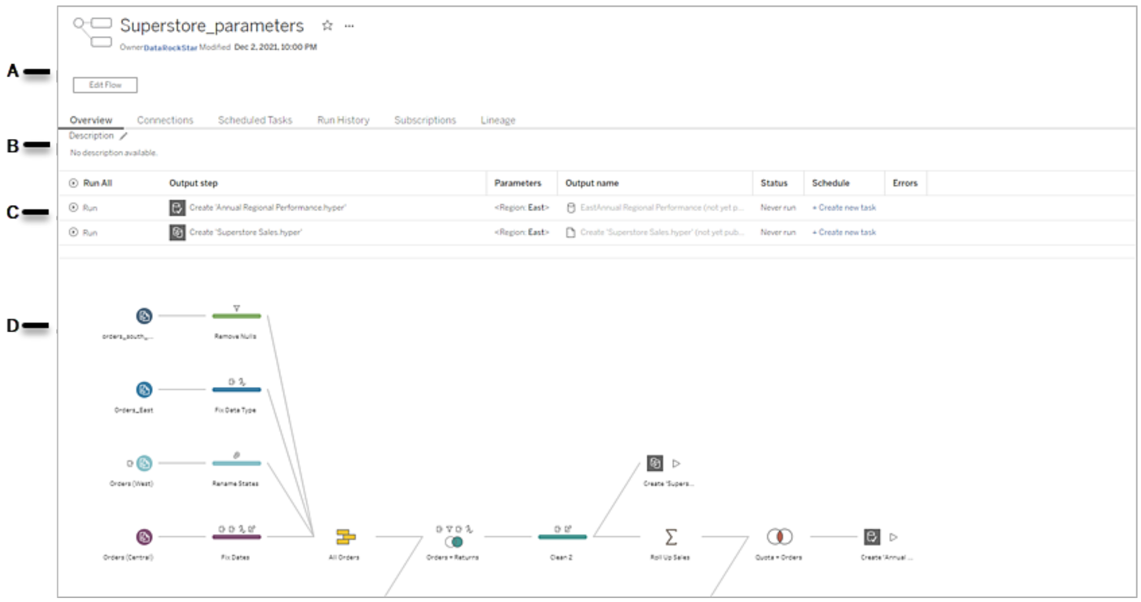
After you publish your flow you can schedule tasks or linked tasks (version 2021.3 and later) in Tableau Cloud to automatically run your flows on a regular basis to keep your output data fresh. You can also run your flows manually at any time (no Data Management required).

Tableau Prep Conductor leverages much of the same functionality for managing flows that you might see when managing workbooks or data sources from Tableau Desktop in Tableau Cloud. For example, just like extract refreshes, scheduled flow tasks and on-demand flow runs are queued as background tasks. But when it comes to working with flows, there are a few differences.

## Flow Overview page

The flow **Overview** page is the main landing page where you can view data about your flow and schedule, monitor, and maintain the flow. If you don't have the Data Management, you will have different options.

Open the flow **Overview** page by clicking on a flow in your list. You can navigate there from **Content** > **Explore** > **All Flows** or by opening the project that contains your flows.




A. The header lists the name of the flow, the flow owner and the date that the flow was last modified. Starting in version 2020.4, click **Edit** to edit existing flows.

   Add a flow to your favorites, or from the **More actions** ••• menu you can also edit, run, download the flow, set permissions, change the flow owner, restore previous flow versions, and more.

B. View and edit the flow description and set tags to help others find the flows they are looking for.

c. View the output steps for a flow along with any parameters applied to the flow (version 2021.4 and later), the status of the last update, any schedule the output is assigned to, and any errors from the last flow run. You can also click the **Run** button to run all output steps or individual output steps on-demand.

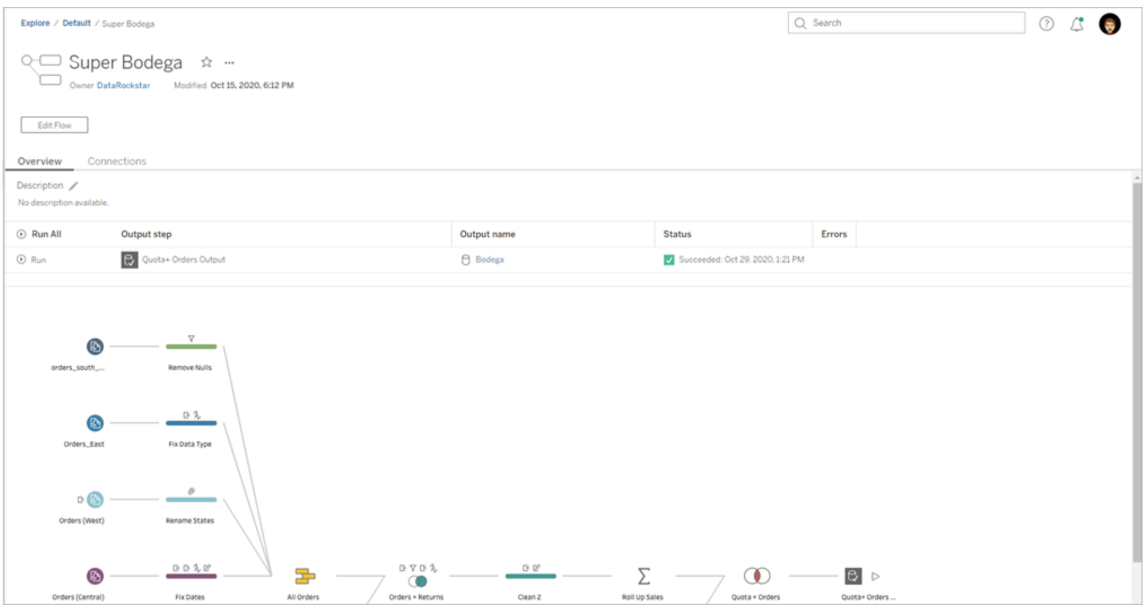
| | |
|---|---|
| **Parameters** | If the flow includes user parameters, the parameter value last run in the flow is shown and you can see all generated outputs in the **Output** column. When the flow is run, you'll be prompted to enter the parameter values.<br><br>System parameters (version 2023.2 and later) are automatically generated at flow run time and the type of system parameter is shown in the **Parameters** column. To see the last system parameter value applied to the flow, edit the flow.<br><br>For more information about using parameters in flows, see Create and Use Parameters in Flows in the Tableau Prep help. |
| **Status** | After a flow has run successfully, outputs that are data sources become links that you can click to open the **Data Source** page to view more information about the data source or edit the flow input connection. |
| **Schedule** | In the **Schedule** field, view the scheduled tasks that the output step is assigned to. A flow output can be assigned to one or more tasks.<br><br>If no schedule has been assigned yet, click **Create new task** to add the output step to a schedule. To immediately run the flow to update a specific output step, click the **Run** button on the left-hand side of the row. |
| **Errors** | If the flow has errors, the flow run will fail. Connectivity errors can be resolved directly by navigating to the **Connections** tab for the flow and editing the input connections. |

| | |
|---|---|
| | To resolve any other flow errors, edit the flow then republish it and try running the flow again. If you are using an earlier version of Tableau Prep Builder, from the **More actions** ••• menu, you can also download and open the flow in Tableau Prep Builder, then republish it and try running the flow again. |

D. View an image of the flow.

Flow Overview page without the Data Management

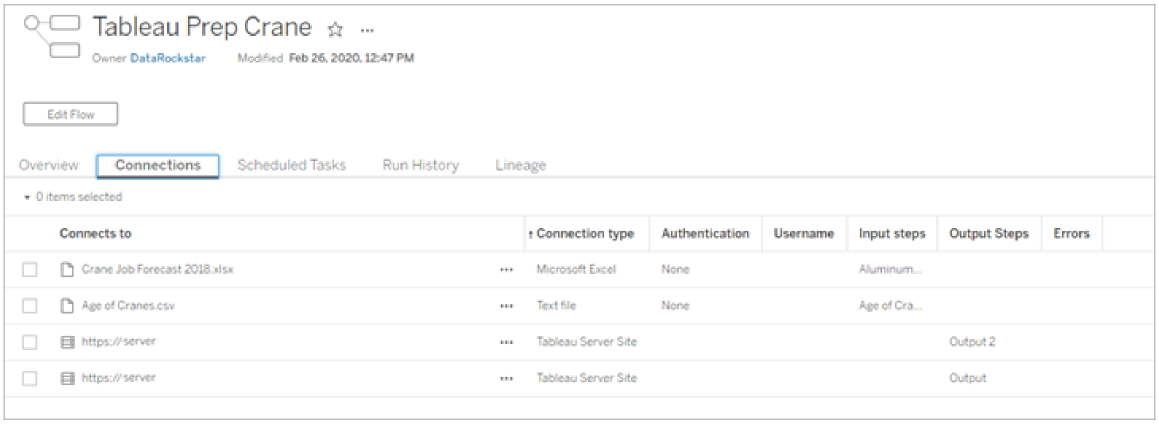
If you don't have the Data Management installed on your server, you can still publish flows to Tableau Cloud, but you will see fewer options to manage your flow.




## Flow Connections page

View both the input and output locations for a flow, connection types, authentication settings, input and output steps and any connectivity errors. You can set authentication settings when publishing a flow. For more information, see Publish a Flow.

For database input types, click the **More actions** ••• menu for an input connection to edit the connection and change the server name, port, user name and password.




## Flow Scheduled Tasks page (Data Management required)

View any schedules that the flow is assigned to, the outputs that are included in those schedules, and any parameters applied to the flow (version 2021.4 and later). As an administrator, you can click the schedule link to open the **Schedules** page and see a list of flows that are assigned to that schedule. For more information about assigning flows to a schedule, see *Schedule Flow Tasks* in the Tableau Cloud or Tableau Server help.

To view the outputs on a schedule or the tasks assigned to a linked task (version 2021.3 and later), click the links in the **Schedule type** column.

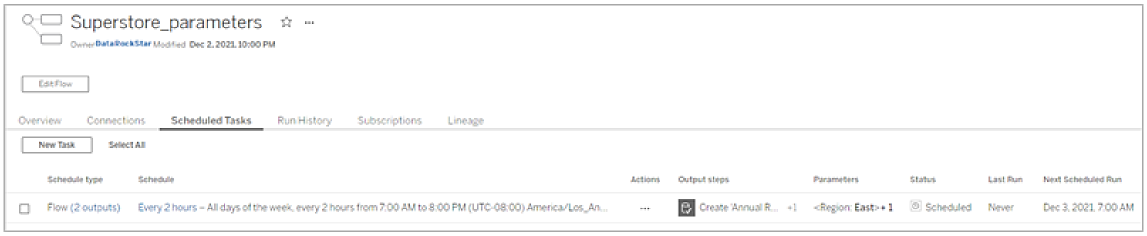
You can also add new tasks or manage existing ones from this page. To take action on an existing task, select the check box on a task card then click the **Actions** drop-down menu to run, edit, or delete the task.

If a flow task fails to run after 5 consecutive attempts, the flow is automatically suspended.

You can see that status on the **Overview** tab as well as this tab. You can resume suspended tasks from this menu.

For more information about suspended flow tasks, see View and resolve errors.

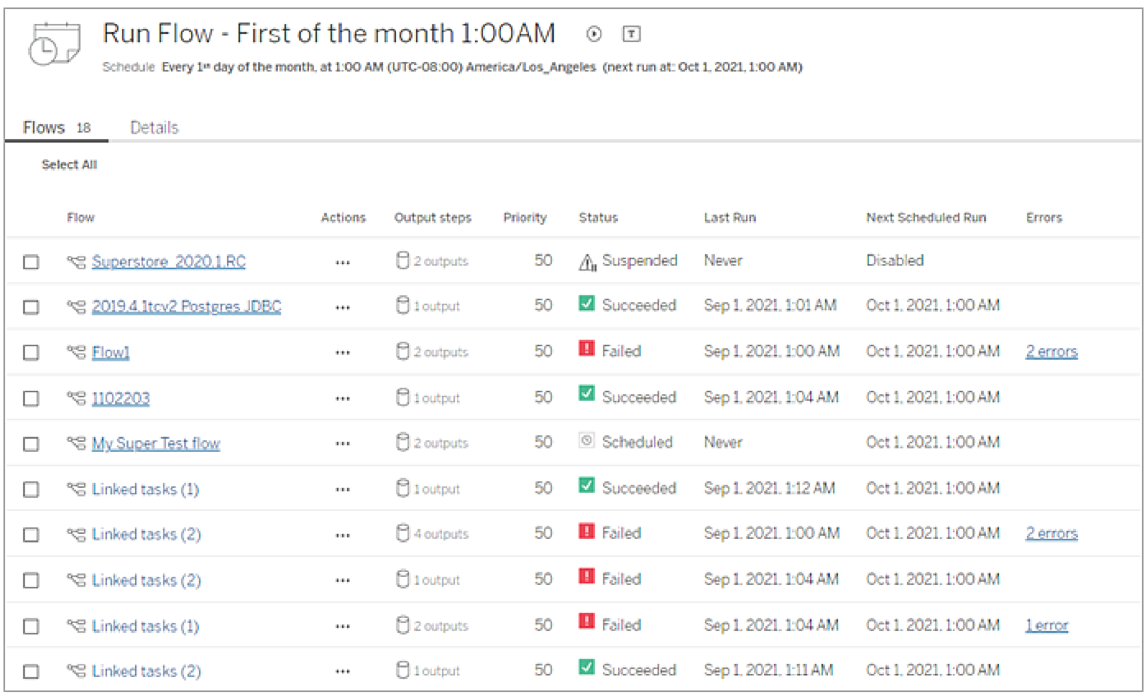
**Note**: The Scheduled Tasks page for flows was redesigned in version 2021.3. Your view may look different depending on your server version.




## Schedules page

On the **Schedules** page, you can view the flows assigned to a schedule and the details about the flow runs. If the schedule includes linked tasks (version 2021.3 and later) the number of flows included in the linked tasks is shown.

You can run the schedule on-demand and run all flows assigned to it. You can also select one or more flows, then use the **Actions** menu to change the flow schedule or priority, delete selected flows from the schedule or resume suspended flows.



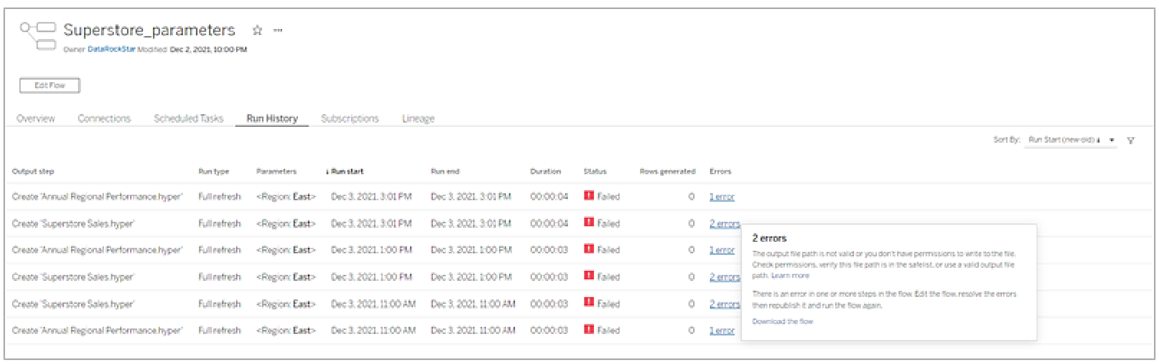

| Flow | Actions | Output steps | Priority | Status | Last Run | Next Scheduled Run | Errors |
|---|---|---|---|---|---|---|---|
| Superstore_2020.1.RC | ... | 2 outputs | 50 | Suspended | Never | Disabled | |
| 2019.4.1tcv2 Postgres JDBC | ... | 1 output | 50 | Succeeded | Sep 1, 2021, 1:01 AM | Oct 1, 2021, 1:00 AM | |
| Flow1 | ... | 2 outputs | 50 | Failed | Sep 1, 2021, 1:00 AM | Oct 1, 2021, 1:00 AM | 2 errors |
| 1102203 | ... | 1 output | 50 | Succeeded | Sep 1, 2021, 1:04 AM | Oct 1, 2021, 1:00 AM | |
| My Super Test flow | ... | 2 outputs | 50 | Scheduled | Never | Oct 1, 2021, 1:00 AM | |
| Linked tasks (1) | ... | 1 output | 50 | Succeeded | Sep 1, 2021, 1:12 AM | Oct 1, 2021, 1:00 AM | |
| Linked tasks (2) | ... | 4 outputs | 50 | Failed | Sep 1, 2021, 1:00 AM | Oct 1, 2021, 1:00 AM | 2 errors |
| Linked tasks (2) | ... | 1 output | 50 | Failed | Sep 1, 2021, 1:04 AM | Oct 1, 2021, 1:00 AM | |
| Linked tasks (1) | ... | 2 outputs | 50 | Failed | Sep 1, 2021, 1:04 AM | Oct 1, 2021, 1:00 AM | 1 error |
| Linked tasks (2) | ... | 1 output | 50 | Succeeded | Sep 1, 2021, 1:11 AM | Oct 1, 2021, 1:00 AM | |

## Flow Run History (Data Management required)

See, search, and sort through a list of historical runs for a flow. This page also includes details about the flow run such as run type, parameter values applied to flows included in each flow run (version 2021.4 and later), duration and number of rows that were generated.

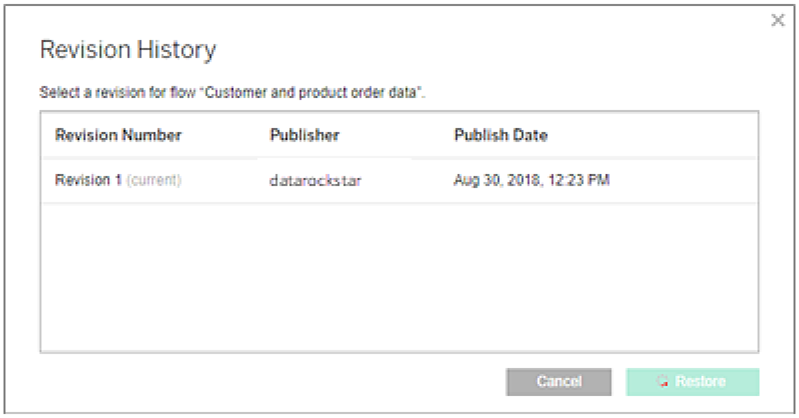
If the flow output has an error, hover over the error to view the messages. If applicable, click the **Go to Connections** link in the error message to navigate to the **Connections** page to fix connectivity errors. You can also edit the flow directly to fix any errors, or click **Download the flow** to download and fix flow errors in Tableau Prep Builder, then republish the flow to continue to manage it using Tableau Prep Conductor.

**Note**: The run history for a flow will persist unless the flow is deleted.



## Flow Revision History

If you need to revert a flow to a previous version, from the **More actions** ••• menu for the flow, select **Revision History**. On the **Revision History** dialog, select the flow version from the list that you want to revert to.




### Who can do this

Server Administrators can activate Data Management license keys.

Server administrators can enable Tableau Prep Conductor.

Creators can create, edit, and run flows manually. If the Data Management is installed, creators can run flows on a schedule.

## Enable Tableau Prep Conductor on your Tableau Cloud Site

Prep Conductor is automatically enabled on your Tableau Cloud site after you purchase Data Management. For information on how to purchase Data Management, contact your account manager.

### Verify Tableau Prep Conductor is enabled

1. From Tableau Prep Builder, sign in to Tableau Cloud by selecting **Server** >**Sign In**.

   If your site is set up to use Tableau authentication, enter your user name (email address) and password you use for Tableau Cloud, and then click Sign In. If multi-factor authentication (MFA) is enabled with Tableau authentication, you are prompted to verify your identity using the verification you selected during the MFA registration process. If you are signing in to Tableau Cloud or registering for MFA for the first time, see Register for multi-factor authentication.

After verifying your identity, you are redirected to your site.

2. Open any of your flows.

3. Verify if there is a **Scheduled Tasks** tab. If the tab is there, then Prep Conductor is enabled.

# Schedule Flow Tasks

**Note**:Flows can be scheduled to run on Tableau Cloud or Tableau Server using Tableau Prep Conductor. Prep Conductor is licensed through Data Management on a per deployment basis. After you purchase and license Data Management, you must enable Prep Conductor.
Starting in version 2020.4.1, you no longer need the Data Management license to publish flows to the web. As a Creator, you can also create and edit flows directly on your server. For more information authoring flows on the web, see Tableau Prep on the Web.

**Note**: With the 2024.1 release, changes were introduced for flow schedules on Tableau Cloud. The Schedules tab on the left navigation pane has been removed and you can now create custom schedules directly from your flows Scheduled Tasks tab.

Starting in version 2021.3, you can link flow runs together when scheduling tasks to run flows one after the other. For more information, see Schedule linked tasks in this topic.

Starting in version 2022.1, you can also run linked tasks via the REST API using the new flow methods **Query Linked Tasks**, **Query Single Linked Tasks**, and **Run Linked Task Now**. For more information, see Flow Methods in the Tableau REST API help.

**Running flows that include parameters**

Starting in version 2021.4, you can include user parameters in your flows to make flows more dynamic. When the flow runs, you are prompted to enter your parameter values. When setting up flows on a schedule, you specify parameter values at that time.

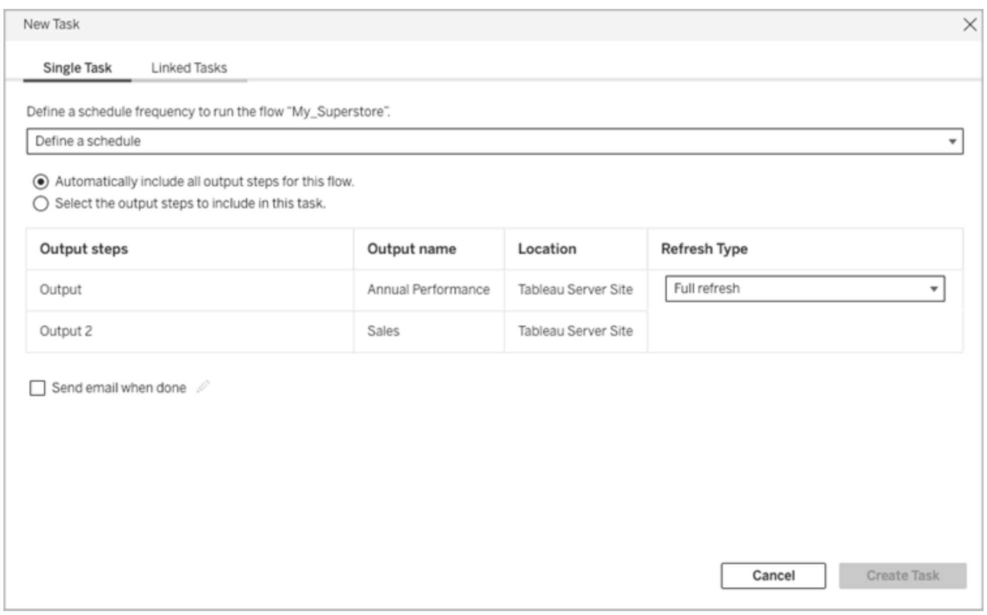
You must specify the parameter values for any required parameters. For optional parameters, you can enter those values as well, or accept the current (default) value for the parameter. For more information about running flows with parameters, see Run flows on a schedule in the Tableau Prep help.

Starting in Tableau Prep Builder and Tableau Cloud version 2023.2, you can apply date or time system parameters to flow output names for file and published data source output types. The start time is automatically added to the flow output name.

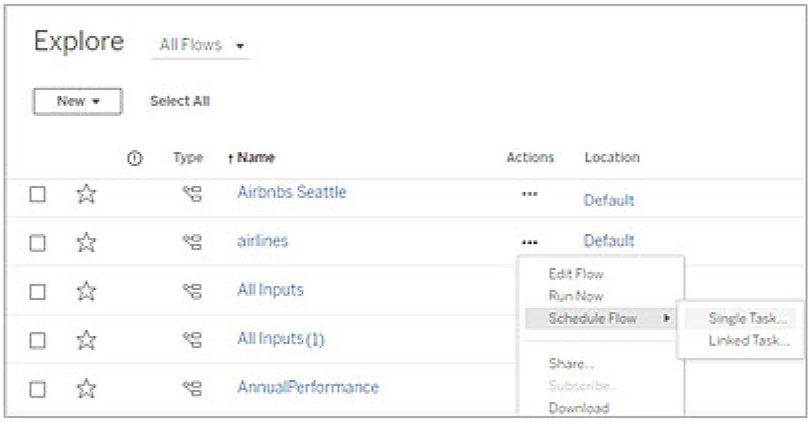
> **Note**: Your administrator must enable the **Flow Parameter** server and site settings on your server before you can run flows that include parameters in Tableau Server or Tableau Cloud. For more information, see **Create and Interact with Flows on the Web** in the Tableau Server or Tableau Cloud help.

## Schedule a flow task

1. To create a schedule for a single task, do one of the following:
   - From the Overview page for the flow, click the Scheduled Tasks tab, click **New Task** or click the drop-down and select **Single Task**.



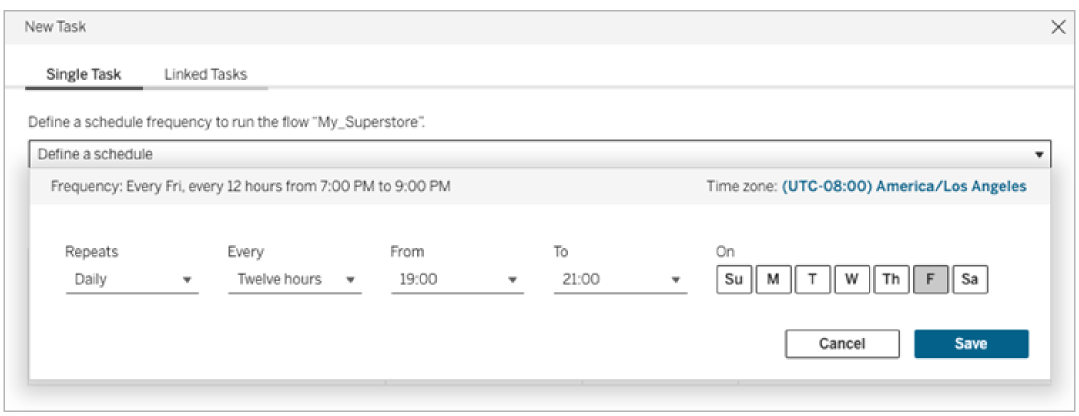
- From the **Explore** page, in **List** view, in the **Actions** menu, select **Schedule Flow** > **Single Task**. If you select a flow in the list, you can also use the top **Actions** menu.




2. On the Single Task tab of the New Task dialog, click **Define a schedule**.

3. Click **Time zone**. You are directed to the settings page. Scroll to Time Zone for Scheduled Tasks, select a time zone, then click **Save Changes**.

4. Enter the frequency of the task, then click **Save**.




You can set the frequency to run hourly, daily, weekly or monthly. The time and day intervals depend on the repeat frequency that you select as described below:

- **Hourly**: The available frequency is every hour from a specific time to a specific time. This means that the task will run every hour during the specified time.

- **Daily**: The available frequencies are every two, four, six, eight, or twelve hours, or just once a day. You can also choose one or more days of the week, in addition to start and end times. This means you can run a task on all or certain days of the week at specific hourly intervals or once a day.
- **Weekly**: The available frequency is one or more days of the week at a specific time. This means you can run the task on certain days of the week, once a week at a certain time.
- **Monthly**: You can set this up in two different ways:
  - You can select **Day** as the frequency interval which then allows you to select specific dates of the month. For example you can select the task to run on the 2nd, 15th and 28th of every month at 2:45 pm.
  - You can also choose the first, second, third, fourth, fifth, and the last day of the week at a specific time. For example you can choose to run the task every second Wednesday of the month at 2:45 pm.

5. Select one of the following options:
   - **Automatically include all output steps for this flow:**(default) Select this option to include all current and future output steps for this flow in the scheduled task. As new output steps are added to the flow over time, they're automatically included in the schedule when it runs.
   - **Select the output steps to include in this task**: Select this option and manually select the output steps to include in this scheduled task.

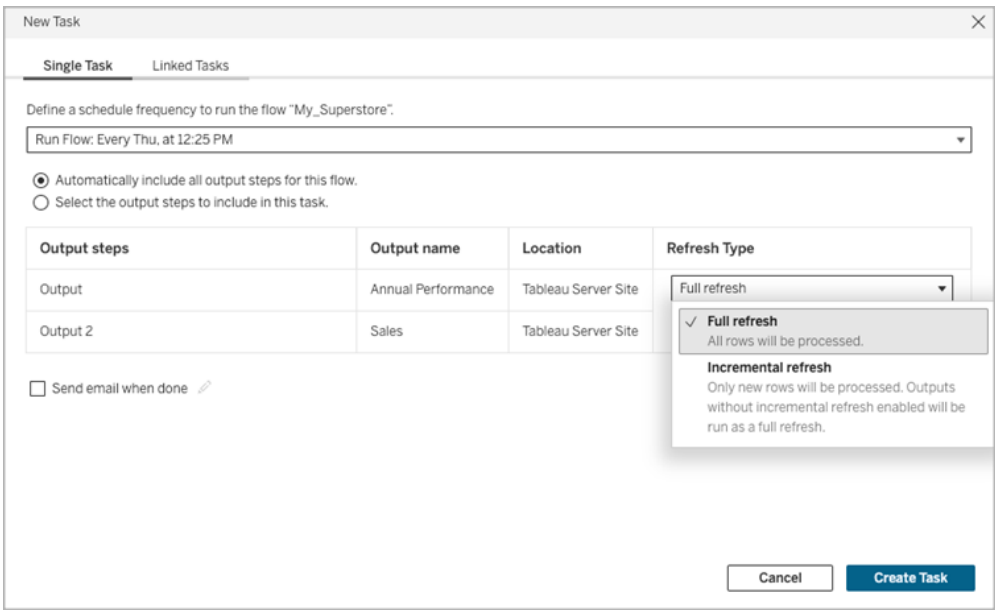
     To include all output steps in the flow task, select the check box next to **Output Steps**. This area can't be edited if the **Automatically include all output steps for this flow** radio button is selected. Select the other radio button to enable this section.

6. Select a **Refresh Type**. For more information about these settings, see Refresh Flow Data Using Incremental Refresh.

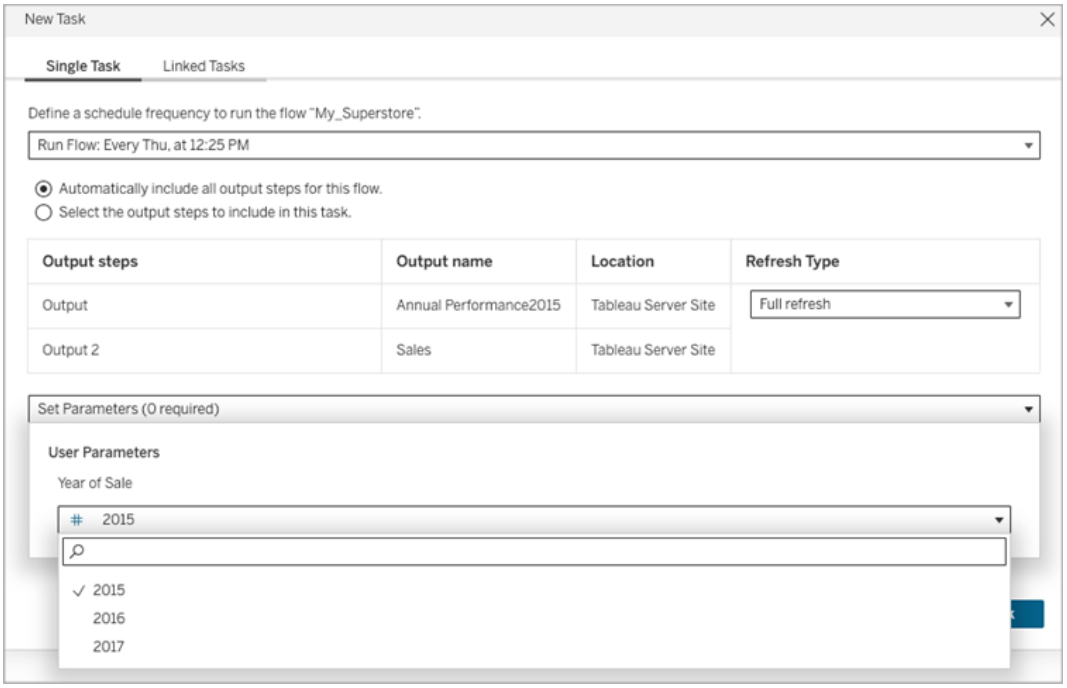
   > **Note**: If one input is configured to use incremental refresh and it's associated with multiple outputs, those outputs must be run together and must use the same refresh type. Otherwise the flow fails.

- **Full refresh** (default): Refresh all data and create or append data to your table based on the flow output setting.
- **Incremental refresh**: Refresh only the new rows and create or append data to your table based on the flow output setting. The incremental refresh option is only available when the flow is configured to use this refresh type.

> **Note**: Tableau Prep Conductor runs a full refresh for all outputs regardless of the run option you select if no existing output is found. Subsequent flow runs will use the incremental refresh process and retrieve and process only your new rows unless incremental refresh configuration data is missing or the existing output is removed.




7. (optional) If you're the flow owner, select **Send email when done** to notify users when the flow is successful. For more information about how to send email notifications on flow runs, see Notify Users of Successful Flow Runs.
8. If your flows include parameters, enter any required or optional parameter values. You must enter required values for the flow to run.




9. Click **Create Task** to create the scheduled task.

## Schedule linked tasks

*Supported in Tableau Server and Tableau Cloud version 2021.3.0 and later.*

**Note**: Starting in version 2022.1, Linked tasks functionality is enabled by default. Server and Site Administrators can turn off this functionality on the **Settings** page and on flow schedules in the **Schedules** dialog. In previous versions, Server Administrators must first enable this functionality to use and manage it.

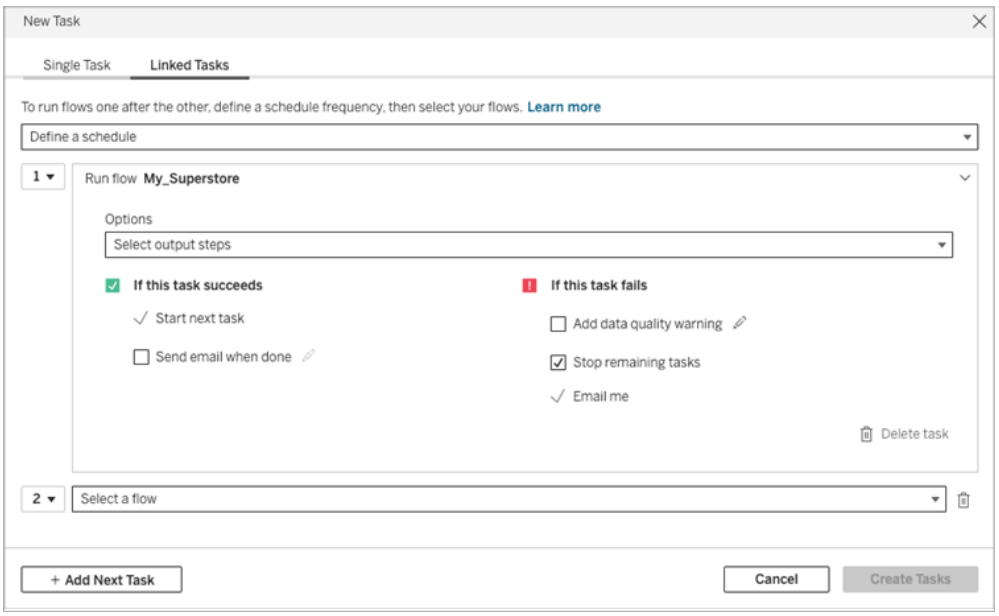
Use the **Linked Tasks** option to schedule up to 20 flows to run sequentially, one after the other. Easily set up your flow list by selecting your schedule, then select downstream flows to run in the order you choose.

Flows run in the order specified in the list. Use the menu to move flows around in your list or add new upstream or downstream flows to the list at any time.

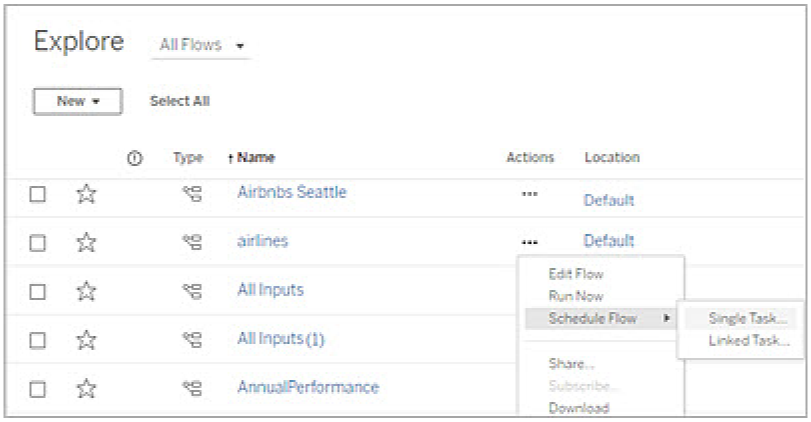
The duration of each individual linked task is counted towards the total flow runtime limit. If the runtime limit is reached when a flow task is run, the flow task will timeout, the linked task fails, and any downstream flows won't run. For more information, see Job Runtime capacity.

Select the outputs that you want to include in the flow run and configure the settings to tell Tableau what to do with remaining flows in the schedule when the previous flow run fails.

1. To create a schedule for a linked task, do one of the following:
   - From the **Overview** page for the flow, **Scheduled Tasks** tab, click **New Task** and select the **Linked Task** tab, or click the drop-down and select **Linked Task**.

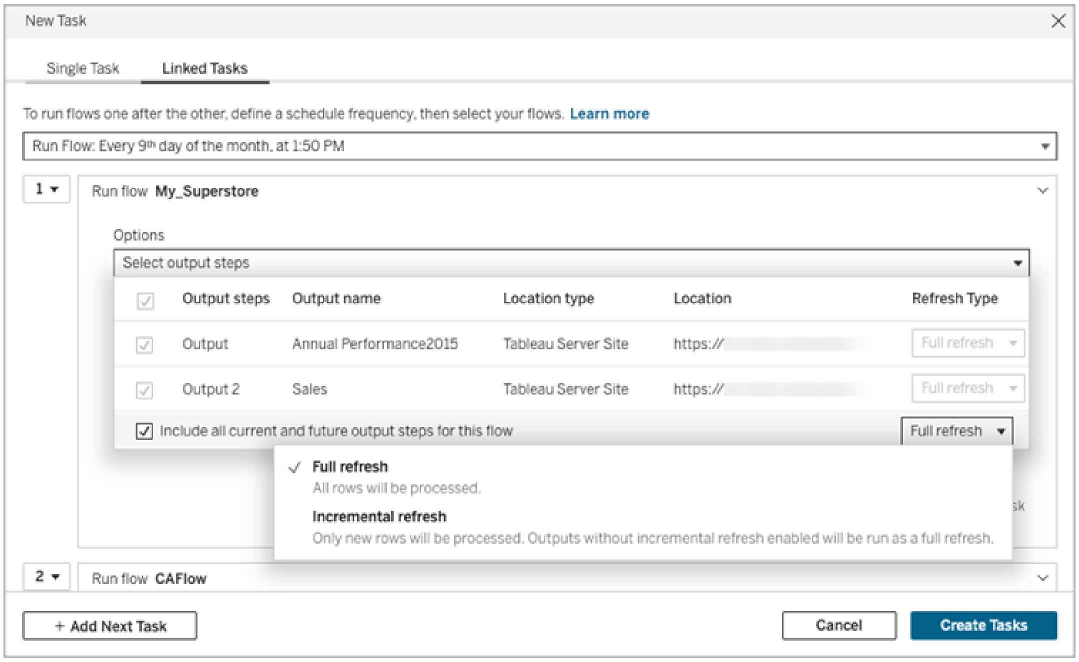
   - From the **Explore** page, in **List** view, in the **Actions** menu, select **Schedule Flow** > **Linked Task**. If you select multiple flows in the list, you can also use the top **Actions** menu.




If the output step isn't assigned to a task, you can also create a new task from the **Overview** page. On that page, in the **Schedules** field, click **Create new task**.

2. On the Linked Task tab of the New Task dialog, click **Define a schedule**.
3. Enter the frequency of the task, then click **Save**.
4. Click the **Select output steps** drop-down to select the flow outputs to run. By default, all flow outputs are included. To select specific outputs, clear the **Include all current and future output steps for this flow** check box.

   The flow where the task is initiated is automatically set as the first flow to run, but you can use the menu to change the run order after you add other flows to your list.




5. Select your refresh type from the following options:

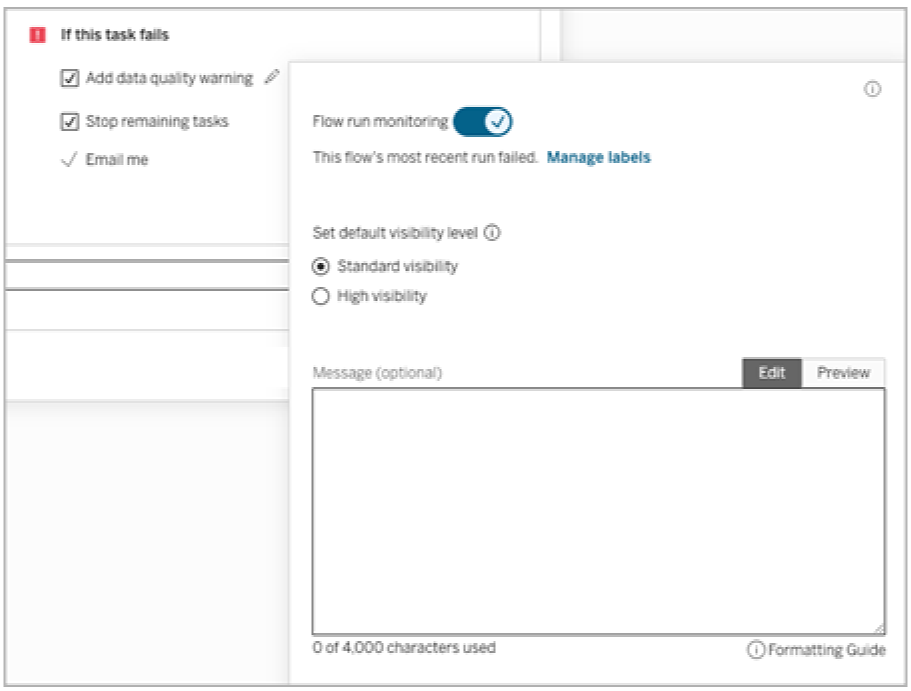
> **Note**: If one input is configured to use incremental refresh and it's associated with multiple outputs, those outputs must be run together and must use the same refresh type. Otherwise the flow fails.

- **Full refresh** (default): Refresh all data and create or append data to your table based on the flow output setting.
- **Incremental refresh**: Refresh only the new rows and create or append data to your table based on the flow output setting. The incremental refresh option is only available when the flow is configured to use this refresh type. For more information, see Refresh Flow Data Using Incremental Refresh.

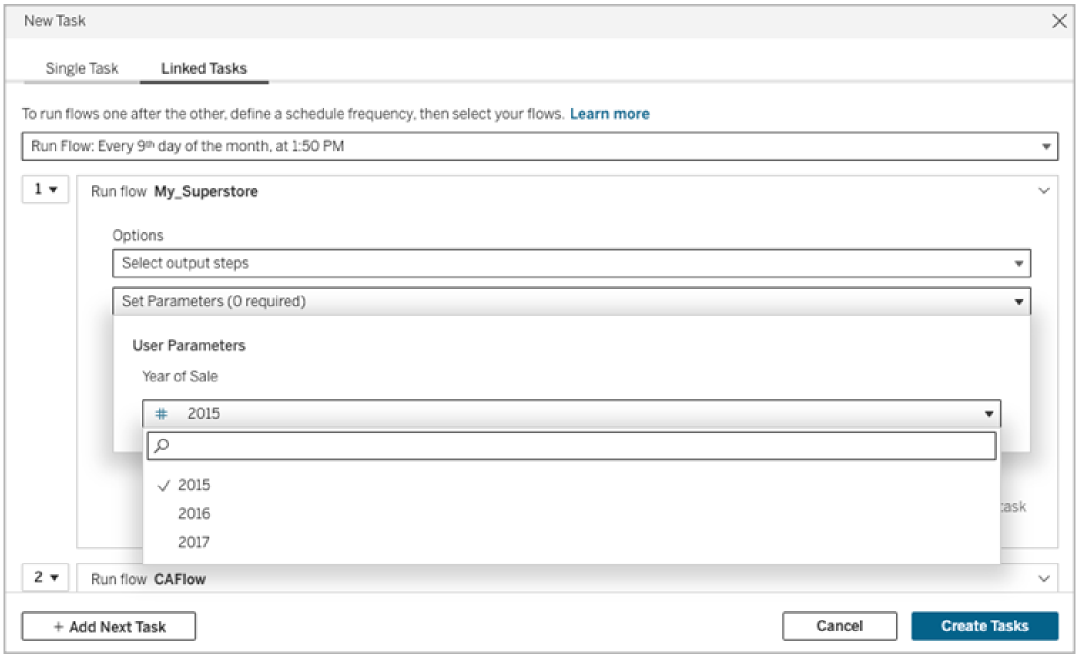
> **Note**: If no existing output is found, Tableau Prep Conductor runs a full refresh for all outputs regardless of the run option you select. Subsequent flow runs use the incremental refresh process and retrieve and process only

your new rows unless incremental refresh configuration data is missing or the existing output is removed.

6. (optional) If you’re the flow owner, select **Send email when done** to notify users when the flow is successful. For more information about how to send email notifications on flow runs, see Notify Users of Successful Flow Runs.
7. Set your flow failure options:
   - **Add data quality warning**: Select the check box to set a warning message on the flow so that users of the data are aware of issues. The message remains until the flow runs successfully. If the flow already has a data quality warning, this option shows selected and can't be turned off.



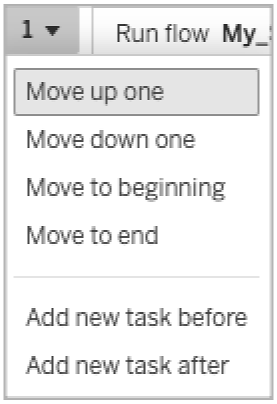

   - **Stop remaining tasks**: Select this option to prevent the downstream tasks in the list from being queued to run.
   - **Email me**: Email notifications are automatically sent to the flow owner and the linked task creator when the flow fails, is suspended, or is canceled.
8. If your flows include parameters, enter any required or optional parameter values. You must enter required values for the flow to run.




9. Click the drop-down for the second task to add your next flow. Flows that use the previous flow's outputs are shown automatically or click **View all flows** to see all available flows
10. Select one or more flows and click **Add** or click **Add Next Task** to add more flow run tasks to your list.

    If you don't have permission to run the flow, you must contact the flow owner to grant permissions before adding the flow to your list.

11. Repeat steps 4–6 to configure your flow run options.
12. (Optional) Click the drop-down next to any numbered task to open the menu to change the order of your flow tasks or insert new tasks between existing tasks.




13. Click **Create Tasks** to create the scheduled linked tasks.

Who can do this

- The Server administrator can do this on all sites on the server. The Site administrator can do this on sites they have access to if the site settings to allow users to publish and schedule tasks is enabled.
- For linked tasks, the Server administrator can do this on all sites where the server settings to allow users to schedule linked tasks is enabled. The Site administrator can do this on sites they have access to if the site settings to allow users to schedule linked tasks is enabled.
- Flow owners and project leaders with the Creator site role can create flow tasks for flows or projects that they own respectively.

Site administrators, flow owners, and project leaders can create flow tasks for the flows and projects that they own respectively. Only the Creator site role and above can create or edit a flow task.

For more information, see Set Users' Site Roles and Content Ownership and Permissions

## Notify Users of Successful Flow Runs

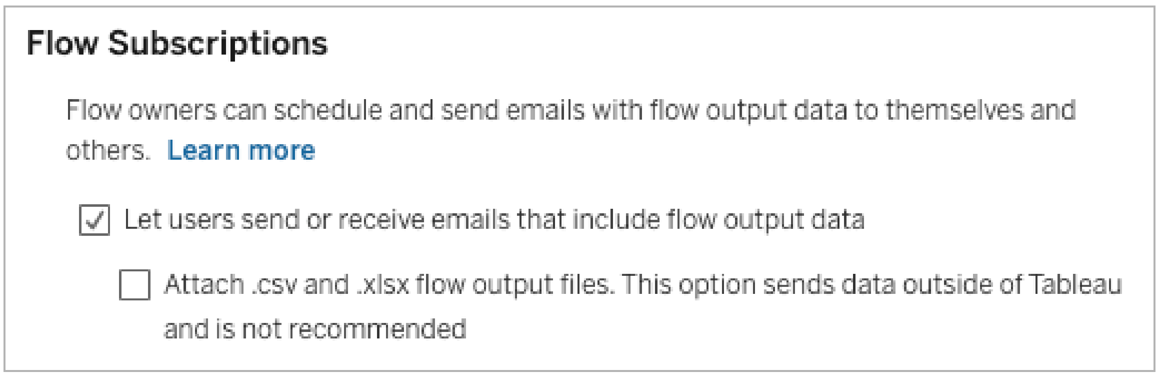
*Supported in Tableau Prep Builder version 2021.4.1 and later and in Tableau Server and Tableau Cloud version 2021.4 and later. Data Management is required to use this feature.*

Flow owners can subscribe themselves, individual users, and groups to email notifications for information about scheduled tasks for successful flow runs. The email includes links to data within the Tableau environment, or you can optionally include the details of the flow run in attached Excel and CSV files.

Flow subscriptions are added to scheduled tasks for flows. You can add flow subscriptions when you create a new flow task or to an existing flow task. Email notifications are sent when the scheduled task is completed successfully.

## Configure the site settings for flow subscriptions

By default, the **Flow Subscriptions** site setting for sending and receiving email notifications is enabled.




- The **Let users send or receive emails that include flow output data** option allows the flow owner to receive, and subscribe users and groups to successful flow run notifications. From the notification email, users can access the full data source or view the flow details from within Tableau.
- (Not recommended) The **Attach .csv and .xlsx flow output files** option lets the flow owner attach files to notification emails. The email recipients must be added to the Tableau server or site, however, the files contain the data source and can be exposed outside of the Tableau system. This option is available only for on-premise environments.

## Publish the Flow

Publish the flow output as either a file, database table, or data source. Consider the following when saving the flow:

- (On-premise only) When publishing you can save the output as a file or as a database table and choose to attach either a .csv or .xlsx file type to the email.
- When publishing and saving the output as a published data source, the email notification provides a link to the flow in Tableau. Files cannot be attached to the email.
- When choosing to save as a file output, you must use a network share and the output and input location must be included in a safe list. For more information, see Step 4: Safe list Input and Output locations.
- Flow subscriptions are supported on Windows and Linux. The following restrictions apply to flow subscriptions on Linux:
  - File outputs must be output to a Windows server.
  - For flows that output to a file, use the UNC format for the path: *server**path**filename*. Do not use a local drive letter.
  - The mounted path must be safe listed.
- When attaching files to an email, the file limit is approximately 25 MB for Tableau Cloud. When using an on-premise Tableau Server, you configure the size of attachment files.

## Add a flow subscription

1. As the owner of the flow, select a published flow in Tableau Server or Tableau Cloud that you want to add subscriptions to for email notifications.
2. You can add subscriptions to a new or existing task:
   - If you are adding a subscription to a new task:
     1. Click **Scheduled Tasks** > **New Task**.
     2. In the New Task dialog select a schedule to run the flow from the **Select a schedule** drop-down list.
     3. Enable **Send email when done**

- If you are adding a subscription to an existing task:
    1. Click **Subscriptions** > **Subscribe**.
    2. In the **Add Flow Subscriptions** dialog, select a schedule from the **Frequency** drop-down list.

3. In the **Send to** field, start typing the name of the user or group to populate the field. Select the users and groups that you want to send a notification to.

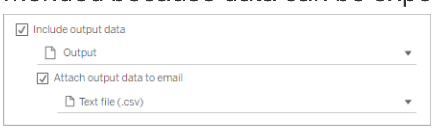
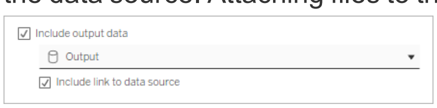
   Users and groups must be added to the Tableau environment by the administrator.

4. (Optional) To be included in the notification, check the **Send to me** box.

5. (Optional) In the **Subject** field, customize the default email subject line for the flow run notification.

6. (Optional) Add information about the flow run in the **Email message** text box.

7. Click **Include output data** and select the type of output that you want to include in the email.

    - If you published your flow as a file or database table output you can choose to attach .csv or .xlsx files containing the data source to the email. This is not recommended because data can be exposed outside of the Tableau system.
      
      
    - If you published your flow as a data source, you can choose to include the link to the data source. Attaching files to the email is not supported.
      
      

8. If you are adding a subscription to an existing task, click Subscribe.

## Unsubscribe from a flow subscription

To unsubscribe from notifications from the email, follow these steps.

1. Click **Unsubscribe** from the bottom of a subscription email.

2. As the flow owner, Sign in to Tableau Server or Tableau Cloud. At the top of the page, click the **Notifications** icon.

3. Expand the **…** menu, then select **Remove notification**.

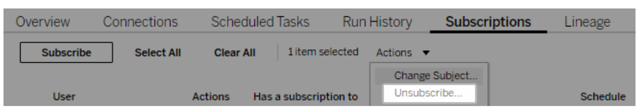
To unsubscribe and remove the subscription as the flow owner, follow these steps.

1. Click **Subscriptions**.

2. Open the published flow in Tableau Server or Tableau Cloud.

3. From the list of flow subscriptions, click the selection box for the flow you want to unsubscribe from.

4. Select **Actions** > **Unsubscribe**.




## View Subscriptions

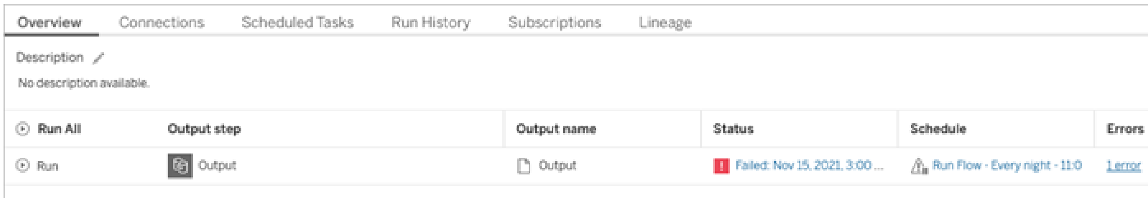
You can view your current flow subscriptions in Tableau Server or Tableau Cloud.

- From the **Subscriptions** tab on the **Overview** page of the flow, you can see the list of current subscriptions.
- From the **Subscriptions** tab on the **Tasks** page, you can see the list of subscriptions along with subscriptions to workbooks.

## Resume suspended flow subscriptions

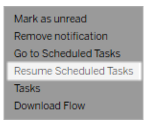
Sometimes, subscriptions fail because of an issue with the flow. If a subscription fails more than five times, you'll receive a notification email thatyour scheduled flow task has been suspended.

From the flow Overview page, you can see when a scheduled flow task fails.

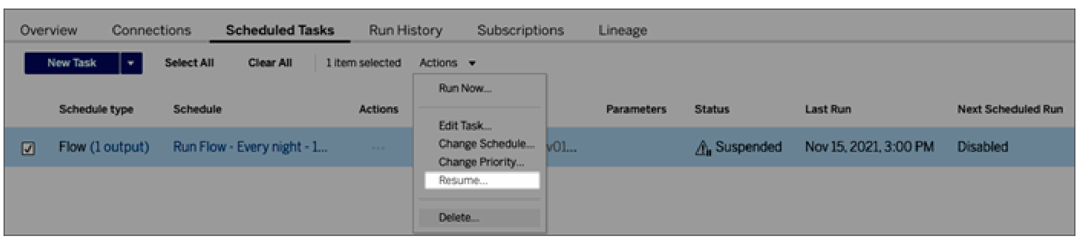



There are a few ways to resume a suspended flow task. If you're flow owner:

- From the My Content area of Tableau web pages, an icon appears in the Last update column to indicate that the subscription is suspended. Select **...** > **Resume Scheduled Tasks** to resume.



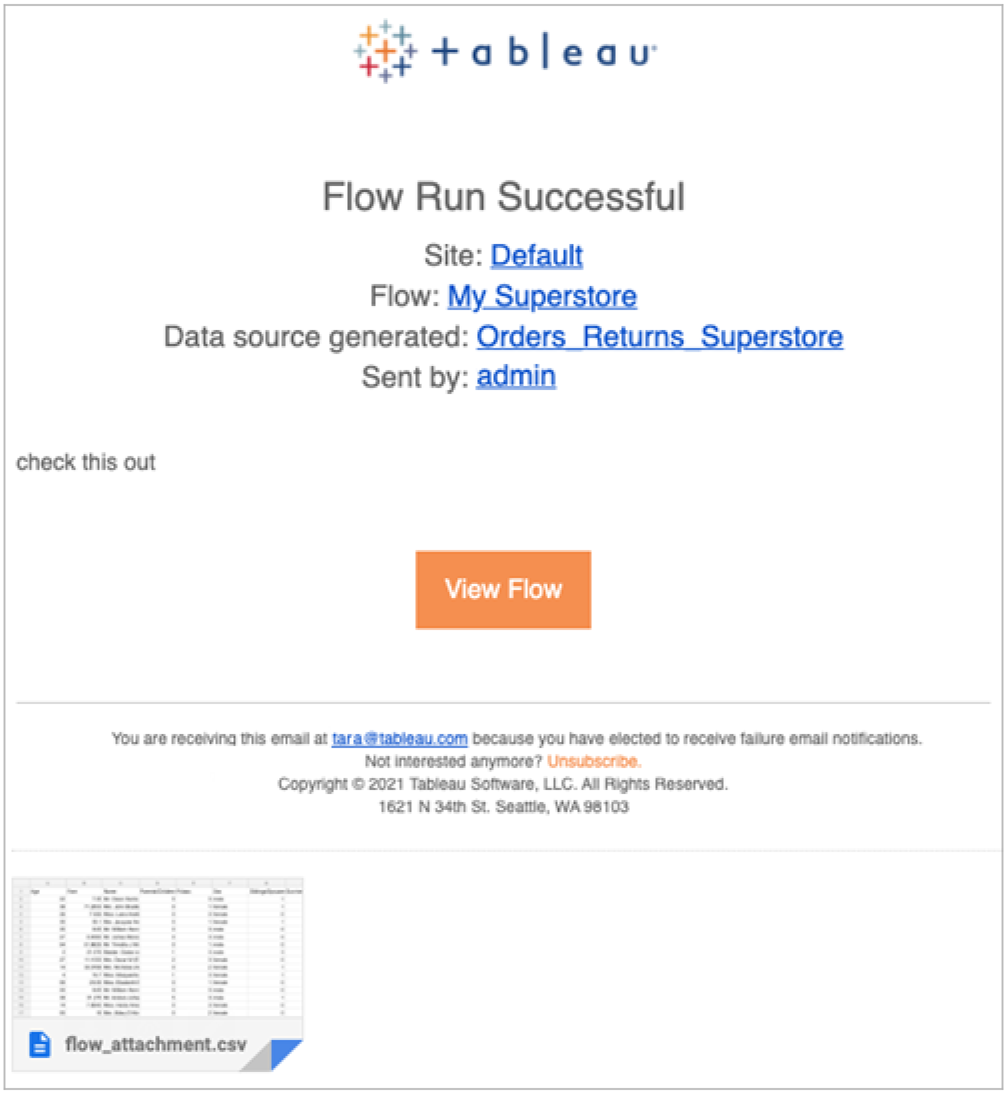

- From the Scheduled Tasks page, an icon appears in the last update column to indicate that the subscription is suspended. Select the flow, then click **Actions** > **Resume**.




## Access the flow data from a notification email

Depending on how the flow notification was configured, you can access the data source and file attachments from the notification email.

- Click View Flow to open the flow in Tableau Server or Tableau Cloud.
- Click the attachment file to view the flow data.




Who can do this

- Flow owners can create flow notification subscriptions for flows that they own.
- To receive notifications, users and groups must be added to the Tableau environment by the administrator.

For more information, review the following articles:

- Windows: Set Users' Site Roles and Content Permissions and Ownership
- Linux: Set Users' Site Roles and Content Permissions and Ownership

# Manage a Flow

Once you publish a flow to Tableau Server or Tableau Cloud, you can manage your flows and make changes to them as necessary. This topic describes the various actions you can take to manage your flows.

**Note**: The content in this topic applies to both Tableau Server and Tableau Cloud, exceptions are called out specifically.

## Managing your flows

**Following is a list of actions you can take to manage your flows:**

- **Create flows:** Starting in version 2020.4, as a Creator you can create flows directly on the web. From the **Home** page, click **Create** > **Flow** or from the **Explore** page, click **New** > **Flow**. For more information, see Tableau Prep on the Web.

- **Edit flows:** Starting in version 2020.4, as a Creator you can edit flows directly on the web. Navigate to the list of flows, select **Actions** and click **Edit Flow**, or open a flow and click the **Edit** button.

  When you edit a flow, your changes are moved to a draft state. When you're finished, publish your flow to commit your changes and create a new version of the flow. For more information, see Autosave and working with drafts.

  You can edit the data connection using the **Edit Connection** menu option from the **Connections** view, **Actions** (…) menu for the data source. The new connection is saved and used the next time the flow runs in Tableau Prep Conductor. However, when you open the flow to view it, the original connection persists and won't be updated until you edit the flow, update the connector, and republish it.

If you open, edit, and republish the flow without changing the original connection, any connection changes made using the **Edit Connection** menu will be overridden and replaced with the original connection.

- **Run flows:** You can manually run a flow in addition to creating scheduled flows tasks that run at a specific time.
- **Note**: The Data Management is not required to manually run flows, but is required to schedule flows to run.
- Navigate to the list of flows, select one or more flows you want to run, select **Actions** and click **Run Now**.
- **Tag:** Tags are keywords you can create for flows to help you find, filter, and categorize content. Authors can add tags to flows when they publish it. But you can also add tags to any workbook, view, or data source that you are allowed to access and you can delete any tags you have added. You can add a tag to a list of flows.

  Navigate to the list of flows, select one or more items you want to tag, select **Actions** and click **Tag**. To add a tag to a specific flow you can do it from the list of flows as described above. Open the Flow, from the Overview tab, select **Actions**, and click **Tag**.
- **Change Owner:** Administrators and flow owners can change owners, and only to themselves.
- **Permissions:** You can set permissions for users and specify if they can perform edit actions like save, download, move to a different project and delete. In addition, you can specify who can view and run the flow.
- **Download:** You can download a flow to view or modify it using Tableau Prep Builder. To download a flow, you need download permissions. You’ll have that by default if you are the owner, but you might need to add it for other users.

- **Revision History:** When you make a change to the flow, and republish it to the same project with the same name, a new version of the flow is created. You can view the revision history by selecting revision history from the actions menu. Flow owners have permissions to restore a previous version of a flow.
- **Move:** You can move flows between projects. To move a flow, users need Move permission. You’ll have that by default for flows you own, but you might need to add it for other users.
- **Rename:** You can rename a flow. To rename a flow, users need the Save permission. You'll have that by default for flows you own, but you might need to add it for other users.
- **Delete:** You can delete a flow. To delete a flow, users need the Delete permission. You’ll have that by default for flows you own, but you might need to add it for other users.

Who can do this

## Tableau Server Administrator

**Can do the following tasks across all the sites:**

- Create flows
- Edit published flows
- View a list of all draft flows
- Run flows
- Delete flows
- Download flows
- Change Owner

- Change Permissions
- Change Project
- Add/Remove Tags
- Change Description
- Change Name
- Update Flow Task
- Delete Flow Task
- Create a Flow Task*
- Version Management*

*Some additional conditions apply to these actions:

- To create a flow task:
  - A flow schedule must be available. Only Server Administrators can create a schedule.
  - The flow must have at least one output step.
  - The flow version must be compatible with the Tableau Server version.
- Version management:
  - Revision history must be enabled on the site.
  - User role is allowed to publish to the project.

## Tableau Site Administrator

**Can do the following tasks on flows published to the sites that they are site administrator for:**

- Create flows
- Edit published flows
- View a list of all draft flows
- Run flows
- Delete flows
- Download flows
- Change Owner
- Change Permissions
- Change Project
- Add/Remove Tags
- Change Description
- Change Name
- Update Flow Task
- Delete Flow Task
- Create a Flow Task*
- Version Management*

Some additional conditions apply to these actions:

- To create a flow task:
  - A flow schedule must be available. Only Server Administrators can create a schedule.
  - The flow must have at least one output step.
  - The flow version must be compatible with the Tableau Server version.
- Version management:

- Revision history must be enabled on the site.
- User role is allowed to publish to the project.

## Project Leader

**Can do the following tasks on flows published to the projects where they have project leader permissions:**

- Create flows
- Edit published flows
- Run Flows
- Delete
- Download
- Change Permissions
- Change Project
- Add/Remove Tags
- Change Description
- Change Name
- Update Flow Task
- Delete Flow Task
- Create a Flow Task*
- Version Management*

*Some additional conditions apply to these actions:

- To create a flow task:
    - A flow schedule must be available. Only Server Administrators can create a schedule.
    - The flow must have at least one output step.
    - The flow version must be compatible with the Tableau Server version.
- Version management:
    - Revision history must be enabled on the site.
    - User role is allowed to publish to the project.

## Project Owner

**Can do the following tasks on flows published to the projects that they own:**

- Create Flows
- Edit published flows
- Run Flows
- Delete
- Download
- Change Permissions
- Change Project
- Add/Remove Tags
- Change Description
- Change Name
- Update Flow Task

- Delete Flow Task
- Create a Flow Task*
- Version Management*

* Some additional conditions apply to these actions:

- To create a flow task:
  - A flow schedule must be available. Only Server Administrators can create a schedule.
  - The flow must have at least one output step.
  - The flow version must be compatible with the Tableau Server version.
- Version management:
  - Revision history must be enabled on the site.
  - User role is allowed to publish to the project.

## Flow Owner

**Can do the following tasks on flows that they own:**

- Create Flows
- Edit Draft (flows they own) and Published Flows
- Run flows
- Delete flows
- Download flows
- Change Owner
- Change Permissions

- Change Project
- Add/Remove Tags
- Change Description
- Change Name
- Update Flow Task
- Delete Flow Task
- Create a Flow Task*
- Version Management*

*Some additional conditions apply to these actions:

- To create a flow task:
  - A flow schedule must be available. Only Server Administrators can create a schedule.
  - The flow must have at least one output step.
  - The flow version must be compatible with the Tableau Server version.
- Version management:
  - Revision history must be enabled on the site.
  - User role is allowed to publish to the project.

## User with Creator License

**Can do the following tasks:**

- Create Flows
- Edit Draft (flows they own) and Published Flows

- Run Flows (with Run flow permissions)
- Delete (with delete permissions)
- Download (with download or Save as, and read permissions)
- Change Permissions (with Change Permissions)
- Change Project (with move permissions, and write permissions on the destination project)
- Add/Remove Tags (with read permissions)
- Change Description (with Save permissions)
- Change Name (with Save permissions)
- Update Flow task (with Execute permissions)
- Delete Flow Task (with Execute permissions)
- Create a Flow Task* (with Execute permissions)
- Version Management* (with view, read, save as, download permissions)

* Some additional conditions apply to these actions:

- To create a flow task:
  - A flow schedule must be available. Only Server Administrators can create a schedule.
  - The flow must have at least one output step.
  - The flow version must be compatible with the Tableau Server version.
- Version management:
  - Revision history must be enabled on the site.
  - User role is allowed to publish to the project.

## User with Explorer License

**Can do the following tasks:**

> **Note**: Starting in version 2020.4, Explorer license users can no longer run flows on Tableau Server.

- Explorer license users (with Run flow permissions) can run flows on Tableau Cloud.
- Delete (with delete permissions)
- Download (with download or Save as, and read permissions)
- Change Permissions (with Change Permissions)
- Change Project (with move permissions and write permissions on the destination project)
- Add/Remove Tags (with read permissions)
- Change Description (with Save permissions)
- Change Name (with Save permissions)
- Update Flow task (with Execute permissions)
- Delete Flow Task (with Execute permissions)
- Create a Flow Task* (with Execute permissions)
- Version Management* (with view, read, save as, download permissions)

*Some additional conditions apply to these actions:

- To create a flow task:
  - A flow schedule must be available. Only Server Administrators can create a schedule.
  - The flow must have at least one output step.
  - The flow version must be compatible with the Tableau Server version.
- Version management:

- Revision history must be enabled on the site.
- User role is allowed to publish to the project.

## User with Viewer License

Viewers cannot manage flows, they can however view the flow and the different versions of the flow.

For more information about the full capabilities you can set on flows, see Permission capabilities.

# Monitor Flow Health and Performance

After you publish flows and schedule them to run periodically, you want to know that they are running as expected and resolve any issues as they occur. You will also want to monitor and understand the performance of your flows.

This topic describes the various methods that Tableau Cloud provide to help you monitor your flows.

## Detect issues as they occur and resolve them

In Tableau Cloud, email notifications are automatically sent when flows fail. You can also find and review errors on your server using the Alerts menu or by reviewing the flow pages for the flows that you are interested in. This type of monitoring allows you to detect problems as they occur.

Get notifications when a flow fails:

Email notifications is turned on by default for your site in Tableau Cloud. You can verify this by going to **Settings** > **General** page.

View and resolve errors

**Note**: Starting in version 2020.4.1, you can now create and edit flows directly in Tableau Server and Tableau Cloud. The content in this section applies to all platforms, unless specifically noted. For more information about authoring flows on the web, see Tableau Prep on the Web.

The following errors can happen when running a flow:

- **Connection errors:** Connection errors generally happen when Tableau Cloud is unable to connect to one or more data inputs or is unable to make a connection in one or more output steps.
  - For Input connection errors, use the **Edit connections** option on the **Connections** tab to make changes to connection details, then run the flow again.
  - For output connection errors, check the output location for the flow output steps. If the flow output is going to a network share, make sure the output steps are pointing to a safe listed location. After you make any changes republish the flow and try running it again.

  **Note**: To fix output connection errors for flows that output to a file or network share, download the flow to Tableau Prep Builder, then republish the flow to your server. Flows that output to a published data source or database can be edited directly on the web.

- **Errors in the flow:** If there are errors in one or more steps in the flow, you will see an error message. You can edit the flow directly on the web and republish it. You can also download the flow to Tableau Prep Builder, resolve the errors, republish the flow to the server and then run the flow again.

- **Suspended flow tasks:** When a scheduled flow task fails to run after a configured number of attempts, the flow task is suspended. By default, a flow task is suspended after 5 consecutive flow tasks failures.

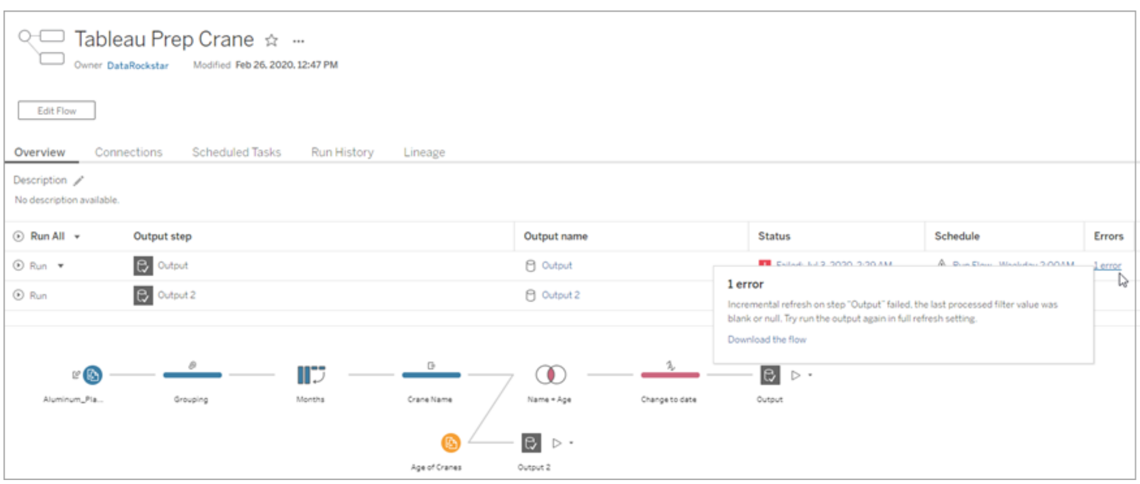
  A flow can have multiple scheduled tasks assigned to it, but only the failed tasks are suspended. All other flow tasks will continue to run unless they have errors. To resolve a suspended task, review and resolve the errors then run the flow on-demand or let the flow run automatically based on the assigned schedule.

You can view errors on the following pages:

Flow Overview page

On this page you can see the status of the most recent flow run and any errors. Hover on the error text to review the error details. If a scheduled task is suspended, a warning icon shows next to the schedule. Hover on the icon to view the status.

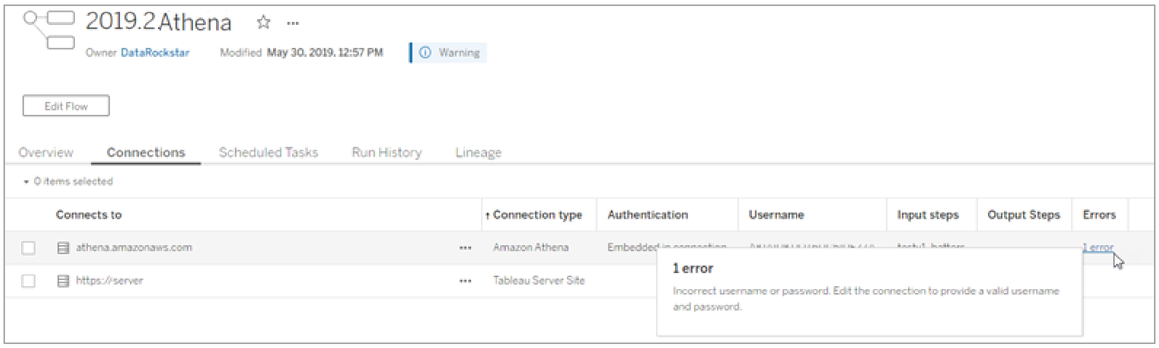
After you resolve the error that caused the flow to fail or the task to be suspended, you can run the flow manually or let the flow run based on the assigned schedule. For suspended flow tasks, click the **Go to Scheduled Task** link on the tooltip for the suspended task to navigate to the **Scheduled Tasks** page and click the **Resume Scheduled Tasks** button to resume the suspended tasks.



Connections page

The **Connections** page shows the most recent status and any related connectivity errors. To correct input errors, click the **More actions** ••• menu for an input connection to edit the connection and change the server name, port, user name and password.

To fix output connection errors, edit the flow directly or download the flow in Tableau Prep Builder, correct the file path, then republish the flow to continue running it.




Scheduled Tasks page

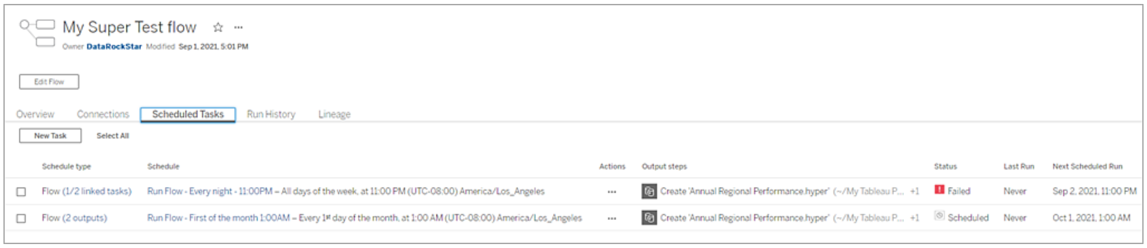
**Note**: The Data Management is required to see this tab.

View the scheduled tasks assigned to a flow. If a scheduled task is suspended, you can see the status of that tasks here and you can manually resume the flow tasks from this page. Before resuming a suspended task, resolve any errors in the flow.

Error details are not shown on this page, but you can review them on the **Overview** or **Run History** pages. You can also click the links in the **Schedule type** column to view the details of what was scheduled and to edit the tasks.

A suspended scheduled task will automatically resume when the flow is republished, if you edit a connection for the flow or manually run the flow tasks. To manually resume a suspended tasks, on the **Scheduled Tasks** page, click **Resume Scheduled Tasks**. This resumes all suspended tasks for the flow.

To resume individual tasks, click the **More actions ...** menu for a scheduled task and select **Resume**. You can also click **Run Now** to run all tasks for the flow immediately.

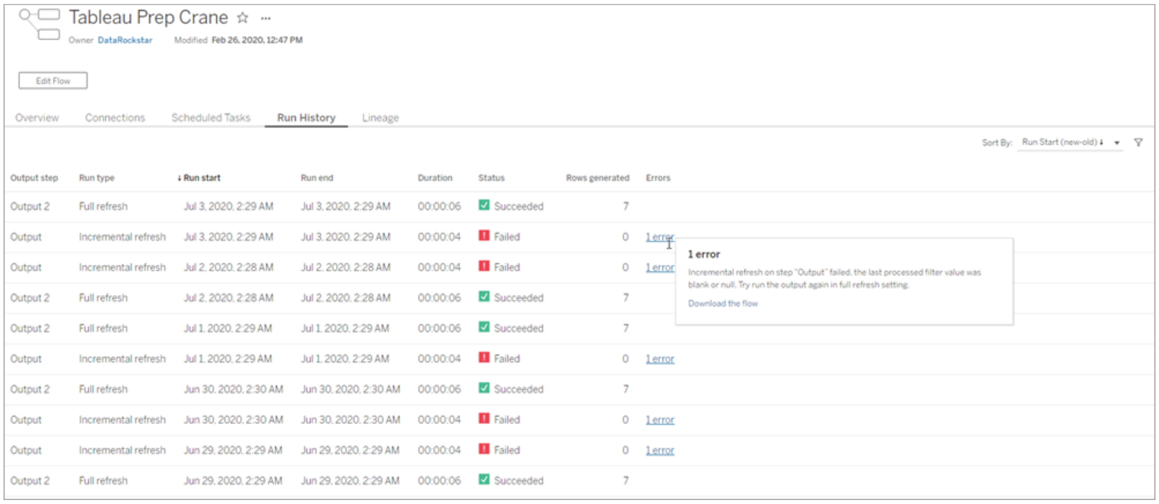



Run History page

> **Note**: The Data Management is required to see this tab.

The **Run History** page shows the details of all the flow runs that have either completed or are in progress for each output. View any error details by hovering over the errors in the **Errors** column. The duration column shows you the run time of the flow.

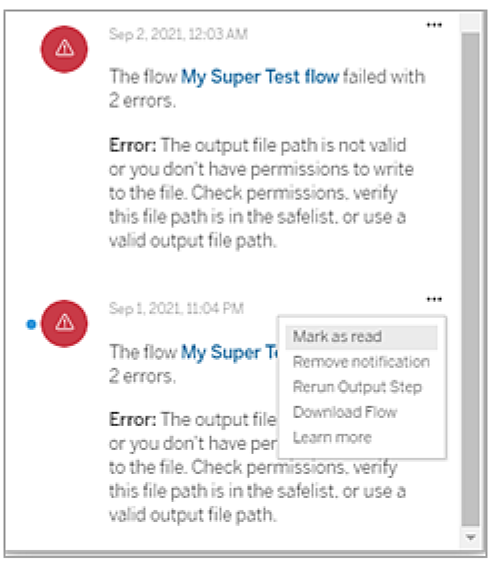
> **Note**: Starting in version 2020.2.1, the **Run Type** field shows the refresh type for the output. In prior releases this field showed whether the output was run on a schedule or on-demand. For more information about setting up output refresh types, see Refresh Flow Data Using Incremental Refresh.




## Alerts

When a flow fails, the alerts menu is populated with the error details with the option to re-run the flow, or download the flow to troubleshoot.

> **Note**:Flow owners and Site Administrators can see this menu.



Who can do this

- **Tableau Site Administrators**:
  - Set up email notifications at the site level
  - View errors
  - Resume suspended tasks
  - View alerts
- **Flow owners, project leaders and any user who is granted permissions to view the flow**:
  - View errors
  - Resume suspended tasks
  - View alerts (Flow owners)

## Administrative Views for Flows

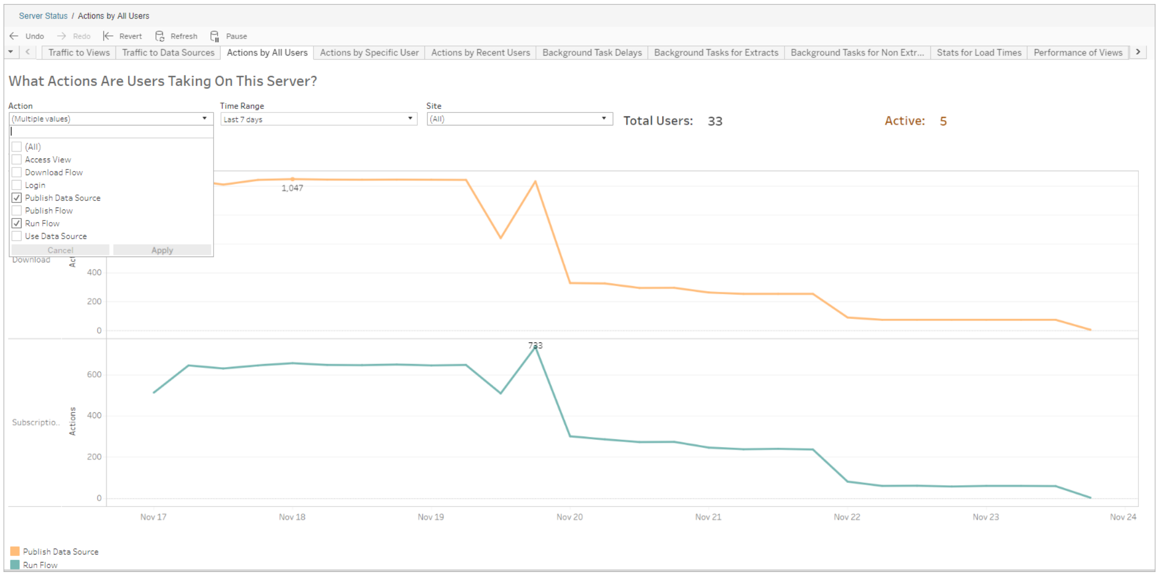
Administrative views can be used to monitor the activities related to flows, performance history, and the disk space used. The **Status** page contains an embedded Tableau workbook with various administrative views that can be used to monitor different types of server or site activity.

Who can do this?

Tableau Site administrators can view and work with Administrative Views.

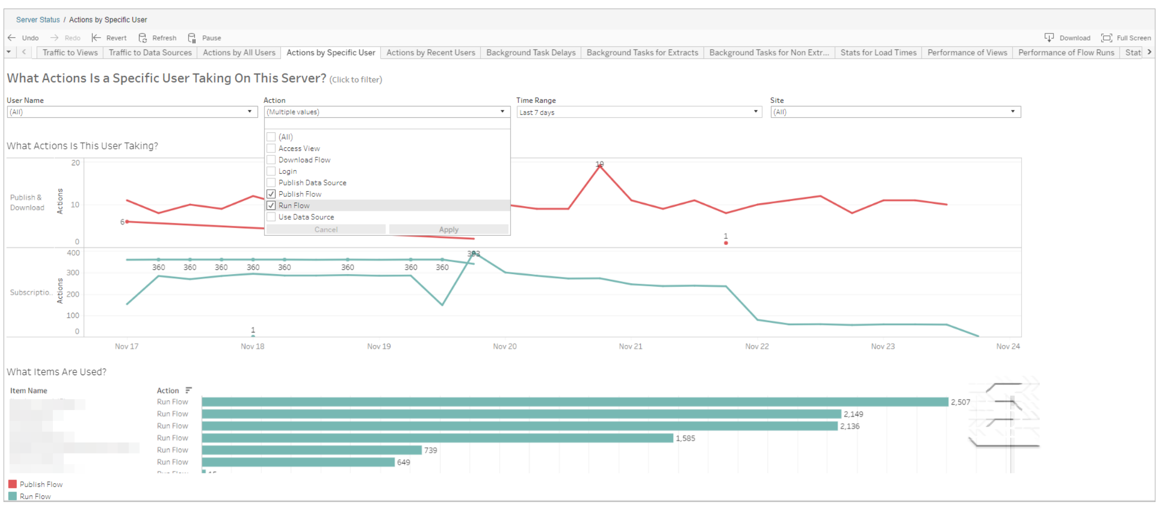
Action by all users

Use this view to gather insight into how flows are being used. This includes actions like publish, download, and flow runs. You can filter the view by actions, by site, and by time range. The Total Users count shows the number of users who have performed an action. This value is not affected by any filtering. The Active user count shows the number of users who have been active during the selected time period and performed one of the selected actions.




## Action by Specific User

Use this view to gather insights about how an individual user is working with flows. You can filter the view by user name, the type of action, and by time range.




## Action by Recent Users

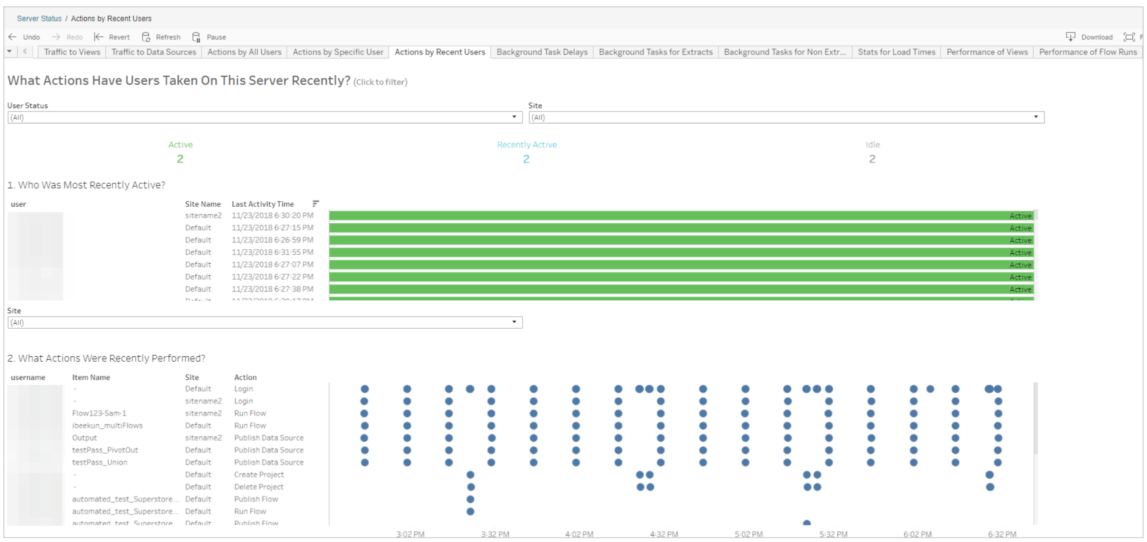
This view shows you which users have been active on Tableau Cloud over the past 24 hours.

This can be useful if you need to do some maintenance activity on the server and want to know which users and how many this will affect, and what they're doing.

The view shows **Active**, **Recently Active**, and **Idle** users that are currently signed in to Tableau Cloud.

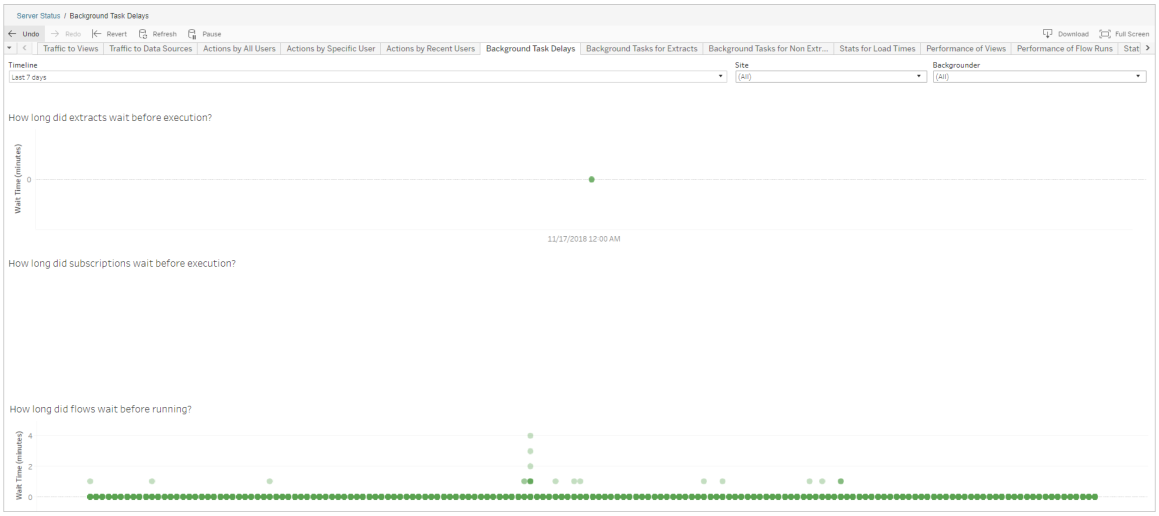
For this view, an active user is one who took an action in the last 5 minutes, a recently active user is one who last took an action within 30 minutes, and an idle user is one who last took an action more than 30 minutes ago.

Select a user to see only the actions that user performed recently. Hover over an action to see details of the action.




## Backgrounder Task Delays

This view shows the delay for extract refresh tasks, subscription, and flow tasks—that is, the amount of time between when they are scheduled to run and when they actually run. You can use the view to help identify places you can improve server performance by distributing your task schedules and optimizing tasks.



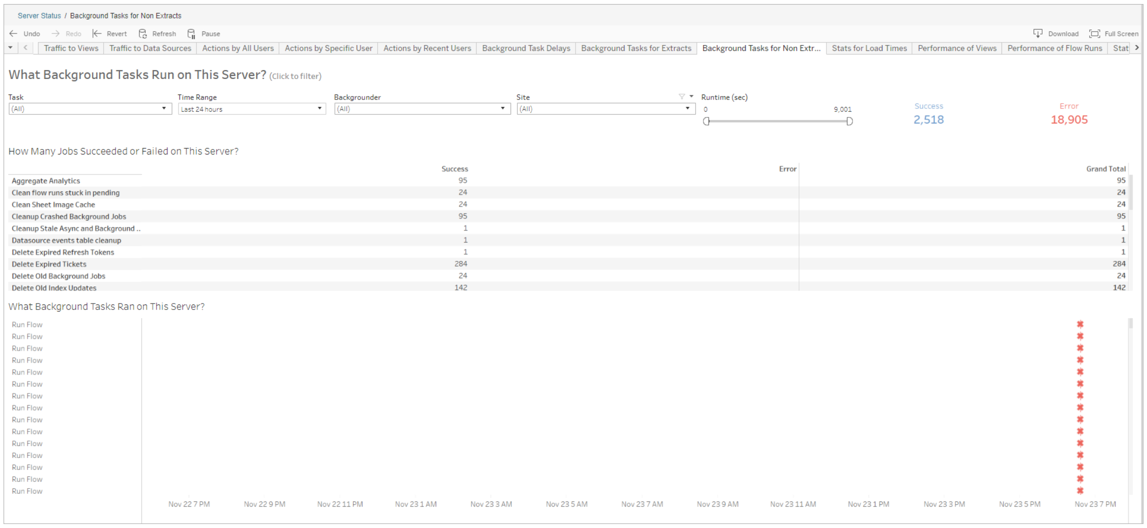

Possible reasons for the delays and ways to reduce the delays include the following:

- Many tasks are scheduled for the same time.

  In the example view, tasks that show long delays are clustered at the same time every day, which creates spikes in the wait time. You can set the Timeline filter to a single day to view task delays by hour and identify the hours of the day when many tasks are scheduled at the same time. One solution is to distribute the tasks to off-peak hours to reduce load on the server.

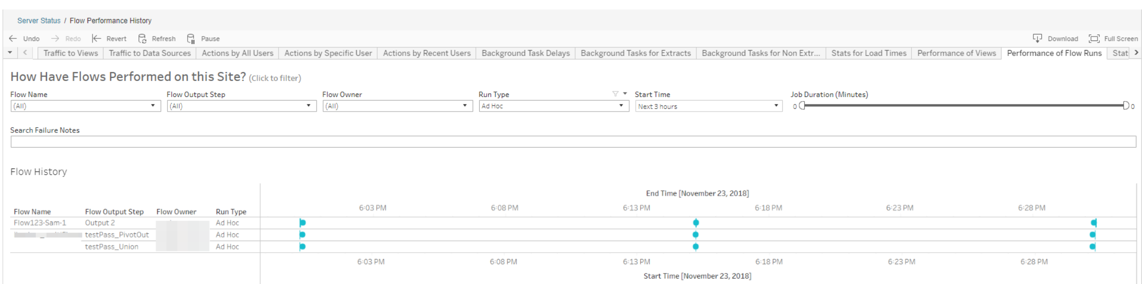
### Background Tasks for Non Extracts

Background Tasks are created to run flows (scheduled and ad hoc). You can use this view to see how many flow tasks succeeded or failed on this site. For details on a task, hover over its icon.



Performance of Flow Runs

Use this view to see the performance history for all the flows on a site. You can filter by Flow Name, Output Step Name, Flow Owner, Run Type (Scheduled or Ad Hoc), and the time the flow runs were started.



Questions you can answer using this view include:

- **What flow tasks are currently scheduled?** – To do this, use the Start Time filter and select the time frame you want to look at. For example, to see flow tasks that are scheduled in the next 3 hours, select **Hours** -> **Next** -> and enter **3**.

- **What is the duration of flow tasks?** - To answer this, click on a mark in the view to see details, including the task duration.

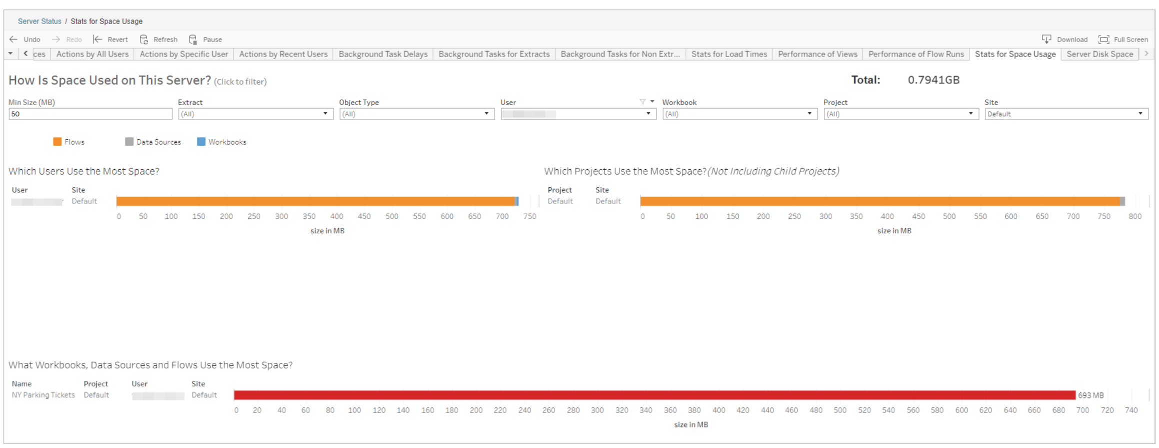
- **How many flows were run ad hoc, and how many were scheduled runs?** - To answer this, use the **Run Type** filter and select **Ad hoc** or **Scheduled**.

This view can also show you the following information:

- Flows with the highest run frequency have the most marks.
- To see flows that are currently running at the same time, hover over a mark that shows "**In Progress**" or "**Pending and select** "**Keep Only**" to filter all flow runs that are currently running.
- To see flows that are running at the same time during a specific time range, select a range for the **Start Time** filter. For example, select "**Next three hours**" to see which flows will be running in the next three hours.

Stats for Space Usage

Use this view to identify which flow outputs are taking up the most disk space on the server. Disk space usage is displayed by user, project, and by the size of flow output and is rounded down to the nearest number.




Use the Min Size filter to control which flow outputs are displayed, based on the amount of space they take up. Use the object type filter for flows.

- **What Users Use the Most Space** – This section shows the users who own flows (when filtered for flows) that are taking up the most space. Click a user name to filter the next two graphs for that user.

- **What Projects Use the Most Space** – This section shows the projects with flows (when filtered for flows) that are using the most space.

- **What Workbooks, Data Source and Flows Use the Most Space** – This section shows the flows (when filtered for flows) that take up the most space.

Who can do this

- **Tableau Site Administrators**:
  - Set up email notifications at the site level
  - View errors
  - Resume suspended tasks
  - View alerts
- **Flow owners, project leaders and any user who is granted permissions to view the flow**:
  - View errors
  - Resume suspended tasks
  - View alerts (Flow owners)

# About Tableau Catalog

Data is increasing in volume, formats, and importance leading to more complex environments. With the rapid pace that data changes, it can be hard to keep track of that data and how it's being used in such complex environments. At the same time, more users need to access more of that data in more places, and it’s difficult for users to find the right data. Ultimately, this causes a lack of trust in the data because people question whether they’re using the right source or if the source is up to date.

Tableau Catalog integrates features like lineage, impact analysis, data dictionary, data quality warnings, and search into your Tableau applications, helping solve these problems differently from a stand-alone catalog. It focuses on both IT and the end user so that everyone using Tableau Server or Tableau Cloud has more trust in and visibility into the data, while also enabling more discoverability. Tableau Catalog builds a catalog out of the Tableau content being used by your organization, enabling comprehensive functionality like the following:

- **Impact analysis and lineage**.
  - You can see the workbooks and other Tableau content that depend on particular columns or fields from tables or data sources you manage. When you need to make changes to your data, you can notify the impacted Tableau authors using email.
  - As a workbook author, you can use lineage to trace the fields that your workbook depends on.
  - As a user, when you use a Tableau visualization, you can see where the data came from that was used to create the view.
- **Curation and trust**. As a data steward, you can add helpful metadata, like descriptions and certification, so that users find the right data. You can set data quality warnings, view data details on the Data Details pane, certify assets, and remove assets from the catalog.
- **Data discovery**. In Tableau Desktop or Tableau web authoring, you can use Tableau Catalog to search for databases, tables, data sources, and virtual connections to analyze in Tableau and connect to them from the search results.

Starting in 2019.3, Tableau Catalog is available as part of Data Management for Tableau Server and Tableau Cloud. When the product key is active and enabled, the catalog features described above are integrated into the product you're using, so you can work with the data where you find it.

## How Tableau Catalog works

Tableau Catalog discovers and indexes all the content on your site—workbooks, data sources, sheets, virtual connections, and flows—to gather metadata about the content. From the metadata, external assets (databases, tables, and other objects) are identified. Knowing the relationships between the content and the external assets enables Tableau to display the lineage of the content and external assets. Tableau Catalog also enables users to connect to external assets using Tableau Server or Tableau Cloud.

Users on your site can publish or delete content, can attach data quality warnings or certifications, or do anything else that changes the content or its metadata on the site, and Tableau Catalog will update its information accordingly.

For information about how you can use Tableau Catalog to support data governance in your organization, see Governance in Tableau in the Tableau Blueprint Help.

## Key Tableau Catalog terms

- Metadata. Information about the data.
- Tableau content. Content created in Tableau such as workbooks, data sources, virtual connections, and flows.
- External assets. The metadata about the databases and tables used by Tableau content that's published to Tableau Server or Tableau Cloud.

## License Tableau Catalog

Tableau Catalog is licensed through Data Management. For information about how Data Management licensing works, see License Data Management.

## Enable Tableau Catalog

After Tableau Server or Tableau Cloud is licensed with Data Management capabilities, you can enable Tableau Catalog by doing one of the following tasks:

- **For Tableau Cloud**, no action is necessary. Tableau Catalog is on by default, configured to use derived permissions, and ready to use. For more information about derived permissions, see the Permissions on metadata topic.

- **For Tableau Server**, the Server admin must first enable the Tableau Metadata API using the `tsm maintenance metadata-services` command. For more information, see Enable Tableau Catalog.

  After the Metadata API is enabled, Tableau Catalog is on by default, configured to use derived permissions, and ready to use. For more information about derived permissions, see the Permissions on metadata topic.

# Features and functionality

To learn more about the features you can use with Tableau Catalog, see the following Help articles:

## Data discovery

- In the **Connect** pane on Tableau Desktop, under **Search for Data** select **Tableau Server** to connect to data using Tableau Server or Tableau Cloud. When Tableau Catalog is enabled, in addition to searching for published data sources to connect to, you can now search for and connect to the specific databases, tables, and objects used by published data sources and workbooks on your Tableau Server or your Tableau Cloud site.
- Search is expanded to include results based on columns, databases, tables, and other objects when Tableau Catalog is enabled.
- If you author in the web, in addition to published data sources, you can also connect to databases and tables.
- If you use Tableau Prep on the web, you can create new flows based on external assets, such as databases and tables.
- If you connect to Salesforce Data Cloud, you'll see support for native Data Cloud objects built into Tableau Catalog. Data Lake Objects (DLOs), Data Model Objects (DMOs), and calculated insights appear distinct in search, connect, and lineage pages, which makes discovering, connecting to, and reusing them simpler.

## Curation and trust

- Certify your data assets to help users find trusted and recommended data.
- Set data quality warnings to alert users to data quality issues, such as stale or deprecated data.
- Add sensitivity labels to warn users about data that needs to be handled with care.
- Add custom labels to classify data in ways that suit the needs of your organization
- Manage data labels to extend the label names and categories available to users.
- Categorize items on Tableau Server and Tableau Cloud using tags to help users filter external assets.
- Better understand published visualizations by using the Data Details tab to see information about the data used.
- Add descriptions to databases, tables, and columns to help users find the data they're looking for.

### Lineage and impact analysis

- Use lineage to trace the source of your data and to analyze the impact of changes to your data and identify which users might be impacted.
- Email owners of a workbook, data source, or flow about data-related updates. Do the same with database, table, or object contacts.

### Developer resources

You can use metadata methods in the Tableau REST API to programmatically update certain metadata. For more information about the metadata methods, see Metadata Methods in the Tableau Server REST API.

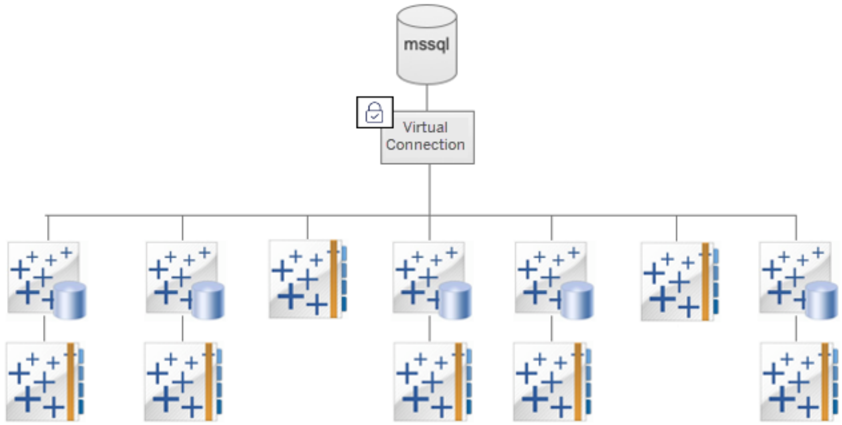
In addition to the REST API, you can use the Tableau Metadata API to programmatically query metadata from the content published to Tableau Server or Tableau Cloud. The Metadata API is fast and flexible and is best when you are looking to find out specific information about the relationship between metadata and its structures. Explore and test queries against the Metadata API using an interactive in-browser tool called GraphiQL.

**Note:** Data Management is not required to use the Metadata API or GraphiQL.

# About Virtual Connections and Data Policies

Virtual connections are a Tableau content type, along with data sources, workbooks, and flows, to help you see and understand your data. Virtual connections provide a central access point to data. Another key feature introduced with virtual connections is data policies, which support row-level security at the connection level, rather than the workbook or data source level. Row-level security data policies are applied to any workbook, data source, or flow that uses the virtual connection.

A virtual connection can access multiple tables across several databases. Virtual connections let you manage extracting the data and the security in one place, at the connection level.




For information about row-level security options, see an Overview of Row-Level Security Options in Tableau.

Not every virtual connection has an associated data policy. You can also use a virtual connection simply as a central place to manage connection credentials.

## Key terms

- Virtual connection. A sharable resource that provides a central access point to data.
- Connection. The server name, database, and credentials you use to access data. A virtual connection has one or more connections. Each connection accesses one database or file.
- Virtual connection table. A table in a virtual connection.
- Data policy. A policy that's applied to one or more tables in a virtual connection to filter data for users. For example, use a data policy to apply row-level security to tables in a virtual connection.
- Policy table. A fact or data table in a data policy that is filtered.
- Policy column. A column that's used to filter the data in the policy tables. A policy column can be in a policy table or in an entitlement table.
- Entitlement table. A table that includes both a policy column you can use to filter policy tables and another column you can relate (map) to a column in a policy table.
- Policy condition. An expression or calculation that is evaluated for every row at query time. If the policy condition is TRUE, then the row is shown in the query.

## License virtual connections and data policies

Virtual connections and data policies are licensed through Data Management. For information about how Data Management licensing works, see License Data Management.

## Enable virtual connections and data policies

Virtual connections and data policies are automatically enabled on Tableau Server and Tableau Cloud with Data Management.

## Permissions

Permissions for virtual connections work much like the permissions for other Tableau content. After you publish a virtual connection, anyone can view the connection. However, only the connection creator and administrators can access data using the connection, until the connection creator explicitly grants more permissions.

When you create a virtual connection, you must set the permissions for the Connect capability to enable other users to connect to data using the virtual connection. The Connect capability allows you to share a virtual connection and allows users to query it. With connect permissions, a user can view the tables in a virtual connection and create content using the tables. For more information, see Set permissions on a virtual connection.

### Permissions vs. data policies

Permissions define what a person can or can't do with a piece of content in Tableau. Permissions are made up of capabilities—the ability to do things like view content, web edit, download data sources, or delete content. Permission rules define which capabilities are allowed or denied for a user or group on a piece of content. The interplay between license level, site role, and potentially multiple permission rules factor into the final determination of what a person can or can't do—their effective permissions. See Permissions for details.

Data policies filter the data in a virtual connection, making sure that people see only the data they're supposed to see. A data policy is applied and filters the data when it's viewed in the

Tableau content (for example, a workbook or flow). The policy condition in a data policy is a calculation or expression that defines access to the data. User functions are often used to limit access to users or groups. Access can be based on the user name, the group a user belongs to, or a region value. See Create a Data Policy for Row-Level Security for details.

Both permissions and data policies govern access. Simply put, permissions determine which *content* you can see, access, use, or create; data policies determine which *data* you can see.

How permissions and data policies work together

Tableau permissions are applied to Tableau content first. People can only do the things they have the capabilities to do with Tableau content—data policies don't override Tableau permissions. After permissions are evaluated, the data policy is applied to determine which data in the virtual connection the person can see based on the policy condition.

The following example describes the effects of permissions and data policies on a virtual connection that contains salary data:

- The virtual connection is in the HR project, which is restricted to Tableau users in the HR group. Anyone outside the HR group can't see content in the HR project, which means they can't browse to, connect to, or view the virtual connection.
- The virtual connection has Connect permissions granted only to members of the HR Business Partners group. All others in the HR group can see that the virtual connection exists, but they can’t view the data it contains. When they view a workbook that uses that virtual connection, they can't see any data.
- The virtual connection also contains a data policy that filters the salary data based on the individual user, so HR Business Partners can see only rows that pertain to employees in their business unit. When they view a workbook that uses that virtual connection, they see data only for their business unit.

## Features and functionality

For the manager of data, virtual connections provide:

- **Securely managed service accounts.** If you use a ‘service account’ model, now instead of having to share that service account information with any user who wants to access that data, you can give the service account credentials to the few analysts who are empowered to create virtual connections.

- **Agile physical database management.** You must make database changes (for example, a field is added or table name is changed) only one time in the virtual connection, rather than in every piece of content where the data is used.
- **Reduced data proliferation.** By centrally managing extract refresh schedules, refreshes are scheduled once, ensuring that anyone who accesses the data from that virtual connection is seeing fresh data.
- **Centralized row-level security.** You can create data policies that apply row-level security to both Tableau extracts and live queries at the connection level. The data policies are applied to any workbook, data source, or flow that uses the virtual connection.

**Note:** Data policies are valid for flow input data, but not for flow output data. Users with access to flow output data will see all of the data, and not only a subset of it that pertains only to them.

As the user of data, you benefit from virtual connections knowing that you have:

- **Appropriate access** to only the data you should see, because row-level security is already applied to the data.
- **Flexibility** to use data that's been curated and secured. The virtual connection stores and shares the connection information. All you have to do is create a data source with a data model specific to your needs.
- **Trust** that data is fresh because the extract refresh schedule has already been set.
- The ability to **share** content freely, assured that you won’t put security at risk because data policies are always enforced.

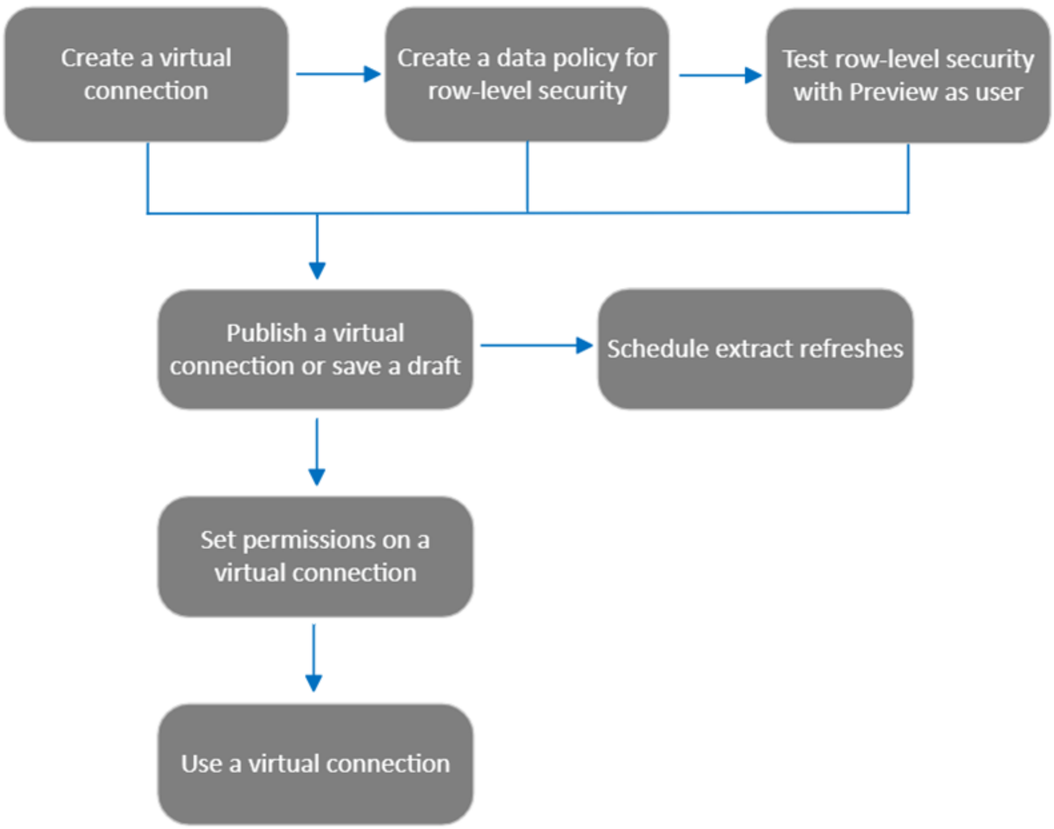
## Virtual connection editor workflow

The virtual connection editor enables you to create:

- Virtual connections, which are a Tableau content type that provides a sharable central access point to data.
- Data policies that support row-level security at the connection level.

After you create a virtual connection and its associated data policies, you can publish it and set the permissions to share with other users. You can also schedule extract refreshes so that all content that uses the virtual connection is accessing fresh data.

The following diagram shows the workflow to create a virtual connection. At any time during the process, you can publish or save a draft of your connection, but the connection must be published before you can schedule extract refreshes or use (or edit) a virtual connection. You must also set permissions before others can use the connection.




Click a step in the process to go to that help topic.

## Next step

The first step is to Create a Virtual Connection.

# Create a Virtual Connection

A virtual connection is a Tableau content type that provides a sharable central access point to data, and supports row-level security at the connection level. Creating a virtual connection is a multi-step process. This topic covers connecting to the data you want to share and working in the Tables tab of the virtual connection editor.

## Connect to data

To create a virtual connection in Tableau Cloud or Tableau Server:

1. From the Home or Explore page, click **New** > **Virtual Connection**.
2. In the Connect to Data dialog box, select the connector for your data. For a list of supported connectors for virtual connections, see Creators: Connect to Data in the Tableau Desktop and Web Authoring help.
3. Enter the information you're prompted for. The credentials you enter are saved in the virtual connection, so connection users don't have to enter credentials to connect to the data.
4. Click **Sign In** if prompted. To add another connection, click and select a connector, enter credentials, and sign in.

A virtual connection can have multiple connections. Each connection accesses one database or file.

**Note:** For Tableau Cloud, virtual connections that connect to private network data use Tableau Bridge to keep data fresh. For information about configuring Tableau Bridge, see Configure and Manage the Bridge Client Pool. For information about supported connections, see Connectivity with Bridge.

## Add another connection

As needed, add another connection to a virtual connection and connect to more than one database by clicking next to **Connections**. You can add a connection to a different server or database, or to the same server or database.

With multiple connections, you can:

- Use a table from any connection or database as an entitlement table in a data policy that secures tables from other connections and databases.
- Add or replace tables in a virtual connection with tables from a different database. For example, say you migrate data from one database to another. In the virtual connection editor, you can add a connection to the second database and replace the existing tables from the first database with tables from the second one.
- Add multiple connections to the same server or database. This can be helpful when you need to for example access data from the same database but with different credentials.
- Share a group of tables that are related or meant to be used together, no matter where they're physically located. For example, from multiple databases you can group tables related to employee information.

When you open a virtual connection to edit it, if prompted you must authenticate connections in sequence. If any connections fail to authenticate, you can't edit the virtual connection.

## Select tables to include in the connection

If necessary, select a database to view the tables in it.

1. On the left, under **Tables**, select the tables and click or drag them to the Tables tab on the right. You can include tables from different connections. Include an entitlement table, if you're using one.
2. (Optional) Click **New Custom SQL** to create a custom table schema.

> **Note:** Virtual connections don't support tables with a spatial data type.

## Select live or extract mode for tables

You can set individual tables—whether they're from multiple connections or not—to either live or extract mode in the same virtual connection.

- **Live**- Tables are queried directly from the database. (Live is the default.)
- **Extracts**- Tables are extracted and saved to Tableau.

As an example, you can set some tables to extract mode so that they're not impacted by report generation or heavy customer traffic.

Under Tables, select the table or tables you want to change the mode for and select **Actions**, and **Change to Live** or **Change to Extract**. Alternatively, select the Actions Menu (...) in the table's row and select **Live** or **Extract**.

Incremental Extracts

Starting in Tableau Cloud June 2024 and Tableau Server 2024.2, you can configure table extracts for incremental refresh.

When configuring an incremental extract, you specify a key column that is used to identify new rows. When the incremental extract is refreshed, only the rows where the key column has increased will be added to the extract. Fewer rows processed means a faster extract refresh job and less load on the database.

For example, suppose we have an extract for the **Batters** table, and the data in the extract is:

| Year | Team |
|---|---|
| 1978 | Lions |
| 1979 | Tigers |

The **Batters** table is configured for incremental extract refresh, and the key column is **Year**.

The live table is updated with a new row for **1980**:

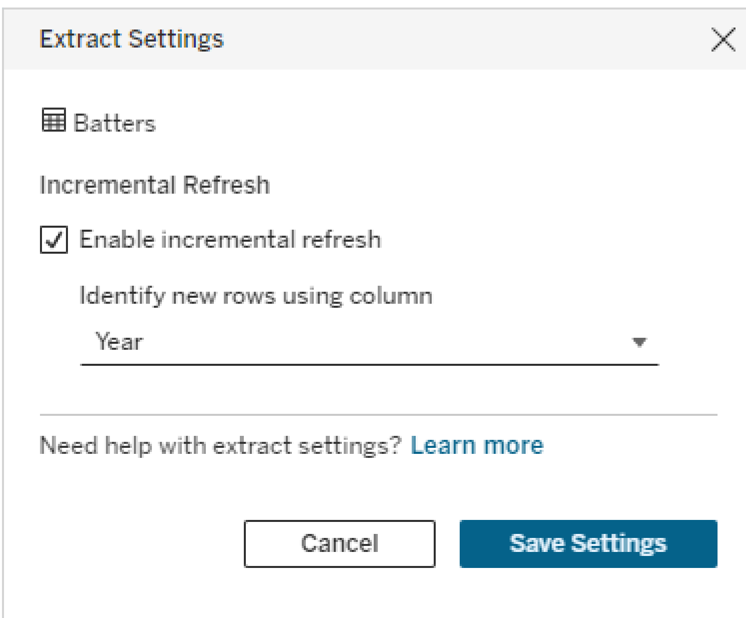
| Year | Team |
|---|---|
| 1978 | Lions |
| 1979 | Tigers |
| 1980 | Bears |

When the **Batters** table's extract is refreshed incrementally, only rows that exceed the greatest value in the extract's key column are added. In this case, that means that the **1980** row is added to the extract. Instead of refreshing the entire extract file, only 1 row is processed and appended.

You can still do a full refresh on an extract configured for incremental refresh if you want to refresh the entire extract.

To configure incremental refresh for a table extract:

1. Change the table from **Live** to **Extract.**
2. Select the Actions Menu (...) in the table's row and select **Extract Settings...**.
3. Check **Enable incremental refresh**.
4. Select an incrementing column to use when determining which rows to add.
5. Select **Save Settings**.




Convert to Custom SQL

Starting in Tableau Cloud June 2024 and Tableau Server 2024.2, you can approximate the SQL used to connect to a table and use that as a starting point for your own custom SQL. Custom SQL allows you to filter or make other query changes that can modify the result set. Creating custom SQL this way instead of using **New Custom SQL** in the data pane is less impactful to existing virtual connections. Downstream assets see the table as the same table instead of a new one.

To convert a table to custom SQL:

1. Select the Actions menu (...) in the row for the table.
2. Select **Convert to Custom SQL**.
3. In the **Edit Custom SQL** dialog, edit the SQL as needed.
4. Select **Generate Table**.

Note: The SQL that first appears in the dialog should be considered a starting point, and may not work without modification. The virtual connection editor lacks nuanced information about the specific SQL syntax used in the connection. If you encounter errors when selecting the Generate Table button, try removing or changing single quotes, double quotes, back quotes, and square brackets to make the SQL compliant with the database you're using.

To edit the custom SQL:

1. Select the Actions menu (...) in the row for the table.
2. Select **Edit Custom SQL**.
3. In the **Edit Custom SQL** dialog, edit the SQL.
4. Select **Generate Table**.

To return the table to its default state, without custom SQL:

1. Select the Actions menu (...) in the row for the table.
2. Select **Replace**.
3. In the replace table dialog, select the original table name.
4. Select **OK**.

Extract table data

After a table or tables are changed from live to extract but haven’t been extracted yet, click **Create Pending Extracts** to run the pending extracts. After all pending extracts are run, click **Refresh All Extracts** to extract all table data at that time.

Alternatively, in Tableau Cloud June 2024 or Tableau Server 2024.2 and later, select the Actions Menu (...) in the table's row and select **Refresh Extract...**. If incremental refresh is not configured for the table, you can only select **Refresh (Full)**. If incremental refresh is configured, you can choose either **Refresh (Full)** to refresh the extract completely, or **Refresh (Incremental)** to incrementally refresh the extract.

You must run any pending extracts before you publish the virtual connection. You can't edit the connection while extracts are generated.

Schedule extract refreshes of the tables in your virtual connection on the virtual connection page after you publish the connection. See Schedule Extract Refreshes for a Virtual Connection.

## Set the table visibility state

Use the Visibility toggle on the Tables tab to show or hide tables and their data from users.

 Users can see table data. You can create a data policy to govern which data users can see. (Visible is the default.)

 Users can't see table data. You can use hidden tables in a data policy and as an entitlement table.

## See table details

Click a table at the top of the Tables tab to see its details. You can make simple edits in the Table Details section, such as change a table name, hide or rename a column, or change a data type.

Switch the table information you see using these icons:

A list of columns in the table and each column's data type.

Sample data for each column and linked keys, if available. Linked keys show which columns link to other tables. They're visible only when databases have primary and foreign key information.

- The range of values in a histogram for each column selected.

## Refresh data from the database

Click the refresh icon in the toolbar to get the latest data from the database for all the connections in a virtual connection, including:

- The lists of databases, tables, and columns. Both the tables included in a virtual connection and not included are refreshed.

- Table and histogram data.

For tables in live mode, refreshing retrieves the latest list of databases, tables, and columns and the most recent table and histogram data. For tables in extract mode, refreshing retrieves the updated list of tables and columns. But to see the most recent table and histogram data, you must start a new extract. For example, when there's a new column in a database table and you click the refresh icon, the new column appears in the editor but its data does not. To see the most current data, you must start a new extract.

Refreshing data invalidates any currently cached data. Closing and reopening the editor, switching tables from extract to live mode, and changing a connection credential like user-name or password also refreshes data.

### Who can do this

To create a virtual connection, you must

- have credentials to the database that the virtual connection connects to, and
- be a server or site administrator, or a Creator.

### Next steps

After tables have been added and configured on the Tables tab, you can choose to Create a Data Policy for Row-Level Security or Publish a Virtual Connection and Set Permissions.

### See also

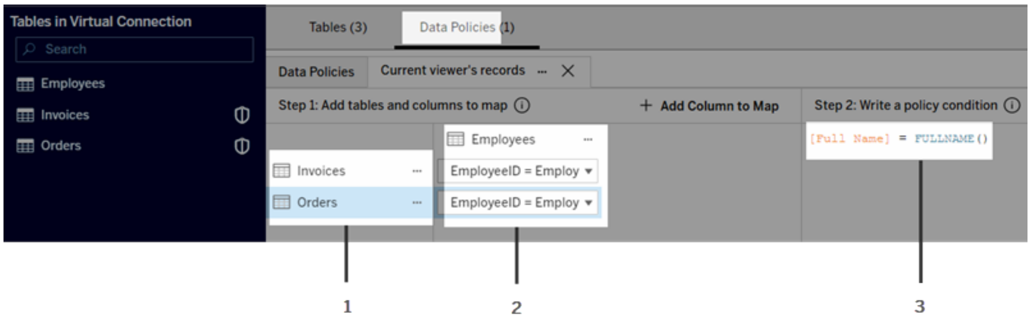
Use a .properties file to customize a JDBC connection — If you're customizing a JDBC-based connection, you can also make customizations in a .properties file

## Create a Data Policy for Row-Level Security

Use a data policy to apply row-level security to one or more tables in a virtual connection. A data policy filters the data, ensuring that users see only the data they're supposed to see. Data policies apply to both live and extract connections.

## About data policies

A data policy has three main components:




1. The tables it applies to, called policy tables. These are the tables that are filtered.
2. The mapped columns that define the relationships between tables (for example, between entitlement and fact tables) and between table columns and policy columns. A policy column is the column used to filter data.
3. The policy condition, which is an expression or calculation that is evaluated for every row at query time. If the policy condition is TRUE, then the row is shown in the query.

When you create a data policy, you need a column you can use to filter the data. This column is called a policy column. Data is filtered by the policy condition, usually using a user function, such as USERNAME() or FULLNAME().

If your policy table includes a column that you can filter on, then use that column as your policy column.

When a policy table doesn't include such a column, use an entitlement table with a column you can use to filter the data. An entitlement table is a table that includes both a policy column you can use to filter policy tables and another column you can relate (map) to a column in a policy table (as shown in the data policy example image above).

## Filter with a policy column from a policy table

The most common way to filter data is to use a column in the table that has the data that you want to filter on. Use that column as a policy column and then map the appropriate table columns to the policy column.

To use a policy column to filter your data, first, add tables to the policy from the left pane. To add a table, do one of the following:

- Double-click the table name.
- Click the drop-down arrow near the table name and select **Manage table with policy**.
- Or, drag the table to the right and drop it on **Add as Policy Table**.

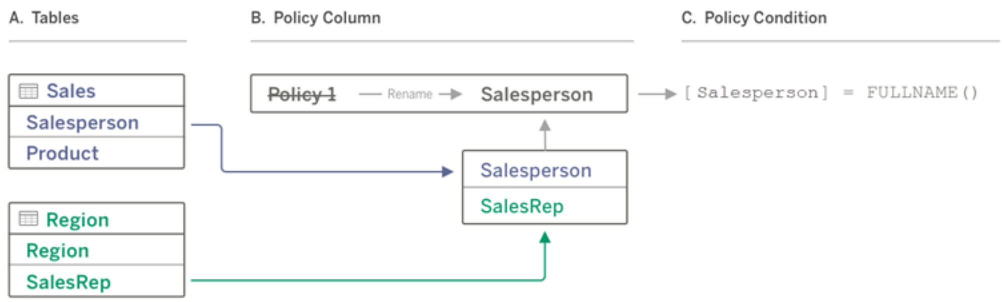
After a table is added to a policy, a shield icon appears to the right of the table name in the left pane indicating that it's a policy table.

Next, map columns to create a relationship between the column name in the table and the policy column name. Use the policy column name in the data policy condition to control row-level data access for users:

1. Click **+Add Column to Map** to add one or more columns you’ll use to filter data.
2. Name the policy column. You'll use this name in the policy condition.
3. For each table the policy applies to, use the drop-down menu to select the table column that maps to the policy column.
4. Repeat this process for as many policy columns as you want to use in the policy condition.

**Tip:** Instead of using the +Add Column to Map button, you can start typing the calculation in the policy condition area and use auto-complete to choose the column name, which will then populate the policy column information under Step 1.

An example using a policy column from a policy table




A. The Sales table has a [Salesperson] column, and the Region table has a [SalesRep] column. The Salesperson and SalesRep data matches the full name of Tableau users on your site.
B. You want to filter the Sales and Region data by Salesperson, so you name the policy column "Salesperson" and then map the Salesperson column from Sales and the SalesRep column from Region to the Salesperson policy column.
C. Then write the policy condition to filter both tables. Use the [Salesperson] policy column and the FULLNAME() user function so that each user can see only their own data.

## Filter with policy column from an entitlement table

Entitlement tables are used when your policy table doesn't contain a column you can filter on. You can use the entitlement table to map a column in the data table to a column in the entitlement table. Note the following:

- Be sure to include the entitlement table as a table in the virtual connection. You can use a table from any connection or database as a central entitlement table that secures tables across many other databases. In some cases, an entitlement table that's in the same database as the tables you're securing can be a potential security risk because of the potential for exposing employee data. And having an entitlement table in a different database can make it easier to control permissions, for example, to grant someone access to a database.
- If you don't want virtual connection users to see the entitlement table, you can toggle the setting in the Visibility column on the Tables tab to hide it. Once hidden, the enti-

tlement table is still available for policy filtering but can’t be used in vizzes or workbook data sources.

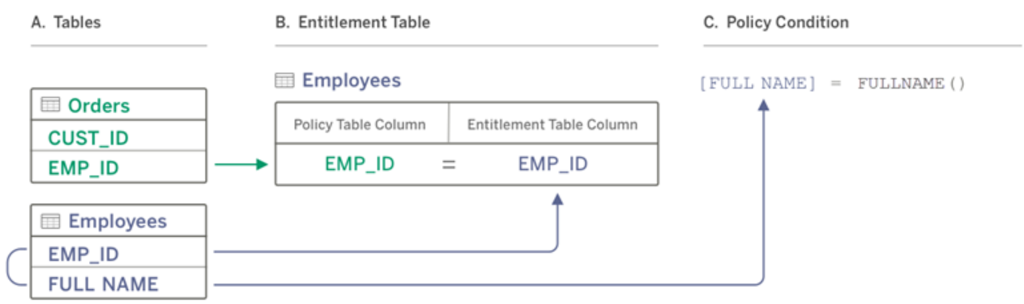
> **Note**: Connecting directly to a flow output (.hyper file) is not supported for the entitlement table. The flow output must write directly to the database.

To use an entitlement table to filter your data:

1. Add the data tables that you want the data policy to apply to. Do one of the following:
   - Double-click the table name.
   - Click the drop-down arrow near the table name and select **Manage table with policy**.
   - Or, drag the table to the right and drop it on **Add as Policy Table**.
2. After a table is added to a policy, a shield icon appears to the right of the table name in the left pane indicating that it's a policy table.
3. Select the entitlement table, then either:
   - Click the drop-down arrow and select **Use as entitlement table**.
   - Or, drag the table to the right and drop it on **Add as Entitlement Table**.
4. For each table that the policy applies to, click the drop-down menu and select the

column to map the policy table to the entitlement table.

An example using a policy column from an entitlement table




A. The data you want to filter has an EMP_ID column, but not an employee name column. However, you have a second table that includes columns for both EMP_ID and the employee's FULL NAME. And, the values in the employee FULL NAME column match the full name of Tableau users on your site.
B. You can add Employees table to the policy as an entitlement table, and then map the policy table column name EMP_ID to the entitlement column name EMP_ID for each table.
C. Then use the FULLNAME() function in your policy condition to match the Tableau Server user's full name with the entitlement table's [FULL NAME] column (which is the policy column) so that each user can see only their own data.

## Write a policy condition

The last step in creating a data policy is to write a policy condition, which is a calculation or expression used to define row-level access. Policy conditions are often used to limit access to users or groups through user functions.

A policy condition:

- Is required in a data policy.
- Must evaluate to true or false.
- Shows rows when the policy condition is true.

When you close a policy tab, it doesn't discard your work.

Policy condition examples

Shows only rows where the Region column value is North:

```
[Region] = "North"
```

Enables a signed-in user to see the rows where the user's name matches the value in EmployeeName:

```
FULLNAME() = [EmployeeName]
```

Enables members of the Managers group to see all rows, while users can see only the rows where their username matches the value in the employee_name column:

```
ISMEMBEROF('Managers') OR USERNAME() = [employee_name]
```

Supported Tableau functions in policy conditions

Policy conditions support a subset of Tableau functions:

- Logical (except null-related)
- String
- User
- Date
- Number: MIN, MID, MAX

To see which specific functions are supported, in the virtual connection editor, on the Data Policies tab, see the **Reference** panel on the right.

> **Note**: If the virtual connection has a data policy that contains user functions (for example, `USERNAME()`) and you connect to it from a workbook or data source and create an extract there, the extract will contain only the rows that match the virtual connection data policy at the time the extract is created. To take advantage of a virtual connection with user functions in the data policy, use a live connection from the workbook or data source to the virtual connection instead of an extract.

### Who can do this

To create a data policy, you must

- have credentials to the database that the virtual connection connects to, and
- be a server or site administrator, or a Creator.

### Next steps

After you create a data policy, the next step is to verify that it works as you expect it to. See Test Row-Level Security with Preview as User. Or, if you're ready to share the virtual connection and its data policies with others, see Publish a Virtual Connection and Set Permissions.

### Resources

For detailed information about calculations, see Understanding Calculations in Tableau in the Tableau Desktop and Web Authoring help.

For information about user functions, see User Functions in the Tableau Desktop and Web Authoring help.

For information about other row-level security options in Tableau, see Overview of Row-Level Security Options in Tableau in the Tableau Server help.

## Test Row-Level Security with Preview as User

Use **Preview as user** to test your data policy. You can see the data as the user sees it and ensure that row-level security is working as expected. This helps when the data policy keeps you from seeing the rows in the table (for example, if only salespeople can see rows, and you’re not a salesperson).

To preview the data when the data policy is applied:

1. Select a table.
2. In the Table Details section, select the **With policy applied** check box.
3. Click **Preview as user**, select a **Group** (optional) and a **User**.

4. Verify that the policy shows the correct data for that user in the table details.
5. Repeat for other users as needed.

**Tip:** In Table Details, click to show the range of values for a column, including which values show and which are filtered out by the data policy. Select one or two columns that are good indicators that the policy is correctly filtering the data.

### Who can do this

To test a virtual connection, you must

- have credentials to the database that the virtual connection connects to, and
- be a server or site administrator, or a Creator.

### Next step

After you test your data policy, when you're ready to share the virtual connection with others, see Publish a Virtual Connection and Set Permissions.

## Publish a Virtual Connection and Set Permissions

When you work in the virtual connection editor, your changes are automatically saved as a draft while you work. To share a new virtual connection with other users, you need to publish it.

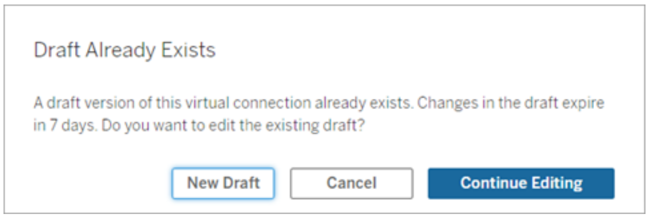
### Save a draft

You can manually save a draft of the connection by clicking the save icon in the toolbar or by selecting **File** > **Save Draft** from the menu.

When editing a published virtual connection, the connection stays available to users in its current published state. You can save your updates as a draft while you work on the connection in the editor. To share the updates to the virtual connection with other users, you need to publish it.

Draft in progress

If you close the editor while updating a published virtual connection, the next time you open the connection in the editor within seven days, you have the option of continuing to make edits to the existing draft, starting a new draft, or opening the connection in its current published state by clicking **Cancel**.




To return to a draft version of an unpublished virtual connection, you need to manually save the URL of the draft **before** you close the editor. You can use the URL to open the draft in the editor the next time you want to work on the connection within seven days. For example:

```
https://yourserver.test.com/published-connection-edit-
or/?draft=d1789edc-5d9f-40ae-988d-9fc879f37a98
```

## Publish the connection

To publish a new connection:

1. Click the **Publish** button in the upper right corner of the editor or select **File** > **Publish** from the menu.
2. In the Publish dialog box:
   a. Type a name in the **Name** field.
   b. Select a project to save the connection to.
3. Click **Publish**.

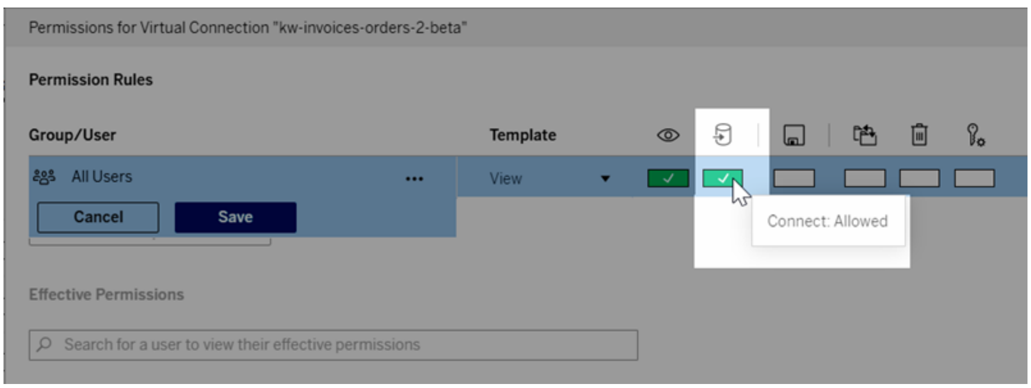
To publish an updated connection, click the **Publish** button in the upper right corner of the editor or select **File** > **Publish** from the menu.

## Set permissions on a virtual connection

After you publish a virtual connection, you need to set the permissions so that others can use it. By default, all users can **View** the connection, in other words, see it listed under Virtual Connections in Tableau, but unless you set the **Connect** capability to Allowed, only you and administrators can use the virtual connection. For more information on the Connect capability, see Permissions.

To set permissions:

1. Navigate to the virtual connection.
2. Open the Actions menu (...) and click **Permissions**.
3. Check the box under the Connect icon so that connect is allowed for all users.

   **Tip:** You can add additional rules if you want to grant the permission only to certain users or groups.

4. Click **Save**.

For more information about permissions on Tableau content, see Permissions. For information on embedding passwords when you publish Tableau content such as a data source or workbook that uses a virtual connection, see Virtual connections in the Tableau Server help.

## Who can do this

To publish a virtual connection or set permissions, you must

- have credentials to the database that the virtual connection connects to, and
- be a server or site administrator, or a Creator.

### Next step

After you publish a virtual connection and set its permissions, you can Use a Virtual Connection .

## Schedule Extract Refreshes for a Virtual Connection

One of the benefits of virtual connections is that you can reuse the same extract multiple times, reducing data proliferation and removing redundant extract refresh jobs. To ensure that extract data is fresh for any content that uses a virtual connection, you can create an extract refresh schedule for the tables in your connection after you publish the connection.

You can also schedule extract refreshes of data sources and workbooks that use virtual connections. See Schedule Refreshes on Tableau Cloud and Refresh Data on a Schedule (Tableau Server).

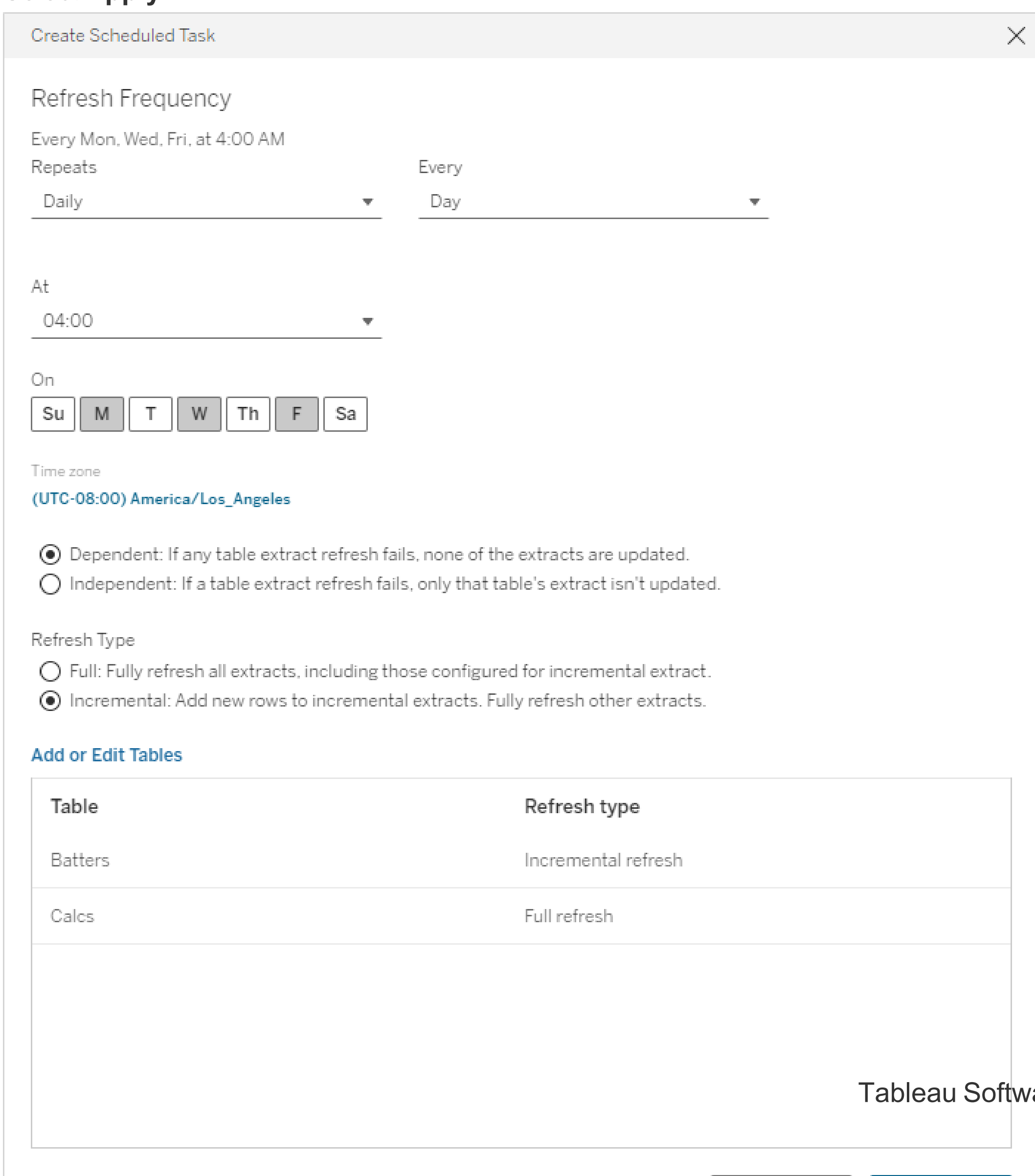
### Extract tables

See Extract table data.

### Schedule extract refreshes on Tableau Cloud

1. Navigate to the virtual connection page. (From the **Home** or **Explore** page, click **Virtual Connections** from the dropdown menu, then select your virtual connection.)
2. At the top of the page, a heading should say **Data is Extract**. If it says **Data is Live**, refresh your browser.
3. Select the **Scheduled Tasks** tab and click **+New Task**.
4. The **Create Scheduled Task** dialog box opens. The **Create Scheduled Task** dialog box looks different in Tableau Server and Tableau Cloud. If you are using Tableau Server, see Schedule Extract Refreshes for a Virtual Connection in the Tableau Server Product Help.
5. Select the **Refresh Frequency** using the dropdowns for **Repeats**, **Every**, and **At**. Use the buttons under **On** to select the days of the week.

6. For cases when multiple tables use extracts, select **Dependent** or **Independent**.
   - **Dependent** means that none of the extracts will be updated if one or more tables' extract refresh jobs fails.
   - **Independent** means that the success or failure of a table's extract job doesn't affect whether or not other tables' extracts are updated.
7. Select **Refresh Type**. You can configure the type of extract in the virtual connection editor. For more information, see the Incremental Extracts section of the Create a Virtual Connection page.
   - **Full** means that full extract refresh jobs will be run on all extracts in the virtual connection, regardless of whether they are configured for full extract refresh or incremental extract refresh.
   - **Incremental** means that incremental extract refresh jobs will be run on all incremental extracts in the virtual connection. For all other extracts in the virtual connection, full extract refresh jobs will be run.
8. Select **Add or Edit Tables** and select the tables you want to refresh.
9. Select **OK**.
10. Select **Apply**.



Virtual connections that connect to private network data use Tableau Bridge to keep data fresh. For more information, see Configure and Manage the Bridge Client Pool.

### Time limit for extract refreshes

To ensure that long running refresh tasks don't take up all system resources and don't prevent refreshes of other extracts on your site, extract refreshes for a virtual connection are subject to a two-hour time limit. For more information about the timeout limit for refresh tasks and suggestions for resolving these errors, see Time limit for extract refreshes. However note that virtual connections support only full and not incremental refreshes.

### Who can do this

To publish a virtual connection or set permissions, you must

- have credentials to the database that the virtual connection connects to, and
- be a server or site administrator, or a Creator.

### Next step

After you schedule extract refreshes for a virtual connection, you can Use a Virtual Connection

## Use a Virtual Connection

After a virtual connection is published and permissions are set, it's available to users to connect to data in the same ways that users access all data in Tableau. When you must edit a virtual connection or the data policy in the connection—for example, when the underlying schema changes—simply open the connection in the virtual connection editor, make your changes, and either save or publish the updates. You can also replace an existing data source in a workbook with a virtual connection.

### Connect to a virtual connection

For web authoring in Tableau Cloud or Tableau Server:

1. On the Home or Explore page, click **New**.
2. Select the type of content you want to create: workbook, flow, or published data source.

3. In Connect to Data > On This Site > Content Type dropdown menu, select **Virtual Connections**.
4. Select the name of the connection and click **Connect**.

For Tableau Desktop and Tableau Prep:

1. On the Connect pane, under Search for Data, click **Tableau Server**.
2. Enter the server name and click **Connect**, or click **Tableau Cloud**.
3. Enter the information prompted for.
4. On the Search for Data dialog box, from the Content Type dropdown menu, select **Virtual Connections**.
5. Select the name of the connection and click **Connect**.

**Note:** There's no need to enter credentials when you connect using a virtual connection. The credentials to access the data are embedded in the connection.

## Edit a virtual connection or data policy

When editing a published virtual connection, the connection stays available to users in its current published state. For more information, see Publish a Virtual Connection and Set Permissions.

To edit a connection, navigate to it from the Explore page. Note that even though database credentials are embedded in the connection, only those with the database credentials can make any changes to a virtual connection.

1. From the dropdown menu, select **All Virtual Connections**, then select the connection you want to edit.
2. Click **Edit Virtual Connection**.
3. Enter the information prompted for to connect. To edit a connection, you must enter the credentials required to access the data.
4. Click **Sign In**.
5. In the virtual connection editor, make your changes and then either save a draft or publish the connection.

Respond to underlying schema changes

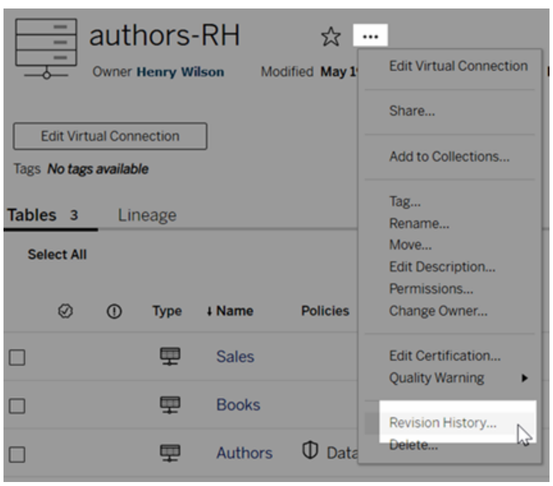
When the underlying schema in a virtual connection changes—for example, a table is added or deleted, or a column is added or renamed—you must edit the virtual connection to reflect the schema changes and then republish the connection. (If the connection has extracts, remember to refresh the extracts.) This way, you can add or edit the tables, columns, and policies in the connection before new data is exposed to everyone.

## Work with virtual connection revision history

When you publish a virtual connection, a version is saved in the revision history for Tableau Cloud or Tableau Server. You can revert to a previous version at any time.

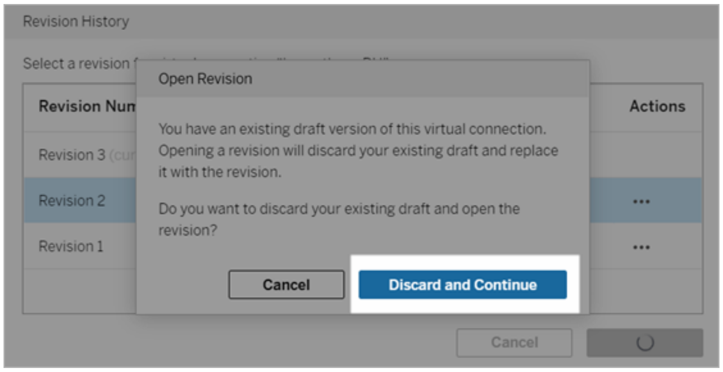
To access revision history, you must have a **Creator** site role and the **View** and **Overwrite** permissions.

To see the virtual connection revision history, click the actions menu (. . .) for the virtual connection, then click **Revision History**.

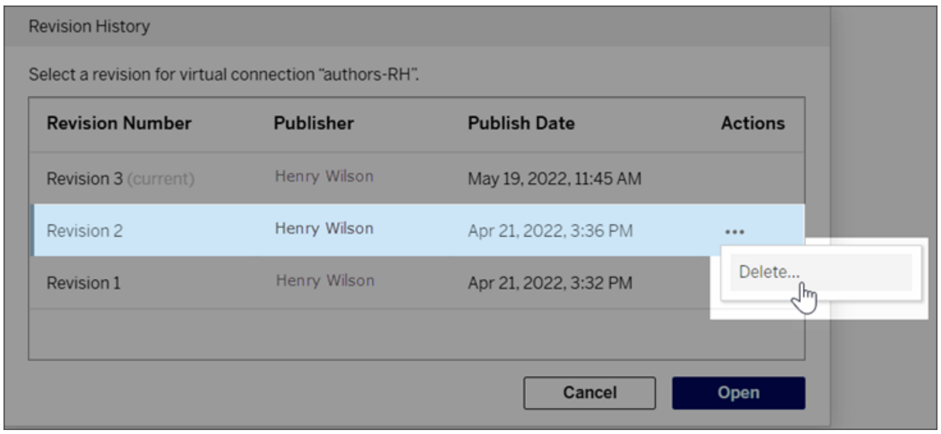



Restore or delete a virtual connection revision

To restore a virtual connection revision, select a revision, and then click **Open**. You are then prompted to discard the existing version of the connection. When you click **Discard and Continue**, the revision you selected becomes the current version of the connection.




To delete a revision, from the revision's actions menu (. . .), click **Delete**.




## Replace an existing data source in a workbook with a virtual connection

For web authoring in Tableau Cloud or Tableau Server:

1. Download the workbook. For more information, see Download Views and Workbooks in Tableau Desktop Help.
2. In Tableau Desktop, open the workbook and replace its existing data source with a virtual connection. For more information, see Replace Data Sources in Tableau Desktop Help.
3. In Tableau Desktop, upload the workbook to your Tableau Cloud or Tableau Server site. For more information, see Upload Workbooks to a Tableau Site in Tableau Desktop Help.
4. In Tableau Cloud or Tableau Server, click **Publish** to save your changes to the server.

For Tableau Desktop:

1. Open the workbook and replace its existing data source with a virtual connection. For more information, see Replace Data Sources in Tableau Desktop Help.
2. Republish the workbook. For more information, see Simple Steps to Publish a Workbook in Tableau Desktop Help.

## Who can do this

To use a virtual connection, you must be a Server Administrator, Site Administrator Creator, or Creator.

To edit a virtual connection or data policy, you must

- have credentials to the database that the virtual connection connects to, and
- be a server or site administrator, or a Creator.

To migrate existing content to use a virtual connection, you must

- be a server or site administrator, or
- be a Creator who is also the data source owner.

# About Tableau Advanced Management on Tableau Cloud

**Important:** As of September 16, 2024, Advanced Management is no longer available as an independent add-on option. Advanced Management capabilities are only available if you previously purchased Advanced Management, or if you purchase certain license editions - either Tableau Enterprise (for Tableau Server or Tableau Cloud) or Tableau+ (for Tableau Cloud).

Tableau Advanced Management is a collection of features designed to provide enhanced security, manageability, and scalability capabilities for your Tableau Cloud deployment.

## Advanced Management Licensing

Advanced Management is licensed on a per deployment basis as part of Tableau Enterprise or Tableau+.

- Advanced Management can only be used with a Tableau Cloud deployment. For more information on how to purchase Advanced Management for an existing Tableau Cloud deployment, contact your account manager.
- If Advanced Management is removed or deactivated for your deployment, you will no longer be able to use the features associated with Advanced Management.

## Feature table

The following table lists the features that are included with Advanced Management:

| Feature | Description | Requirements to use the feature |
|---|---|---|
| Content Migration Tool | The Content Migration Tool provides an easy way to copy or migrate content between Tableau projects in your Tableau Cloud deployment.<br><br>For more information, see About Tableau Content Migration Tool. | • The Content Migration Tool must be installed on a version of Microsoft Windows that supports .NET 4.6.1 (Windows 7 or later, Windows Server 2008R2 or later). |
| Activity Log | The Activity Log can send log events to Amazon Simple Storage Service (S3), where you can use them to conduct further auditing and analysis.<br><br>For more information, see Activity Log. | • Amazon Web Services (AWS) account.<br>• Amazon Simple Storage Service (S3) bucket to receive data.<br>• AWS Key Management Service (KMS) key. |
| Admin Insights data retention | Admin Insights data sources retain up to 365 days of site data.<br><br>For more information, see Use Admin Insights to Create Custom Views. | |
| Customer-Managed Encryption Keys | Customer-Managed Encryption Keys give you an extra level of security by allowing you to encrypt your site data extracts with a customer managed site-specific key. For more information, see Customer-Managed Encryption Keys. | |
| Increased Site Capa- | With Advanced Management you get the following capacity increases for your | |

| Feature | Description | Requirements to use the feature |
|---|---|---|
| city | licensed sites:<br>• Storage of up to 5 Terabytes (TB)<br>• Maximum file size of 25 Gigabytes (GB)<br>• Up to 25 concurrent Extract refreshes<br><br>For more information on site capacity, see Tableau Cloud Site Capacity. | |

# Activity Log

If you have Tableau Cloud with Advanced Management, you can configure the Activity Log to send log events to Amazon Simple Storage Service (S3) for further analysis and auditing. It can take up to 15 minutes for events to appear in your S3 bucket after they occur. With the Activity Log, you can:

- View detailed event data for Tableau Cloud.
- Capture compliance information and keep track of who is doing what on your Tableau sites.
- Audit permissions changes including:
  - Adding or removing users from a group.
  - Moving a piece of content from one project to another.
  - Explicitly changing the permissions on a piece of content.

  You can track permissions change events are essential for implementing a robust book of controls on your Tableau environment. These controls are useful for compliance use cases.

Supplement the information provided by Admin Insights and Admin Views to track site activity and usage metrics.

All events include a timestamp and the ID of the actor that performed the event. If relevant, the ID of the piece of affected content is included with the event.

You can use tools like Splunk or Amazon Cloudwatch to examine the Activity Log. You can use these tools to query log fields and answer questions like:

- What were the 10 actions last taken by a particular user.
- Who last performed an event on a piece of content.
- What was the last action taken on a piece of content.

## Set Up Activity Log

The Activity Log contains detailed events for your Tableau deployment that you can use for compliance, monitoring, and auditing. You must complete the following steps in order to use Activity Log.

Prerequisites

To use the Activity Log, you must have the following:

- Tableau Cloud with Advanced Management
- Amazon Web Services (AWS) account
  - You'll need your own AWS account to complete these steps.
  - You'll also need the Tableau AWS account number (`061095916136`) in Step 3 below, to receive the activity log in your Amazon Simple Storage Service (S3) bucket.
- Amazon Simple Storage Service (S3) bucket to receive data
  - You'll create an Amazon S3 bucket as part of the setup process. Amazon S3 is currently the only supported data delivery option.

  - You must create the Amazon S3 bucket in the same AWS region where your Tableau Cloud site is hosted. For more information about data locations, see Security in the Cloud and Tableau Cloud IP addresses for data provider authorization.

    **Important:** Pods in the Europe - Ireland region have moved to the Europe - Germany region as part of Tableau Cloud's migration to Hyperforce. If your site resided on a Europe - Ireland pod, you'll need to reconfigure Activity Log to use an AWS S3 bucket in the new region, Europe - Germany. For more information, see AWS region change for sites on Europe - Ireland pods below.

- AWS Key Management Service (KMS) single-region key for the Amazon S3 bucket that you create during setup.

Step 1. Create an AWS account

If you don't already have an Amazon Web Services (AWS) account, you can sign up for an AWS account at the AWS website.

Step 2. Create an Amazon S3 bucket and set up permissions

1. Create an Amazon S3 bucket to receive your log data. For more information, see Creating a bucket at the AWS website.

2. Configure the Amazon S3 bucket with the following settings:

    a. Under **Object Ownership**, select **ACLs disabled** (recommended). This ensures that the bucket owner is the owner of all objects written to it.

    b. Under **Bucket Versioning**, select **Enable**. Bucket versioning must be enabled in order to replicate objects.

    c. Under **Default encryption**, select **Enable**.

    d. Choose **AWS Key Management Service (SSE-KMS)**.

e. Choose **Enter AWS KMS key ARN**.

f. Click the **Create key** button that appears to create a new AWS Key Management Service (KMS) key.

> **Note:** KMS multi-region keys aren't supported.

g. Select **Symmetric Key** type and **Encrypt and decrypt Key usage**.

h. Name the key with an alias, and then click through until the **Review** page.

i. Add the following statement to the **Statement list** inside the Key policy, to give Tableau access to encrypt objects in the S3 bucket.

> **Note:** This statement allows the Tableau IAM role to encrypt the objects placed in the Amazon S3 bucket. “kms:GenerateDataKey” is used to generate a data key to encrypt object replicas. “kms:Encrypt” is used to encrypt object replicas created in the target S3 bucket. “Resource”: “*” grants permission for the KMS key only to the replication role and doesn’t allow the role to elevate its permissions. For more information see Protecting data using server-side encryption with AWS Key Management Service (SSE-KMS) at the AWS website.

```
{

"Sid": "AllowTableauS3ReplicationSourceRoleToUseTheKey",

"Effect": "Allow",

"Principal": {
```

```
"AWS": "arn:aws:iam::061095916136:role/prod-replication-rule-role"

},

"Action": [

"kms:GenerateDataKey",

"kms:Encrypt"

],

"Resource": "*"

}
```

j. Click **Finish** to create the KMS key.

k. Click **Create bucket** to create the Amazon S3 bucket.

3. Update permissions on the Amazon S3 bucket policy.

   a. Open the Amazon S3 bucket and click the **Permissions** tab.

   b. Locate the **Bucket policy** section and click **Edit**.

   c. Add the following to the **Statement list** in the bucket policy. Replace **S3-BUCKET-NAME** with the name of the bucket.

   **Note:** This statement allows the Tableau IAM role to replicate objects into the bucket. Using "*" and "<path>/*" grants access to all prefixes in the specified bucket and path in the bucket, respectively. The "s3:ReplicateObject" and "s3:ReplicateDelete" permissions are the minimum permissions required to successfully replicate objects and delete markers. See Granting

> permissions when the source and destination buckets are owned by different AWS accounts at the AWS website.

```
{
"Sid": "TableauS3ReplicationRoleAccess",
"Effect": "Allow",
"Principal": {
"AWS":
"arn:aws:iam::061095916136:role/prod-replication-rule-role"
},
"Action": [
"s3:ReplicateObject",
"s3:ReplicateDelete"
],
"Resource": [
"arn:aws:s3:::S3-BUCKET-NAME",
"arn:aws:s3:::S3-BUCKET-NAME/*"
]
}
```

d. Optional. If your destination bucket has a policy that restricts access through an Amazon Virtual Private Cloud (VPC) endpoint, you must change the bucket policy in addition to the TableauS3ReplicationRoleAccess that you just added. For more information, see How can I restrict access to my Amazon S3 bucket using specific VPC endpoints or IP addresses? at the AWS website.

If the current bucket policy contains a VPC restriction like this:

```
{
"Sid": "Restricted VPC Access",
"Effect": "Deny",
"Principal": "*",
"Action": "s3:",
"Resource": [
"arn:aws:s3:::<S3-BUCKET-NAME>",
"arn:aws:s3:::<S3-BUCKET-NAME>/*"
],
"Condition": {
"StringNotEquals": {
"aws:SourceVpc": "vpc-<ID>"
}
}
}
```

Then edit the “Condition” list to include the following:

```
"StringNotLike": {
```

```
"aws:userId": ["AROAQ4OMZWJUBZG3DRFW5:*"]

}
```

**Note:** You must use the "AROAQ4OMZWJUBZG3DRFW5" RoleId for the Tableau IAM role.

The edited policy should look like the following:

```
{

"Sid": "Restricted VPC Access",

"Effect": "Deny",

"Principal": "*",

"Action": "s3:",

"Resource": [

"arn:aws:s3:::<S3-BUCKET-NAME>",

"arn:aws:s3:::<S3-BUCKET-NAME>/*"

],

"Condition": {

"StringNotLike": {

"aws:userId": ["AROAQ4OMZWJUBZG3DRFW5:*"]

},

"StringNotEquals": {

"aws:SourceVpc": "vpc-<ID>"

}
```

```
}

}
```

This policy explicitly allows the Tableau IAM role to ReplicateObject and ReplicateDelete, and additionally excludes the role from the existing explicit VPC deny statement.

e. Click **Save changes**.

Step 3. Configure Tableau Cloud

1. Navigate to your Tableau site.
2. On the **Settings** page, select the **Integrations** tab.
3. In the **Activity Log** section, select the **Enable** button.
4. In the **Set Up Connection** dialog box, enter the following information:
    a. In the **AWS account number** box, enter your 12-digit AWS account number. This is the AWS account number associated with your Amazon S3 bucket location.
    b. In the **S3 bucket name** box, enter the name of the Amazon S3 bucket where Activity Log files will be delivered. This is the Amazon S3 bucket you created in Step 2. Create an Amazon S3 bucket and set up permissions. This must be a valid name according to AWS bucket name requirements.
    c. In the **KMS key ARN** box, enter the KMS key Amazon Resource Name (ARN) that you created in Step 2. Create an Amazon S3 bucket and set up permissions. The account number in the ARN must match the provided AWS account number, and be of valid format (i.e. arn:aws:kms:<*region*>:<*account-id*>:key/<*key-id*>).
5. Click **Submit**.

The connection status column will show In progress as the system attempts to replicate a text file to the target Amazon S3 bucket to test the connection.

After the file has been successfully replicated to the target Amazon S3 bucket, the connection status column will state Pending verification and display a widget to input ‘Test file contents’. You might need to refresh the page to see updates.

Verify security file replication

1. Go to the target Amazon S3 bucket and find the folder beginning with **siteLuid** (the remainder of the name is the site’s unique identifier).
2. Find the text file named `SECURITY_VERIFICATION_FILE.txt`.
3. Download and open the text file.
4. Copy the text content inside the file.
5. Return to the **Settings** page and paste the text contents into the **Text file contents** input field, and then click **Submit**.
6. If the submitted content is correct, the connection status changes to **Active**. Activity Log is now enabled, and data will begin to replicate to the target Amazon S3 bucket.
7. If the submitted content is incorrect, an error message will be displayed. Check that the content was copied correctly without extra characters or spaces.

Troubleshooting

Security verification file not appearing?

- The file could take up to 15 minutes to appear in the target Amazon S3 bucket due to Amazon S3 limitations.

  If the connection status says "In progress", the file is still attempting to replicate. For more information, see Troubleshooting replication at the AWS website.
- A connection status of **Failed** means that the file was unable to replicate successfully.

Confirm that the permissions on the Amazon S3 bucket policy and the AWS Key Management Service (KMS) key policy contain the appropriate statements. For more information, see the following topics at the AWS website:

- Troubleshooting replication
- Configuring replication when source and destination buckets are owned by different accounts
- I set up replication between my buckets, but new objects aren't replicating. How can I troubleshoot this?

Other settings that are required for log files to reach the Amazon S3 bucket

- The Amazon S3 bucket has **Bucket Versioning** enabled (under **Properties** > **Bucket Versioning**).
- The Amazon S3 bucket has **Block all public access** enabled (under **Permissions** > **Block public access (bucket settings)**).
- The Amazon S3 bucket has the following ACL permissions for only "Bucket owner" (under **Permissions** > **Access Control List (ACL)**):
  - Objects: List, Write
  - Bucket ACL: Read, Write
- The KMS key permissions policy contains the statement in Step 2. Create an Amazon S3 bucket and set up permissions, step 2. i. (under **Properties** > **Default encryption** click on the ARN under **AWS KMS Key ARN** to go to the KMS key policy).
- The Amazon S3 bucket has default encryption enabled and bucket key enabled (under Properties > Default encryption).
- The Amazon S3 bucket permissions policy (under Permissions > Bucket Policy) exactly matches the one in the instructions. Ensure that you have replaced the example value "S3-BUCKET-NAME" with the Amazon S3 bucket you just created.

AWS region change for sites on Europe - Ireland pods

From August 2024 to March 2025, Tableau Cloud will be migrating to Salesforce's Hyperforce by pod. As part of the migration, pods in the Europe - Ireland region are moving to Europe - Germany region. If your site resides on a Europe - Ireland pod, you'll need to reconfigure Activity Log to use an AWS S3 bucket in the new region, Europe - Germany.

For more information about the migration and when the Europe - Ireland pods are moving, see the Tableau Cloud Migration to Hyperforce knowledge article.

# Audit Permissions Using the Activity Log

Permission auditing allows system administrators to monitor which users have modified access controls to Tableau content. There are two ways to modify access control: *explicit* changes (by changing permission capabilities on a project or content item) and *effective* changes (by changing user site roles, group membership, moving content, and so on). All of these changes are recorded, so administrators can certify that security and access controls are maintained.

For more information about how permission rules are evaluated, see Effective permissions.

## Log format

Every action that modifies user or group access to content will get a log entry. Each log entry is structured in a JSON format, with specific keys representing different pieces of information. A log entry contains two parts:

- Metadata: Contains information about when and where an action occurred and what user performed the action.
- Action: Contains information about what piece of content had its permissions changed, what capabilities were changed, and to what values the capabilities were changed.

**Note:** Activity Log records changes made through the Permissions Dialog UI and REST API. For more information about API methods, see Permissions Methods.

The Activity Log entries are not formatted, and the keys are not sorted in any particular order in the logs. When auditing permissions, you can combine Activity Log data with other data sources, such as Admin Insights, to link IDs to names and make the events easier to interpret.

Example

The following is an example log entry showing a group was allowed to connect to a data source.

```
{
event: {
        actorUserId: 39872
        actorUserLuid: “4e6b42bf-9040-4e60-b326-1c56a4fb96f8”
        authorizableType: “DATASOURCE”
        capabilityId: 32
        capabilityValue: “connect”
        contentId: 2099835
        contentName: “Superstore ExtractNeal3”
        eventTime: “2023-01-31T22:44:23.650058Z”
        granteeId: 22
        granteeLuid: “dae0717a-d524-436d-b469-fadeaa22a5dd”
        granteeType: “Group”
        granteeValue: “GROUP_ALLOW”
        initiatingUserId: 39872
        initiatingUserLuid: “4e6b42bf-9040-4e60-b326-1c56a4fb96f8”
        isError: false
        metadata: {
                applicableToOnline: true
                applicableToServer: true
                comment: “Update Permissions”
                customerAccessible: true
                eventCategory: “security”
                eventType: “update_permissions”
```

```
                eventVersion: "1.0"
                internalAccessible: false
        }
        permissionType: explicit"
        siteLuid: "b45e272d-10c7-49d5-9037-e53ce47dbf4e"
}
traceUuid: "3a108a2f-c0ac-4ac7-a5f8-29zf7e064ae1"
}
```

The log entry captures essential information regarding the event, including:

- `eventType` shows an update permissions event occurred
- `permissionType` shows an explicit change to permissions
- `contentId` shows the ID of the content that was modified
- `authorizableType` shows the content type, in this case, a data source
- `capabilityValue` shows the capability that was changed
- `granteeId` shows the grantee that was affected
- `actorUserId` shows the ID of the user who performed the change
- `eventTime` shows the date and time of the change

### Events

Log entries contain various event types for permissions changes, such as `content_owner_change` when the content owner changes or `delete_permissions` when an explicit permission rule is deleted on content. For more information about event types, attributes, and when they're recorded, see Activity Log Site Event Type Reference.

## Activity Log Tenant Event Type Reference

This topic describes the Activity Log tenant event types and attributes. For information about site events, see Activity Log Site Event Type Reference.

## Event type details

The following content describes tenant event types and attributes in Activity Log. Use the alphabetically sorted list of event types on the right, or **ctrl/cmd-f** to go directly to keywords you have in mind.

**Note:** Timestamps for events are recorded in ISO 8601 UTC.

## Common attributes

The table contains common attributes for all Activity Log tenant events. For event-specific attributes, review the individual event tables in this topic.

| Attribute Name | Type | Description |
|---|---|---|
| eventOutcome | string | Represents the final outcome of the operation. Possible values are:<br>• **success:** The attempted operation completed successfully.<br>• **unauthorized:** The initiating user wasn't authorized to perform the operation.<br>• **client_error:** The operation failed due to a cause attributable to the client/caller. For example, invalid API request parameters, client connection timeout, or throttling.<br>• **internal_error:** The operation failed due to an unexpected internal error. |
| eventOutcomeReason | string | Provides additional details about the event outcome |
| eventTime | string | Timestamp when the event occurred |
| initiatingSessionId | string | ID of user's session which initiated the operation |

| | | |
|---|---|---|
| initiatingUrl | string | URL associated with the request that initiated the operation, such as the URL of a REST API endpoint that was invoked. |
| initiatingUserAgent | string | User-Agent HTTP header associated with the request that initiated the operation |
| initiatingUserDisplayName | string | Display name of the user who initiated the operation |
| initiatingUserEmail | string | Email address of the user who initiated the operation |
| initiatingUserIpAddress | string | Remote client IP address of the request that initiated the operation. Either a valid IPv4 or IPv6 address. |
| initiatingUserId | string | ID of the user who initiated the operation |
| initiatingUserRole | string | Role or privilege level that allowed the initiating user to perform the operation |
| podUri | string | Uniform Resource Identifier (URI) of pod where the operation occurred |
| siteId | string | ID of site where the operation occurred |
| siteName | string | Name of site where the operation occurred |
| siteUri | string | Uniform Resource Identifier (URI) of site where the operation occurred |
| tenantId | string | ID of tenant where the operation occurred |
| tenantName | string | Name of tenant where the operation occurred |
| tenantUri | string | Uniform Resource Identifier (URI) of tenant where the operation occurred |
| traceUuid | string | Auto-generated UUID identical across all the |

| | | |
|---|---|---|
| | | events in a batch, such as multiple permissions changed by a single user action. |

### batch_revoke_personal_access_token

The `batch_revoke_personal_access_token` event occurs when a tenant is suspended or deleted, or a user is removed.

| Attribute Name | Type | Description |
|---|---|---|
| patUserId | string | ID of the user whose PATs were revoked. Not included if PATs were revoked for the entire tenant. |

### batch_revoke_session

The `batch_revoke_sessions` event occurs when all sessions associated with a tenant or user are revoked.

| Attribute Name | Type | Description |
|---|---|---|
| sessionUserId | string | ID of the user whose sessions were revoked. Not included if sessions were revoked for the entire tenant. |

### create_or_update_oidc_config

The `create_or_update_oidc_config` event occurs when the OIDC configuration is changed.

| Attribute Name | Type | Description |
|---|---|---|
| isSecretUpdated | bool | Indicates whether the secret has been updated. The actual secret value isn't recorded. This attribute helps admins track changes in their organization, such as those affecting system functionality or ensuring scheduled secret rotations are carried out properly. |

| | | |
|---|---|---|
| newSettingsValue | string | New OIDC configuration settings |
| oldSettingsValue | string | Previous OIDC configuration settings |
| resourceId | string | Resource ID of an OIDC configuration |

## create_or_update_saml_config

The `create_or_update_saml_config` event occurs when the SAML configuration is changed.

| Attribute Name | Type | Description |
|---|---|---|
| newSettingsValue | string | New SAML configuration settings |
| oldSettingsValue | string | Previous SAML configuration settings |
| resourceId | string | Resource ID of a SAML configuration |

## create_personal_access_token

The `create_personal_access_token` event occurs when a personal access token (PAT) is generated.

| Attribute Name | Type | Description |
|---|---|---|
| expiresAt | string | Timestamp when the PAT expires. Not included if the creation attempt failed. |
| tokenId | string | ID of the PAT created. Not included if the creation attempt failed. |
| tokenName | string | Name of the PAT |

## create_private_connection

The `create_private_connection` event occurs when a private connection is created in a tenant.

| Attribute Name | Type | Description |
|---|---|---|
| description | string | Description of the private connection created |
| endpointServiceName | string | Endpoint service name of the private connection created |
| name | string | Name of the private connection created |
| privateConnectionId | string | ID of the private connection created |
| region | string | AWS Region where the private connection is created |

## create_site

The `create_site` event occurs when a site is created in a tenant.

| Attribute Name | Type | Description |
|---|---|---|
| This event only uses common attributes. For more information, see the Common attributes section in this topic. | | |

## create_tenant

The `create_tenant` event occurs when a tenant is created.

| Attribute Name | Type | Description |
|---|---|---|
| This event only uses common attributes. For more information, see the Common attributes section in this topic. | | |

## create_user

The `create_user` event occurs when a new user is created in a tenant.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| email | string | Email of the user added to the tenant |
| language | string | Language code of the user added to the tenant |
| locale | string | Locale code of the user added to the tenant |
| userId | string | Unique identifier of the user added to the tenant |
| userName | string | User name of the user added to the tenant |

## delete_oidc_config

The `delete_oidc_config` event occurs when the OIDC configuration is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| idpConfigurationId | string | ID of the IdP configuration |
| idpConfigurationName | string | Name of the IdP configuration |
| resourceId | string | Resource ID of the OIDC configuration |

## delete_private_connection

The `delete_private_connection` event occurs when a private connection is deleted in a tenant.

| Attribute Name | Type | Description |
|---|---|---|
| privateConnectionId | string | ID of the deleted private connection |

## delete_saml_config

The `delete_saml_config` event occurs when the SAML configuration is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| idpConfigurationId | string | ID of the IdP configuration |

| | | |
|---|---|---|
| idpConfigurationName | string | Name of the IdP configuration |
| resourceId | string | Resource ID of the SAML configuration |

## delete_site

The `delete_site` event occurs when a site is deleted from a tenant.

| Attribute Name | Type | Description |
|---|---|---|
| This event only uses common attributes. For more information, see the Common attributes section in this topic. | | |

## delete_tenant

The `delete_tenant` event occurs when a tenant is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| This event only uses common attributes. For more information, see the Common attributes section in this topic. | | |

## delete_user

The `delete_user` event occurs when a user is deleted from a tenant.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email of the user removed |
| userId | string | ID of the user removed |
| userName | string | User name of the user removed |

## get_sites

The `get_sites` event occurs when a list of sites under a tenant is requested.

| Attribute Name | Type | Description |
|---|---|---|
| This event only uses common attributes. For more information, see the Common attributes section in this topic. | | |

## get_users

The `get_user` event occurs when a list of users within a tenant or site is requested.

| Attribute Name | Type | Description |
|---|---|---|
| This event only uses common attributes. For more information, see the Common attributes section in this topic. | | |

## list_personal_access_tokens

The `list_personal_access_tokens` event occurs when all valid personal access tokens (PATs) in Tableau Cloud Manager (TCM) are requested.

| Attribute Name | Type | Description |
|---|---|---|
| This event only uses common attributes. For more information, see the Common attributes section in this topic. | | |

## merge_tenant

The `merge_tenant` event occurs when a Tableau Cloud Manager tenant is merged into another tenant. This consolidation allows cloud admins to manage all sites under one tenant and benefit from unified governance.

| Attribute Name | Type | Description |
|---|---|---|
| sourceTenantId | string | ID of source tenant in the merge operation |
| sourceTenantName | string | Name of the source tenant in the merge operation |
| sourceTenantUri | string | Uniform Resource Identifier (URI) of the source tenant in the merge operation |

### migrate_site

The `migrate_site` event occurs when a site is migrated to a tenant.

| Attribute Name | Type | Description |
|---|---|---|
| This event only uses common attributes. For more information, see the Common attributes section in this topic. | | |

### personal_access_token_login

The `personal_access_token_login` event occurs when a personal access token (PAT) is used to sign in to Tableau Cloud Manager.

| Attribute Name | Type | Description |
|---|---|---|
| newSessionId | string | ID of the session created by this login request. Not included if the login failed. |
| tokenId | string | ID of the PAT used to login |
| tokenName | string | Name of the PAT |

### reactivate_site

The `reactivate_site` event occurs when a site in a tenant is reactivated.

| Attribute Name | Type | Description |
|---|---|---|
| This event only uses common attributes. For more information, see the Common attributes section in this topic. | | |

### revoke_personal_access_token

The `revoke_personal_access_token` event occurs when a personal access token (PAT) is revoked in Tableau Cloud Manager.

| Attribute Name | Type | Description |
|---|---|---|
| tokenId | string | ID of the PAT revoked |
| tokenName | string | Name of the PAT |

## revoke_session

The `revoke_session` event occurs when a user is logged out due to a revoked session, such as a user explicitly logging out or the session expiring.

| Attribute Name | Type | Description |
|---|---|---|
| This event only uses common attributes. For more information, see the Common attributes section in this topic. | | |

## site_limits_change

The `site_limits_change` event occurs when site-level license capacity limits for site roles (Creator, Explorer, or Viewer) are changed.

| Attribute Name | Type | Description |
|---|---|---|
| newCreatorCapacity | integer | New value for the Creator site role limit. Not included if the new limit is the default cloud limit. |
| newCreatorCapacityIsDefaultCloudLimit | bool | New Creator limit was set to the default cloud limit |
| newExplorerCapacity | integer | New value for the Explorer site role limit. Not included if the new limit is the default cloud limit. |
| newExplorerCapacityIsDefaultCloudLimit | bool | New Explorer limit is set to the default cloud limit |
| newViewerCapacity | integer | New value for the Viewer site role limit. Not included if the new |

| | | |
|---|---|---|
| | | limit is the default cloud limit. |
| newViewerCapacityIsDefaultCloudLimit | bool | New Viewer limit is set to the default cloud limit |
| oldCreatorCapacity | integer | Previous value for the Creator site role limit. Not included if the previous limit was the default cloud limit. |
| oldCreatorCapacityIsDefaultCloudLimit | bool | Previous Creator limit was set to the default cloud limit |
| oldExplorerCapacity | integer | Previous value for the Explorer site role limit. Not included if the previous limit was the default cloud limit. |
| oldExplorerCapacityIsDefaultCloudLimit | bool | Previous Explorer limit was set to the default cloud limit |
| oldViewerCapacity | integer | Previous value for the Viewer site role limit. Not included if the previous limit was the default cloud limit. |
| oldViewerCapacityIsDefaultCloudLimit | bool | Previous Viewer limit was set to the default cloud limit |

## suspend_site

The `suspend_site` event occurs when a site in a tenant is suspended.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| suspensionSource | string | Source for the site suspension |

## tcm_activity_log_access

The `tcm_activity_log_access` event occurs when Tableau Cloud Manager (TCM) Activity Log data is accessed.

| Attribute Name | Type | Description |
|---|---|---|
| eventProcessedTimeEnd | string | End time (based on the events' processed timestamp) of the data accessed. If not included, assume all available data was accessed. |
| eventProcessedTimeStart | string | Start time (based on the events' processed timestamp) of the data accessed. If not included, assume all available data was accessed. |
| eventTypeAccessed | string | Type of events accessed. If not included, assume all available data was accessed. |

## update_personal_access_token

The `update_personal_access_token` event occurs when a personal access token (PAT) is updated.

| Attribute Name | Type | Description |
|---|---|---|
| expiresAt | string | Timestamp when the PAT expires |
| tokenId | string | ID of the PAT created. Not included if the creation attempt failed. |
| tokenName | string | Name of the PAT |

## update_private_connection

The `update_private_connection` event occurs when a private connection is updated.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| newDescription | string | Description of private connection after update |
| newSiteIds | string | Comma-separated list of site IDs, representing the private connection after the update. |
| oldDescription | string | Description of private connection before update |
| oldSiteIds | string | Comma-separated list of site IDs, representing the private connection before the update. |
| privateConnectionId | string | ID of the updated private connection |

## update_session

The `update_session` event occurs when the expiration time of a session is updated.

| Attribute Name | Type | Description |
|---|---|---|
| expiresAt | string | New expiration time of the session |

## update_tenant

The `update_tenant` event occurs when the tenant name or status is updated.

| Attribute Name | Type | Description |
|---|---|---|
| newStatus | string | Tenant status after the update |
| newTenantName | string | Tenant name after the update |
| newTenantOrg62Id | string | Tenant Org62 ID after the update |
| newTenantUri | string | Tenant Uniform Resource Identifier (URI) after the update |
| oldStatus | string | Tenant status before the update |
| oldTenantOrg62Id | string | Tenant Org62 ID before the update |

## update_user

The `update_user` event occurs when an existing user in the tenant is updated.

| Attribute Name | Type | Description |
|---|---|---|
| newEmail | string | New email of the user |
| newLanguage | string | New language code of the user |
| newLocale | string | New locale code of the user |
| oldEmail | string | Previous email of the user |
| oldLanguage | string | Previous language code of the user |
| oldLocale | string | Previous locale code of the user |
| userId | string | Unique ID of the user added |
| userName | string | User name of the user added to the tenant |

## update_user_site_role

The `update_user_site_role` event occurs when a user’s access to a site is updated, either by adding, changing, or removing their site role.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email of the user added to the tenant |
| newIdp | string | New authentication method assigned to the site user, or null if the user is being removed from the site. |
| newRole | string | New role of the user on the site, or null if the user is being removed from the site. |
| oldIdp | string | Previous authentication method assigned to the site user, or null if the user didn't previously have a role on the site. |
| oldRole | string | Previous role of the user on the site, or null if the user didn’t |

| | | |
|---|---|---|
| | | previously have a role on the site. |
| userId | string | The unique identifier of the user |
| userName | string | User name of the user added to the site |

## update_user_tenant_role

The `update_user_tenant_role` event occurs when a user's access to a tenant is updated by adding, changing, or removing the cloud administrator role.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email of the user added to the tenant |
| newIdp | string | New authentication method assigned to the tenant user, or null if the user is being removed from the tenant. |
| newRole | string | New role of the user on the tenant, or null if the user is being removed from the tenant. |
| oldIdp | string | Previous authentication method assigned to the tenant user, or null if the user didn't previously have a role on the tenant. |
| oldRole | string | Previous role of the user on the tenant, or null if the user didn't previously have a role on the tenant. |
| userId | string | The unique identifier of the user |
| userName | string | User name of the user added to the tenant |

## user_login_create_session

The `user_login_create_session` event occurs when a user signs in to Tableau Cloud Manager (TCM) through the sign-in page or other interactive login.

| Attribute Name | Type | Description |
|---|---|---|
| expiresAt | string | Timestamp when the session expires. Not included if the cre- |

| | | |
|---|---|---|
| | | ation attempt failed. |
| idpId | string | ID of the IdP, indicating how the user is authenticated. |
| idpName | string | Name of the IdP, indicating how the user is authenticated. |
| newSessionId | string | New ID of the session key. Not included if the creation attempt failed. |

# Activity Log Site Event Type Reference

This topic describes the Activity Log site event types and attributes. For information about tenant events, see Activity Log Tenant Event Type Reference.

## Event type details

The following content describes site event types and attributes in Activity Log. Use the alphabetically sorted list of event types on the right, or **ctrl/cmd-f** to go directly to keywords you have in mind.

**Note:** Timestamps for events are recorded in ISO 8601 UTC.

## Common attributes

The table contains common attributes for all Activity Log site events. For event-specific attributes, review the individual event tables in this topic.

| Attribute Name | Type | Description |
|---|---|---|
| actorUserId | integer | ID of the user who performed the action that initiated the event |
| actorUserLuid | string | LUID of the user who performed the action that initiated the event |
| eventOutcome | string | Represents the final outcome of the operation. |

| | | |
|---|---|---|
| | | Possible values are:<br>• **success:** The attempted operation completed successfully.<br>• **unauthorized:** The initiating user wasn't authorized to perform the operation.<br>• **client_error:** The operation failed due to a cause attributable to the client/caller. For example, invalid API request parameters, client connection timeout, or throttling.<br>• **internal_error:** The operation failed due to an unexpected internal error. |
| eventOutcomeReason | string | Provides additional details about the event outcome |
| eventTime | string | Timestamp when the event occurred |
| initiatingUserId | integer | ID of the initiating user. For impersonation, it's the ID of the administrative user who initiated impersonation. For standard login, the value is the same as `userId`. |
| initiatingUserLuid | string | LUID of the initiating user. For impersonation, it's the LUID of the administrative user who initiated impersonation. For standard login, the value is the same as `userLuid`. |
| licensingRoleName | string | Name of the user's licensing role when the event occurred |
| siteLuid | string | LUID of the Tableau site where the event occurred |
| siteRoleId | integer | The user's site role ID. The value 0 = SiteAdministratorExplorer, 1 = SupportUser, 2 = ExplorerCanPublish, 3 = Explorer, 7 = Guest, 8 = Unlicensed, 9 = Viewer, 10 = Creator, and 11 = SiteAdministratorCreator. |

| | | |
|---|---|---|
| systemAdminLevel | integer | Indicates if the user is a system administrator. The value 10 = System Admin and 0 = Not a system admin. |

## add_delete_group_to_group_set

The `add_delete_group_to_group_set` event is logged when a group is added or deleted from a group set.

| Attribute Name | Type | Description |
|---|---|---|
| groupId | integer | The ID of the group |
| groupLuid | string | The LUID of the group |
| groupSetId | integer | The ID of the group set |
| groupSetLuid | string | The LUID of the group set |
| groupSetOperation | string | Group Set operation, either add or delete user to a group set |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |

## add_delete_user_to_group

The `add_delete_user_to_group` event is logged when a user is added or removed from a group.

| Attribute Name | Type | Description |
|---|---|---|
| groupId | integer | The ID of the group |
| groupLuid | string | The LUID of the group |
| groupOperation | string | Group operation, either add or delete user to a group |
| isError | boolean | Indicates if the audit scenario was completed suc- |

| | | |
|---|---|---|
| | | cessfully or failed with an error |
| userId | integer | The ID of the user |
| userLuid | string | The LUID of the user |

## activity_log_settings_change

The `activity_log_settings_change` event occurs when an administrator changes the Activity Log settings.

| Attribute Name | Type | Description |
|---|---|---|
| errorCode | string | Error code generated when altering Activity Log settings |
| newAwsAccountNumber | string | New AWS account number where Activity Log events will be received |
| newKmsKeyArn | string | New AWS Key Management Service (KMS) single-region key for the Amazon S3 bucket |
| newS3BucketName | string | New AWS S3 bucket where Activity Log events will be received |
| oldAwsAccountNumber | string | Previous AWS account number where Activity Log events were received |
| oldKmsKeyArn | string | Previous AWS Key Management Service (KMS) single-region key for the Amazon S3 bucket |
| oldS3BucketName | string | Previous AWS S3 Bucket where Activity Log events were received |
| operationType | string | The type of operation, either create, update, or delete. |
| platform | string | The platform where changes are recorded, such as Tableau Cloud. |

| | | |
|---|---|---|
| platformVersion | string | The version of the platform, such as 2024.3.0. |

## background_job

The `background_job` event logs information about jobs run as background tasks. For each job, an event is created to record its various states, including initiation time, queueing, start time, and success or failure.

| Attribute Name | Type | Description |
|---|---|---|
| args | string | Arguments of the job |
| duration | long | Duration of the job |
| eventInitiatedTime | string | Start time of the job |
| eventState | string | State of the job |
| isRunNow | bool | Indicates whether the job was initiated manually, by clicking the “Run Now” option on the site or using REST API, or if it was triggered by a schedule.<br><br>**Note:** Starting in April 2024, jobs triggered by a schedule (`False`) include data for all attributes listed in the table. Attributes for jobs initiated manually (`True`) are under active development, and tentatively scheduled for inclusion in a future release. |
| jobId | integer | ID of the job |
| jobLuid | string | LUID of the job |
| jobType | string | Identifies the background job type associated with the event<br><br>**Note:** Starting in April 2024, only the `IncrementExtracts`, `RefreshExtracts`, and |

| | | |
|---|---|---|
| | | `RefreshExtractsViaBridge` jobs include data for all attributes listed in the table. Attributes for other job types are under active development, and tentatively scheduled for inclusion in a future release. |
| notes | string | Notes of the job |
| objLuid | string | Some tasks are specific to a particular workbook or data source. In such cases, the object_luid is the primary key of the relevant item, in either the work-books or data sources tables, as indicated by obj_type. |
| objName | string | Name of the associated object. Used in conjunction with obj_luid, as described there. |
| objOwnerLuid | string | A foreign key reference to the user who owns the job target object |
| objOwnerName | string | Name of the user who owns the job target object |
| objRepositoryUrl | string | Uniquely identifies a workbook or data source and is used when referencing the object in a URL. The value is derived from the ASCII characters in the workbook or data source name. |
| objRevision | string | The revision number. Starts with 1.0 and increments by 0.1 with each republication. |
| objSize | integer | The number of bytes used in storing the job target object information |
| objType | string | Either a workbook or data source. Used in conjunction with obj_luid. |
| podName | string | Name of the Tableau pod that handled the job |
| projectLuid | string | A foreign key reference to the project in which the job target object exists |

| | | |
|---|---|---|
| projectName | string | Name of the project that contains the job target object |
| projectOwnerEmail | string | Email address of the user who owns the project containing the job target object |
| projectOwnerLuid | string | A foreign key reference to the user who owns the project containing the job target object |
| scheduleLuid | string | Schedule LUID of the task; may be null if the job was manually started |
| scheduleName | sring | Schedule name of the task; may be null if the job was manually started |
| siteId | integer | ID of the site |
| siteName | string | Name of the Tableau site |
| taskId | integer | ID of the task; may be null if the job was manually started. |
| taskLuid | string | LUID of the task; may be null if the job was manually started. |
| timeZone | integer | Time zone of the job |

## content_owner_change

The `content_owner_change` event is logged when the content owner changes.

| Attribute Name | Type | Description |
|---|---|---|
| contentId | integer | The ID of the content that had the owner changed |
| contentLuid | string | LUID of the content that had the owner changed |
| contentName | string | Name of the content that had the owner changed |
| contentType | string | The type of content, such as data source, workbook, or view |

| | | |
|---|---|---|
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |
| newOwnerId | integer | The ID of the new content owner |
| newOwnerLuid | string | The LUID of the new content owner |
| oldOwnerId | integer | The ID of the old content owner |
| oldOwnerLuid | string | The LUID of the old content owner |

## create_datasource_connection

The `create_datasource_connection` event occurs when an administrator creates a data source using an existing private connection.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| database | string | The type of database for which the connection is being made, such as Amazon Athena, Snowflake, or other databases. |
| datasource | string | The data source or hostname of the connection being made |
| ipAddress | string | The IP address of the machine that initiated the request |
| privateConnectionId | string | The ID of the private connection that the data source connection is using |
| privateConnectionName | string | The name of the private connection that the data source connection is using |
| siteId | string | The ID of the site where the data source connection is created |
| tenantId | string | The ID of the tenant for which the underlying private connection was created |

| | | |
|---|---|---|
| userAgent | string | The client software used by the actorUser to make the change |

## create_delete_group

The `create_delete_group` event is logged when a group is created or deleted.

| Attribute Name | Type | Description |
|---|---|---|
| groupDomain | string | The domain of the group, such as local |
| groupId | integer | The ID of the group |
| groupLuid | string | The The LUID of the group |
| groupName | string | The name of the group that had its permissions changed |
| groupOperation | string | Group operation, either create or delete |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |

## create_delete_group_set

The `create_delete_group_set` event is logged when a group set is created or deleted.

| Attribute Name | Type | Description |
|---|---|---|
| groupSetId | integer | The ID of the group set |
| groupSetLuid | string | The LUID of the group set |
| groupSetName | string | The name of the group set that is created or deleted |
| groupSetOperation | string | Group Set operation, either create or delete |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |

## create_permissions

The `create_permissions` event is logged when a new explicit permission rule is created.

**Note:** Deprecated in October 2024. Use the set_permissions event instead.

| Attribute Name | Type | Description |
|---|---|---|
| authorizableType | string | The type of content that had its permissions changed, such as a project or workbook |
| capabilityId | integer | The ID of the capability. A capability is the ability to perform actions on content, such as view, filter, download, or delete |
| capabilityValue | string | Description of the capability |
| contentId | integer | The ID of the content that had the permissions updated |
| contentLuid | string | The LUID of the content item |
| contentName | string | The name of the content that had the permissions updated |
| granteeId | integer | The ID of the grantee |
| granteeLuid | string | The LUID of the grantee |
| granteeType | string | The type of grantee, either user or group |
| granteeValue | string | The updated permissions value, such as 'user allow' or 'group allow' |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |

## delete_all_permissions

The `delete_all_permissions` event is logged when all explicit permission rules for content are deleted, typically when content is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| authorizableType | string | The type of content that had its permissions changed, such as a project or workbook |
| contentId | integer | The ID of the content that had the permissions updated |
| contentLuid | string | The LUID of the content |
| contentName | string | The name of the content that had the permissions updated |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |

## delete_datasource_connection

The `delete_datasource_connection` event occurs when an existing data source connection is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| datasource | string | The data source or hostname of the connection being deleted |
| ipAddress | string | The IP address of the machine that initiated the request |
| userAgent | string | The client software used by the `actorUser` to make the change |

## delete_permissions

The `delete_permissions` event is logged when an explicit permission rule is deleted on content.

| Attribute Name | Type | Description |
|---|---|---|
| authorizableType | string | The type of content that had its permissions changed, such as a project or workbook |
| capabilityId | integer | The ID of the capability. A capability is the ability to perform actions on content, such as view, filter, download, or delete |
| capabilityValue | string | Description of the capability |
| contentId | integer | The ID of the content that had the permissions updated |
| contentLuid | string | The LUID of the content |
| contentName | string | The name of the content that had the permissions updated |
| granteeId | integer | The ID of the grantee |
| granteeLuid | string | The LUID of the grantee |
| granteeType | string | The type of grantee, either user or group |
| granteeValue | string | The updated permissions value, such as 'user allow' or 'group allow' |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |

## delete_permissions_grantee

The `delete_permissions_grantee` event is logged when all explicit permission rules for a user are deleted, typically when the user is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| granteeId | integer | The ID of the grantee |
| granteeLuid | string | The LUID of the grantee |

| | | |
|---|---|---|
| granteeType | string | The type of grantee, either user or group |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |

## display_sheet_tabs

The `display_sheet_tabs` event is logged when the "Tabbed Views" value is updated on a workbook.

| Attribute Name | Type | Description |
|---|---|---|
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |
| workbookId | integer | The ID of the workbook |

## hist_access_authoring_view

The `hist_access_authoring_view` event is logged when a user authors view.

| Attribute Name | Type | Description |
|---|---|---|
| caption | string | The descriptive phrase constructed for the worksheet based on the workbook definition |
| description | string | Description of the view |
| fields | string | A list of fields extracted from the workbook .twb file |
| firstPublishedAt | string | Timestamp of when the view was first published. The value won't change when republishing the workbook containing the view. |
| index | integer | Each view has an index that is unique among views belonging to that workbook |

| | | |
|---|---|---|
| name | string | Name of the view |
| ownerLuid | string | User LUID of the view owner |
| ownerName | string | Name of the view owner |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number of the view. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetId | string | The ID of the worksheet |
| sheetType | string | The type of worksheet. Either a story, dashboard, or view. |
| siteName | string | Name of the Tableau site |
| title | string | The worksheet title from the workbook .twb file |
| viewLuid | string | The LUID of the view |
| workbookLuid | string | The LUID of the workbook containing the view |
| workbookName | string | Name of the workbook containing the view |

## hist_access_datasource

The `hist_access_datasource` event is logged when a user accesses a data source.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |

| | | |
|---|---|---|
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_access_datasource_remotely

The `hist_access_datasource_remotely` event is logged when a user accesses a data source from Tableau Bridge.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_access_metric

The `hist_access_metric` event is logged when users interact with metrics on the site.

> **Note:** Tableau's legacy metrics feature was retired in February 2024. As a result, this event no longer records user interaction with metrics on the site. For more information, see Set Up for Metrics.

| Attribute Name | Type | Description |
|---|---|---|
| customizedViewLuid | string | Unique ID of the custom view from which the metric queries its data |
| description | string | Description of the metric |
| metricLuid | string | Unique ID of the metric |
| name | string | Name of the metric |
| projectLuid | string | Unique ID of the project that contains the metric |
| projectName | string | Name of the project that contains the metric |
| siteName | string | Name of the Tableau site |
| suspendState | integer | State of the metric. The value 0 = Not suspended, 1 = Auto-suspended, and 3 = Manually suspended. |
| viewLuid | string | Unique ID of the view from which the metric queries its data |

## hist_access_summary_data

The `hist_access_summary_data` event is logged when users access the Summary Data window.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | The version of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web |

| | | |
|---|---|---|
| | | authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetName | string | Name of the sheet for which data was accessed |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumb- |

| | | |
|---|---|---|
| | | nail image. Null unless specified. |
| viewCount | integer | Counts the number of views that are associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_access_underlying_data

The `hist_access_underlying_data` event is logged when users access the Underlying Data window.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | The version of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if this workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |

| | | |
|---|---|---|
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when |

| | | |
|---|---|---|
| | | referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetName | string | Name of the sheet for which data was accessed |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views that are associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

### hist_access_view

The `hist_access_view` event is logged when users access a view.

| Attribute Name | Type | Description |
|---|---|---|
| actorExternalId | string | The external ID for the acting user. This is an opaque identifier dependent on the actor type, but could, for example, be a user email. Can also show the identifier of a user accessing content through on-demand access. |
| caption | string | The descriptive phrase constructed for the worksheet based on the workbook definition |
| description | string | Description of the view |
| fields | string | A list of fields extracted from the workbook .twb file |

| | | |
|---|---|---|
| firstPublishedAt | string | Timestamp of when the view was first published. The value won't change when republishing the workbook containing the view. |
| index | integer | Each view has an index that is unique among views belonging to that workbook |
| name | string | Name of the view |
| ownerLuid | string | User LUID of the view owner |
| ownerName | string | Name of the view owner |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number of the view. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetId | string | The ID of the worksheet |
| sheetType | string | The type of worksheet. Either a story, dashboard, or view. |
| siteName | string | Name of the Tableau site |
| title | string | The worksheet title from the workbook .twb file |
| viewLuid | string | The LUID of the view |
| workbookLuid | string | The LUID of the workbook containing the view |
| workbookName | string | Name of the workbook containing the view |

## hist_activate_site

The `hist_activate_site event` is logged when a Tableau site is activated.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| name | string | Name of the Tableau site |
| siteEventLuid | string | Unique ID of the site affected by the event |
| siteName | string | Name of the Tableau site |
| urlNamespace | string | Used in the construction of URLs that target the site |

## hist_add_user_to_group

The `hist_add_user_to_group` event is logged when a user is added to a group.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| groupLuid | string | Unique ID of the group |
| name | string | Name of the group |
| siteName | string | Name of the site |
| userLuid | string | LUID of the user added to the group |
| userName | string | Name of the user added to the group |

## hist_append_to_datasource_extract

The `hist_append_to_datasource_extract` event is logged when data is added to a data extract.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| details | string | A message string |

| | | |
|---|---|---|
| isCertified | boolean | Indicates whether the data source is certified |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| taskLuid | string | LUID of the associated task |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_bulk_delete_columns

The `hist_bulk_delete_columns` event is logged when columns are deleted from a data source.

| Attribute Name | Type | Description |
|---|---|---|
| columnLuid | string | Unique ID of the column |
| description | string | Description of the published column |
| name | string | Name of the published column |
| ownerLuid | string | User LUID of the column owner |
| ownerName | string | The name of the column owner |
| projectLuid | string | LUID of the project that contains the column |
| projectName | string | Name of the project that contains the column |
| siteName | string | Name of the Tableau site |

## hist_change_collection_ownership

The `hist_change_collection_ownership` event is logged when the collection owner is changed.

| Attribute Name | Type | Description |
|---|---|---|
| collectionLuid | string | Unique ID of the collection |
| description | string | Description of the collection |
| name | string | Name of the collection |
| newOwnerLuid | string | The LUID of the new collection owner |
| newOwnerName | string | The name of the new collection owner |

| | | |
|---|---|---|
| oldOwnerLuid | string | The LUID of the previous collection owner |
| oldOwnerName | string | The name of previous collection owner |
| ownerLuid | string | User LUID of the collection owner |
| ownerName | string | Name of the collection owner |
| siteName | string | Name of the Tableau site |

## hist_change_data_role_ownership

The `hist_change_data_role_ownership` event is logged when data role ownership is changed.

| Attribute Name | Type | Description |
|---|---|---|
| dataRoleLuid | string | Unique ID of the data role |
| description | string | Description of the data role |
| name | string | Name of the data role |
| newOwnerLuid | string | The LUID of the new data role owner |
| newOwnerName | string | Name of the new data role owner |
| oldOwnerLuid | string | The LUID of the previous data role owner |
| oldOwnerName | string | Name of the previous data role owner |
| ownerLuid | string | User LUID of the data role owner |
| ownerName | string | Name of the data role owner |
| projectLuid | string | LUID of the project that contains the data role |
| projectName | string | Name of the project that contains the data role |
| siteName | string | Name of the Tableau site |

## hist_change_database_contact

The `hist_change_database_contact` event is logged when changing the database contact.

| Attribute Name | Type | Description |
|---|---|---|
| databaseLuid | string | Unique ID of the database |
| description | string | Description of the database |
| name | string | Name of the database |
| newContactLuid | string | LUID of the new contact |
| newContactName | string | Name of the new contact |
| oldContactLuid | string | LUID of the previous contact |
| oldContactName | string | Name of the previous contact |
| ownerLuid | string | User LUID of the database owner |
| ownerName | string | Name of the database owner |
| projectLuid | string | LUID of the project that contains the database |
| projectName | string | Name of the project that contains the database |
| siteName | string | Name of the Tableau site |

## hist_change_datasource_ownership

The `hist_change_datasource_ownership` event is logged when changing the data source owner.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |

| | | |
|---|---|---|
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| newOwnerLuid | string | LUID of the new data source owner |
| newOwnerName | string | Name of the new data source owner |
| oldOwnerLuid | string | LUID of the previous data source owner |
| oldOwnerName | string | Name of the previous data source owner |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses |

| | | |
|---|---|---|
| | | remote query agent |

## hist_change_flow_ownership

The `hist_change_flow_ownership` event is logged when changing the flow owner.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| newOwnerLuid | string | LUID of the new flow owner |
| newOwnerName | string | Name of the new flow owner |
| oldOwnerLuid | string | LUID of the previous flow owner |
| oldOwnerName | string | Name of previous flow owner |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_change_metric_ownership

The `hist_change_metric_ownership` event is logged when changing the metric owner.

**Note:** Tableau's legacy metrics feature was retired in February 2024. As a result, this event no longer records user interaction with metrics on the site. For more information, see Set Up for Metrics.

| Attribute Name | Type | Description |
| --- | --- | --- |
| customizedViewLuid | string | Unique ID of the custom view from which the metric queries its data |
| description | string | Description of the metric |
| metricLuid | string | Unique ID of the metric |
| name | string | Name of the metric |
| newOwnerLuid | string | LUID of the new metric owner |
| newOwnerName | string | Name of the new metric owner |
| oldOwnerLuid | string | LUID of the previous metric owner |
| oldOwnerName | string | Name of the previous metric owner |
| projectLuid | string | Unique ID of the project that contains the metric |
| projectName | string | Name of the project that contains the metric |
| siteName | string | Name of the Tableau site |
| suspendState | integer | State of the metric. The value 0 = Not suspended, 1 = Auto-suspended, and 3 = Manually suspended. |
| viewLuid | string | Unique ID of the view from which the metric queries its data |

## hist_change_project_ownership

The `hist_change_project_ownership` event is logged when project ownership is changed.

| Attribute Name | Type | Description |
| --- | --- | --- |
| description | string | Description of the project |

| | | |
|---|---|---|
| name | string | Name of the project |
| newOwnerLuid | string | LUID of the new project owner |
| newOwnerName | string | Name of the new project owner |
| oldOwnerLuid | string | LUID of the previous project owner |
| oldOwnerName | string | Name of the previous project owner |
| ownerLuid | string | LUID of the project owner |
| ownerName | string | Name of the project owner |
| parentProjectLuid | string | LUID of the parent project. The value is Null for top-level projects. |
| projectLuid | string | Unique ID of the project |
| siteName | string | Name of the Tableau site |
| state | string | State of the project. The default value is active. Any other value indicates the project is inactive. |

## hist_change_published_connection_ownership

The `hist_change_published_connection_ownership` event is logged when published connection ownership is changed.

| Attribute Name | Type | Description |
|---|---|---|
| activated | boolean | Indicates whether the published connection is available for use |
| description | string | Description of the published connection |
| name | string | Name of the published connection |
| newOwnerLuid | string | LUID of the new published connection owner |

| | | |
|---|---|---|
| newOwnerName | string | Name of the new published connection owner |
| oldOwnerLuid | string | LUID of the previous published connection owner |
| oldOwnerName | string | Name of the previous published connection owner |
| ownerLuid | string | LUID of the published connection owner |
| ownerName | string | Name of the published connection owner |
| projectLuid | string | LUID of the project that contains the published connection |
| projectName | string | Name of the project that contains the published connection |
| publishedConnectionLuid | string | Unique ID of the published connection |
| siteName | string | Name of the Tableau site |

## hist_change_site_extract_encryption_mode

The legacy change site extract encryption mode event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| name | string | Name of the Tableau site |
| siteEventLuid | string | Unique ID of the site affected by the event |
| siteName | string | Name of the Tableau site |
| urlNamespace | string | Used in the construction of URLs that target the site |

## hist_change_table_contact

The `hist_change_table_contact` event is logged when the table contact is changed.

| Attribute Name | Type | Description |
|---|---|---|
| description | string | Description of the table |
| name | string | Name of the table |
| newContactLuid | string | LUID of the new contact |
| newContactName | string | Name of the new contact |
| oldContactLuid | string | LUID of the previous contact |
| oldContactName | string | Name of the previous contact |
| ownerLuid | string | User LUID of the table owner |
| ownerName | string | Name of the table owner |
| projectLuid | string | LUID of the project that contains the table |
| projectName | string | Name of the project that contains the table |
| siteName | string | Name of the Tableau site |
| tableLuid | string | Unique ID of the table |

## hist_change_workbook_ownership

The `hist_change_workbook_ownership` event is logged when workbook ownership is changed.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | The version of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if this workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |

| | | |
|---|---|---|
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| newOwnerLuid | string | LUID of the new project owner |
| newOwnerName | string | Name of the new project owner |

| | | |
|---|---|---|
| oldOwnerLuid | string | LUID of the previous project owner |
| oldOwnerName | string | Name of the previous project owner |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the workbook owner |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |

| | | |
|---|---|---|
| workbookLuid | string | Unique ID of the workbook |

## hist_create_collection

The `hist_create_collection` event is logged when a user creates a collection.

| Attribute Name | Type | Description |
|---|---|---|
| collectionLuid | string | Unique ID of the collection |
| description | string | Description of the collection |
| name | string | Name of the collection |
| ownerLuid | string | User LUID of the collection owner |
| ownerName | string | Name of the collection owner |
| siteName | string | Name of the Tableau site |

## hist_create_column

The `hist_create_column` event is logged when a user creates a column.

| Attribute Name | Type | Description |
|---|---|---|
| columnLuid | string | Unique ID of the column |
| description | string | Description of the column |
| name | string | Name of the column |
| ownerLuid | string | User LUID of the column owner |
| ownerName | string | Name of the column owner |
| projectLuid | string | LUID of the project that contains the column |
| projectName | string | Name of the project that contains the column |

| | | |
|---|---|---|
| siteName | string | Name of the Tableau site |

## hist_create_data_quality_indicator

The `hist_create_data_quality_indicator` event is logged when users create data quality warnings.

| Attribute Name | Type | Description |
|---|---|---|
| dataQualityIndicatorLuid | string | Unique ID of the data quality indicator |
| dataQualityType | string | The type of data quality indicator Either warning, deprecated, stale data, under maintenance, sensitive data, or a custom value. |
| isActive | boolean | Indicates whether the data quality indicator is active or not |
| isSevere | boolean | Indicates whether the data quality indicator is severe or not |
| message | string | Message of data quality indicator |
| siteName | string | Name of the Tableau site |
| userDisplayName | string | Display name of user who created or modified the data quality indicator |
| userLuid | string | LUID of user who created or modified the data quality indicator |

## hist_create_database

The `hist_create_database` event is logged when a user creates a database.

| Attribute Name | Type | Description |
|---|---|---|
| databaseLuid | string | Unique ID of the database |

| | | |
|---|---|---|
| description | string | Description of the database |
| name | string | Name of the database |
| ownerLuid | string | User LUID of the database owner |
| ownerName | string | Name of the database owner |
| projectLuid | string | LUID of the project that contains the database |
| projectName | string | Name of the project that contains the database |
| siteName | string | Name of the Tableau site |

## hist_create_datasource_extracts

The `hist_create_datasource_extracts` event is logged when a new data source extract is created.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| details | string | Message that includes details about the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |

| | | |
|---|---|---|
| projectLuid | string | LUID of the project that contains the data source |
| projectName | string | Name of the project that contains the data source |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| taskLuid | string | LUID of the associated task |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_create_datasource_task

The `hist_create_datasource_task` event is logged when a new data source task is created.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If the task is inactive, it will not run when the schedule is triggered. |

| | | |
|---|---|---|
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |

| | | |
|---|---|---|
| title | string | Task title. Provides additional information about the task. |
| type | string | The type of task. Either an extract, sub-scription, flow, encryption, or system. |

## hist_create_datasource_trigger

The `hist_create_datasource_trigger` event specifies what caused the data source to be created.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters |

| | | |
|---|---|---|
| | | in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_create_flow_task

The `hist_create_flow_task` event is logged when a new flow task is created.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If the task is inactive, it will not run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |

| | | |
|---|---|---|
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Task title. Provides additional information about the task. |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_create_flow_trigger

The `hist_create_flow_trigger` event specifies what caused the flow to be created.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |

| | | |
|---|---|---|
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_create_group

The `hist_create_group` event is logged when creating a group.

| Attribute Name | Type | Description |
|---|---|---|
| groupLuid | string | Unique ID of the group |
| name | string | Name of the group |
| siteName | string | Name of the Tableau site |

## hist_create_linked_task

The `hist_create_linked_task` event is logged when creating linked tasks that run sequentially.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |

| | | |
|---|---|---|
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Task title. Provides additional information about the task. |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_create_materialized_views

The `hist_create_materialized_views` event logs the successful creation of materialized views on a workbook.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| details | string | Details of the action (why were the materialized views created or deleted). |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| eventType | string | The type of the event. Either Create, Delete, Encrypt, Decrypt, or Rekey Materialized Views. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. |

| | | |
|---|---|---|
| | | The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is pub- |

| | | |
|---|---|---|
| | | lished. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_create_metric

The `hist_create_metric` event is logged when users create metrics on the site.

**Note:** Tableau's legacy metrics feature was retired in February 2024. As a result, this event no longer records user interaction with metrics on the site. For more information, see Set Up for Metrics.

| Attribute Name | Type | Description |
|---|---|---|
| customizedViewLuid | string | The view from which the metric queries its data |
| description | string | Description of the metric |
| metricLuid | string | Unique ID of the metric |
| name | string | Name of the metric |
| projectLuid | string | Unique ID of the associated project |
| projectName | string | Name of the associated project |
| siteName | string | Name of the Tableau site |

| | | |
|---|---|---|
| suspendState | integer | State of the metric. The value 0 = Not suspended, 1 = Auto-suspended, and 3 = Manually suspended. |
| viewLuid | string | The view from which the metric queries its data |

## hist_create_project

The `hist_create_project` event is logged when users create projects on the site.

| Attribute Name | Type | Description |
|---|---|---|
| description | string | Description of the project |
| name | string | Name of the project |
| ownerLuid | string | Unique ID of the project owner |
| ownerName | string | Name of the project owner |
| parentProjectLuid | string | LUID of the parent project. The value is Null for top-level projects. |
| projectLuid | string | Unique identifier for the project |
| siteName | string | Name of the Tableau site |
| state | string | State of the project. The default value is active. Any other value indicates the project is inactive. |

## hist_create_schedule

The `hist_create_schedule` event is logged when users create schedules on the site.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the schedule is active or not. If set to False, no tasks will run when the schedule is triggered. |

| | | |
|---|---|---|
| dayOfMonthMask | integer | Indicates which day of the month the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the month correspond to 1st = 1, 2nd = 10, 3rd = 100, 4th = 1000, 5th = 10000, etc. |
| dayOfWeekMask | integer | Indicates which day of the week the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the week correspond to Sunday = 1, Monday = 10, Tuesday = 100, Wednesday = 1000, Thursday = 10000, Friday = 100000, and Saturday = 1000000. |
| endAtMinute | integer | The minute after the specified schedule_type period begins, indicating when the schedule should stop triggering. |
| endScheduleAt | string | Timestamp when the schedule should stop triggering |
| isSerial | boolean | Indicates whether the schedule is run serially or not |
| minuteInterval | integer | Once triggered, the schedule will repeat at this interval until it ends as per the schedule_type, end_at_minute, or end_schedule_at. |
| name | string | Name of the schedule |
| priority | integer | Priority ranges from 1 to 100, with lower values corresponding to a higher priority. |
| scheduleLuid | string | Unique ID of the schedule |
| scheduleType | integer | The type of schedule. The value 0 = Hourly, 1 = Daily, 2 = Weekly, and 3 = Monthly. |
| scheduledAction | integer | Category of the scheduled action. The value 0 = Extracts and 1 = Subscriptions. |
| siteName | string | Name of the Tableau site |

| | | |
|---|---|---|
| startAtMinute | integer | The minute after the scheduled start time per the schedule_type. For example, in a daily schedule, it's minutes past midnight; for hourly, it's minutes past the hour. |

## hist_create_site

The legacy create site from historical_events

| Attribute Name | Type | Description |
|---|---|---|
| name | string | Name of the Tableau site |
| siteEventLuid | string | Unique ID of the site affected by the event |
| siteName | string | Name of the Tableau site |
| urlNamespace | string | Used in the construction of URLs that target the site |

## hist_create_subscription_task

The `hist_create_subscription_task` event is logged when subscription tasks are created.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in his- |

| | | |
|---|---|---|
| | | torical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Provides additional information about the task |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_create_system_user

The `hist_create_system_user` event is logged when adding a system user.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_create_table

The `hist_create_table` event is logged when creating a database table on the site.

| Attribute Name | Type | Description |
|---|---|---|
| description | string | Description of the table |
| name | string | Name of the table |
| ownerLuid | string | Unique ID of the table owner |
| ownerName | string | Name of the table owner |
| projectLuid | string | Unique ID of the project that contains the table |
| projectName | string | Name of the project that contains the table |
| siteName | string | Name of the Tableau site |
| tableLuid | string | Unique ID of the table |

## hist_create_user

The `hist_create_user event` is logged when adding a user to the site.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_create_workbook_extracts

The `hist_create_workbook_extracts` event is logged when changes are made to workbooks containing extracts.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| details | string | A message string |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |

| | | |
|---|---|---|
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isFailure | boolean | Indicates whether the action failed or not |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |

| | | |
|---|---|---|
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| taskLuid | string | LUID of the associated task |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_create_workbook_task

The `hist_create_workbook_task` event is logged for workbook related tasks.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule |

| | | |
|---|---|---|
| | | is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |

| | | |
|---|---|---|
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Provides additional information about the task |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_decrypt_datasource_extracts

The legacy decrypt datasource extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | Unique ID of the data source |
| description | string | Description of the data source |
| details | string | A message string |
| isCertified | boolean | Indicates whether the data source is certified |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the data source |
| ownerLuid | string | Unique ID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | Unique ID of the project that contains the data source |
| projectName | string | Name of the project that contains the data source |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |

| | | |
|---|---|---|
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_decrypt_datasource_extracts_request

The legacy decrypt datasource extracts request event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | Unique ID of the data source |
| description | string | Description of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | Unique ID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | Unique ID of the project that contains the data source |

| | | |
|---|---|---|
| projectName | string | Name of the project that contains the data source |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_decrypt_flow_draft_extracts

The legacy decrypt flow draft extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| createdAt | string | Timestamp when the record was created |
| details | string | A message string |
| flowDraftLuid | string | Unique ID of the flow draft |
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |
| isFailure | boolean | Indicates whether the action failed or not |

| | | |
|---|---|---|
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| updatedAt | string | Timestamp when the record was last updated |

## hist_decrypt_flow_draft_extracts_request

The legacy decrypt flow draft extracts request event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| createdAt | string | Timestamp when the record was created |
| flowDraftLuid | string | Unique ID of the flow draft |
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |

| | | |
|---|---|---|
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| updatedAt | string | Timestamp when the record was last updated |

## hist_decrypt_flow_extracts

The legacy decrypt flow extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | Version of the flow file, increments by 1 on each publish. |
| description | string | Description of the flow |
| details | string | A message string |
| flowLuid | string | Unique ID of the flow |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_decrypt_flow_extracts_request

The legacy decrypt flow extracts request event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| contentVersion | string | Version of the flow file, increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_decrypt_materialized_views

The hist_decrypt_materialized_views event logs the successful decrypting of materialized views on a workbook.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| details | string | Details of the action (why were the materialized views created or deleted). |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| eventType | string | The type of the event. Either Create, Delete, Encrypt, Decrypt, or Rekey Materialized Views. |

| | | |
|---|---|---|
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |

| | | |
|---|---|---|
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_decrypt_site_extracts_request

The legacy decrypt site extracts request event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| name | string | Name of the Tableau site |
| siteEventLuid | string | Unique ID of the site affected by the event |

| | | |
|---|---|---|
| siteName | string | Name of the Tableau site |
| urlNamespace | string | Used in the construction of URLs that target the site |

## hist_decrypt_workbook_extracts

The legacy decrypt workbook extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| details | string | A message string |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isFailure | boolean | Indicates whether the action failed or not |

| | | |
|---|---|---|
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |

| | | |
|---|---|---|
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_decrypt_workbook_extracts_request

The legacy decrypt workbook extracts request event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |

| | | |
|---|---|---|
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |

| | | |
|---|---|---|
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_delete_access_token

The `hist_delete_access_token` event is logged when a user deltes an access token.

| Attribute Name | Type | Description |
|---|---|---|
| siteName | string | Name of the Tableau site where the access token is deleted. |

## hist_delete_collection

The `hist_delete_collection` event is logged when a collection is deleted.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| collectionLuid | string | Unique identifier |
| description | string | Description of the collection |
| name | string | Name of the collection |
| ownerLuid | string | Unique ID of the user who owns the collection |
| ownerName | string | Name of the user who owns the collection |
| siteName | string | Name of the Tableau site |

## hist_delete_column

The `hist_delete_column` event is logged when deleting a database column.

| Attribute Name | Type | Description |
|---|---|---|
| columnLuid | string | Unique identifier |
| description | string | Description of the column |
| name | string | Name of the column |
| ownerLuid | string | Unique ID of the user who owns the column |
| ownerName | string | Name of the user who owns the column |
| projectLuid | string | Unique ID of the project that contains the column |
| projectName | string | Name of the project that contains the column |
| siteName | string | Name of the Tableau site |

## hist_delete_data_quality_indicator

The `hist_delete_data_quality_indicator` event is logged when a data quality warning is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| dataQualityIndicatorLuid | string | Unique identifier |
| dataQualityType | string | The type of data quality indicator |
| isActive | boolean | Indicates whether the data quality indicator is active or not |
| isSevere | boolean | Indicates whether the data quality indicator is severe or not |
| message | string | Data quality filter message |
| siteName | string | Name of the Tableau site |
| userDisplayName | string | Name of user who created or modified the data quality indicator |
| userLuid | string | Unique ID of the user who created or modified the data quality indicator |

## hist_delete_data_role

The `hist_delete_data_role` event is logged when deleting a data role.

| Attribute Name | Type | Description |
|---|---|---|
| dataRoleLuid | string | Unique identifier |
| description | string | Description of the data role |
| name | string | Name of the data role |
| ownerLuid | string | Unique ID of the data role owner |
| ownerName | string | Name of the data role owner |
| projectLuid | string | Unique ID of the project that contains the data role |

| | | |
|---|---|---|
| projectName | string | Name of the project that contains the data role |
| siteName | string | Name of the Tableau site |

## hist_delete_database

The `hist_delete_database` event is logged when a database is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| databaseLuid | string | Unique identifier |
| description | string | Description of the database |
| name | string | Name of the database |
| ownerLuid | string | Unique ID of the database owner |
| ownerName | string | Name of the database owner |
| projectLuid | string | Unique ID of the project that contains the database |
| projectName | string | Name of the project that contains the database |
| siteName | string | Name of the Tableau site |

## hist_delete_datasource

The `hist_delete_datasource` event is logged when deleting a data source.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |

| | | |
|---|---|---|
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_delete_datasource_task

The `hist_delete_datasource_task` event is logged when a data source related task is deleted.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |

| | | |
|---|---|---|
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Provides additional information about the task |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_delete_datasource_trigger

The `hist_delete_datasource_trigger` event specifies what caused the data source to be deleted.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used |

| | | |
|---|---|---|
| | | when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_delete_expired_refresh_token

The `hist_delete_expired_refresh_token` event is logged when an expired refresh token is deleted by the Backgrounder process.

| Attribute Name | Type | Description |
|---|---|---|
| deviceName | string | Name of the device associated with the refresh token |
| refreshTokenGuid | string | Unique ID of the refresh token |
| siteName | string | Name of the Tableau site |

## hist_delete_flow

The `hist_delete_flow` event is logged when a flow is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |

| | | |
|---|---|---|
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_delete_flow_draft

The `hist_delete_flow_draft` event is logged when a flow draft is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| createdAt | string | Timestamp when the record was created |
| flowDraftLuid | string | Unique ID of the flow draft |
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| updatedAt | string | Timestamp when the record was last updated |

## hist_delete_flow_task

The `hist_delete_flow_task` event is logged when deleting flow related tasks.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |

| | | |
|---|---|---|
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Provides additional information about the task |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_delete_flow_trigger

The `hist_delete_flow_trigger` event specifies what caused the flow to be deleted.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_delete_group

The `hist_delete_group` event is logged when a group is deleted.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| groupLuid | string | Unique ID of the group |
| name | string | Name of the group |
| siteName | string | Name of the Tableau site |

## hist_delete_linked_task

The `hist_delete_linked_task` event is logged when deleting tasks that are linked and scheduled to run serially.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |

| | | |
|---|---|---|
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Provides additional information about the task |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_delete_materialized_views

The `hist_delete_materialized_views` event logs the successful deletion of materialized views on a workbook

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |

| | | |
|---|---|---|
| details | string | Details of the action (why were the materialized views created or deleted). |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| eventType | string | The type of the event. Either Create, Delete, Encrypt, Decrypt, or Rekey Materialized Views. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |

| | | |
|---|---|---|
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_delete_metric

The `hist_delete_metric` event is logged when a metric is deleted.

> **Note:** Tableau's legacy metrics feature was retired in February 2024. As a result, this event no longer records user interaction with metrics on the site. For more information, see Set Up for Metrics.

| Attribute Name | Type | Description |
|---|---|---|
| customizedViewLuid | string | The view from which the metric queries its data |
| description | string | Description of the metric |
| metricLuid | string | Unique ID of the metric |
| name | string | Name of the metric |
| projectLuid | string | Unique ID of the associated project |
| projectName | string | Name of the associated project |
| siteName | string | Name of the Tableau site |
| suspendState | integer | State of the metric. The value 0 = Not suspended, 1 = Auto-suspended, and 3 = Manually suspended. |
| viewLuid | string | The view from which the metric queries its data |

## hist_delete_project

The `hist_delete_project` event is logged when a project is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| description | string | Description of the project |

| | | |
|---|---|---|
| name | string | Name of the project |
| ownerLuid | string | Unique ID of the project owner |
| ownerName | string | Name of the project owner |
| parentProjectLuid | string | LUID of the parent project. The value is Null for top-level projects. |
| projectLuid | string | Unique identifier for the project |
| siteName | string | Name of the Tableau site |
| state | string | State of the project. The default value is active. Any other value indicates the project is inactive. |

## hist_delete_refresh_token_session

The `hist_delete_refresh_token_session` event is logged when a session created by refresh token is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| deviceName | string | Name of the device associated with the refresh token |
| refreshTokenGuid | string | Unique ID of the refresh token |
| sessionId | string | ID of the session |
| siteName | string | Name of the Tableau site |

## hist_delete_schedule

The `hist_delete_schedule` event is logged when a schedule is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the schedule is active or not. If set to False, no tasks will run when the schedule is triggered. |

| | | |
|---|---|---|
| dayOfMonthMask | integer | Indicates which day of the month the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the month correspond to 1st = 1, 2nd = 10, 3rd = 100, 4th = 1000, 5th = 10000, etc. |
| dayOfWeekMask | integer | Indicates which day of the week the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the week correspond to Sunday = 1, Monday = 10, Tuesday = 100, Wednesday = 1000, Thursday = 10000, Friday = 100000, and Saturday = 1000000. |
| endAtMinute | integer | The minute after the specified schedule_type period begins, indicating when the schedule should stop triggering. |
| endScheduleAt | string | Timestamp when the schedule should stop triggering |
| isSerial | boolean | Indicates whether the schedule is run serially or not |
| minuteInterval | integer | Once triggered, the schedule will repeat at this interval until it ends as per the schedule_type, end_at_minute, or end_schedule_at. |
| name | string | Name of the schedule |
| priority | integer | Priority ranges from 1 to 100, with lower values corresponding to a higher priority. |
| scheduleLuid | string | Unique ID of the schedule |
| scheduleType | integer | The type of schedule. The value 0 = Hourly, 1 = Daily, 2 = Weekly, and 3 = Monthly. |
| scheduledAction | integer | Category of the scheduled action. The value 0 = Extracts and 1 = Subscriptions. |
| siteName | string | Name of the Tableau site |

| | | |
|---|---|---|
| startAtMinute | integer | The minute after the scheduled start time per the schedule_type. For example, in a daily schedule, it's minutes past midnight; for hourly, it's minutes past the hour. |

## hist_delete_site

The `hist_delete_site` event is logged when a site is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| name | string | Name of the Tableau site |
| siteEventLuid | string | Unique ID of the site affected by the event |
| siteName | string | Name of the Tableau site |
| urlNamespace | string | Used in the construction of URLs that target the site |

## hist_delete_system_user

The `hist_delete_system_user` event is logged when a system user is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates whether the user is a site admin. The value 5 = site admin and 0 = not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | The unique identifier of the user |

## hist_delete_table

The `hist_delete_table` event is logged when a table is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| description | string | Description of the table |
| name | string | Name of the table |
| ownerLuid | string | Unique ID of the table owner |
| ownerName | string | Name of the table owner |
| projectLuid | string | Unique ID of the project that contains the table |
| projectName | string | Name of the project that contains the table |
| siteName | string | Name of the Tableau site |
| tableLuid | string | Unique identifier |

## hist_delete_user

The `hist_delete_user` event is logged when a user is deleted from the site.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_delete_user_from_group

The `hist_delete_user_from_group` event is logged when a user is removed from a group.

| Attribute Name | Type | Description |
|---|---|---|
| groupLuid | string | Unique ID of the group |
| name | string | Name of the group |
| siteName | string | Name of the Tableau site |
| userLuid | string | LUID of the user deleted from the group |
| userName | string | The name of the user deleted from the group |

## hist_delete_view

The `hist_delete_view` event is logged when a view is deleted from the site.

| Attribute Name | Type | Description |
|---|---|---|
| caption | string | The descriptive phrase constructed for the worksheet based on the workbook definition |
| description | string | Description of the view |
| fields | string | A list of fields extracted from the workbook .twb file |
| firstPublishedAt | string | Timestamp of when the view was first published. The value won't change when republishing the workbook containing the view. |
| index | integer | Each view has an index that is unique among views belonging to that workbook |
| name | string | Name of the view |
| ownerLuid | string | User LUID of the view owner |
| ownerName | string | Name of the view owner |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII |

| | | |
|---|---|---|
| | | characters in the view name. |
| revision | string | The revision number of the view. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetId | string | The ID of the worksheet |
| sheetType | string | The type of worksheet. Either a story, dashboard, or view. |
| siteName | string | Name of the Tableau site |
| title | string | The worksheet title from the workbook .twb file |
| viewLuid | string | The LUID of the view |
| workbookLuid | string | The LUID of the workbook containing the view |
| workbookName | string | Name of the workbook containing the view |

## hist_delete_workbook

The `hist_delete_workbook` event is logged when a workbook is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract |

| | | |
|---|---|---|
| | | refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook |

| | | |
|---|---|---|
| | | were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_delete_workbook_task

The `hist_delete_workbook_task` event is logged when a workbook related task is deleted.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |

| | | |
|---|---|---|
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |

| | | |
|---|---|---|
| title | string | Provides additional information about the task |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_disable_linked_task_schedule

The `hist_disable_linked_task_schedule` event is logged when a linked task schedule is turned off.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the schedule is active or not. If set to False, no tasks will run when the schedule is triggered. |
| dayOfMonthMask | integer | Indicates which day of the month the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the month correspond to 1st = 1, 2nd = 10, 3rd = 100, 4th = 1000, 5th = 10000, etc. |
| dayOfWeekMask | integer | Indicates which day of the week the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the week correspond to Sunday = 1, Monday = 10, Tuesday = 100, Wednesday = 1000, Thursday = 10000, Friday = 100000, and Saturday = 1000000. |
| endAtMinute | integer | The minute after the specified schedule_type period begins, indicating when the schedule should stop triggering. |
| endScheduleAt | string | Timestamp when the schedule should stop triggering |
| isSerial | boolean | Indicates whether the schedule is run serially or not |
| minuteInterval | integer | Once triggered, the schedule will repeat at this interval |

| | | |
|---|---|---|
| | | until it ends as per the schedule_type, end_at_minute, or end_schedule_at. |
| name | string | Name of the schedule |
| priority | integer | Priority ranges from 1 to 100, with lower values corresponding to a higher priority. |
| scheduleLuid | string | Unique ID of the schedule |
| scheduleType | integer | The type of schedule. The value 0 = Hourly, 1 = Daily, 2 = Weekly, and 3 = Monthly. |
| scheduledAction | integer | Category of the scheduled action. The value 0 = Extracts and 1 = Subscriptions. |
| siteName | string | Name of the Tableau site |
| startAtMinute | integer | The minute after the scheduled start time per the schedule_type. For example, in a daily schedule, it's minutes past midnight; for hourly, it's minutes past the hour. |

## hist_disable_schedule

The `hist_disable_schedule` event is logged when a schedule is turned off.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the schedule is active or not. If set to False, no tasks will run when the schedule is triggered. |
| dayOfMonthMask | integer | Indicates which day of the month the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the month correspond to 1st = 1, 2nd = 10, 3rd = 100, 4th = 1000, 5th = 10000, etc. |

| | | |
|---|---|---|
| dayOfWeekMask | integer | Indicates which day of the week the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the week correspond to Sunday = 1, Monday = 10, Tuesday = 100, Wednesday = 1000, Thursday = 10000, Friday = 100000, and Saturday = 1000000. |
| endAtMinute | integer | The minute after the specified schedule_type period begins, indicating when the schedule should stop triggering. |
| endScheduleAt | string | Timestamp when the schedule should stop triggering |
| isSerial | boolean | Indicates whether the schedule is run serially or not |
| minuteInterval | integer | Once triggered, the schedule will repeat at this interval until it ends as per the schedule_type, end_at_minute, or end_schedule_at. |
| name | string | Name of the schedule |
| priority | integer | Priority ranges from 1 to 100, with lower values corresponding to a higher priority. |
| scheduleLuid | string | Unique ID of the schedule |
| scheduleType | integer | The type of schedule. The value 0 = Hourly, 1 = Daily, 2 = Weekly, and 3 = Monthly. |
| scheduledAction | integer | Category of the scheduled action. The value 0 = Extracts and 1 = Subscriptions. |
| siteName | string | Name of the Tableau site |
| startAtMinute | integer | The minute after the scheduled start time per the schedule_type. For example, in a daily schedule, it's minutes past midnight; for hourly, it's minutes past the hour. |

## hist_download_datasource

The `hist_download_datasource` event is logged when a data source is downloaded from the site.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |

| | | |
|---|---|---|
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_download_flow

The `hist_download_flow` event is logged when a flow is downloaded from the site.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_download_flow_draft

The `hist_download_flow_draft` event is logged when a flow draft is downloaded from the site.

| Attribute Name | Type | Description |
|---|---|---|
| createdAt | string | Timestamp when the record was created |
| flowDraftLuid | string | Unique ID of the flow draft |
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |

| | | |
|---|---|---|
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| updatedAt | string | Timestamp when the record was last updated |

## hist_download_workbook

The `hist_download_workbook` event is logged when downloading a workbook from the site.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |

| | | |
|---|---|---|
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were |

| | | |
|---|---|---|
| | | published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_enable_linked_task_schedule

The `hist_enable_linked_task_schedule` event is logged when a linked task scheduled is turned on.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| active | boolean | Indicates whether the schedule is active or not. If set to False, no tasks will run when the schedule is triggered. |

| | | |
|---|---|---|
| dayOfMonthMask | integer | Indicates which day of the month the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the month correspond to 1st = 1, 2nd = 10, 3rd = 100, 4th = 1000, 5th = 10000, etc. |
| dayOfWeekMask | integer | Indicates which day of the week the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the week correspond to Sunday = 1, Monday = 10, Tuesday = 100, Wednesday = 1000, Thursday = 10000, Friday = 100000, and Saturday = 1000000. |
| endAtMinute | integer | The minute after the specified schedule_type period begins, indicating when the schedule should stop triggering. |
| endScheduleAt | string | Timestamp when the schedule should stop triggering |
| isSerial | boolean | Indicates whether the schedule is run serially or not |
| minuteInterval | integer | Once triggered, the schedule will repeat at this interval until it ends as per the schedule_type, end_at_minute, or end_schedule_at. |
| name | string | Name of the schedule |
| priority | integer | Priority ranges from 1 to 100, with lower values corresponding to a higher priority. |
| scheduleLuid | string | Unique ID of the schedule |
| scheduleType | integer | The type of schedule. The value 0 = Hourly, 1 = Daily, 2 = Weekly, and 3 = Monthly. |
| scheduledAction | integer | Category of the scheduled action. The value 0 = Extracts and 1 = Subscriptions. |
| siteName | string | Name of the Tableau site |

| | | |
|---|---|---|
| startAtMinute | integer | The minute after the scheduled start time per the schedule_type. For example, in a daily schedule, it's minutes past midnight; for hourly, it's minutes past the hour. |

## hist_enable_schedule

The `hist_enable_schedule` event is logged when a schedule is turned on.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the schedule is active or not. If set to False, no tasks will run when the schedule is triggered. |
| dayOfMonthMask | integer | Indicates which day of the month the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the month correspond to 1st = 1, 2nd = 10, 3rd = 100, 4th = 1000, 5th = 10000, etc. |
| dayOfWeekMask | integer | Indicates which day of the week the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the week correspond to Sunday = 1, Monday = 10, Tuesday = 100, Wednesday = 1000, Thursday = 10000, Friday = 100000, and Saturday = 1000000. |
| endAtMinute | integer | The minute after the specified schedule_type period begins, indicating when the schedule should stop triggering. |
| endScheduleAt | string | Timestamp when the schedule should stop triggering |
| isSerial | boolean | Indicates whether the schedule is run serially or not |
| minuteInterval | integer | Once triggered, the schedule will repeat at this interval until it ends as per the schedule_type, end_at_minute, or end_schedule_at. |

| | | |
|---|---|---|
| name | string | Name of the schedule |
| priority | integer | Priority ranges from 1 to 100, with lower values corresponding to a higher priority. |
| scheduleLuid | string | Unique ID of the schedule |
| scheduleType | integer | The type of schedule. The value 0 = Hourly, 1 = Daily, 2 = Weekly, and 3 = Monthly. |
| scheduledAction | integer | Category of the scheduled action. The value 0 = Extracts and 1 = Subscriptions. |
| siteName | string | Name of the Tableau site |
| startAtMinute | integer | The minute after the scheduled start time per the schedule_type. For example, in a daily schedule, it's minutes past midnight; for hourly, it's minutes past the hour. |

## hist_encrypt_datasource_extracts

The legacy encrypt datasource extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | Unique identifier |
| description | string | Description of the data source |
| details | string | A message string |
| isCertified | boolean | Indicates whether the data source is certified |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the data source |

| | | |
|---|---|---|
| ownerLuid | string | Unique ID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | Unique ID of the project that contains the data source |
| projectName | string | Name of the project that contains the data source |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_encrypt_datasource_extracts_request

The legacy encrypt datasource extracts request event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |

| | | |
|---|---|---|
| datasourceLuid | string | Unique identifier |
| description | string | Description of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | Unique ID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | Unique ID of the project that contains the data source |
| projectName | string | Name of the project that contains the data source |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_encrypt_flow_draft_extracts

The legacy encrypt flow draft extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| createdAt | string | Timestamp when the record was created |
| details | string | A message string |
| flowDraftLuid | string | Unique ID of the flow draft |
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| updatedAt | string | Timestamp when the record was last updated |

## hist_encrypt_flow_draft_extracts_request

The legacy encrypt flow draft extracts request event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| createdAt | string | Timestamp when the record was created |

| | | |
|---|---|---|
| flowDraftLuid | string | Unique ID of the flow draft |
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| updatedAt | string | Timestamp when the record was last updated |

## hist_encrypt_flow_extracts

The legacy encrypt flow extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | Version of the flow file, increments by 1 on each publish. |
| description | string | Description of the flow |
| details | string | A message string |
| flowLuid | string | Unique ID of the flow |
| isFailure | boolean | Indicates whether the action failed or not |

| | | |
|---|---|---|
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_encrypt_flow_extracts_request

The legacy encrypt flow extracts request event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | Version of the flow file, increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_encrypt_materialized_views

The `hist_encrypt_materialized_views` event logs the successful encrypting of materialized views on a workbook.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |

| | | |
|---|---|---|
| details | string | Details of the action (why were the materialized views created or deleted). |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| eventType | string | The type of the event. Either Create, Delete, Encrypt, Decrypt, or Rekey Materialized Views. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |

| | | |
|---|---|---|
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_encrypt_site_extracts_request

The legacy encrypt site extracts request event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| name | string | Name of the Tableau site |
| siteEventLuid | string | Unique ID of the site affected by the event |
| siteName | string | Name of the Tableau site |
| urlNamespace | string | Used in the construction of URLs that target the site |

## hist_encrypt_workbook_extracts

The legacy encrypt workbook extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| details | string | A message string |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh |

| | | |
|---|---|---|
| | | occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isFailure | boolean | Indicates whether the action failed or not |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets pub- |

| | | |
|---|---|---|
| | | lished and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_encrypt_workbook_extracts_request

The legacy encrypt workbook extracts request event from historical_events.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |

| | | |
|---|---|---|
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |

| | | |
|---|---|---|
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_export_summary_data

The `hist_export_summary_data` event is logged when summary data is exported from a view.

| Attribute Name | Type | Description |
| --- | --- | --- |
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value |

| | | |
|---|---|---|
| | | will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetName | string | Name of the sheet for which data was accessed. |
| siteName | string | Name of the Tableau site |

| | | |
|---|---|---|
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_export_underlying_data

The `hist_export_underlying_data` event is logged when underlying data is exported from a view.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |

| | | |
|---|---|---|
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is |

| | | |
|---|---|---|
| | | derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetName | string | Name of the sheet for which data was accessed. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_hyper_data_update_job

The legacy Hyper data update job event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | Unique identifier |
| description | string | Description of the data source |
| details | string | Details of the action (why was the data updated). |
| isCertified | boolean | Indicates whether the data source is certified |

| | | |
|---|---|---|
| isFailure | boolean | Whether the action succeeded or failed. |
| name | string | Name of the data source |
| ownerLuid | string | Unique ID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | Unique ID of the project that contains the data source |
| projectName | string | Name of the project that contains the data source |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_impersonate_user

The `hist_impersonate_user` event logs when a user ID has been impersonated.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| email | string | Email address of the user |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_increment_datasource_extract

The `hist_increment_datasource_extract` event is logged when a data source extract is incrementally refreshed.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | Unique identifier |
| description | string | Description of the data source |
| details | string | A message string |
| isCertified | boolean | Indicates whether the data source is certified |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the data source |
| ownerLuid | string | Unique ID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | Unique ID of the project that contains the data source |

| | | |
|---|---|---|
| projectName | string | Name of the project that contains the data source |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| taskLuid | string | LUID of the associated task |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_increment_workbook_extracts

The `hist_increment_workbook_extracts` event is logged when extracts in a workbook are incrementally refreshed.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |

| | | |
|---|---|---|
| details | string | A message string |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isFailure | boolean | Indicates whether the action failed or not |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |

| | | |
|---|---|---|
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| taskLuid | string | LUID of the associated task |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_issue_refresh_token

The `hist_issue_refresh_token` event is logged when a refresh token or personal access token (PAT) is issued.

| Attribute Name | Type | Description |
|---|---|---|
| refreshTokenGuid | string | The unique ID of the refresh token or PAT |
| siteName | string | Name of the Tableau site |

## hist_lock_site

The `hist_lock_site` event is logged when a site is locked.

| Attribute Name | Type | Description |
|---|---|---|
| name | string | Name of the Tableau site |
| siteEventLuid | string | Unique ID of the site affected by the event |
| siteName | string | Name of the Tableau site |
| urlNamespace | string | Used in the construction of URLs that target the site |

## hist_login

The `hist_login` event is logged when a user signed in to the site.

| Attribute Name | Type | Description |
|---|---|---|
| actorExternalId | string | The external ID for the acting user. This is an opaque identifier dependent on the actor type, but could, for example, be a user email. Can also show the identifier of a user accessing content through on-demand access. |
| groupNames | string | The list of group names assigned to the user with on-demand access during sign-in |

| | | |
|---|---|---|
| siteName | string | Name of the Tableau site |

## hist_login_with_pat

The `hist_login_with_pat` event is logged when a user signed in with a personal access token (PAT).

| Attribute Name | Type | Description |
|---|---|---|
| clientId | string | Used for PATs. The client ID is typically the PAT name displayed in the Tableau UI. |
| createdAt | string | The timestamp when the PAT was first created |
| expiresAt | string | The timestamp when the PAT expires |
| lastUsedAt | string | The timestamp when the PAT was last used |
| refreshTokenGuid | string | The unique ID of the PAT |
| siteName | string | Name of the Tableau site |

## hist_logout

The `hist_logout event` is logged when a user logged out of the site.

| Attribute Name | Type | Description |
|---|---|---|
| siteName | string | Name of the Tableau site |

## hist_move_data_role

The `hist_move_data_role` event is logged when a data role is moved to a new project.

| Attribute Name | Type | Description |
|---|---|---|
| dataRoleLuid | string | Unique identifier |

| | | |
|---|---|---|
| description | string | Description of the data role |
| destinationProjectLuid | string | Unique ID of the destination project |
| destinationProjectName | string | Name of the destination project |
| name | string | Name of the data role |
| ownerLuid | string | Unique ID of the data role owner |
| ownerName | string | Name of the data role owner |
| projectLuid | string | Unique ID of the project that contains the data role |
| projectName | string | Name of the project that contains the data role |
| siteName | string | Name of the Tableau site |
| sourceProjectLuid | string | Unique ID of the source project |
| sourceProjectName | string | Name of the source project |

## hist_move_database

The `hist_move_database` event is logged when a database is moved to a new project.

| Attribute Name | Type | Description |
|---|---|---|
| databaseLuid | string | Unique identifier |
| description | string | Description of the database |
| destinationProjectLuid | string | Unique ID of the destination project |
| destinationProjectName | string | Name of the destination project |
| name | string | Name of the database |
| ownerLuid | string | Unique ID of the database owner |
| ownerName | string | Name of the database owner |

| | | |
|---|---|---|
| projectLuid | string | Unique ID of the project that contains the database |
| projectName | string | Name of the project that contains the database |
| siteName | string | Name of the Tableau site |
| sourceProjectLuid | string | Unique ID of the source project |
| sourceProjectName | string | Name of the source project |

## hist_move_datasource

The `hist_move_datasource` event is logged when a published data source is moved to a new project.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| destinationProjectLuid | string | Unique ID of the destination project |
| destinationProjectName | string | Name of the destination project |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |

| | | |
|---|---|---|
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| sourceProjectLuid | string | Unique ID of the source project |
| sourceProjectName | string | Name of the source project |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_move_flow

The `hist_move_flow` event is logged when a flow is moved to a new project.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| destinationProjectLuid | string | Unique ID of the destination project |
| destinationProjectName | string | Name of the destination project |
| flowLuid | string | Unique ID of the flow |

| | | |
|---|---|---|
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |
| sourceProjectLuid | string | Unique ID of the source project |
| sourceProjectName | string | Name of the source project |

## hist_move_flow_draft

The `hist_move_flow_draft` event is logged when a flow draft is moved to a new project.

| Attribute Name | Type | Description |
|---|---|---|
| createdAt | string | Timestamp when the record was created |
| destinationProjectLuid | string | Unique ID of the destination project |
| destinationProjectName | string | Name of the destination project |
| flowDraftLuid | string | Unique ID of the flow draft |
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |

| | | |
|---|---|---|
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| sourceProjectLuid | string | Unique ID of the source project |
| sourceProjectName | string | Name of the source project |
| updatedAt | string | Timestamp when the record was last updated |

## hist_move_metric

The `hist_move_metric` event is logged when a metric is moved to a new project.

**Note:** Tableau's legacy metrics feature was retired in February 2024. As a result, this event no longer records user interaction with metrics on the site. For more information, see Set Up for Metrics.

| Attribute Name | Type | Description |
|---|---|---|
| customizedViewLuid | string | The view from which the metric queries its data |
| description | string | Description of the metric |
| destinationProjectLuid | string | Unique ID of the destination project |
| destinationProjectName | string | Name of the destination project |
| metricLuid | string | Unique ID of the metric |
| name | string | Name of the metric |
| projectLuid | string | Unique ID of the associated project |
| projectName | string | Name of the associated project |
| siteName | string | Name of the Tableau site |

| | | |
|---|---|---|
| sourceProjectLuid | string | Unique ID of the source project |
| sourceProjectName | string | Name of the source project |
| suspendState | integer | State of the metric. The value 0 = Not suspended, 1 = Auto-suspended, and 3 = Manually suspended. |
| viewLuid | string | The view from which the metric queries its data |

## hist_move_project

The `hist_move_project` event is logged when a project is moved.

| Attribute Name | Type | Description |
|---|---|---|
| description | string | Description of the project |
| destinationProjectLuid | string | Unique ID of the destination project |
| destinationProjectName | string | Name of the destination project |
| name | string | Name of the project |
| ownerLuid | string | Unique ID of the project owner |
| ownerName | string | Name of the project owner |
| parentProjectLuid | string | LUID of the parent project. The value is Null for top-level projects. |
| projectLuid | string | Unique identifier for the project |
| siteName | string | Name of the Tableau site |
| sourceProjectLuid | string | Unique ID of the source project |
| sourceProjectName | string | Name of the source project |
| state | string | State of the project. The default value is active. |

| | | |
|---|---|---|
| | | Any other value indicates the project is inactive. |

## hist_move_published_connection

The `hist_move_published_connection` event is logged when a published connection is moved to a new project.

| Attribute Name | Type | Description |
|---|---|---|
| activated | boolean | Whether this published connection was ever made available for consumption |
| description | string | Description of the published connection |
| destinationProjectLuid | string | Unique ID of the destination project |
| destinationProjectName | string | Name of the destination project |
| name | string | Name of the published connection |
| ownerLuid | string | Unique ID of the user that owns the published connection |
| ownerName | string | Name of the user who owns the published con-nection |
| projectLuid | string | The associated project |
| projectName | string | The name of the associated project |
| publishedConnectionLuid | string | Unique ID of the published connection |
| siteName | string | Name of the Tableau site |
| sourceProjectLuid | string | Unique ID of the source project |
| sourceProjectName | string | Name of the source project |

## hist_move_table

The `hist_move_table` event is logged when a table is moved to a new project.

| Attribute Name | Type | Description |
|---|---|---|
| description | string | Description of the table |
| destinationProjectLuid | string | Unique ID of the destination project |
| destinationProjectName | string | Name of the destination project |
| name | string | Name of the table |
| ownerLuid | string | Unique ID of the table owner |
| ownerName | string | Name of the table owner |
| projectLuid | string | Unique ID of the project that contains the table |
| projectName | string | Name of the project that contains the table |
| siteName | string | Name of the Tableau site |
| sourceProjectLuid | string | Unique ID of the source project |
| sourceProjectName | string | Name of the source project |
| tableLuid | string | Unique identifier |

## hist_move_workbook

The `hist_move_workbook` event is logged when a workbook is moved to a new project.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |

| | | |
|---|---|---|
| defaultViewIndex | integer | Indicates which view will be shown by default |
| destinationProjectLuid | string | Unique ID of the destination project |
| destinationProjectName | string | Name of the destination project |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |

| | | |
|---|---|---|
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| sourceProjectLuid | string | Unique ID of the source project |
| sourceProjectName | string | Name of the source project |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the |

| | | |
|---|---|---|
| | | workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_pause_datasource_extract_refresh

The `hist_pause_datasource_extract_refresh` event is logged when a data source extract refresh is paused.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | Unique identifier |
| description | string | Description of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | Unique ID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | Unique ID of the project that contains the data source |
| projectName | string | Name of the project that contains the data source |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |

| | | |
|---|---|---|
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| taskLuid | string | LUID of the associated task |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_pause_workbook_extract_refresh

The `hist_pause_workbook_extract_refresh` event is logged when a workbook extract refresh is paused.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |

| | | |
|---|---|---|
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can |

| | | |
|---|---|---|
| | | be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| taskLuid | string | LUID of the associated task |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_publish_data_role

The `hist_publish_data_role` event is logged when a data role is published.

| Attribute Name | Type | Description |
|---|---|---|
| dataRoleLuid | string | Unique identifier |
| description | string | Description of the data role |
| name | string | Name of the data role |
| ownerLuid | string | Unique ID of the data role owner |

| | | |
|---|---|---|
| ownerName | string | Name of the data role owner |
| projectLuid | string | Unique ID of the project that contains the data role |
| projectName | string | Name of the project that contains the data role |
| siteName | string | Name of the Tableau site |

## hist_publish_datasource

The `hist_publish_datasource` event is logged when a data source is published on the site.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. |

| | | |
|---|---|---|
| | | The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_publish_flow

The `hist_publish_flow` event is logged when a flow is published on the site.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_publish_view

The `hist_publish_view` event is logged when a view is published on the site.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| caption | string | The descriptive phrase constructed for the worksheet based on the workbook definition |
| description | string | Description of the view |
| fields | string | A list of fields extracted from the workbook .twb file |
| firstPublishedAt | string | Timestamp of when the view was first published. The value won't change when republishing the workbook containing the view. |
| index | integer | Each view has an index that is unique among views belonging to that workbook |
| name | string | Name of the view |
| ownerLuid | string | User LUID of the view owner |
| ownerName | string | Name of the view owner |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number of the view. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetId | string | The ID of the worksheet |
| sheetType | string | The type of worksheet. Either a story, dashboard, or view. |
| siteName | string | Name of the Tableau site |
| title | string | The worksheet title from the workbook .twb file |
| viewLuid | string | The LUID of the view |
| workbookLuid | string | The LUID of the workbook containing the view |
| workbookName | string | Name of the workbook containing the view |

## hist_publish_workbook

The `hist_publish_workbook` event is logged when a workbook is published.

| Attribute Name | Type | Description |
| --- | --- | --- |
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, |

| | | |
|---|---|---|
| | | the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |

| | | |
|---|---|---|
| thumbUserLuid | string | Unique ID of the user for generating the thumb-nail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_redeem_refresh_token

The `hist_redeem_refresh_token` event is logged when a refresh token or personal access token (PAT) is redeemed.

| Attribute Name | Type | Description |
|---|---|---|
| refreshTokenGuid | string | The unique ID of the refresh token or PAT |
| siteName | string | Name of the Tableau site |

## hist_refresh_datasource_extract

The `hist_refresh_datasource_extract` event is logged when a data extract is refreshed.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| details | string | A message string |
| isCertified | boolean | Indicates whether the data source is certified |
| isFailure | boolean | Indicates whether the action failed or not |

| | | |
|---|---|---|
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| taskLuid | string | LUID of the associated task |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_refresh_workbook_extracts

The `hist_refresh_workbook_extracts` event is logged when extracts in a workbook are refreshed.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| details | string | A message string |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isFailure | boolean | Indicates whether the action failed or not |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the |

| | | |
|---|---|---|
| | | workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| taskLuid | string | LUID of the associated task |

| | | |
|---|---|---|
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_rekey_datasource_extracts

The legacy rekey datasource extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | Unique identifier |
| description | string | Description of the data source |
| details | string | A message string |
| isCertified | boolean | Indicates whether the data source is certified |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the data source |
| ownerLuid | string | Unique ID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | Unique ID of the project that contains the data source |
| projectName | string | Name of the project that contains the data source |
| remoteQueryAgentName | string | Name of the remote query agent used by the |

| | | |
|---|---|---|
| | | data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_rekey_flow_draft_extracts

The legacy rekey flow draft extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| createdAt | string | Timestamp when the record was created |
| details | string | A message string |
| flowDraftLuid | string | Unique ID of the flow draft |
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |

| | | |
|---|---|---|
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| updatedAt | string | Timestamp when the record was last updated |

## hist_rekey_flow_extracts

The legacy rekey flow extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | Version of the flow file, increments by 1 on each publish. |
| description | string | Description of the flow |
| details | string | A message string |
| flowLuid | string | Unique ID of the flow |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_rekey_materialized_views

The hist_rekey_materialized_views event logs the successful rekeying of materialized views on a workbook.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| details | string | Details of the action (why were the materialized views created or deleted). |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| eventType | string | The type of the event. Either Create, Delete, Encrypt, Decrypt, or Rekey Materialized Views. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. |

| | | |
|---|---|---|
| | | The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a for-eign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the work-book. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't pub-lished. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a view and is used when ref-erencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number. Starts with 1.0 and incre-ments by 0.1 each time a new version is pub- |

| | | |
|---|---|---|
| | | lished. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_rekey_site_extracts_request

The legacy change rekey site extracts request event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| name | string | Name of the Tableau site |
| siteEventLuid | string | Unique ID of the site affected by the event |
| siteName | string | Name of the Tableau site |
| urlNamespace | string | Used in the construction of URLs that target the site |

## hist_rekey_workbook_extracts

The legacy rekey workbook extracts event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |

| | | |
|---|---|---|
| defaultViewIndex | integer | Indicates which view will be shown by default |
| details | string | A message string |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isFailure | boolean | Indicates whether the action failed or not |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |

| | | |
|---|---|---|
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_rename_collection

The `hist_rename_collection` event is logged when a collection is renamed.

| Attribute Name | Type | Description |
|---|---|---|
| collectionLuid | string | Unique identifier |
| description | string | Description of the collection |
| formerName | string | The former name of the collection |
| name | string | Name of the collection |
| ownerLuid | string | Unique ID of the user who owns the collection |
| ownerName | string | Name of the user who owns the collection |
| siteName | string | Name of the Tableau site |

## hist_rename_data_role

The `hist_rename_data_role` event is logged when a data role is renamed.

| Attribute Name | Type | Description |
|---|---|---|
| dataRoleLuid | string | Unique identifier |
| description | string | Description of the data role |
| formerName | string | The former name of the data role |
| name | string | Name of the data role |
| ownerLuid | string | Unique ID of the data role owner |
| ownerName | string | Name of the data role owner |
| projectLuid | string | Unique ID of the project that contains the data role |
| projectName | string | Name of the project that contains the data role |

| | | |
|---|---|---|
| siteName | string | Name of the Tableau site |

## hist_rename_datasource

The `hist_rename_datasource` event is logged when a data source is renamed.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| formerName | string | The former name of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new |

| | | |
|---|---|---|
| | | version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_rename_flow

The `hist_rename_flow` event is logged when a flow is renamed.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| formerName | string | The former name of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_rename_flow_draft

The `hist_rename_flow_draft` event is logged when a flow draft is renamed.

| Attribute Name | Type | Description |
|---|---|---|
| createdAt | string | Timestamp when the record was created |
| flowDraftLuid | string | Unique ID of the flow draft |

| | | |
|---|---|---|
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |
| formerName | string | The former name of the flow draft |
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| updatedAt | string | Timestamp when the record was last updated |

## hist_rename_group

The `hist_rename_group` event is logged when a group is renamed.

| Attribute Name | Type | Description |
|---|---|---|
| formerName | string | The former name of the group |
| groupLuid | string | Unique ID of the group |
| name | string | Name of the group |
| siteName | string | Name of the Tableau site |

## hist_rename_metric

The `hist_rename_metric` event is logged when a metric is renamed.

> **Note:** Tableau's legacy metrics feature was retired in February 2024. As a result, this event no longer records user interaction with metrics on the site. For more information, see Set Up for Metrics.

| Attribute Name | Type | Description |
|---|---|---|
| customizedViewLuid | string | The view from which the metric queries its data |
| description | string | Description of the metric |
| formerName | string | The former name of the metric |
| metricLuid | string | Unique ID of the metric |
| name | string | Name of the metric |
| projectLuid | string | Unique ID of the associated project |
| projectName | string | Name of the associated project |
| siteName | string | Name of the Tableau site |
| suspendState | integer | State of the metric. The value 0 = Not suspended, 1 = Auto-suspended, and 3 = Manually suspended. |
| viewLuid | string | The view from which the metric queries its data |

## hist_rename_published_connection

The `hist_rename_published_connection` event is logged when a published connection is renamed.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| activated | boolean | Whether this published connection was ever made available for consumption |
| description | string | Description of the published connection |
| formerName | string | The former name of the published connection |
| name | string | Name of the published connection |
| ownerLuid | string | Unique ID of the user that owns the published connection |
| ownerName | string | Name of the user who owns the published connection |
| projectLuid | string | The associated project |
| projectName | string | The name of the associated project |
| publishedConnectionLuid | string | Unique ID of the published connection |
| siteName | string | Name of the Tableau site |

## hist_rename_workbook

The `hist_rename_workbook` event is logged when a workbook is renamed.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |

| | | |
|---|---|---|
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| formerName | string | The former name of the workbook |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the work- |

| | | |
|---|---|---|
| | | book. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_replace_datasource_extract

The `hist_replace_datasource_extract` event is logged when a data extract is replaced.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| details | string | A message string |
| isCertified | boolean | Indicates whether the data source is certified |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |

| | | |
|---|---|---|
| taskLuid | string | LUID of the associated task |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_revoke_refresh_token

The `hist_revoke_refresh_token` event is logged when a refresh token or personal access token (PAT) is revoked.

| Attribute Name | Type | Description |
|---|---|---|
| refreshTokenGuid | string | The unique ID of the refresh token or PAT |
| siteName | string | Name of the Tableau site |

## hist_run_flow

The `hist_run_flow` event is logged when a flow is run manually.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_run_flow_scheduled

The `hist_run_flow_scheduled` event is logged when a flow is run from a schedule.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |
| taskLuid | string | LUID of the associated task |

## hist_save_flow

The `hist_save_flow` event is logged when a flow is saved.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_save_flow_draft

The `hist_save_flow_draft` event is logged when a flow draft is saved.

| Attribute Name | Type | Description |
| --- | --- | --- |
| createdAt | string | Timestamp when the record was created |
| flowDraftLuid | string | Unique ID of the flow draft |
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| updatedAt | string | Timestamp when the record was last updated |

## hist_send_data_driven_alert_email

The `hist_send_data_driven_alert_email` event is logged when a data-driven alert email or notification is sent successfully.

| Attribute Name | Type | Description |
| --- | --- | --- |
| caption | string | The descriptive phrase constructed for the worksheet based on the workbook definition |
| description | string | Description of the view |

| | | |
|---|---|---|
| fields | string | A list of fields extracted from the workbook .twb file |
| firstPublishedAt | string | Timestamp of when the view was first published. The value won't change when republishing the workbook containing the view. |
| index | integer | Each view has an index that is unique among views belonging to that workbook |
| name | string | Name of the view |
| ownerLuid | string | User LUID of the view owner |
| ownerName | string | Name of the view owner |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number of the view. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetId | string | The ID of the worksheet |
| sheetType | string | The type of worksheet. Either a story, dashboard, or view. |
| siteName | string | Name of the Tableau site |
| title | string | The worksheet title from the workbook .twb file |
| viewLuid | string | The LUID of the view |
| workbookLuid | string | The LUID of the workbook containing the view |
| workbookName | string | Name of the workbook containing the view |

## hist_send_failing_data_alert_email

The `hist_send_failing_data_alert_email` event is logged when a data-driven alert email or notification fails.

| Attribute Name | Type | Description |
|---|---|---|
| caption | string | The descriptive phrase constructed for the worksheet based on the workbook definition |
| description | string | Description of the view |
| fields | string | A list of fields extracted from the workbook .twb file |
| firstPublishedAt | string | Timestamp of when the view was first published. The value won't change when republishing the workbook containing the view. |
| index | integer | Each view has an index that is unique among views belonging to that workbook |
| name | string | Name of the view |
| ownerLuid | string | User LUID of the view owner |
| ownerName | string | Name of the view owner |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number of the view. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetId | string | The ID of the worksheet |
| sheetType | string | The type of worksheet. Either a story, dashboard, or view. |
| siteName | string | Name of the Tableau site |
| title | string | The worksheet title from the workbook .twb file |
| viewLuid | string | The LUID of the view |
| workbookLuid | string | The LUID of the workbook containing the view |
| workbookName | string | Name of the workbook containing the view |

## hist_send_refresh_pre_pause_email_for_content

The `hist_send_refresh_pre_pause_email_for_content` event logs when a refresh pre-pause email is sent.

| Attribute Name | Type | Description |
|---|---|---|
| contentLuid | string | LUID of the content item for which the refresh pre-pause email was sent |
| contentName | string | Name of the content item for which the refresh pre-pause email was sent |
| email | string | Email address of the user |
| name | string | Name of the user |
| ownerLuid | string | LUID of the content owner |
| ownerName | string | Name of the content owner |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_send_subscription_email_for_view

The `hist_send_subscription_email_for_view event` event is logged when a view subscription email is sent successfully.

| Attribute Name | Type | Description |
|---|---|---|
| caption | string | The descriptive phrase constructed for the worksheet based on the workbook definition |
| description | string | Description of the view |

| | | |
|---|---|---|
| fields | string | A list of fields extracted from the workbook .twb file |
| firstPublishedAt | string | Timestamp of when the view was first published. The value won't change when republishing the workbook containing the view. |
| index | integer | Each view has an index that is unique among views belonging to that workbook |
| name | string | Name of the view |
| ownerLuid | string | User LUID of the view owner |
| ownerName | string | Name of the view owner |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number of the view. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| scheduleLuid | string | The UUID of the schedule. Used in REST API. |
| scheduleName | string | Name of the schedule |
| sheetId | string | The ID of the worksheet |
| sheetType | string | The type of worksheet. Either a story, dashboard, or view. |
| siteName | string | Name of the Tableau site |
| title | string | The worksheet title from the workbook .twb file |
| viewLuid | string | The LUID of the view |
| workbookLuid | string | The LUID of the workbook containing the view |
| workbookName | string | Name of the workbook containing the view |

## hist_send_subscription_email_for_workbook

The `hist_send_subscription_email_for_workbook` event is logged when a workbook subscription email is sent successfully.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For work- |

| | | |
|---|---|---|
| | | books last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| scheduleLuid | string | The UUID of the schedule. Used in REST API. |

| | | |
|---|---|---|
| scheduleName | string | A schedule can be given a name, which is stored here. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_send_suspended_data_alert_email

The `hist_send_suspended_data_alert_email` event is logged when a data-driven alert is suspended.

| Attribute Name | Type | Description |
|---|---|---|
| caption | string | The descriptive phrase constructed for the worksheet based on the workbook definition |
| description | string | Description of the view |
| fields | string | A list of fields extracted from the workbook .twb file |
| firstPublishedAt | string | Timestamp of when the view was first published. The value won't change when republishing the workbook containing the view. |
| index | integer | Each view has an index that is unique among views belonging to that workbook |
| name | string | Name of the view |
| ownerLuid | string | User LUID of the view owner |

| | | |
|---|---|---|
| ownerName | string | Name of the view owner |
| repositoryUrl | string | Uniquely identifies a view and is used when referencing the view in a URL. The value is derived from the ASCII characters in the view name. |
| revision | string | The revision number of the view. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| sheetId | string | The ID of the worksheet |
| sheetType | string | The type of worksheet. Either a story, dashboard, or view. |
| siteName | string | Name of the Tableau site |
| title | string | The worksheet title from the workbook .twb file |
| viewLuid | string | The LUID of the view |
| workbookLuid | string | The LUID of the workbook containing the view |
| workbookName | string | Name of the workbook containing the view |

## hist_suspend_site

The `hist_suspend_site` event is logged when a site is suspended.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| name | string | Name of the Tableau site |
| siteEventLuid | string | Unique ID of the site affected by the event |
| siteName | string | Name of the Tableau site |
| urlNamespace | string | Used in the construction of URLs that target the site |

## hist_update_collection

The `hist_update_collection` event is logged when a collection is updated.

| Attribute Name | Type | Description |
|---|---|---|
| collectionLuid | string | Unique identifier |
| description | string | Description of the collection |
| name | string | Name of the collection |
| ownerLuid | string | Unique ID of the user who owns the collection |
| ownerName | string | Name of the user who owns the collection |
| siteName | string | Name of the Tableau site |

## hist_update_column

The `hist_update_column` event is logged when a column is updated.

| Attribute Name | Type | Description |
|---|---|---|
| columnLuid | string | Unique identifier |
| description | string | Description of the column |
| name | string | Name of the column |
| ownerLuid | string | Unique ID of the user who owns the column |
| ownerName | string | Name of the user who owns the column |
| projectLuid | string | Unique ID of the project that contains the column |
| projectName | string | Name of the project that contains the column |
| siteName | string | Name of the Tableau site |

## hist_update_data_quality_indicator

The `hist_update_data_quality_indicator` event is logged when a data quality indicator is updated.

| Attribute Name | Type | Description |
|---|---|---|
| dataQualityIndicatorLuid | string | Unique identifier |
| dataQualityType | string | The type of data quality indicator |
| isActive | boolean | Indicates whether the data quality indicator is active or not |
| isSevere | boolean | Indicates whether the data quality indicator is severe or not |
| message | string | Data quality filter message |
| siteName | string | Name of the Tableau site |
| userDisplayName | string | Name of user who created or modified the data quality indicator |
| userLuid | string | Unique ID of the user who created or modified the data quality indicator |

## hist_update_data_role

The `hist_update_data_role` event is logged when a data role is updated.

| Attribute Name | Type | Description |
|---|---|---|
| dataRoleLuid | string | Unique identifier |
| description | string | Description of the data role |
| name | string | Name of the data role |
| ownerLuid | string | Unique ID of the data role owner |
| ownerName | string | Name of the data role owner |
| projectLuid | string | Unique ID of the project that contains the data role |

| | | |
|---|---|---|
| projectName | string | Name of the project that contains the data role |
| siteName | string | Name of the Tableau site |

## hist_update_database

The `hist_update_database` event is logged when a database is updated.

| Attribute Name | Type | Description |
|---|---|---|
| databaseLuid | string | Unique identifier |
| description | string | Description of the database |
| name | string | Name of the database |
| ownerLuid | string | Unique ID of the database owner |
| ownerName | string | Name of the database owner |
| projectLuid | string | Unique ID of the project that contains the database |
| projectName | string | Name of the project that contains the database |
| siteName | string | Name of the Tableau site |

## hist_update_datasource

The `hist_update_datasource` event is logged when a data source is updated.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |

| | | |
|---|---|---|
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_update_datasource_task

The `hist_update_datasource_task` event is logged when data source related tasks are updated.

| Attribute Name | Type | Description |
|---|---|---|

| | | |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |

| | | |
|---|---|---|
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Provides additional information about the task |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_update_datasource_trigger

The `hist_update_datasource_trigger` event specifies what caused the data source to be updated.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | LUID of the data source |
| description | string | Description of the data source |
| isCertified | boolean | Indicates whether the data source is certified |
| name | string | Name of the data source |
| ownerLuid | string | User LUID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | LUID of the project containing the data source |
| projectName | string | Name of the project where the data source was published |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used |

| | | |
|---|---|---|
| | | when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_update_flow

The `hist_update_flow` event is logged when a flow is updated.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_update_flow_draft

The `hist_update_flow_draft` event is logged when a flow draft is updated.

| Attribute Name | Type | Description |
| --- | --- | --- |
| createdAt | string | Timestamp when the record was created |
| flowDraftLuid | string | Unique ID of the flow draft |
| flowLuid | string | Unique ID of the flow. The value is Null if the flow draft isn't connected to a published flow. |
| name | string | Name of the flow draft |
| ownerLuid | string | Unique ID of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| ownerName | string | Name of the flow draft owner. The owner of the flow draft may be different than the flow owner. |
| projectLuid | string | Unique ID of the project that contains the flow draft |
| projectName | string | Name of the project that contains the flow draft |
| publishedAt | string | Timestamp when the flow draft was last published |
| siteName | string | Name of the Tableau site |
| size | long | Size of the flow draft in bytes |
| updatedAt | string | Timestamp when the record was last updated |

## hist_update_flow_task

The `hist_update_flow_task` event is logged when a flow update task is run.

| Attribute Name | Type | Description |
| --- | --- | --- |
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |

| | | |
|---|---|---|
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Provides additional information about the task |

| | | |
|---|---|---|
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_update_flow_trigger

The `hist_update_flow_trigger` event specifies what caused the flow to update.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | string | The version of the flow file. Increments by 1 on each publish. |
| description | string | Description of the flow |
| flowLuid | string | Unique ID of the flow |
| name | string | Name of the flow |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the flow in bytes |

## hist_update_linked_task

The `hist_update_linked_task` event is logged when a linked update task is run.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in |

| | | |
|---|---|---|
| | | seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Provides additional information about the task |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_update_metric

The `hist_update_metric` event is logged when a metric is updated.

**Note:** Tableau's legacy metrics feature was retired in February 2024. As a result, this event no longer records user interaction with metrics on the site. For more information, see Set Up for Metrics.

| Attribute Name | Type | Description |
|---|---|---|
| customizedViewLuid | string | The view from which the metric queries its data |
| description | string | Description of the metric |
| metricLuid | string | Unique ID of the metric |
| name | string | Name of the metric |
| projectLuid | string | Unique ID of the associated project |
| projectName | string | Name of the associated project |
| siteName | string | Name of the Tableau site |
| suspendState | integer | State of the metric. The value 0 = Not suspended, 1 = Auto-suspended, and 3 = Manually suspended. |
| viewLuid | string | The view from which the metric queries its data |

## hist_update_project

The `hist_update_project` event is logged when a project is updated.

| Attribute Name | Type | Description |
|---|---|---|
| description | string | Description of the project |

| | | |
|---|---|---|
| name | string | Name of the project |
| ownerLuid | string | Unique ID of the project owner |
| ownerName | string | Name of the project owner |
| parentProjectLuid | string | LUID of the parent project. The value is Null for top-level projects. |
| projectLuid | string | Unique identifier for the project |
| siteName | string | Name of the Tableau site |
| state | string | State of the project. The default value is active. Any other value indicates the project is inactive. |

## hist_update_schedule

The `hist_update_schedule` event is logged when a scheduled is updated.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the schedule is active or not. If set to False, no tasks will run when the schedule is triggered. |
| dayOfMonthMask | integer | Indicates which day of the month the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the month correspond to 1st = 1, 2nd = 10, 3rd = 100, 4th = 1000, 5th = 10000, etc. |
| dayOfWeekMask | integer | Indicates which day of the week the schedule will run. The information is encoded in the given integer. To interpret it, convert the integer to binary. The days of the week correspond to Sunday = 1, Monday = 10, Tuesday = 100, Wednesday = 1000, Thursday = 10000, Friday = 100000, and Saturday = 1000000. |

| | | |
|---|---|---|
| endAtMinute | integer | The minute after the specified schedule_type period begins, indicating when the schedule should stop triggering. |
| endScheduleAt | string | Timestamp when the schedule should stop triggering |
| isSerial | boolean | Indicates whether the schedule is run serially or not |
| minuteInterval | integer | Once triggered, the schedule will repeat at this interval until it ends as per the schedule_type, end_at_minute, or end_schedule_at. |
| name | string | Name of the schedule |
| priority | integer | Priority ranges from 1 to 100, with lower values corresponding to a higher priority. |
| scheduleLuid | string | Unique ID of the schedule |
| scheduleType | integer | The type of schedule. The value 0 = Hourly, 1 = Daily, 2 = Weekly, and 3 = Monthly. |
| scheduledAction | integer | Category of the scheduled action. The value 0 = Extracts and 1 = Subscriptions. |
| siteName | string | Name of the Tableau site |
| startAtMinute | integer | The minute after the scheduled start time per the schedule_type. For example, in a daily schedule, it's minutes past midnight; for hourly, it's minutes past the hour. |

## hist_update_site

The `hist_update_site` event is logged when a site is updated.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|

| | | |
|---|---|---|
| name | string | Name of the Tableau site |
| siteEventLuid | string | Unique ID of the site affected by the event |
| siteName | string | Name of the Tableau site |
| urlNamespace | string | Used in the construction of URLs that target the site |

## hist_update_system_user_email

The `hist_update_system_user_email` event is logged when a system user's email is changed.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| formerEmail | string | The former Email address of the user. |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_update_system_user_force_password_update

The `hist_update_system_user_force_password_update` event logs a successful invocation that forces a password update.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| name | string | Name of the user |

| | | |
|---|---|---|
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_update_system_user_image

The `hist_update_system_user_image` event is logged when a system user updates their profile image.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_update_system_user_name

The `hist_update_system_user_name` event is logged when a system user updates their name.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| formerName | string | The former friendly name of the user. |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site |

| | | |
|---|---|---|
| | | Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_update_system_user_password

The `hist_update_system_user_password` event is logged when a system user updates their password.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_update_system_user_reset_login_rate_limiting

The `hist_update_system_user_reset_login_rate_limiting` event logs a successful invocation that resets the login rate limiting values

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |

| | | |
|---|---|---|
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_update_table

The `hist_update_table` event is logged when a table is updated.

| Attribute Name | Type | Description |
|---|---|---|
| description | string | Description of the table |
| name | string | Name of the table |
| ownerLuid | string | Unique ID of the table owner |
| ownerName | string | Name of the table owner |
| projectLuid | string | Unique ID of the project that contains the table |
| projectName | string | Name of the project that contains the table |
| siteName | string | Name of the Tableau site |
| tableLuid | string | Unique identifier |

## hist_update_task_state

The `hist_update_task_state` event is logged when the state of a task is changed.

| Attribute Name | Type | Description |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |

| | | |
|---|---|---|
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Provides additional information about the task |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_update_user_site_role

The `hist_update_user_site_role` event is logged when a user's site role is changed.

| Attribute Name | Type | Description |
|---|---|---|
| email | string | Email address of the user |
| name | string | Name of the user |
| siteAdminLevel | integer | Indicates if the user is a site admin. The value 5 = Site Admin and 0 = Not a site admin. |
| siteName | string | Name of the Tableau site |
| userLuid | string | Unique ID of the user |

## hist_update_workbook

The `hist_update_workbook` event is logged when a workbook is updated.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |

| | | |
|---|---|---|
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |

| | | |
|---|---|---|
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_update_workbook_task

The `hist_update_workbook_task` event is logged when a workbook update task is run.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| active | boolean | Indicates whether the task is active or not. If set to False, the task won't run when the schedule is triggered. |
| consecutiveFailureCount | integer | Number of times the task has failed |
| creatorLuid | string | User ID of the user who created the task |

| | | |
|---|---|---|
| creatorName | string | Name of the user who created the task |
| historicalQueueTime | integer | Amount of time the task was queued in seconds. Used to compare the difference in historical queue times. |
| historicalRunTime | integer | Amount of time running after the task was started in seconds. Used to compare the difference in historical run times. |
| lastSuccessCompletedAt | string | Timestamp of the last successful task completion |
| objLuid | string | Unique ID of the object. Used as the primary key in workbook or data source tables. |
| objName | string | Name of the object. Used with objLuid. |
| objType | string | The type of object. Either a workbook or data source. Used with objLuid. |
| priority | integer | Priority of the task, ranging from 10 (default) to 0 (highest). Jobs with higher priority will be processed earlier. |
| scheduleLuid | string | Unique ID of the associated schedule. Tasks will run at the scheduled start time. |
| siteName | string | Name of the Tableau site |
| state | integer | State of the task. The value 0 = Active, 1 = Suspended, and 2 = Disabled. |
| subtitle | string | Provides additional information about the task |
| taskLuid | string | The UUID of the task. Used in the REST API. |
| title | string | Provides additional information about the task |
| type | string | The type of task. Either an extract, subscription, flow, encryption, or system. |

## hist_upgrade_datasource_extract_storage

The legacy upgrade data source extract storage event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | Unique identifier |
| description | string | Description of the data source |
| details | string | A message string |
| isCertified | boolean | Indicates whether the data source is certified |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the data source |
| ownerLuid | string | Unique ID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | Unique ID of the project that contains the data source |
| projectName | string | Name of the project that contains the data source |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new |

| | | |
|---|---|---|
| | | version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| taskLuid | string | LUID of the associated task |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_upgrade_datasource_tde_extract

The legacy upgrade data source tde extract event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| certificationNote | string | Reason for the certification status of the data source |
| datasourceLuid | string | Unique identifier |
| description | string | Description of the data source |
| details | string | A message string |
| isCertified | boolean | Indicates whether the data source is certified |
| isFailure | boolean | Indicates whether the action failed or not |
| name | string | Name of the data source |
| ownerLuid | string | Unique ID of the data source owner |
| ownerName | string | Name of the data source owner |
| projectLuid | string | Unique ID of the project that contains the data source |
| projectName | string | Name of the project that contains the data |

| | | |
|---|---|---|
| | | source |
| remoteQueryAgentName | string | Name of the remote query agent used by the data source |
| repositoryUrl | string | Uniquely identifies a data source and is used when referencing the data source in a URL. The value is derived from the ASCII characters in the data source name. |
| revision | string | The revision number of the data source. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the data source in bytes |
| taskLuid | string | LUID of the associated task |
| usingRemoteQueryAgent | boolean | Indicates whether the data source uses remote query agent |

## hist_upgrade_workbook_extract_storage

The legacy upgrade workbook extract storage event from historical_events.

| Attribute Name | Type | Description |
|---|---|---|
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| details | string | A message string |

| | | |
|---|---|---|
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isFailure | boolean | Indicates whether the action failed or not |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |

| | | |
|---|---|---|
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| taskLuid | string | LUID of the associated task |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## hist_upgrade_workbook_tde_extract

The legacy upgrade workbook tde extract event from historical_events.

| Attribute Name | Type | Description |
| --- | --- | --- |
| contentVersion | integer | Version number of the workbook. Increments by 1 on each publish. |
| dataEngineExtracts | boolean | Indicates if the workbook has associated data engine extracts |
| defaultViewIndex | integer | Indicates which view will be shown by default |
| details | string | A message string |
| displayTabs | boolean | Indicates whether sheets of the workbook are displayed as tabs or not |
| documentVersion | string | Version number of the document description. The description is entered when saving the workbook. |
| extractsIncrementedAt | string | Timestamp when the last incremental extract refresh occurred |
| extractsRefreshedAt | string | Timestamp when the last extract refresh occurred |
| firstPublishedAt | string | Timestamp when the workbook was first published. The value won't change when republishing the workbook containing the view. |
| incrementableExtracts | boolean | Indicates whether it's possible to perform an incremental extract refresh |
| isFailure | boolean | Indicates whether the action failed or not |
| isPrivate | boolean | Indicates whether the workbook is private or not. The value True = Private and Null or False = Not private. |

| | | |
|---|---|---|
| lastPublishedAt | string | Timestamp when the workbook was last published or saved while web authoring. For workbooks last published before this column existed, the value will be Null. |
| modifiedByUserLuid | string | The user who last modified and published the workbook or saved the workbook while web authoring. For workbooks that were last published before this column existed, the value will be the same as owner_id. |
| name | string | Name of the workbook |
| ownerLuid | string | Unique ID of the workbook owner. Used as a foreign key. |
| ownerName | string | Name of the user who owns the workbook |
| projectLuid | string | Unique ID of the project that contains the workbook. Used as a foreign key. |
| projectName | string | Name of the project that contains the workbook |
| publishedAllSheets | boolean | Indicates whether all sheets in the workbook were published. The value True = All sheets published and False = One or more sheets weren't published. |
| refreshableExtracts | boolean | Indicates whether extracts in the workbook can be refreshed |
| repositoryUrl | string | Uniquely identifies a workbook and is used when referencing the workbook in a URL. The value is derived from the ASCII characters in the workbook name. |
| revision | string | The revision number. Starts with 1.0 and increments by 0.1 each time a new version is published. |

| | | |
|---|---|---|
| siteName | string | Name of the Tableau site |
| size | integer | Size of the workbook in bytes |
| taskLuid | string | LUID of the associated task |
| thumbUserLuid | string | Unique ID of the user for generating the thumbnail image. Null unless specified. |
| viewCount | integer | Counts the number of views associated with the workbook |
| workbookLuid | string | Unique ID of the workbook |

## login_authentication

The `login_authentication` event logs authentication events (including default, SAML, OIDC, and Tab ID + MFA).

| Attribute Name | Type | Description |
|---|---|---|
| acceptLanguage | string | The browser `Accept-Language` request HTTP header |
| logRecordType | string | The record type associated with the event, either verification or authentication. |
| loginKey | string | Unique login tracking value. Used to associate user activity with the authentication event. |
| loginType | string | The authentication type used to log in, either DEFAULT, SAML, OIDC, or TABID_WITH_MFA. |
| loginUrl | string | URL to which the user sent the login request, including the protocol, hostname, and, if applicable, the site path prefix. |
| reason | string | The failure reason if login is unsuccessful |
| sourceIp | string | Source IP of the login request. Uses XFF or webRTC to |

| | | |
|---|---|---|
| | | identify the originating IP address of the client. |
| status | string | The authentication result, either success or failure. |
| tenantId | string | The ID of the tenant or organization |
| timestamp | string | Timestamp of the event |
| userAgent | string | Name of the agent or browser that initiated login |
| userId | string | The ID of the user |
| userType | string | The type of user accessing Tableau, either through the user interface or API. |
| username | string | Username used for login |
| uuid | string | Unique ID for the request |

## metric_subscription_change

The `metric_subscription_change` event is logged when a user adds or removes a subscription to a Pulse metric.

| **Attribute Name** | **Type** | **Description** |
|---|---|---|
| actorGroupLuid | string | Group LUID of the group that followed or unfollowed the metric. If a user changes the scoped metric, the `actorGroupLuid` value will be empty, and `actorUserLuid` will be populated instead. |
| scopedMetricId | string | The ID of the scoped metric that had a subscription change |
| subscriptionOperation | string | Subscription operation, such as 'metric followed' or 'metric unfollowed' |

## move_content

The `move_content` event is logged when content is moved, for example, moving a workbook between projects.

| Attribute Name | Type | Description |
|---|---|---|
| contentId | integer | The ID of the content that had the owner changed |
| contentLuid | string | LUID of the content that had the owner changed |
| contentName | string | Name of the content that had the owner changed |
| contentType | string | The type of content, such as data source, workbook, or view |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |
| newContainerLuid | string | LUID of the new container |
| newContainerType | string | The new container type, such as a project |
| oldContainerLuid | string | LUID of the previous container |
| oldContainerType | string | The previous container type, such as a project |

## oauth_settings_change

The `oauth_settings_change` event occurs when the OAuth Clients Registry setting is updated on the General tab.

| Attribute Name | Type | Description |
|---|---|---|
| clientId | string | Client ID registered with the data provider |
| connectionType | string | The type of connection |
| errorCode | string | Error code generated when altering OAuth settings |

| | | |
|---|---|---|
| openAuthInstanceUrl | string | OAuth instance URL |
| openAuthProvider | string | OAuth provider |
| operationType | string | The type of operation, either create or delete. |
| platform | string | The platform where changes are recorded, such as Tableau Cloud. |
| platformVersion | string | The version of the platform, such as 2024.3.0. |
| uploadedFile | string | Name of the file uploaded to change OAuth settings |

## platform_settings_change

The `platform_settings_change` event occurs when security and access configurations are changed on the Settings page.

| Attribute Name | Type | Description |
|---|---|---|
| errorCode | string | Error code generated when altering the configuration setting |
| ipAddress | string | The IP address of the machine that initiated the request |
| isSecretUpdated | bool | Indicates whether the secret has been updated. The actual secret value isn't recorded. This attribute helps admins track changes in their organization, such as those affecting system functionality or ensuring scheduled secret rotations are carried out properly. |
| newSettingsValue | string | New settings value |
| oldSettingsValue | string | Previous settings value |
| platform | string | The platform where changes are recorded, such as Tableau Cloud. |
| platformVersion | string | The version of the platform, such as 2024.3.0. |

| | | |
|---|---|---|
| settingDescription | string | Description of the setting that is being affected |
| settingIdentifier | string | The setting identifier for this feature, such as `prep_end-point_control`. |
| siteName | string | Name of site where the operation occurred |
| tenantName | string | Name of the tenant where the operation occurred |
| userAgent | string | The client software used by the `actorUser` to make the change |

## project_lock_unlock

The `project_lock_unlock` event is logged when project permissions are locked or unlocked.

| Attribute Name | Type | Description |
|---|---|---|
| controllingProjectLuid | string | LUID of the project that controls permissions for the nested project |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |
| projectLuid | string | LUID of the project |
| projectOperation | string | Project operation, either lock or unlock |

## set_permissions

The `set_permissions` event is logged when an explicit permissions rule is created or updated for a content item.

| Attribute Name | Type | Description |
|---|---|---|
| authorizableType | string | The type of content that had its permissions changed, such as project or workbook |

| | | |
|---|---|---|
| capabilityId | integer | The ID of the capability. A capability is the ability to perform a certain action on a particular piece of content, such as view, filter, download or delete. |
| capabilityValue | string | Description of the capability |
| contentId | integer | The ID of the content that had the permissions set |
| contentLuid | string | The LUID of the content item |
| contentName | string | The name of the content that had the permissions set |
| granteeId | integer | The ID of the grantee |
| granteeLuid | string | The LUID of the grantee |
| granteeType | string | The type of grantee, either user or group |
| granteeValue | string | The set permissions value, such as 'user allow' or 'group allow' |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |
| permissionType | string | The permission type, either explicit or unspecified |

## site_storage_usage

The `site_storage_usage` event logs the total storage capacity of the site in bytes, the amount of storage used, and the percentage of the total consumed. Administrators can use this data to proactively monitor storage consumption and take action before reaching the site's storage limit.

| Attribute Name | Type | Description |
|---|---|---|
| actorUsername | string | Username of the user who performed the action that initiated the event |
| initiatingUsername | string | Username of the initiating user |

| | | |
|---|---|---|
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |
| totalPercentageStorageQuotaUsed | float | Total percentage of storage usage |
| totalStorageQuotaLimit | long | Total storage capacity in bytes |
| totalStorageQuotaUsed | long | Total storage used in bytes |

## update_permissions

The `update_permissions` event is logged when an explicit permission rule is updated for a content item.

**Note:** Deprecated in October 2024. Use the set_permissions event instead.

| Attribute Name | Type | Description |
|---|---|---|
| authorizableType | string | The type of content that had its permissions changed, such as a project or workbook |
| capabilityId | integer | The ID of the capability. A capability is the ability to perform actions on content, such as view, filter, download, or delete |
| capabilityValue | string | Description of the capability |
| contentId | integer | The ID of the content that had the permissions updated |
| contentLuid | string | The LUID of the content |
| contentName | string | The name of the content that had the permissions updated |
| granteeId | integer | The ID of the grantee |

| | | |
|---|---|---|
| granteeLuid | string | The LUID of the grantee |
| granteeType | string | The type of grantee, either user or group |
| granteeValue | string | The updated permissions value, such as 'user allow' or 'group allow' |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |
| permissionType | string | The permission type, either explicit or unspecified |

## update_permissions_template

The `update_permissions_template` event is logged when a permission template for a project is updated.

| Attribute Name | Type | Description |
|---|---|---|
| authorizableType | string | The type of content that had its permissions changed, such as a project or workbook |
| capabilityId | integer | The ID of the capability. A capability is the ability to perform actions on content, such as view, filter, download, or delete |
| capabilityValue | string | Description of the capability |
| contentId | integer | The ID of the content that had the permissions updated |
| contentLuid | string | The LUID of the content |
| contentName | string | The name of the content that had the permissions updated |
| granteeId | integer | The ID of the grantee |
| granteeLuid | string | The LUID of the grantee |
| granteeType | string | The type of grantee, either user or group |

| | | |
|---|---|---|
| granteeValue | string | The updated permissions value, such as 'user allow' or 'group allow' |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |
| permissionType | string | The permission type, either explicit or unspecified |
| templateType | string | The type of permission template used to change permissions, such as workbook or data source |

## user_create_delete

The `user_create_delete` event is logged when a user is created or deleted.

| Attribute Name | Type | Description |
|---|---|---|
| forUserName | string | The name of the user whose account was either created, updated or deleted |
| isError | boolean | Indicates if the audit scenario was completed successfully or failed with an error |
| siteRole | string | Site role of the user. Determines the maximum level of access a user can have on the site |
| targetUserId | integer | The ID of the user whose account was either created, updated, or deleted |
| targetUserLuid | string | The LUID of the user whose account was either created, updated, or deleted |
| userOperation | string | The action performed on a user, either create, delete, or site role change |

# Customer-Managed Encryption Keys

Customer-Managed Encryption Keys gives you an extra level of security by allowing you to encrypt your site data extracts with a customer managed site-specific key. The Salesforce Key Management System (KMS) instance stores the default site-specific encryption key for anyone who enables encryption on a site.

## Encryption process

The encryption process follows a key hierarchy. First, Tableau Cloud encrypts an extract. Next, Tableau Cloud KMS checks its key caches for a suitable data key. If a key isn't found, one is generated by the KMS GenerateDataKey API, using the permission granted by the key policy that's associated with the key. KMS uses the CMK to generate a data key and returns a plaintext copy and encrypted copy to Tableau Cloud. Tableau Cloud uses the plaintext copy of the data key to encrypt the data and stores the encrypted copy of the key along with the encrypted data.

## Enable encryption

After you enable encryption, Tableau Cloud will create a job for every extract on your site to get encrypted. These jobs are the lowest priority. Any previously set extract job runs before the encrypted extracts job. When there are extra resources, these jobs run encryption on all extracts without needing to be refreshed.

To enable encryption complete the following steps.

1. Select the **General** tab.
2. Under **Extract Encryption**, select the check box next to **Enable encryption of extract refreshes**.
3. Read the confirmation message and select **OK** to continue.
4. Select **Save**. A confirmation message or an error message appears.

**Note:** To turn off extract encryption, contact your account manager.

## Generate and rotate a key

You can rotate a key on your company's schedule for extra security. Rotating a key creates a key based on the original key.

**Note:** If there's a long refresh rate or if the extract isn't refreshed, the extract is encrypted with the last active key instead of the new key.

To rotate a key complete the following steps.

1. Select the **General** tab.
2. Under **Extract Encryption**, in **Actions**, select **Generate and Rotate Key**.
3. Select **Generate and Rotate Key** or Cancel. A confirmation message appears.

## Disable encryption

You can turn off encryption by contacting your account manager. If your Advanced Management license is inactive, your extracts remain decrypted until it's reactivated.

## Delete a key (non-recoverable data extracts)

**Warning:** If you delete a key, there isn't a way to regain access to the data extracts.

Delete the key only if there's a dire security incident. You can't access your data extracts after you've deleted the key. Any data extracts tied to the deleted key are permanently unavailable.

**Note:** If you want to disable the encryption and keep your key see Disable Encryption.

To delete a key complete the following steps.

1. Select the **General** tab.
2. Under **Extract Encryption**, in **Actions**, select **Delete**.
3. In the text field, enter **Delete Key**.

**Warning:** You can’t access your data extracts after you’ve deleted the key. Delete the key only if there’s a dire security incident.

4. Choose **Delete Encryption Key** or **Cancel**. A confirmation or error message appears.

## Audit logs

You can download audit logs to review operations performed on your keys including creation, rotation, deletion, decryption, and downloading logs. The audit log also includes the following information.

- Date and Time
- Event Type
- Success or Failure
- Authenticated Identity of calling service
- User
- Key name

## Frequently asked questions (FAQ)

**Question:**

What happens if I don’t renew my Advanced Management license?

**Answer:**

If you don’t renew the Advanced Management license, the Customer-Managed Encryption Keys feature automatically changes to a disabled state.

**Question:**

What happens to my key data if I stop being a Tableau Cloud customer?

**Answer:**

Per the Tableau Cloud data policy, there’s a 90-day wait period before your key data gets deleted.

**Question:**

What happens if I move to a different Tableau Cloud region?

**Answer:**

The key data is in the Salesforce (KMS) instance that’s in the same region as your Tableau Cloud pod. If you want to move to another region, you must turn off the feature and run your extracts first.

# About Tableau Content Migration Tool

This set of articles guides you through setting up, using, and maintaining the Tableau Content Migration Tool.

> **Note**: The Tableau Content Migration Tool is not recommended for migrations when moving from Tableau Server to Tableau Cloud. To migrate from Tableau Server to Tableau Cloud, use the Tableau Migration SDK. For Tableau Content Migration Tool recommended use cases, see Tableau Content Migration Tool Use Cases

## What is Content Migration Tool?

The Content Migration Tool provides an easy way to copy or migrate content between projects. The Content Migration Tool user interface walks you through the steps necessary to build a "migration plan" that you can use once or as a template for multiple migrations.

> **Note:** If you have a Tableau Server deployment, you can migrate content between projects on a Tableau Server installation and a Tableau Cloud site. Both deployments must have a valid Advanced Management license.

Before migrating content, we recommend reviewing the Content Governance section in Tableau Blueprint.

## Help and Support

If you have problems that you cannot solve with this documentation, contact Tableau Technical Support.

## Getting Started with Tableau Content Migration Tool

This article will help you get started with the Tableau Content Migration Tool. It contains links to other articles about information you need to prepare before installing the Content Migration Tool, and steps to design a migration plan and upgrade existing installations.

### Pre-installation

#### Installation requirements

The Content Migration Tool can only be installed on Windows operating systems. Before installing, you must be able to connect to the Tableau source site (the site you are migrating from) and the destination site (the site you are migrating to) from the computer where Content Migration Tool is installed. Both the source and destination sites must have a valid Advanced Management license. For more information about installing and upgrading Content Migration Tool, see Install Tableau Content Migration Tool.

#### Compatibility with Tableau Cloud

Content Migration Tool version 2022.2.1 and later support content migration for all Tableau Cloud deployments. We recommend installing the most recent version from the Tableau Advanced Management downloads page to take advantage of the latest features and fixes.

#### Compatibility with Tableau Server

The Content Migration Tool supports content migration for Tableau Server versions 2019.3 and later.

The table lists compatible versions of Tableau Server based on the installed version of Content Migration Tool.

| CMT Version | Tableau Server Version |
|---|---|
| 2024.3x | 2023.1x - 2024.2x |
| 2024.2x | 2022.3x - 2024.2x |
| 2024.1x | 2022.1x - 2024.1x |
| 2023.1.x | 2021.2.x - 2023.1.x |
| 2022.4.x | 2021.1.x - 2022.4.x |
| 2022.3.x | 2020.4.x - 2022.3.x |
| 2022.2.x | 2020.3.x - 2022.2.x |
| 2022.1.x | 2020.2.x - 2022.1.x |
| 2021.4.x | 2020.1.x - 2021.4.x |
| 2021.3.x | 2019.4.x - 2021.3.x |
| 2021.2.x | 2019.3.x - 2021.2.x |
| 2021.1.x | 2019.3.x - 2021.1.x |
| 2020.4.x | 2019.3.x - 2020.4.x |
| 2020.3.x | 2019.3.x - 2020.3.x |

**Note:** If you have a Tableau Server deployment, you can migrate content between projects on a Tableau Server installation and a Tableau Cloud site. Both sites must have a valid Advanced Management license.

Compatibility with Tableau content

The Content Migration Tool supports migrating workbooks and published data sources saved in the eight most recent versions of Tableau. While you can migrate existing data sources, only data sources that use the connection types in the table below can be changed and modified during migration. For more information, see Data Source Transformations in Migration Plans: Workbooks and Migration Plans: Published Data Sources.

| | | |
|---|---|---|
| Actian Matrix | Google Drive | Pivotal Greenplum Database |
| Actian Vectorwise | HortonWorks Hadoop Hive | PostgreSQL |
| Amazon Athena | HP Vertica | Progress OpenEdge |
| Amazon Aurora | IBM DB2 | Salesforce |
| Amazon EMR | IBM Netezza | SAP HANA |
| Amazon Redshift | Map R Hadoop Hive | SAP Sybase ASE |
| Apache Drill | Microsoft Access | SAP Sybase IQ |
| Aster Database | Microsoft Analysis Services | Snowflake |
| Box | Microsoft Excel | Spark SQL |
| Cloudera Hadoop | Microsoft Excel Direct | Statistical File |
| Delimited Text File | Microsoft OneDrive | Tableau Extract |
| EXASOL | Microsoft SQL Server | Tableau Published Data Source |
| Firebird | MySQL | Teradata |
| Google Analytics | OData | Text File |
| Google BigQuery | Oracle | Web Data Connector |
| Google Cloud SQL | Oracle Essbase | Other Databases (ODBC) |

### Post-installation

Limitations when migrating content

Before you start, make sure you understand the limitations when migrating content using the Content Migration Tool. For more information, see Migration Limitations.

Create a migration plan

The Content Migration Tool walks you through migrating content across projects on a single site, to a new site on the same Tableau Server instance, and to sites that exist on different Tableau Server instances. The plan you create can be saved and used again for future migrations. For more information, see Migration Plan Overview.

## Install Tableau Content Migration Tool

Installing Tableau Content Migration Tool is straightforward and easy.

### Installation requirements

The Content Migration Tool tool is run from a Windows computer and can connect to Tableau Cloud sites and Tableau Server 19.3 and later with a valid Advanced Management license. For more information about compatible versions, see Getting Started with Tableau Content Migration Tool.

The computer that you install Content Migration Tool on must meet the requirements below:

- Microsoft Windows 10 or newer (x64)
- Intel Core i3 or AMD Ryzen 3 (Dual Core)
- 4 GB memory or larger
- Can connect to the source and destination sites. Both sites must have a valid Advanced Management license to migrate content.
- 2 GB HDD or larger. The drive where the `\temp` folder resides must have enough disk space to hold a copy of all content being migrated in a single migration. All content is stored locally on the disk and deleted when the migration is complete.
- Have enough free disk space to hold the application and its logs.

In addition, confirm that the REST API is enabled on Tableau Server (this is the default). Use the `tsm configuration get -k api.server.enabled` command to confirm this. A return value of `true` means the REST API is enabled. To enable the REST API, use the `tsm configuration set` command. For more information, see api.server.enabled in Tableau Server help.

## Install Content Migration Tool

To install the Content Migration Tool:

1. Download the Content Migration Tool installer (`Tabcmt-64bit-<version>.exe`) from the Tableau Advanced Management downloads page.
2. Run the Content Migration Tool Setup program.

   > **Note:** Running the Content Migration Tool Setup program overwrites the previous version.

3. After reading the EULA, select **I agree to the license terms and conditions**, and click **Install**.
4. If the User Account Control dialog opens, click **Yes** to allow the installer to make changes.

## Upgrade Content Migration Tool

Upgrading to the latest version of Content Migration Tool ensures that you can take advantage of the latest features and fixes included with each new version.

**Important:**

- Running the Content Migration Tool Setup program overwrites the previous version.
- Content Migration Tool doesn’t support side-by-side installation of previous versions.

To upgrade Content Migration Tool:

1. Log on to the machine where Content Migration Tool is installed. If there are instances of Content Migration Tool open, save your migration plan and exit the application.

2. Follow the steps listed in Install Content Migration Tool to download the latest installer and complete the upgrade.

## Install Content Migration Tool from the command line

You can install Content Migration Tool from the command line if you're a local administrator on the machine.

Install switches

Specify one or more switches in the command line for the installer. For example:

```
Tabcmt-64bit-2022-3-0.exe /quiet /norestart
```

| Switch | Description | Comments |
|---|---|---|
| `/install` \| `/repair` \| `/uninstall` \| `/layout` "<directory>" | Run Setup to either install, repair, or uninstall Content Migration Tool, or with `/layout`, create a complete local copy of the installation bundle in the directory specified. | Default is to install, displaying UI and all prompts. If no directory is specified on a fresh install, `C:\Program Files\Tableau\Tableau Content Migration Tool` is assumed. If Content Migration Tool is already installed, Setup assumes the same location as the current installation. |
| `/passive` | Run Setup with minimal UI and no prompts. | Content Migration Tool doesn't start automatically when installed in `/passive` mode. To start Content Migration Tool, open the application manually. |
| `/quiet` \| `/silent` | Run Setup in unattended, fully silent mode. No UI or prompts are displayed. | Content Migration Tool doesn't start automatically when installed in `/silent` or `/quiet` mode. To start Content Migration Tool, open the application manually. |

| | | |
|---|---|---|
| | | **Note:** Use either `/silent` or `/quiet`, not both. |
| `/norestart` | Run Setup without restarting Windows, even if a restart is necessary. | **Note:** In certain rare cases, a restart cannot be suppressed, even when this option is used. This is most likely when an earlier system restart was skipped, for example, during installation of other software. |

### Who can do this

A user with Administrator access on the machine.

## Using Tableau Content Migration Tool

The following steps are designed to guide you through using the Tableau Content Migration Tool:

- Migration Plan Overview
  - Migration Plans: Sites
  - Migration Plans: Source Projects
  - Migration Plans: Workbooks
  - Migration Plans: Published Data Sources
  - Migration Plans: Permissions and Ownership
  - Migration Plans: Migration Scripts
  - Migration Plans: Plan Options
- Using the Tableau Content Migration Tool Console Runner

# Tableau Content Migration Tool Use Cases

Tableau Content Migration Tool as the name suggests, is primarily used for moving Tableau Cloud content from one project to another. However, there are many features in the tool that makes it ideal for accomplishing several tasks related to content migration and maintenance.

> **Note:** In many of the use cases we use the term migration to describe moving content from one environment, site, or project to another. However, technically the Content Migration Tool copies content and does not automatically delete or archive the original or source content.

The information below describes some common use cases where you can leverage the Content Migration Tool.

## Content promotion

You can use the Content Migration Tool to create content for development projects and then perform routine migrations to promote content to staging or production projects on your site.

**Use the following steps to migrate content to production projects:**

1. **Create a plan** and select the site to use as your source. In this example, we describe a migration between projects on the same site, so choose the same Tableau site as your destination. For more information, see Create a Plan in Migration Plan Overview topic.

   When migrating workbooks between two projects on the same site, your sign-in credentials for the source and destination may be similar or identical. In this scenario, we recommend using personal access tokens for a more reusable connection. For more information, see Personal Access Tokens.

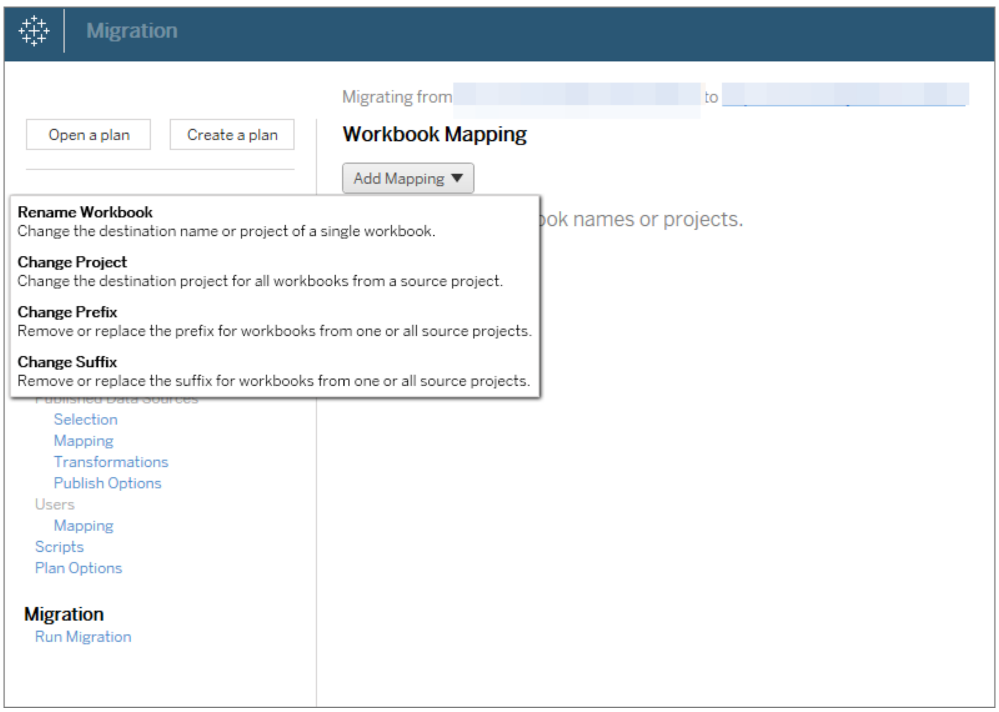
2. **Select the development project** with the content you want to migrate. You can select entire projects, specific workbooks and data sources, and user permissions. For more information, see Planning in Migration Plan Overview topic.

If you need to make any **changes or transformations** to the content during this migration, you can configure that in the plan as well. This is referred to as **Mapping**.

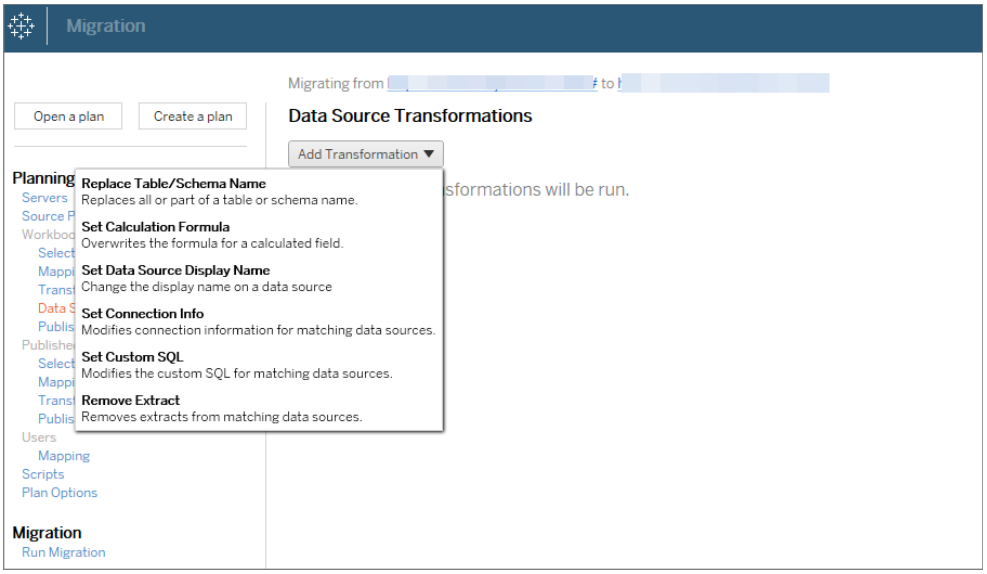
3. Select **Change Project** from the **Add Mapping** menu to add a project mapping. Select your development project as the source and production project as the destination, or click **Add New** to create a new project.

   Other types of mapping include:

   - **Changes to workbooks:** Includes renaming workbooks and changing the destination project. For a full list of workbook transformations, see Migration Plans: Workbooks.

   - **Changes to data sources:** Includes replacing table or schema names, settings calculation formulas, and setting connection information. For a full list of data source transformations, see Migration Plans: Workbooks (embedded data sources) and Migration Plans: Published Data Sources (published data sources).




- **Changes to Users:** Includes domain, user, and group name changes in the destination.

4. When you are ready, click **Run Migration** to end the Planning phase and prepare to run your plan.

5. **To schedule** this to run regularly, you can script this as a job using the Content Migration Tool Runner and schedule it. For more information on using the Content Migration Tool Runner, see Using the Tableau Content Migration Tool Console Runner.

## Tailoring content for customers

When working in a consulting scenario, you can customize content for each of your customers using the Content Migration Tool. Each workbook functions as a template for your migration plan, allowing you to apply styling (text, images, etc.) and replace data sources for specific customers.

In this example, we describe a migration between projects; an internal project where you store templates, and an external project you share with customers.

**Use the following steps to customize content for your customers:**

1. **Create a plan** and select the site to use as your source. Choose the same Tableau site as your destination. For more information, see Create a Plan in Migration Plan Overview topic.

   When migrating workbooks between two projects on the same site, your sign-in credentials for the source and destination may be similar or identical. In this scenario, we recommend using personal access tokens for a more reusable connection. For more information, see Personal Access Tokens.

2. **Select the internal project** that contains the template content you want to migrate. You can select entire projects, specific workbooks and data sources, and user permissions. For more information, see Planning in the Migration Plan Overview.

   If you need to make any **changes or transformations** to the content during this migration, you can configure that in the plan as well. This is referred to as **Mapping**.

3. Select **Change Project** from the **Add Mapping** menu to add a project mapping. Select your internal project as the source and production project as the destination, or click **Add New** to create a new project.

4. **In the Workbooks** step of the Migration Plan, use workbook mappings and transformations to customize your content. Below are two examples of frequently used transformations. For a full list of workbook transformations, see Migration Plans: Workbooks.

   - To personalize content, you can use the **Replace Image** and **Replace Text** transformations to update the workbook with a customer's company name and logo.

   - When it comes to data sources, you can use the **Replace Table/Schema Name** or **Set Custom SQL** transformations to modify content for your customer.

5. **Verify and run** the plan. When you are ready, click **Run Migration** to end the Planning phase and prepare to run your plan.

## Environment migration

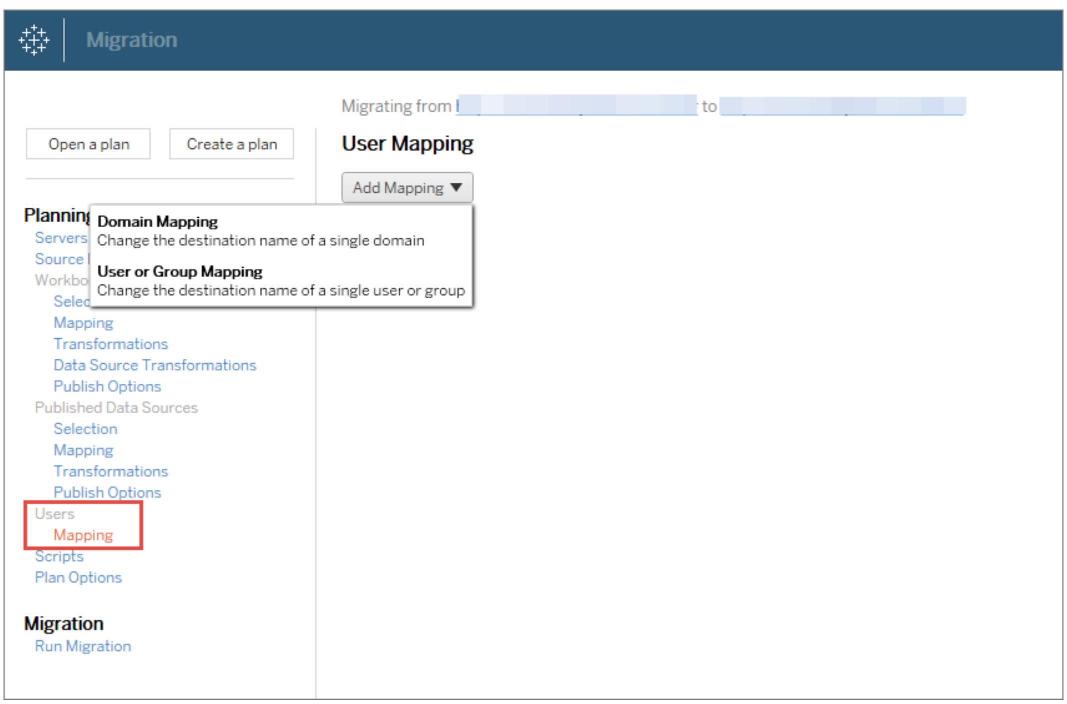
You can use the Content Migration Tool to migrate content between Tableau Cloud and Tableau Server environments with a valid Advanced Management license.

**Use the following steps to migrate content between Tableau deployments:**

1. **Create a plan** and **select the site** you want to migrate from as your source. For more information, see Create a Plan in Migration Plan Overview topic.

2. **Select the content** you want to migrate from your source site. You can select entire projects, specific workbooks and data sources, and user permissions.

3. **Create user permissions mappings** to customize and secure content. For more information, see Migration Plans: Permissions and Ownership.



4. **Verify and run** the plan. When you are ready, click **Run Migration** to end the Planning phase and prepare to run your plan.

**Tips**

- Before you perform an environment migration, make sure you understand the Migration Limitations when using the Content Migration Tool.
- You can migrate your content in stages, test and validate content iteratively before final migration is complete.
- Content Migration Tool migration does not handle embedded credentials, subscriptions, and custom views. These will have to be migrated manually.

## External content sharing

You can use the Content Migration Tool to share internal content with external collaborators, without allowing access to your project. This keeps your data secure and allows you to publish only select workbooks and data sources. Once content has been shared, collaborators sign in to their Tableau Cloud site to view and make changes, without affecting content stored on your internal project.

Before you continue, make sure the content you are sharing is compatible between the internal and external projects.

**Use the following steps to share content externally:**

1. **Prepare internal content**. As a best practice, we recommend separating content on the internal project, with locked permissions and strict governance rules. Workbooks and data sources should be clearly labeled to indicate the content is for external use. For more information, see Use Projects to Manage Content Access.

   **Note:** Content shared with external projects must use data extracts unless the data source is publicly accessible. For information about creating extracts and replacing data sources, see Extract Your Data and Replace Data Sources in Tableau Desktop help.

If you have implemented row level security, those data sources must be updated to reflect user filters and other details for the external project. For more information about row level security, see Restrict Access at the Data Row Level in Tableau Desktop help.

2. **Create a plan** and select the site to use as your source. Choose the same Tableau site as your destination. For more information, see Create a Plan in Migration Plan Overview topic.

   When migrating workbooks between two projects on the same site, your sign-in credentials for the source and destination may be similar or identical. In this scenario, we recommend using personal access tokens for a more reusable connection. For more information, see Personal Access Tokens.

3. **Select the internal project** that contains the template content you want to migrate. You can select entire projects, specific workbooks and data sources, and user permissions. For more information, see Planning in the Migration Plan Overview.

   If you need to make any **changes or transformations** to the content during this migration, you can configure that in the plan as well. This is referred to as **Mapping**.

4. Select **Change Project** from the **Add Mapping** menu to add a project mapping. Select your internal project as the source and external project as the destination, or click **Add New** to create a new project.

5. **Verify and run** the plan. When you are ready, click **Run Migration** to end the Planning phase and prepare to run your plan.

## Validating database migrations

This use case is when you intend to validate content after a migration of the underlying databases. One example of database migration is moving from SQL Server to Snowflake. CMT can help you validate the content built from both data sources is the same before you finalize your migration, but it cannot perform the actual database migration.

**Use the following steps to validate database migrations:**

1. **Create a plan** and select the site to use as your source. Choose the same Tableau site as your destination. For more information, see Create a Plan in Migration Plan Overview topic.
2. **Select the content** you want to change the data source or database connections.
3. **Configure the migration** to copy your content to a new project. Let's call the **source** project as **Project A**, and the new or the **destination** project as **Project B**.
   - Changes to workbooks: Create a workbook mapping to change Project A to Project B. For a full list of workbook transformations, see Migration Plans: Workbooks.
   - Changes to data sources: Create a data source mapping to change the Project A to Project B. For a full list of data source transformations, see Migration Plans: Published Data Sources.
4. **Verify and run** the plan. When you are ready, click **Run Migration** to end the Planning phase and prepare to run your plan.
5. **Update the content** in **Project B** with the new database connections or replace the data sources. This needs to be done manually by authoring.
6. **Test each workbook** in **Project A** with the copy in **Project B** and review for any inconsistencies in the data due to the change in data source.
7. Once you have confirmed everything is working as expected, **overwrite the content** in Project A with the updated content in Project B.

> **Note:** If the content already exists in the destination project and you do not select the **Overwrite Newer Workbooks** and **Overwrite Newer Data Sources** publish options, the content will not be copied to the destination project.

## Maintenance tasks

You can use the Content Migration Tool to perform a variety of maintenance tasks.

### Tagging stale content

Using the Content Migration Tool, you can manage archiving stale content. For example, you can build a plan that runs on a regular schedule that can automatically pick up content tagged as Stale Content and move it to an Archive project. After a certain amount of time, the content in this project can be purged from the system. For more information see, Migration Plans: Workbooks.

### Restoring content

You can use the Content Migration Tool to restore content removed (accidentally or purposefully) from a project with content from a backup project.

**Use the following steps to restore content from a backup project:**

1. **Create a plan** and select the site to use as your source. Choose the same Tableau site as your destination. For more information, see Create a Plan in Migration Plan Overview topic.

2. **Select the content** you want to restore from the backup project.

3. **Configure the migration** to restore content from your backup project. Let’s call the backup project **Project A** and the project you want to restore to **Project B**.

   - Changes to workbooks: Create a workbook mapping to change Project A to Project B. For a full list of transformations, see Migration Plans: Workbooks.

- Changes to data sources: Create a data source mapping to change Project A to Project B. For a full list of data source transformations, see Migration Plans: Published Data Sources.

4. **Verify and run** the plan. When you are ready, click **Run Migration** to end the Planning phase and prepare to run your plan.

5. **Review the content** on the production site.

Partial backup

Once you have a backup project, you can use the Content Migration Tool to transfer new content from production to the backup project.

**Notes:**
- Before you perform a partial backup, make sure you understand the Migration Limitations when using the Content Migration Tool.
- The Content Migration Tool shouldn't be used to backup your entire site. We recommend prioritizing the content you need most.

**Use the following steps to perform a partial backup of your content:**

1. **Create a plan** and select the site to use as your source. Choose the same Tableau site as your destination. For more information, see Create a Plan in Migration Plan Overview topic.

2. **Select the content** you want to backup from the production project. You can select entire projects, specific workbooks and data sources, and user permissions. To migrate only new content, make sure the publish options **Overwrite Newer Workbooks** and **Overwrite Newer Data Sources** are not selected. For more information, see Migration Plans: Workbooks.

3. **Configure the migration** to copy content to your backup project. Let’s call the source project **Project A** and the backup project **Project B**.

- Changes to workbooks: Create a workbook mapping to change Project A to Project B. For a full list of transformations, see Migration Plans: Workbooks.
- Changes to data sources: Create a data source mapping to change Project A to Project B. For a full list of data source transformations, see Migration Plans: Published Data Sources.

4. **Verify and run** the plan. When you are ready, click **Run Migration** to end the Planning phase and prepare to run your plan.
5. **To schedule** this to run on a regular basis, you can script this as a job using the Content Migration Tool Runner and schedule it. For more information on using the Content Migration Tool Runner, see Using the Tableau Content Migration Tool Console Runner.

# Migration Plan Overview

Tableau Content Migration Tool creates a streamlined process for migrating Tableau content between projects. The easy-to-follow plan can be audited, is repeatable, and works via a batch process so any number of workbooks and data sources can be migrated in a simple and efficient process.

The Content Migration Tool will display contextual tips to walk you through creating or editing a migration plan. Once you select the source and destination sites, a summary of your migration will be displayed at the top of the screen as follows:

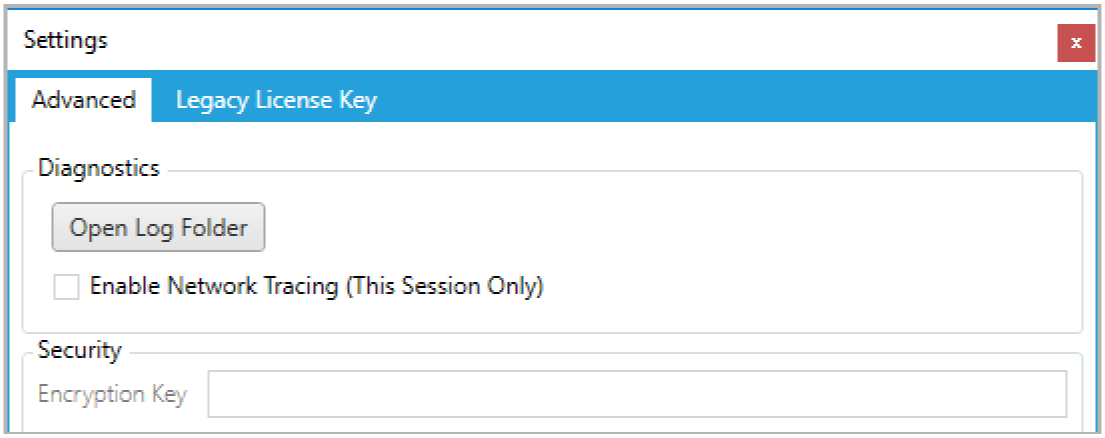
Migrating from http://admin@win-vj23dhvudie:80/#/site/Accounting-sandbox to http://admin@win-vj23dhvudie:80/#/site/Accounting

## Limitations when migrating content

Before you start, make sure you understand the limitations when migrating content using the Content Migration Tool. For more information, see Migration Limitations.

## Encryption keys

Each migration plan file is generated with an encryption key unique to the application that created the plan. Encryption keys can be shared if the migration plan needs to be run through an application that did not originally generate the file. When sharing encryption keys, you will need to overwrite the existing key in the application to run the migration plan. To view your encryption key, select **Help** > **Settings**.




If you will be using the Content Migration Tool Console Runner for migration plans, you must specify the encryption key using the `tabcmt-runner encryption` command before running the plan. For more information, see Using the Tableau Content Migration Tool Console Runner.

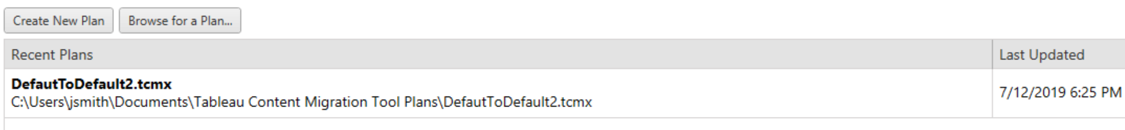
## Migration process

Step 1: Start

The core of the migration process is creating a plan, which you can save and re-use for future migrations or modify and update as needed. The first step is choosing whether to create a new plan, or select a previously saved plan.

To create a new plan, click **Create New Plan**. If you already created a migration plan and want to use it, click **Browse for a Plan**.


By default, all of your saved migration plans will be stored in the `Tableau Content Migration Tool Plans` folder in your My Documents folder. All migration plans are saved with a `.tcmx` extension, with recently accessed plans listed separately to make them easy to select:




You can select a recently accessed plan and duplicate it to modify the plan and save it as a new plan. Select the plan you want to copy and click **Duplicate**.


Step 2: Planning

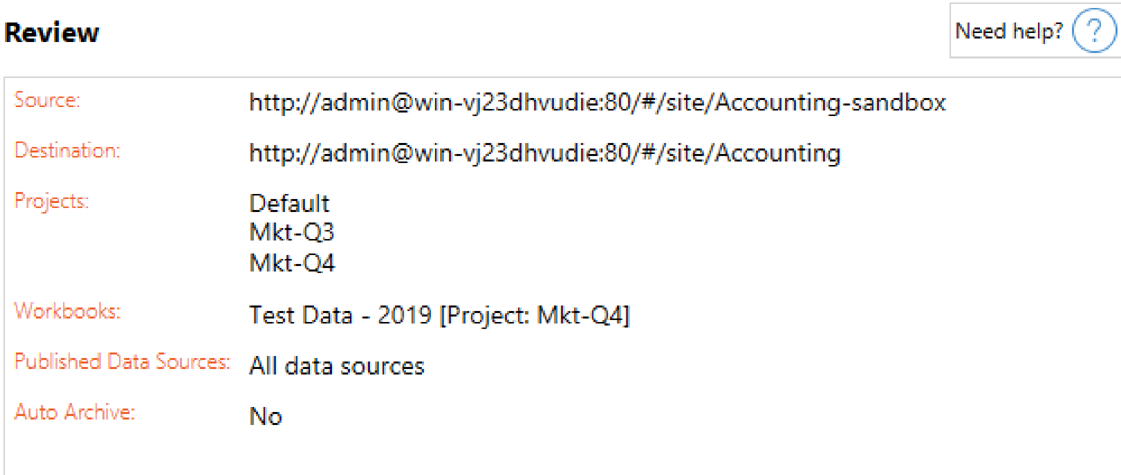
The Content Migration Tool guides you through building or editing your migration plan in six steps.

Click on each step for detailed instructions:

- Migration Plans: Sites
- Migration Plans: Source Projects
- Migration Plans: Workbooks
- Migration Plans: Published Data Sources
- Migration Plans: Permissions and Ownership
- Migration Plans: Migration Scripts
- Migration Plans: Plan Options

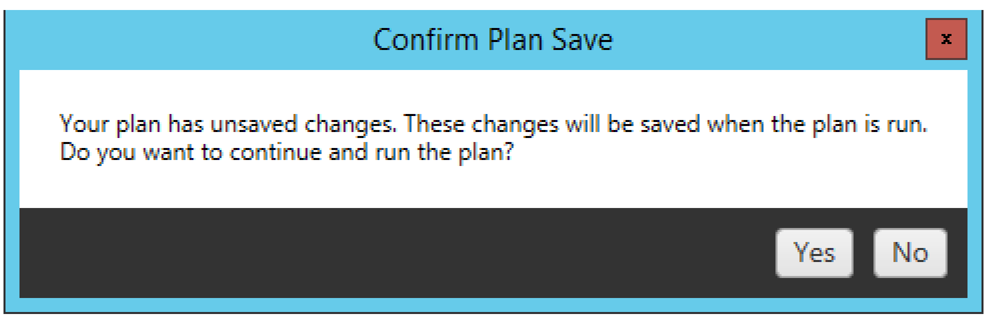
Step 3: Migration

Once you have completed your plan, you are now ready to run the batch process for migration. When you reach the final step of the migration, a plan summary displays for your verification:

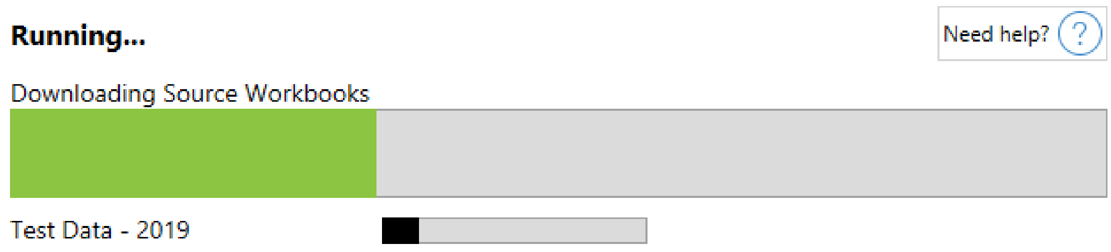



If you want to change any aspects of your plan, you can click on a section in the left sidebar to go directly to that phase. When you are ready, click **Run** to begin your migration.

When you click **Run**, the migration tool will prompt you about any unsaved elements of your plan. By default, any unsaved elements will be saved when you click **Yes**. Remember you can always keep your previous plan without making any changes by duplicating it during the Start phase of the migration process.



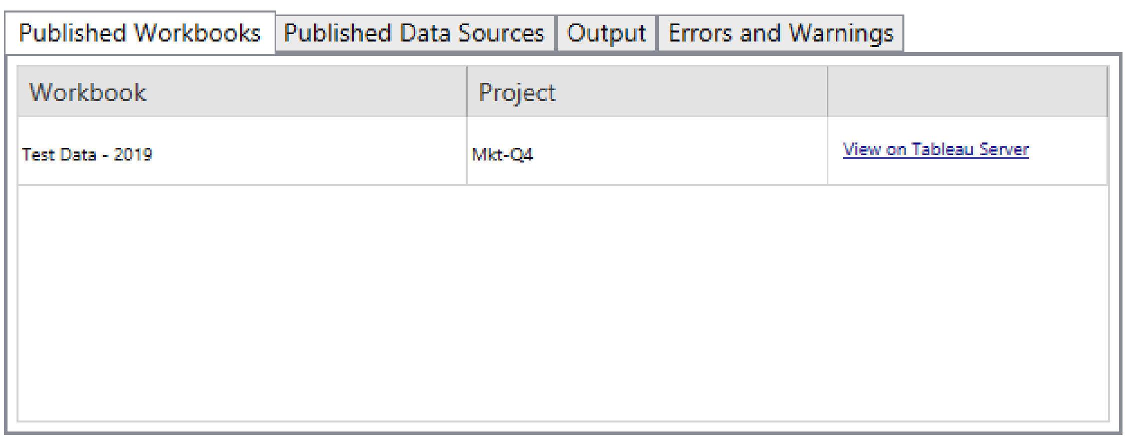

Your migration plan will run and a status bar displays for the overall plan progress and each workbook being sent to the destination server.




When the plan finishes running, you can click the tabs at the bottom of the screen for more information about the migration.

Published workbooks

**Published Workbooks** details the newly published workbooks and the projects where they were migrated.

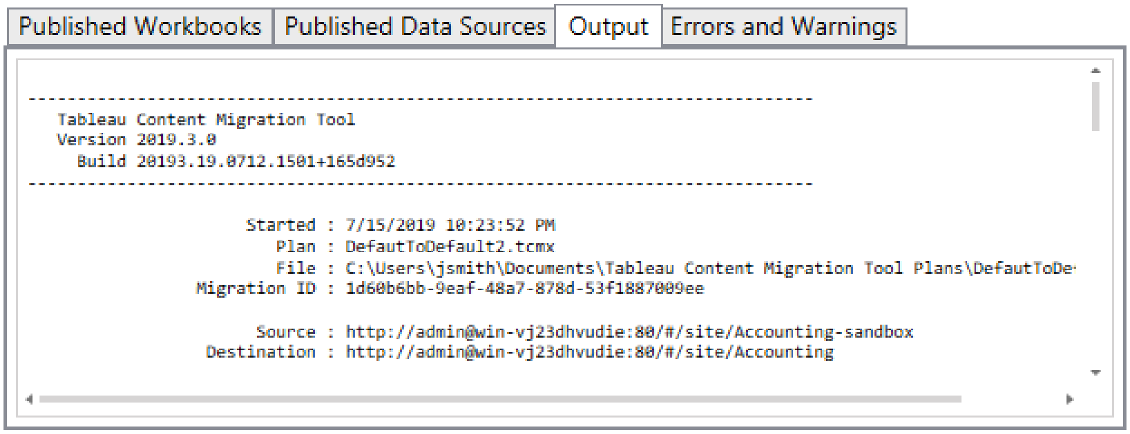



Published data sources

**Published Data Sources** details the newly published data sources and the projects where they were migrated.

Output

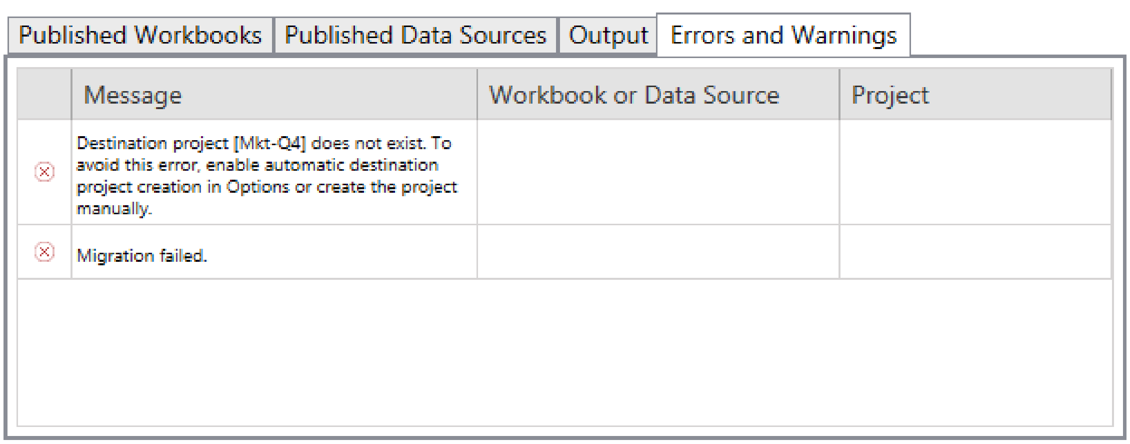
The **Output** tab details the migration log of your plan.




You can save this log by clicking **Save Log**.


Errors and warnings

The **Errors and Warnings** tab highlights any problems that occurred during the migration.




You can correct these and rerun your plan. When you have completed your migration and saved your plan, click **Done** to finish.


## Who can do this

Tableau site user with an Explorer role or higher. To migrate content, you must have **View** and **Download/Save a Copy** capabilities for workbooks on the source site and **View** and **Publish** capabilities for target projects on the destination site. For more information, see Permissions.

## Migration Limitations

There are certain limitations to migrations when using the Tableau Content Migration Tool. Before creating your migration plan, review the sections below to learn about version compatibility and content that will not be migrated.

### Compatibility with Tableau content

The Content Migration Tool supports migrating workbooks and published data sources saved in the eight most recent versions of Tableau. Workbooks and published data sources saved before version 2018.1.x are not supported by CMT. For more information, see Getting Started with Tableau Content Migration Tool.

### Configurations

The following configurations are not migrated to the destination site when using the Content Migration Tool.

- Users
- Groups
- Site settings (custom logos, view recommendations, etc.)

### Data connections

While you can migrate existing data sources, only data sources that use the connection types in the table below can be changed and modified during migration. For more information, see

Data Source Transformations in Migration Plans: Workbooks and Migration Plans: Published Data Sources.

| | | |
|---|---|---|
| Actian Matrix | Google Drive | Pivotal Greenplum Database |
| Actian Vectorwise | HortonWorks Hadoop Hive | PostgreSQL |
| Amazon Athena | HP Vertica | Progress OpenEdge |
| Amazon Aurora | IBM DB2 | Salesforce |
| Amazon EMR | IBM Netezza | SAP HANA |
| Amazon Redshift | Map R Hadoop Hive | SAP Sybase ASE |
| Apache Drill | Microsoft Access | SAP Sybase IQ |
| Aster Database | Microsoft Analysis Services | Snowflake |
| Box | Microsoft Excel | Spark SQL |
| Cloudera Hadoop | Microsoft Excel Direct | Statistical File |
| Delimited Text File | Microsoft OneDrive | Tableau Extracts |
| EXASOL | Microsoft SQL Server | Tableau Server Data Sources |
| Firebird | MySQL | Teradata |
| Google Analytics | OData | Text File |
| Google BigQuery | Oracle | Web Data Connector |
| Google Cloud SQL | Oracle Essbase | Other Databases (ODBC) |

Unsupported content

The following content is not migrated to the destination site when using the Content Migration Tool and will require additional configuration.

| Content | Action required |
|---|---|
| Ask Data lenses | Users must recreate Ask Data lenses on the destination site. For more information, see Create Lenses that Focus Ask Data for Specific Audiences. |
| Collections | Users must recreate collections on the destination site. For more information, see Collections in Tableau Desktop help. |
| Comments | Users must re-add comments to views on the destination site. For more information, see Comment on Views in Tableau Desktop help. |
| Custom views | Users must recreate custom views on the destination site. For more information, see Use Custom Views in Tableau Desktop help. |
| Data roles | Users must recreate data roles on the destination site. For more information see Use Data Roles to Validate your Data in Tableau Prep Builder help. |
| Data source certifications | If you have the following site roles and capabilities, you can certify data sources on the destination site.<br>• Site Administrator Creator<br>• Creator or Explorer (can publish) with Project Leader capability on the project containing the data source<br>For more information, see Use Certification to Help Users Find Trusted Data. |
| Data-driven alerts | Users must recreate data-driven alerts for dashboards and views on the destination site. After data-driven alerts are created, anyone with access to the view can add themselves to existing alerts.<br>For more information, see Send Data-Driven Alerts from Tableau Cloud or Tableau Server in Tableau Desktop help. |
| Descriptions for workbooks and | If you own the content item or have the appropriate permissions, you can edit the item's description on the destination site. For more inform- |

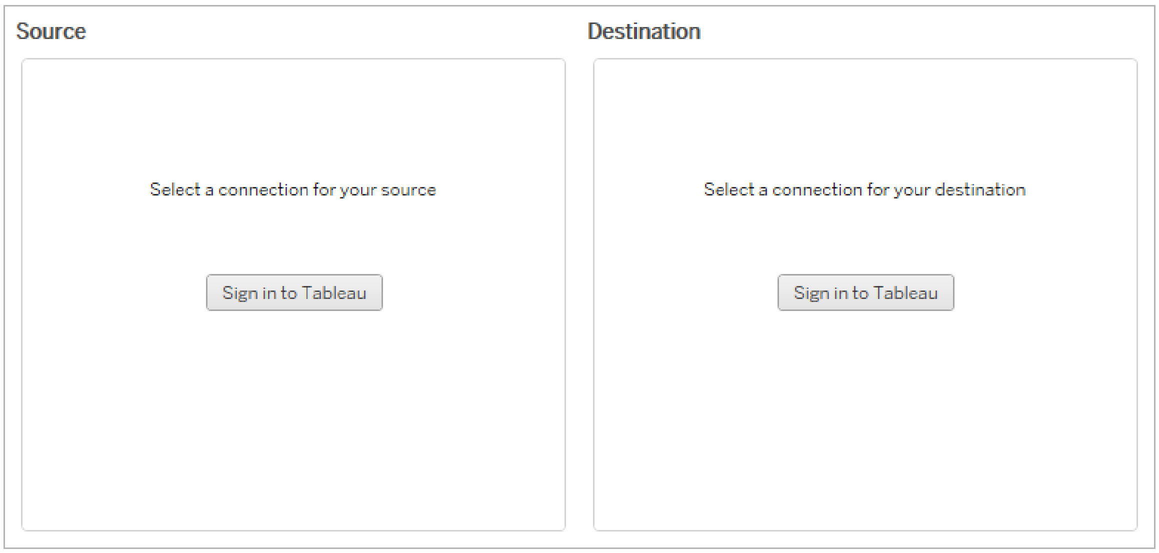
| | |
|---|---|
| data sources | ation, see Add or edit descriptions in Tableau Desktop help. |
| Embedded credentials | For security purposes, Tableau Server removes embedded credentials from data sources during the download process.<br>• To include embedded credentials when migrating from Tableau Server to Tableau Cloud, use the Migrate Embedded Credentials for Workbooks and Migrate Embedded Credentials for Data Source publish options. For more information, see Migrate Workbooks and Data Sources with Embedded Credentials.<br>• To include embedded credentials when publishing to Tableau Server sites, use the Set Connection Info data source transformation. For more information, see Migration Plans: Published Data Sources.<br>**Note:** CMT does not support embedded credential migration for OAuth connections. To migrate OAuth credentials, use the Set Connection Info data source transformation. |
| External assets | Customized attributes for external assets are not migrated to the destination site. For example, tags, certifications, data quality warnings, descriptions, permissions, user contacts, tables, and columns must be recreated. For more information, see Manage Permissions for External Assets. |
| Extract refresh schedules | Extract refresh schedules cannot be migrated to Tableau Cloud destination sites. To refresh data on Tableau Cloud, you can run extract refreshes manually or create new extract refresh schedules. For more information, see Schedule Refreshes on Tableau Cloud. |
| Favorites | Users must reselect their favorite content on the destination site. For more information, see Mark Favorites in Tableau Desktop help. |
| Flows | To run flows on a schedule, users must republish flows to the des- |

| | |
|---|---|
| | tination site with Tableau Prep. For more information, see Publish a Flow to Tableau Server or Tableau Cloud in Tableau Prep help. |
| Incremental extract refreshes | Incremental extract refreshes are changed to full extract refreshes on the destination site. Users must reconfigure incremental refreshes in Tableau Desktop and publish extracts to the destination site after migration. For more information, see Refresh Extracts in Tableau Desktop help. |
| Metrics | The historical values for metrics are removed from views, and users must recreate metrics on the destination site. For more information, see Create and Troubleshoot Metrics (Retired). The legacy Metrics feature was retired in February 2024 for Tableau Cloud and in Tableau Server version 2024.2. For more information, see Create and Troubleshoot Metrics (Retired). |
| Revision history | To migrate previous versions of workbooks to the destination site, users must download the versions they wish to keep and republish the workbook to the destination site. For more information see Work with Content Revisions in Tableau Desktop help. |
| Subscriptions | Users must resubscribe to views and workbooks on the destination site. For more information, see Create a Subscription to a View or Workbook. |
| Thumbnails for workbooks and views | Workbooks and views that are migrated using the Content Migration Tool will retain their original thumbnails, even if the migration plan includes transformations that result in the views being rendered differently (for example, if data connections change).<br><br>To update thumbnails, edit the workbook or view on the destination site and re-save it. For more information, see Edit Tableau Views on the Web in Tableau Desktop help. |
| Virtual connections | Users must recreate virtual connections on the destination site. For more information, see Create a Virtual Connection. |

## Migration Plans: Sites

The first step when creating a migration plan in the Tableau Content Migration Tool is to sign in to the source and destination sites.

In the Sites section of the planning phase, you'll sign in to the source and destination sites. The permissions of the user credentials you use govern the sites and projects you see when creating a migration plan. You can only migrate content that the user has access to.




### Required permissions and licenses

The user account(s) used to sign in to the source and destination sites must have an Explorer role or higher, and the following permissions for the content you want to migrate:

- View
- Download Workbook/Save a Copy
- Optional: Administrator (to select workbooks, to access a user list)

Both the source and destination sites must have Advanced Management capacities. For more information, see About Tableau Advanced Management on Tableau Cloud.

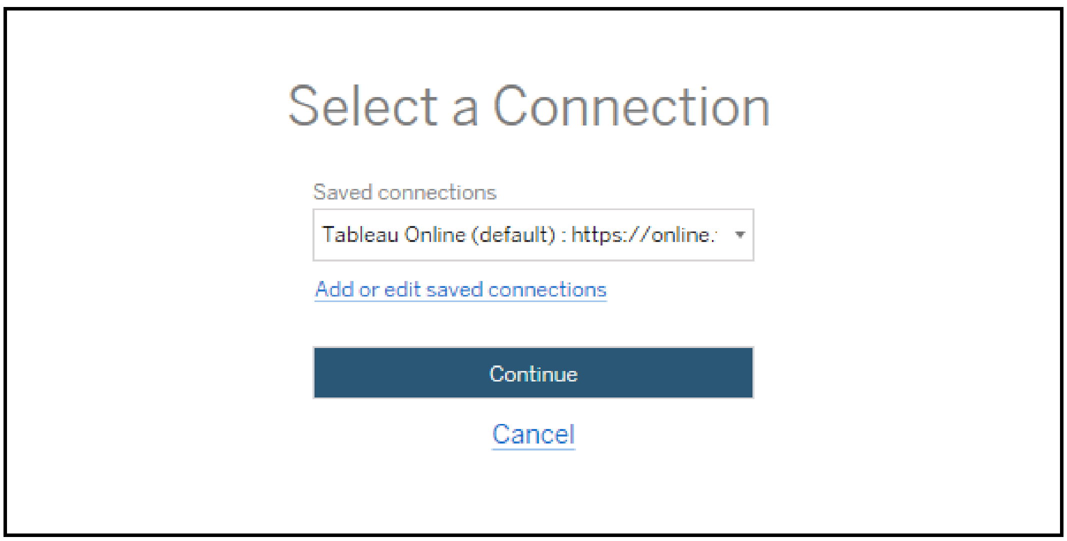
Step 1: Source

Here is the starting point of the migration. Sign in to Tableau Cloud, then select your *site* to use as the source. Sites are independent silos of workbooks, data, and user lists created within Tableau to group related content for selected users. You can only migrate content from one site at a time.

Sign in to the source site

Use the steps below to sign in to Tableau Cloud or Tableau Server. For more information about signing in to Tableau Cloud with Single Sign-On and Tableau with MFA, see Sign In to Tableau Cloud.

1. Click **Sign in to Tableau**.
2. In the **Select a Connection** dialog window, select a saved connection and click **Continue**.

   If no connections are available, click **Add or edit saved connections** to add a new connection. For more information, see Saved connections.
3. Enter your username and password, and click **Sign In**.

If your server is configured for SAML or Single Sign-On, you are redirected to the Identity Provider sign-in page to complete the authentication process.

4. Select the site you want to use.


To change the source server or update your site selection, click **Select a different source**.

Step 2: Destination

Repeat the sign-in process for the destination site (the site you are migrating content to).

If you are migrating your workbooks between two projects on the same Tableau site, your sign-in credentials for the source and destination site will be identical (including the server URL and site name).

Saved connections

Using saved connections allow you to quickly sign in to the source and destination sites by creating a reusable connection. When adding a saved connection, you must specify the preferred sign-in method for your site.

The Content Migration Tool supports the following sign-in methods:

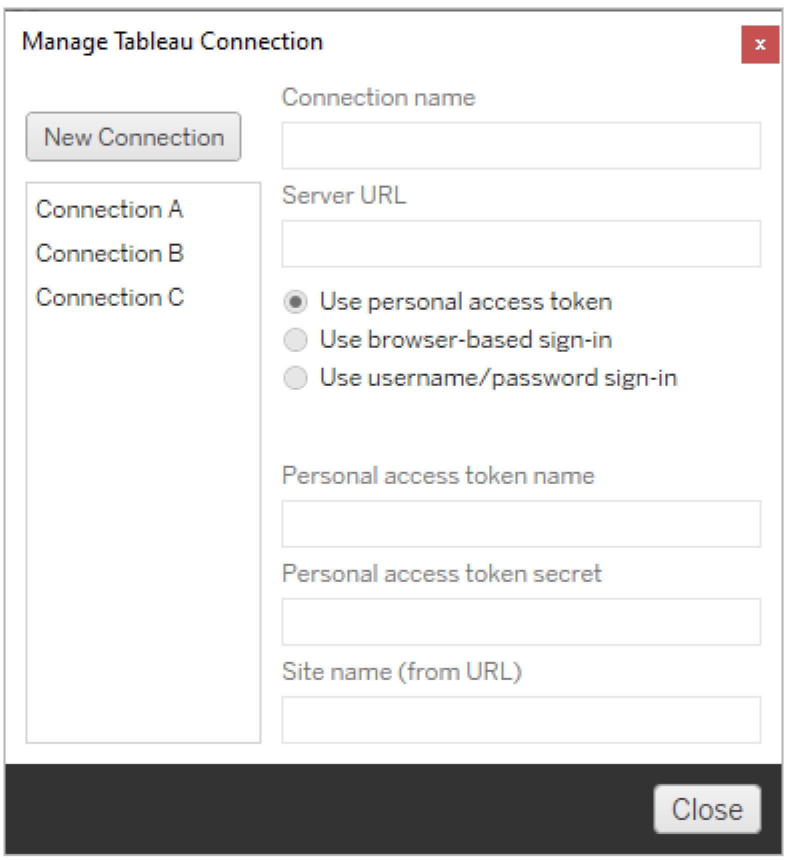
- **Personal access tokens:** Allows users to create long-lived authentication tokens for improved security, auditing, and automation of migration plans. Personal access tokens let users sign in without requiring interactive login in the Content Migration Tool. For more information, see Personal Access Tokens.

- **Browser-based sign-in:** Users enter their credentials and complete authentication through an embedded web browser. This option may be similar to how you usually authenticate to Tableau.

- **Username and password sign-in:** Users authenticate through the Content Migration Tool instead of an embedded browser window. This option passes credentials to the server using Tableau REST APIs. You can use username and password sign-in to troubleshoot issues that prevent the use of browser-based sign-in.

Add or edit saved connections

A link to **Add or edit saved connections** is displayed at the bottom of the Content Migration Tool, and when signing in to the source and destination sites. Clicking this link will open the **Manage Tableau Connections** window.




Use the steps below to add a saved connection:

1. On the **Manage Tableau Connections** window, click **New Connection**, or select an existing connection to make changes.

2. Enter a **Connection Name** (name to describe your server) and the **Server URL**.

   If you don't include a prefix for the Server URL, the Content Migration Tool will use `http://`.

3. Select the sign-in method for your connection.

   If you're using personal access tokens, see Add saved connections with personal access tokens.

4. Click **Save**.

After you create a saved connection, it's listed in the Select a Connection window next time you sign in to the source and destination sites.

Add saved connections with personal access tokens

Adding a saved connection with a personal access token requires more information than other sign-in methods. You will need to create a new personal access token on the source and destination sites to begin. Personal access tokens should not be shared between applications. For more information, see Personal Access Tokens.

## Creating personal access tokens

1. In a web browser, sign in to your Tableau site.

2. At the top of the page, click your profile image or initials, and then select **My Account Settings**.

3. Under **Personal Access Tokens**, enter a descriptive name for your token in the **Token Name** field, and then click **Create new token**.

4. In the resulting window, click **Copy to clipboard** and then close the window.

5. Paste the token secret to a file. Store the file in a safe location.

## Adding personal access tokens

1. In the Content Migration Tool, click **Add or edit saved connections**.

2. On the **Manage Tableau Connections** window, enter a **Connection name** and the **Server URL**.

   If you are connecting to Tableau Cloud, you must enter the full pod URL of your site. For example, `https://10ay.online.tableau.com`. Your pod is shown in the first portion of the site URL after signing in to Tableau Cloud.

3. Enter the **Personal access token name** and **Personal access token secret**, obtained when creating a personal access token in the previous section.

4. In the **Site name** field, enter the site name as it appears in the URL, without spaces. This is different than the friendly site name. For example, “Site A” would be “sitea” in a browser URL.

5. Click **Save**.

Step 3: Continue to the next step

After successfully signing in to both source and destination sites, click **Next** to continue to the Migration Plans: Source Projects section of the planning phase.

Who can do this

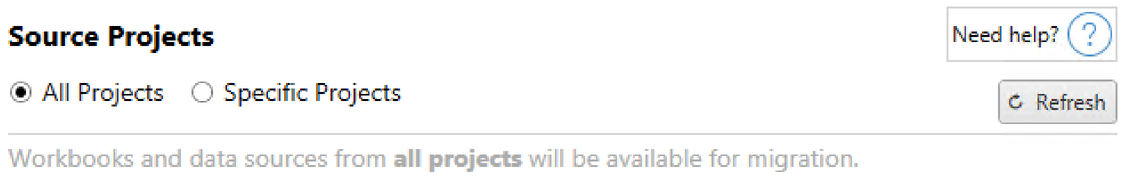
Tableau site user with an Explorer role or higher. To migrate content, you must have **View** and **Download/Save a Copy** capabilities for workbooks on the source site and **View** and **Publish** capabilities for target projects on the destination site. For more information, see Permissions.

## Migration Plans: Source Projects

The next step in creating a migration plan in the Tableau Content Migration Tool is to select the source projects. Source projects are the projects the workbooks and published data sources will be migrated from. The projects you choose determine which workbooks are available to migrate in the next step of the migration plan.

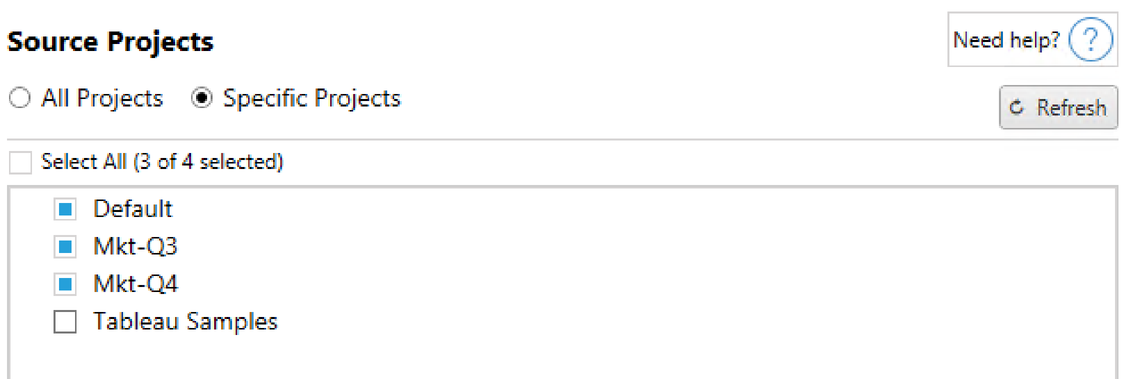
Step 1: Select your source project

There are two options when selecting source projects, **All Projects**, and **Specific Projects**:




The **All Projects** option selects all projects from the source site you specified in the Servers step. The **Specific Projects** option allows you to select specific projects from the source site.

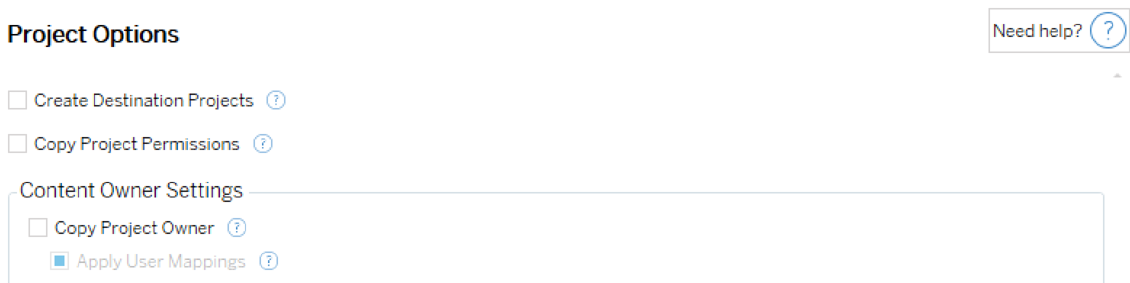
> **Note:** Source projects must contain workbooks or data sources. Content Migration Tool will not migrate empty projects.



You can select each project individually or use the **Select All** button and then clear selections for the projects you don't want to include. If you make any changes on the source site while on this step, you can use the **Refresh** button to update the projects list.


Step 2: Select project options

Once the source projects are selected, select which project options to apply for the destination location. There are options to create projects that don't exist, in addition to copying project permissions and ownership from the source location. To assign new content ownership based on user mappings, select **Apply User Mappings**.




- **Create Destination Projects**: Automatically create projects that don't exist in the destination location. Content Migration Tool will not create destination projects if the source project is empty or no workbooks or data sources are selected. By default, attempts to migrate to a non-existent project will result in a failed migration.
- **Copy Project Permissions**: Copy source project permissions as closely as possible.
- **Copy Project Owner**: Copy project ownership settings from the source location to assign the project owner.
- **Apply User Mappings**: Apply user mappings to assign content ownership of projects in the destination location. Content ownership won't be applied if the destination project

already exists. For more information, see Migration Plans: Permissions and Ownership.

Step 3: Continue to the next step

After selecting the source projects, click **Next** to continue to the Migration Plans: Workbooks section of the planning phase. If you are migrating workbooks between two projects on the same Tableau site, you'll choose your destination project in the next section.

Who can do this

Tableau site user with an Explorer role or higher. To migrate content, you must have **View** and **Download/Save a Copy** capabilities for workbooks on the source site and **View** and **Publish** capabilities for target projects on the destination site. For more information, see Permissions.

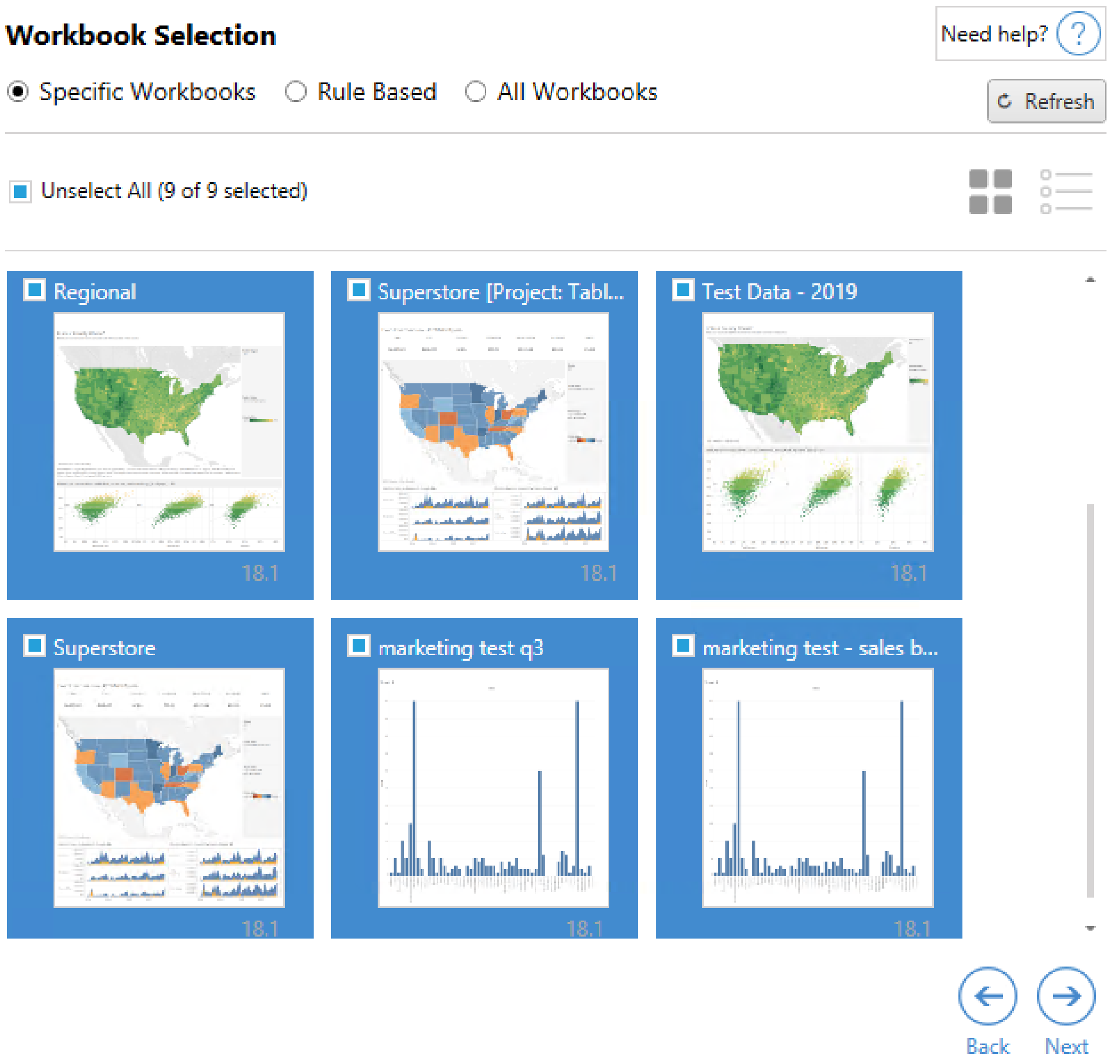
## Migration Plans: Workbooks

You have successfully signed in to your source and destination sites and selected projects. The next step is to prepare your workbooks for migration.

> **Note:** If your workbooks or data sources include extracts, be sure you read and understand the information in Migrate Workbooks and Data Sources with Extracts.

Step 1: Workbook selection

All of the workbooks in the source site and selected projects appear on the **Workbook Selection** screen.




If you make any changes to the workbooks in the source site while on this step, you can click **Refresh** to update the workbook listings. There are several different ways to select these workbooks.

Specific Workbooks Selection

There are three buttons in the **Specific** section. Any choices from the Basic section will immediately include the specifically selected workbook in the migration plan. Alternately, you can individually select specific workbooks by clicking on each one.

## Select All

This button will select or clear selection of all the workbooks in the site. If additional workbooks are added to the site after the plan is saved, they will not be automatically added the next time the plan is used.

## Display:

Thumbnails

The default view shows your workbooks in thumbnail previews to help you differentiate each of them. In this view, mousing over the thumbnail will show previews of the other worksheets and dashboards within that workbook.

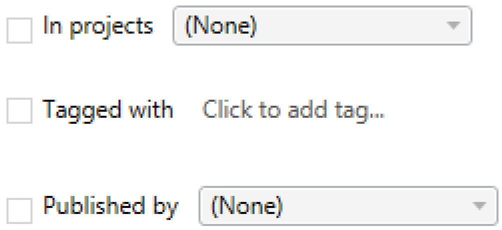
List

The list view is a more succinct listing that also provides additional information, including Workbook Name, Project, Tableau Version, and Last Modified.

Clicking on any of the column headers will sort the workbooks appropriately. Also, mousing over any of the workbooks will also provide a floating preview of the worksheets and dashboards within that workbook. List view is particularly useful if you have a large amount of workbooks in a site.

Rule Based Selection

You can use **Rule Based** selection to choose workbooks based on specific criteria. Rule-based options will create workbook selection criteria to be used when the migration plan is run. Be aware that selecting "all" in any of the **Rule Based** options is different than the **Specific Workbooks** selection. A rule-based "all" selection will always include all workbooks, so any newly added workbooks are included in future migrations.




The **Rule Based** radio button allows you to select workbooks by using the following options:

## Workbooks in projects

This menu allows you to select workbooks from specific projects.

## Workbooks tagged with

This menu allows you to select workbooks by their tags.

## Workbooks published by

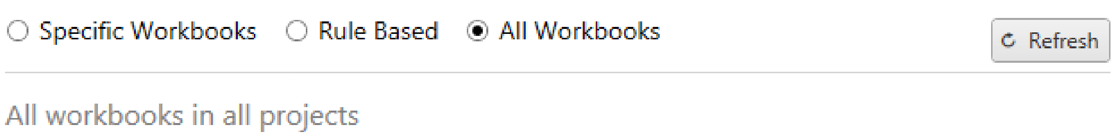
This menu allows you to select workbooks by their author.

With each option, you can select individually or multiple by clicking on the option next to each entry. All selected workbooks will appear in the **Selection Description** box.

All Workbooks Selection

The last option is to select the **All Workbooks** radio button, which selects all workbooks in all projects in the site.

Using the **All Workbooks** radio button is different than selecting all of the workbooks using the **Specific Workbook** method because it will use every workbook in the source site each time the migration plan is used in the future.

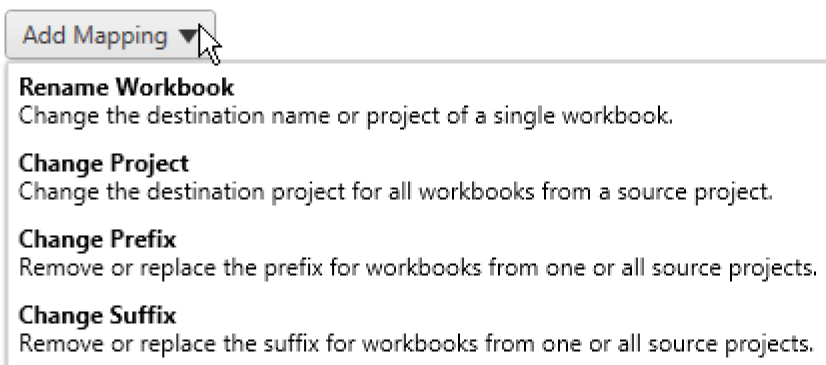


When you are satisfied with your workbook selections, click **Next**.

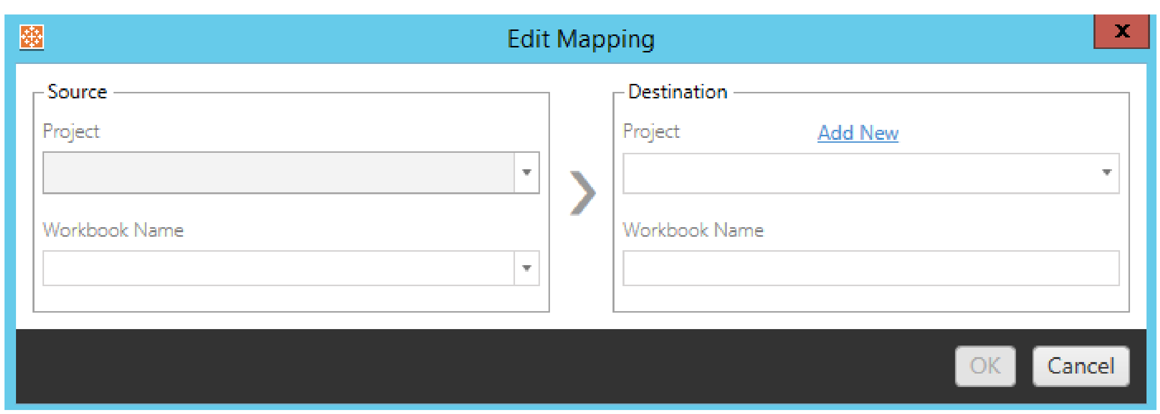
Step 2: Workbook mapping

You can now map your selected workbooks from the source file to the destination file. Mapping allows you to rename source workbooks as they are migrated and choose different destinations. You can also add mapping to change the project, prefix, or suffix for the workbooks as well. Projects can be added to the Destination in this section as well.

If you make no changes here, then the selected workbooks will simply be migrated with the same name and into the same project as the source. If you have not defined projects in your destination site, then they will be migrated into the Default project. To add workbook mapping click the **Add Mapping** button. The following options will appear in the mapping area.

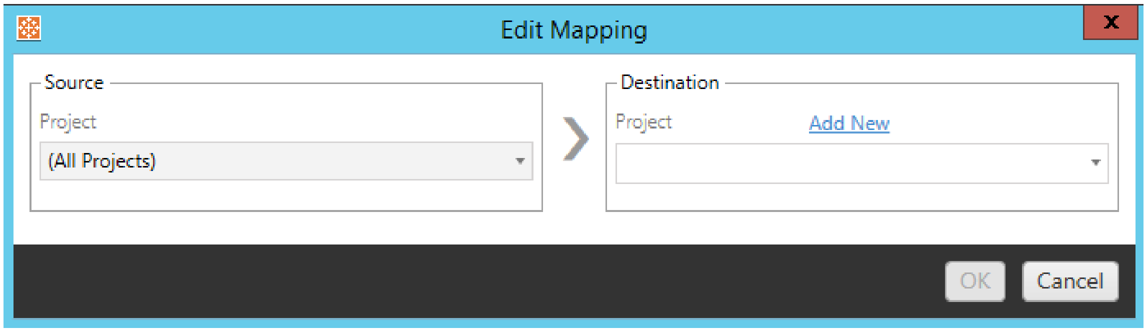



Rename Workbook



This transformation allows you to filter by the **Source** project and select the desired workbook(s) to rename. In the **Destination** field, select which project you would like the workbook to be directed to and enter the desired name.

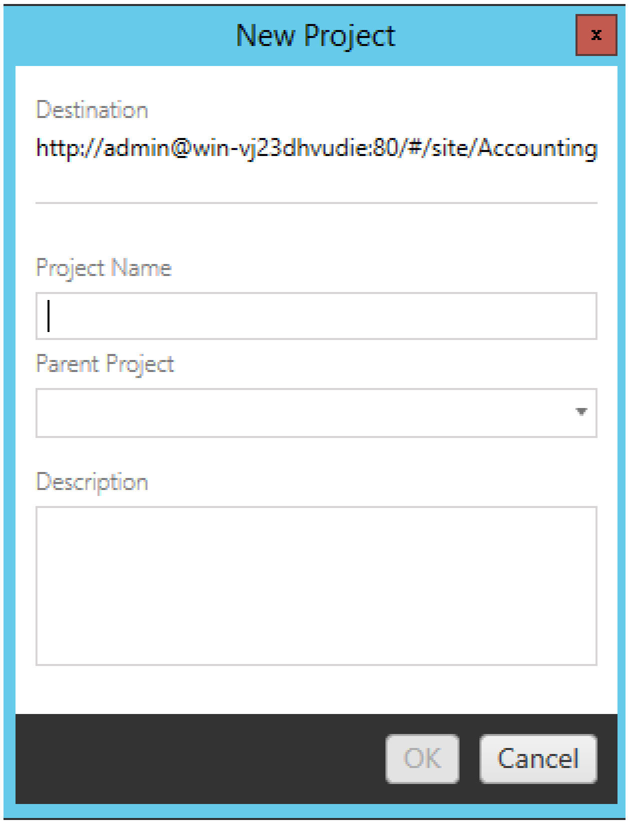
Change Project



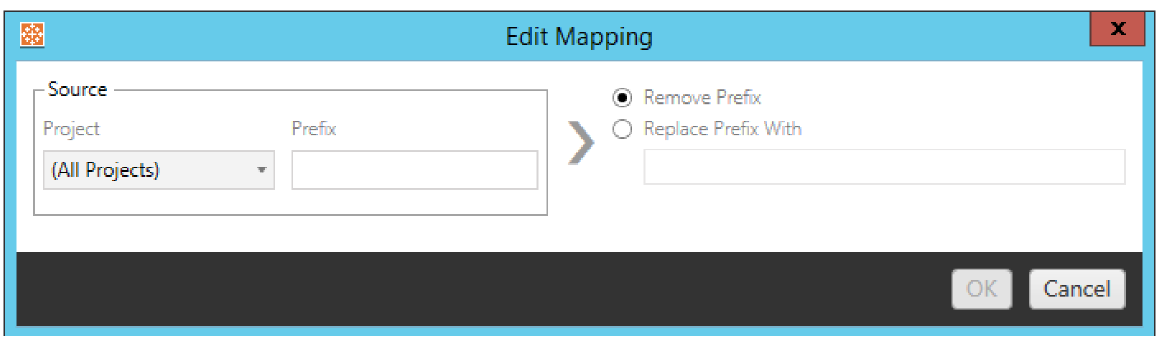

By default, the workbooks are migrated to the same project in the destination. This mapping allows you to change the destination project for all workbooks from a source project.

Add Project

When renaming the workbook or changing the project, the **Add New** option allows you to create a destination project without having to sign in to the destination site and create the project manually. You can create both projects and nested projects using the **Add New** dialog box.




Change Prefix




This allows you to remove or replace the prefix for workbooks from one or all source projects.

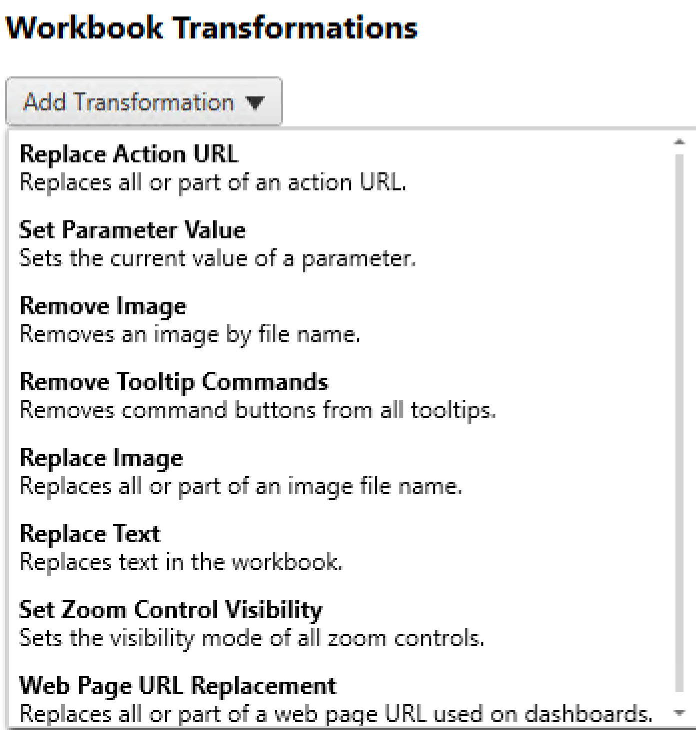
Change Suffix

Like the prefix mapping, you can remove or replace the suffix for workbooks from one or all source projects.

Step 3: Workbook transformations

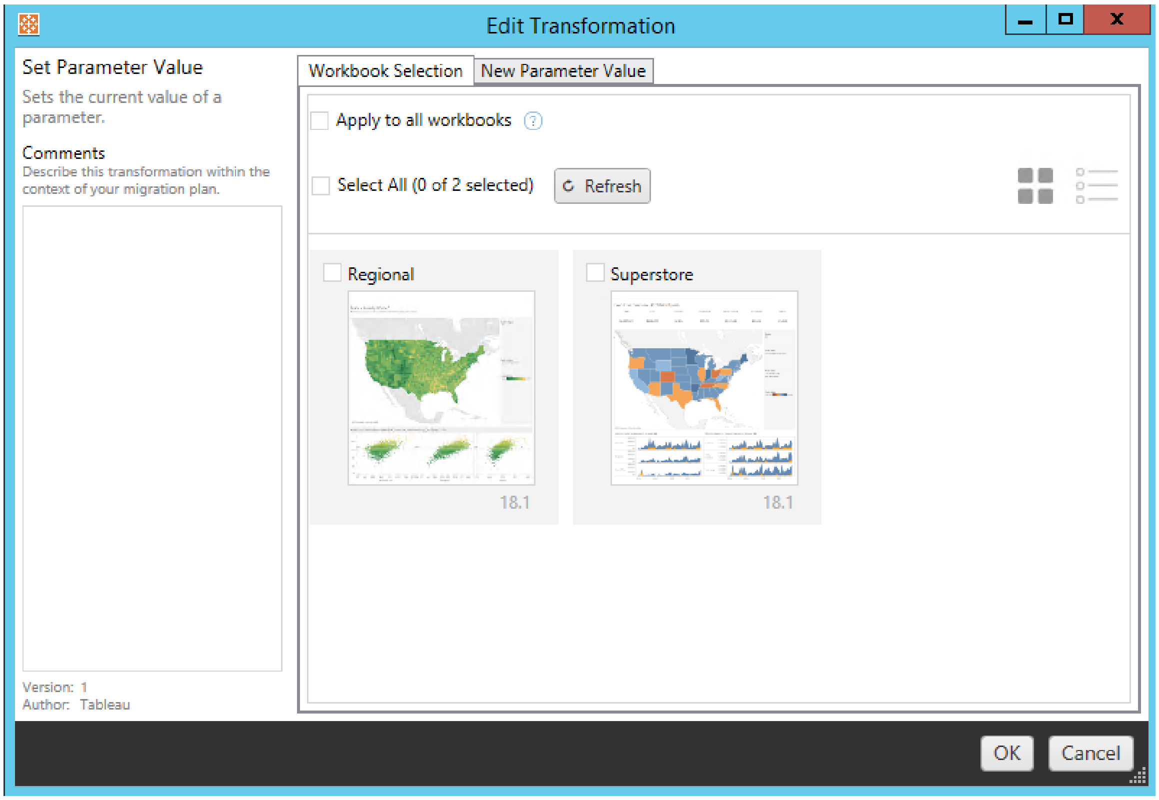
You can change and modify your workbooks by using the Transformation step.


Transformations modify your workbooks in a specified manner. Additional transformations can be included via plug-ins or will be added in future versions of the application. Click on the **Add Transformation** drop-down menu to see the selection of Transformations currently available.

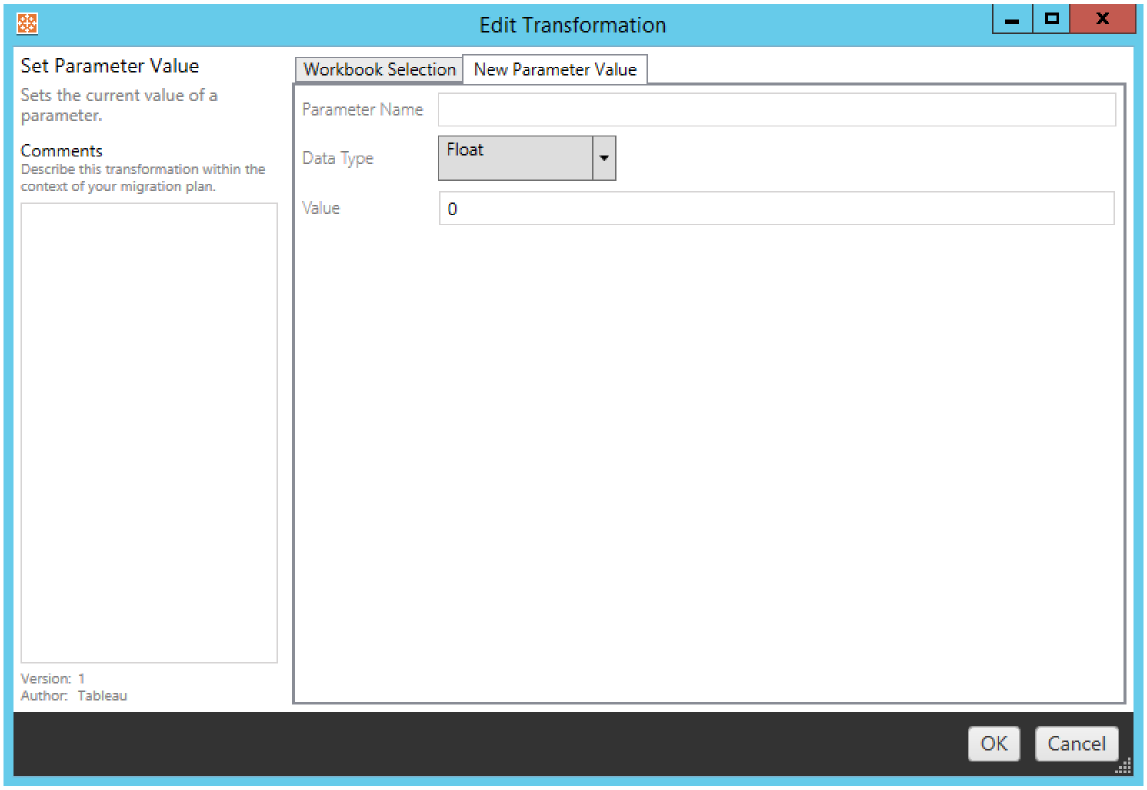



Selecting any of the transformations will bring up the Edit Transformation window, which will allow you to customize it to your selected workbooks. All transformations will be completed in the order that they are listed from top to bottom.

For all of the different types of transformations, there are two basic steps. The first step is to make your selection for the transformation. In this case, select the workbook(s) you want to transform. The selection area is similar to the Workbook Selection section of the Planning phase with all of the features of the Basic selection radio button: **Select/Unselect All**, **Refresh**, **Thumbnail** Display, and **List** Display. At the top of the list, you can select **Select All** workbooks, which is an option to automatically select all workbooks for future transformations. You can also **Refresh** the workbook display window to reflect any changes or updates to the source site.



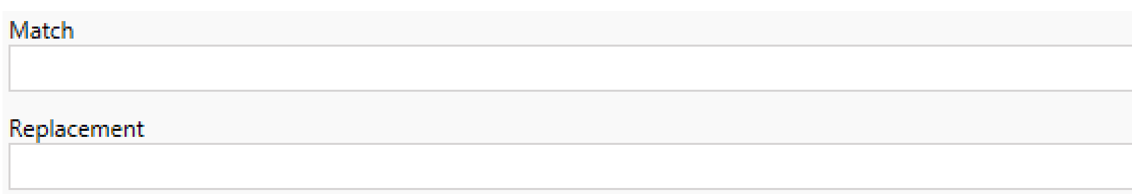

The second step is to use the options tab to enter the specific selections for whichever transformation you select.




Each of the workbook transformations have different values to be entered on the options tab, and the tab will have different names, depending on the transformation you're editing:

Action URL Replacement

Replace part or all of an URL action inside of the workbook using this transformation. On the options tab, enter the text that should be matched and its replacement value.




## Example:

URL: `www.exampledev.com`

Match: `dev`

Replacement: `Prod`

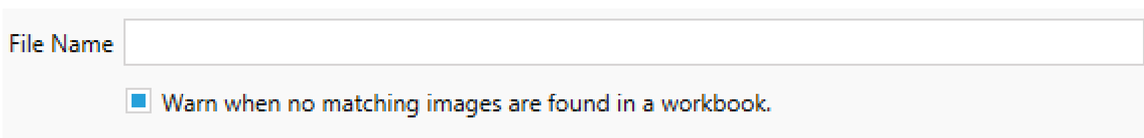
Result: `www.exampleProd.com`

Set Parameter Value

Define a new parameter. On the options tab, enter the name of the Parameter, the data type from the drop-down menu, and the value.


Remove Images

Remove any images (such as a watermark) in the selected workbooks by entering in the file name on the options tab. There is an additional check box to receive a warning during migration if no image is found.

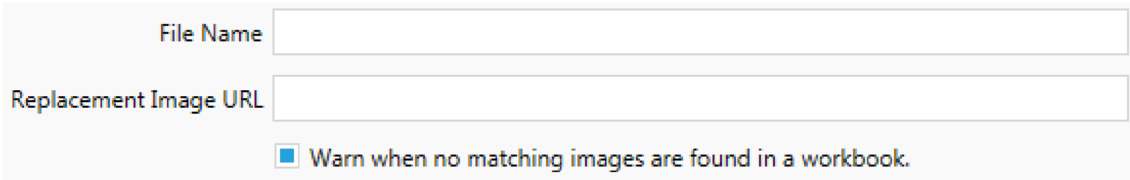



Remove Tooltip Commands

Remove all of the tooltip commands from the selected workbooks. There are no additional options to define for this transformation.

Replace Images

Replace images embedded in the selected workbooks. On the options tab, enter the file name of the current image and the replacement image. You can replace images using a local file path or URL.



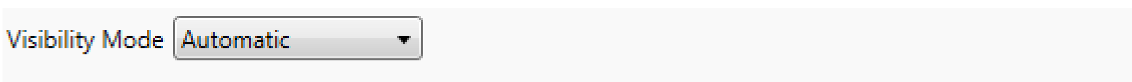

## Example:

File Name: `image.png`

Replacement Image URL: `https://www.exampledev.com/replacementImage.png`

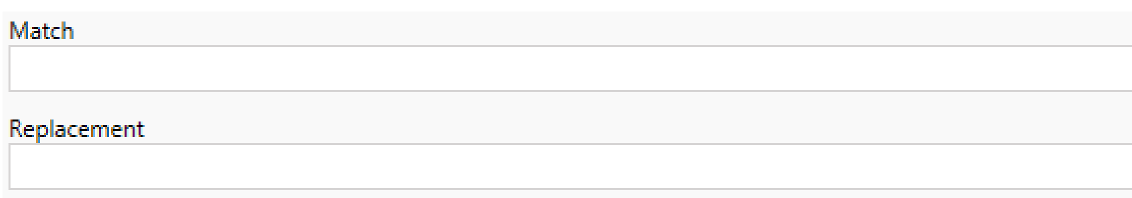
Zoom Control Visibility

Set the visibility mode from the drop-down menu: **Automatic**, **Show on Hover**, or Hide on the options tab.




Web Page URL Replacement

Replace part or all of a web page URL used on dashboards using this transformation. On the options tab, enter the text that should be matched and its replacement value.




## Example:

URL: `www.exampledev.com`

Match: `dev`

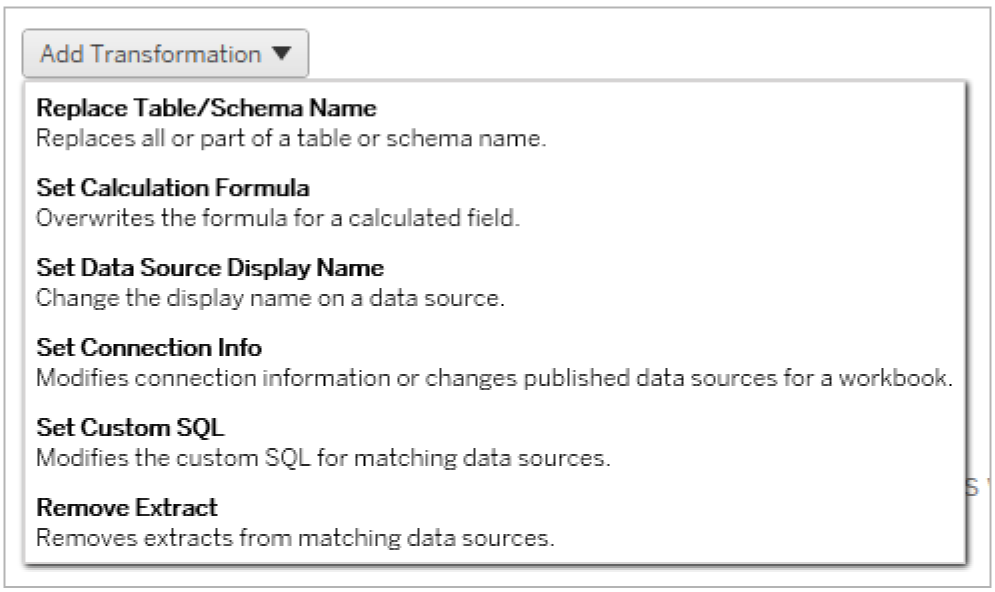
Replacement: `Prod`

Result: `www.exampleProd.com`

Step 4: Data source transformations

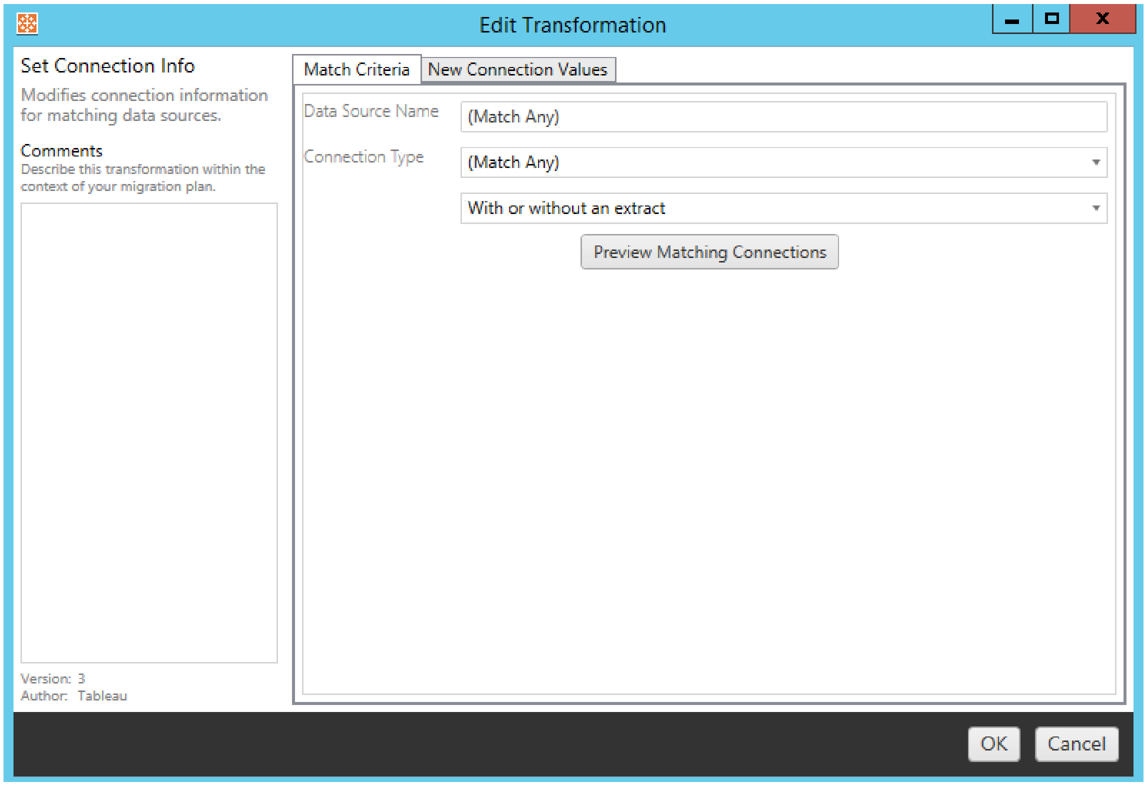
The next step in planning your workbooks for your enterprise migration are your data source transformations. It is similar in function to the Workbook Transformations step. These are for data sources that are packaged within the workbooks. Published data sources are handled in a different step in the process.


Click on the **Add Transformation** drop-down menu and the following options will appear:

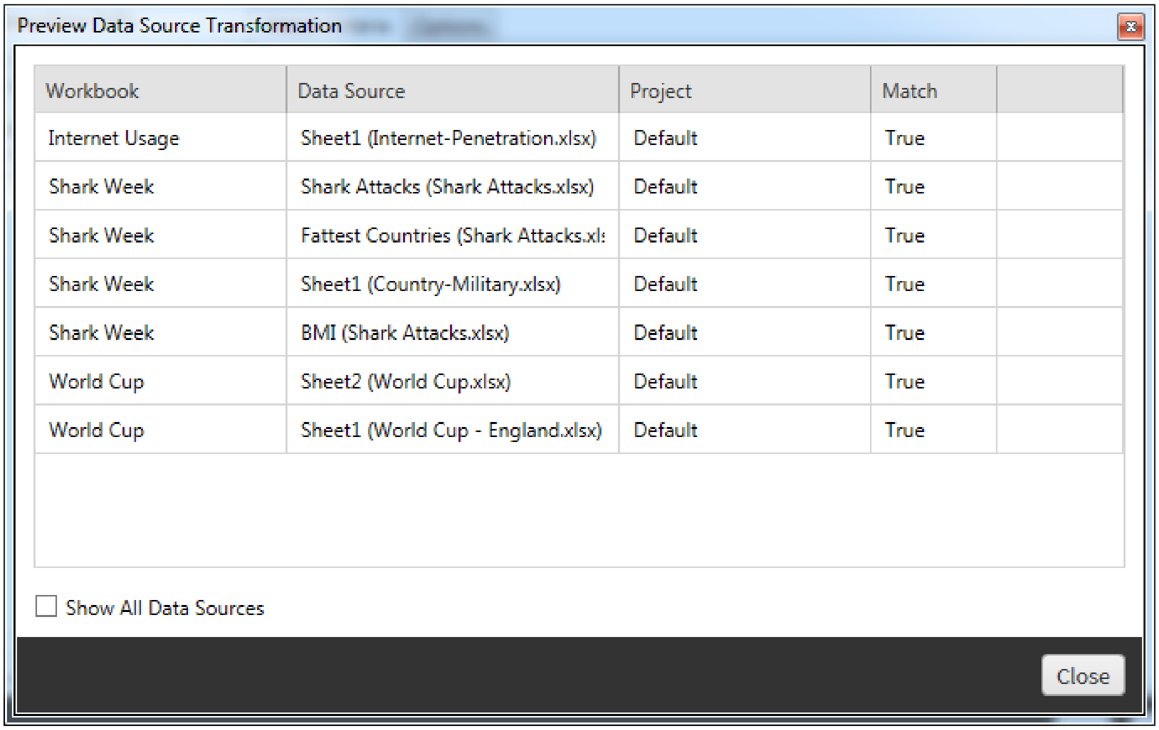



Selecting any of the data source transformations will bring up the Edit Transformation window, which will allow you to customize it to your selected data sources. All transformations will be completed in the order that they are listed from top to bottom.

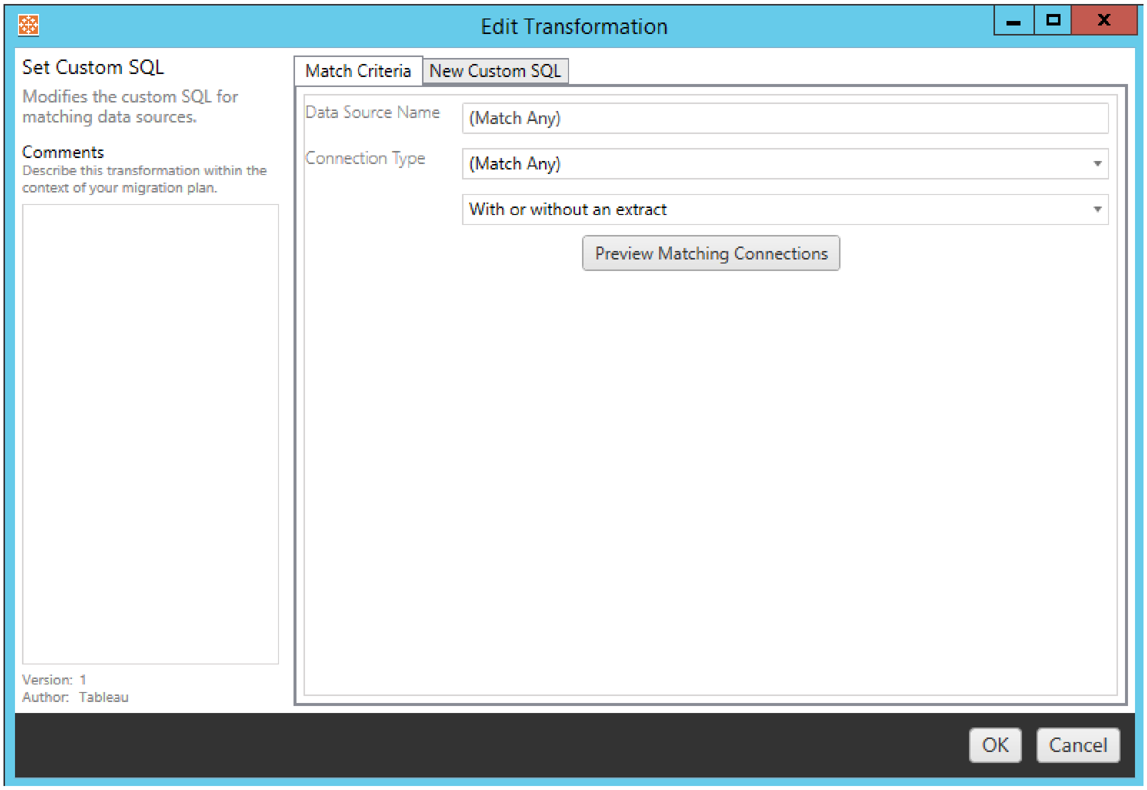
For all of the different types of data source transformations, there are two basic steps. The first step is to enter in the match criteria for the desired data source. Depending on which connection type you select, more fields will appear on the **Match Criteria** tab.




Click on the **Preview Source Connections** to find any connections that match the criteria entered.



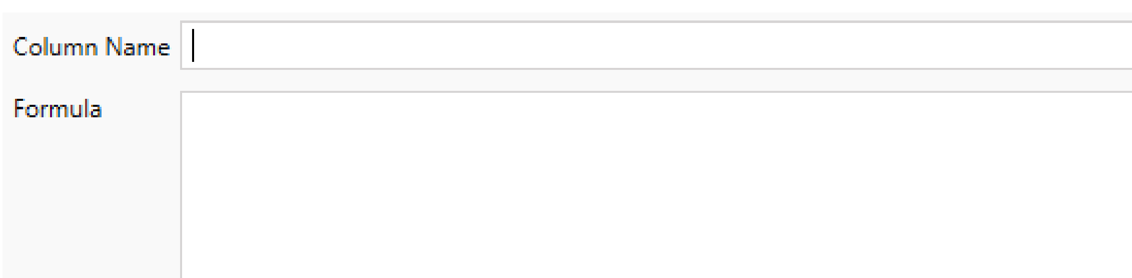

The second step is to use the options tab to enter the specific selections for whichever transformation you select.




Each of the data source transformations have different values to be entered on the options tab:

## Set Calculation Formula

On the options tab, you can replace the calculation for a column.



## Set Connection Info

On the **New Connection Values** tab, enter the authentication method and connection details for the new data source. Depending on which connection type you select, more fields will appear.

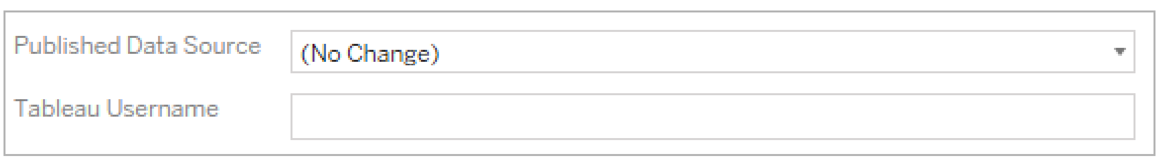
**Change published data sources with CMT**

Select the **Tableau Server (Published Data Source)** connection type to change the published data source for a workbook. This can reduce the manual steps required when migrating workbooks between projects, for example, promoting content from development to production.

To change the published data source, select a data source from the drop-down menu and enter the **Tableau Username** for authentication. The user must exist on the destination site and have the Connect capability for the published data source.

- For file-based data sources, users will access the workbook and see data based on permissions of the specified Tableau user.
- For all other data sources, users are prompted for their own database credentials when the view or workbook loads.

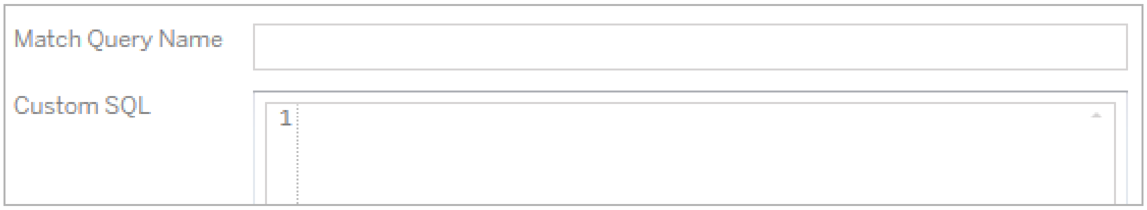
If Tableau Username isn't specified, only users with the Connect capability can see data in the workbook.




## Set Custom SQL

On the **New Custom SQL** tab, enter the name of the custom SQL query you want to modify for **Match Query Name**. The query name must match the custom SQL query name from the physical layer of the data source. If these names don't match, the transformation will fail. For more information about data modeling and the physical layer, see The Tableau Data Model.

After entering the query name, enter the desired **Custom SQL** in the text field. Be aware that custom SQL can negatively impact the performance of your workbooks if improperly used.




## Remove Extract

There is no options tab for this transformation, simply enter in the **Match Criteria** information and the extract will be removed during migration.

In addition, on each of the transformations you can enter notes in the **Comments** section on the left-hand side of the **Edit Transformation** window.

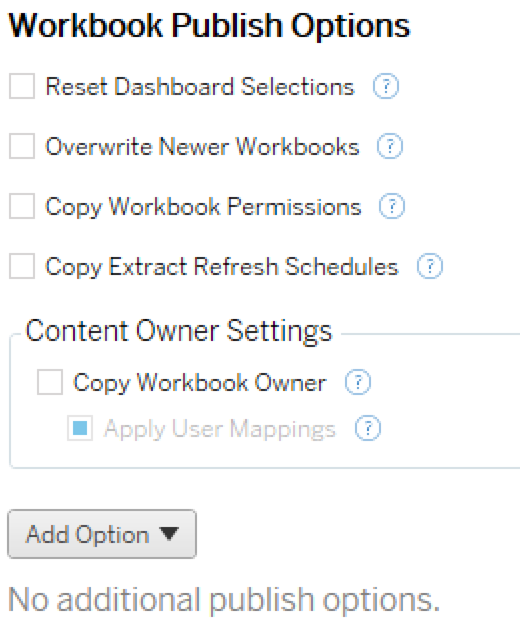
## Apply Saved Credentials

Deprecated in version 2022.3. Use the Set Connection Info data source transformation instead.

On the options tab, enter the **Tableau Username** and corresponding **Saved Credentials Username** for the data connection. You can only apply saved credentials for existing data connections on the Account Settings page of your Tableau site. For more information, see Manage Saved Credentials for Data Connections.


Step 5: Publish options

The final step in the Workbooks phase is to select publish options and create transformations for tags, extract refresh schedules, and permissions.




## Reset Dashboard Selections

This option deselects all objects on dashboards.

## Overwrite Newer Workbooks

If checked, a workbook will be migrated even if it will overwrite a workbook that has been created at the same time or more recently than the moved workbook

## Copy Workbook Permissions

When selected, the migration tool will attempt to match source workbook permissions as closely as possible.

## Copy Extract Refresh Schedules

When selected, the migration tool will attempt to set the destination workbook extract refresh schedule(s) to schedules matching the source's name.

**Note:** Extract refresh schedules cannot be created in Tableau Cloud. This option is not available if the destination is a Tableau Cloud site. For more information, see Migration Limitations.

## Copy Embedded Credentials for Workbooks

Copy the embedded credentials for data sources embedded in workbooks. Only available when migrating from Tableau Server to Tableau Cloud sites. For more information, see Migrate Workbooks and Data Sources with Embedded Credentials.

**Note:** CMT does not support embedded credential migration for OAuth connections. To migrate OAuth credentials to the destination site, use the Set Connection Info data source transformation.

## Copy Workbook Owner

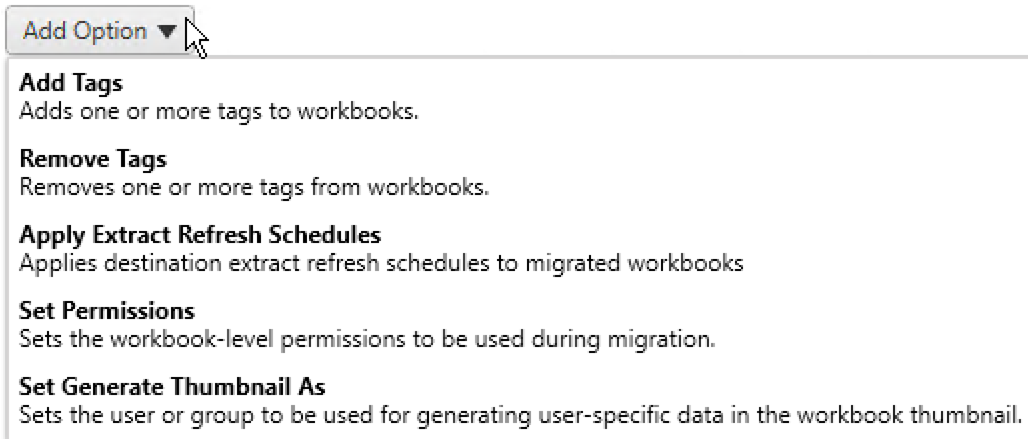
Copy workbook owner settings from the source location to assign the workbook owner. If unselected, the Content Migration Tool user is given ownership of the workbook in the destination location.

## Apply User Mappings

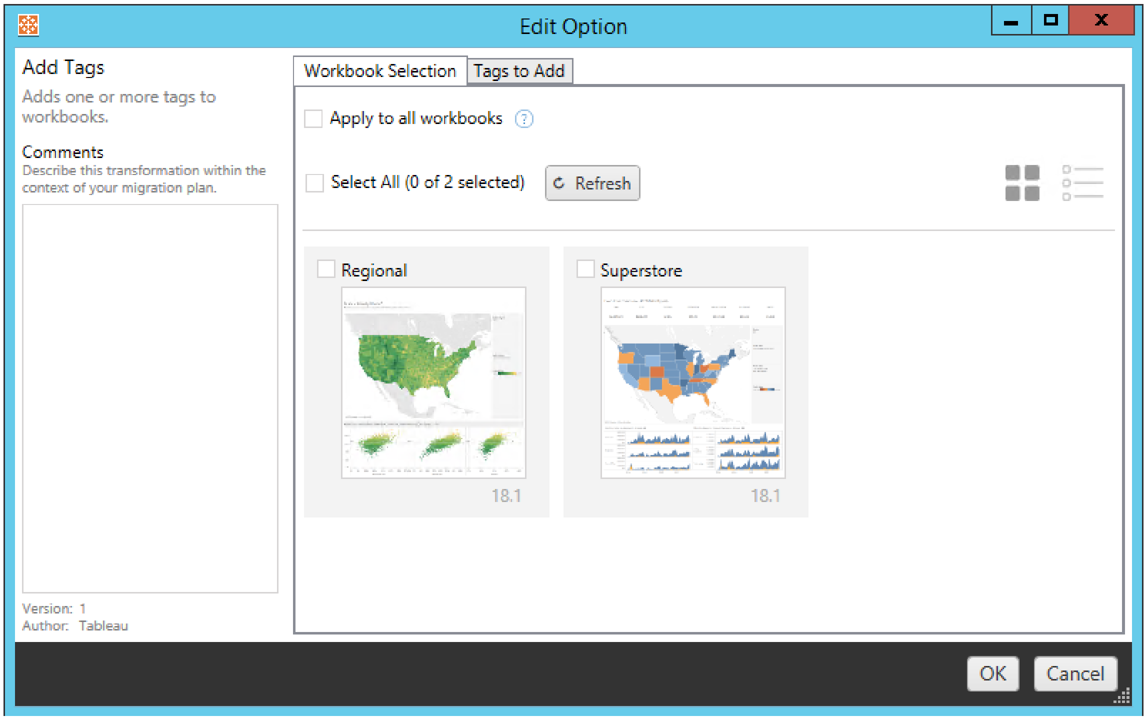
Apply user mappings to assign content ownership. Select this option if there are differences in username syntax in the destination location. For more information, see Migration Plans: Permissions and Ownership.

Add Option

Click on the **Add Option** drop-down menu for the different types of transformations you can add:



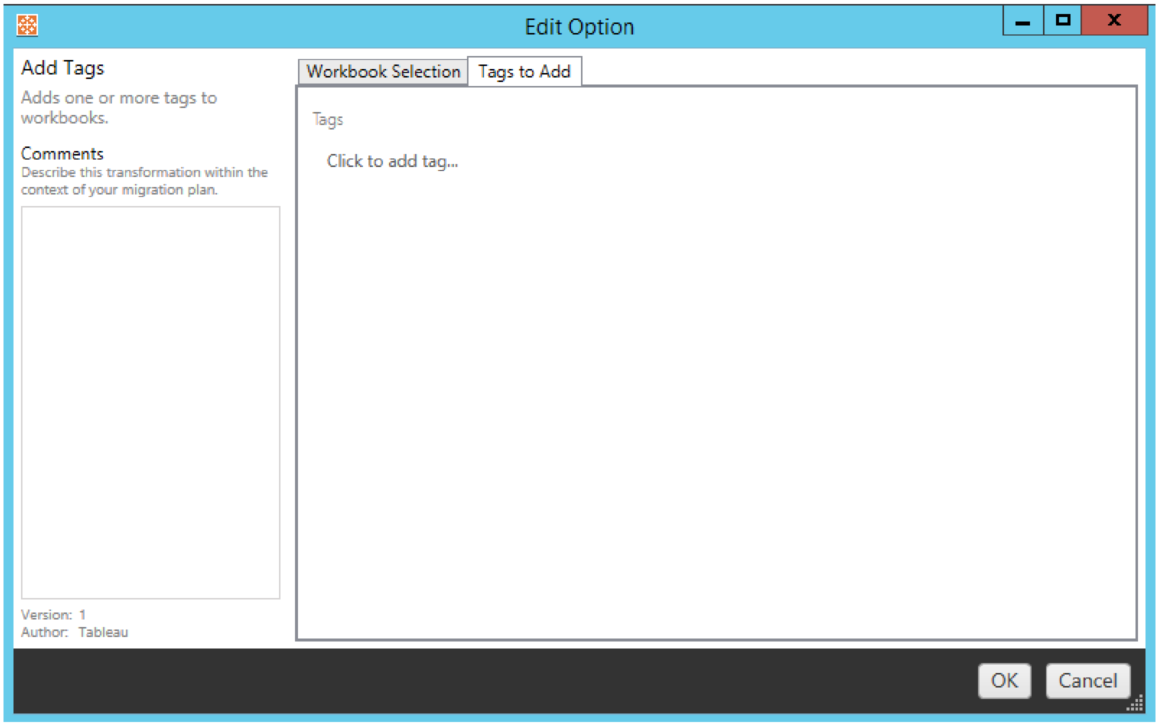

For all of the different types of transformations, there are two basic steps. The first step is to make your selection for the transformation. In this case, select the workbook(s) you want to transform. The selection area is similar to the Workbook Selection section of the Planning phase with all of the features of the Basic selection radio button: **Select/Unselect All**, **Refresh**, **Thumbnail Display**, and **List Display**. At the top of the list, you can select **Select All** workbooks, which is an option to automatically select all workbooks for future transformations. You can also **Refresh** the workbook display window to reflect any changes or updates to the source site.




The second step is to use the options tab to enter the specific selections for whichever transformation you select. **Note:** The options tab will have different names, depending on which transformation you are editing.

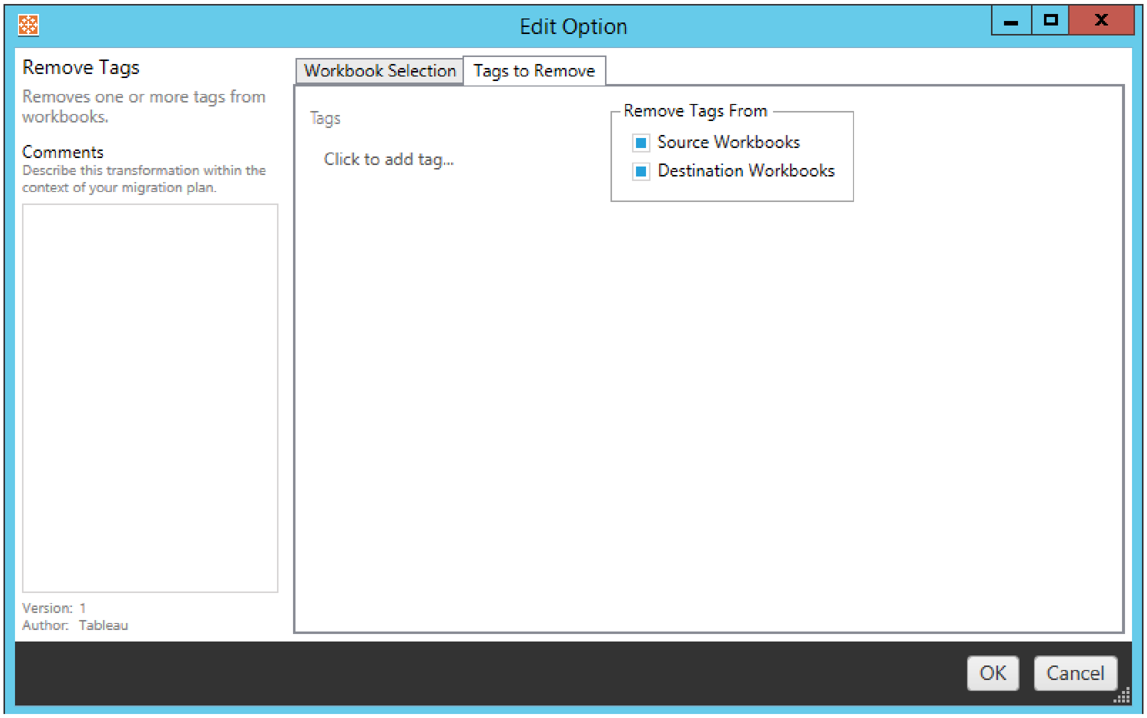
## Add Tags

This allows you to add one or more tags to the workbook. If you hover your mouse over a previously entered tag, a blue “X” will appear to allow deletion.




## Remove Tags

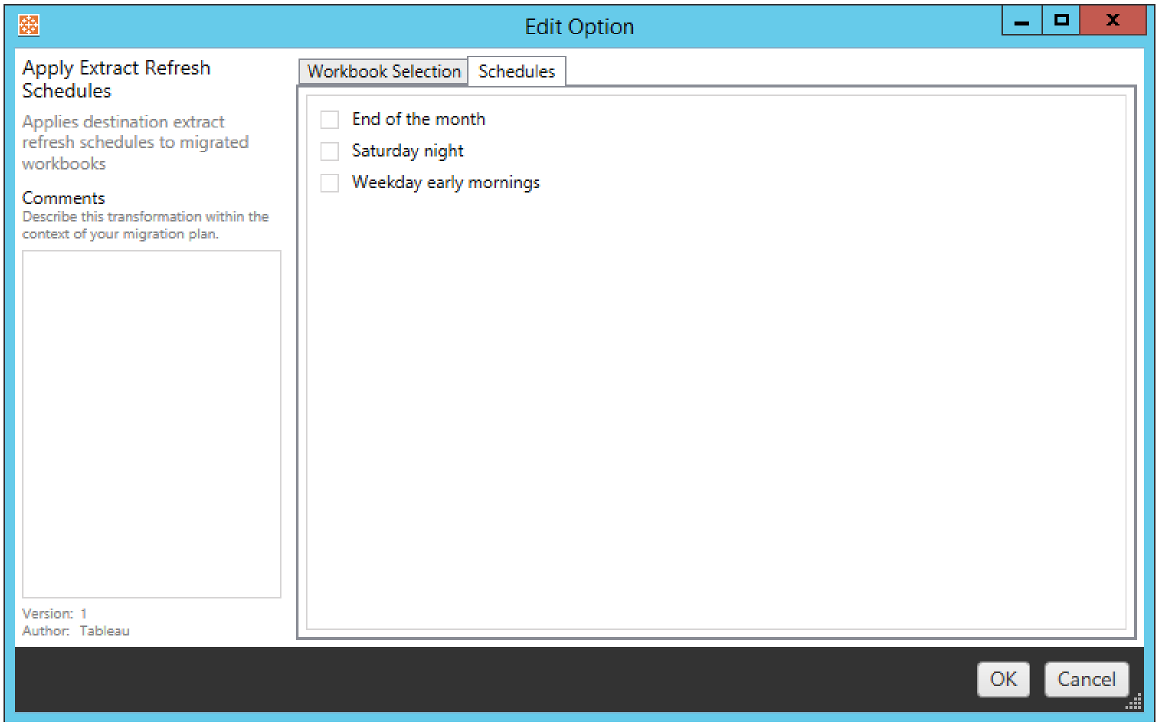
This allows you to add one or more tags to the workbook. If you hover your mouse over a previously entered tag, a blue “X” will appear to allow deletion. You can also choose to remove the tag from the source or destination workbooks.




## Apply Extract Refresh Schedules

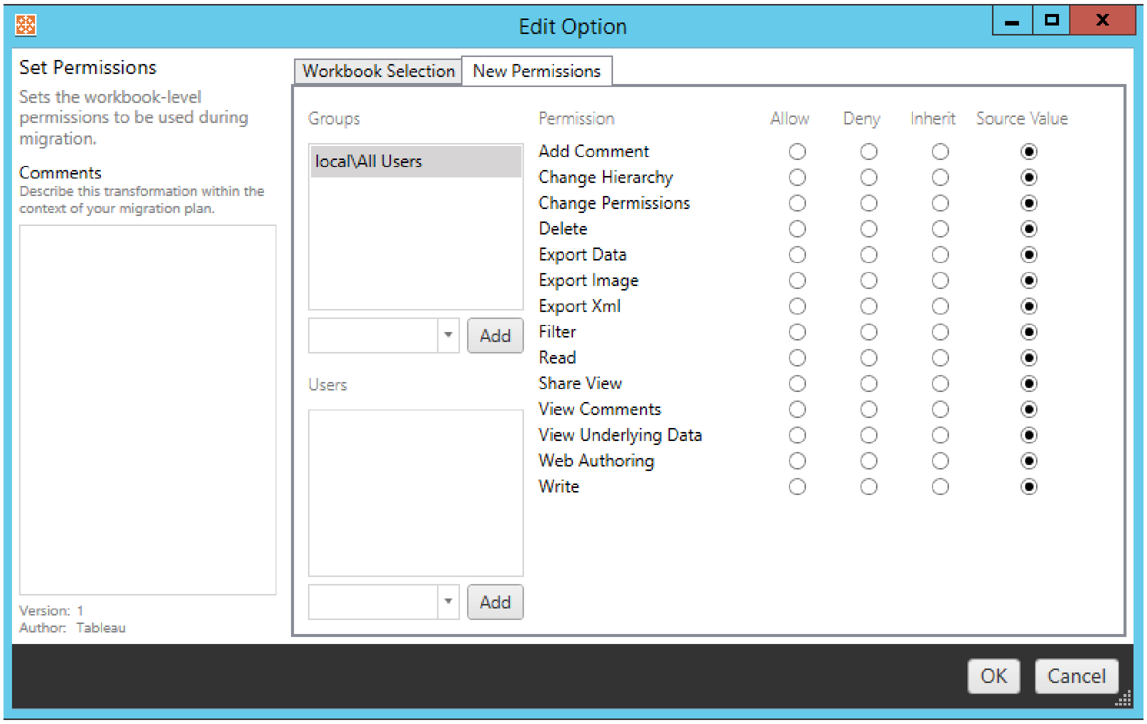
Here you can apply destination extract refresh schedules to migrated workbooks. The list of schedules generated are from the destination.

**Note:** Extract refresh schedules cannot be created in Tableau Cloud. This option is not available if the destination is a Tableau Cloud site. For more information, see Migration Limitations.



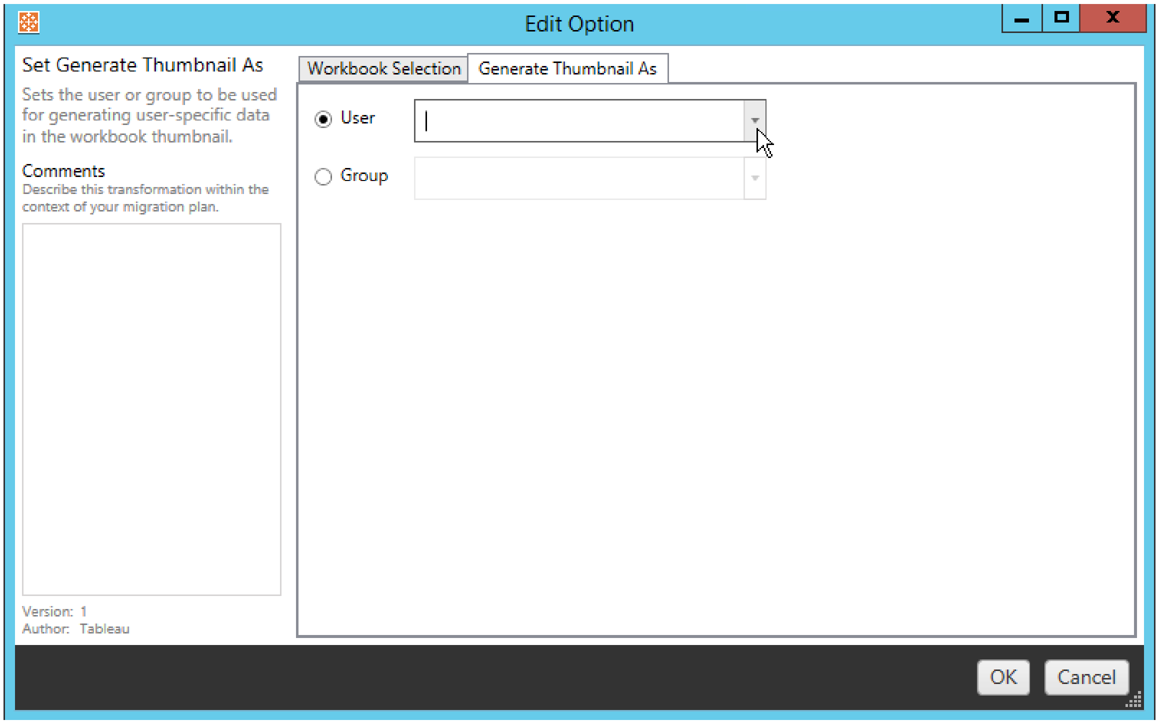

## Set Permissions

This transformation is to edit the permissions for the selected workbooks. Enter in a Group or User and then click **Add**. Adjust the permissions as desired. The four different options are to **Allow** the permission, **Deny** the permission, **Inherit**, or to keep the **Source Value**.




## Set Generate Thumbnail As

This allows you to set the **User** or **Group** to be used for generating user-specific data in the workbook thumbnail after being migrated. Each option has a drop down to select the desired user or group.




Step 6: Continue to the next step

After selecting your workbooks and preferences, click **Next** to continue to the Migration Plans: Published Data Sources section of the planning phase.

Who can do this

Tableau site user with an Explorer role or higher. To migrate content, you must have **View** and **Download/Save a Copy** capabilities for workbooks on the source site and **View** and **Publish** capabilities for target projects on the destination site. For more information, see Permissions.

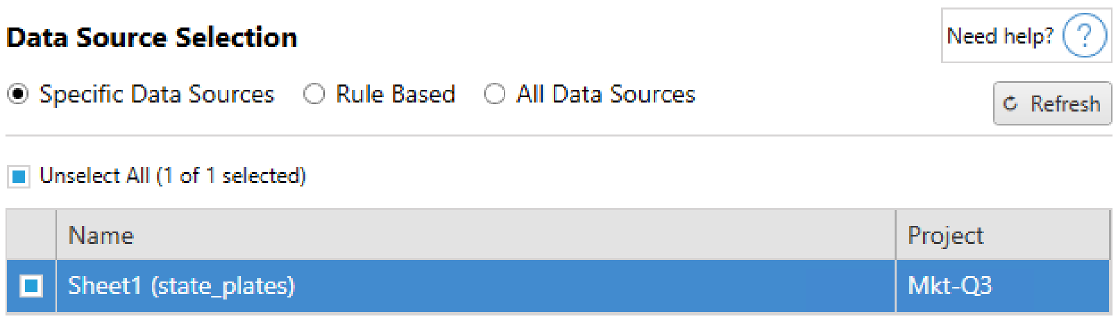
## Migration Plans: Published Data Sources

The next step of creating a migration plan in the Tableau Content Migration Tool is to select, map, and add any transformations to your published data sources. The process is very similar to the Workbooks step of the planning phase, particularly the data source mapping step.

**Note:** If your workbooks or data sources include extracts, be sure you read and understand the information in Migrate Workbooks and Data Sources with Extracts.

Step 1: Selection

Starting the Published Data Sources phase of the migration plan, you'll select any data sources you want to include in the migration plan:

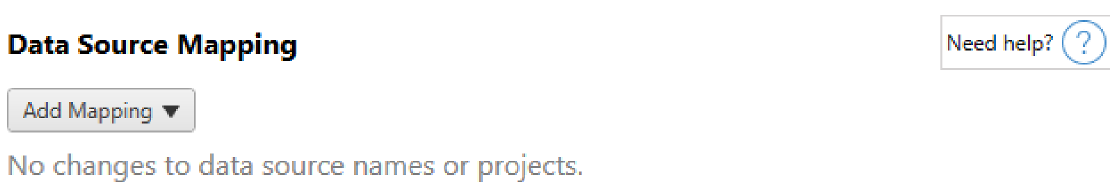



The data sources will only be selected at the moment of migration. You have two methods of selection. Use **Specific Data Sources** to choose one or more published data sources. Click **Refresh** to reload the list of published data sources available.

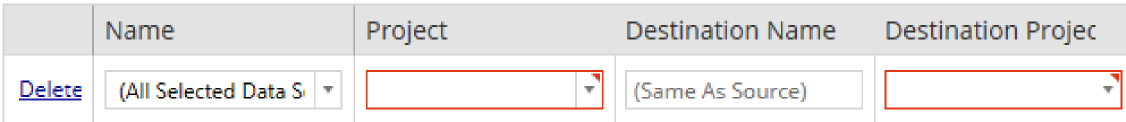
The second option is **All Data Sources**, which selects every data source in the source site.

Step 2: Mapping

The next step is to map your source data sources to the new destination. This is similar in functionality to mapping workbooks.




If you make no changes here, then the selected data sources will simply be deployed with the same name and project as the source. To add data source mapping click **Add Mapping**. The following options will appear in the mapping area.




The entry has the following options:

Delete

Clicking the **Delete** link will delete this mapping entry.

Name

Use the **Name** menu to select the data source you wish to map. You can select **(All Selected Data Sources)** to choose all of the data sources.

Project

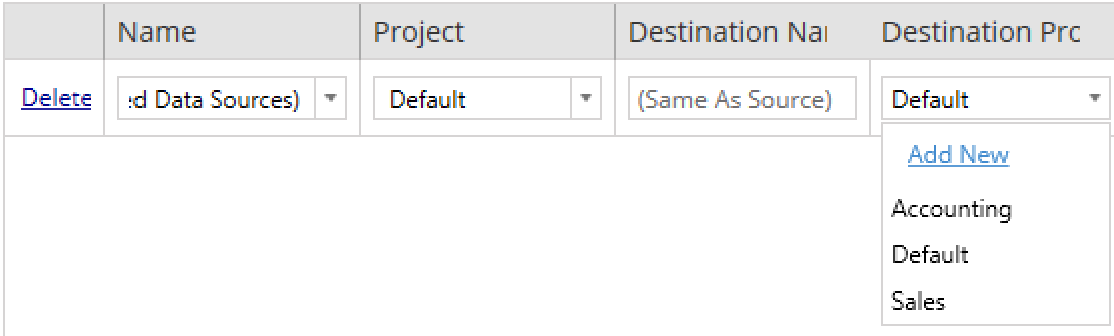
The **Project** is the project of the associated data source names.

Destination Name

By default, the Content Migration Tool will use the same **Destination Name(Same As Source)**, keeping the original name in the Source file, but you can type in a new name here for the destination folder.

Destination Project

If your destination projects have already been created on your site, you can choose which project to place your migrated workbooks or click **Add New** to create a new project. You can create different project destinations for individual data sources.

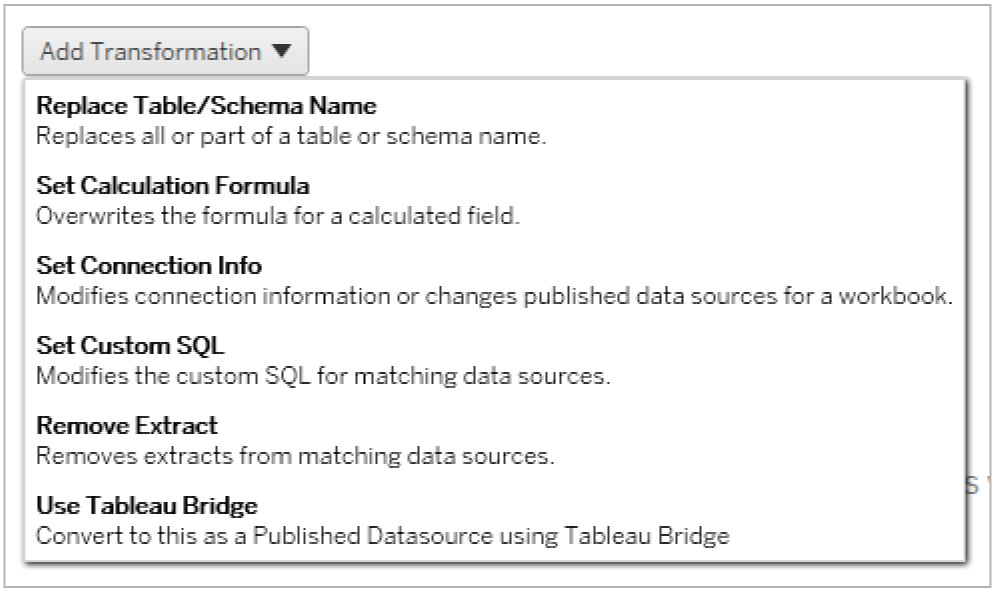



In most situations if multiple mapping entries exist for a single data source, a validation error will be displayed and must be fixed to continue. There is one important exception to this – a data source may match both a specific selection and a project-wide mapping entry. In this instance, the more specific entry will be used.

When you have completed all of the data source mapping necessary, click **Next** to continue.

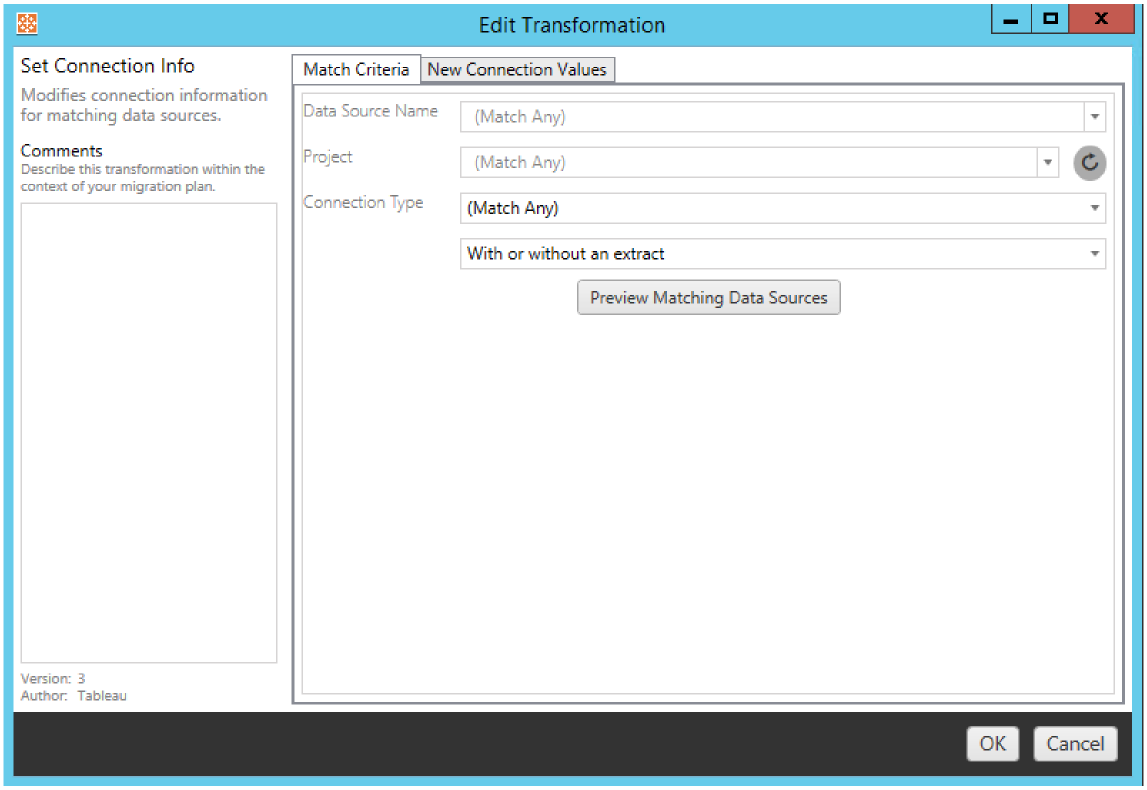

Step 3: Data source transformations

You can modify your data sources by using the transformation option. Click **Add Transformation** to see the list of transformations available.




Selecting any of the data source transformations opens the **Edit Transformation** window. Use this to customize your selected data sources. Transformations are executed in the order they are listed, from top to bottom.

For most data source transformations, there are two basic steps. The first step is to enter in the **Match Criteria** for the desired data source. Depending on which connection type you select, more fields will appear on the **Match Criteria** tab.




The second step depends on which transformation type you are adding. Each of the data source transformations have different values to be entered on the second tab.

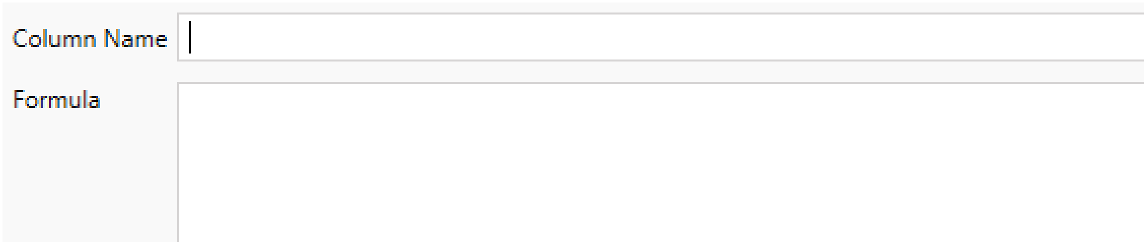
You can add notes in the **Comments** section on the left side of the **Edit Transformation** window for each of the transformations you add.

Replace Table/Schema Name

On the **Options** tab, you can replace all or part of a table or schema name.

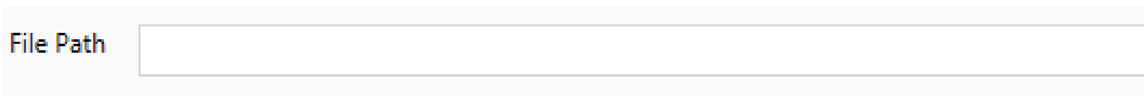
Set Calculation Formula

On the **New Calculation Formula** tab, you can replace the calculation for a column.




Set Connection Info

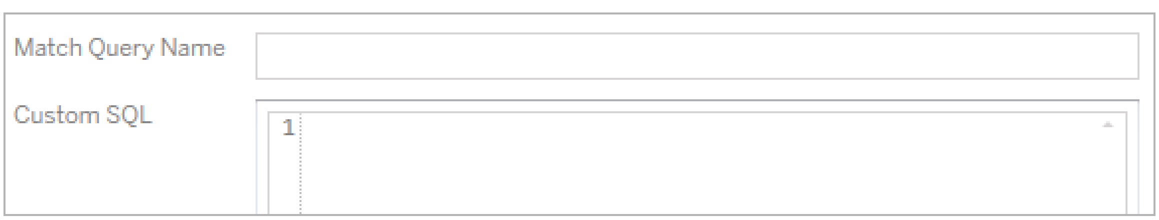
On the **New Connection Values** tab, enter the authentication method and connection details for the new data source. Depending on which connection type you select, more fields will appear.




Set Custom SQL

On the **New Custom SQL** tab, enter the name of the custom SQL query you want to modify for **Match Query Name**. The query name must match the custom SQL query name from the physical layer of the data source. If these names don't match, the transformation will fail. For more information about data modeling and the physical layer, see The Tableau Data Model.

After entering the query name, enter the desired **Custom SQL** in the text field. Be aware that custom SQL can negatively impact the performance of your workbooks if improperly used.




Remove Extract

There is no **Options** tab for this transformation. Type the **Match Criteria** information and the extract will be removed during migration.

Use Tableau Bridge

There is no **Options** tab for this transformation. Type the **Match Criteria** information and data sources that are within a private network (inaccessible to the public internet) will be allowed to refresh using Tableau Bridge.

The destination Tableau Cloud site must have Tableau Bridge configured before migrating data sources. For information about Tableau Bridge, see Use Tableau Bridge in Tableau Cloud help. After the migration, data sources will need to be assigned a refresh schedule through Tableau Cloud.

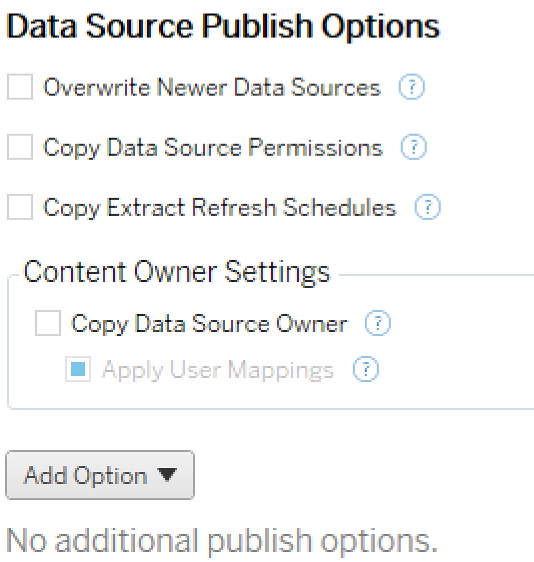
Apply Saved Credentials

Deprecated in version 2022.3. Use the Set Connection Info data source transformation instead.

On the options tab, enter the **Tableau Username** and corresponding **Saved Credentials Username** for the data connection. You can only apply saved credentials for existing data connections on the Account Settings page of your Tableau site. For more information, see Manage Saved Credentials for Data Connections.


Step 4: Publish options

The final step in the Published Data Source phase is to create transformations for permissions and tags and finalize the publish options specific to the data sources.




### Overwrite Newer Data Sources

If selected, a data source will be published even if it will overwrite a data source that has been updated more recently.

### Copy Data Source Permissions

When selected, the migration tool will attempt to match source published data source permissions as closely as possible.

### Copy Extract Refresh Schedules

When selected, the migration tool will attempt to set the destination data source extract refresh schedule to schedules matching the source's name.

> **Note:** Extract refresh schedules cannot be created in Tableau Cloud. This option is not available if the destination is a Tableau Cloud site. For more information, see Migration Limitations.

## Copy Embedded Credentials for Data Sources

Copy the embedded credentials for published data sources. Only available when migrating from Tableau Server to Tableau Cloud sites. For more information, see Migrate Workbooks and Data Sources with Embedded Credentials.

**Note:** CMT does not support embedded credential migration for OAuth connections. To migrate OAuth credentials to the destination site, use the Set Connection Info data source transformation.

## Copy Data Source Owner

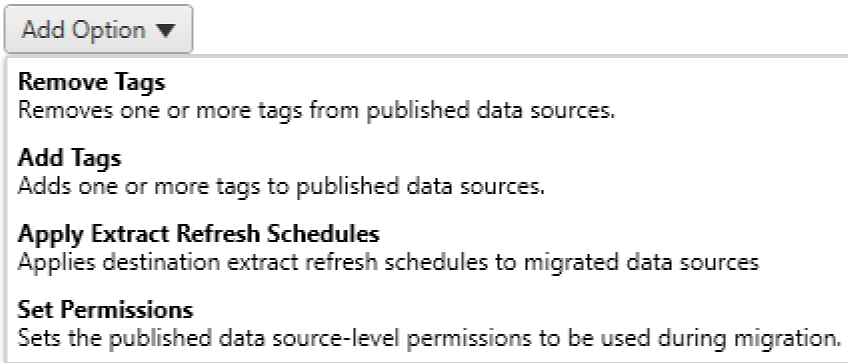
Copy data source owner settings from the source location to assign the data source owner. If unselected, the Content Migration Tool user is given ownership of the data source in the destination location.

## Apply User Mappings

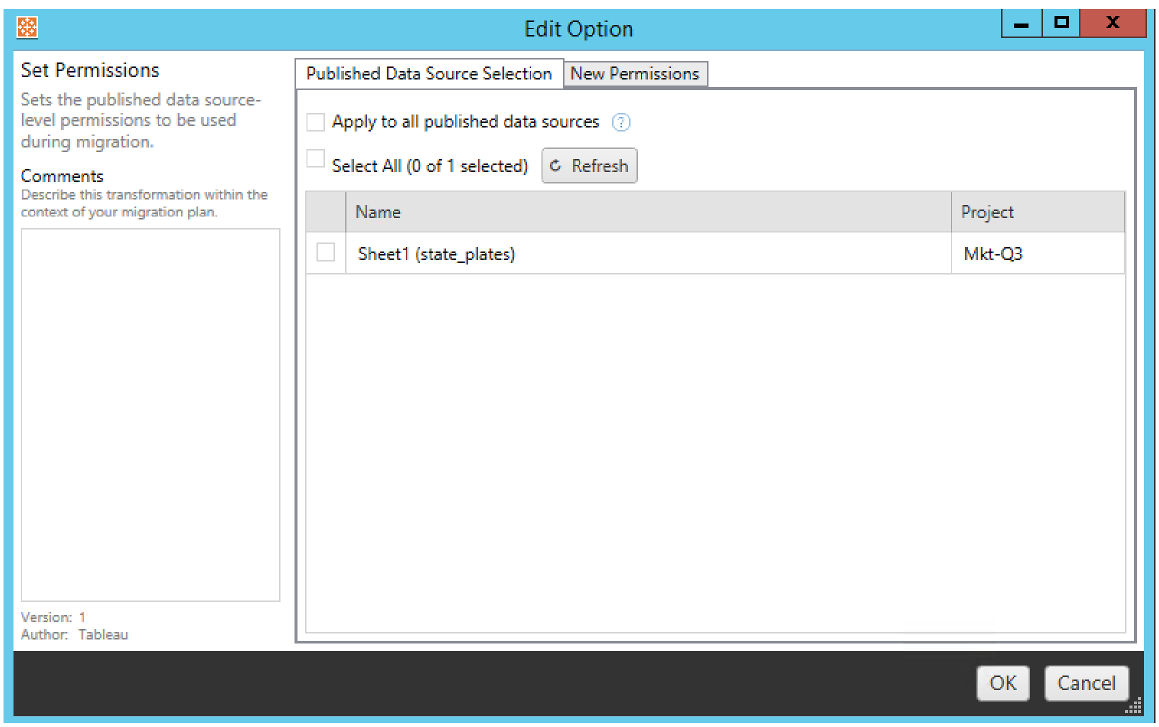
Apply user mappings to assign content ownership. Select this option if there are differences in username syntax in the destination location. For more information, see Migration Plans: Permissions and Ownership.

Add Options

Click on the **Add Option** drop-down menu for the different types of transformations you can add:



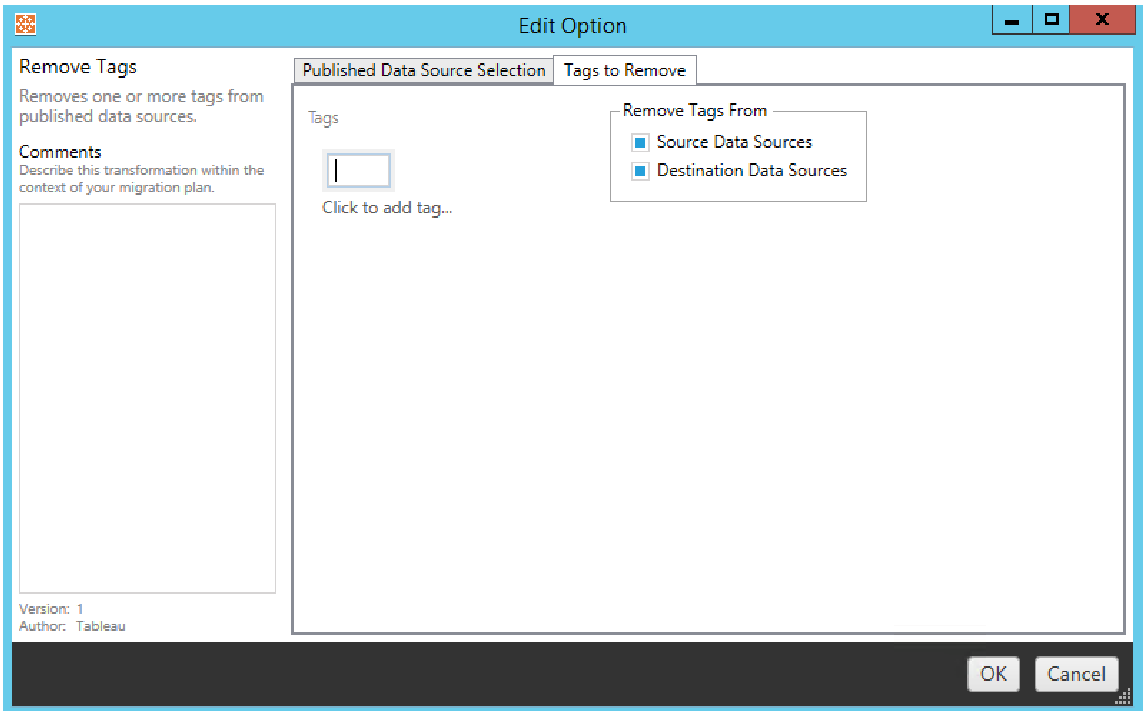

For all of the different types of transformations, there are two basic steps. The first step is to make your selection for the transformation. In this case, select the data source(s) you want to transform. At the top of the list, you can select **Apply to all published data sources**, which is an option to automatically select all data sources for future transformations. You can also **Refresh** the data source display window to reflect any changes or updates to the source site.




The second step is to enter the specific selections for the transformation you select.

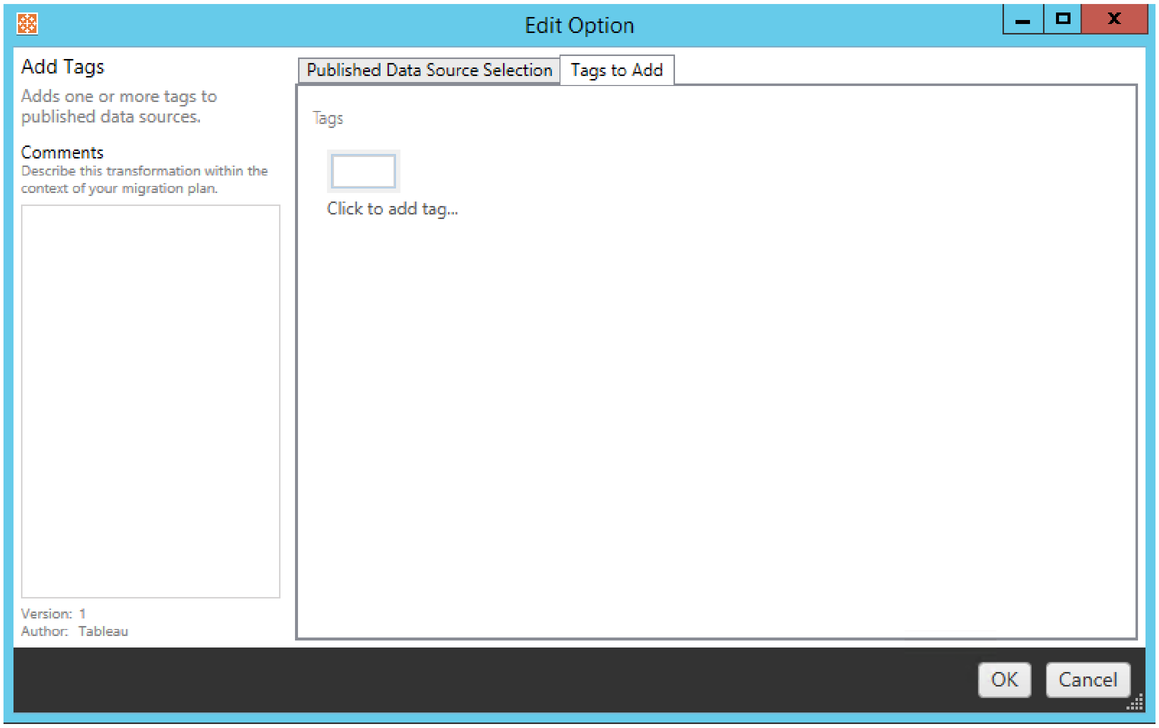
Remove Tags

Once the data sources you would like to remove tags from are selected, enter any tags you want to remove by entering them into the field at the bottom and click **Add**. From this screen, you can also select to remove from the source or destination data sources. If you want to remove a previously entered tag, click on it and press the delete key.




Add Tags

After selecting the data sources desired, enter any tags you want to assign by entering them into the field at the bottom and click **Add**. If you want to remove a tag, click on it and press the delete key.

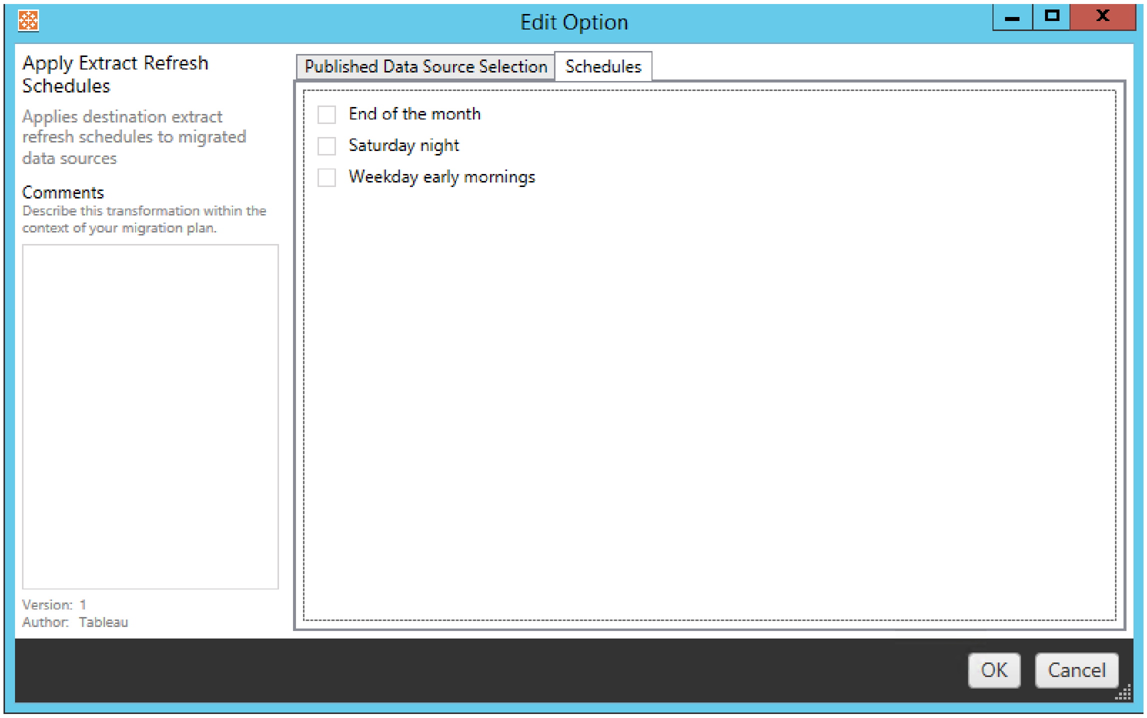



In addition, on each of the transformations you can enter notes in the **Comments** section on the left-hand side of the Edit Transformation window.

Apply Extract Refresh Schedules

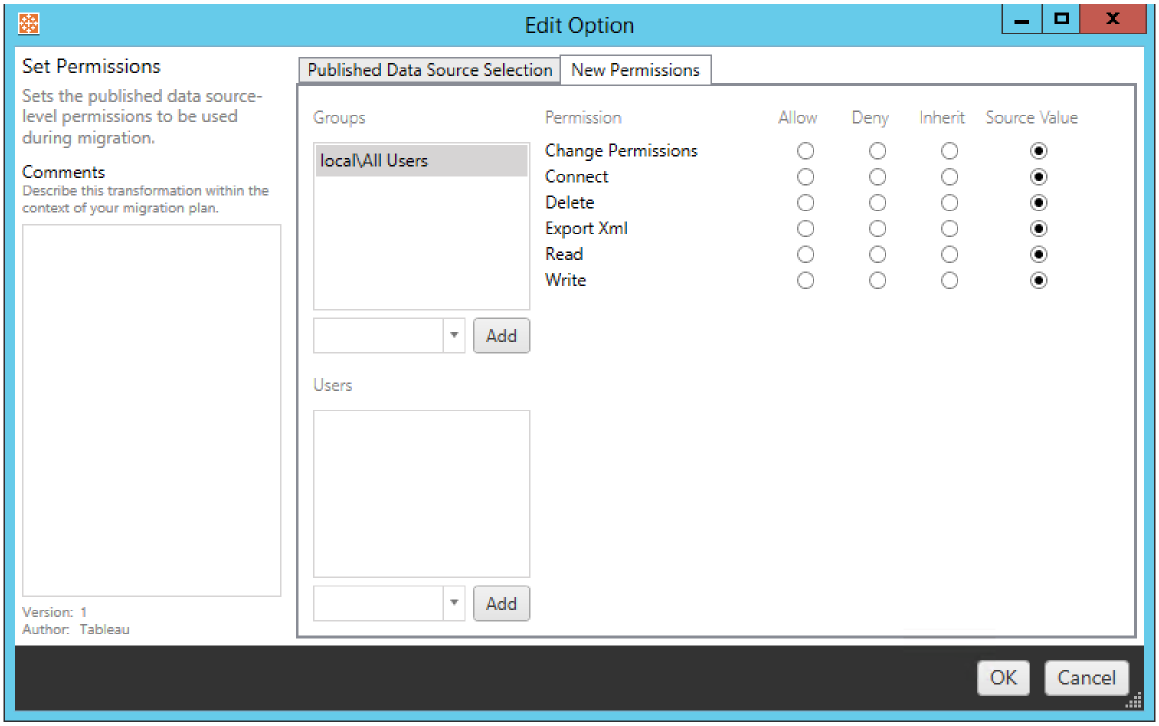
This transformation applies destination extract refresh schedules to migrated data sources. The list of schedules generated are from the destination.

> **Note:** Extract refresh schedules cannot be created in Tableau Cloud. This option is not available if the destination is a Tableau Cloud site. For more information, see Migration Limitations.




Set Permissions

The last type of transformation is to edit the permissions for the selected data sources. Enter in a Group or User and click **Add**. Adjust the permissions as desired. The four different options are to **Allow** the permission, **Deny** the permission, **Inherit**, or to keep the **Source Value**.




Step 5: Continue to the next step

When you are ready, click **Next** to continue to the Migration Plans: Permissions and Ownership section of the planning phase.

Who can do this

Tableau site user with an Explorer role or higher. To migrate content, you must have **View** and **Download/Save a Copy** capabilities for workbooks on the source site and **View** and **Publish** capabilities for target projects on the destination site. For more information, see Permissions.

## Migration Plans: Permissions and Ownership

The Content Migration Tool allows you to replicate workbook and data source permissions to different users. You can create user permissions mappings to customize and secure content after it has been published to the destination location. Mappings are applied if **Copy Project Permissions**, **Copy Workbook Permissions**, or **Copy Data Source Permissions** have been selected earlier in the planning phase, along with **Apply User Mappings**.

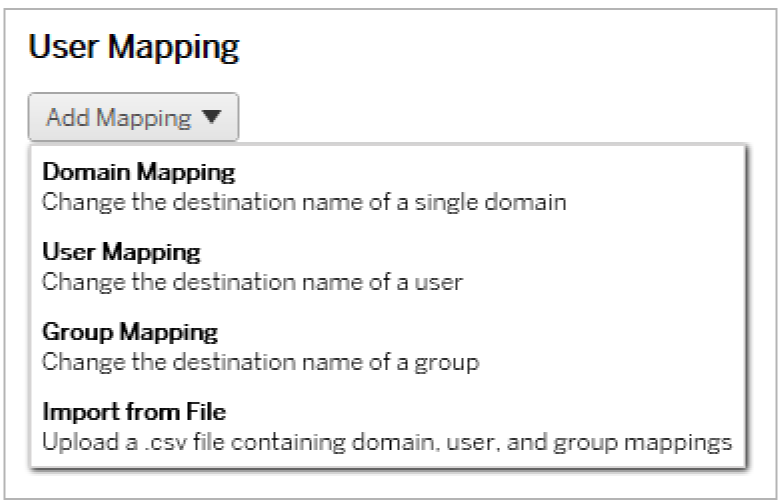
For more information, see Migration Plans: Source Projects, Migration Plans: Workbooks, and Migration Plans: Published Data Sources.

Mapping limitations

- Content Migration Tool will stop the migration process if it fails to find the mapped user or group in the destination location. Subsequent user or group permissions mappings are not checked after the first failure, and the plan must be run again.
- Content Migration Tool cannot replicate permissions if the source content has permissions for multiple users and groups with identical names. This only occurs when there are duplicate user or group names sourced from separate domains.

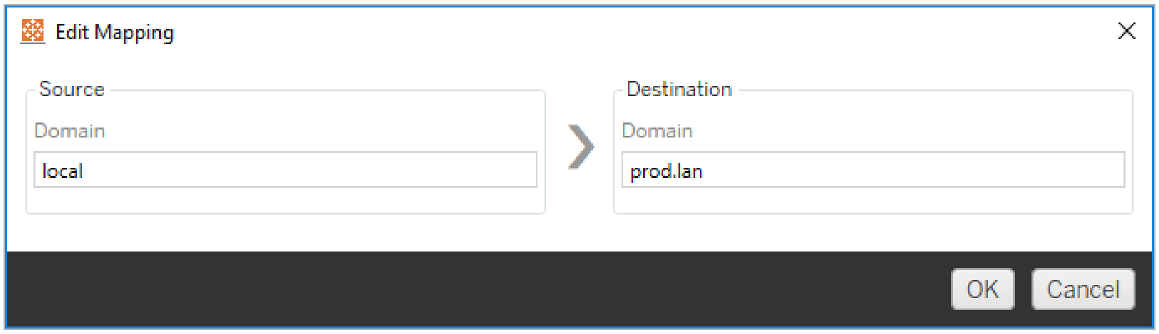
Step 1: Add mapping

To add user permissions mapping, click **Add Mapping** and select whether to change the name of a domain, user, group or to import mappings from a comma-separated values (CSV) file. If Content Migration Tool is unable to match a permission in the destination location, the source content will not be migrated.




Domain Mapping

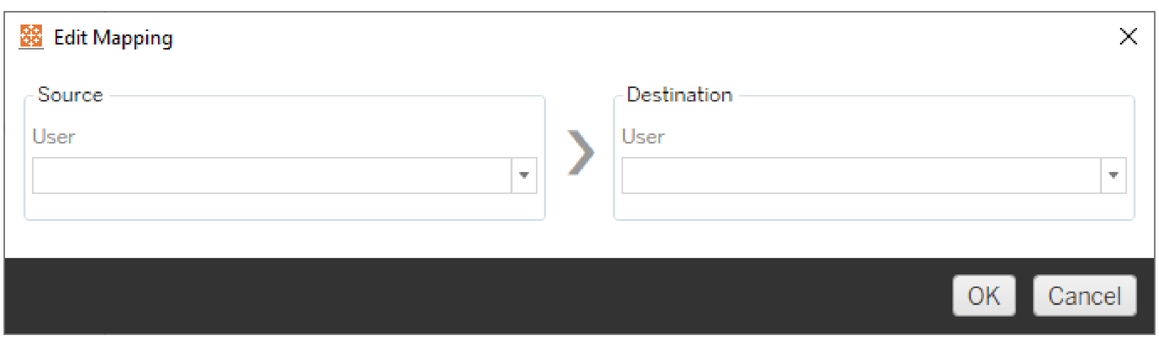
Domain permissions mapping applies to all users and groups in the destination location. If you are unsure about the source or destination domain, you can check the user and group pages on your Tableau site. If local user provisioning has been selected, the domain must be specified as `local`.




User Mapping

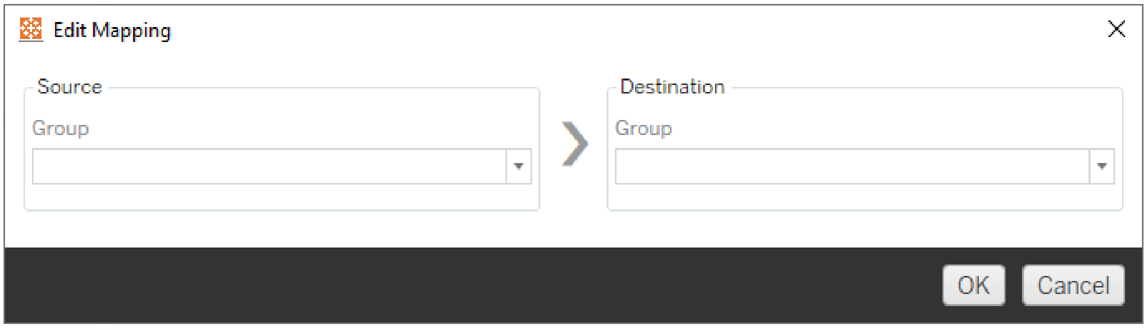
User permissions mapping automatically populates a list of users from the source and destination locations using the syntax `domain\user`. You cannot enter and save the names of users that don't exist.

**Note:** When migrating between projects on the same site, the destination location and list of users will be the same. You can use mappings to update content ownership from `User_A` to `User_B` on the site.




Group Mapping

Group permissions mapping automatically populates a list of users from the source and destination locations using the syntax `domain\group`. You cannot enter and save the names of groups that don’t exist.




Import mappings from a CSV file

Starting in version 2021.4, you can import a CSV file containing domain, user, and group mappings to quickly prepare your data for migration. Importing mappings can reduce the manual steps required to run a migration plan by allowing you to create and edit your mappings in bulk outside of Content Migration Tool. To import mappings, select **Import from File** from the Add Mapping menu.

CSV file format requirements

When you create a CSV file to import mappings, make sure that the file meets the following requirements:

- The file does not include column headings. Tableau assumes that every line represents a mapping.
- The file contains three comma-separated values per row: mapping type, source domain/user/group, and destination domain/user/group.
- Include the domain for user names and groups if the server uses Active Directory authentication or "local" if a local identity store is used.

You must specify "domain," "user," or "group" for mapping type, as shown in the following table. The source and destination columns provide example syntax for Active Directory and a local identity store. Actual values in the CSV file will vary depending on your organization.

| Mapping Type | Source | Destination |
|---|---|---|
| domain | <domain> | <domain> |
| user | <domain>\<user name><br>local\<user name> | <domain>\<user name><br>local\<user name> |
| group | <domain>\<group name><br>local\<group name> | <domain>\<group name><br>local\<group name> |

Import user permissions mappings

To import user permissions mappings in the Content Migration Tool:

1. Click **Add Mapping** and select **Import from File**.
2. In the dialogue window, click **Export CSV** to export a .csv file containing all users and groups from the source site. Edit the resulting file in a text editor to add mappings for the destination site.

   If you already have a mapping file, skip to step 3.

   > **Note:** The exported CSV file doesn’t include domains from the source site. Domains must be added manually to the CSV to create domain mappings.

3. Click **Import Mappings** and select the mapping file you want to import.

Content Migration Tool will validate the mappings for errors when importing the file. If errors are detected, you must fix each error in the CSV file and then import it again.

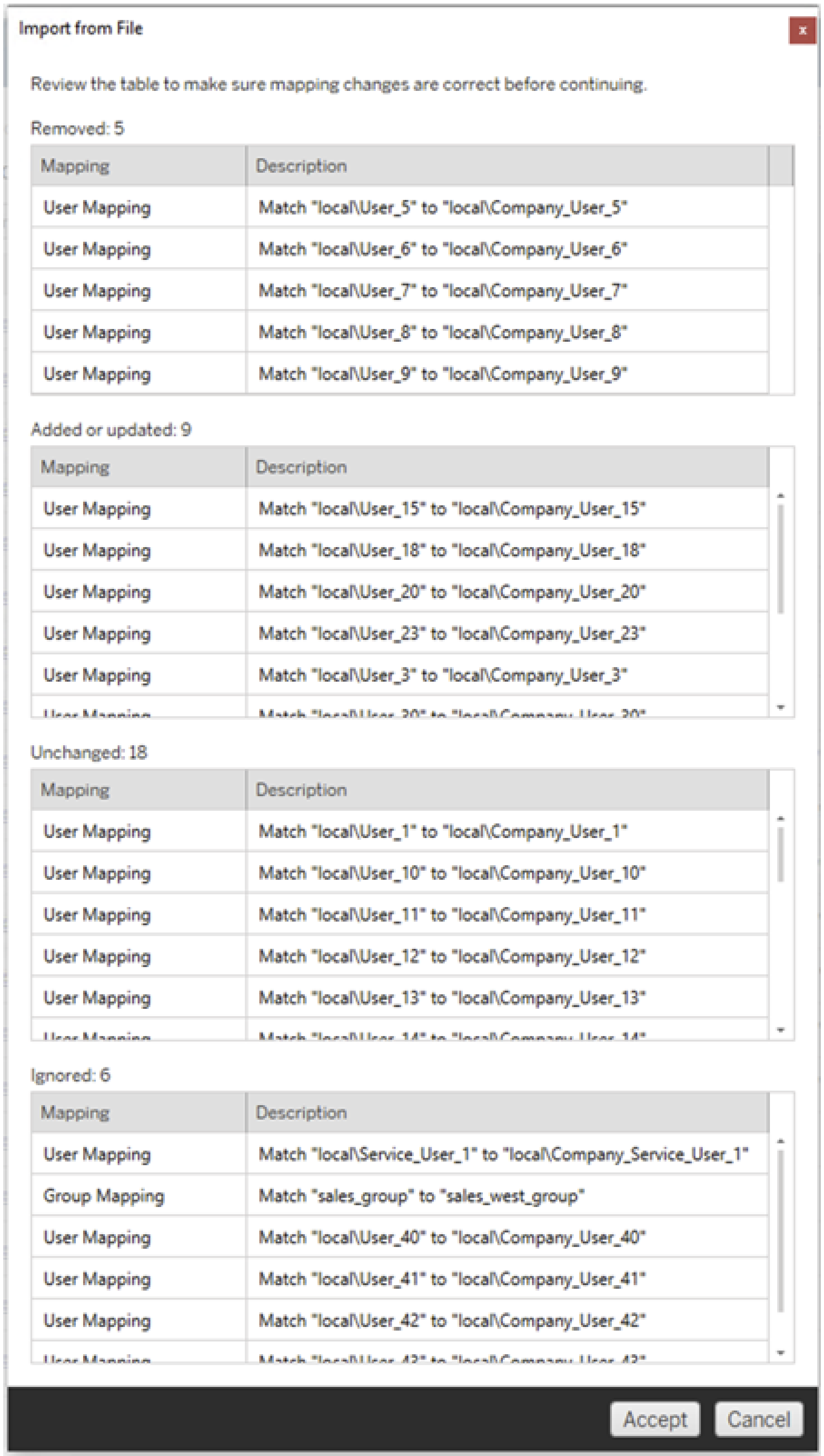
CSV import example

The following example shows a CSV file that contains multiple mapping types.

```
user,local\hwilson,companyx.lan\henry.wilson
user,local\jjohnson,companyx.lan\janna.johnson
user,local\mkim,companyx.lan\michele.kim
```

```
user,local\fsuzuki,companyx.lan\fred.suzuki
user,local\awang,companyx.lan\alan.wang
user,local\snguyen,companyx.lan\susan.nguyen
user,local\lrodriguez,companyx.lan\laura.rodriguez
user,local\agarcia,companyx.lan\ashley.garcia
group,local\All Users,companyx.lan\All Users
group,local\Finance Team,companyx.lan\Finance Group
domain,dev.mycompany,prod.mycompany
```

A preview window is displayed while importing the CSV that shows mappings removed, added or updated, unchanged, and ignored. Review that the mapping changes are correct and click **Accept**.


Import from File
Review the table to make sure mapping changes are correct before continuing.
Removed: 5
Mapping
Description
User Mapping
Match "local\User_5" to "local\Company_User_5"
User Mapping
Match "local\User_6" to "local\Company_User_6"
User Mapping
Match "local\User_7" to "local\Company_User_7"
User Mapping
Match "local\User_8" to "local\Company_User_8"
User Mapping
Match "local\User_9" to "local\Company_User_9"
Added or updated: 9
Mapping
Description
User Mapping
Match "local\User_15" to "local\Company_User_15"
User Mapping
Match "local\User_18" to "local\Company_User_18"
User Mapping
Match "local\User_20" to "local\Company_User_20"
User Mapping
Match "local\User_23" to "local\Company_User_23"
User Mapping
Match "local\User_3" to "local\Company_User_3"
Unchanged: 18
Mapping
Description
User Mapping
Match "local\User_1" to "local\Company_User_1"
User Mapping
Match "local\User_10" to "local\Company_User_10"
User Mapping
Match "local\User_11" to "local\Company_User_11"
User Mapping
Match "local\User_12" to "local\Company_User_12"
User Mapping
Match "local\User_13" to "local\Company_User_13"
Ignored: 6
Mapping
Description
User Mapping
Match "local\Service_User_1" to "local\Company_Service_User_1"
Group Mapping
Match "sales_group" to "sales_west_group"
User Mapping
Match "local\User_40" to "local\Company_User_40"
User Mapping
Match "local\User_41" to "local\Company_User_41"
User Mapping
Match "local\User_42" to "local\Company_User_42"
Accept
Cancel

Once the mappings are imported successfully, you can edit, delete, or change the mapping order as described in Step 2.

Step 2: Change mapping order

After a permissions mapping is created, you can change the order using the **Up** or **Down** options to determine when it will be handled during the migration. When a domain, user, or group is handled in a permissions mapping, any subsequent permissions mappings for the source domain, user, or group will be ignored.

In the example below, permissions for `User_A` are mapped to `User_B`. Content Migration Tool will ignore the second permissions mapping because `User_A` has already been handled.

| | Mapping | Description |
|---|---|---|
| Edit Delete Up Down | User Mapping | Match "local\User_A" to "local\User_B" |
| Edit Delete Up Down | User Mapping | Match "local\User_A" to "local\User_C" |

In the example below, the first permissions mapping associates the domain for all users to `prod`. Content Migration Tool will ignore the second permissions mapping because the domain for `User_A` has already been handled.

| | Mapping | Description |
|---|---|---|
| Edit Delete Up Down | Domain Mapping | Match "local" to "prod" |
| Edit Delete Up Down | User Mapping | Match "User_A" to "dev\User_B" |

Step 3: Continue to next step

When you are ready, click **Next** to continue to the Migration Plans: Migration Scripts section of the planning phase.

Who can do this

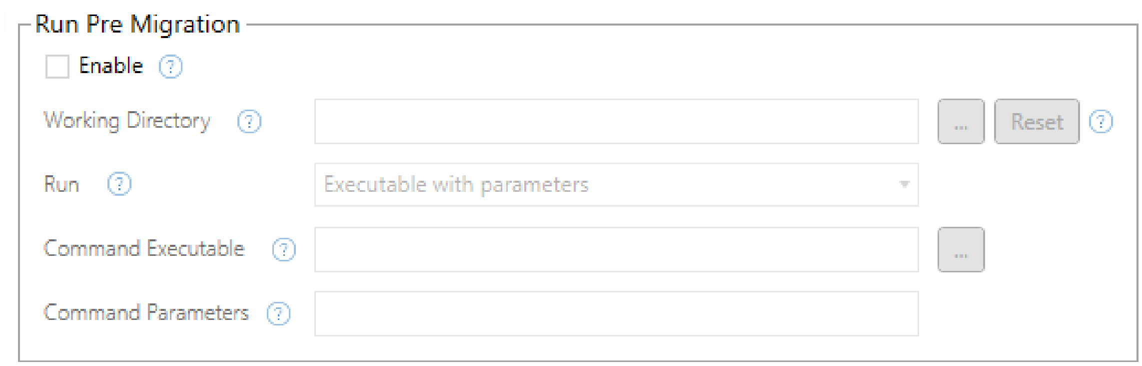
Tableau site user with an Explorer role or higher. To migrate content, you must have **View** and **Download/Save a Copy** capabilities for workbooks on the source site and **View** and **Publish** capabilities for target projects on the destination site. For more information, see Permissions.

## Migration Plans: Migration Scripts

The next step of creating a migration plan in the Tableau Content Migration Tool is to create any scripts you want to run with your plan before or after migration.

Step 1: Pre-Migration

The **Run Pre Migration** section of the screen is dedicated to scripts that will run before the migration.




Each field has a help icon you can get information from by moving your cursor over it. To start with your pre-migration scripts, select **Enable**, which will then activate the fields below.

## Working Directory

This is the working directory for the script. The default directory is the same folder as the migration plan. Click on the browse button to select a different folder. The **Reset** button will restore the current migration plan folder as the working directory.

## Run

This drop down allows you to choose either to run a custom script or an executable with parameters.

## Command Executable

If you selected **Executable with Parameters** from the **Run** menu, this field will appear. This is the file path to the command executable to run before migration. Type it in directly or use the browse button to find the executable. This is a required field.

## Command Parameters

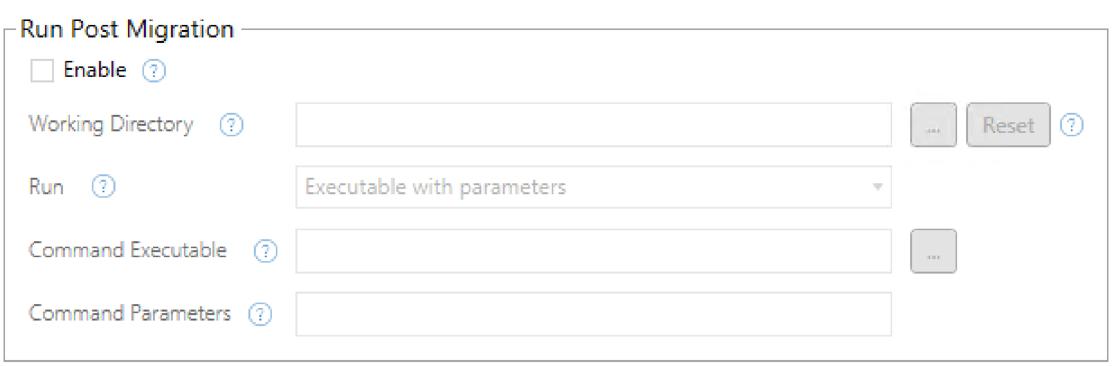
If you selected **Executable with Parameters** from the Run drop-down menu, this field will appear. Enter in command line parameters here to use with the command executable.

## Script

If you selected **Custom script** from the **Run** menu, enter in your pre-migration script here. It will be executed as a *.cmd file. This is a required field.

Step 2: Post-Migration

The **Run Post Migration** half of the screen is dedicated to scripts that will run after migration.




Each field has a help icon you can get information from by moving your cursor over it. To start with your post-migration scripts, select **Enable**, which will then activate the fields below.

### Working Directory

This is the working directory for the script. The default directory is the same folder as the migration plan. Click on the browse button to select a different folder. The **Reset** button will restore the current migration plan folder as the working directory.

### Run

This drop down allows you to choose either to run a custom script or an executable with parameters.

### Command Executable

If you selected **Executable with Parameters** from the **Run** menu, this field will appear. This is the file path to the command executable to run before migration. Type it in directly or use the browse button to find the executable. This is a required field.

### Command Parameters

If you selected **Executable with Parameters** from the **Run** menu, this field displays. Enter in command line parameters here to use with the command executable.

### Script

If you selected **Custom script** from the **Run** menu, enter in your post-migration script here. It will be executed as a *.cmd file. This is a required field.

Step 3: Continue to Next Step

When you are ready, click **Next**.

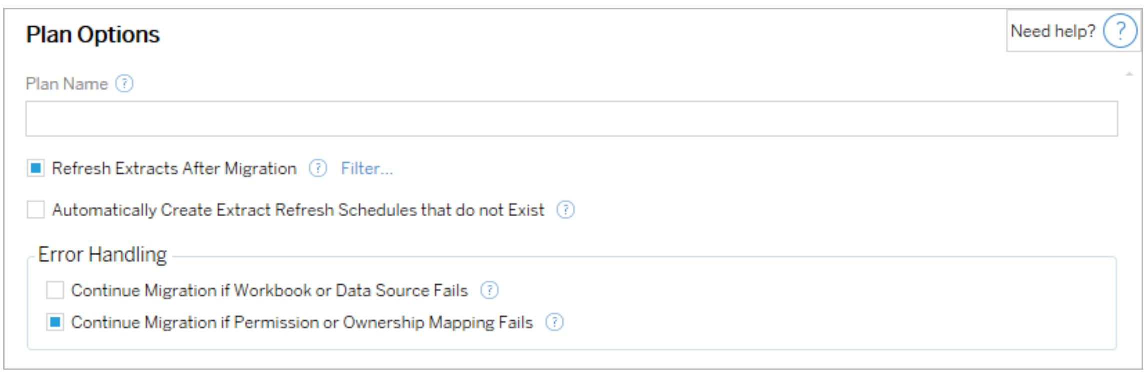
Who can do this

Tableau site user with an Explorer role or higher. To migrate content, you must have **View** and **Download/Save a Copy** capabilities for workbooks on the source site and **View** and **Publish** capabilities for target projects on the destination site. For more information, see Permissions.

## Migration Plans: Plan Options

The last step of creating a migration plan in the Tableau Content Migration Tool is configuring the plan options.

Step 1: Configure options




The **Plan Name** is the name of the plan as it will appear in Content Migration Tool. We recommend using a user-friendly name for your plan name.

The following are available options:

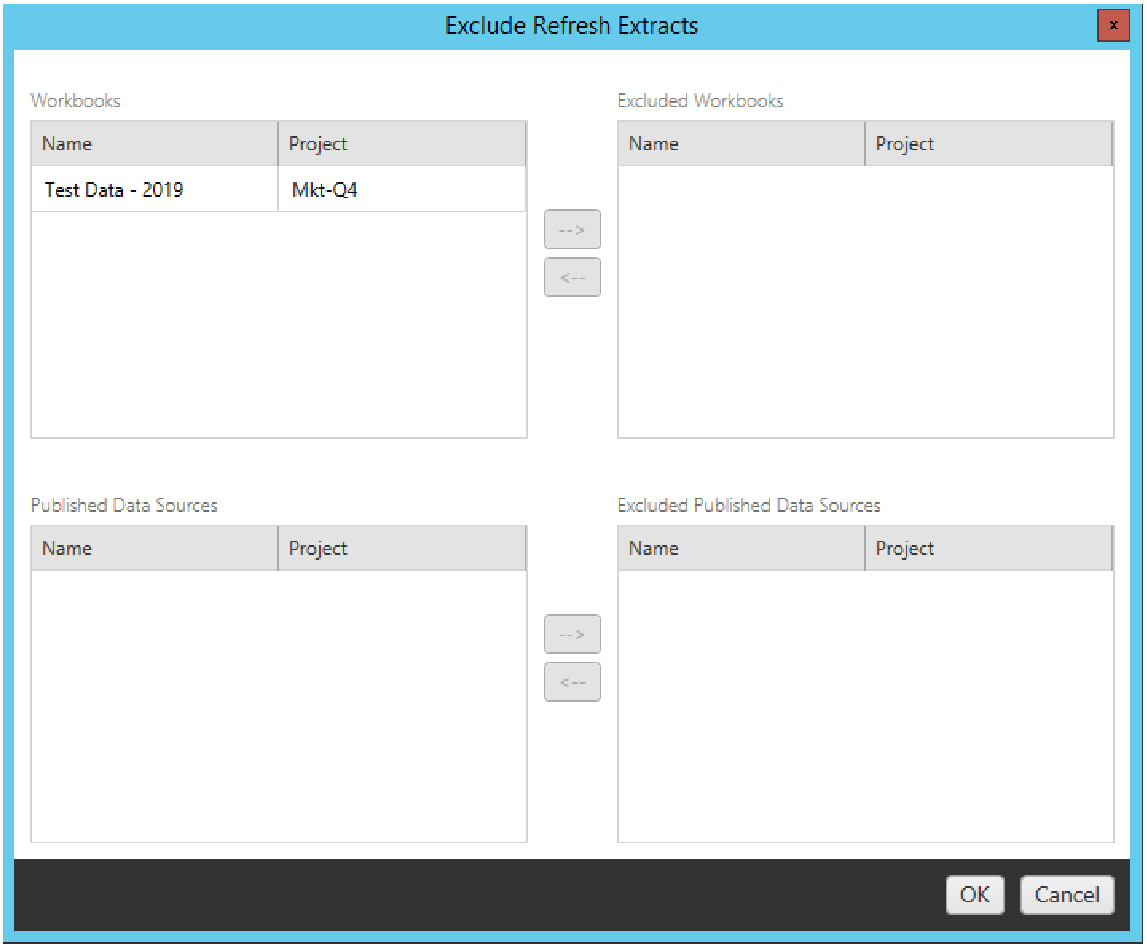
- **Refresh Extracts After Migration**: If selected, data extracts will be refreshed immediately after migration if Content Migration Tool detects they have been modified during migration. Click the **Filter** link to exclude specific extracts. For more information, see Exclude extract refreshes below.

- **Automatically create Extract Refresh Schedules that do not Exist**: Automatically creates destination extract schedules that do not exist. If not checked, source schedules that do not exist on the destination site will not be copied.

- **Continue Migration if Workbook or Data Source Fails**: If checked, errors migrating a workbook or data source will not cause the migration to stop. The errors will be logged and the migration will continue. Errors during version control will always stop the migration.
- **Continue Migration if Permission or Ownership Mapping Fails**: If checked, errors copying permissions or ownership will not cause the migration to stop. The errors will be logged and the migration will continue.

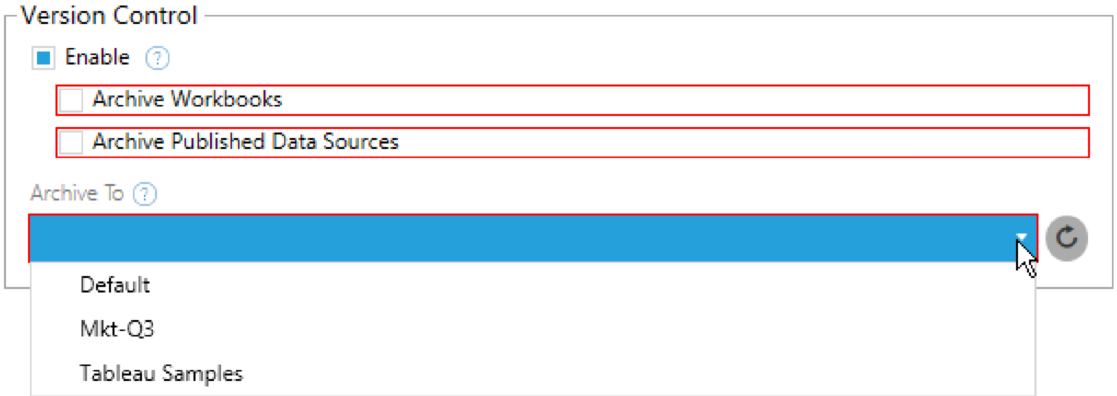
Exclude extract refreshes

By clicking **Filter** next to **Refresh Extracts After Migration**, you can choose the workbooks or published data sources that will not be refreshed automatically. Use the arrow buttons to select the items you want to exclude, and click**OK**.




Step 2: Version control

These options allow you to avoid losing the existing workbooks in the destination site that might be replaced by the migrated workbooks.




Select **Enable** to save previous versions of your content. You can choose to archive workbooks and/or published data sources. Once version control is enabled, you must select a project from the **Archive To** menu, which lists all of the projects in your site. We recommend creating a separate archive project to store your versioned content. Click the refresh button to display any projects that have been added or modified on the site.

Step 3: Save plan

Once you have selected your plan options, click **Save Plan** to save your plan for future use. The plan will be saved to the `Documents\Tableau Content Migration Tool Plans` folder on your local machine.

Step 4: Continue to next step

When you are ready, click **Verify & Run** to end the Planning phase and prepare to run your plan.

Who can do this

Tableau site user with an Explorer role or higher. To migrate content, you must have **View** and **Download/Save a Copy** capabilities for workbooks on the source site and **View** and **Publish** capabilities for target projects on the destination site. For more information, see Permissions.

## Migrate Workbooks and Data Sources with Extracts

Tableau Cloud users can publish extracts which are copies, or subsets of the original data. These extracts may be embedded in a workbook or a data source. By default, when you use the Tableau Content Migration Tool to migrate a workbook or data source that contains an extract, that extract is migrated along with the workbook or data source that contains it. The Content Migration Tool gives you a couple options for controlling this behavior:

- **Switching to a Live Connection**

  You can add the **Remove Extract** transformation to your migration plan to remove the extract from your workbook or data source during migration. As always, the source workbook or data source will not be modified. The copy of the workbook or data source migrated to the destination project will have the extract removed from it. This effectively switches the data connection back to a live connection.

- **Refreshing Extracts after Migration**

  You can enable the **Refresh Extracts After Migration** option in your migration plan to have an immediate extract refresh task scheduled after the workbook or data source is migrated.

  We don't recommend using the **Refresh Extracts After Migration** option if your migration plan also uses the **Set Connection Info** transformation to change the data connection to point to a different set of data (for example, a different database server or database). When you change the connection information to point to different data and use the **Refresh Extracts After Migration** option, this can unintentionally expose data in a way that is a potential security issue.

  For more information, see Option 3: Refresh Extracts After Migration.

## Changing data connections that use extracts

Tableau data connections are either live connections that directly query a data source, or they are extracts of a data source. Extracts are copies or subsets of the original data and can be embedded in a workbook or data source. When present, the views will query data from the extract instead of the underlying data source.

Commonly, you'll want to modify the data source connection during the migration so that it points to a different database in the destination project than it did in the source project.

For example, if you are migrating a workbook from your staging project to your production project, you will likely want to update the data connections inside the workbook to connect to your production database. You can implement this by using the **Set Connection Info** transformation in your migration plan. Now you have a migration plan which copies a workbook from staging to production and updates the data connections to point to the production database.

If your workbook uses an extract, additional work is required. In this scenario, the workbook will be migrated and the live data connection updated. However, the views will still show data from the staging database since it still contains the staging database extract - copied from the source (staging) project. There are a few ways to address this.

## Option 1: Use Published Data Sources

You can change your workbooks so that they use published data sources instead. This way, the extract will be managed as part of the published data source and migrating updates to the workbooks that use that data source can be simplified by not having to worry about the connection to the live database or the data extract.

## Option 2: Remove the Extract During Migration

You can add a **Remove Extract** transformation to your migration plan. This will remove the extract from your workbook, effectively switching the data source to a live connection.

## Option 3: Refresh the Extract After Migration

You can use the **Refresh Extracts After Migration** option in your migration plan. This will migrate the extract along with the workbook but will schedule an immediate extract refresh task for that workbook after the migration is complete.

This option is usually not recommended when used in combination with a **Set Connection Info** transformation because of potential security issues that it can introduce.

The issue is that the migrated workbook in your destination project will still show the old (source) extract data for the period between the completion of migration and the completion of the extract refresh task. If the extract refresh task fails, then the old/source extract data will remain until the extract is refreshed.

In a scenario like we've outlined above, migrating from a staging to production environment, this may be acceptable but you should be aware that the users of your workbooks may not be aware that the workbook is showing old/staging data due it being recently migrated and the extract not being refreshed yet.

In other scenarios where you may be using **Set Connection Info** to change data connections to point to a different set of customer or client data, this could introduce serious security issues where the workbook's extract contains data from a different client or customer until the extract has been refreshed post-migration.

One way to mitigate this issue is to implement a 2-stage migration. This approach requires you to create two migration plans, one for each step described below and ensures the workbooks and data sources have an up-t-o-date extract before they are accessible.

- **Stage 1:** Migrate your content to a project on your destination site that only administrators have access to. This migration allows you to use the **Refresh the Extract After Migration** option along with the **Set Connection Info** transformation to update the data connection, because no unauthorized users will have an opportunity to see the old data, even if the extract refresh fails.
- **Stage 2:** After stage 1 is complete and you confirm there is a successful extract refresh, run a second migration plan to migrate the content from the stage 1 destination to the final destination where it is visible to end-users.

Who can do this

Tableau site user with an Explorer role or higher. To migrate content, you must have **View** and **Download/Save a Copy** capabilities for workbooks on the source site and **View** and **Publish** capabilities for target projects on the destination site. For more information, see Permissions.

## Migrate Workbooks and Data Sources with Embedded Credentials

Starting in version 2023.1, authorized users can migrate workbooks and published data sources with embedded credentials from Tableau Server to Tableau Cloud. Additional configuration is required before migrating with Content Migration Tool.

> **Note:** Content Migration Tool does not support embedded credential migration for OAuth connections. For more information, see Migration Limitations.

Overview

Migrating embedded credentials using Content Migration Tool (CMT) is available when connecting to Tableau Server as the source site and Tableau Cloud as the destination site. Both sites must have an Advanced Management license.

Now that we've covered the requirements, let's discuss how migration works. You'll need to work closely with the Tableau Cloud site administrator and TSM administrator (sometimes the same person) to allow the feature and authorize a site user. After the feature is activated, the authorized site user builds a migration plan and selects the publish options *Migrate Embedded Credentials for Workbooks* and *Migrate Embedded Credentials for Data Sources*.

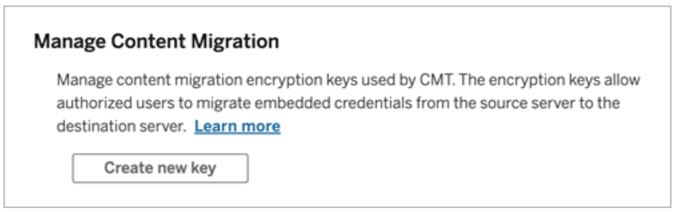
When running the migration plan, all required content credentials are transmitted in an encrypted content manifest from Tableau Server to Tableau Cloud. As CMT publishes content, the destination Tableau Cloud site embeds matched credentials securely from the manifest into the content (workbooks or published data sources). Any problems that occur during migration will appear in the Errors and Warnings tab in CMT. For more information, see Migration Plan Overview.

Allow embedded credential migration

Use the following steps to allow embedded credential migration from Tableau Server to Tableau Cloud.

Tableau Cloud

1. Open a browser window and sign in to Tableau Cloud as a site administrator.
2. Select **Settings** > **General**, and scroll down to **Manage Content Migration**.




3. Click **Create new key** to generate an encryption key pair.

> **Note:** The public key is only displayed once. If you lose the key before completing the configuration, you'll need to generate a new key.

4. In the resulting window, click **Copy to clipboard** and then close the window.
5. Paste the public key to a file and store it in a safe location. The TSM administrator will use the public key to allow migration. You can view the public key expiration date on the Settings page.

TSM Command Line Interface

1. Depending on your operating system, do one of the following:
   - Tableau Server on Windows: Open Windows Command Prompt with an account that is a member of the Administrators group on a node in the cluster.

- Tableau Server on Linux: Open a command prompt with an account that is a member of the `tsmadmin` group on a node in the cluster.

2. Use `tsm security authorize-credential-migration` to allow embedded credential migration to the Tableau Cloud site. For more information, see tsm security in Tableau Server help.

```
tsm security authorize-credential-migration --source-site-url-namespace <Tableau Server site ID> --destination-site-url-namespace <Tableau Cloud site ID> --destination-server-url <Tableau Cloud site url> --authorized-migration-runner <user-name> --destination-public-encryption-key <public key>
```

> **Note:** When running TSM commands from a remote node, use `tsm login` to authenticate a session with the Tableau Server Administration Controller service before running `tsm security authorize-credential-migration`.

3. (Optional) Use `tsm security cancel-credential-migrations` to cancel granted authorizations. By default, migration authorization will expire in 7 days or the number of days specified with the `--expiration-time-in-days` option.

Content Migration Tool

1. Open Content Migration Tool and select **Create New Plan** or **Browse for a Plan**.
2. On the Sites page, click **Sign in to Tableau**, and connect to Tableau Server as the source and Tableau Cloud as the destination. Embedded credential migration is only available when migrating from Tableau Server to Tableau Cloud.
3. Build your migration plan and select the following Publish Options:
    - On the Workbook Publish Options page, select **Migrate Embedded Credentials for Workbooks**. For more information, see Migration Plans: Workbooks.

- On the Data Source Publish Options page, select **Migrate Embedded Credentials for Data Sources**. For more information, see Migration Plans: Published Data Sources.

4. When you are ready, click **Verify & Run** to start the migration.

The workbooks and published data sources you selected are migrated to your Tableau Cloud site and should not prompt for authentication. If you experience issues while migrating embedded credentials, see Troubleshooting.

Troubleshooting

This section includes some common migration issues you might encounter and suggestions to resolve them.

There is no option to migrate embedded credentials

You can only migrate embedded credentials from a Tableau Server to a Tableau Cloud site. Tableau Server and Content Migration Tool must be running versions 2023.1 or later. For more information, see Install Tableau Content Migration Tool.

Migrating embedded credentials failed

In the Errors and Warnings tab of CMT, you may receive an error indicating that migrating the embedded credentials failed. This can occur when the public key used to authorize migration has expired.

As a Tableau Cloud site administrator, go to the Settings page and verify that the public key is valid. You'll have to create a new encryption pair to authorize the migration if the public key expires. For more information, see Allow embedded credential migration.

Who can do this?

- Tableau Cloud site administrator and TSM administrator are required to allow embedded credential migration.

- The authorized site user must have an Explorer role or higher. They must also have View and Download/Save a Copy capabilities for workbooks on the source site and View and Publish capabilities for target projects on the destination site.

For more information, see Permissions.

## Using the Tableau Content Migration Tool Console Runner

The Tableau Content Migration Tool includes a command-line utility for running migrations, `tabcmt-runner.exe`, located in the installation folder. The default installation folder is `%PROGRAMFILES%\Tableau\Tableau Content Migration Tool`.

> **Note:** The `tabcmt-runner.exe` utility is not the same as the `tabcmt.cmd` command line utility which is used to configure the Content Migration Tool graphical application. For more information about `tabcmt.cmd`, see Using the Tableau Content Migration Tool Command Line Interface.

Usage:

- tabcmt-runner [options] <plan_file.tcmx>
- tabcmt-runner license --remove
- tabcmt-runner license <new license key>
- tabcmt-runner license <license file path> [--passphrase=<license file passphrase>]
- tabcmt-runner encryption --reset
- tabcmt-runner encryption <new_key>
- tabcmt-runner improvement [on|off]
- tabcmt-runner --help
- tabcmt-runner --version
- tabcmt-runner script-warning [on|off]

Options:

- --version
- --help
- --quiet

- --info
- --logfile=VALUE
- --src-user=VALUE
- --src-password=VALUE
- --dest-user=VALUE
- --dest-password=VALUE
- --https=VALUE
- --allow-scripts

## Run Plan

Executes a migration plan immediately.

```
tabcmt-runner [options] <plan file>
```

Available options:

- `--logfile=<file name>` sets the file name to log output to
- `--https=<secure|legacy>` sets the HTTPS mode
- `--quiet` disables logging to stdout
- `--src-user=<username>` sets the username of the source connection
- `--src-password=<password>` sets the password of the source connection
- `--dest-user=<username>` sets the username of the destination connection
- `--dest-password=<password>` sets the password of the destination connection

Exit codes:

- 0 indicates that the migration was successful.
- 1 indicates that the migration was successful but warning messages were logged.
- 2 indicates that the migration failed. Specific errors will be included in the log output.

## Show Plan Summary

Shows a summary of the migration plan and then exits.

```
tabcmt-runner --info <plan file>
```

help

Shows usage information for the command line utility.

```
tabcmt-runner --help
```

version

Shows the current application version information.

```
tabcmt-runner --version
```

encryption

Reset the encryption key, or specify a new one. You must specify the encryption key before using the `tabcmt-runner` utility, even if you already done so from the Content Migration Tool UI.

```
tabcmt-runner encryption <new_key> | --reset
```

improvement

Default value: `on`

Enables or disables collection of anonymous usage information by the application. This information is completely anonymous and is sent periodically to Tableau to help us improve Content Migration Tool.

Examples

Show whether the improvement program is enabled or disabled:

```
tabcmt-runner improvement
```

Enable or disable the improvement program:

```
tabcmt-runner improvement <on|off>
```

license

Deprecated in July 2022.

This command is only applicable for legacy licenses. Manages a legacy application license for the current user. When using a legacy key, to use the `tabcmt-runner` utility you must activate the license using this command, even if you already activated it from the Content Migration Tool UI.

Examples

Show the current license information:

```
tabcmt-runner license
```

Set/activate a serial key or offline license key:

```
tabcmt-runner license <key>
```

Remove/deactivate the current license:

```
tabcmt-runner license --remove
```

Set/activate using a license file:

```
tabcmt-runner license <file path> [--passphrase=<password>]
```

script-warning

Default value: `on`

Shows a warning message when running a migration plan that includes migration scripts.

> **Note:** This command updates your selection on the Settings page. For more information, see Tableau Content Migration Tool Settings.

Examples

Show if script warning is turned on or off.

```
tabcmd-runner script-warning
```

Turn script warning on or off

```
tabcmd-runner script-warning <on|off>
```

If turned on, you must include the option `--allow-scripts` to execute migration plans.

```
tabcmd-runner --allow-scripts <plan file>
```

## Who can do this

To use the console runner, you must have all the following:

- Administrator permissions on the Content Migration Tool machine.
- Tableau site user account with an Explorer role or higher.
- View and Download Workbook/Save a Copy permissions on the source site.
- Publishing rights for the destination site.

## Example: Scripting Migration Plans

**Note:** This topic includes a sample script you can use as the basis for scripting a multi-plan migration that satisfies your needs and environment. This script is intended to be used as a sample only, and not to be run as-is. For detailed instructions on using the console runner, see Using the Tableau Content Migration Tool Console Runner.

Tableau Content Migration Tool command line utility for running migrations can be used to automate the running of a migration plan from an external scheduler (such as Windows Task Scheduler) or from a custom script. The console runner only runs one migration plan (stored in a .edt file) at a time. If you have a group of migration plans you want to run as a group, then you can use a custom script in combination with the Content Migration Tool console runner.

The example below is written in PowerShell and uses the console runner to execute a list of migration plans as a group.

The following example code demonstrates:

- Running multiple migration plans as a group using the console runner.
- Optionally halting deployment of the group of plans immediately when any single migration in the group fails.
- Using the console runner’s exit code to determine whether the migration failed or logged warnings.

```
# List of migration plans to execute as a group.
$planFiles = @(
       'customer 1.tcmx',
       'customer 2.tcmx'
)

# True of false whether to continue with the next plan if a migra-
tion fails.
$continueOnFailure = $false

# Path to the CMT console runner executable
$runnerExe = 'C:\Program Files (x86)\Tableau\Tableau Content Migra-
tion Tool\tabcmt-runner.exe'

# Store the exit code from the previously run migration plan.
$lastResult = -1

# Loop through and run each migration plan one at a time.
$planFiles | % {
       $file = $_

       if ($lastResult -ge 2 -and -not($continueOnFailure)) {
               Write-Warning "Skipping plan because previous migration failed.
`nSkipped plan: $file"
               return
       }

       Write-Verbose "Running migration plan: $file"
       & $runnerExe $file
       $lastResult = $LASTEXITCODE

       if ($lastResult -ge 2) {
               Write-Error "Migration failed. See output or log file for error
details.`nPlan: $file" -ErrorAction 'Continue'
```

```
        }
        elseif ($lastResult -eq 1) {
                Write-Warning "Migration completed with warnings. See output or
log file for warning details.`nPlan: $file"
        }
}
```

Who can do this

To script migration plans, you must have all the following:

- Administrator permissions on the Content Migration Tool machine.
- Tableau site user account with an Explorer role or higher.
- View and Download Workbook/Save a Copy permissions on the source site.
- Publishing rights for the destination site.

## Using the Tableau Content Migration Tool Command Line Interface

The Tableau Content Migration Tool includes a command line interface, `tabcmt.cmd`, located in the installation folder. The default installation folder is `%PROGRAMFILES%\Tableau\Tableau Content Migration Tool` (32-bit Windows) or `%PROGRAMFILES (x86)%\Tableau\Tableau Content Migration Tool` (64-bit Windows).

> **Note:** The `tabcmt.cmd` utility is not the same as the Content Migration Tool console runner, `tabcmt-runner.exe`. The console runner is a separate command line utility used for running migrations from the command line. For information on using the Content Migration Tool console runner, see Using the Tableau Content Migration Tool Console Runner.

Here are the commands that can be used with the `tabcmt` command line:

- migrate
- help
- update
- version

## migrate

Opens a migration plan file to the migrate step in the GUI:

```
tabcmt migrate <plan file>
```

## help

Shows general help about the command line interface and the available commands.

Examples

Show all commands available:

```
tabcmt help
```

Show help and usage information for a specific command:

```
tabcmt help <command>
```

## license

Deprecated in July 2022.

This command is only applicable for legacy licenses. Manages the application license for the current user.

Examples

Show the current license information:

```
tabcmt license
```

Remove/deactivate the current license:

```
edt license remove
```

Set/activate a serial key or offline license key:

```
tabcmt license <key>
```

Set/activate using a license file:

```
tabcmt license <file path> [--passphrase=<password>]
```

## update

Manages the options for application updates.

Examples

Show the current update settings:

```
tabcmt update
```

Enable or disable the automatic update notifications:

```
tabcmt update --disabled=<true|false>
```

Set the URL to detect/download updates from:

```
tabcmt update --url=<url>
```

Enable or disable showing beta updates. Set to false to only show stable release updates.

```
tabcmt update --beta=<true|false>
```

## version

Shows the current application version information.

```
tabcmt version
```

## Who can do this

To use the command line interface, you must have all the following:

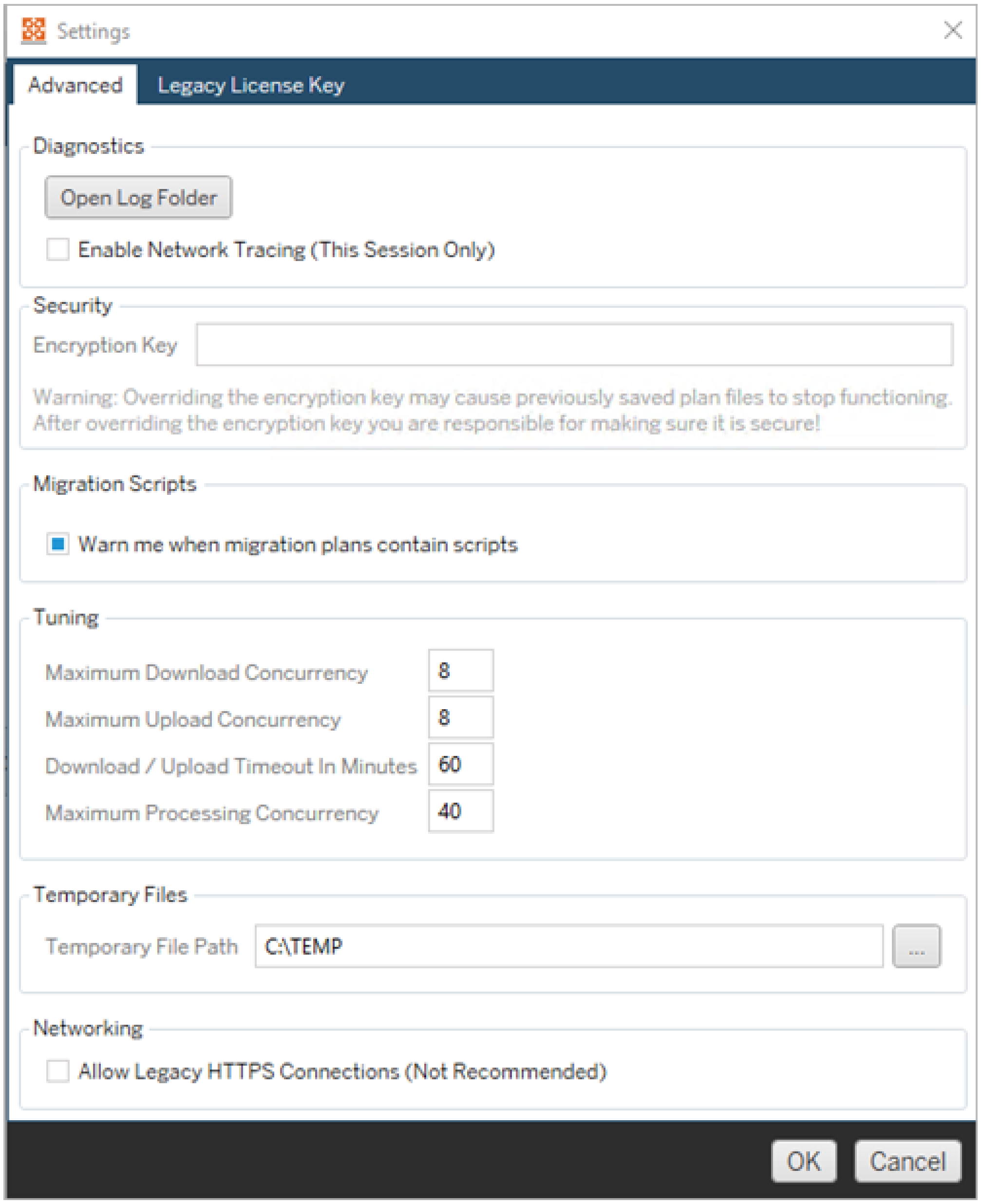
- Administrator permissions on the Content Migration Tool machine.
- Tableau site user account with an Explorer role or higher.
- View and Download Workbook/Save a Copy permissions on the source site.
- Publishing rights for the destination site.

# Tableau Content Migration Tool Settings

The Tableau Content Migration Tool default settings work in most cases, but you can change these if you need to, or if you are working with Tableau Support and they ask you to make changes.

To view or update the Content Migration Tool settings:

1. Open Content Migration Tool.
2. Click **Help** > **Settings**. The Settings dialog opens:




**Diagnostics**—Click **Open Log Folder** to open the logs location. Here you can view the logs, and zip them up if you need to send them to Tableau. For more information, see Tableau Content Migration Tool Log Files.

Select **Enable Network Tracing** if you are working with Support and they ask you to include a network trace in the logs. This applies until you clear the option or restart the Content Migration Tool.

**Security**—The encryption key is automatically generated on installation. If you change the encryption key, any migration plans with embedded passwords that were created with the previous key cannot be opened. If you have multiple installations of Tableau Content Migration Tool and want to share migration plans, you need to make sure the encryption key used by each instance of the tool is the same.

**Migration Scripts**—By default, a warning is displayed when running a migration plan that includes migration scripts or executables. Other users can edit these files, so verify that they're safe before running the migration. Toggling this setting on and off will also update your warning preference for the console runner. For more information, see Using the Tableau Content Migration Tool Console Runner.

**Tuning**—In almost all cases you can leave these set to the defaults. If you are working with Support, they may ask you to change these settings.

**Temporary Files**—Select a location for temporary files if you want to change the default. This is the location where content is copied during a migration. You may want to change this if the default location does not have enough space to temporarily hold migrated content.

**Networking**—Selecting **Allow Legacy HTTPS Connections** gives you the ability to connect to Tableau Server installations running with older HTTPS configurations (for example, SSL v3). This is not recommended.

## Who can do this

Typically, the tasks listed above can only be done by a user with Administrator access on the machine where Content Migration Tool is installed.

# Tableau Content Migration Tool Log Files

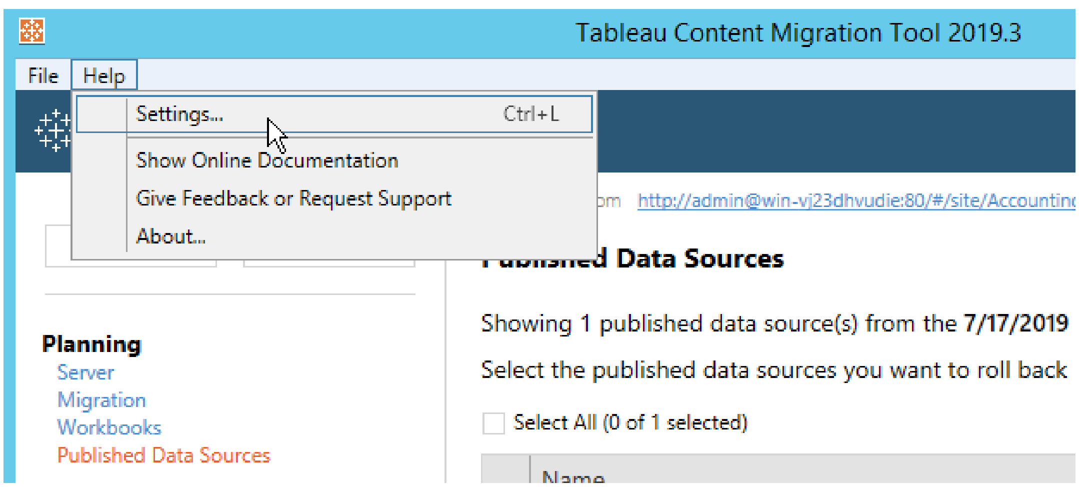
Tableau Content Migration Tool generates log files when you run migrations. These can be helpful for troubleshooting problems.

> **Note:** For information on all the Content Migration Tool settings, see Tableau Content Migration Tool Settings.

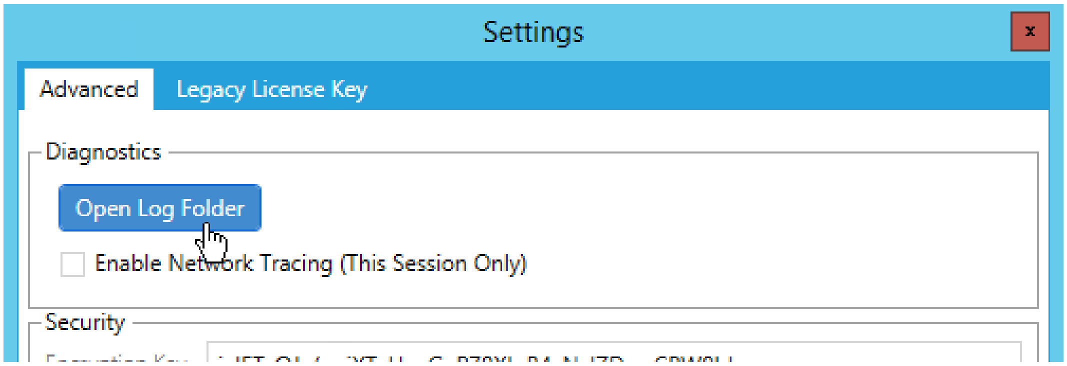
## Content Migration Tool Log File Location

To find the Content Migration Tool log files from within the Content Migration Tool:

1. Start Content Migration Tool.
2. Click **Help** and **Settings**:




3. In the **Settings** dialog, click **Open Log Folder**:




A window opens with the log files.

If you are working with Tableau Support and they ask you to send log files, zip the files up before you send them. For more information on sending log files to Tableau, see the Tableau Knowledge Base.

## Who can do this

Typically, the tasks listed above can only be done by a user with Administrator access on the machine.