



Analyze Your Data

Salesforce, Winter '18



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ANALYTICS

Explore Data and Take Action with Einstein Analytics

Salesforce Einstein Analytics (formerly known as Wave) is a cloud-based platform for connecting data from multiple sources, creating interactive views of that data, and sharing those views in apps. It's a better way to distribute insight to business users so they can understand and take action on changing information.

Online Help	Other Resources
Get to Know Analytics	
Get Started Using Analytics	<ul style="list-style-type: none">• Watch an Intro: Personalize, Collaborate, and Take Action from the Analytics Tab (English Only)• Trailhead: Analytics Basics• Trailhead: Analytics Dashboard Navigation• Watch an Intro: Build Unique Einstein Analytics Apps in the Analytics Studio (English Only)
Access Insights from the Analytics Mobile App	<ul style="list-style-type: none">• Analytics for iOS• Analytics for Android• Trailhead: Mobile Analytics Exploration
Enable Analytics and Integrate Data	
Set Up the Analytics Platform PDF	<ul style="list-style-type: none">• Trailhead: Analytics Administration Basics• Analytics Security Implementation Guide PDF
Load Data into Analytics Datasets PDF	<ul style="list-style-type: none">• Watch a Demo: Trend Report Data in Analytics (English Only)• Trailhead: Analytics Data Integration Basics• Analytics External Data API Developer Guide• Analytics External Data Format Reference
Build, Customize, and Develop Analytics Assets	
Explore and Visualize Your Data	<ul style="list-style-type: none">• Watch an Intro: Introduction to Explorer

Build, Customize, and Develop Analytics Assets	
	<ul style="list-style-type: none"> Trailhead: Desktop Analytics Exploration Trailhead: Create a Custom Map for Analytics Charts Trailhead: Build a Gauge Chart That Visually Identifies Regional Data
Build Analytics Dashboards	<ul style="list-style-type: none"> Watch a Demo:  Build Interactive Analytics Dashboards (English Only) Trailhead: Analytics Dashboard Building Basics Trailhead: Create a Product Pipeline Dashboard with Analytics Charts Analytics Bindings Developer Guide for Dashboards
Embed and Customize Analytics	<ul style="list-style-type: none"> Dashboard JSON Reference Extended Metadata (XMD) Reference
Manage and Share Analytics in Apps	<ul style="list-style-type: none"> Analytics Templates Developer Guide
Develop on the Analytics Platform	<ul style="list-style-type: none"> Analytics REST API Developer's Guide Analytics SAQL Reference

Accelerate with Prebuilt Analytics Apps	
The Sales Analytics App	<ul style="list-style-type: none"> Trailhead: Sales Analytics App
The Service Analytics App	<ul style="list-style-type: none"> Trailhead: Service Analytics App
The Field Service Analytics App	
Event Monitoring Analytics App	<ul style="list-style-type: none"> Trailhead: Event Monitoring
B2B Marketing Analytics App	

Detect More Insights with Einstein Discovery	
Get Started Using Einstein Discovery	<ul style="list-style-type: none"> Set Up Einstein Discovery Trailhead: Gain Insight with Einstein Discovery Display Einstein Discovery Recommendations in a Salesforce Object

Get Started Using Analytics

With just a few clicks, you can run Analytics apps, dashboards, and lenses.

IN THIS SECTION:

[Learn What You Can Do with Analytics](#)

Introduce yourself to the Analytics way of data exploration.

[Open Analytics](#)

Access your Analytics home page from a tab within Salesforce. Alternatively, go to the Analytics environment by opening the app menu or app launcher in the Salesforce header and then clicking **Analytics Studio**.

[Get Oriented with Your Analytics Home Page](#)

Start exploring your data! With Analytics, you can take either a business user path or a builder path, depending on what you want to do, and you can switch paths at any time.

[View, Collaborate, and Take Action from Analytics](#)

Personalize your own Analytics experience and collaborate with Analytics apps with features such as notifications, annotations, presentation mode, and downloading filtered data from Analytics. In addition, custom menus in lenses and dashboards allow you to take action in Salesforce directly from Analytics.

[Analytics Glossary](#)

Familiarize yourself with common Analytics terminology.

[Learn Analytics with Trailhead](#)

Trailhead is the fun and free way to learn Salesforce. Now you can get acquainted with Analytics through Trailhead, using a special Analytics-enabled Developer Edition org.

Learn What You Can Do with Analytics

Introduce yourself to the Analytics way of data exploration.

IN THIS SECTION:

[Exploring and Visualizing Your Data Interactively](#)

Data exploration is an iterative process. It typically involves these steps: view, explore, refine, save, and share.

[Collections of Data in Analytics](#)

Analytics collects and organizes your data in datasets, lenses, dashboards, and apps. These collections, also known as “Analytics assets,” represent levels of data refinement—from raw data that’s uploaded from your source systems to highly curated, packaged views of your data.

[Data Exploration Concepts](#)

As you learn how to explore and visualize your data, it’s helpful to review key concepts such as visualization, measure, and dimension.

[What Is a Dashboard?](#)

An Analytics dashboard is a collection of widgets that work together to tell a data story from multiple angles. Depending on what you want the dashboard to show or how to behave, you can add different widgets, such as key performance indicators, charts, tables, filters, and images.

[Key Elements of an Analytics Dashboard](#)

A dashboard isn't just for reading. It's for carrying on a conversation based on one or more datasets that matter to your company. Don't just look at the pictures—use the tools on the dashboard to dive deeper into the data that you care about. Go ahead, click around, and explore!

[Query Your Data to Know Your Business](#)

It's great to have a gut feeling about how well your business is doing. However, before you take action, test the feeling against your data. Ask your data questions.

SEE ALSO:

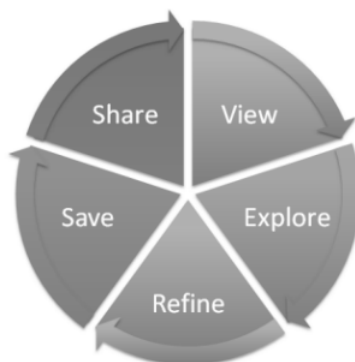
[Learn to Use Explorer](#)

[Build Analytics Dashboards](#)

[Manage and Share Analytics in Apps](#)

Exploring and Visualizing Your Data Interactively

Data exploration is an iterative process. It typically involves these steps: view, explore, refine, save, and share.



- View—View the data set.
- Explore—Get to know the boundaries and shape of your data. Play with different views, zoom in and zoom out, and see what you get with different charting options.
- Refine—Narrow your view to the most important data. Decide the level of detail and categorization that's easiest for your colleagues to understand. Choose the most appropriate chart visualization.
- Save—Save your work.
- Share—Share your view with others. For a more packaged presentation, use your visualization to build a dashboard.

Collections of Data in Analytics

Analytics collects and organizes your data in datasets, lenses, dashboards, and apps. These collections, also known as “Analytics assets,” represent levels of data refinement—from raw data that's uploaded from your source systems to highly curated, packaged views of your data.

- A *dataset* contains a set of source data, specially formatted and optimized for interactive exploration.
- A *lens* is a particular view into a dataset's data. It's where you do exploratory analysis and visualization.
- A *dashboard* is a curated set of charts, metrics, and tables based on the data in one or more lenses.

- An *app* is a purpose-built set of analytics and answers about a specific area of your business. With apps, you can provide pathways through your data, plus powerful tools for spontaneous, deep explorations. After creating dashboards, lenses, and datasets, organize apps to present dashboards in relevant order, and then share apps with appropriate groups.

Data Exploration Concepts

As you learn how to explore and visualize your data, it's helpful to review key concepts such as visualization, measure, and dimension.

A *visualization* is commonly a chart or graph, such as a bar chart, donut chart, timeline, or heat map. It can also be data in tabular form, such as a comparison table or pivot table. Every visualization has an underlying query, which is how Analytics retrieves information from the source data.

A *measure* is a quantitative value, like revenue and exchange rate. You can do math on measures, such as calculating the total revenue and minimum exchange rate. Measures have names (revenue) and values (\$1,000,000). When you're viewing a chart visualization in Analytics, it's important to remember:

- The chart either shows a slice of your data based on the number of or amount of something, or it shows tabular data.
- A measure is typically *aggregated* in some way, which means that it's displayed with some math already applied to it. For example, when you first view a dataset, you often see a simple aggregation such as the count of the number of rows. You typically aggregate by a different method—sum, average, maximum, and so on—as you explore and change or add measures, but you always specify how you want to aggregate at the time when you select the measure.
- You can identify measures by their position (the far left items in the top left corner of a lens) and by the text that indicates the aggregation method (such as Sum of Revenue).



Warning: If you perform a query that aggregates measures—like sum or group by—and the resulting value exceeds the maximum for a numeric field (36,028,797,018,963,967), the value overflows and Analytics returns an incorrect result.

A *dimension* is a qualitative value, like region, product name, and model number. Dimensions are handy for grouping and filtering your data. Unlike measures, you can't perform math on dimensions. Like measures, dimensions also have names (region) and values (northeast). Time is usually considered a dimension rather than a measure.

What Is a Dashboard?

An Analytics dashboard is a collection of widgets that work together to tell a data story from multiple angles. Depending on what you want the dashboard to show or how to behave, you can add different widgets, such as key performance indicators, charts, tables, filters, and images.

When you share Analytics data via a dashboard, you're setting up your audience members to do some exploring of their own, without turning them loose on the whole data set.

One use of a dashboard is to provide a focus for your audience. A dataset can contain vast amounts of data. Some of that data is relevant to specific questions that your audience has; some of that data is irrelevant noise. Data that's critical to one set of questions is sometimes noise in relation to another set of questions.

Keep in mind that even though we call it a dashboard, we're actually doing much more with this interface than we do with a traditional dashboard in a car. This dashboard doesn't just tell us what's changed; it invites us to dig deeper into the underlying data. It's like using the speedometer in a car to tell us not just how fast we're going but how our speed has changed at various points in our trip, how traffic conditions ahead of us are changing, and how those changes affect our arrival time.

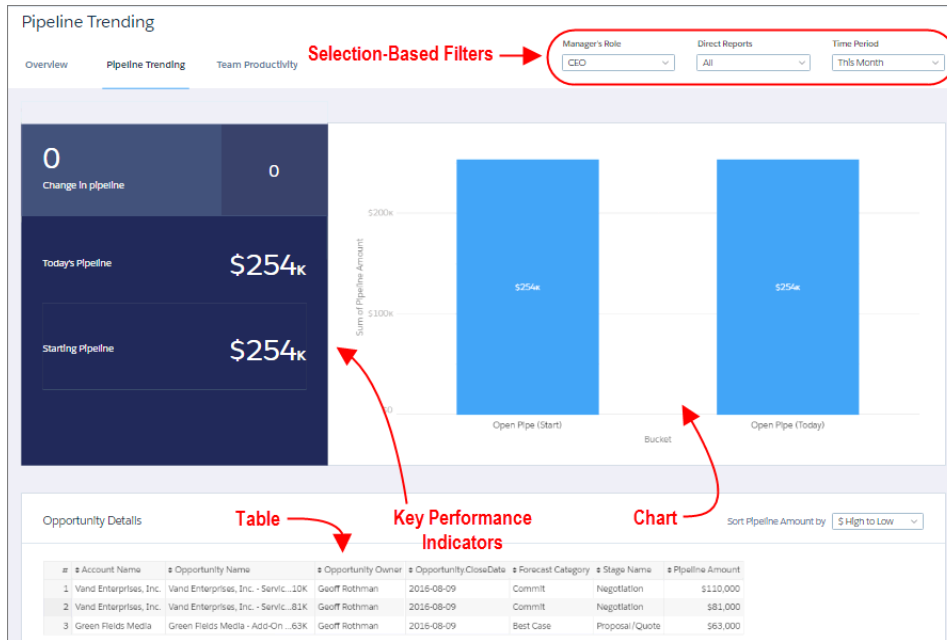
SEE ALSO:

[Build Analytics Dashboards](#)

[Build a Dashboard with the Classic Designer](#)

Key Elements of an Analytics Dashboard

A dashboard isn't just for reading. It's for carrying on a conversation based on one or more datasets that matter to your company. Don't just look at the pictures—use the tools on the dashboard to dive deeper into the data that you care about. Go ahead, click around, and explore!



You read a Salesforce Analytics dashboard interactively by clicking its displayed elements. Every element is a picture of a live, filtered query.

Selection-Based Filters

A selection-based filter lets you apply whatever filters you wish while viewing the dashboard. For example, set the minimum and maximum values in a range widget to make the dashboard show the amounts that fall within that range. These types of filters are often tied to each other so that you can progressively drill deeper. For example, use one filter to look at sales of a product. Then use the next to filter sales by region. Finally, use another to filter sales by account. The dashboard shows the results based on all three filters. There are different types of selection-based filter widgets: date, list, range, and toggle.

Key Performance Indicators

Some information is best measured by a single number, also known as a key performance indicator. Some number elements can be filtered based on selections in charts and filters. For example, in a bar chart that shows individual salespeople's pipelines, click a bar to focus on a particular person's pipeline. Notice that the number changes from showing the total value for all salespeople to show the value for the selected person.

Charts

A rich variety of charts shows you data from multiple angles. Many parts of a chart are interactive. For example, click a bar in a bar chart and watch what happens. Clicking a bar filters the query that the bar chart represents. Your revision changes other values in this chart, values in other charts, and number displays.

Tables

A table provides the record-level details. For example, a chart can show you a performance summary for each region, but the table can show you the opportunity-specific details. You can sort tables to show the top and bottom records. You can also create calculated columns in tables to compute values based on existing data.

Query Your Data to Know Your Business



It's great to have a gut feeling about how well your business is doing. However, before you take action, test the feeling against your data. Ask your data questions.


The easiest method for asking questions about data in datasets is to use the explorer. You ask questions in the form of queries. Use the left panel (1) of the explorer to create your query. You can perform calculations (referred to as measures), like sum of amount or average case duration. To break down the measure across different areas, group it by descriptive fields (known as dimensions), like region or owner. To find the top or bottom performers, sort the measure in descending or ascending order. Then, if needed, apply filters to focus on a subset of the results.


The screenshot displays the Salesforce Analytics Explorer interface for a dataset named "Opportunities". The interface is divided into three main panels:

- Panel 1 (Left):** The "Measures" section shows "Sum of Amount" selected. The "Group by" section has "Account Name" selected. The "Filter by" section includes "Closed: Open", "Forecast Category: BestCase, Forecast,..." (with a close button), and "Close Date this year - next year" (with a close button).
- Panel 2 (Middle):** A horizontal bar chart titled "Sum of Amount" showing the sum of amount for various accounts. The x-axis ranges from \$0 to \$10M. The y-axis lists account names. The top account is Harris13 Inc with a sum of \$10M.
- Panel 3 (Right):** The "CHART PROPERTIES" panel, which is currently set to "General". It includes fields for "Title" (No title), "Subtitle" (No subtitle), "Title Alignment" (center), "Bar Chart" (selected), "Y-Axis", "X-Axis (Top)", "Legend", and "Trellis".

Red boxes with numbers 1, 2, and 3 are overlaid on the interface to highlight these three panels respectively.

The middle explorer panel (2) shows a visual representation of the query results. You can display the results as a chart or table. When in chart mode (), you can choose which chart type to use—Analytics offers many. In table mode (), you can display the dataset records as a values table or create calculated fields and display them in a compare table. And, yes, pivot tables are also possible.

The right explorer panel (3) shows the visualization properties—configure them to modify the appearance of the chart or table. For instance, you can remove the legend, change the axis scale, or add a title. To view this panel, click .

If you're more advanced, write your own custom queries using Salesforce Analytics Query Language (SAQL) notation. In SAQL mode (), you have more flexibility to write robust queries, like ones that span multiple datasets or have modified query limits. For example, if the results are sorted in descending order, you set the limit to 5, and click **Run Query**, the query returns only the top five accounts.

The screenshot shows an analytics tool interface for a dataset named 'Opportunities'. At the top, there are navigation icons for back, forward, refresh, and search. Below that, there are icons for filter, table view, and a right arrow. The main area is a 'Query' editor with a 'Run Query' button. The query is as follows:

```

1 q = load "opportunity5";
2 q = filter q by 'IsClosed' == "false";
3 q = filter q by 'ForecastCategory' in ["BestCase", "Forecast", "Pipeline"];
4 q = filter q by date('CloseDate_Year', 'CloseDate_Month', 'CloseDate_Day') in ["current year".."1 year ahead"];
5 q = group q by 'Account.Name';
6 q = foreach q generate 'Account.Name' as 'Account.Name', sum('Amount') as 'sum_Amount';
7 q = order q by 'sum_Amount' desc;
8 q = limit q 55;
    
```

A red circle highlights the number '55' in the last line of the query. A red arrow points from this circle to a table below. The table is titled 'ACCOUNT NAME' and 'SUM OF AMOUNT' and contains the following data:

ACCOUNT NAME	SUM OF AMOUNT
Harris13 Inc	\$10,051,950
Watts685 Inc	\$8,577,295
Ramirez137 Inc	\$6,671,595
Myers581 Inc	\$5,198,280
Benson346 Inc	\$4,747,520

IN THIS SECTION:

[Monitor Your Business Regularly with Analytics Dashboards](#)

Analytics dashboards are populated with your data based on queries that you define. To continually get answers to common questions, save and organize your queries in interactive Analytics dashboards. Each time you open the dashboard, the queries get the latest results based on the available data.

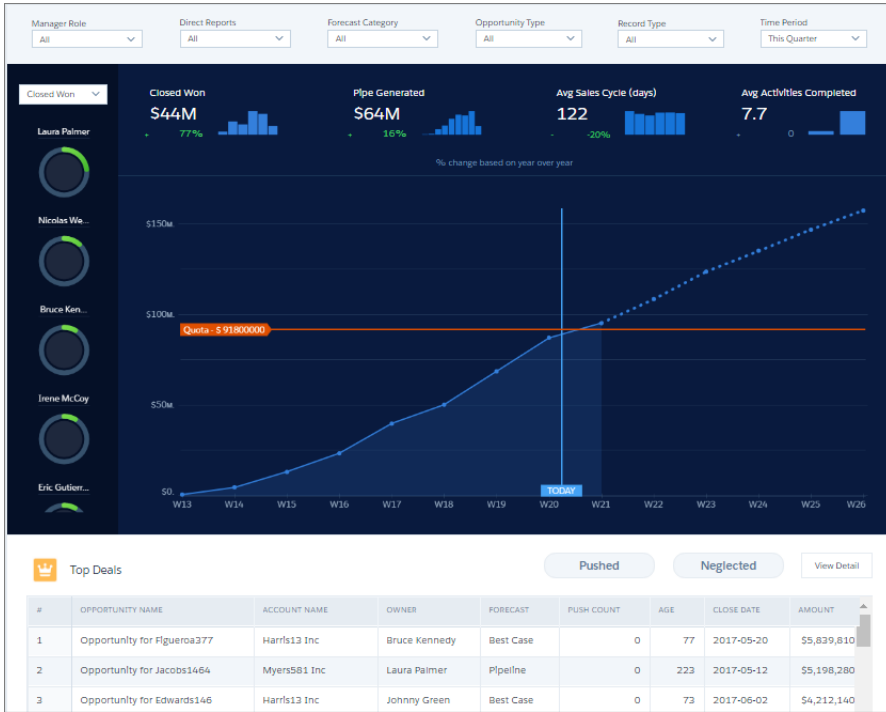
[Answer Ad Hoc Questions with Analytics Lenses](#)

Dashboards are great for answering common questions, but sometimes you don't have a question in mind. You just want to poke around your data and ask questions as you notice things. To explore your data, open a dataset and create ad hoc queries. To revisit the query later, save it as a lens. The lens includes the query and the visualization—how the results appear. Like dashboards, lenses can be shared.

Monitor Your Business Regularly with Analytics Dashboards

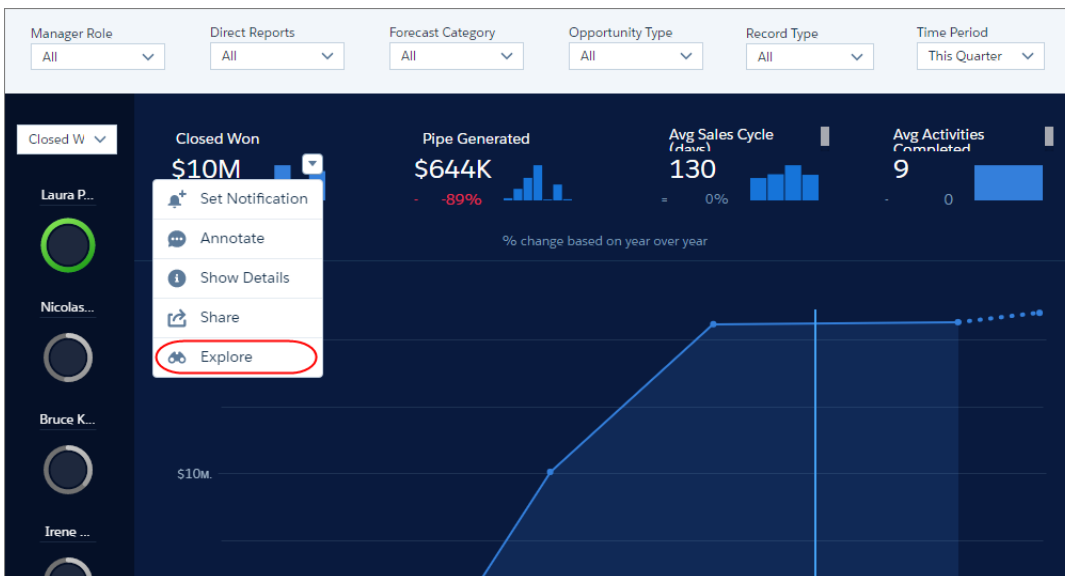
Analytics dashboards are populated with your data based on queries that you define. To continually get answers to common questions, save and organize your queries in interactive Analytics dashboards. Each time you open the dashboard, the queries get the latest results based on the available data.

As the sales executive, the start of your day might include a cup of coffee and the following sales leader dashboard. Each component is based on a query. For example, the timeline chart component shows the cumulative opportunity amount for each week of this quarter. The leaderboard in the left column ranks reps by sales (closed won opportunities).



Because of built-in dashboard interactivity, you don't have to add more queries to ask follow-up questions. For example, to focus on an individual's performance, select the rep's donut chart in the leader panel on the left. Analytics filters the dashboard results based on the selected rep. Behind the scenes, Analytics modifies the underlying queries, filtering the results to get the specific rep's opportunities.

If the dashboard can't be used to answer a question, hover over a dashboard component and click **Explore** to create a new query based on the same dataset.



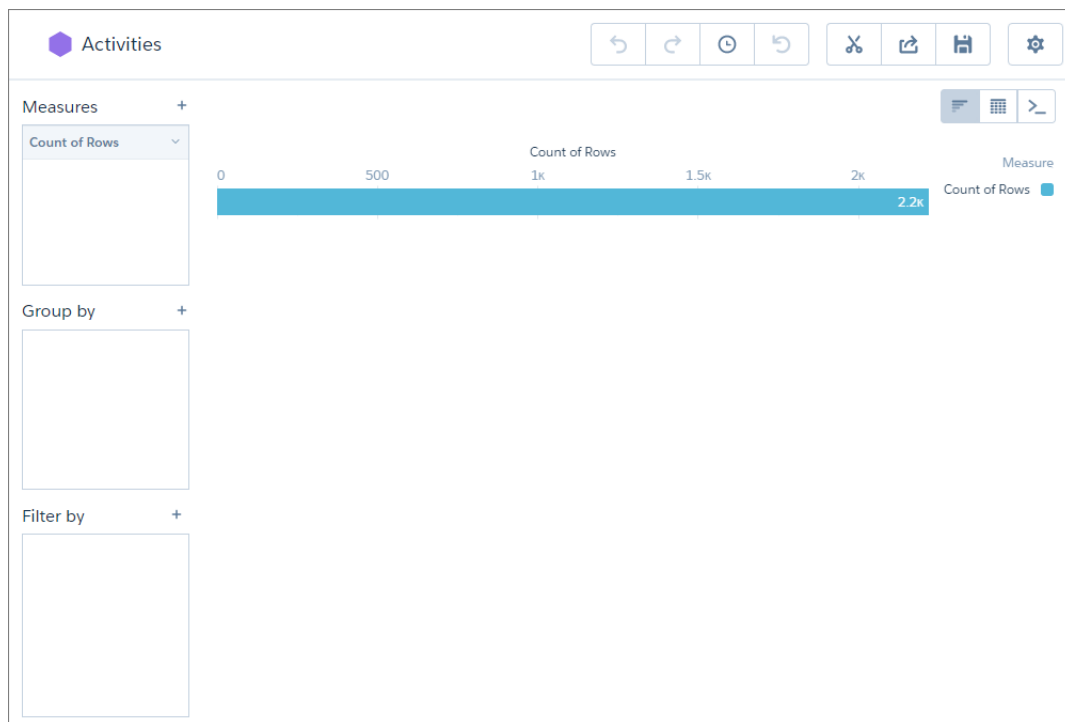
SEE ALSO:




[Manage Steps for Widgets](#)

Answer Ad Hoc Questions with Analytics Lenses

Dashboards are great for answering common questions, but sometimes you don't have a question in mind. You just want to poke around your data and ask questions as you notice things. To explore your data, open a dataset and create ad hoc queries. To revisit the query later, save it as a lens. The lens includes the query and the visualization—how the results appear. Like dashboards, lenses can be shared.

When you open a dataset, the explorer shows the number of dataset rows as a bar chart, by default.



To change the query, add measures, groupings, and filters to the Measures, Group by, and Filter by boxes. To represent the results as a different chart type, click . To represent the results as a table or to create calculated fields based on existing fields, click . If you're more advanced and want a more robust way to create SAQL queries, click  to manually enter the query.

Product Sales

Query Run Query

```

1 q = load "SuperStoreSales5";
2 q = group q by ('Product_Category', 'Product_Sub_Category');
3 q = foreach q generate 'Product_Category' as 'Product_Category', 'Product_Sub_Category' as 'Product_Sub_Category', sum('Unit_Price')
  as 'sum_Unit_Price';
4 q = filter q by ('sum_Unit_Price' >= 1000) && ('sum_Unit_Price' <= 204548.11);
5 q = order q by ('Product_Category' asc, 'Product_Sub_Category' asc);
6 q = limit q 2000;

```

PRODUCT_CATEGORY	PRODUCT_SUB_CATEGORY	SUM OF UNIT_PRICE
Furniture	Bookcases	35,572
	Chairs & Chairmats	81,500
	Office Furnishings	29,836
	Tables	88,354
Office Supplies	Appliances	35,612

To add a query to a dashboard, click to clip it.

SEE ALSO:

[Explore and Visualize Your Data](#)

Open Analytics

Access your Analytics home page from a tab within Salesforce. Alternatively, go to the Analytics environment by opening the app menu or app launcher in the Salesforce header and then clicking **Analytics Studio**.

To start in the Analytics Studio, click the tile (1). To start in the Analytics tab, click the Analytics item (2). Each environment allows easy movement to the other.

EDITIONS

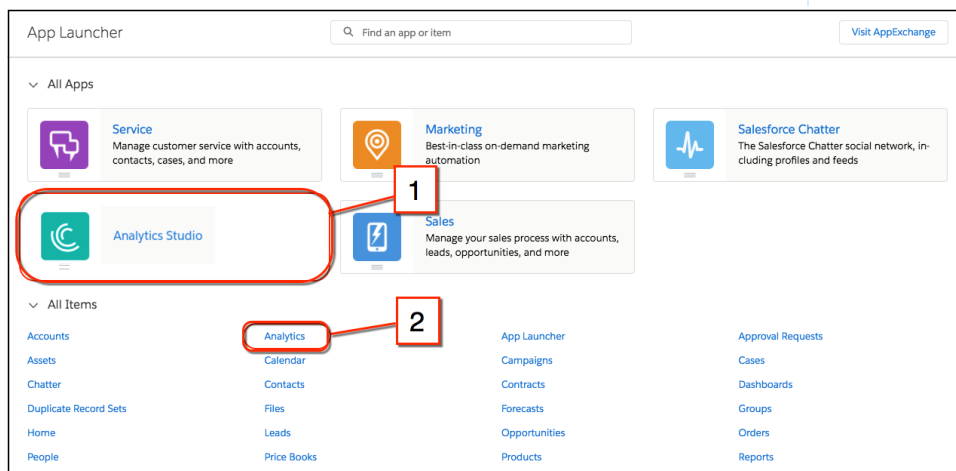
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

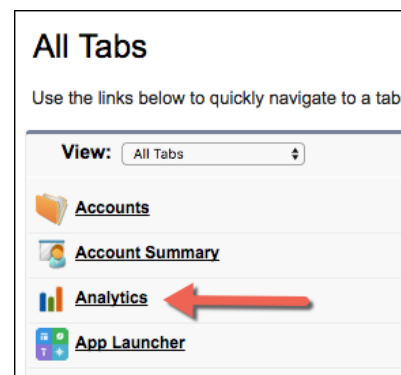
USER PERMISSIONS

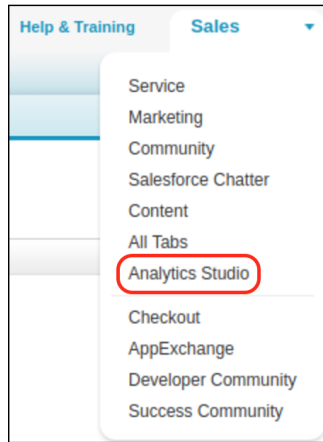
To access Analytics:

- Use Analytics



If you don't see the tab, your administrator sets it up like any new tab.





Get Oriented with Your Analytics Home Page

Start exploring your data! With Analytics, you can take either a business user path or a builder path, depending on what you want to do, and you can switch paths at any time.

Salesforce Tab

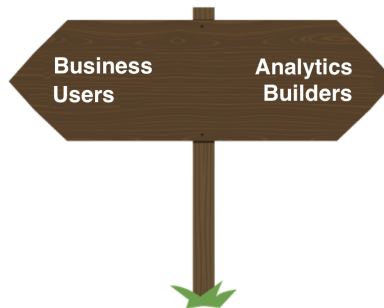
Stay in Salesforce



Run and explore apps

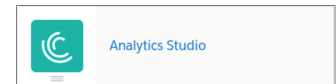


Two Paths



Analytics Studio

Go to Analytics > >



Browse and build assets

TITLE	CREATOR	MODIFIED	APPROVED
DTC Sales	Kim Chouat	Kim Chouat (6/26/17 at 10:22 AM)	Kim B. 2017 at 10:20 AM
Sales Performance with Salesforce Resources	Kim Chouat	Kim Chouat (6/26/17 at 10:22 AM)	Kim B. 2017 at 10:20 AM
Open Opportunity	Kim Chouat	Kim Chouat (6/26/17 at 10:20 AM)	Kim B. 2017 at 10:20 AM
Regional Sales	Kim Chouat	Kim Chouat (6/26/17 at 10:20 AM)	Kim B. 2017 at 10:20 AM

The business user path, generally for those with Use Analytics permission, leads to ready-to-explore dashboards and lenses in curated apps. For this path, work in the Analytics tab to run apps and collaborate with coworkers over dashboards.

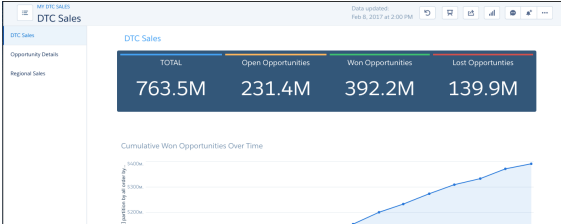
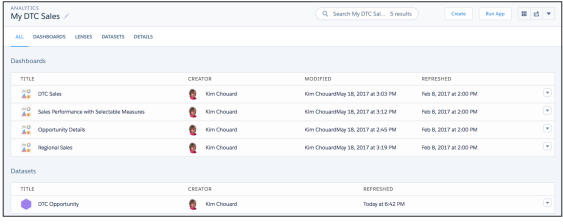
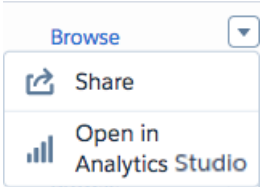
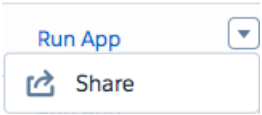
The builder path, generally for those with permission to create Analytics assets, leads to ready-to-explore datasets and ready-to-edit apps, dashboards, and lenses. For this path, work in the Analytics Studio to browse your assets and build new ones.

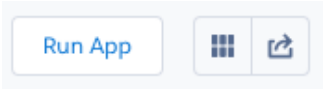
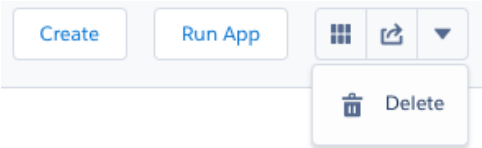

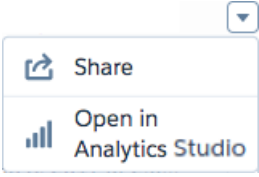
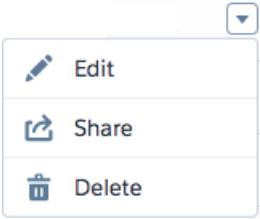

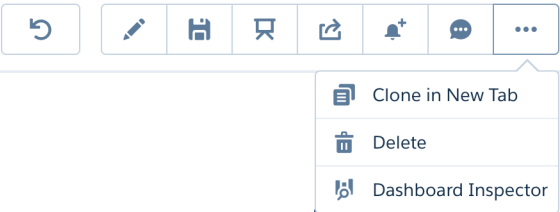
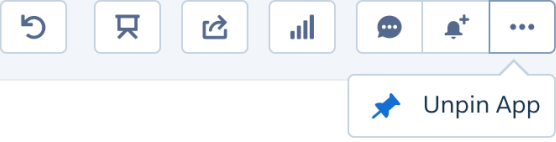

This table summarizes the differences between the Analytics tab in Salesforce and the Analytics Studio.


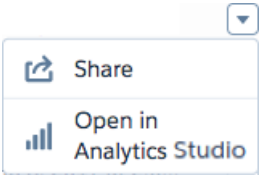
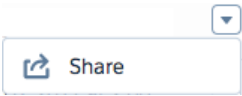

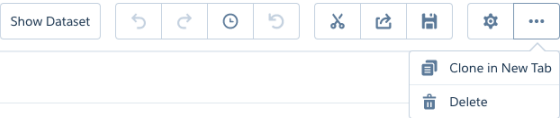
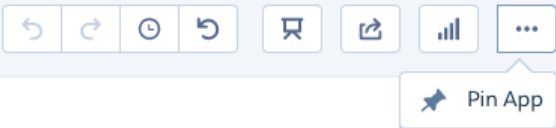


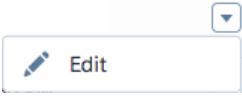
Action	Salesforce Tab (Run and Collaborate)	Analytics Studio (Browse and Build)
Create		

Action	Salesforce Tab (Run and Collaborate)	Analytics Studio (Browse and Build)
Annotate	✓	✓
Set Notification	✓	✓
Pin Apps	✓	✓
Edit		✓
Full Screen	✓	✓
Clip to Designer		✓
Clone in New Tab		✓
Save		✓
Share	✓	✓
Delete		✓

This table details the differences in behavior and functionality between the Analytics tab in Salesforce and the Analytics Studio.

Analytics Asset	Salesforce Tab	Analytics Studio
Apps		
What happens when you click an app name or icon on the home page	Runs app 	Browses app 
App actions on home page tile or list entry	Browse; Share; Open in Analytics Studio 	Run App; Share 

Analytics Asset	Salesforce Tab	Analytics Studio
<p>Actions on the Browse App page</p>	<p>Run App; Tile/List View; Share</p> 	<p>Create; Run App; Tile/List View; Share; Delete</p> 
<p>Dashboards</p>		<p> Note: Actions are available depending upon user permissions and app sharing access.</p>
<p>Dashboard actions on home page tile or list entry</p>	<p>Share; Open in Analytics Studio</p> 	<p>Edit; Share; Delete</p> 
<p>Dashboard actions when opened from home page</p>	<p>Follow; Open in Analytics Studio; Show Notifications</p> 	<p>(Dashboard designer preview mode) Follow; Reset; Edit; Save; Full Screen; Share; Show Notifications; Clone in New Tab; Delete; Dashboard Inspector</p> 
<p>Dashboard actions when opened in running Analytics app</p>	<p>Return to Initial View; Full Screen; Share; Open in Analytics Studio; Show Annotations; Show Notifications; Pin App</p> 	<p>Return to Initial View; Full Screen; Share; Edit; Show Annotations; Show Notifications; Pin App; Browse App</p> 

Analytics Asset	Salesforce Tab	Analytics Studio
Lenses		 Note: Actions are available depending upon user permissions and app sharing access.
Lens actions on home page tile or list entry	Share; Open in Analytics Studio 	Share 
Lens actions when opened from home page	Show Dataset; Undo; Redo; View History; Return to Initial View; Open in Analytics Studio; Properties 	(Explorer window) Show Dataset; Undo; Redo; View History; Return to Initial View; Clip to Designer; Share; Save; Properties; Clone in New Tab; Delete 
Lens actions when opened in running Analytics app	Undo; Redo; View History; Return to Initial View; Full Screen; Share; Open in Analytics Studio; Pin App 	Undo; Redo; View History; Return to Initial View; Full Screen; Share; Edit; Pin App; Browse App 
Datasets		 Note: Edit is available depending upon user permissions and app sharing access.
Dataset actions on home page tile or list entry	N/A	Edit 

IN THIS SECTION:

[Find Your Analytics Assets](#)

Your Analytics home page provides easy access to apps, dashboards, and lenses, and a variety of filter and search options help you find those Analytics assets fast.

[Run Apps](#)

Analytics apps are where you run dashboards and lenses.

[Pin Apps to Your Analytics Home](#)



Set up your Analytics home by pinning apps that will help you quickly locate and run your favorite, often-used assets.

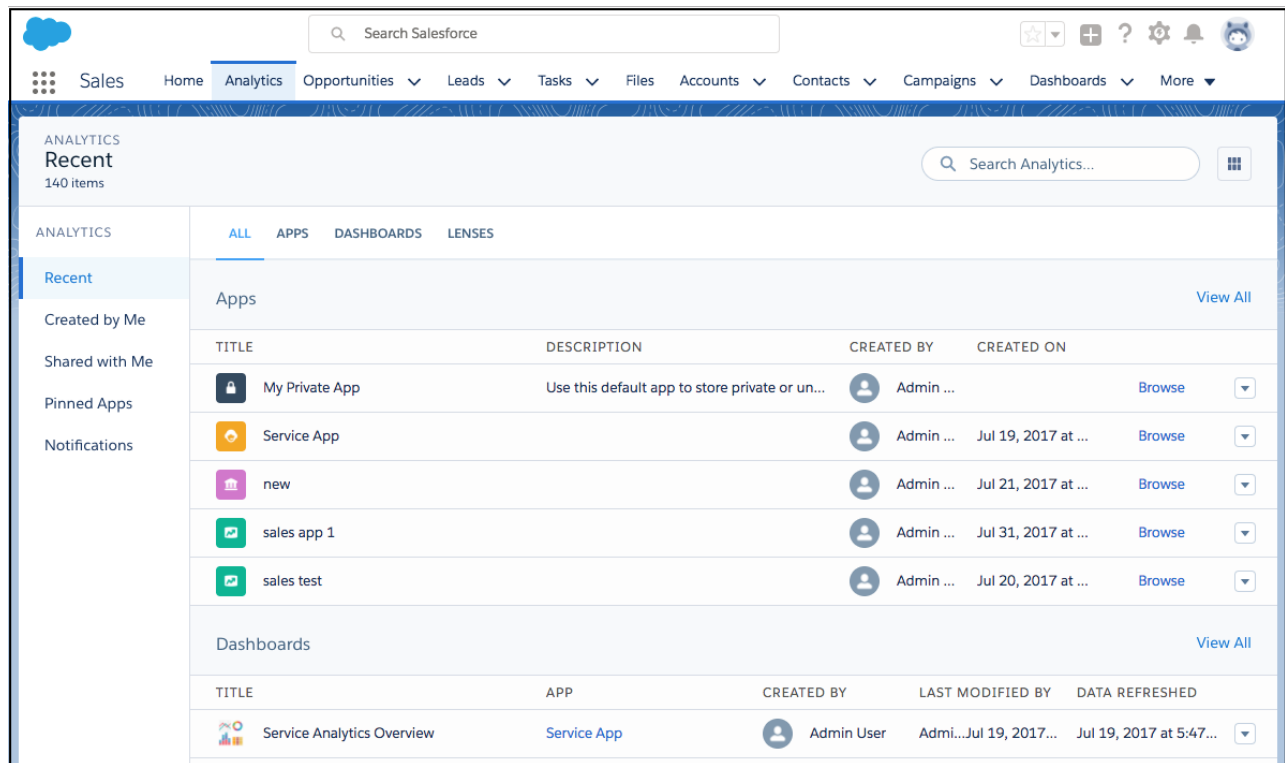
[Track Notifications](#)

Quickly monitor important changes in your data by tracking the status of your notifications.

Find Your Analytics Assets

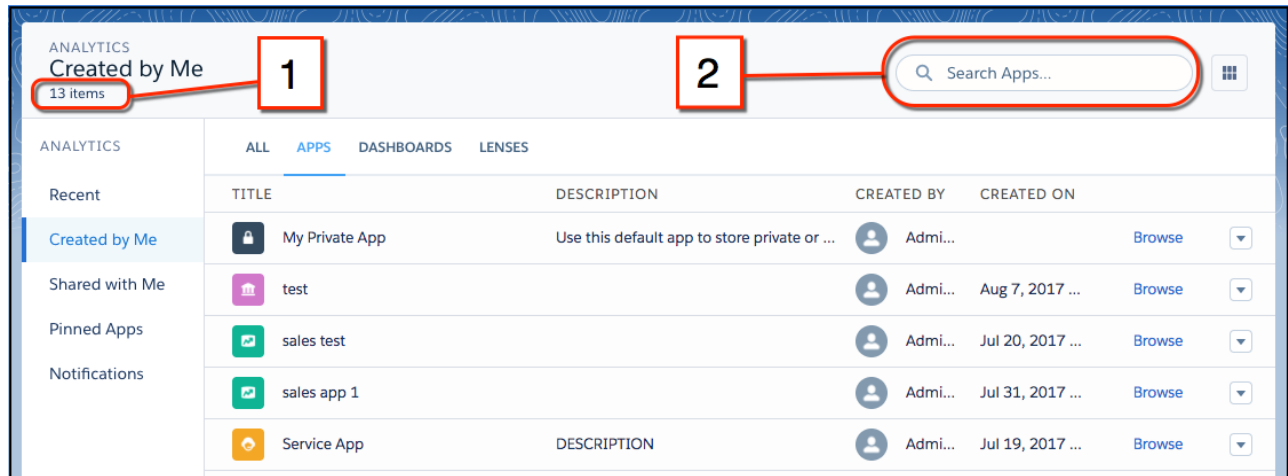
Your Analytics home page provides easy access to apps, dashboards, and lenses, and a variety of filter and search options help you find those Analytics assets fast.

Lists of Analytics assets are arranged in most recently used order. Click the list view icon () to view assets with their descriptions and additional information. Click the tile view icon () to view tiles with thumbnail images of dashboards and lenses.

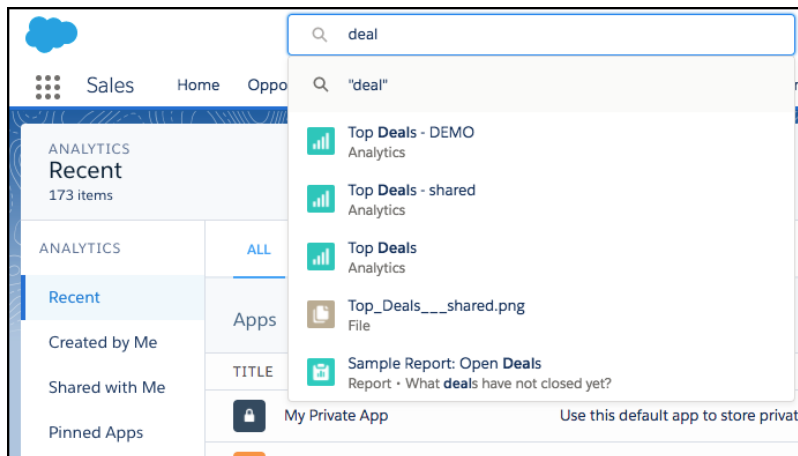


All views, whether tiles or list, include one-click access to both run and browse actions, as well as other actions if appropriate for the asset. Relevant timestamps are provided, depending on the asset. For lenses and dashboards, Data Refreshed is the last time the asset's dataset was updated. If a dashboard contains components that reference more than one dataset, the Data Refreshed timestamp will reflect the most recently updated dataset.

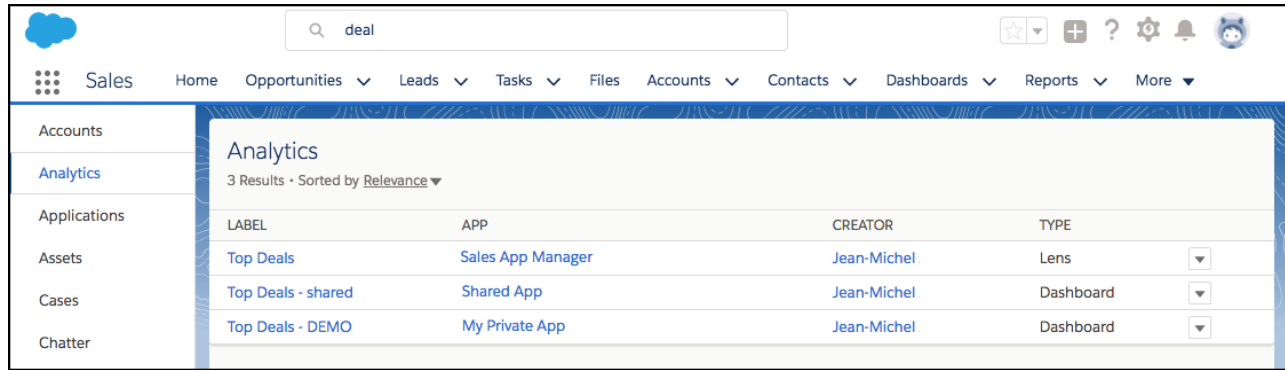
Filter using **Created by Me** and **Shared with Me**, as well as the **Apps**, **Dashboards**, and **Lenses** subtabs (and the **Datasets** subtab in Analytics Studio). The count of items reflects the filters you selected (1), and the search box searches only filtered items (2).



If you're working in Lightning Experience, you can use the global search box to quickly find and view lenses and dashboards. The search box dropdown list includes Analytics assets among its suggestions. Selecting an asset from the list runs it in the Analytics tab.



Or start typing and press Enter to see a page of found resources. To narrow the search results to only Analytics lenses and dashboards, click **Analytics** in the left panel. From the results, you can click to run either the asset or its app.



Run Apps

Analytics apps are where you run dashboards and lenses.

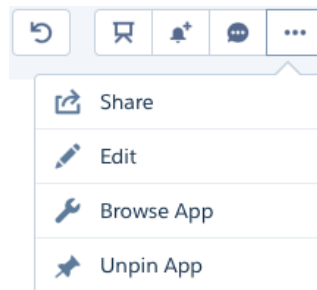
In the Analytics tab, click an app to run it. In Analytics Studio, click **Run App**. Running an app opens it in presentation mode, displaying the first dashboard or lens on your navigation list.

To open the navigation panel, click the navigation icon (☰). The panel lists the available dashboards and lenses. Click the icon again to close the panel.

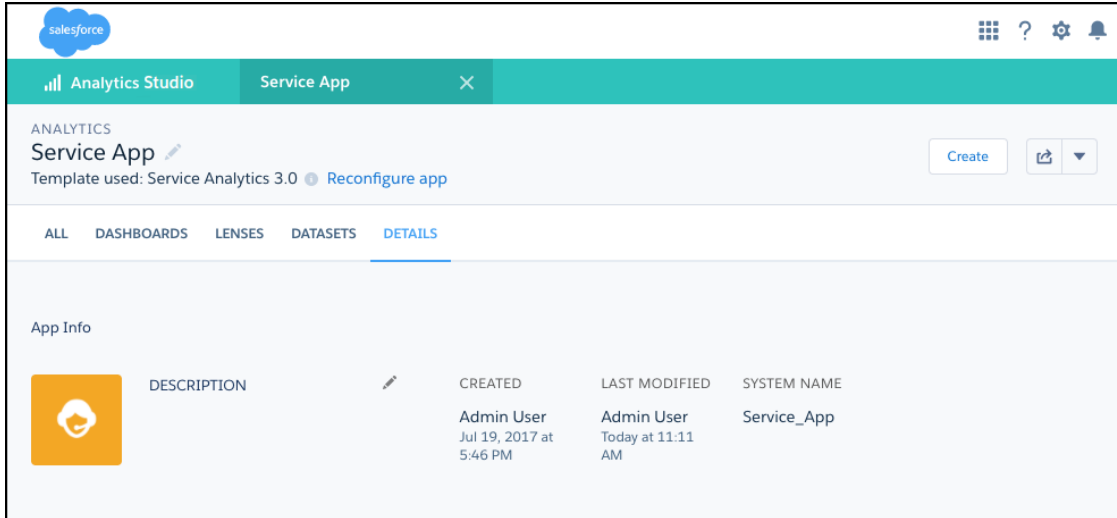
When the navigation panel is open, click any asset in the list. Dashboards and lenses let you explore live, interactive views of your data.

When you want to return the asset to its initial state, click the Reset icon (↶).

In addition, from the running app you can:



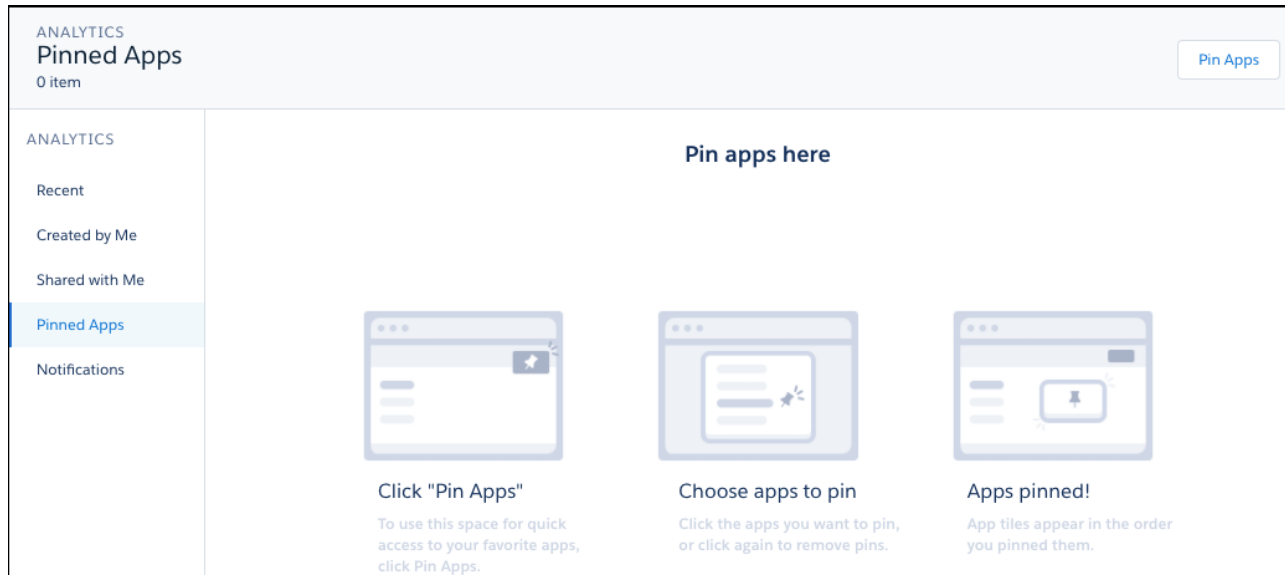
- Present full screen
- Set and manage notifications
- Annotate dashboard widgets
- Share
- View exploration history
- Open dashboards in the dashboard designer in order to edit them on page 369 (if you have permission and access)
- Pin the app to the home page (if you have permission and access).
- Browse the contents of the app to see its assets. The app browse page has the **Details** subtab. In addition to viewing app details, the Details tab is where you can add a description for the app and change its icon.



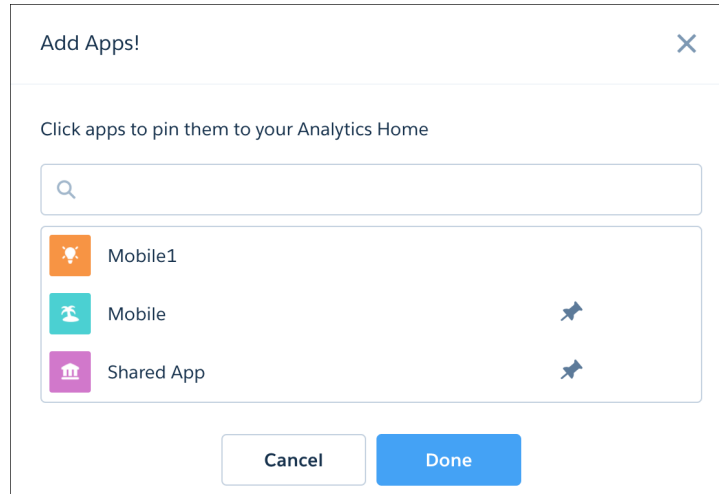
Pin Apps to Your Analytics Home

Set up your Analytics home by pinning apps that will help you quickly locate and run your favorite, often-used assets.

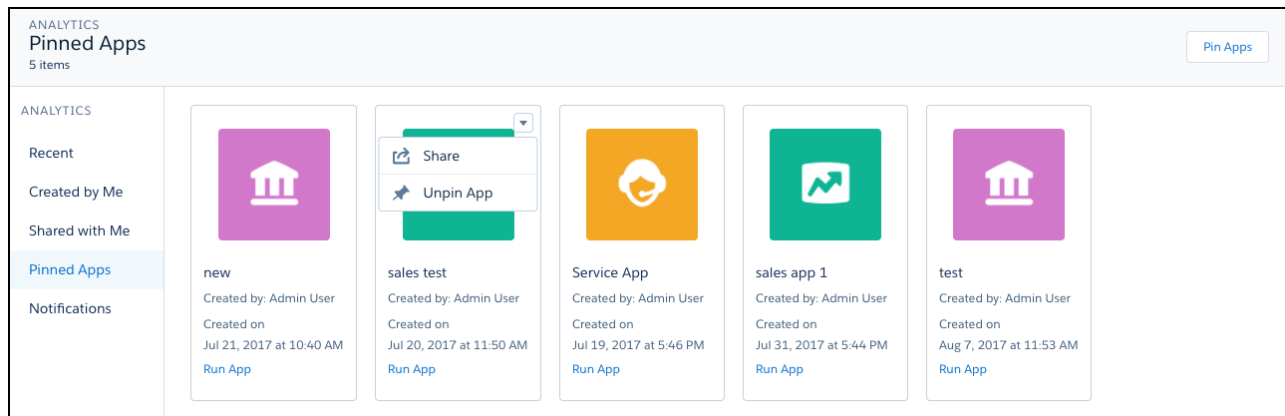
Click the **Pinned Apps** filter on the left of your Analytics home.




Click **Pin Apps** in the upper right to select the apps that you want to access regularly. Or to unpin an app, click it again to remove the pin.



Apps appear on your Analytics home in the order that you pinned them.

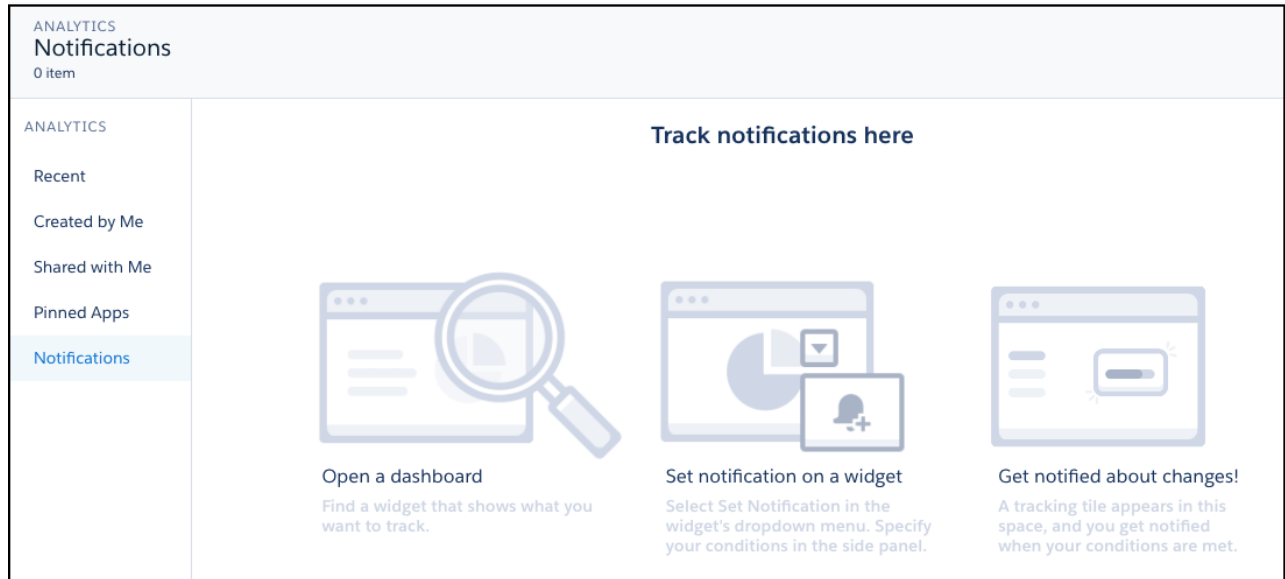


 **Note:** If you don't have any apps yet, go to [Create an App](#).

Track Notifications

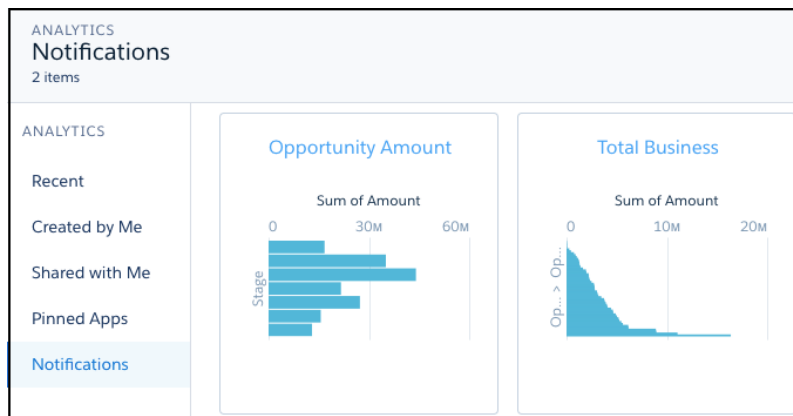
Quickly monitor important changes in your data by tracking the status of your notifications.

Click the **Notifications** filter on the left of your Analytics home.



If you don't have any notifications yet, navigate to a dashboard with a number or chart you'd like to follow. Dashboard widgets are where you set notifications. Hover over the upper right corner of the widget, locate the dropdown action list, and select **Set Notification**. For more information, see [Set Smart Notifications for Your Most Important Business Metrics](#).

You can set active notifications to appear on your Analytics home page. The notifications tracking gauges and bar charts are designed to show the progress toward the conditions set in your notification.



View, Collaborate, and Take Action from Analytics

Personalize your own Analytics experience and collaborate with Analytics apps with features such as notifications, annotations, presentation mode, and downloading filtered data from Analytics. In addition, custom menus in lenses and dashboards allow you to take action in Salesforce directly from Analytics.

IN THIS SECTION:

[Set Smart Notifications for Your Most Important Business Metrics](#)

With notifications, Analytics works for you, when and where you choose. Attach notification criteria to widgets in dashboards, and select when to run the queries. You can see notifications in Analytics, Lightning Experience, and email. Notifications are available in dashboards built in the Wave dashboard designer.

[Collaborate with Dashboard Annotations](#)

Annotate dashboard widgets with comments posted in the dashboard and in Chatter. With annotations, you can hold conversations about your data and how it's visualized, with the dashboard right there for reference.

[Present Live, Interactive Dashboards](#)

Conduct meetings directly from Analytics by presenting dashboards in running apps. With dashboards instead of slides with static images, you have real-time access to your data, and you can showcase dynamic visualizations.

[Download Images and Filtered Data](#)

Download filtered data from lens explorations and dashboard widgets. Download formats include image (.png), Microsoft® Excel® (.xls), and comma-separated values (.csv) files. This feature downloads the results of a displayed query (or step).

[Incorporate Visualizations through Chatter Posts and Sharing Links](#)

Share a visualization with your colleagues by posting to Chatter, or by getting its unique URL. A Chatter post provides an image and a link to the asset—lens, dashboard, or app—in Analytics. Colleagues with the link and access to the asset can drill in and explore the information that's presented.

[Take Control of Your Salesforce Experience with Analytics Custom Actions Menus](#)

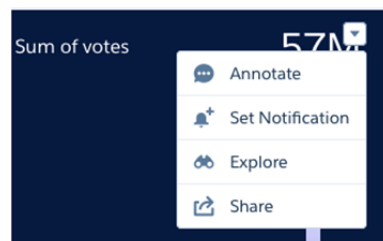
Analytics custom actions menus in charts and tables let you take advantage of Salesforce actions—such as posting to Chatter, creating an event or opportunity, or updating a record—and go directly to Salesforce records.

Set Smart Notifications for Your Most Important Business Metrics

With notifications, Analytics works for you, when and where you choose. Attach notification criteria to widgets in dashboards, and select when to run the queries. You can see notifications in Analytics, Lightning Experience, and email. Notifications are available in dashboards built in the Wave dashboard designer.

To set up an Analytics notification, follow these steps.

1. Locate a dashboard widget that shows information you want to be notified about. You can set notifications on any chart except timeline or values table. Optionally, you can use the dashboard's selectors to create a more personalized query of your data.
2. Select **Set Notification** from the drop-down list.



3. In the New Notification panel, set the value that you want to know about as soon as your widget query returns it. Depending on the chart, the panel provides relevant options to select for creating a notification. You can include up to four groupings. If the chart has multiple measures, select the one you want from the list of options.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To set notifications on Analytics dashboard widgets:

- Use Analytics
- Run Reports

For example, say that you want to know when your team has reached 75% of quota. You'd click **Set Notification** on the Quota Attainment number widget. In the New Notification panel, you'd select **Equals or is greater than** from the drop-down list and enter 75 for the threshold value.

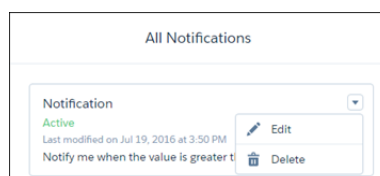
Notifications read generally like a sentence. For example, "Notify me when any channel's sum of open cases is less than 20" or "Notify me when any product or reason's count of cases is greater than 20."

4. Select the frequency and time when you want the query to run. Optionally, set Analytics to track the progress toward the conditions set in the notification on your Analytics home page.

5. Test your notification on the spot with **Save and Run**, or simply save it. No administrator setup is required.

When the conditions you've set for the notification are met, you're notified in the app and via email. In Analytics and Lightning Experience, the bell icon (🔔) informs you of notifications.

In Analytics, the drop-down list from the bell includes the option to manage Analytics notifications. You can also manage notifications on the dashboard. The bell icon with the plus (🔔+) opens the list of notifications and shows numbers in blue (1) on widgets that have notifications attached. In the All Notifications panel, each notification has a drop-down action list for editing and deleting the notification.





Take note of these considerations for Analytics notifications.

- You can set up to five notifications per user.
- Notifications are available only for dashboards designed in the Wave dashboard designer.
- Notifications are available on all widgets except timeline and values tables.
- For queries with groupings, all results are evaluated for the notification criteria, not just the first row.

Collaborate with Dashboard Annotations

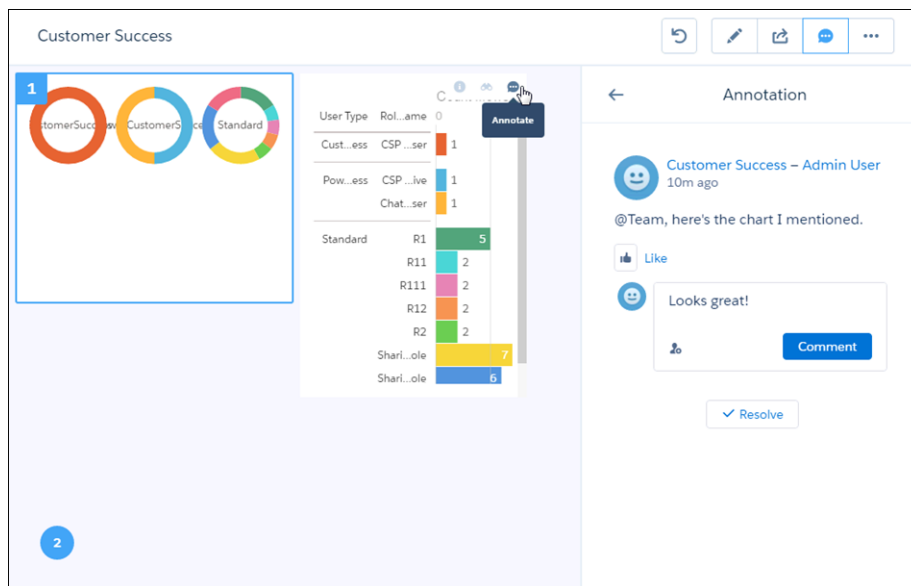
Annotate dashboard widgets with comments posted in the dashboard and in Chatter. With annotations, you can hold conversations about your data and how it's visualized, with the dashboard right there for reference.

 **Note:** Annotations are supported only in dashboards built using the Wave dashboard designer.

To create annotations, select Annotate from the drop-down list on a widget, or click the speech bubble icon () in the dashboard control bar. Widgets with annotations show a blue square with the number of open annotations.

Analytics saves both open and resolved annotations. And if you delete a widget, its open annotations are saved as detached annotations. You can access detached annotations from the blue circle at the bottom of the dashboard.

Click an annotation in a blue square or circle to open it for comments.



Although you can @mention anyone in your org, the security you have set up controls access to the dashboard.

Analytics dashboard annotations are natively integrated with Chatter, and comments on dashboards also appear as Chatter posts. The Annotation panel includes the option to post a screenshot of the current state of the dashboard. Attach current screenshot

On an open annotation, you can refresh the feed or close the annotation.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

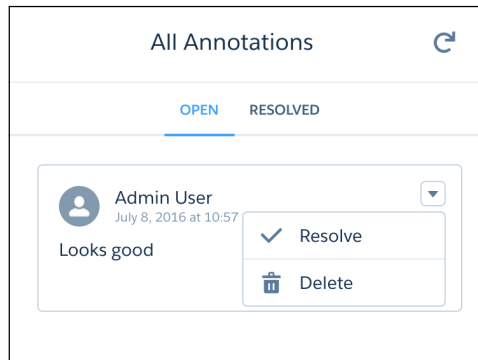
USER PERMISSIONS

To annotate Analytics dashboard widgets:

- Use Analytics



In the dashboard panel, each annotation has a drop-down action list for resolving or deleting the annotation.




You receive all posts on a dashboard if you click its [+ Follow](#) button. When you see annotations in Chatter, click the dashboard image to navigate directly to the annotation on the dashboard in Analytics.

SEE ALSO:

[Enable Annotations on Dashboard Widgets](#)

Present Live, Interactive Dashboards

Conduct meetings directly from Analytics by presenting dashboards in running apps. With dashboards instead of slides with static images, you have real-time access to your data, and you can showcase dynamic visualizations.

Start a presentation by clicking the Full Screen icon () in the control bar of a running app or dashboard.

During the presentation, you can use all the Analytics functionality, such as filtering, faceting, and exploring lenses. In addition, the presentation has a control bar.

EDITIONS

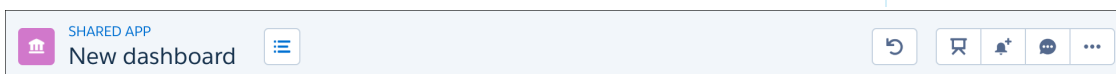
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.



USER PERMISSIONS

To present from Analytics:

- Use Analytics



You can share, download, set notifications, and collaborate in a dashboard's feed with annotations.

To move to another dashboard or lens, click  to open the navigation panel and select the next asset to present. Click  again to close the navigation panel.

Download Images and Filtered Data

Download filtered data from lens explorations and dashboard widgets. Download formats include image (.png), Microsoft® Excel® (.xls), and comma-separated values (.csv) files. This feature downloads the results of a displayed query (or step).

Select **Share** from the dropdown menu on a dashboard widget, or from a lens, click the **Share** icon. In the Share dialog, select **Download**.

EDITIONS

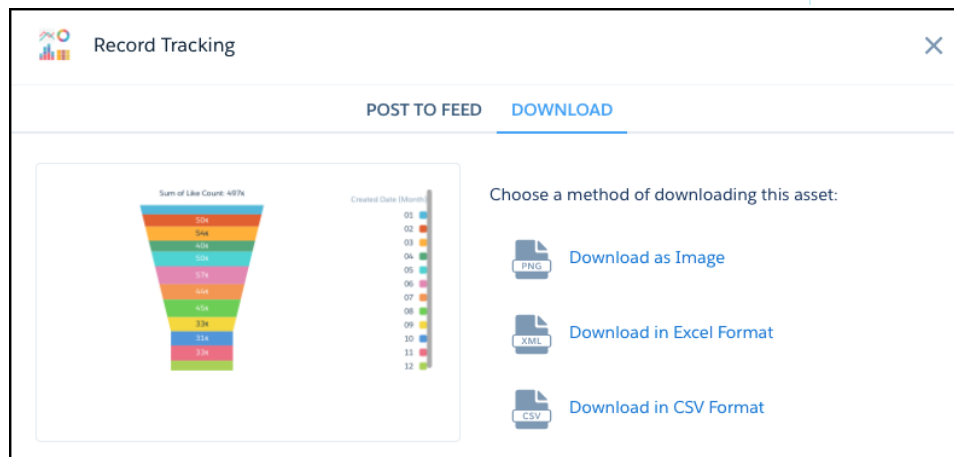
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To download screenshots and data in tabular format through the Analytics user interface:

- Download Data from Analytics



When downloading filtered data, the number of rows is limited by the query. The default limit per query is 10,000 rows of data. To set a different value, use the SAQL `limit` statement.

SEE ALSO:

[Enable Downloading from Analytics](#)

Incorporate Visualizations through Chatter Posts and Sharing Links

Share a visualization with your colleagues by posting to Chatter, or by getting its unique URL. A Chatter post provides an image and a link to the asset—lens, dashboard, or app—in Analytics. Colleagues with the link and access to the asset can drill in and explore the information that's presented.

1. Click **Share**.



2. Click the tab for the sharing method that you want: **Post to Feed**, which posts to Chatter an image and link to the lens, dashboard, or app; or **Get URL**, which is a unique URL to the asset.
 - a. If you're posting to Chatter, select **User** or **Group** feed, enter the name, and then type your comment. You can also remove the image from your post by hovering over it and clicking the **x**. Note that posted images are public.
 - b. If you're getting the unique URL, copy the link, and then paste it wherever you want to share it.
3. If applicable, click **Give Access** to set the level of sharing access.
4. Click **Done**.



Note: To share a visualization, you must give access to the app that contains it. Lenses, datasets, and dashboards within the default Shared App are accessible to all Analytics users, unless administrators have restricted access. All other apps are private unless someone with Manager access to the app has shared it with a specific user, group, or role.

Take Control of Your Salesforce Experience with Analytics Custom Actions Menus

Analytics custom actions menus in charts and tables let you take advantage of Salesforce actions—such as posting to Chatter, creating an event or opportunity, or updating a record—and go directly to Salesforce records.

With custom actions menus, you can use quick actions that have been added to Salesforce objects—directly from Analytics dashboards and lenses. You can also open records from Salesforce or elsewhere on the Web through the menus.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

- Use Analytics

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.


USER PERMISSIONS











To use custom actions menus:

- "Use Analytics"

Opportunity Name
 Equals Opportunity for Pearson1363 Filter

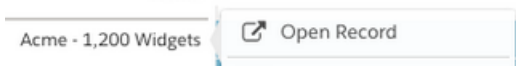
#	Opportunity Name	Amount	ValidFromDate
1	Opportunity for Pearson1363		02 20
2	Opportunity for Pearson1363	\$	02 20
3	Opportunity for Pearson1363	\$	02 30

-  Open Record

-  Log a Call
-  New Task
-  New Event
-  Post
-  File
-  New Case
-  New Note
-  Link
-  Poll
-  Question

You can access actions menus from the following parts of charts and tables in Analytics:

- Value labels on charts (such as “Opportunity for Pearson” in the image above).



- Legend value labels in table cells.



- Values in table cells.

The screenshot shows a table with columns and rows. A cell containing the text 'CMI:Close this case using Clos...' is selected, and an actions menu is displayed over it. The menu includes options like 'Open Record' and 'New Opportunity'. The table data includes values like '1', '0', and '1,673'.

comment test	1	0	1,673
CMI:Close this case using Sev...795	0	1	96
asp_account_manager_id...no...			
CMI:Close this case using Clos...ton			
comment test	1	0	1,673

Hover over the labels to see if an actions menu is available. Click the value, cell, or legend to see the menu's contents, and then select an action or open a record.

To learn more, see [Add Actions to Analytics Lenses and Dashboards](#)

Analytics Glossary

Familiarize yourself with common Analytics terminology.

App

An *app* contains dashboards, lenses, and datasets in any combination that makes sense for sharing your data analyses with colleagues. Apps are like folders. They allow users to organize their data projects—private and shared—and to control sharing.

Dashboard

A *dashboard* is a curated set of charts, metrics, and tables based on the data in one or more lenses.

Dashboard JSON file

A *dashboard JSON file* defines the components that a dashboard contains and describes how they're connected.

Data monitor

The *data monitor* tool allows you to monitor dataflow and system jobs. You can also use it to start, stop, reschedule, download, and upload dataflows.

Dataflow

A *dataflow* is a set of instructions that specifies what data to extract from Salesforce objects or datasets, how to transform the datasets, and which datasets to make available for querying.

Dataflow definition file

A *dataflow definition file* is a JSON file that contains transformations that represent the dataflow logic.

Dataflow job

A *dataflow job* processes the logic in a dataflow.

Dataset

A *dataset* contains a set of source data, specially formatted and optimized for interactive exploration.

Dataset builder

The *dataset builder* is a point-and-click user interface that allows you to easily select and extract data from related Salesforce objects to create a single dataset.

Date

A *date* can be represented as a day, month, year, and, optionally, time. You can group, filter, and perform math on dates.

Designer

Designer is the interface where you create dashboards. There are two versions: Wave dashboard designer (the new one) and classic designer (the legacy one).

Dimension

A *dimension* is a qualitative value, like region, product name, and model number. Dimensions are handy for grouping and filtering your data. Unlike measures, you can't perform math on dimensions.

Explorer

Explorer is the interface where you explore datasets and lenses.

Extended metadata (XMD)

Extended metadata (XMD) allows you to customize the formatting of many dashboard elements in Analytics.

External data

External data is data that resides outside of Salesforce, such as data from outside applications and spreadsheets.

External Data API

Use *External Data API* to upload external data files to Analytics to create datasets.

Lens

A *lens* is a particular view into a dataset's data. It's where you do exploratory analysis and visualization.

Measure

A *measure* is a quantitative value, like revenue and exchange rate. You can do math on measures, such as calculating the total revenue and minimum exchange rate.

Metadata file

A *metadata file* is a JSON file that describes the structure of an external data file.

Predicate

A *predicate* is a filter condition that defines row-level access to records in a dataset.

Salesforce Analytics Query Language (SAQL)

Use *SAQL* to access and analyze data in Analytics datasets.

Step

A *step* determines the results shown in a widget. Steps either get data dynamically or statically. For example, a step can query a dataset to get the average opportunity amount for each account, or it can retrieve an unchanging, user-defined value.

Transformation

A *transformation* refers to the manipulation of data. You can add transformations to a dataflow to extract data from Salesforce objects or datasets, transform datasets that contain Salesforce or external data, and register datasets.

Visualization

A *visualization* is commonly a chart or graph, such as a bar chart, donut chart, timeline, or heat map. It can also be data in tabular form, such as a comparison table or pivot table. Every visualization has an underlying query, which is how Analytics retrieves information from the source data.

Learn Analytics with Trailhead

Trailhead is the fun and free way to learn Salesforce. Now you can get acquainted with Analytics through Trailhead, using a special Analytics-enabled Developer Edition org.

For the Analytics trails, you can't use an old Developer Edition org. You must sign up for the special Developer Edition that comes with a limited Analytics Platform license and contains sample data required for the Analytics trails.

You'll find the sign up for the special Developer Edition org in these trails:

- Explore with Analytics: http://trailhead.salesforce.com/trail/wave_analytics_explorer
- Build and Administer Analytics: https://trailhead.salesforce.com/trails/wave_analytics_enable_and_produce
- Accelerating Analytics with Apps: http://trailhead.salesforce.com/trail/wave_analytics_apps
- Gain Insight with Einstein Discovery: https://trailhead.salesforce.com/trails/wave_analytics_einstein_discovery

SEE ALSO:

[Analytics Limits](#)

[Analytics Limits](#)

Access Insights from the Analytics Mobile App

Analytics on mobile gives you a fast, fluid way to discover the compelling insights within your data and to share the right visuals wherever you are. This page has resources for Analytics for Android and iOS.

IN THIS SECTION:

[Download the Analytics Mobile App](#)

Click the link to go to the download site for the iOS or Android Analytics mobile app.

[Learn How to Use Analytics for iOS](#)

Access your data anywhere with the Analytics for iOS mobile app. For the complete online help, go to [Analytics for iOS](#). Get up and running with these online help pages.

[Learn How to Use Analytics for Android](#)

Access your data anywhere with the Analytics for Android mobile app. For the complete online help, go to [Analytics for Android](#). Get up and running with these online help pages.

[Set Up and Manage Analytics on Mobile](#)

Optimize dashboard layouts for mobile devices, and administer Analytics for mobile.

[Analytics Mobile Features](#)

Analytics is available as a downloadable app on iOS and Android devices. This table details supported Analytics features in the mobile apps.

Download the Analytics Mobile App

Click the link to go to the download site for the iOS or Android Analytics mobile app.

For Analytics for iOS, go to [iTunes](#).

For Analytics for Android, go to [Google Play](#).

Learn How to Use Analytics for iOS

Access your data anywhere with the Analytics for iOS mobile app. For the complete online help, go to [Analytics for iOS](#). Get up and running with these online help pages.

IN THIS SECTION:

[Log In from Analytics for iOS](#)


Log in to Salesforce to explore data from your org.

[Learn Your Way Around Analytics for iOS](#)

Explore your data using the control bar at the bottom of the screen and a few simple gestures.

Log In from Analytics for iOS



Log in to Salesforce to explore data from your org.

1. Tap the icon in the upper left corner to open the Select Account screen.
2. Tap  **Add New Account**.

USER PERMISSIONS

To log in to Salesforce from Analytics for iOS or Android:

- Use Analytics

- Optionally, tap  to connect to a sandbox instance or to add a new connection. **Note:** Don't tap **Use Custom Domain**; instead tap  and then either select a connection or add one by tapping the plus sign.
- Enter your user name and password, and then tap **Log In**.

 **Note:** Your desktop browser must be set to allow cookies.



- Tap **Allow** to grant permission to Analytics on mobile.
Analytics reloads on your device. Now you can access your apps on the home screen!

Learn Your Way Around Analytics for iOS

Explore your data using the control bar at the bottom of the screen and a few simple gestures.

Home

The home screen, My Analytics Apps, is your customizable apps home. Each app has a clickable tile that gives you access to info and app actions.

Tap the tile to open the app's browse screen and access the app's assets. Or, tap  on the tile to open the info/action panel. App actions can include Browse () , Run, Get Link, and Pin.


Customize your Analytics home by pinning your favorite and often used apps. Whether you pin apps on mobile or in Analytics on desktop, you'll see the same pinned apps on your Analytics home.

Browse



Open Browse by tapping  on the control bar at the bottom of the screen.

In the list, you can scroll through, filter, and open apps, dashboards, lenses, and datasets. If you've marked assets as "Favorite," they have a yellow star, and a **Favorites** filter appears.


Tap the magnifier at the top () to enter search terms. Tap the toggle to sort the list between alphabetical () and most recently used () order.

Notice that each asset has a . Tap it to open a panel where you can see information such as the asset's dataset or which app it's in. From the panel, you can also mark as "Favorite," open, get the link, run, or delete, depending upon the asset and your access to it.

Running Apps

When viewing a dashboard, tap the down arrow () in the header next to the dashboard's name to open a dropdown list and select another dashboard in the app. To refresh a dashboard and return to its default state, tap the curved arrow () .

Notification Tracking

Open the notifications tracking screen by tapping  . When you set notifications in Analytics on desktop, the tiles for tracking progress appear here. Tap a tile to go directly to the dashboard that contains the notification.

Settings

Open Settings by tapping  at the lower right side of the screen. The Settings screen is where you can:

- Switch on Presentation Mode.
- Add data to Analytics.
- Change settings, send feedback, and get help, and share the Analytics App.
- Log out of your org.

A Few Simple Gestures

These gestures help you quickly navigate through Analytics.

Gesture	Result
Swipe up	Scroll down lists and dashboards.
Swipe down	<ul style="list-style-type: none"> • Scroll up lists and dashboards. • Refresh lists when at the top of the list. • When creating a filter, pull down to open the text entry field for the Contains option.
Swipe left	<ul style="list-style-type: none"> • When in a paginated dashboard, flip between screens. • When on the home screen, flip between asset filters. • If you have permission, swiping left on an app, lens, dashboard, or dataset reveals buttons to run, pin, share, favorite, or delete, depending on the asset. • While adding measures, filters, or groupings to a lens, swipe left over an applied condition to reveal a delete button.
Swipe right	<ul style="list-style-type: none"> • When in a paginated dashboard, flip between screens. • When on the home screen, flip between asset filters.
Press (for devices with 3D Touch)	<ul style="list-style-type: none"> • On the Home screen, press the Analytics icon to open the shortcuts menu. The menu lets you share, search within Analytics, or go directly to the two most recently viewed assets. • On a dashboard or lens, press lightly to peek at the asset, and press deeper to pop it open.

Learn How to Use Analytics for Android

Access your data anywhere with the Analytics for Android mobile app. For the complete online help, go to [Analytics for Android](#). Get up and running with these online help pages.

IN THIS SECTION:

[Log In from Analytics for Android](#)


Log in to Salesforce to explore data from your org.

[Learn Your Way Around Analytics for Android](#)

Explore your data using the home screen, the navigation menu, and a few simple gestures.

Log In from Analytics for Android

Log in to Salesforce to explore data from your org.

1. Analytics opens to the log in screen. If you are already logged in and want to change to another org, tap  to open the navigation menu. Then tap **Log out**.
2. Enter your user name and password, and then tap **Log In**.

USER PERMISSIONS

To log in to Salesforce from Analytics for iOS or Android:

- Use Analytics

 **Note:** Your desktop browser must be set to allow cookies.

3. Tap **Allow** to grant permission to Analytics on mobile.
Analytics reloads on your device. Now you can access your apps on the home screen!



Learn Your Way Around Analytics for Android

Explore your data using the home screen, the navigation menu, and a few simple gestures.

The Home Screen

The home screen is the first thing that you see when you open Analytics on your mobile device. The home screen consists of the header and a list of Analytics assets.

In the header, you can access:

- Lists of your apps, dashboards, and lenses—in most recently used order.
- Navigation () to change settings, get help, and log out.
- Search ()

The Navigation Menu

Open the navigation menu from the home screen by tapping . The navigation menu is where you can:

- Change settings.
- Send feedback.
- Get help.
- Log out of your org.

A Few Simple Gestures

These gestures help you quickly navigate through Analytics.

Gesture	Result
Swipe up	Scroll down lists and dashboards.
Swipe down	<ul style="list-style-type: none"> • Scroll up lists and dashboards. • Refresh lists when at the top of the list.
Swipe left	<ul style="list-style-type: none"> • When in a paginated dashboard, flip between screens. • When on the home screen, flip between asset filters.
Swipe right	<ul style="list-style-type: none"> • When in a paginated dashboard, flip between screens. • When on the home screen, flip between asset filters.
Scroll	Use one finger to scroll a dashboard or a scrolling widget; use two fingers to scroll the dashboard when directly over a scrolling widget.

Set Up and Manage Analytics on Mobile

Optimize dashboard layouts for mobile devices, and administer Analytics for mobile.

IN THIS SECTION:

[Generate Unique Analytics Dashboard Layouts for Different Devices](#)

After you add widgets to the dashboard, optimize the layout for each device on which the dashboards can be viewed. For example, you can remove widgets from a mobile phone layout to reduce the dashboard size for the smaller screen. You can also move widgets around in one layout and it doesn't affect the other layouts.

[Connected App for Analytics on Mobile](#)

Install the Salesforce Analytics App Package to allow your mobile clients to easily connect to your org. This package contains the Connected App component that gives you control over who's logging in and how your mobile clients share images and links.

[Customize Analytics for iOS using Mobile SDK](#)

Set custom login servers and manage access to settings on Analytics for iOS.

[Limitations of Analytics on iPhone® and iPad®](#)

Be aware of these mobile-specific limitations.

[Limitations of Analytics on Android Devices](#)

Be aware of these mobile-specific limitations.

[Launch Einstein Analytics Directly from Your iOS App](#)


The Einstein Analytics mobile app for iOS supports deep linking URL schemes, which allow a user to launch the app from a third-party or web application.

Generate Unique Analytics Dashboard Layouts for Different Devices

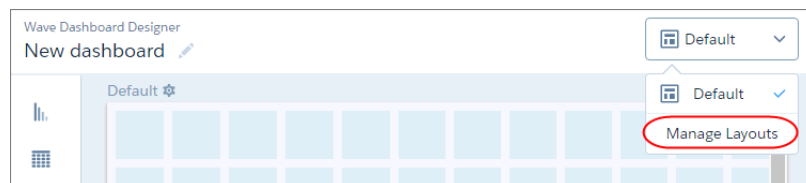
After you add widgets to the dashboard, optimize the layout for each device on which the dashboards can be viewed. For example, you can remove widgets from a mobile phone layout to reduce the dashboard size for the smaller screen. You can also move widgets around in one layout and it doesn't affect the other layouts.

Watch a Demo: [▶ Optimize Wave Dashboards for Devices with Layouts \(English Only\)](#)

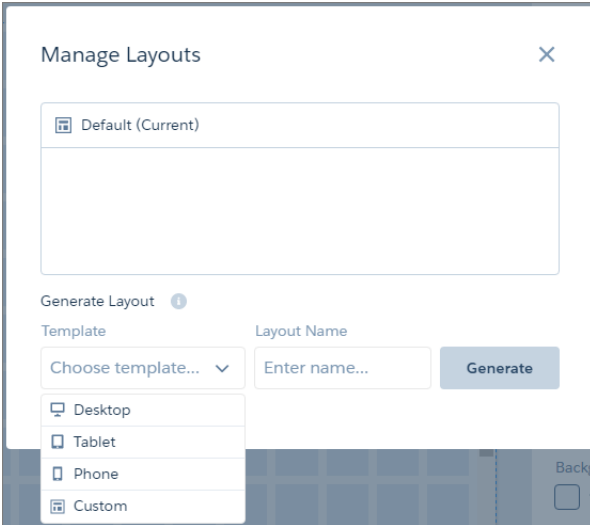
When you generate a new layout, Analytics adds the widgets from the currently selected layout to the new layout. If the current layout contains multiple pages, Analytics also copies the pages to the new layout.

 **Note:** Although you can add all chart types to a mobile layout, some aren't supported on mobile devices. For more information, see [Analytics mobile limitations](#).

1. Open in the Wave designer dashboard.
2. Because each layout can contain different widgets, open the layout that contains the widgets that you want to include in your new layout.
3. From the Layouts menu, select **Manage Layouts**.



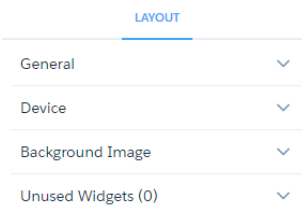
4. Select the layout template, and enter a unique layout name.



Each layout template comes with predefined layout properties that you can change.

5. Click **Generate.**

The layout properties appear for the new layout. If needed, click  to show the Layout panel.



6. In the Layout panel, expand the following sections and change the default properties, if needed.

General

Set the layout name, designer grid settings, and background color.

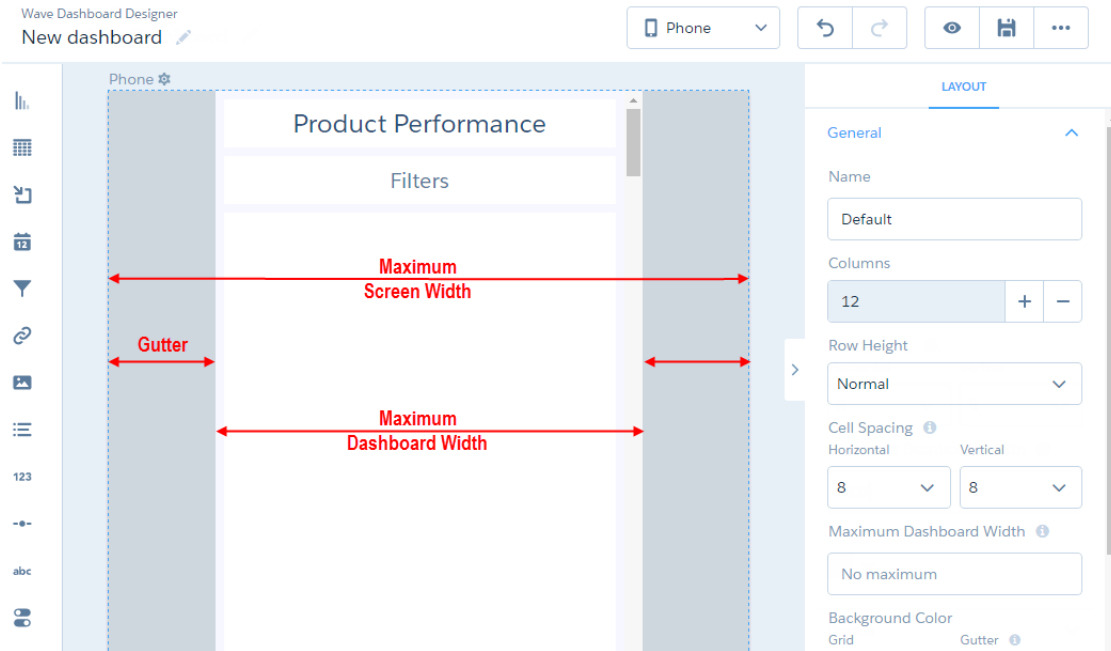
Device


Specify information about the devices that can use this layout. For more information about how Analytics uses these properties to choose the right layout, see [Rules for Choosing a Layout for a Device](#).

Background Image

To apply a background image to the entire dashboard when this layout is used, enter the details about the background image. You don't have to include a background image.

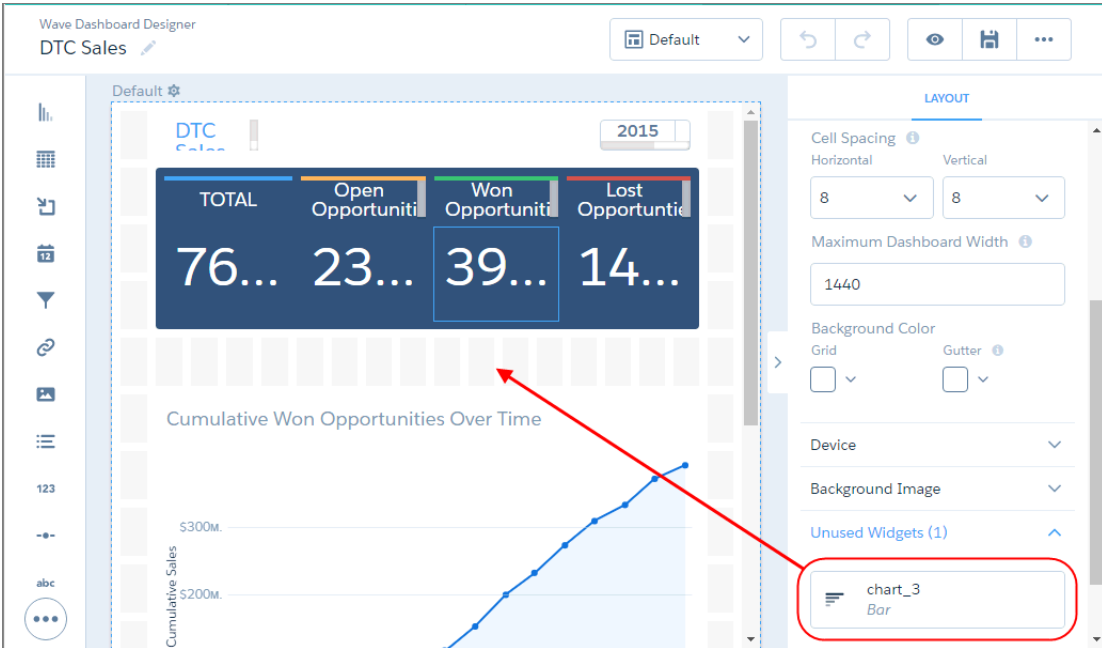
The designer previews the dashboard and layout based on the layout property settings. The designer updates the preview in real time so that you can see how your changes affect the display. If you shrink the maximum dashboard width, the designer shows you how the dashboard fits when using this layout. If needed, the designer rearranges the widgets to fit the new size.




7. Rearrange the widgets, if needed.
8. To hide a widget from the layout, select the widget, and click . If you hide a widget, it appears in the Unused Widgets section of the layout properties.



9. To add an unused widget to the layout, drag the widget from the Unused Widgets section to the canvas.

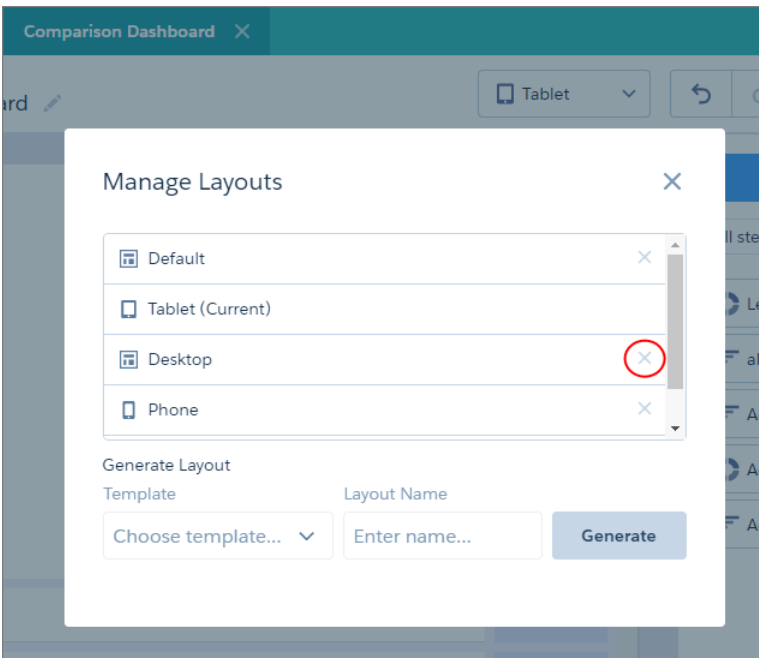



10. To create a widget, drag the widget from the widget toolbar to the canvas.

 **Note:** Analytics adds the widget only to the current layout. To add the widget to another layout, open the other layout and drag the widget from the “Unused Widgets” section of the layout properties.

11. To save your layout changes, save the dashboard.

12. To delete a layout, in the Layouts menu, click **Manage Layouts**, and then click  next to the layout.



 **Note:** You can't delete the layout that's currently open. To delete the current layout, switch to another one first.

IN THIS SECTION:

[Layout Properties for Analytics Dashboards](#)

Layout properties specify the layout name, designer grid settings, background settings, and requirements for devices that can use this layout. The properties apply only to dashboards created in the Wave dashboard designer.

[Rules for Choosing a Layout for a Device](#)

If multiple layouts are defined for a dashboard, Analytics chooses the optimal layout when displaying the dashboard on a device. To determine the optimal layout, Analytics uses the device properties specified for each layout.

Connected App for Analytics on Mobile

Install the Salesforce Analytics App Package to allow your mobile clients to easily connect to your org. This package contains the Connected App component that gives you control over who's logging in and how your mobile clients share images and links.

1. While logged in as an admin, navigate to <https://login.salesforce.com/packaging/installPackage.apexp?p0=04tB0000000DKTA>.
2. Select **Install for All Users**.
If you install the Connected App only for certain roles, then only those clients are subject to your policies.
3. After clicking **Done**, click the Salesforce Analytics App Package and then **View Components**.
4. Select iOS or Android. To configure policies and other settings, click **Edit**. When you are finished, save your changes.
For more information about Connected App settings, see [Edit a Connected App](#).
5. If you want to disable sharing options for mobile users, click **New** in the Custom Attributes section.

All sharing options are enabled by default. To disable an option, add its attribute key and enter "false" for the attribute value. See the table for the supported attribute keys.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To install and configure Connected App:

- Manage Analytics


Attribute Key	Mobile clients can share	Mobile Device
SHARE_IMAGE_AIRDROP	Images via AirDrop	iOS
SHARE_IMAGE_CAMERAROLL	Images from Camera Roll	iOS
SHARE_IMAGE_OPEN	The image that's currently open on the mobile device	iOS
SHARE_IMAGE_S1	Images in Salesforce	iOS
SHARE_IMAGE_EMAIL	Images through email	iOS
SHARE_LINK_NFC	Links via Near Field Communication (NFC)	Android
SHARE_LINK_BLUETOOTH	Links over Bluetooth	Android
SHARE_LINK_AIRDROP	Links via AirDrop	iOS

Attribute Key	Mobile clients can share	Mobile Device
SHARE_LINK_CLIPBOARD	The link that's currently in the clipboard of the mobile device	iOS and Android
SHARE_LINK_S1	Links in Salesforce	iOS and Android
SHARE_LINK_EMAIL	Links through email	iOS and Android
SPOTLIGHT_SEARCH	Mobile clients can see Analytics assets in Spotlight search results	iOS

 **Note:** To apply custom attributes to connected users, you can revoke them and ask them to reconnect.

- To view and control how mobile clients connect to your Analytics-enabled org, from Setup, enter *Connected Apps* in the Quick Find box, then select **Connect Apps OAuth Usage**.

You can block user sessions, revoke individual users, and drill in to user details. For more information, see [Monitoring Usage for a Connected App](#).

 **Note:** For certificate-based authentication, users must set their desktop browsers to allow cookies.

For additional security, use Mobile Device Management (MDM) with the option to show only authorized hosts. The "OnlyShowAuthorizedHosts" key allows you to hide the "Add New Account" plus sign in the mobile app. For more information, see [Using MDM with Salesforce Mobile SDK Apps](#).

Customize Analytics for iOS using Mobile SDK

Set custom login servers and manage access to settings on Analytics for iOS.

The following set up options are available for Analytics for iOS.

[Set Custom Login Servers](#)

[Manage Access to Settings](#)

Limitations of Analytics on iPhone® and iPad®

Be aware of these mobile-specific limitations.

General Limitations

Feature	Limitations
Layout	Landscape mode is supported only for iPad. Portrait mode is supported for both iPad and iPhone. Split screen isn't supported.
Share	You can't create, edit, or delete sharing permissions for apps.
Delete	<ul style="list-style-type: none"> Deleting a dashboard or lens in Analytics on your mobile device also deletes it in your Salesforce org on the Web. Once deleted, a dashboard or lens can't be recovered. The only exception is the playground sample data, which can be restored from the Settings screen.

Feature	Limitations
	<ul style="list-style-type: none"> • Datasets can't be deleted from your mobile device.
Playground	Imported or created data, lenses, and dashboards aren't backed up in a device backup. Playground sample data can be restored from the Settings screen.
Favorites	Pinned apps are shared across all your logged in devices. Favorites of dashboards, lenses, and datasets are stored locally on your mobile device and aren't synced to other devices.
Other Features	<ul style="list-style-type: none"> • Creating apps and dashboards isn't supported. • Custom bulk actions via Visualforce aren't supported. • Offline mode isn't available.

Data Exploration and Visualization Limitations

Feature	Limitations
Charts and Tables	<ul style="list-style-type: none"> • These chart types are supported: Horizontal Bar, Vertical Bar, Stacked Horizontal Bar, Stacked Vertical Bar, Line, Donut, Scatter Plot, Map (standard only, not custom maps), Values Table, Combination Line-Bar, Heat Map, Waterfall, Stacked Waterfall, Matrix, Flat Gauge, Polar Gauge, Timeline, Funnel, Metrics Radar, Treemap, and Pyramid charts. In Compare Tables, summary rows aren't shown. • Charts support conditional formatting and styling options. • Row heights are optimized (on desktop, row heights are fixed). • Charts don't support multiple selection actions such as copy and focus. • Tables don't support the Number of Lines per Row property.
Widgets	<p>List No expanded mode is available.</p> <p>Text Vertical alignment options aren't supported for text widgets on mobile.</p> <p>Range If necessary, ranges are automatically truncated by appending an ellipsis (...) to the minimum and maximum values.</p> <p>Box Boxes can't display images that are encoded in a string, such as a URL.</p> <p>Image The image widget doesn't support .svg files.</p> <p>Number Exploring a number widget isn't supported.</p>
Queries	<ul style="list-style-type: none"> • If more measures or groupings are added to a chart than the chart type supports, then the chart becomes a Compare Table.

Feature	Limitations
	<ul style="list-style-type: none"> The maximum results returned by a query vary based on the step type that contains the query. For example, the default query limit for an aggregate step with multiple groupings is 500, so just the first 500 records are displayed by default. The default can be changed in the Dashboard Designer. Apex steps (Beta) aren't supported on mobile.
Dashboards designed in the Analytics Studio	<ul style="list-style-type: none"> Analytics Dashboards designed in your Salesforce org on the Web can be viewed in Analytics for iOS on your local device. Some widgets appear different on mobile. To optimize dashboards for mobile, generate a layout for phone or tablet in the Wave dashboard designer. If the dashboard was built in the classic designer, you can optimize it for mobile by adding a layouts section in the dashboard's JSON file. Gutter color options aren't supported. Dynamic chart types (configured with bindings using the visualizationType widget property) aren't supported.

Data Import Limitations

Feature	Limitations
Analytics Data Connector	<ul style="list-style-type: none"> Only CSV, TSV, and XLSX files, and ZIP files containing these types, can be imported as datasets. Imported datasets aren't available in Analytics on the Web. They are only available on your mobile device in the playground. Imported datasets aren't encrypted.
Date Formats	<p>Dates can be imported as any of these formats:</p> <ul style="list-style-type: none"> YYYY YYYY-MM YY-MM YYYY-MM-DD YY-MM-DD YYYYMMDD YYMMDD YYDDMM MM/DD/YY DD/MM/YY YY/MM/DD YY-MM-DD HH:MM:SS YYYYMMDDHHMMSS YYMMDDHHMMSS YY-MM-DDTHH:MM:SS YYYY-MM-DDTHH:MM:SSZ

Feature	Limitations
	• YY-MM-DDTHH:MM:SSZ
	• YYYY-MM-DD HH:MM:SSZ
	• YY-MM-DD HH:MM:SSZ
	• YYYYMMDDTHH:MM:SSZ
	• YYMMDDTHH:MM:SSZ
	• YYYYMMDD HH:MM:SSZ
	• YYYYDDMM
	• YYYY/MM/DD
	• YYYY/DD/MM
	• DD/MM/YYYY
	• MM/DD/YYYY
	• YYYY-DD-MM
	• DD-MM-YYYY
	• MM-DD-YYYY
	• DD.MM.YYYY
	• DD.MM.YYYY HH:MM:SS
	• DD.MM.YY HH:MM:SS
	• MM.DD.YYYY
	• DD-Mon-YY
	• DD-Mon-YYYY
	• DD-Mon-YYYY HH:mm
	• YYYYMMDD HH:MM:SS
	• YYYY/MM/DD HH:MM:SS
	• MM/DD/YYYY HH:MM:SS
	• MM/DD/YYYY HH:MM:SS AM/PM
	• MM/DD/YY HH:MM:SS AM/PM
	• DD/MM/YYYY HH:MM:SS
	• YYYY/MM/DD HH:MM
	• MM/DD/YYYY HH:MM
	• DD/MM/YYYY HH:MM
	• DD/MM/YY HH:MM:SS
	• DD/MM/YYYY HH:MM:SS AM/PM
	• DD/MM/YY HH:MM:SS AM/PM
	• YYYY-MM-DD HH:MM:SS
	• YY-MM-DD HH:MM:SS
	• DD-MM-YYYY HH:MM:SS
	• DD-MM-YY HH:MM:SS
	• DD-MM-YYYY HH:MM:SS AM/PM

Feature	Limitations
	<ul style="list-style-type: none"> • DD-MM-YY HH:MM:SS AM/PM • MM-DD-YYYY HH:MM:SS • MM-DD-YYYY HH:MM:SS AM/PM • MM-DD-YY HH:MM:SS AM/PM • YYYY-MM-DD HH:MM • DD-MM-YYYY HH:MM • MM-DD-YYYY HH:MM • YYYY-MM-DDTHH:MM:SS • DD-MM-YYYYTHH:MM:SS • MM-DD-YYYYTHH:MM:SS • YYYY-MM-DDTHH:MM • DD-MM-YYYYTHH:MM • MM-DD-YYYYTHH:MM • YYYY-MM-DDTHH:MM:SS-HH:MM • YYYY-MM-DDTHH:MM:SS+HH:MM • YYYY-MM-DDTHH:MM:SSTZD • YYYYMMDDTHH:MM:SS • HH:MM:SS DD/MM/YYYY • HH:MM:SS DD/MM/YY • DD-MM-YYYYTHH

Limitations of Analytics on Android Devices

Be aware of these mobile-specific limitations.

General / Home

Supported	Not Supported
<ul style="list-style-type: none"> • Viewing dashboards • Viewing lenses • Posting images or links to Chatter • Opening Salesforce records directly from dashboards • Linking to external sites 	<ul style="list-style-type: none"> • Exploring lenses or dashboard widgets • Saving or cloning lenses • Deleting anything • Creating or editing dashboards • Opening datasets • Importing data • Local playground data • Org switching without logout • Viewing item metadata • Links from external apps

Charts and Visualizations

Unsupported chart types render as Values Tables.

Supported	Not Supported
<ul style="list-style-type: none"> • Horizontal / Vertical Bar chart • Horizontal / Vertical Stacked Bar chart • Line chart • Timeline • Donut chart • Heat Map • Waterfall chart • Scatter Plot • Combination Bar-Line chart • Choropleth (Map) chart • Compare Table • Values Table 	<ul style="list-style-type: none"> • Stacked Waterfall charts • Pivot Table • Treemap • Matrix • Horizontal / Vertical Dot Plot • Parallel Coordinates • Funnel chart • Flat and Polar Gauges • Metrics Radar chart

Dashboard Widgets

Supported	Not Supported
<ul style="list-style-type: none"> • Pill button / Toggle • List selector (compact) • Text widget • Number widget • Date Range selector • Box widget • Container widget • Link widget • Global Filters widget • Measure Range selector • Image widget 	<ul style="list-style-type: none"> • List selector (expanded) • YouTube widget


Launch Einstein Analytics Directly from Your iOS App

The Einstein Analytics mobile app for iOS supports deep linking URL schemes, which allow a user to launch the app from a third-party or web application.

An administrator or developer can customize a URL scheme to perform one of the following actions when the app launches:

- View a particular asset type in the Einstein Analytics app (dashboard, lens, or application)
- Apply a runtime state (selections and filters)

For example, you can create a deep link to a dashboard in the Einstein Analytics app. Then when users receive the link in an email, they can click it to go directly to the dashboard.

 **Note:** Some deep link scheme features, such as passing filters and selections, apply only to dashboards. Support is only for dashboards that are built using the Wave Dashboard Designer.

URL Scheme Format

Use the following format to make a request to an Einstein Analytics app.

```
<scheme_name>://<assetType>/<assetID>?orgId=<orgId>&loginHost=<loginHost>&dashboardState=<url-encoded json>
```

The following parameters are supported.

Variable	Type	Description	Required
scheme_name	String	The value must be <code>sfanalytics</code> .	Yes
assetType	String	Supported values: dashboard lens application	Yes
assetID	String	Unique asset identifier. The identifier is the 18-character code beginning with 0FK found in the asset URL.	Yes
orgID	String	ID of the organization that contains the content. If users are logged in to the same org ID, they are directed to the content. If users are not logged in to the same org ID, they are redirected to the login screen.	Yes
loginHost	String	URL that displays the login screen when the user is not logged in to the application.	Yes
dashboardState	String	Available only when <code>assetType</code> is <code>dashboard</code> . State of the dashboard and all its datasets. The state depends on user selection, start values, global filters, and external or initial filters that are applicable to the dataset.	No

Example (not including `dashboardState`):

```
sfanalytics://dashboard/0FKB00000006TFVOA2?orgId=00DB00000000XXX&loginHost=cs4.salesforce.com
```

Refer to the information in the following tables when constructing the JSON string for `dashboardState`.

dashboardState

Property Name	Type	Description
datasets	Map<String, state[]>	The list of datasets for which a specific state is applied. The key string is the API name of the dataset.

state

Property Name	Type	Description
fields	String[]	The list of dimension or measure fields for which selection or filtering is applied.
filter	dashboardFilter	The filter that is applied to the dashboard.
selection	String[]	The list of values that is selected.

dashboardFilter

Property Name	Type	Description
operator	String	Supported operators for dimensions: "in", "not in", "matches" Supported operators for measures: "==" cant=" ">=", ">", "<=", "<"
values	String[] or Double[]	The list of dimension or measure values corresponding to the fields.

JSON Examples

The following syntax causes `value1` and `value2` to be selected on `field1`. It also filters on `field2` based on `operator1` with `values3` and `values4`.

```
{'datasets' : {'dataset1': [ {'fields': ['field1'], 'selection': ['$value1', '$value2']},
  {'fields': ['field2'], 'filter': { 'operator': 'operator1', 'values': ['$value3', '$value4'] } } ]}}
```

Example of the `dashboardState` JSON.

```
{
  "datasets": {
    "Opportunities": [
      {
        "fields": ["OpptyName"],
        "selection": ["RelateIQ", "BeyondCore"],
        "filter": {
          "operator": "not in",
          "values": ["Salesforce"]
        }
      },
      {
        "fields": ["State", "Country"],
```



```

        "selection": ["TX", "US"],
        "filter": {
            "operator": "in",
            "values": ["TX, US"], ["AL", "DE"]]
        }
    },
    ],
    "Accounts": [
        {
            "fields": ["Revenue"],
            "selection": [],
            "filter": {
                "operator": ">=",
                "values": [1000000]
            }
        }
    ]
}
    
```

The JSON must be rewritten with no whitespace characters.

```

{"datasets":{"Opportunities":{"fields":["OpptyName"],"selection":["RelateIQ","BeyondCore"],"filter":{"operator":"notin","values":["Salesforce"]}},{"fields":["State","Country"],"selection":["TX","US"],"filter":{"operator":"in","values":["TX,US"],["AL","DE"]}}},"Accounts":{"fields":["Revenue"],"selection":[],"filter":{"operator":">=","values":[1000000]}}}}
    
```

Finally, the JSON must be rewritten with URL encoding.

```

%7B%22datasets%22%3A%7B%22Opportunities%22%3A%7B%22fields%22%3A%5B%22OpptyName%22%5D%2C%22selection%22%3A%5B%22RelateIQ%22%2C%22BeyondCore%22%5D%2C%22filter%22%3A%7B%22operator%22%3A%22notin%22%2C%22values%22%3A%5B%22Salesforce%22%5D%7D%7D%2C%7B%22fields%22%3A%5B%22State%22%2C%22Country%22%5D%2C%22selection%22%3A%5B%22TX%22%2C%22US%22%5D%2C%22filter%22%3A%7B%22operator%22%3A%22in%22%2C%22values%22%3A%5B%22TX%2C%22US%22%5D%2C%5B%22AL%22%2C%22DE%22%5D%7D%7D%7D%2C%22Accounts%22%3A%7B%7B%22fields%22%3A%5B%22Revenue%22%5D%2C%22selection%22%3A%5B%5D%2C%22filter%22%3A%7B%22operator%22%3A%22%3E%3D%22%2C%22values%22%3A%5B%221000000%22%5D%7D%7D%7D%7D%7D
    
```

With this URL encoded JSON, the example earlier in this topic is modified as follows.

```

%7B%22Opportunities%22%3A%7B%22fields%22%3A%5B%22OpptyName%22%5D%2C%22selection%22%3A%5B%22RelateIQ%22%2C%22BeyondCore%22%5D%2C%22filter%22%3A%7B%22operator%22%3A%22notin%22%2C%22values%22%3A%5B%22Salesforce%22%5D%7D%7D%2C%7B%22fields%22%3A%5B%22State%22%2C%22Country%22%5D%2C%22selection%22%3A%5B%22TX%22%2C%22US%22%5D%2C%22filter%22%3A%7B%22operator%22%3A%22in%22%2C%22values%22%3A%5B%22TX%2C%22US%22%5D%2C%5B%22AL%22%2C%22DE%22%5D%7D%7D%7D%2C%22Accounts%22%3A%7B%7B%22fields%22%3A%5B%22Revenue%22%5D%2C%22selection%22%3A%5B%5D%2C%22filter%22%3A%7B%22operator%22%3A%22%3E%3D%22%2C%22values%22%3A%5B%221000000%22%5D%7D%7D%7D%7D%7D
    
```

Analytics Mobile Features

Analytics is available as a downloadable app on iOS and Android devices. This table details supported Analytics features in the mobile apps.

Feature	Analytics for iOS	Analytics for Android
General		
Local playground	✓	
Filter list views (by asset)	✓	✓
Sort list views (alphabetic and MRU)	✓	
Search	✓	✓
In-app navigation	✓	
Access to app sharing controls		

Feature	Analytics for iOS	Analytics for Android
Pin apps	✓	
Favorite dashboards, lenses, datasets	✓	
Track notifications	✓	
Custom bulk actions (via Visualforce)		
Wave REST API	✓	✓
Actions		
View asset information	✓	
View, filter, and facet dashboards and lenses	✓	✓
Explore datasets, lenses, and widgets	✓	
Create and edit dashboards		
Save and delete lenses and dashboards	✓	
Create apps		
Import data (CSV, TSV, XLSX only)	✓	
Delete datasets and apps		
Post images or links to Chatter	✓	✓
Copy link to dashboard or lens	✓	✓
Open Salesforce records directly from dashboards	✓	✓
Use external links to other sources	✓	✓
Open to asset from link in external app	✓	
Annotate dashboard widgets		
Do Salesforce actions from custom action menus		
Exploration and Queries (Steps)		
Apply aggregation functions on datasets	✓	
Apply groupings on datasets	✓	
Filter by measure, dimensions, and absolute or relative dates	✓	
View lenses using SAQL or SOQL step types	✓	✓
View lenses using Apex step types (Beta)		
Charts and Tables		
Bar	✓	✓
Column	✓	✓

Feature	Analytics for iOS	Analytics for Android
Stacked Bar	✓	✓
Stacked Column	✓	✓
Scatter Plot	✓	✓
Donut	✓	✓
Heat Map	✓	✓
Line	✓	✓
Horizontal/Vertical Dot Plot		
Timeline	✓	✓
Waterfall	✓	✓
Stacked Waterfall	✓	
Combo (Bar and Line)	✓	✓
Funnel	✓	
Origami		
Sankey		
Metrics Radar	✓	
Map	✓	✓
Bubble Map		
Geo Map		
Pyramid	✓	
Stacked Pyramid		
Gauge		
Polar Gauge	✓	
Flat Gauge	✓	
Rating		
Matrix	✓	
Tree Map	✓	
Calendar Heat Map		
Parallel Coordinates		
Values Table	✓	✓
Compare Table (without summary rows)	✓	✓

Feature	Analytics for iOS	Analytics for Android
Pivot Table		
Chart Properties		
Title, subtitle customization	✓	✓
Border customization	✓	✓
Text customization	✓	✓
Number customization	✓	✓
Conditional formatting/styling options	✓	✓
Table cell customization	✓	✓
Customized tooltips		
Trellis	✓	✓
Reference lines	✓	✓
Selection of multiple chart elements	✓	✓
Focus on multiple sections		
Dashboard Widgets		
Global filters	✓	✓
Container	✓	✓
Date Range selector	✓	✓
Link	✓	✓
Image (except .svg files)	✓	✓
List selector (compact only)	✓	✓
Number (view only)	✓	✓
Measure Range selector	✓	✓
Text	✓	✓
Toggle	✓	✓
Open as lens	✓	✓
Dashboard Properties		
Custom background images	✓	✓
Themes	✓	✓
Gutter color options		
Dynamic start values	✓	✓

Feature	Analytics for iOS	Analytics for Android
User tokens in queries	✓	✓
Static step, selection, and result bindings	✓	✓
Nested bindings	✓	✓
Bindings using the visualizationType widget property (dynamic chart types)		
Connected data sources	✓	✓
Customized display values	✓	✓
Access and Security		
Configure connections to multiple instances from the login page	✓	
Switch between multiple Salesforce accounts without logging out	✓	
Control app access with a security passcode	✓	✓
Forget all trusted domains	✓	
Use Connected App security settings to meet industry compliance regulations	✓	✓
Get enhanced security with Mobile Device Management (MDM)	✓	✓
Miscellaneous		
Offline mode		
Presentation mode	✓	
Developer mode	✓	
Spotlight search	✓	

Set Up the Analytics Platform

Set up your organization to use the Salesforce Analytics platform by enabling Analytics and creating and assigning permission sets.

The information here describes how to set up your organization to use the Analytics platform. Read [Prebuilt Analytics Apps](#) to get started with and set up Sales Analytics, Service Analytics, and other apps.

Each Analytics Platform license is a single-user license that provides access to the Salesforce Analytics Cloud. It includes Sales Analytics Apps and Service Analytics Apps single-user licenses. The table shows data storage limits for each license. If you require more data, you can purchase Analytics Cloud - Additional Data Rows, which entitles you to an additional 100 million rows.

License	Limit
Analytics Platform	100 million rows

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

License	Limit
Sales Analytics Apps	25 million rows when used without Analytics Cloud - AnalyticsPlatform license. Use of Sales Analytics app license does not increase data limit for platform license
Service Analytics Apps	25 million rows when used without Analytics Cloud - AnalyticsPlatform license. Use of Service Analytics app license does not increase data limit for platform license
Analytics Cloud - Additional Data Rows	100 million rows

Important:

- Analytics license data storage limits are contractual, not technical. Licensee agrees to strictly monitor its total number of data rows.
- If you purchased a Analytics Platform license before October 20, 2015 with Analytics Cloud Builder or Analytics Cloud Explorer permission set licenses: Read [Set up the Analytics Platform With Licenses Purchased Before October 20, 2015](#). If you're migrating users from Builder or Explorer licenses to the new Analytics Platform license: See [Migrating From Analytics Licenses Purchased Before 10/20/2015 to New Analytics Platform Licenses](#) before you start the setup process for those users.
- If you disable Analytics, user permissions are removed from each defined permission set. If you re-enable Analytics later, you must define the permission sets again.

Analytics Platform Setup Process

Follow these basic steps to set up your organization to use the Analytics platform.

1. Enable Analytics for your organization.
2. Define the main Analytics user types in your organization.
3. Create permission sets to group related user permissions according to the needs of each user type.
4. Assign a permission set to an individual user, which also *auto-assigns* the Analytics Platform permission set license to that user.

 **Note:** For efficiency, you can assign a permission set to groups of users. You can also assign multiple permission sets to a user.

You can assign an Analytics permission set license along with any of the following Salesforce user licenses:

- Force.com (app subscription)
- Force.com (one app)
- Full CRM
- Salesforce Platform
- Salesforce Platform One

For best results, follow the steps for setting up the Analytics platform in the order shown here.

IN THIS SECTION:

1. [Learn About Analytics Permission Set Licenses and User Permissions](#)

Analytics permission set licenses enable the permissions to explore data with and manage the Salesforce Analytics platform. They also let Salesforce Community users view Analytics dashboards.

2. [Identify Analytics Platform User Types](#)
Identifying types of Analytics platform users helps assure that the setup process meets your team’s analytics needs.
3. [Enable Analytics and Create Permission Sets](#)
After Salesforce provisions you with the Analytics platform license, enable Analytics and create permissions.
4. [Assign Analytics Permission Sets to Users](#)
Assign permission sets to one or more users—either one at a time, or in bulk—to give them access to Analytics functionality.
5. [Complete Setting up the Analytics Platform](#)
Enhance the Analytics platform user experience and fine-tune Analytics access to Salesforce data with optional setup procedures.
6. [Analytics Requirements](#)
This section provides requirements for using Analytics.
7. [Analytics Limits](#)
This section describes Analytics limits.
8. [Analytics Limitations](#)
Analytics differs from other Salesforce features in some ways.

SEE ALSO:

- [Set Up the Analytics Platform with Licenses Purchased Before October 20, 2015](#)
- [Migrating From Analytics Licenses Purchased Before 10/20/2015 to New Analytics Platform Licenses](#)
- [Analytics Requirements](#)
- [Analytics Limits](#)
- [Analytics Limitations](#)

Learn About Analytics Permission Set Licenses and User Permissions


Analytics permission set licenses enable the permissions to explore data with and manage the Salesforce Analytics platform. They also let Salesforce Community users view Analytics dashboards.

- Each Analytics platform user needs an Analytics Platform permission set license to use the Analytics platform. Creating a permission set and assigning it to a user *auto-assigns* the Analytics platform permission set license to that user. You can also manually assign permission set licenses to users.
- Community users need an Analytics for Communities permission set license to view Analytics apps shared via dashboards embedded in Visualforce pages.

The Analytics Platform permission set license enables the following permissions.

User Permission	What It Enables
“Use Analytics”	Accessing Analytics. Viewing and exploring datasets. Viewing and sharing lenses and dashboards.
“Create and Edit Analytics Dashboards”	Creating, editing, and deleting Analytics dashboards.
“Create Analytics Apps”	Creating, editing, deleting, and sharing Analytics applications.
“Upload External Data to Analytics”	Uploading external data to Analytics to create a dataset. Monitoring dataflow and system jobs in the data monitor.

"Edit Analytics Dataflows"	Editing, starting, stopping, and rescheduling the dataflow. Creating, editing, and running dataset recipes. Monitoring dataflow and system jobs in the data monitor. Use discretion when assigning this user permission because it enables access to all Salesforce object data to which the Integration User has access. See Salesforce Data Access in Analytics .
"Manage Analytics"	Accessing all Analytics features. Provides Analytics administrator-level capabilities.
"Download Data from Analytics"	Downloading screenshots and data in tabular format through the Analytics user interface.

 **Note:** When you create permission sets for Analytics users, selecting any Analytics permission automatically enables the "Use Analytics" permission as well. Also, the type of access granted on an app controls the actions that can be performed on its datasets, lenses, and dashboards. For example, if a user has the "Use Analytics" permission, the user must also have Viewer access on an app to view its datasets, lenses, and dashboards.

The Analytics for Communities permission set license enables the "View Analytics on Communities pages" permission. That permission enables external users to view Analytics dashboards embedded in VisualForce pages in their communities. See [Enable Analytics for Communities](#) on page 60.

Identify Analytics Platform User Types

Identifying types of Analytics platform users helps assure that the setup process meets your team's analytics needs.

The Analytics Platform license includes the permissions that enable users in your organization to import, work with, and explore data using the Analytics platform. The license also includes permissions that let administrators manage Analytics. To set up Analytics in the most useful way, think through the different ways people access Analytics features and categorize them into user types. Here are a few examples.

Most people on your team fall into two basic categories:

- Users, who view Analytics dashboards, lenses, and datasets and occasionally import data to Analytics.
- Administrators or managers, who access to the full range of Analytics functionality to create apps, dashboards, lenses, and datasets, edit data, and otherwise customize the Analytics experience.

Accordingly, when you set up the Analytics platform, creating two basic permission sets can meet the needs of most of your organization:

- A "view" permission set that contains the permissions needed by most basic-level users when they access Analytics.
- A "manage" permission set that's reserved for a select few administrators and managers and contains permissions to use all Analytics features

You can set up Analytics however you want, defining other user types and permissions sets based on the needs of users in your organization. For example, you can create a "superuser" permission set for users who create and share apps and dashboards. Or, a "data wizard" permission set would enable other users to work closely with datasets.

We focus on two main types of people on your team -- users and administrators -- in the example permission sets we describe in our detailed setup instructions.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

Enable Analytics and Create Permission Sets

After Salesforce provisions you with the Analytics platform license, enable Analytics and create permissions.

Enable the Analytics Platform

To use the Analytics platform, first enable it for your organization.

1. In the Salesforce Setup menu, under Administer, click **Analytics | Getting Started**.
2. Click **Enable Analytics**.

Create Permission Sets

The next step in the setup process is to create permission sets made up of Analytics user permissions. We show you how to create two permission sets:

- *Manage Analytics* permission set, for users who create and administer Analytics.
- *View Analytics* permission set, for users who explore app dashboards and datasets.

Note:

- Customers who purchased Analytics before October 20, 2015: See [Set up the Analytics Platform With Licenses Purchased Before October 20, 2015](#) before following the instructions here.
 - The Manage Analytics permission set enables the equivalent functionality provided by the previous Analytics Builder license (purchased before October 20, 2015). If you have a Builder license or you're migrating to the current Analytics platform license, follow these steps to create a permission set with the same functionality.
 - The View Analytics permission set enables the equivalent functionality provided by the previous Analytics Explorer license (purchased before October 20, 2015). If you have an Explorer license or you're migrating to the current Analytics platform license, follow these steps to create a permission set with the same functionality.
1. In the Setup menu, under administer, click **Manage Users | Permission Sets** and then click **New**.
 2. Enter `Manage Analytics` or `View Analytics` in the Label field, as appropriate. This automatically creates the API name as well. You can change it if you like, but it can't include spaces, end with an underscore, or have two consecutive underscores.
 3. For License, select the license to associate with this permission set. In this case, select the Analytics Platform permission set license.

When you select a specific permission set license, any user assigned to the permission set is *auto-assigned* the permission set license. If you select --None--, you must *manually* assign the permission set license to users before you can add them to the new permission set.

4. Click **Save**. The Permission Set Overview page shows the new permission set. Now add user permissions to the set.
5. Click **System Permissions** to open the list of user permissions enabled by the Analytics Platform license. Then click **Edit**.
6. Do one of the following.
 - If you're creating the Manage Analytics permission set, select "Manage Analytics" user permissions and click **Save**. You've successfully created a permission set that enables access to all Analytics features. You don't have to select any of the other individual permissions. Assign this permission set sparingly because it provides access to all Analytics features, many of which are inappropriate for most analytics users.
 - If you're creating the View Analytics permission set, select "Use Analytics" and "Upload External Data to Analytics" user permissions and click **Save**. You've successfully created a permission set that enables a user to view the Analytics datasets, lenses, and dashboards that they have permission to view, and to upload data files from outside Salesforce.
7. You can now assign your new permission set to users, which is covered in [Assign Permission Sets to Users](#).

Repeat these steps for every user in your organization who requires access to Analytics.

Assign Analytics Permission Sets to Users

Assign permission sets to one or more users—either one at a time, or in bulk—to give them access to Analytics functionality.

1. In the Setup menu, under administer, click **Manage Users | Permission Sets**.
2. Click the permission set you want to assign to users. If you've followed the instructions in [Enable Analytics and Create Service Analytics Permission Sets](#) on page 57, select either the Manage Analytics or View Analytics permission sets.

USER PERMISSIONS

To assign a permission set to users:

- Assign Permission Sets

3. Click **Manage Assignments** and click **Add Assignments**.
4. Select the users who need access to Analytics, and click **Done**. When you assign the permission set to users, Salesforce *auto-assigns* the Analytics Cloud - Analytics Platform *permission set license* to those users.

Assign the Manage Analytics permission set sparingly, since it provides access to all Analytics features. Assign it only to users who administer or manage the Analytics platform.

Complete Setting up the Analytics Platform

Enhance the Analytics platform user experience and fine-tune Analytics access to Salesforce data with optional setup procedures.

IN THIS SECTION:

[Enable Preview Thumbnails for All Lenses and Dashboards](#)

Make it easier for users to find their lenses and dashboards on the home page and on app pages. Replace the generic icons with preview thumbnails of the contents of all lenses and dashboards, including those assets that have row-level security restrictions.

[Enable Analytics for Communities](#)

Securely share Analytics apps with community partner and customer users.

[Enable Downloading from Analytics](#)

Enable users to download the results from lens explorations and dashboard widgets as images (.png), Microsoft® Excel® (.xls), or comma-separated values (.csv) files.

[Grant Users Access to the Wave Dashboard Designer and Classic Designer](#)

To grant users access to either dashboard designer, assign each of them the "Create and Edit Analytics Dashboards" user permission. For users to access the Wave dashboard designer, the **Enable Wave dashboard designer** setup option must also be enabled, which it is by default.

[Enable Annotations on Dashboard Widgets](#)

Annotate dashboard widgets with comments posted in the dashboard and in Chatter.

[Enable the Analytics REST API](#)

You can access Analytics datasets and lenses programmatically using the Analytics REST API. Selecting this option overrides the "APIEnabled" permission for individual users and gives all Analytics users (including Community users) access to the API.

[Connected App for Analytics on Mobile](#)

Install the Salesforce Analytics App Package to allow your mobile clients to easily connect to your org. This package contains the Connected App component that gives you control over who's logging in and how your mobile clients share images and links.

[Analytics Security Implementation Guide](#)

Analytics has different levels of security that your organization can implement to ensure that the right user has access to the right data.

[Salesforce Data Access in Analytics](#)

Analytics requires access to Salesforce data when extracting the data and also when the data is used as part of row-level security. Analytics gains access to Salesforce data based on permissions of two internal Analytics users: Integration User and Security User.

[Set Up a Whitelist of Trusted Sites for Embedded Analytics Dashboards](#)

Specify your trusted sites in the Analytics whitelist, you can include embedded Analytics dashboards in websites and apps outside of Salesforce servers.

[Einstein Analytics Encryption](#)

The Einstein Analytics Encryption solution enhances security for Salesforce customers by extending encryption capabilities to the data at rest that is stored on the Salesforce file system. Data in use is already encrypted without requiring Einstein Analytics Encryption.

Enable Preview Thumbnails for All Lenses and Dashboards

Make it easier for users to find their lenses and dashboards on the home page and on app pages. Replace the generic icons with preview thumbnails of the contents of all lenses and dashboards, including those assets that have row-level security restrictions.

If no security predicate is defined for a dataset, then preview thumbnails always appear. If a security predicate is defined, then preview thumbnails don't show unless this setting is enabled. With the setting enabled, preview thumbnails appear for all assets.

Important: Even if row-level security applies to the dataset used by a lens or dashboard, the preview thumbnail could expose data from restricted rows. Row-level security restrictions take effect only after you've clicked through to the lens or dashboard.

1. From Setup, enter *Analytics* in the **Quick Find** box, then select **Settings**.
2. Select `Show preview thumbnails for lenses and dashboards with row level-security enabled`.
3. Click **Save**.

Enable Analytics for Communities

Securely share Analytics apps with community partner and customer users.

Note: Only users with a Customer Community Plus or Partner Community license can use this feature. This feature is supported in communities but not in portals.

To set up Analytics for sharing with Communities, complete the following steps.

1. From Setup, enter *Analytics* in the **Quick Find** box, then select **Settings**. Select `Enable Analytics for Communities`.
2. Assign your community members the Analytics for Communities permission set license.
3. Create a permission set that includes the "View Analytics on Communities pages" permission and assign it to your community members.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To modify settings:

- Manage Analytics

EDITIONS

Available in: Salesforce Classic

Available for an extra cost in: **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in: **Developer Edition**

USER PERMISSIONS

To modify settings:


- Manage Analytics

To view Analytics dashboards and lenses:

- View Analytics on Communities pages

Enable Downloading from Analytics

Enable users to download the results from lens explorations and dashboard widgets as images (.png), Microsoft® Excel® (.xls), or comma-separated values (.csv) files.

 **Note:** Complete dashboards can be downloaded only as images.

To set up users to download data from Analytics, complete the following steps.

1. From Setup, enter *Permission Sets* in the **Quick Find** box, and then select **Permission Sets** under Manage Users.
2. Select the Analytics Cloud Permission Set where you want to add the permission, and then select **System Permissions**.
3. Select **Download Data from Analytics**.
4. Click **Save**.

SEE ALSO:

[Download Images and Filtered Data](#)

Grant Users Access to the Wave Dashboard Designer and Classic Designer

To grant users access to either dashboard designer, assign each of them the “Create and Edit Analytics Dashboards” user permission. For users to access the Wave dashboard designer, the **Enable Wave dashboard designer** setup option must also be enabled, which it is by default.

If Wave dashboard designer is disabled, complete the following tasks to enable it.

1. From Setup, enter *Analytics* in the **Quick Find** box, then select **Settings**.
2. Select **Enable Wave dashboard designer**, and then click **Save**.
3. For each user that builds dashboards, assign the “Create and Edit Analytics Dashboards” user permission to them.
Each user has a choice whether to use the classic designer or Wave dashboard designer for each dashboard.

SEE ALSO:

[Build Analytics Dashboards](#)

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To modify settings:

- [Manage Analytics](#)

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To access the Wave dashboard designer or classic designer:

- [Create and Edit Analytics Dashboards](#)

Enable Annotations on Dashboard Widgets

Annotate dashboard widgets with comments posted in the dashboard and in Chatter.

 **Note:** Annotations are supported only in dashboards built with the Wave dashboard designer.

To enable annotations, complete the following steps.

1. From Setup, enter *Feed Tracking* in the *Quick Find* box, and then select **Feed Tracking** under Chatter.
2. Scroll down and select **Wave Asset**.
3. Select *Enable Feed Tracking*.
4. Click **Save**.

SEE ALSO:

[Collaborate with Dashboard Annotations](#)

Enable the Analytics REST API

You can access Analytics datasets and lenses programmatically using the Analytics REST API. Selecting this option overrides the "APIEnabled" permission for individual users and gives all Analytics users (including Community users) access to the API.

1. From Setup, enter *Analytics* in the *Quick Find* box, then select **Settings**.
2. Select *Grant all users access to Wave API*.
3. Click **Save**.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To modify settings:

- Manage Analytics

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To modify settings:

- Manage Analytics

Connected App for Analytics on Mobile

Install the Salesforce Analytics App Package to allow your mobile clients to easily connect to your org. This package contains the Connected App component that gives you control over who's logging in and how your mobile clients share images and links.

1. While logged in as an admin, navigate to <https://login.salesforce.com/packaging/installPackage.apexp?p0=04tB0000000DKTA>.
2. Select **Install for All Users**.
If you install the Connected App only for certain roles, then only those clients are subject to your policies.
3. After clicking **Done**, click the Salesforce Analytics App Package and then **View Components**.
4. Select iOS or Android. To configure policies and other settings, click **Edit**. When you are finished, save your changes.
For more information about Connected App settings, see [Edit a Connected App](#).
5. If you want to disable sharing options for mobile users, click **New** in the Custom Attributes section.

All sharing options are enabled by default. To disable an option, add its attribute key and enter "false" for the attribute value. See the table for the supported attribute keys.

EDITIONS

Available in Salesforce Classic and Lightning Experience.


Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To install and configure Connected App:


- Manage Analytics

Attribute Key	Mobile clients can share	Mobile Device
SHARE_IMAGE_AIRDROP	Images via AirDrop	iOS
SHARE_IMAGE_CAMERAROLL	Images from Camera Roll	iOS
SHARE_IMAGE_OPEN	The image that's currently open on the mobile device	iOS
SHARE_IMAGE_S1	Images in Salesforce	iOS
SHARE_IMAGE_EMAIL	Images through email	iOS
SHARE_LINK_NFC	Links via Near Field Communication (NFC)	Android
SHARE_LINK_BLUETOOTH	Links over Bluetooth	Android
SHARE_LINK_AIRDROP	Links via AirDrop	iOS
SHARE_LINK_CLIPBOARD	The link that's currently in the clipboard of the mobile device	iOS and Android
SHARE_LINK_S1	Links in Salesforce	iOS and Android
SHARE_LINK_EMAIL	Links through email	iOS and Android
SPOTLIGHT_SEARCH	Mobile clients can see Analytics assets in Spotlight search results	iOS

 **Note:** To apply custom attributes to connected users, you can revoke them and ask them to reconnect.

- To view and control how mobile clients connect to your Analytics-enabled org, from Setup, enter *Connected Apps* in the **Quick Find** box, then select **Connect Apps OAuth Usage**.

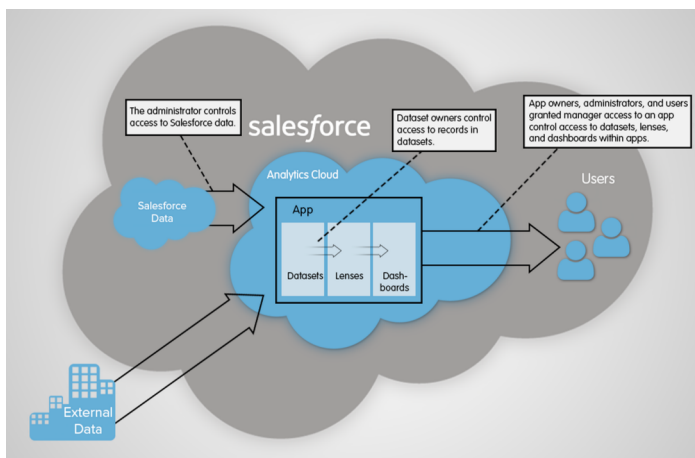
You can block user sessions, revoke individual users, and drill in to user details. For more information, see [Monitoring Usage for a Connected App](#).

 **Note:** For certificate-based authentication, users must set their desktop browsers to allow cookies.


For additional security, use Mobile Device Management (MDM) with the option to show only authorized hosts. The "OnlyShowAuthorizedHosts" key allows you to hide the "Add New Account" plus sign in the mobile app. For more information, see [Using MDM with Salesforce Mobile SDK Apps](#).

Analytics Security Implementation Guide

Analytics has different levels of security that your organization can implement to ensure that the right user has access to the right data.



- The administrator can implement object-level and field-level security to control access to Salesforce data. For example, the administrator can restrict access to prevent the dataflow from loading sensitive Salesforce data into datasets. This document describes how Analytics uses object-level and field-level security on Salesforce data and how to configure permissions on Salesforce objects and fields.
- Dataset owners can implement row-level security on each dataset that they create to restrict access to its records. If a dataset does not have row-level security, users who have access to the dataset can view all records. This document describes how to configure row-level security on datasets and provides some sample implementations based on datasets created from Salesforce data and external data.
- App owners, administrators, and users granted manager access to an app control access to datasets, lenses, and dashboards within apps. This document describes the different levels of access for apps and how to share datasets, lenses, dashboards in an app with other users.

 **Note:** Analytics supports security predicates, a robust row-level security feature that enables you to model many different types of access controls on datasets. Also, Analytics supports sharing inheritance, to synchronize with sharing that's configured in Salesforce, subject to certain limitations. If you use sharing inheritance, you must also set a security predicate to take over in situations when sharing settings can't be honored.

For complete information about implementing Analytics security, see [Analytics Security Implementation Guide](#).

Salesforce Data Access in Analytics

Analytics requires access to Salesforce data when extracting the data and also when the data is used as part of row-level security. Analytics gains access to Salesforce data based on permissions of two internal Analytics users: Integration User and Security User.

Analytics uses the permissions of the Integration User to extract data from Salesforce objects and fields when a dataflow job runs. Because the Integration User has View All Data access, consider restricting access to particular objects and fields that contain sensitive data. If the dataflow is configured to extract data from an object or field on which the Integration User does not have permission, the dataflow job fails.

When you query a dataset that has row-level security based on the User object, Analytics uses the permissions of the Security User to access the User object and its fields. The Security User must have at least read permission on each User object field included in a predicate. A predicate is a filter condition that defines row-level security for a dataset. By default, the Security User has read permission on all standard fields of the User object. If the predicate is based on a custom field, then grant the Security User read access on the field. If the Security User does not have read access on all User object fields included in a predicate expression, an error appears when you try to query the dataset using that predicate.

IN THIS SECTION:


[Control Access to Salesforce Objects and Fields](#)

Analytics requires access to Salesforce data when extracting the data and also when the data is used as part of row-level security. Configure the permissions of the Integration User on Salesforce objects and fields to control the dataflow's access to Salesforce data. Configure the permissions of the Security User to enable row-level security based on custom fields of the User object.

Control Access to Salesforce Objects and Fields

Analytics requires access to Salesforce data when extracting the data and also when the data is used as part of row-level security. Configure the permissions of the Integration User on Salesforce objects and fields to control the dataflow's access to Salesforce data. Configure the permissions of the Security User to enable row-level security based on custom fields of the User object.

When configuring permissions for the Integration User or Security User, make changes to a cloned version of the user profile.

1. From Setup, enter *Profiles* in the **Quick Find** box, then select **Profiles**, and then select the user profile.
For the Integration User, select the Analytics Cloud Integration User profile. For the Security User, select the Analytics Cloud Security User profile.
 2. Click **Clone** to clone the user profile.
 3. Name and save the cloned user profile.
 4. Click **Object Settings**.
 5. Click the name of the Salesforce object.
 6. Click **Edit**.
 - a. To enable permission on the object, select **Read** in the Object Permissions section.
 - b. To enable permission on a field of the object, select **Read** for the field in the Field Permissions section.
-  **Note:** You can't change the permissions on standard fields of the User object.
7. Save the object settings.
 8. Assign the cloned user profile to the Integration User or Security User.
 - a. From Setup, enter *Users* in the **Quick Find** box, then select **Users**.
 - b. Select the user to which you want to assign the user profile.

USER PERMISSIONS

To clone a user profile:

- Manage Profiles and Permission Sets

To edit object permissions:

- Manage Profiles and Permission Sets
- AND
- Customize Application

- c. Click **Edit**.
- d. In the Profile field, select the user profile.
- e. Click **Save**.

9. Verify that the Integration User or Security User has the right permissions on fields of the objects.

Set Up a Whitelist of Trusted Sites for Embedded Analytics Dashboards

Specify your trusted sites in the Analytics whitelist, you can include embedded Analytics dashboards in websites and apps outside of Salesforce servers.

To set up an Analytics whitelist, complete the following steps.

1. From Setup, enter *whitelist* in the **Quick Find** box, then select **Whitelist** under Analytics.
2. On the Whitelist for Embedding Dashboards page, click **New**.
3. On the Whitelisted Site Edit page, enter the information for the site you want to add to the Analytics whitelist.
4. Click **Save**.

Einstein Analytics Encryption

The Einstein Analytics Encryption solution enhances security for Salesforce customers by extending encryption capabilities to the data at rest that is stored on the Salesforce file system. Data in use is already encrypted without requiring Einstein Analytics Encryption.

Digital data is considered to be in use if it is in transit, currently being processed, or stored in memory.

By contrast, digital data is considered at rest if it is stored physically in persistent storage but is not currently in use. To encrypt data at rest and preserve functionality, Einstein Analytics Encryption services are built natively into the Einstein Analytics platform. The solution applies strong, probabilistic encryption on data stored at rest. Platform encryption is based on the Advanced Encryption Standard (AES) with 256-bit keys using CTR mode and an initialization vector (IV) for every write.

All operations, including sort and group-by, function the same as without encryption (except for key management functions, as noted in this topic).

How Einstein Analytics Encryption Works

As a prerequisite to Einstein Analytics Encryption, you must be approved by the Einstein Analytics Encryption Product Manager and your org must have a Shield Platform Encryption (PE) Tenant Secret created. (Einstein Analytics Encryption uses PE key management, so it is not necessary to encrypt objects and fields in core Salesforce.)

To enable Einstein Analytics Encryption, your Salesforce admin must go to the Platform Encryption setup page, select the **Einstein Analytics** tenant secret type from the drop-down, click **Generate Tenant Secret**, and then select **Encrypt Analytics**. Your instance is then assigned a unique, secure key for encryption and decryption of your data on disk.

When using Einstein Analytics with your encryption enabled instance, data read from and written to disk is automatically encrypted with the unique key for your account. For more information about the encryption technology, refer to the [Shield Platform Encryption Architecture](#) white paper. To verify that encryption is enabled, go to the Analytics Settings page in the Setup UI.

EDITIONS

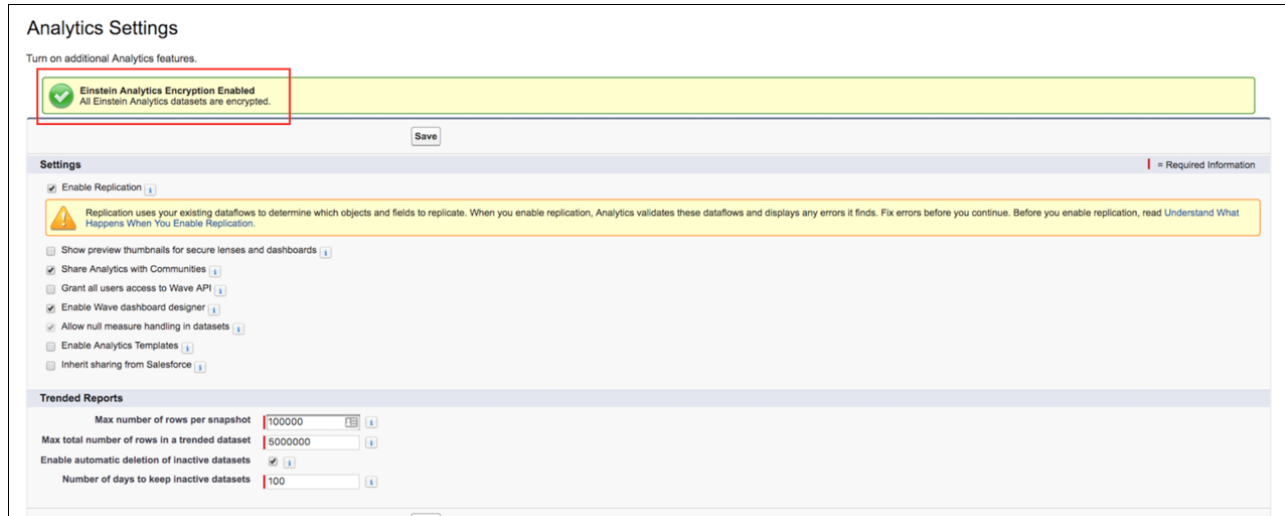
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To modify settings:

- [Manage Analytics](#)



Features

All Einstein Analytics features are supported, with the following exceptions:

- Full key management is not implemented. Key export is available; however, other key management features, including key revocation, Bring Your Own Key, key rotation, and import key, are not currently available.
- Pre-existing data is not encrypted. Data that was in Einstein Analytics before encryption was enabled is not encrypted. If pre-existing data is imported from Salesforce objects through the dataflow, the data becomes encrypted on the next dataflow run. Other pre-existing data (such as CSV data) must be reimported to become encrypted. Although pre-existing data is not encrypted, it is still accessible and fully functional in its unencrypted state when encryption is enabled.

Frequently Asked Questions

Is data encrypted in transit? Yes. However, encryption in transit is different from encryption at rest. This feature covers encryption at rest.

Can Einstein Analytics bring in data encrypted with Shield Platform Encryption? Yes. Einstein Analytics reads platform encrypted data in the same way that any user reads platform encrypted data. The data is then written and encrypted in Einstein Analytics. It is not required that data be encrypted with Shield Platform Encryption to be encrypted in Einstein Analytics. It is only required that a Tenant Secret exist for the org.

Can I mask my data? No. Masking data is not currently available and it does not fall under the Einstein Analytics scope.

Are the keys different for Shield Platform Encryption and Einstein Analytics Encryption? Yes, although Shield and Einstein Analytics use the same key management technology, they use different keys.

Do mobile dashboards still work with encryption? Yes. All Einstein Analytics functionality, including support for mobile devices, works with encryption enabled. All data stored on mobile (mainly JSON code and thumbnails) is AES 256 encrypted.


Is there any impact on application performance? The Einstein Analytics Encryption solution is designed to have at most a minimal performance impact on your Einstein Analytics application experience.

Analytics Requirements

This section provides requirements for using Analytics.

Supported Browsers

Browser support is available for Microsoft® Edge, Microsoft Internet Explorer® version 11, and the most recent stable versions of Mozilla® Firefox® and Google Chrome™.

 **Note:** Analytics isn't supported on Apple® Safari®.

Screen Resolution

The minimum screen resolution required to support all Salesforce features is 1024 x 768 pixels.

Supported Mobile Devices

Analytics for iOS: Apple® devices running iOS 10 or later.

Analytics for Android: Android™ devices running Android 5 or later.

Analytics Limits

This section describes Analytics limits.

API Call Limits

These limits apply to all supported editions.

Limit	Value
Maximum concurrent Analytics API calls per org	100
Maximum Analytics API calls per user per hour	10,000

Dataset Storage Limits

These limits apply to all supported editions and are contractual, not technical. The licensee agrees to strictly monitor its total number of data rows. Use of a prebuilt Analytics app license, such as the Sales Analytics app license, does not increase the data limit for the Analytics Platform license.


Limit	Value
Maximum number of rows for all registered datasets combined	100 million with Einstein Analytics Platform 25 million with Sales Analytics or Service Analytics 50 million with Event Monitoring Analytics 25 million with B2B Marketing Analytics 25 million with Einstein Analytics for Financial Services Cloud 25 million with Einstein Analytics for Health Cloud +100 million per Additional Data Rows license Whether the row limits are additive depends on the SKUs for your org. Examples: <ul style="list-style-type: none"> The Einstein Analytics platform SKU includes Sales Analytics and Service Analytics, so the total row limit is 100 million.

Limit	Value
	<ul style="list-style-type: none"> If your org has an Einstein Analytics Platform SKU and then obtains an additional SKU for Sales Analytics or Services Analytics, the limit increases to 125 million. If your org has an Einstein Analytics Platform SKU and adds the Event Monitoring SKU, the total row limit becomes 150 million.
Maximum number of fields in a dataset	5,000 (including up to 1,000 date fields)
Maximum value for each numeric field in a dataset	36,028,797,018,963,967
Minimum value for each numeric field in a dataset	-36,028,797,018,963,968

Dataflow Limits

Analytics uses the bulk API, but this does **not** count towards Salesforce bulk API limits. The dataflow submits a separate bulk API call to extract data from each Salesforce object. The dataflow uses a batch size of 100K to 250K, depending on whether the dataflow or the bulk API chunks the data. As a result, to extract 1 million rows from an object, the dataflow creates 4-10 batches.

Limit	Value
Maximum number of dataflows (with replication enabled)	20
Maximum number of dataflow runs in a rolling 24-hour period	Production Org: 30; Sandbox Org: 30

 **Note:** Dataflows and recipes that take less than 2 minutes to run, and replication, don't count toward the 24-hour dataflow run limit. However, you can't run any of these data jobs, regardless of size, if you've already reached the 24-hour run limit.

ELT Job Limits

ELT jobs include user dataflows, CSV uploads, dataset recipes, and replication.

Limit	Value
Timeout for ELT jobs that have been scheduled but not executed	5 minutes

Replication Limits

If you are currently extracting more than 50 objects in your dataflows, contact Salesforce Customer Support before you enable replication.

Limit	Value
Maximum number of objects that can be enabled for replication	50

Trending Data Limits

Trended datasets count toward the overall Analytics platform limits, including total number of rows.

Limit	Value
Maximum number of trended datasets per user	5
Maximum number of rows per snapshot	100,000
Maximum number of rows for all monthly snapshots per org	40 million

Lens and Dashboard Creation Limits

These limits apply to the creation of lenses and dashboards.

Limit	Value
Character limit for description fields	1000
Default number of rows in a compare table	2000 (To set a different value, use the SAQL <code>limit</code> statement)
Default number of rows in a values table	100 (To set a different value, use the SAQL <code>limit</code> statement)
Maximum file size for geojson	10 MB
Maximum number of notifications per user	5

Prebuilt Analytics App Limits

Each Analytics app limits custom object support to no more than 10 custom objects and one dataflow for each org that implements the app. These are contractual, not technical, limits.

External Data Limits

Limit	Value
Maximum file size per external data upload	40 GB
Maximum file size for all external data uploads in a rolling 24-hour period	50 GB
Maximum number of external data files that can be uploaded in a rolling 24-hour period	50
Maximum number of characters in a field	32,000
Maximum number of fields in a record	5,000 (including up to 1,000 date fields)
Maximum number of characters for all fields in a record	400,000

Query Limits


Trended datasets count toward the overall Analytics platform limits, including total number of rows.

Limit	Value
Maximum concurrent queries per organization	50 per platform
Maximum concurrent queries per user	10

Limit	Value
Maximum number of rows returned per query 10,000 is the default value. To set a different value, use the SAQL <code>limit</code> statement	10,000*
Query timeout	2 minutes

*The maximum results returned by a query varies based on the step type that contains the query and whether the query is executed from a desktop or the mobile app.

Step Type	Applies to Wave Designer Dashboards?	Applies to Classic Designer Dashboards?	Desktop Default Limit	Mobile Default Limit
aggregate		✓	2,000	100 if the step contains a single grouping, 500 if it contains multiple groupings.
aggregateflex	✓		2,000	500
grain (for values tables only)	✓	✓	100	100
multi (for compare tables only)		✓	2,000	2,000
saql	✓		2,000	2,000
soql	✓		See <i>Force.com SOQL and SOSL Reference</i> .	See <i>Force.com SOQL and SOSL Reference</i>
static		✓	n/a	n/a
staticflex	✓		n/a	n/a

 **Tip:** To see the `limit` for a given step, click `>` in the explorer. If it's not set, Analytics returns up to 10,000 results. To change the limit, edit the SAQL or SOQL query. The higher you increase the limit, the longer the query might take. For more information about SAQL queries, see the [Analytics SAQL Reference](#). For information about SOQL queries, see *Salesforce Object Query Reference*.

The limit only impacts the number of records returned for display. It doesn't impact calculations across all dataset records. For instance, a query groups by account name and the dataset contains one million account names. With a limit of 20, Analytics only returns 20 results for display, but the summary row adds up all one million records.

Analytics Developer Addition Limits

Analytics is built on the force.com platform and is subject to the force.com platform limits. For example, the SOQL query limit (20,000 characters) controls the number of fields from which the `sfdcDigest` transformation can extract data. If you exceed a force.com limit, an error occurs. See [force.com platform limits](#).

Limit	Value
Maximum number of data rows	250,000
Maximum number of concurrent queries	5

Analytics Limitations

Analytics differs from other Salesforce features in some ways.

General Limitations

This section describes Analytics limitations.

Update Schedule

All customers receive Analytics updates on the same schedule, regardless of instance.

Localization and Internationalization

Analytics has been localized with the following exceptions.

- We do not support right-to-left languages, such as Arabic and Hebrew.
- A subset of error messages is available only in English.
- The mobile iOS app includes only English versions of sample datasets and dashboards.

Analytics provides internationalization support with the following limitations.

- You must set both locale and language to see translated labels.
- Data within datasets is not modified for localization or internationalization.
- Each dataset can have a single locale specified in the metadata. The metadata locale is not overridden by individual user locale settings. All users see the same date, time, and number formats, and dimension names, regardless of their own locale and language settings.
- Search in filters is case-sensitive and accent-sensitive. For example, using the filter “Andre” does not return “André” in the results.
- Multicurrency is not supported. When Analytics extracts your organization’s default currency, it uses the currency for monetary values and doesn’t convert to another currency.

SAQL Query Limitations

You can't filter, group, or sort based on the time fields generated for a date field, like <date_field>_Hour, <date_field>_Minute, and <date_field>_Second.

Sales Analytics Limitations

These limitations apply to Sales Analytics.

App Creation Does Not Support Internet Explorer 11

The Sales Analytics *creation process* does not support Internet Explorer 11. Use another browser when you create the app. Your team can *view the app* using any standard browser after the app is created, including Internet Explorer 11.

Sales Analytics Data Requirements

Sales Cloud data must meet the following requirements for Sales Analytics dashboards to function correctly:

- Use standard sales objects.
- Have at least one event and one task connected with an opportunity.
- Enable history tracking for Amount, Stage, and CloseDate fields on the Opportunities object.
- Cases must be connected to Accounts if you choose to import Cases data to Sales Analytics using the configuration wizard.
- There are two requirements if you choose to import Leads data to Sales Analytics using the configuration wizard.
 1. At least one lead must be converted to an opportunity.
 2. The lead must be connected to an account.
- There are two requirements if you choose to import Campaigns data to Sales Analytics using the configuration wizard.
 1. At least one opportunity must be connected to a campaign.
 2. At least one campaign member must be connected to a campaign.
- There are two requirements if you choose to import opportunity record types to Sales Analytics using the configuration wizard.
 1. At least one opportunity record type must be defined.
 2. The opportunity record type must be connected to at least one opportunity.

Sales Analytics Support for Salesforce Objects and Fields

Sales Analytics supports all Salesforce standard and custom objects and data. To add custom objects or additional fields not included when you first create the app, you need to update the Sales Wave dataflow. For details see [Create Datasets with the Dataflow](#).

When you first create the app it includes only a predefined set of objects and fields. Sales Analytics creates a dataflow that exposes selected fields from the following standard Salesforce objects:

- Accounts
- Users
- Roles
- Opportunities
- Projects (Opportunities line item)
- Tasks
- Events

The fields provided are determined by the answers you provide when you create the app using the built-in configuration wizard.

Sales Analytics supports standard and custom fields on standard Salesforce objects. The fields provided are determined by the answers you provide when you create the app using the built-in configuration wizard.

Sales Analytics limits custom objects support to no more than 10 custom objects for each org that implements Sales Analytics. This limitation is contractual, not technical.

To add custom objects or extra fields not included when you first create the app, you must update the Sales Analytics dataflow. For details, see [Create Datasets with the Dataflow](#).

Sales Analytics Support for Non-Salesforce Data

Sales Analytics does not support external data sources [except a CSV file](#) that contains quota data at the user level. Importing other external data requires an extra license. See your Salesforce representative for details.

To include data about quotas in Sales Analytics, you must upload a CSV file with the details. For more information, see [Collaborative Forecasting and Quotas Data in Sales Analytics](#).

Service Analytics Limitations

The following limitations apply to Service Analytics.

Service Analytics Data Requirements

Service Cloud data must include at least one each of the following for Service Analytics dashboards to function correctly: Events, tasks, closed cases, or published articles attached to a case or an opportunity. It also requires that your org have at least one contact ID associated with a case.

Custom formula fields on the Cases object must exist or be created for the SLA missed (text) and FCR (Boolean) fields.

Service Analytics Support for Salesforce Objects and Fields

Service Analytics supports all Salesforce standard and custom objects and data. When you first create the app by default it includes only a predefined set of objects and fields. The app creates a dataflow that exposes selected fields from the following Salesforce objects:

- Account
- Cases
- Contact
- User
- UserRole
- Task

Service Analytics also uses fields from the following options depending on the answers you select in the configuration wizard:

- Customer satisfaction (CSAT)
- Knowledge
- Business hours
- Case history
- Case record types
- Queues
- Opportunities
- Opportunity record types
- Events
- Telephony
- Live Agent
- Omni-Channel

Service Analytics supports standard and custom fields on standard Salesforce objects. The fields provided are determined by the answers you provide when you create the app using the built-in configuration wizard.

Service Analytics limits custom objects support to no more than 10 custom objects for each org that implements Service Analytics. This limitation is contractual, not technical.

To add custom objects or extra fields not included when you first create the app, you must update the Service Analytics dataflow. For details, see [Create Datasets with a Dataflow](#). For details, see [Create Datasets with the Dataflow](#).

More Service Analytics Limitations

Service Analytics does not support external data sources or registering new datasets from the app-generated dataflow.

Including CSAT score in dashboards/dataflow is optional. The app configuration wizard lets you associate CSAT from a custom case field or Custom Object associated to the Cases object.

You must manually add any security predicates or other dataset filters to the app dataflow.

The app does not support multi-hierarchy (team/manager) when you create it. You must manually add that functionality.

The Knowledge Usage dashboard currently reports on a single Article Type, which you select when you use the configuration wizard.

Field-Level Security

Field-level security isn't available for external data that is uploaded via files. Field-level security that was implemented in the original database or Salesforce object isn't preserved when the data is loaded into an Analytics dataset. For more information, see the [Analytics Security Implementation Guide](#).

Set [Salesforce field-level security](#) to enable the Analytics Integration User to see all fields used in your app—default fields and those selected in the configuration wizard. Integration users run the dataflow, and if they don't have proper field-level security permissions, the dataflow fails.

Dashboards on Mobile Devices

To view an Analytics dashboard on a mobile device, use the Analytics mobile app.

SEE ALSO:


[Tradeoffs and Limitations of Shield Platform Encryption](#)


[Limitations of Analytics on iPhone® and iPad®](#)

[Limitations of Analytics on Android Devices](#)

Set Up the Analytics Platform with Licenses Purchased Before October 20, 2015

If you purchased an Analytics Cloud Builder or Analytics Cloud Explorer license before October 20, 2015, you can continue to use your licenses to set up the Analytics platform for users in your organization or you can migrate to the new single-user Analytics Platform license.

 **Note:** This information applies only to customers who purchased Analytics licenses before October 20, 2015, and continue to use the Analytics Cloud Builder or Analytics Cloud Explorer licenses after that without migrating to the new Analytics Platform license. If you purchased Analytics on or after October 20, 2015, go to [Set Up the Analytics Platform](#).

 **Important:** If you're migrating from the previous Analytics Cloud Builder or Analytics Cloud Explorer platform licenses to the single-user Sales Analytics Apps license, read [Migrating From Analytics Licenses Purchased Before 10/20/2015 to New Analytics Platform Licenses](#).

The Analytics Platform License

An Analytics license purchased before October 20, 2015, enables you to turn on Analytics for your organization. Each previous Analytics Platform license is contractually limited to a maximum of 400 users. If you need more than 400 users, you can purchase additional Analytics licenses.

Each previous Analytics license enables you to:

- Store up to 250,000,000 rows in your final registered datasets.
- Run up to 50 concurrent queries in Analytics.

The Analytics Cloud Permission Set License


Each user needs one of two Analytics permission set licenses to use the product. The permission set license defines what user permissions can be assigned to the user. The administrator assigns permission set licenses to users.

For Analytics licenses sold before October 20, 2015, Salesforce provided the following permission set licenses:

- Analytics Cloud Builder permission set license enables users to access all Analytics features.
- Analytics Cloud Explorer permission set license enables users to upload external data to Analytics and explore data.

Here are Analytics user permissions included with each permission set license.

User Permission	Included in Explorer or Builder Permission Set License?	What It Enables
"Create and Edit Analytics Dashboards"	Builder only	Creating and editing Analytics dashboards.
"Create Analytics Apps"	Builder only	Creating and sharing Analytics applications.
"Edit Analytics Dataflows"	Builder only	Downloading, uploading, starting, stopping, and rescheduling the dataflow. Viewing dataflow and system jobs in the data monitor.
"Manage Analytics"	Builder only	Accessing all Analytics features. Provides Analytics administrator-level capabilities.
"Upload External Data to Analytics"	Builder and Explorer	Uploading external data to Analytics to create a dataset. Viewing dataflow and system jobs in the data monitor.
"Use Analytics"	Builder and Explorer	Using Analytics, and viewing the datasets, lenses, and dashboards that the user has permission to view. Automatically enabled when you select any other Analytics permission.

 **Note:** When you create permission sets for Analytics users, selecting any of the other Analytics permissions automatically enables the "Use Analytics" permission.

You can assign previous Analytics permission set licenses along with any of the following Salesforce user licenses:

- Force.com (app subscription)
- Force.com (one app)
- Full CRM
- Salesforce Platform
- Salesforce Platform One

SEE ALSO:

[Migrating From Analytics Licenses Purchased Before 10/20/2015 to New Analytics Platform Licenses](#)

Migrating From Analytics Licenses Purchased Before 10/20/2015 to New Analytics Platform Licenses

To complete migration from previous Analytics Cloud Builder and Analytics Cloud Explorer licenses purchased before October 20, 2015, to the new Analytics Platform license, you may need to set up Analytics users in your organization with new permission sets.

When Salesforce provisions your organization with the new Analytics Platform license, you may have to set up some users with the new license.

- **Analytics Cloud Builder license users.** Users who access Analytics with the Analytics Cloud Builder license should be able to continue to use the Analytics platform without any additional setup. The Builder license is simply renamed *Analytics Platform*, and you'll see that permission set license in Salesforce Setup.
- **Analytics Cloud Explorer license users.** During the new license provisioning process, Salesforce may remove the Analytics Cloud Explorer license from your org. If that's the case, you'll see the new Analytics Platform license instead of the Explorer license and you have to set up users with that license. If the Explorer permission set license is still visible, you do not have to repeat the setup process for Explorer users.

If users in your organization require you to set them up with the new Analytics Platform license—even if they used Analytics with a previous license—follow the steps in [Analytics Platform Setup](#) on page 53. You need to assign them the new permission set license, create one or more new permission sets, and assign the permission sets to users.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

Collaborative Forecasting and Quotas Data in Sales Analytics

Sales Analytics gives you a choice for how to include your team's quotas depending on whether you use the Sales Cloud Collaborative Forecasts feature to store quotas data.

You have the following options for including quotas data in Sales Analytics.

Table 1: Sales Analytics Quotas Data Options

Option	Sales Cloud Settings	Configuration Wizard Settings	Additional Setup Requirements
1	<ul style="list-style-type: none"> • Sales Cloud Collaborative Forecasts enabled • Collaborative Forecasts includes forecast quota data. 	Select Collaborative Forecasting in first wizard screen that lets you add objects.	None. Sales Analytics automatically adds quota data from the Forecasts object.
2	<ul style="list-style-type: none"> • Sales Cloud Collaborative Forecasts enabled • Collaborative Forecasts <i>does not</i> include forecast quota data. 	Select Collaborative Forecasting in first wizard screen that lets you add objects.	Create .CSV file with quotas data, upload to Analytics, rerun dataflow. See instructions below.

USER PERMISSIONS


To create and manage Analytics apps:


- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Option	Sales Cloud Settings	Configuration Wizard Settings	Additional Setup Requirements
3	Sales Cloud Collaborative Forecasts <i>not</i> enabled	No setting available. Wizard does not give you the option of adding Collaborative Forecasts data.	Create .CSV file with quotas data, upload to Analytics, rerun dataflow. See instructions below.

Wizard settings are optional, depending on whether you want to include Sales Cloud Collaborative Forecasts data in your app.

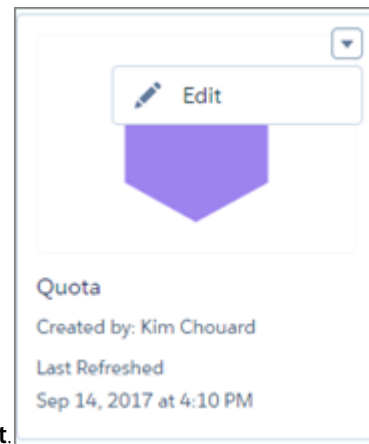
With Option 1, Sales Analytics automatically adds quotas data to your app and its dashboards. With Options 2 and 3, add quotas data to your app by following these instructions. ➤ [Create the Sales App, Part 2: Upload the Quota CSV File and Schedule a Dataflow \(Lightning Experience\)](#), which covers the steps described here.

 **Note:** When you work with .CSV files you want to import to Sales Analytics, create and open them using only a UTF-8-compliant text editor. Opening them in Microsoft Excel or other spreadsheet software reformats .CSV files and makes them unusable in Sales Analytics

 **Important:** When you create the .CSV file, be sure it contains the following fields, in this order, with exactly these names. Field names are case-sensitive:

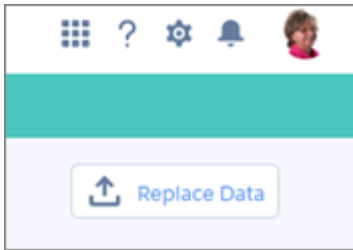
1. StartDate (in yyyy-mm-dd format)
2. QuotaAmount
3. OwnerName
4. Username

1. Create a .CSV file to include the fields just described, that is StartDate (in yyyy-mm-dd format, QuotaAmount, OwnerName, Username. For an example, see [Sales Analytics Example .CSV File](#).
2. Save the file to a location that you can easily remember.
3. In Salesforce, go to the Analytics home page and find the Quota (Target) dataset.
- 4.

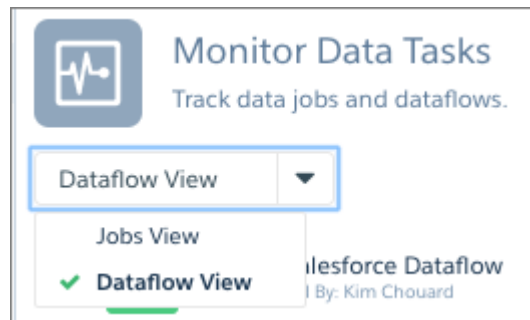


Click the arrow at the upper right corner of the dataset panel and select **Edit**.

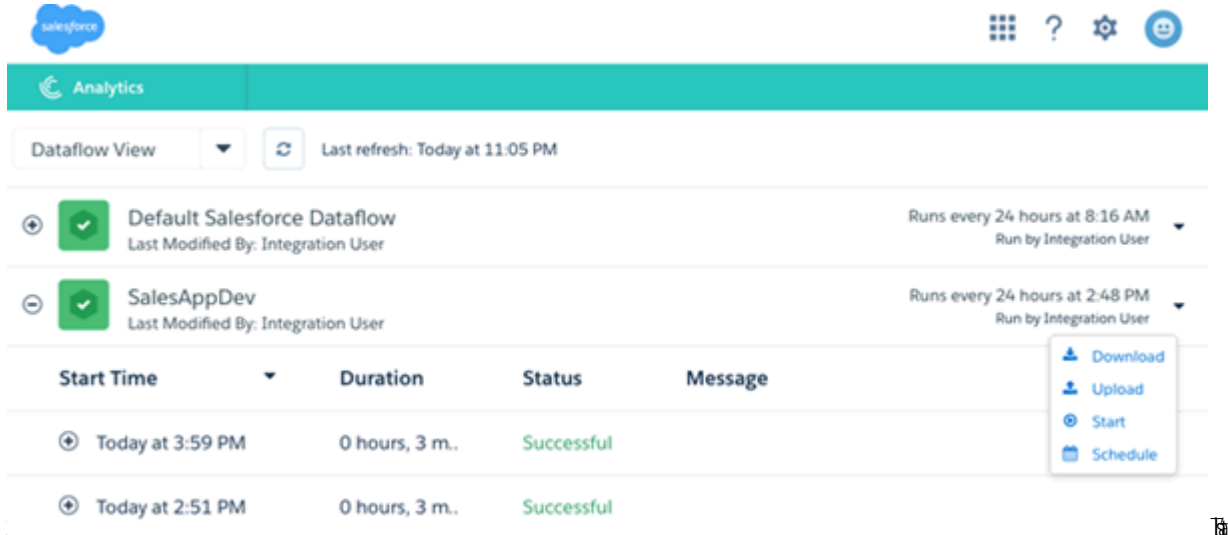
5. Salesforce displays the dataset editing screen for the Quota dataset. Look for **Replace Data** in the upper right corner and click it.



6. In the dialog box that opens, navigate to the .CSV file you created in Step 1, and double-click it.
7. Click **Next** to open the Replace Dataset Data page.
8. If your fiscal period is different than calendar period, that is if it starts on a date other than January 1, update the Quota Metadata file. If your fiscal period starts on January 1, skip to the next step.
- Copy the JSON from [Sales Analytics App Quota Dataset JSON File](#) and paste it into a text editor of your choice.
 - Change the value of "fiscalMonthOffset" from 4 to a number that represents the month your fiscal period starts. In Sales Analytics metadata, the numeral "0" stands for January, "1" stands for February, and so on up to "11," which stands for December. Save the file to your desktop.
 - In Analytics Studio, go to the Replace Dataset Data page and locate the Data Schema File area of the page. Click the arrow next to Quota .JSON file, select Replace File, find the file you just saved and upload it to Analytics.
9. On the Replace Dataset Data page, click **Next**, then on the next page, click **Next** again. You'll be asked to confirm that you want to replace the file. Click **Replace** to upload the file.
10. After uploading your quota data, rerun the dataflow to update the dashboards.
- Click the Gear menu at the upper right of the Sales Analytics screen and select Data Manager.
 - Select Dataflow view from the menu at the top left of the Data Manager screen.



- c. Find your app; you may have to scroll down the page. Open the menu on the far right of the screen next to the app icon and name, and click



The screenshot shows the Salesforce Analytics interface. At the top, there's a teal header with the 'Analytics' logo and a refresh button. Below the header, there's a section for 'Dataflow View' with a dropdown menu and a refresh button. The main content area displays two dataflows: 'Default Salesforce Dataflow' and 'SalesAppDev'. Each dataflow has a green checkmark icon, a name, and a 'Last Modified By' field. To the right of each dataflow, there's a schedule and a 'Run by' field. Below the dataflows, there's a table with columns for 'Start Time', 'Duration', 'Status', and 'Message'. The table shows two rows of data, both with a 'Successful' status. On the right side of the table, there's a context menu with options: 'Download', 'Upload', 'Start', and 'Schedule'.

it. The dataflow assures that Sales Analytics has your company's latest sales data. You can learn more about dataflows from [Schedule the Sales App Daily Dataflow](#).

IN THIS SECTION:

[Sales Analytics Example .CSV File](#)

Here's an example of the .CSV file you create to update the Sales Analytics Quota (Target) dataset.

[Sales Analytics App Quota Dataset JSON File](#)

Use this file to update the Sales Analytics Quota dataset with your fiscal year start date if it's *not* January 1.

Sales Analytics Example .CSV File

Here's an example of the .CSV file you create to update the Sales Analytics Quota (Target) dataset.

 **Note:** This file is for example purposes only. Create a unique .CSV file with quota data for members of your team including the following fields:

- QuotaAmount
- StartDate
- OwnerName
- Username

Save the .CSV file in UTF-8 format. Field names are case-sensitive and must appear in your file exactly as shown here.

 **Important:** Do not open the .CSV file with Microsoft Excel or another spreadsheet application, which can corrupt the file format.

See [Collaborative Forecasting and Quotas Data in Sales Analytics](#) on page 594.

 **Example:**


```

QuotaAmount,StartDate,OwnerName,Username
1700000,2017-04-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-05-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-06-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-07-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-08-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-09-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-10-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-11-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-12-01,Laura Garza,trailhead002@isaweso.me
1700000,2018-01-01,Laura Garza,trailhead002@isaweso.me
1700000,2018-02-01,Laura Garza,trailhead002@isaweso.me
1700000,2018-03-01,Laura Garza,trailhead002@isaweso.me
1700000,2018-04-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-04-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-05-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-06-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-07-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-08-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-09-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-10-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-11-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-12-01,Irene Kelley,trailhead011@isaweso.me
1700000,2018-01-01,Irene Kelley,trailhead011@isaweso.me
1700000,2018-02-01,Irene Kelley,trailhead011@isaweso.me
1700000,2018-03-01,Irene Kelley,trailhead011@isaweso.me
1700000,2018-04-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-04-01,Julie Chavez,trailhead012@isaweso.me
1700000,2017-05-01,Julie Chavez,trailhead012@isaweso.me
1700000,2017-06-01,Julie Chavez,trailhead012@isaweso.me

```

Sales Analytics App Quota Dataset JSON File

Use this file to update the Sales Analytics Quota dataset with your fiscal year start date if it's *not* January 1.

Copy the contents of this file into an editor of your choice and change the `fiscalMonthOffset` value (shown in **bold**) to the month your fiscal period begins. In metadata, the numeral "0" stands for January, "1" stands for February, and so on up to "11," which stands for December. In the code below, the number is set to "4", which stands for May. Use the number that represents the month your fiscal period begins. Then save the file and upload it to Sales Analytics following the instructions in [Collaborative Forecasting and Quotas Data in Sales Analytics](#).

```

{
  "objects": [
    {
      "connector": "CSV",
      "fullyQualifiedName": "Quota_csv",
      "label": "Quota.csv",
      "name": "Quota_csv",
      "fields": [
        {
          "fullyQualifiedName": "QuotaAmount",
          "name": "QuotaAmount",
          "type": "Numeric",

```

```

        "label": "QuotaAmount",
        "precision": 18,
        "defaultValue": "0",
        "scale": 0
    },
    {
        "fullyQualifiedName": "StartDate",
        "name": "StartDate",
        "type": "Date",
        "label": "StartDate",
        "format": "yyyy-MM-dd",
        "fiscalMonthOffset": 4,
        "isYearEndFiscalYear": true
    },
    {
        "fullyQualifiedName": "OwnerName",
        "name": "OwnerName",
        "type": "Text",
        "label": "OwnerName"
    },
    {
        "fullyQualifiedName": "Username",
        "name": "Username",
        "type": "Text",
        "label": "Username"
    }
]
}
]
}

```

Analytics

You can integrate Salesforce data and external data into Analytics to enable users to explore and visualize the data with explorer and designer. *External data* is data that resides outside of Salesforce, such as data from outside applications and spreadsheets.

When you load data into Analytics, you load it into datasets. A dataset is a collection of related data that is stored in a denormalized, yet highly compressed form. You can prepare data in a dataset to combine data from different sources, calculate new values, and clean data.

You can use these tools to create datasets in Analytics.

	Dataflow	Connectors with Replication	CSV Upload Wizard	Analytics Connector for Excel	External Data API	Recipe
Data source	Salesforce objects; existing datasets; replicated data	Salesforce objects; external data	External data	Microsoft Excel	External data	Existing datasets; replicated data
Load data	Yes	Yes	Yes	Yes	Yes	No

	Dataflow	Connectors with Replication	CSV Upload Wizard	Analytics Connector for Excel	External Data API	Recipe
Prepare data	Yes	No	No	No	Yes	Yes
Graphical user interface	Yes (dataflow editor)	Yes	Yes	Yes	No (programmatic access)	Yes
Preview data	No	Yes	Yes	Yes	No	Yes
Refresh data	Schedule	Schedule	Manual	Manual	Manual	Schedule

IN THIS SECTION:

[Get to Know Datasets](#)

A dataset is a collection of related data that is stored in a denormalized, yet highly compressed form.

[Create Datasets with the Dataflow](#)

You can use the dataflow to create one or more datasets based on data from Salesforce objects or existing datasets. A *dataflow* is a set of instructions that specifies what data to extract from Salesforce objects or datasets, how to transform the datasets, and which datasets to make available for querying. With a dataflow, you can manipulate the extracted data and override the metadata before you load it into a dataset. You can schedule the dataflow to run to keep the datasets up to date.

[Bring Data into Analytics](#)

There are two main steps involved in integrating your data: loading and preparing. Loading is the process of bringing data into Analytics from its source, in a form that can be either explored right away or prepared further for later exploration.

[Prepare Data in Analytics](#)

Data preparation is the process of transforming your data into a form that's meaningful and valuable to the people exploring it. This preparation can include combining data from different sources, calculating new values, and cleaning data so that it's consistent and meaningful. Analytics gives you two ways to prepare your data: dataflow and dataset recipes.

[Manage Datasets](#)

Edit a dataset to update its details or extended metadata, apply security, replace data, or restore it to a previous version.

Get to Know Datasets

A dataset is a collection of related data that is stored in a denormalized, yet highly compressed form.

Analytics applies one of the following types to each dataset field:

Date

A *date* can be represented as a day, month, year, and, optionally, time. You can group, filter, and perform math on dates.


Dimension

A *dimension* is a qualitative value, like region, product name, and model number. Dimensions are handy for grouping and filtering your data. Unlike measures, you can't perform math on dimensions. To increase query performance, Analytics indexes all dimension fields in datasets.

Measure

A *measure* is a quantitative value, like revenue and exchange rate. You can do math on measures, such as calculating the total revenue and minimum exchange rate.

For each dataset that you create, you can apply row-level security to restrict access to records in the dataset.

 **Attention:** Before you create a dataset, verify that the source data contains at least one value in each column. Columns with all null values won't be created in datasets and can't be referenced in dataflows, lenses, or dashboards. Consider providing a default value for null values, like "n/a" or "empty."

IN THIS SECTION:

[Numeric-Value Handling in Datasets](#)

Analytics internally stores numeric values in datasets as long values. For example, it stores the number "3,200.99" with a scale of "2" as "320099". The user interface converts the stored value back to decimal notation to display the number as "3200.99."

[Null Measure Handling in Datasets](#)

When you create or update a dataset, through your dataflow or a CSV upload for example, blank measure values in your data need to be replaced with concrete values. Analytics uses the default values specified in your dataflow or CSV metadata file to replace blank values. When null measure handling is enabled, you can specify these defaults using the special "null" value. When no default value is specified, Analytics replaces blanks with null values.


[Date Handling in Datasets](#)

When Analytics loads dates into a dataset, it breaks up each date into multiple fields, such as day, week, month, quarter, and year, based on the calendar year. For example, if you extract dates from a `CreateDate` field, Analytics generates date fields such as `CreateDate_Day` and `CreateDate_Week`. If your fiscal year differs from the calendar year, you can enable Analytics to generate fiscal date fields as well.

Numeric-Value Handling in Datasets


Analytics internally stores numeric values in datasets as long values. For example, it stores the number "3,200.99" with a scale of "2" as "320099". The user interface converts the stored value back to decimal notation to display the number as "3200.99."

The maximum numeric value that can be stored in a dataset is 36,028,797,018,963,967 and the minimum numeric value is -36,028,797,018,963,968.

 **Warning:** If a numeric value is not within this range, you might receive unexpected results. For example, if you try to load the value 3.7E-16 with a scale of 16 into a dataset, Analytics tries to store the value as 37000000000000000. However, because this value exceeds the maximum, Analytics fails to load the entire record. In addition, if you perform a query that aggregates measures—like sum or group by—and the resulting value exceeds the maximum, the value overflows and Analytics returns an incorrect result.

Null Measure Handling in Datasets

When you create or update a dataset, through your dataflow or a CSV upload for example, blank measure values in your data need to be replaced with concrete values. Analytics uses the default values specified in your dataflow or CSV metadata file to replace blank values. When null measure handling is enabled, you can specify these defaults using the special "null" value. When no default value is specified, Analytics replaces blanks with null values.

 **Note:** Null measure handling is enabled in orgs created after the Spring '17 release and can't be disabled. To enable this feature in other orgs, see [Enable Null Measure Handling](#) on page 87.

Null measure handling is important because it affects the results of certain calculations. Without null measure handling, Analytics replaces blanks in your data with zeros, and you can't specify nulls as default values in your dataflows. Consider this example of data with customer satisfaction scores, where some customers have not responded.


Source Data	Dataset with Zeros for Blanks	Dataset with Nulls for Blanks
Customer	Customer	Customer
CSAT	CSAT	CSAT
Customer 1	Customer 1	Customer 1
Customer 2	Customer 2	Customer 2
Customer 3	Customer 3	Customer 3
Customer 4	Customer 4	Customer 4
Customer 5	Customer 5	Customer 5
Average CSAT	Average CSAT	Average CSAT
Min CSAT	Min CSAT	Min CSAT
3	3	3
4	0	null
4	4	4
0	0	null
5	5	5
4	2.4	4
3	0	3

Calculated values such as average and minimum are correct in the source data, but when blank values are replaced with zeros, the resulting calculations are incorrect. Here the zeros are included in the calculation. When the calculations are made using null measures, the average and minimum calculations are correct.

Null measure handling allows the use null values in these dataflow transformations.

append	Analytics can append datasets with different measure fields. For example, if one dataset has an Amount field that is not present in a second dataset, the new dataset created after the append has an Amount field containing nulls in rows from the second dataset. Without null measure handling, appending datasets is not possible when measure fields are different.
augment	When the key in the left dataset is null or has no match in the right dataset, Analytics appends columns from the right dataset and inserts nulls for dimensions and measures. Without null measure handling, Analytics inserts zeros for measures.
computeExpression	<p>The <code>defaultValue</code> attribute for a computed field accepts a value of null. For example:</p> <pre> "SQLNode": { "action": "computeExpression", "parameters": { "source": "extractOpp", "mergeWithSource": true, "computedFields": [{ "name": "Amount2", "type": "Numeric", "precision": 18, "defaultValue": "null", "scale": 5, "sqlExpression": "Amount+Amount" }] } } </pre>
computeRelative	<p>The <code>defaultValue</code> attribute for a computed field accepts a value of null. When a value can't be calculated, such as when <code>previous()</code> or <code>next()</code> has no value, Analytics uses this default. For example:</p> <pre> "computeTrending": { "action": "computeRelative", "parameters": { "partitionBy": ["OpportunityId"], </pre>

	<pre> "orderBy": [{ "name": "CreatedDate", "direction": "asc" }], "computedFields": [{ "name": "AmountPrev", "defaultValue": "null", "expression": { "sourceField": "Amount", "offset": "previous()", "default": "null" } }] </pre>
dim2mea	<p>The <code>measureDefault</code> parameter accepts a value of null. Analytics uses this value when it can't convert a dimension to a valid numeric value. When no default is specified, Analytics uses a value of null. For example:</p> <pre> "Create_Measure_From_Dimension": { "action": "dim2mea", "parameters": { "dimension": "StageVal__c", "measure": "StageValue", "measureDefault": "null", "source": "Extract_Opportunities" } } </pre>
sfdcDigest	<p>The <code>defaultValue</code> attribute for a field accepts a value of null. When no default is specified, Analytics uses a value of null. For example:</p> <pre> Sample Sfdc-digest :{ "Extract_Opportunities": { "action": "sfdcDigest", "parameters": { "object": "Opportunity", "fields": [{ "name": "Amount", "defaultValue": "null", "precision": 18 "scale": 2 }] } } } </pre>
Update	Analytics can update non-null values with nulls.

 **Note:** The `delta` transformation is not supported when null measure handling is enabled and dataflows containing delta transformations fail. Use `computeRelative` and `computeExpression` transformations instead in your dataflows, to calculate changes in measure values over time. For an example, see [Enable Null Measure Handling](#) on page 87.

IN THIS SECTION:

[Enable Null Measure Handling](#)

Null measure handling lets you specify “null” default values in your dataflows and CSV uploads. When no default value is specified, Analytics replaces blanks with null values in your datasets.

Enable Null Measure Handling

Null measure handling lets you specify “null” default values in your dataflows and CSV uploads. When no default value is specified, Analytics replaces blanks with null values in your datasets.

 **Note:** Null measure handling is enabled in orgs created after the Spring '17 release and can't be disabled.

To enable this feature in other orgs, first contact Salesforce Customer Support to evaluate your org and determine what additional steps you might need to take.

Additional steps may be necessary because null measure handling can't retroactively change zeros to nulls, if those zeros have previously replaced blank values. This behavior can result in datasets containing a mixture of zeros coming explicitly from the source data, zeros replacing blank values, and nulls. Aggregate calculations in such datasets are incorrect.

When Salesforce makes null measure handling available in your org, you can enable it from Setup. Enter *Analytics* in the Quick Find box, then click **Settings**. Select **Enable null measure handling in Analytics**, and then click **Save**.

Customer Support may recommend that you take one or more of these steps, after enabling null measure handling.

1. Update your existing dataflow definition files to use null instead of 0 in `defaultValue` attributes for measure fields in these transformations.

<code>computeExpression</code>	<code>defaultValue: "null"</code>
<code>computeRelative</code>	<code>defaultValue: "null"</code>
<code>dim2mea</code>	<code>measureDefault: "null"</code>
<code>sfdcDigest</code>	<code>defaultValue: "null"</code>

2. Create new instances of long-lived datasets used as a source for dataflows, using a `defaultValue` of null for measure fields. Long-lived datasets are typically reference datasets that are not updated through a dataflow and used to augment data in other datasets. For example, you might use a geolocation dataset to augment lead information based on zip codes.
3. If you have incrementally built datasets in which the source data is no longer available, use a custom dataflow to manually convert 0 values to null. Incrementally built datasets are datasets that are created over time by appending rows, such as logs.
4. Reimplement `delta` transformations in your dataflows, using `computeRelative` and `computeExpression` transformations. The `delta` transformation is not supported when null measure handling is enabled and dataflows containing delta transformations fail. In this example, the `delta` transformation on the left calculates the difference between an opportunity amount and its previous amount. The `computeRelative` and `computeExpression` transformations on the right respectively calculate the previous amount and its difference to the current amount.

USER PERMISSIONS

To enable null measure handling:

- Customize Application

delta Transformation	computeRelative and computeExpression Transformations
<pre> "Calculate_Delta": { "action": "delta", "parameters": { "dimension": "OpportunityId", "epoch": "CreatedDate_day_epoch", "inputMeasure": "Amount", "outputMeasure": "DeltaAmount", "source": "Extract_Opportunity_History" } }, </pre>	<pre> "Compute_Previous": { "action": "computeRelative", "parameters": { "partitionBy": ["OpportunityId"], "orderBy": [{ "name": "CreatedDate", "direction": "asc" }], "computedFields": [{ "name": "PrevAmount", "expression": { "sourceField": "Amount", "offset": "previous()", "default": "current()" } }], "source": "Extract_Opportunity_History" } }, "Compute_Delta": { "action": "computeExpression", "parameters": { "computedFields": [{ "name": "DeltaAmount", "type": "Numeric", "precision": 18, "defaultValue": 0, "scale": 2, "saqlExpression": "Amount - PrevAmount" }], "source": "Compute_Previous" } }, </pre>

SEE ALSO:

[computeRelative Transformation](#)

[computeExpression Transformation](#)

Date Handling in Datasets

When Analytics loads dates into a dataset, it breaks up each date into multiple fields, such as day, week, month, quarter, and year, based on the calendar year. For example, if you extract dates from a `CreateDate` field, Analytics generates date fields such as `CreateDate_Day` and `CreateDate_Week`. If your fiscal year differs from the calendar year, you can enable Analytics to generate fiscal date fields as well.

Analytics generates the following date fields.

Field Name	Field Type	Description
<date field name>_Second	Text	Number of seconds. If the date contains no seconds, value is '0.'
<date field name>_Minute	Text	Number of minutes. If the date contains no minutes, value is '0.'
<date field name>_Hour	Text	Number of hours. If the date contains no hours, value is '0.'
<date field name>_Day	Text	Day of the month.
<date field name>_Week	Text	Week number in calendar year.
<date field name>_Month	Text	Month number in calendar year.
<date field name>_Quarter	Text	Quarter number in calendar year.
<date field name>_Year	Text	Calendar year.
<date field name>_Week_Fiscal	Text	Week number in fiscal year.
<date field name>_Month_Fiscal	Text	Month number in fiscal year.
<date field name>_Quarter_Fiscal	Text	Quarter number in fiscal year.
<date field name>_Year_Fiscal	Text	Fiscal year.
<date field name>_sec_epoch	Numeric	Number of seconds that have elapsed since January 1, 1970 (midnight UTC).
<date field name>_day_epoch	Numeric	Number of days that have elapsed since January 1, 1970 (midnight UTC).

You can set metadata attributes to control how dates are loaded into datasets and to enable Analytics to generate fiscal date fields. You set the metadata attributes in the [sfdcDigest transformation parameters](#) for Salesforce data or in the [metadata file](#) for external data.

Important: Before loading dates from an external data file, ensure that you review the date format requirements [here](#). Also, ensure that the column names in the external data file do not conflict with the generated date field names. For example, if you load a CSV with column `Create_Date`, Analytics generates the `Create_Date_Year` field in the dataset. If the CSV also had a field named `Create_Date_Year`, Analytics would throw an error because the names conflict.

Fiscal Periods in Analytics

If the calendar and fiscal year differ, you can enable Analytics to generate the fiscal date fields in the dataset in addition to calendar date fields. To enable Analytics to generate fiscal date fields, set the `fiscalMonthOffset` attribute to a value other than '0'. You set this

attribute for each date column for which you want to generate fiscal date fields. If you set the offset to '0' or you do not specify a value, Analytics does not generate any fiscal date fields.

Additionally, to configure the fiscal periods, set the following metadata attributes for each date column:

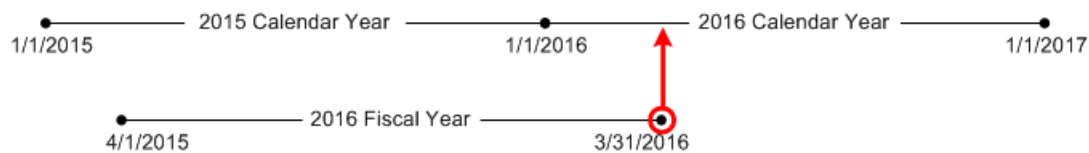
fiscalMonthOffset

In addition to enabling the generation of fiscal date fields, this attribute also determines the first month of the fiscal year. You specify the difference between the first month of the fiscal year and first month of the calendar year (January) in `fiscalMonthOffset`. For example, if your fiscal year begins in April, set `fiscalMonthOffset` to '3'.

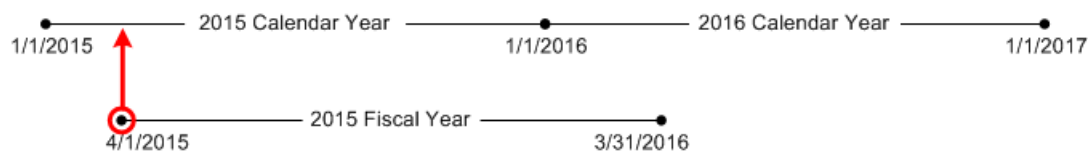
isYearEndFiscalYear

Because the fiscal year can start in one calendar year and end in another, you must specify which year to use for the fiscal year. The `isYearEndFiscalYear` attribute indicates whether the fiscal year is the year in which the fiscal year ends or begins.

To see how this works, let's look at a couple of examples. If `isYearEndFiscalYear` = true (or you do not specify this attribute), then the fiscal year is the year in which the fiscal year ends. As shown in the following diagram, any dates between 4/1/2015 and 3/31/2016 are part of the fiscal year 2016 because the fiscal year ends in 2016.



If `isYearEndFiscalYear` = false, then the fiscal year is the year in which the fiscal year begins. As shown in the following diagram, any dates between 4/1/2015 and 3/31/2016 are part of the fiscal year 2015 because the fiscal year begins in 2015.



Week Numbering in Analytics

For each date loaded into a dataset, Analytics generates the corresponding week number for the calendar year and, if applicable, fiscal year. Similar to the SOQL function `WEEK_IN_YEAR`, week 1 in Analytics is January 1 - January 7. (This is different from the UTC `week()` calculation.)

If needed, you can configure the week to start on a particular day of the week by setting the `firstDayOfWeek` attribute. For example, if January 1 is a Saturday and you configure the week to start on a Monday, then week 1 is January 1 - 2. Week 2 starts on Monday, January 3. Week 3 starts January 10, the following Monday. Notice that week 1 can be a short week to ensure that the subsequent weeks start on the specified day of the week.

Create Datasets with the Dataflow

You can use the dataflow to create one or more datasets based on data from Salesforce objects or existing datasets. A *dataflow* is a set of instructions that specifies what data to extract from Salesforce objects or datasets, how to transform the datasets, and which datasets to make available for querying. With a dataflow, you can manipulate the extracted data and override the metadata before you load it into a dataset. You can schedule the dataflow to run to keep the datasets up to date.

To configure the dataflow, you add transformations to the dataflow definition file. A *dataflow definition file* is a JSON file that contains transformations that represent the dataflow logic. You add transformations to determine what data to extract, how to transform datasets, and which datasets to register to make available for queries. You can edit the dataflow definition file using the visual dataflow editor, or manually using a JSON editor.

IN THIS SECTION:

1. [Design the Dataflow](#)

Before you start creating the dataflow, think about the dataflow design. Consider what data to make available for queries, where to extract the data from, and whether you need to transform the extracted data to get the data you want.

2. [Configure the Dataflow](#)

Configure the dataflow based on your dataflow design. Configure it to extract data, transform datasets based on your business requirements, and register datasets that you want to make available for queries.

3. [Start and Stop a Dataflow](#)

You can manually start a dataflow job to load the data into datasets immediately. You can also stop the job while it's running. You can run a maximum of 30 dataflow jobs during a rolling 24-hour period.

4. [Monitor a Dataflow Job](#)

Use the Monitor tab in the data manager to monitor dataflow jobs to ensure that they complete successfully or to troubleshoot them if they fail.

5. [Schedule a Dataflow](#)

After you run a dataflow job for the first time, it runs on a daily schedule, by default. You can schedule by hour, week, or month, on specific days of the week or dates in the month. You might change the schedule to ensure that the data is available by a particular time or to run the job during non-business hours. You can also unschedule a dataflow.

6. [Transformations for Analytics Dataflows](#)

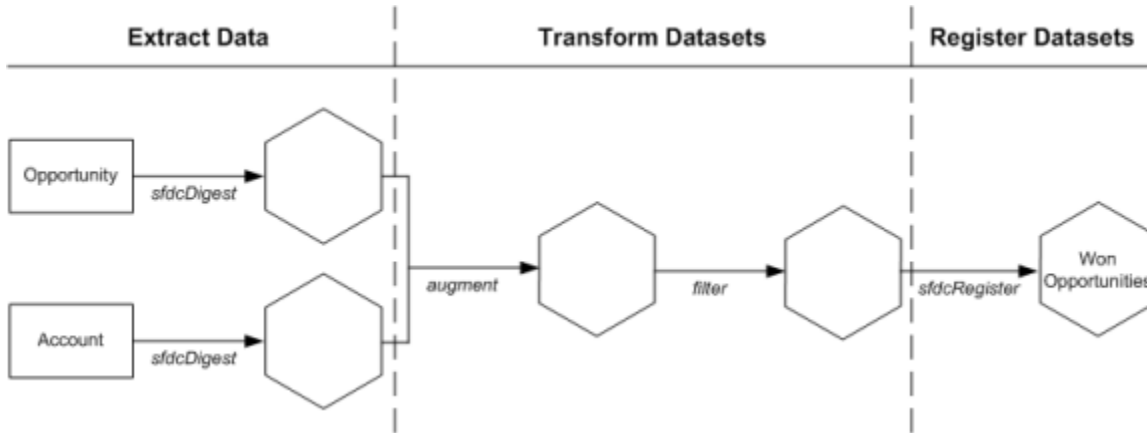
A *transformation* refers to the manipulation of data. You can add transformations to a dataflow to extract data from Salesforce objects or datasets, transform datasets that contain Salesforce or external data, and register datasets.

Design the Dataflow

Before you start creating the dataflow, think about the dataflow design. Consider what data to make available for queries, where to extract the data from, and whether you need to transform the extracted data to get the data you want.

To illustrate some key design decisions, let's consider an example. In this example, the goal is to create a dataset called "Won Opportunities." The dataset will contain opportunity details, including the account name for each opportunity.

To create this dataset, you design the following dataflow:



The dataflow extracts opportunity data from the Opportunity object and extracts the account name from the Account object. For each extracted object, the dataflow creates a new dataset.

The dataflow then transforms the datasets created from the extracted data. First, the dataflow joins the opportunity and account data into a new dataset. Next, the dataflow filters the records based on the opportunity stage so that the dataset contains only won opportunities. Each time the dataflow transforms a dataset, it creates a new dataset.

Finally, because you want users to be able to query won opportunities only, you configure the dataflow to register the final dataset only. However, if you wanted, you could register any dataset created by the dataflow and register as many datasets as you like.

Carefully choose which datasets to register because:

- The total number of rows in all registered datasets cannot exceed 250 million per platform license.
- Users that have access to registered datasets can query their data. Although, you can apply row-level security on a dataset to restrict access to records.

Configure the Dataflow

Configure the dataflow based on your dataflow design. Configure it to extract data, transform datasets based on your business requirements, and register datasets that you want to make available for queries.

You can configure the dataflow by manually editing its definition file, or by using the visual dataflow editor.

IN THIS SECTION:

[Configure the Dataflow with the Dataflow Editor](#)

Use the dataflow editor to configure your dataflow visually, without manually modifying the dataflow definition file.

[Configure the Dataflow Through the Definition File](#)

You can configure the dataflow by adding transformations directly to the dataflow definition file.

Configure the Dataflow with the Dataflow Editor

Use the dataflow editor to configure your dataflow visually, without manually modifying the dataflow definition file.

The dataflow editor visually displays the dataflow you're editing.

EDITIONS

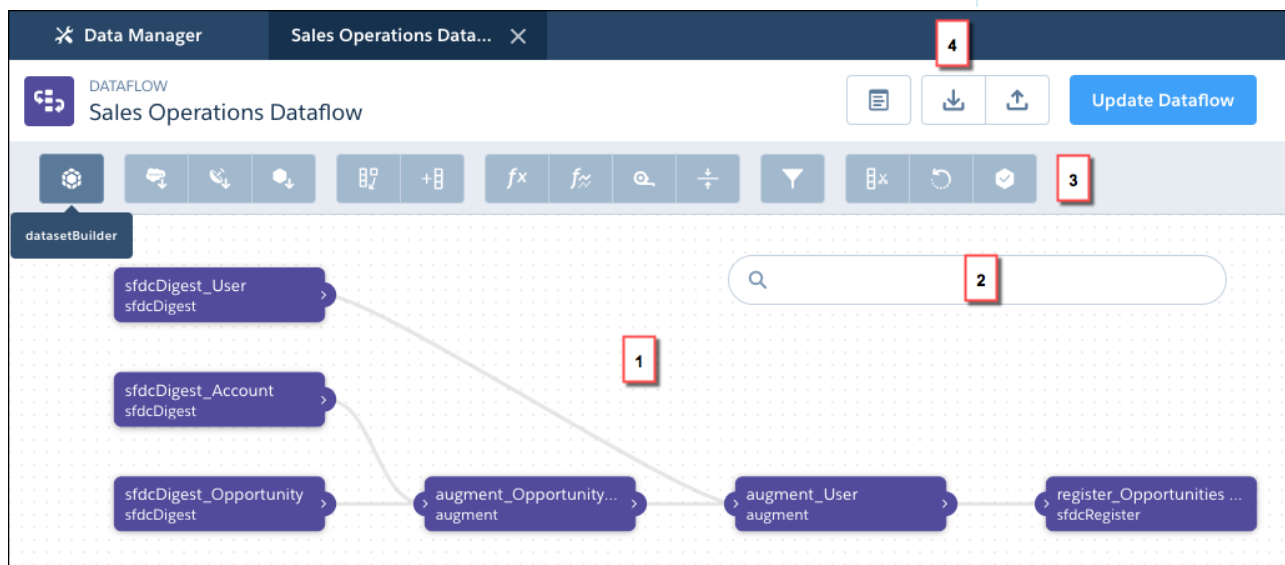
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS


To edit the dataflow:

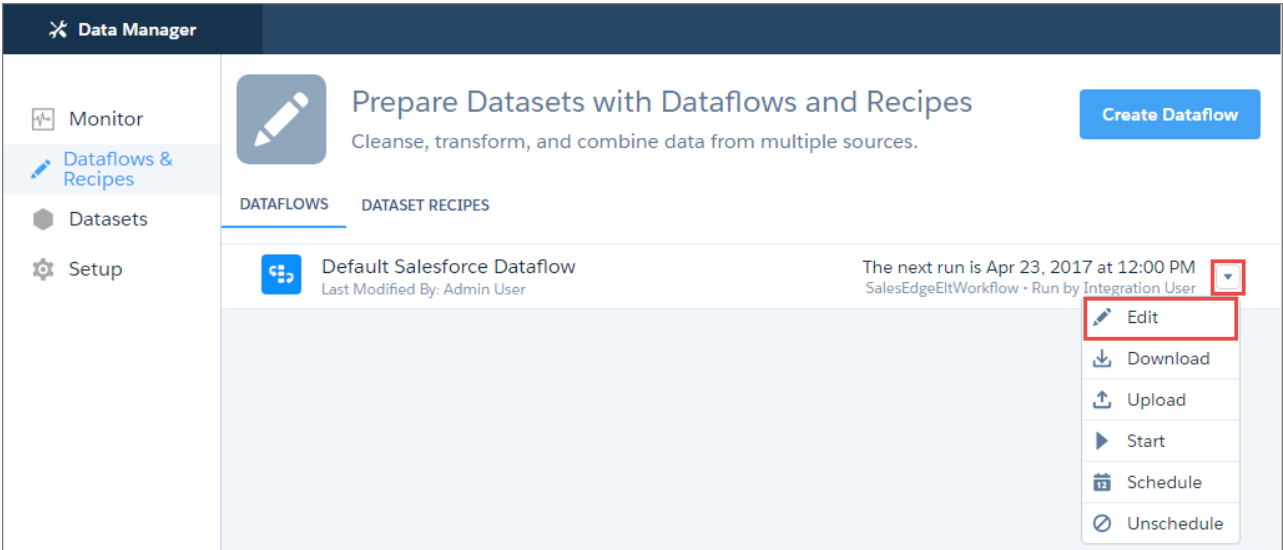
- Edit Analytics Dataflows




The canvas (1) shows the individual nodes in your dataflow and the links between them. If you can't find a node, enter the node name in the search box (2) to focus on that node. The node palette (3) has buttons for each type of node. Click one to add it to the canvas. Use the buttons at the top of the editor (4) to work with the dataflow JSON. Preview and download the underlying JSON or upload an existing JSON file to work with it in the editor.

The dataflow in this example extracts data from the Salesforce Opportunity, Account, and User objects, augments it together, and creates a registered dataset. Imagine that you also want to extract cases in this dataflow, augment them with user data, and register the result as a new dataset. Let's look at how you can use the editor to modify the dataflow.

1. In Analytics, click the gear icon () and then click **Data Manager**.
2. Click the Dataflows & Recipe tab.
3. To the right of the dataflow you want to edit, click the actions button and then select **Edit**.



The dataflow editor opens, displaying the nodes in the dataflow.


4. In the node palette, click the node you want to add. In this example, you want to extract data from a Salesforce object, so click the `sfdcDigest` node ().
5. Enter a unique name for the node.

Create Dataflow Node ✕

First, enter a unique name for your new node.

Name


6. Click **Continue**.
7. Enter the node attributes. In this example, you select Case as the source object, and the fields you need. You don't need an incremental update, or filters.

 **Note:** Attributes that reference objects, fields, or other nodes let you search and select values from a list. This feature avoids errors in your dataflow caused by mistyping.

8. Click **Save**.
The new node appears on the canvas.

 **Tip:** To edit a node on the canvas, just click it. To delete a node, hover over it and click the trash can.



9. In the node palette, click the next node you want to add. In this example, you want to augment the case data with user data, so click the augment node ().
10. Enter a unique node name and click **Continue**.
11. Enter the node attributes. In this example, you select the *Extract Cases* node as the left source. This node is the one you want to add the user columns to. The *Extract Users* node contains the columns you want to add, so you select it as the right source. The left and right keys are the fields from each node that are used to match records. In this case, you select the *OwnerId* field on cases, and the *Id* field on users.

Augment Cases with Users: augment
✕

ATTRIBUTES
OUTPUT FIELDS

Left Source

Left Key

Relationship

Right Source

Right Key


Right Fields

12. Click **Save.**

The new node appears on the canvas, with lines showing the input of data from the source nodes.



Tip: If a node is not where you want it, drag it to wherever you want on the canvas. If it gets crowded, use your scroll wheel to zoom in and out if your browser supports it, or drag the canvas to move nodes into view.

13. In the node palette, click the next node you want to add. In this example, you want to make the augmented case and user data available to use in a dataset, so click the `sfdcRegister` node ().

14. Enter the node attributes. In this example, you select the `Augment Cases with Users` node as the source. The Alias is the API name of the registered dataset, and the Name is its display name.

Register Cases with Users: sfdcRegister
✕

ATTRIBUTES
OUTPUT FIELDS

Source Node

["Augment Cases with Users"]

Alias

CasesUsers

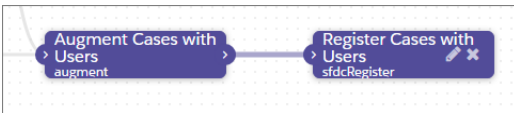
Name

Cases with Users

Row Level Security

15. Click **Save**.

The new node appears on the canvas, with lines showing the input of data from the source node.




 **Tip:** You can drag the output arrow of a source node to draw a link to another node on the canvas.

16. When you finish editing, click **Update Dataflow** to update the definition file with your changes.

Analytics validates your dataflow to ensure that you provided all the required attribute values, and you can't continue if there are errors. Correct the errors it finds before trying again.

 **Important:** Updating a dataflow overwrites the existing dataflow.

If you're adding nodes to create datasets for Salesforce objects, save time by using the dataset builder inside the dataflow editor. The dataset builder lets you specify the related Salesforce objects and fields you want in a dataset. It then adds the necessary sfdcDigest, augment, and register nodes to the dataflow for you.

To open the dataset editor in the dataflow editor, click .

To learn about the dataset builder, read [Load Salesforce Data with the Dataset Builder and the Dataflow](#).


To learn about each dataflow transformation and its attributes, read [Transformations for Analytics Dataflows](#).

Configure the Dataflow Through the Definition File

You can configure the dataflow by adding transformations directly to the dataflow definition file.

A *dataflow definition file* is a JSON file that contains transformations that represent the dataflow logic. The dataflow definition file must be saved with UTF-8 encoding.

Before you can configure a dataflow to process external data, you must [upload the external data to Analytics](#).

1. In Analytics, click the gear icon () and then click **Data Manager**.
2. Click the Dataflows & Recipes tab.
3. Download the existing dataflow definition file by clicking **Download** in the actions menu.

EDITIONS

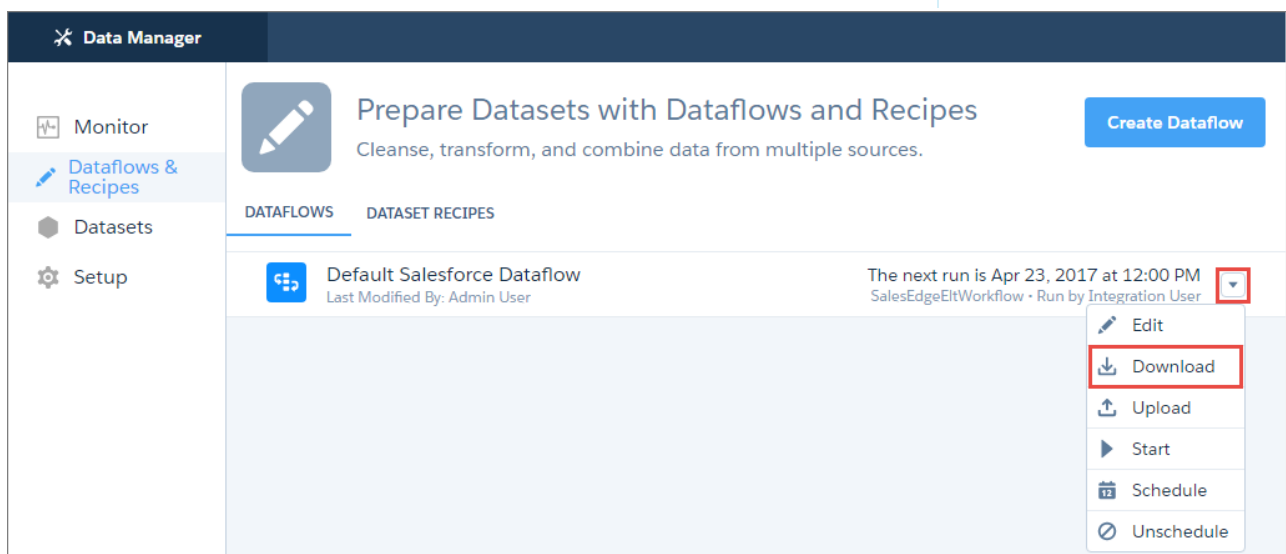
Available in Salesforce Classic and Lightning Experience.

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USER PERMISSIONS

To edit the dataflow definition file:

- Edit Analytics Dataflows



4. Make a backup copy of the existing dataflow definition file before you modify it.
Analytics doesn't retain previous versions of the file. If you make a mistake, you can upload the previous version to roll back your changes.
5. Add each transformation as a node in the dataflow definition file, using a JSON editor.
For example, based on the design in the [previous step](#), you can add the following transformation nodes:

```
{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
```

```

        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    }
  },
  "Extract_AccountDetails": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Account",
      "fields": [
        { "name": "Id" },
        { "name": "Name" }
      ]
    }
  },
  "Transform_Augment_OpportunitiesWithAccountDetails": {
    "action": "augment",
    "parameters": {
      "left": "Extract_Opportunities",
      "left_key": [ "AccountId" ],
      "relationship": "OpptyAcct",
      "right": "Extract_AccountDetails",
      "right_key": [ "Id" ],
      "right_select": [
        "Name"
      ]
    }
  },
  "Transform_Filter_Opportunities": {
    "action": "filter",
    "parameters": {
      "filter": "StageName:EQ:Closed Won",
      "source": "Transform_Augment_OpportunitiesWithAccountDetails"
    }
  },
  "Register_Dataset_WonOpportunities": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "WonOpportunities",
      "name": "WonOpportunities",
      "source": "Transform_Filter_Opportunities"
    }
  }
}

```

See [Transformations for Analytics Dataflows](#) for more about each transformation and its JSON.



Note: The JSON keys and values are case-sensitive. Each bolded key in the example JSON is the node name for a transformation. Each node contains an action value, which identifies the transformation type. The order in which you add the transformations

to the dataflow definition file doesn't matter. Analytics determines the order in which to process the transformations by traversing the dataflow to determine the dependencies among them.

Important: Node names must be unique in a dataflow definition file, and can't contain space or tab characters. Consider that node names are **not** treated as case sensitive, so names such as "Extract_Opportunities" and "extract_opportunities" are not unique in the same definition file.

6. Before you save the dataflow definition file, use a JSON validation tool to verify that the JSON is valid. An error occurs if you try to upload the dataflow definition file with invalid JSON. You can find JSON validation tools on the internet.

7. Save the dataflow definition file with UTF-8 encoding, and then close the file.

8. In the Dataflow view of the Monitor tab, click **Upload** from the action menu to upload the updated dataflow definition file.

Note: Uploading the dataflow definition file does not affect any running dataflow jobs and does not automatically start the dataflow job.

You can now start the dataflow on demand or wait for it to run on the schedule. Users cannot query the registered datasets until the dataflow runs.


If you have enabled replication, you can create multiple dataflows, in addition to the default dataflow, and configure them in the same way. Look out for the **Create Dataflow** button in the Dataflows & Recipes tab of the data manager after you enable replication. See [Optimize Your Dataflows with Replication](#).

The screenshot shows the 'Data Manager' interface. On the left is a navigation menu with 'Monitor', 'Dataflows & Recipes' (selected), 'Datasets', and 'Setup'. The main area is titled 'Prepare Datasets with Dataflows and Recipes' and includes a 'Create Dataflow' button highlighted with a red box. Below this, there are tabs for 'DATAFLOWS' and 'DATASET RECIPES'. Under 'DATAFLOWS', a card for 'Default Salesforce Dataflow' is shown, indicating it was last modified by 'Admin User' and its next run is scheduled for 'Aug 28, 2017 at 7:00 AM' by 'Integration User'.

Note: Your org can have up to 20 dataflows. This number includes the default dataflow, and app dataflows such as the Sales Analytics and Service Analytics dataflows. Keep in mind that dataflows that take longer than 2 minutes to run count towards your 24-hour dataflow run limit.

Start and Stop a Dataflow

You can manually start a dataflow job to load the data into datasets immediately. You can also stop the job while it's running. You can run a maximum of 30 dataflow jobs during a rolling 24-hour period.

1. In Analytics, click the gear icon () and then click **Data Manager**.
The data manager opens on the Monitor tab, with the Jobs view selected by default.
2. Click the Dataflows & Recipes tab.

EDITIONS

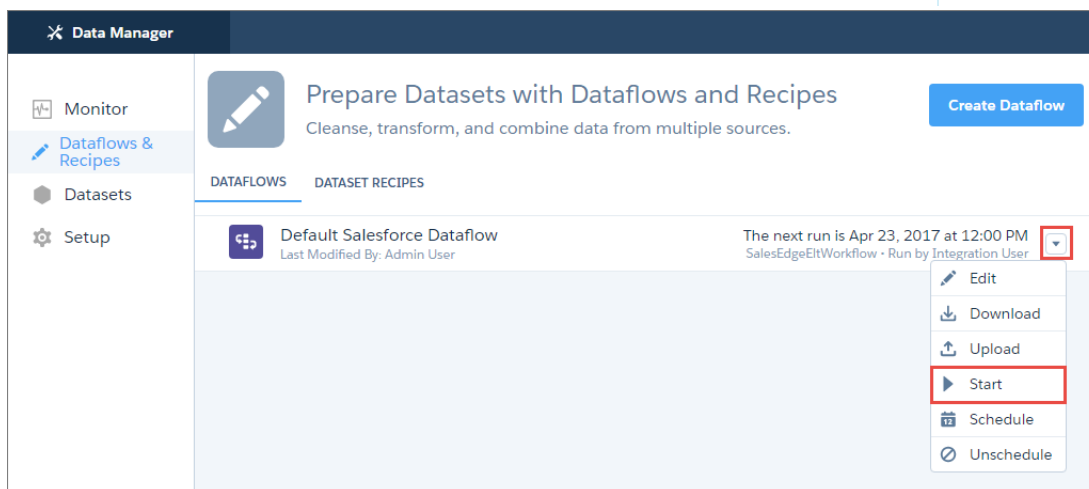
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Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.



USER PERMISSIONS

To start a dataflow job:

- Edit Analytics Dataflows



3. Click **Start** in the actions menu to start the dataflow job.
The dataflow job is added to the job queue. The **Start** action is grayed out while the dataflow job runs.
4. After the job completes, Analytics sends an email notification to the user who created the dataflow.
The email notification indicates whether the job completed successfully. It also shows job details like start time, end time, duration, and number of processed rows. If the job failed, the notification shows the reason for the failure.

 **Note:** If the dataflow creator is not an active user, the notification is sent to the user who last modified the dataflow schedule or definition file.
5. To stop a dataflow job that is currently running, click  next to the job status.
If you click **Start** to restart a stopped dataflow, the job starts over—the dataflow job does not resume from the point at which it was stopped.

You can monitor the dataflow job on the Monitor tab to determine when the dataflow completes. After the dataflow completes successfully, refresh the Analytics home page to view the registered datasets.

Monitor a Dataflow Job

Use the Monitor tab in the data manager to monitor dataflow jobs to ensure that they complete successfully or to troubleshoot them if they fail.

The Dataflow View on the Monitor tab shows the status, start time, and duration of the last 10 dataflow jobs and retains the last 7 days of history. To help you troubleshoot a failed job, you can view error messages about the job, view the run-time details about every transformation that is processed, and download error logs where available.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To access the data monitor:

- Edit Analytics Dataflows, Upload External Data to Analytics, or Manage Analytics

To download an error log:


- Edit Analytics Dataflows and View All Data


The screenshot shows the Dataflow Monitor interface. At the top, there is a dropdown menu labeled "Dataflow View" with a red box and the number "1" next to it. Below this, the job name "Default Salesforce Dataflow" is displayed with a green checkmark icon and "Last Modified By: Jon Oatham". To the right, it says "Runs every 8 hours - next run at 5:00 PM" and "SalesEdgeEltWorkflow · Run by Integration User".

The main table has columns: START TIME, DURATION, STATUS, and MESSAGE. The first row shows a successful job at 9:00 AM. The second row, highlighted in blue, shows a job at 1:00 AM with a "Warning" status. A red box and the number "2" are next to the minus icon in the first column of this row. The message for this job is "The job completed successfully, but some rows failed. Download the error log from the data monitor to view the failed rows." Below this row is a detailed table of nodes:


NODE NAME	START TIME	DURATION	STATUS	NODE TYPE	INPUT ROWS
salesData	Today at 1:00 AM	22 seconds	Successful	sfdcDigest	706
Derived_Fields	Today at 1:00 AM	0 seconds	Warning	computeExpression	706
optimize-Register_Catego...	Today at 1:00 AM	0 seconds	Successful	optimizer	N/A
Register_CategorizedSales	Today at 1:00 AM	3 seconds	Successful	sfdcRegister	N/A

In the "Derived_Fields" row, a red box and the number "3" are next to a download icon in the STATUS column.

1. In Analytics, click the gear icon () and then click **Data Manager**.
The data manager opens on the Monitor tab, with the Jobs view selected by default.
2. Select **Dataflow View** (1).


3. Click  to see the latest status of a job.
Each job can have one of these statuses.

Status	Description
Running	The job is running.
Failed	The job failed.
Successful	The job completed successfully.
Warning	The job completed successfully, but some rows failed.

4. If the dataflow job fails, expand the job node (2) and review the run-time details for every transformation that was processed.
5. If an error log is available for a node, click the download log button (3) to download a CSV file containing the failed rows.
-  **Note:** Error logs display the data from rows that have failed to load. To maintain data security and prevent unauthorized access to this data, only users with the "View All Data" permission can download error logs.
6. If there's a problem with the dataflow logic, edit the dataflow definition file, upload it, and then run the dataflow again.

Schedule a Dataflow

After you run a dataflow job for the first time, it runs on a daily schedule, by default. You can schedule by hour, week, or month, on specific days of the week or dates in the month. You might change the schedule to ensure that the data is available by a particular time or to run the job during non-business hours. You can also unschedule a dataflow.

1. In Analytics, click the gear icon () and then click **Data Manager**.
The data manager opens on the Monitor tab, with the Jobs view selected by default.
2. Click the Dataflows & Recipes tab.

EDITIONS

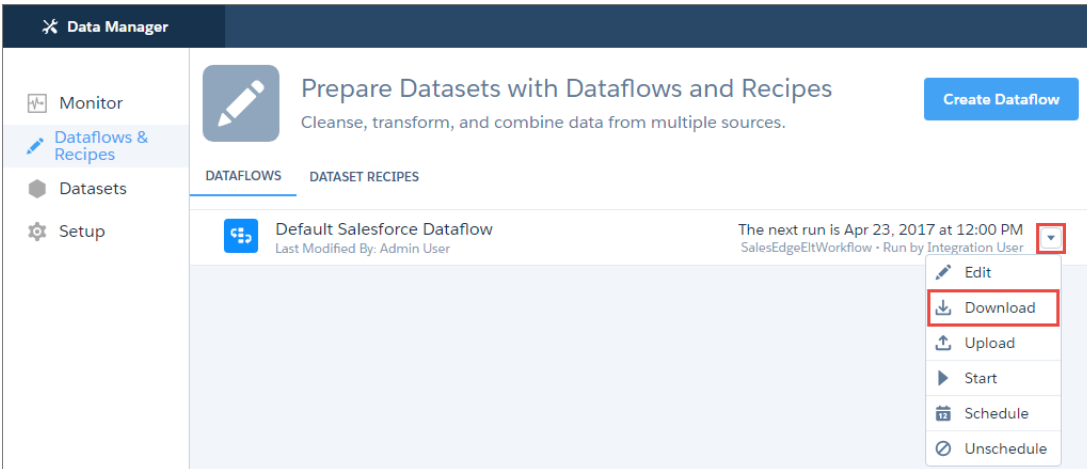
Available in Salesforce Classic and Lightning Experience.

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USER PERMISSIONS

To schedule or unschedule a dataflow job:

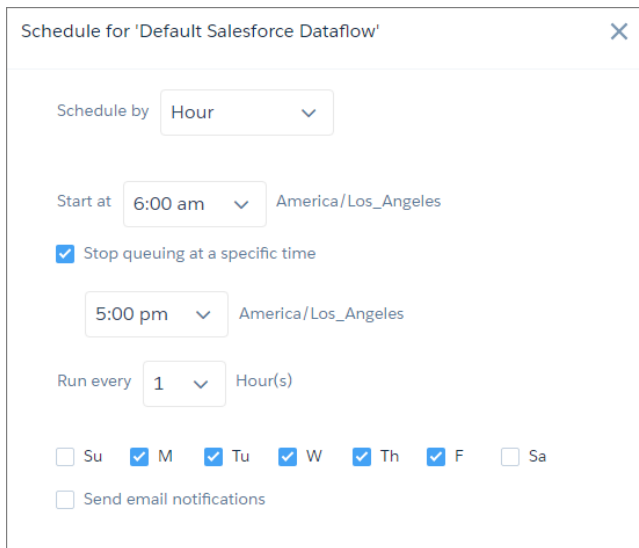
- Edit Analytics Dataflows



3. Click **Schedule** in the actions menu (1) to view or modify the schedule of the dataflow job. The scheduler appears.
4. From the **Schedule by** picklist, select the time frame that you want to schedule by and complete the other settings.

By Hour

Run the dataflow at specified hourly intervals, starting at the time you select on the selected days.



Note: Select **Stop queuing at a specific time** to stop the dataflow from running after a certain time each day. For example, set a job to start at 8:00 am, run every hour, and stop after 6:00 pm to restrict runs to just office hours.

By Week

Run the dataflow at the time you select on the selected days.

Schedule for 'Default Salesforce Dataflow'

Schedule by: Week

Start at: 6:00 am America/Los_Angeles

Su M Tu W Th F Sa

Send email notifications

By Month

Run the dataflow on a specific day or days each month. By default, you can schedule the job to run on a relative day each month, for example, the first Monday. If you want the job to run on a specific date or dates, click **select specific dates** and then select from the list.

Schedule on a Relative Date

Schedule for 'Default Salesforce Dataflow'

Schedule by: Month

Start at: 6:00 am America/Los_Angeles

On the: 1st Monday of every month

Or select specific dates

Send email notifications

Schedule on Specific Dates

Schedule for 'Default Salesforce Dataflow'

Schedule by: Month

Start at: 6:00 am America/Los_Angeles

on dates: 2 Date(s) Selected every month

Or select specific dates

Send email notifications

5. Select Send email notifications if you want to send a notification when the dataflow runs. Send a notification every time the dataflow runs, only when there are warnings, or only when the dataflow fails.

The screenshot shows a configuration window for email notifications. At the top, it says "Or select relative dates". Below that, there is a checked checkbox for "Send email notifications". Underneath, the "To" field contains the email address "joatham@salesforce.com". The "Notify on" section has a dropdown menu currently set to "Warnings". A secondary dropdown menu is open below it, showing "Warnings" with a checkmark, "Always", and "Failures".

 **Note:** Email notifications are sent to the dataflow creator.

6. Click **Save**.

Transformations for Analytics Dataflows

A *transformation* refers to the manipulation of data. You can add transformations to a dataflow to extract data from Salesforce objects or datasets, transform datasets that contain Salesforce or external data, and register datasets.

For example, you can use transformations to join data from two related datasets and then register the resulting dataset to make it available for queries.

IN THIS SECTION:

[append Transformation](#)

The append transformation combines records from multiple datasets into a single dataset.

[augment Transformation](#)

The augment transformation augments an input dataset by combining columns from another related dataset. The resulting, augmented dataset enables queries across both related input datasets. For example, you can augment the Account dataset with the User dataset to enable a query to return account records and the full names of the account owners.

[computeExpression Transformation](#)

The computeExpression transformation enables you to add derived fields to a dataset. The values for derived fields aren't extracted from the input data source. Instead, Analytics generates the values using a SAQL expression, which can be based on one or more fields from the input data or other derived fields. For example, you can use an expression to assign a value to a field, concatenate text fields, or perform mathematical calculations on numeric fields.

[computeRelative Transformation](#)

You can use the computeRelative transformation to analyze trends in your data by adding derived fields to a dataset based on values in other rows. For example, to analyze sales pipeline trends, create derived fields that calculate the number of days an opportunity remains in each stage. You can also calculate the changes to the opportunity amount throughout the stages of the opportunity.

[delta Transformation](#)

The delta transformation calculates changes in the value of a measure column in a dataset over a period of time. The delta transformation generates an output column in the dataset to store the delta for each record. Create deltas to make it easier for business analysts to include them in queries.

[digest Transformation](#)

The digest transformation extracts replicated data in a dataflow. Use it to extract data replicated from your local Salesforce org, or data replicated through an external connection.

[dim2mea Transformation](#)

The dim2mea transformation creates a new measure based on a dimension. The transformation adds the new measure column to the dataset. The transformation also preserves the dimension to ensure that existing lenses and dashboards don't break if they use the dimension.

[edgemart Transformation](#)

The edgemart transformation gives the dataflow access to an existing, registered dataset, which can contain Salesforce data, external data, or a combination of the two. Use this transformation to reference a dataset so that its data can be used in subsequent transformations in the dataflow. You can use this transformation and the augment transformation together to join an existing dataset with a new dataset.

[export Transformation \(Beta\)](#)

The export transformation creates a data file and a schema file from data in a specified source node in your dataflow. After the dataflow runs, Einstein Discovery users can access these files through the public API.

[filter Transformation](#)

The filter transformation removes records from an existing dataset. You define a filter condition that specifies which records to retain in the dataset.

[flatten Transformation](#)

The flatten transformation flattens hierarchical data. For example, you can flatten the Salesforce role hierarchy to implement row-level security on a dataset based on the role hierarchy.

[sfdcDigest Transformation](#)

The sfdcDigest transformation generates a dataset based on data that it extracts from a Salesforce object. You specify the Salesforce object and fields from which to extract data. You might choose to exclude particular fields that contain sensitive information or that aren't relevant for analysis.

[sfdcRegister Transformation](#)

The sfdcRegister transformation registers a dataset to make it available for queries. Users cannot view or run queries against unregistered datasets.

[sliceDataset Transformation](#)

The sliceDataset transformation removes fields from a dataset in your dataflow, leaving you with a subset of fields for use in a new dataset or in other transformations. This allows you to create multiple datasets, each with different sets of fields from a single dataset.

[update Transformation](#)

The update transformation updates the specified field values in an existing dataset based on data from another dataset, which we'll call the lookup dataset. The transformation looks up the new values from corresponding fields in the lookup dataset. The transformation stores the results in a new dataset.

[Overriding Metadata Generated by a Transformation](#)

Optionally, you can override the metadata that is generated by a transformation. You can override object and field attributes. For example, you can change a field name that is extracted from a Salesforce object so that it appears differently in the dataset. To override the metadata, add the overrides to the Schema section of the transformation in the dataflow definition file.

SEE ALSO:


[Create Datasets with the Dataflow](#)

append Transformation

The append transformation combines records from multiple datasets into a single dataset.

Consider the following rules when using this transformation.

- This transformation does not remove duplicate records.
- All input datasets must have the same structure—the corresponding columns must be in the same order and have the same name and field type.

 **Example:** Let's look at an example. Each month, you create a dataset that contains the month's sales targets. Now, you want a holistic view of sales targets for all months. To do that, you create the following dataflow definition file to merge the existing datasets into a single dataset.

```
{
  "Extract_SalesTargets_2014Jan": {
    "action": "edgemart",
    "parameters": { "alias": "SalesTargets_2014Jan" }
  },
  "Extract_SalesTargets_2014Feb": {
    "action": "edgemart",
    "parameters": { "alias": "SalesTargets_2014Feb" }
  },
  "Extract_SalesTargets_2014Mar": {
    "action": "edgemart",
    "parameters": { "alias": "SalesTargets_2014Mar" }
  },
  "Append_SalesTargets_2014Quarter1": {
    "action": "append",
    "parameters": {
      "sources": [
        "Extract_SalesTargets_2014Jan",
        "Extract_SalesTargets_2014Feb",
        "Extract_SalesTargets_2014Mar"
      ]
    }
  },
  "Register_AllSalesTargets": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "AllSalesTargets",
      "name": "AllSalesTargets",
      "source": "Append_SalesTargets_2014Quarter1"
    }
  }
}
```

After you create the single dataset, you can use date filters to analyze the sales targets by month, quarter, or year.

IN THIS SECTION:

[append Parameters](#)

When you define an append transformation, you set the action attribute to `append` and specify the parameters.

append Parameters

When you define an append transformation, you set the action attribute to `append` and specify the parameters.

The following table describes the input parameters.

Parameter	Required?	Value
sources	Yes	Nodes in the dataflow definition file that identify the datasets that you want to merge.

SEE ALSO:

[append Transformation](#)**augment Transformation**

The augment transformation augments an input dataset by combining columns from another related dataset. The resulting, augmented dataset enables queries across both related input datasets. For example, you can augment the Account dataset with the User dataset to enable a query to return account records and the full names of the account owners.

When you create the transformation, you identify each input dataset as the left or right dataset and specify the relationship between them. Analytics combines all the columns of the left dataset with only the specified columns from the right dataset. (Keep in mind that each dataset can't have more than 5,000 columns.) Analytics adds the relationship to column names from the right dataset, which is useful when the left and right datasets have columns with the same names.

For each record in the left dataset, the augment transformation performs a lookup to find a matching record in the right dataset. To match related records, the augment transformation uses a match condition. You specify the match condition based on a key from each dataset. For example:

```
"left_key": [ "Id" ], "right_key": [ "Prod_ID" ]
```

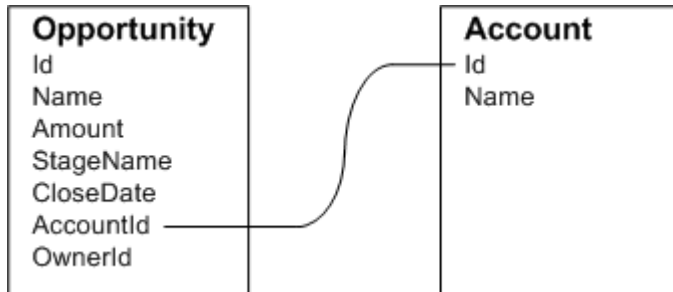
A key can be a single-column key or a composite key. For a match condition based on a composite key, the keys for both datasets must have the same number of columns, specified in the same order.



Tip: To augment more than two datasets, augment two datasets at a time. For example, to augment three datasets, augment the first two datasets, and then augment the resulting dataset with the third dataset.



Example: Let's look at an example of the augment transformation. In this example, you want to extract data from the Opportunity and Accounts objects, and then match the data based on the account ID field.



You create the following dataflow definition file.

```

{
  "Extract_Opportunity": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    }
  },
  "Extract_AccountDetails": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Account",
      "fields": [
        { "name": "Id" },
        { "name": "Name" }
      ]
    }
  },
  "Augment_OpportunitiesWithAccountDetails": {
    "action": "augment",
    "parameters": {
      "operation": "LookupSingleValue",
      "left": "Extract_Opportunity",
      "left_key": [
        "AccountId"
      ],
      "relationship": "OpptyAcct",
      "right": "Extract_AccountDetails",
      "right_key": [
        "Id"
      ],
      "right_select": [ "Name" ]
    }
  }
}

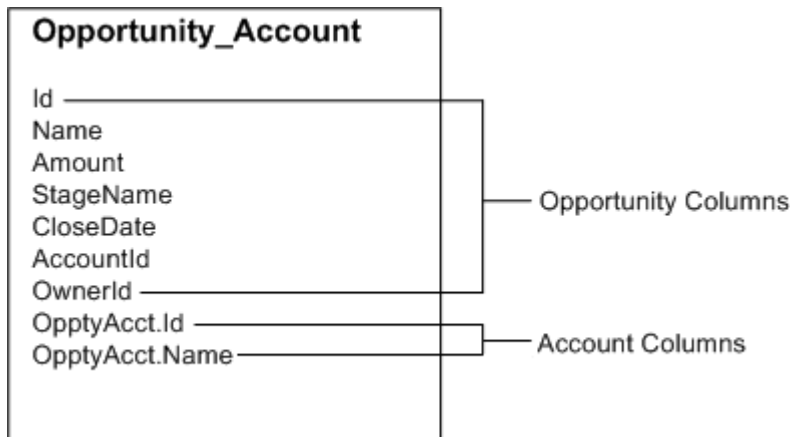
```

```

    },
    "Register_OpportunityDetails": {
      "action": "sfdcRegister",
      "parameters": {
        "alias": "Opportunity_Account",
        "name": "Opportunity_Account",
        "source": "Augment_OpportunitiesWithAccountDetails" }
    }
  }
}

```

After you run the dataflow, Analytics creates and registers the Opportunity_Account dataset. It also adds the relationship as a prefix to all columns from the right dataset.



IN THIS SECTION:

[Special Cases for Matching Records with the augment Transformation](#)

For each record in the left dataset, the augment transformation performs a lookup to find a matching record in the right dataset. However, it's critical that you understand how the augment transformation handles special cases when matching records.

[augment Parameters](#)

When you define an augment transformation, you set the action attribute to `augment` and specify the parameters.

Special Cases for Matching Records with the augment Transformation

For each record in the left dataset, the augment transformation performs a lookup to find a matching record in the right dataset. However, it's critical that you understand how the augment transformation handles special cases when matching records.

Let's look at some examples that illustrate some special cases.

Handling Null Keys

When a record in the left dataset contains a null key, Analytics doesn't perform a lookup to match the record. Instead, Analytics appends the right columns and inserts null for dimensions (including dates) and '0' for measures.

Let's look at an example. You apply the augment transformation on the following datasets, set the relationship to "Price," and match the records based on the `Id` and `ProdId` fields.

Product	
Id	Name
Prod1	Table
Prod2	Chair
<i>null</i>	Bench

Price		
ProdId	Pricebook	UnitPrice
Prod1	Standard	1000
Prod2	Standard	450
<i>null</i>	Custom	800
Prod3	Standard	700

Analytics doesn't match the last record because the product ID is null. Instead, Analytics inserts a null for the `Price.Pricebook` dimension and '0' for the `Price.UnitPrice` measure. Here's the resulting dataset after the augment.

```
[ "id":"Prod1", "Name":"Table", "Price.Pricebook":"Standard", "Price.UnitPrice":1000 ],
[ "id":"Prod2", "Name":"Chair", "Price.Pricebook":"Standard", "Price.UnitPrice":450 ],
[ "id":null, "Name":"Bench", "Price.Pricebook":null, "Price.UnitPrice":0 ]
```

Handling Empty Keys

Analytics matches empty-value left keys and empty-value right keys.

Let's look at an example. You apply the augment transformation on the following datasets, set the relationship to "Price," and match the records based on the `Id` and `ProdId` fields.

Product	
Id	Name
Prod1	Table
Prod2	Chair
""	Bench

Price		
ProdId	Pricebook	UnitPrice
Prod1	Standard	1000
Prod2	Standard	450
""	Custom	800
<i>null</i>	Standard	700

Analytics matches the last record in the Product dataset with the third record in the Price dataset because they both have empty values (""). Here's the resulting dataset after the augment.

```
[ "id":"Prod1", "Name":"Table", "Price.Pricebook":"Standard", "Price.UnitPrice":1000 ],
[ "id":"Prod2", "Name":"Chair", "Price.Pricebook":"Standard", "Price.UnitPrice":450 ],
[ "id": "", "Name":"Bench", "Price.Pricebook":"Custom", "Price.UnitPrice":800 ]
```

Handling Non-Unique Keys

Although it's recommended, the left key doesn't have to be unique. If multiple records have the same left key, Analytics creates the same values for the appended columns.

Let's look at an example. You apply the augment transformation on the following datasets, set the relationship to "Price," and match the records based on the `Id` and `ProdId` fields.

Product		Price		
Id	Name	ProdId	Pricebook	UnitPrice
Prod1	Table	Prod1	Standard	1000
Prod2	Chair	Prod2	Standard	450
Prod2	Chair	Prod3	Standard	700

Analytics matches the records in the Product dataset with records in the Price dataset. Here's the resulting dataset after the augment.

```
{ "id":"Prod1", "Name":"Table", "Price.Pricebook":"Standard", "Price.UnitPrice":1000 },
{ "id":"Prod2", "Name":"Chair", "Price.Pricebook":"Standard", "Price.UnitPrice":450 },
{ "id":"Prod2", "Name":"Chair", "Price.Pricebook":"Standard", "Price.UnitPrice":450 }
```

Handling No Match

If left key doesn't have a match in the right dataset, Analytics appends the right columns and inserts null for dimensions (including dates) and '0' for measures.

Let's look at an example. You apply the augment transformation on the following datasets, set the relationship to "Price," and match the records based on the `Id` and `ProdId` fields.

Product		Price		
Id	Name	ProdId	Pricebook	UnitPrice
Prod1	Table	Prod4	Standard	1000
Prod2	Chair	Prod5	Standard	450
Prod3	Bench			

Because no keys match, Analytics doesn't match any records in the Product dataset with records in the Price dataset. Here's the resulting dataset after the augment.

```
{ "id":"Prod1", "Name":"Table", "Price.Pricebook": null, "Price.UnitPrice":0 },
{ "id":"Prod2", "Name":"Chair", "Price.Pricebook": null, "Price.UnitPrice":0 },
{ "id":"Prod3", "Name":"Bench", "Price.Pricebook": null, "Price.UnitPrice":0 }
```

Handling Multiple Matches

If the left dataset has a one-to-many relationship with the right dataset, Analytics might find multiple matches for a left record. What Analytics does with multiple matches depends on the specified augment operation. You can specify one of the following operations to handle the multiple-match case:

LookupSingleValue

The augment transformation returns results from a single row. Analytics randomly selects one row from the list of matched rows.

 **Note:** Each time you run the dataflow, Analytics can return different results depending on the returned row.

Let's look at an example. You apply the augment transformation on the following datasets, set the relationship to "Price," set the operation to `LookupSingleValue`, and match the records based on the `Id` and `ProdId` fields.

Product		Price		
Id	Name	ProdId	Pricebook	UnitPrice
Prod1	Table	Prod1	Standard	1000
Prod2	Chair	Prod2	Standard	450
Prod3	Bench	Prod3	Custom	800
		Prod3	Standard	700

Although there are multiple rows for Prod3 in the Price dataset, Analytics randomly chooses one matching row and returns values based on that row. Here's the resulting dataset after the augment if Analytics chooses the first Prod3 row.

```
{ "id":"Prod1", "Name":"Table", "Price.Pricebook":"Standard", "Price.UnitPrice":1000 },
{ "id":"Prod2", "Name":"Chair", "Price.Pricebook":"Standard", "Price.UnitPrice":450 },
{ "id":"Prod3", "Name":"Bench", "Price.Pricebook":"Custom", "Price.UnitPrice":800 }
```

LookupMultiValue

Analytics returns results from all matched rows.

Let's look at an example. You apply the augment transformation on the following datasets, set the relationship to "Price," set the operation to `LookupMultiValue`, and match the records based on the `Id` and `ProdId` fields.

Product		Price		
Id	Name	ProdId	Pricebook	UnitPrice
Prod1	Table	Prod1	Standard	1000
Prod2	Chair	Prod2	Standard	450
Prod3	Bench	Prod3	Custom	800
		Prod3	Standard	700

Because the lookup returns multiple rows for Prod3, the dimension `Price.Pricebook` field in the resulting dataset becomes a multi-value field, showing all dimension values. The measure field `Price.UnitPrice` contains 1500, which is the sum of 800 and 700. Here's the resulting dataset after the augment.

```
{ "id":"Prod1", "Name":"Table", "Price.Pricebook":"Standard", "Price.UnitPrice":1000 },
{ "id":"Prod2", "Name":"Chair", "Price.Pricebook":"Standard", "Price.UnitPrice":450 },
{ "id":"Prod3", "Name":"Bench", "Price.Pricebook":"Custom", "Price.Pricebook":"Standard", "Price.UnitPrice":1500 }
```


SEE ALSO:

[augment Transformation](#)

augment Parameters

When you define an augment transformation, you set the action attribute to `augment` and specify the parameters.

The following table describes the input parameters.

Parameter	Required?	Value
operation	No	<p>Indicates what the transformation does if it matches multiple rows in the right dataset with a row in the left. Valid values:</p> <ul style="list-style-type: none"> • <code>LookupSingleValue</code>. Returns values from one of the matched rows. If you don't specify the <code>operation</code> parameter, the transformation uses this operation. • <code>LookupMultiValue</code>. Returns values from all matched rows. <p>For more information about each operation, see Special Cases for Matching Records with the augment Transformation.</p>
left	Yes	Node in the dataflow definition file that identifies the left dataset. This is one of two input sources for this transformation.
left_key	Yes	<p>Key column in the left dataset used to augment the datasets. If you use a composite key, the left and right keys must have the same number of columns in the same order. For a composite key, use the following syntax:</p> <pre>["Key Column1", "Key Column2", ..., "Key ColumnN"]</pre> <p> Note: The left or right key can't be a multi-value field.</p>
right	Yes	Node in the dataflow definition file that identifies the right dataset. This is one of two input sources for this transformation.
relationship	Yes	Relationship between the left and right datasets. The dataflow adds the relationship to the beginning of the right column names in the output dataset to make the column names unique and descriptive.
right_select	Yes	An array of column names from the right dataset that you want to include in the output dataset. The dataflow adds the relationship as a prefix to the column name to determine the name of the right column in the output dataset.


Parameter	Required?	Value
right_key	Yes	Key column in the right dataset used to augment the datasets. If you use a composite key, the left and right keys must have the same number of columns in the same order.

SEE ALSO:

[augment Transformation](#)

computeExpression Transformation

The computeExpression transformation enables you to add derived fields to a dataset. The values for derived fields aren't extracted from the input data source. Instead, Analytics generates the values using a SAQL expression, which can be based on one or more fields from the input data or other derived fields. For example, you can use an expression to assign a value to a field, concatenate text fields, or perform mathematical calculations on numeric fields.

 **Note:** The computeExpression and computeRelative transformations are similar, but they have a key difference. The computeExpression transformation performs calculations based on other fields within the same row. The computeRelative transformation performs calculations based on the previous and next values of the same field in other rows.

Consider the following guidelines when creating a computeExpression transformation:

- You can include only the following SAQL operators and functions in the expression:
 - [Arithmetic operators](#)
 - [Case operator](#)
 - [String operator](#)
 - [Date functions](#)
- Multi-value fields aren't supported. The dataflow fails if you include a multi-value field in the SAQL Expression parameter.
- The values of the derived field must match its specified type. For example, set the type of the derived field to `Text` if the values are strings.
- Analytics calculates the values of derived fields in the order in which they are listed in the JSON. Thus, if you create a derived field based on other derived fields in the same computeExpression transformation, the input derived fields must be listed first. For example, `Derived_A` must be listed before `Derived_B` in the following computeExpression transformation JSON snippet:


```
"CreateDerivedFields": {
  "action": "computeExpression",
  "parameters": {
    "source": "sourceNode",
    "mergeWithSource": false,
    "computedFields": [
      {
        "name": "Derived_A",
        "type": "Text",
        "label": "Derived Field A",
        "saqlExpression": "\"hello \""
      },
      {
        "name": "Derived_B",
```

```

        "type": "Text",
        "label": "Derived Field B Dependent on Field A",
        "sqlExpression": "Derived_A + \"world\""
    ]
}
}

```

- You can choose whether the resulting dataset includes only the derived fields, or includes the input and derived fields.

 **Example:** Let's look at an example. You want to create a dataset based on Salesforce opportunity data. You create a dataflow that extracts the Id and Amount fields from the Opportunity object. In addition, you also want to add the following derived fields to the dataset: ModifiedId, SalesTax, FinalPrice, and ValueCategory. For the derived fields, you will:

- Append "SFDC" to each opportunity Id to get a new modified Id.
- Calculate the sales tax based on an 8% tax rate.
- Calculate the final price by adding the amount and sales tax.
- Categorize opportunities into low-, medium-, and high-value buckets based on the calculated final price.

You create the following dataflow definition.

```

{
  "salesData": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        {"name": "Amount"},
        {"name": "Id"}
      ]
    }
  },
  "Derived_Fields": {
    "action": "computeExpression",
    "parameters": {
      "source": "salesData",
      "mergeWithSource": true,
      "computedFields": [
        {
          "name": "ModifiedId",
          "type": "Text",
          "sqlExpression": "\"SFDC\" + Id",
        },
        {
          "name": "SalesTax",
          "type": "Numeric",
          "precision": 18,
          "defaultValue": "0",
          "scale": 5,
          "sqlExpression": "Amount * 0.08",
        },
        {
          "name": "FinalPrice",
          "type": "Numeric",
          "precision": 18,
          "defaultValue": "0",
          "scale": 5,
          "sqlExpression": "Amount + SalesTax",
        },
        {
          "name": "ValueCategory",

```

```

        "type": "Text",
        "sqlExpression": "case when FinalPrice < 1000 then \"Low\" when
FinalPrice >= 1000 and FinalPrice < 2000 then \"Medium\" else \"High\" end"}
    ]
  },
  "Register_CategorizedSales": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "Categorized_Sales",
      "name": "Categorized_Sales",
      "source": "Derived_Fields" }
  }
}

```

IN THIS SECTION:

[computeExpression Parameters](#)

When you define a `computeExpression` transformation, you set the `action` attribute to `computeExpression`. You also specify the parameters for the input source and the expression used to generate the values.

computeExpression Parameters

When you define a `computeExpression` transformation, you set the `action` attribute to `computeExpression`. You also specify the parameters for the input source and the expression used to generate the values.

You can specify parameters in the following sections of the `computeExpression` node: `parameters` and `computedFields`.




Parameters

The following table describes the parameters in the `parameters` section.

Parameter	Required?	Value
<code>source</code>	Yes	Node in the dataflow definition file that identifies the input source for this transformation.
<code>mergeWithSource</code>	No	Indicates whether the input fields are included with the derived fields in the resulting dataset. When true, the resulting dataset contains all input fields from the source and the newly generated derived fields. When false, the resulting dataset contains the derived fields only. Default is true.
<code>computedFields</code>	Yes	Attributes and expression used to generate derived fields in the dataset. See computedFields .

computedFields

The following table describes the attributes in the `computedFields` section. It also describes optional attributes that you can provide to override the field metadata to make the data appear differently in a dataset. For example, Analytics can replace null values in a field with a default value.

Attribute	Required?	Value
name	Yes	<p>API name of the generated field.</p> <p> Note: The API names must be unique. Otherwise, the dataflow fails to run.</p>
type	Yes	<p>Analytics field type associated with the field. Valid types are Text, Numeric, or Date.</p> <p>Example:</p> <pre>"type": "Text"</pre>
label	No	<p>The display name of the generated field that appears in the Analytics user interface. Can be up to 255 characters. Defaults to input field name if not specified.</p>
sqlExpression	Yes	<p>SAQL expression used to calculate the value for the derived field. The expression can be based on input fields or other derived fields in the transformation.</p> <p>Example:</p> <pre>"sqlExpression": "toDate (birth_day, \"yyy-M-d\")"</pre> <p> Note: If a field name in a SAQL expression contains characters other than letters, numbers, or underscores, enclose the name in single quotes. For example, field names resulting from an augment are prefixed with the relationship name and a dot, and must be enclosed in single quotes.</p> <pre>"sqlExpression": "augment (c, \"a.b.c\")"</pre> <p> Note: The use of multi-value fields as input fields isn't supported.</p>
format	Yes (for Date fields only)	<p>Format of the derived date field. For information about formats, see the Analytics External Data Format Reference.</p>


Attribute	Required?	Value
precision	Yes (for Numeric fields only)	<p>The maximum number of digits in a numeric value, or the length of a text value. For numeric values: Includes all numbers to the left and to the right of the decimal point (but excludes the decimal point character). Value must be between 1 and 16, inclusive. For text values: Value defaults to 255 characters, and must be between 1 and 32,000 characters, inclusive.</p> <p>Example:</p> <pre>"precision": 10</pre>
scale	Yes (for Numeric fields only)	<p>The number of digits to the right of the decimal point in a numeric value. Must be less than the precision value. Value must be between 0 and 15 characters, inclusive.</p> <p>Example:</p> <pre>"scale": 2</pre>
defaultValue	No	<p>For text and numeric fields that can be null. Default value that replaces a null value for the specified field. Enter a string value.</p> <p>Example:</p> <pre>"defaultValue": "0"</pre>

SEE ALSO:


[computeExpression Transformation](#)

computeRelative Transformation

You can use the `computeRelative` transformation to analyze trends in your data by adding derived fields to a dataset based on values in other rows. For example, to analyze sales pipeline trends, create derived fields that calculate the number of days an opportunity remains in each stage. You can also calculate the changes to the opportunity amount throughout the stages of the opportunity.

-  **Note:** The `computeExpression` and `computeRelative` transformations are similar, but the `computeExpression` transformation performs calculations based on fields within the same row. The `computeRelative` transformation performs calculations based on the same field in other rows—particularly the current, first, previous, or next rows.

When you define a `computeRelative` transformation, you specify a source transformation as the input, partition the records, and sort the records within each partition. For example, you can use `sfdcDigest` to extract opportunity history records, and then use `computeRelative` to calculate changes in each opportunity over time. You can partition opportunity history records by opportunity ID, and then chronologically sort records within each partition to correctly identify the previous and next values.

-  **Note:** Derived fields can be based on a source field or on a SAQL expression.



Example: Let's look at an example. To perform trending analysis on the sales pipeline, create a dataflow that contains the following transformations.

sfdcDigest transformation

Extracts the following data from the OpportunityHistory object.

Opportunity ID	Created Date	Stage Name	Amount	Close Date
006R0000001rerEIAQ	2017-09-11T18:47:39.000Z	Id. Decision Makers	120,000	2015-06-24
006R0000001rerGIAQ	2017-09-11T18:48:12.000Z	Qualification	20,000	2015-10-22
006R0000001rerFIAQ	2017-09-11T18:48:39.000Z	Value Proposition	75,000	2015-09-23
006R0000001rerDIAQ	2017-09-11T18:49:11.000Z	Perception Analysis	38,000	2015-07-15
006R0000001rerHIAQ	2017-09-11T18:49:36.000Z	Negotiation/Review	120,000	2015-07-31

computeRelative transformation

Performs the following tasks:

- Partitions the extracted records by opportunity ID.
- Within each partition, sorts the extracted records by CreatedDate in ascending order. Sorting by CreatedDate ensures that the changes that occur for each opportunity are listed in chronological order.
- Adds the following derived fields to the final dataset.

OpportunityCreatedDate

Determines the date that the opportunity was first created. You can use this date with the actual close date to determine the number of days required to close the sale. The goal is to shorten the sales cycle to recognize revenue.

AmountPrev

Determines the previous amount of the opportunity. You can use this field to determine if the values of opportunities are increasing or decreasing, which can affect whether you hit your sales targets.

CloseDatePrev

Determines the previous expected close date for the opportunity. You can use this field to analyze how the expected close date changes over the sales cycle of the opportunity. If the expected close date keeps getting pushed out, identify the issues that are causing the longer sales cycle.

AmountChange

Uses a SAQL expression to calculate the percentage change of the opportunity amount from its previous amount.

AmountChangeDirection

Uses a SAQL expression to generate a text value to show the direction in which an opportunity amount has changed: Up, Down, or No Change.

sfdcRegister transformation

Registers the final dataset that contains the extracted fields from the sfdcDigest transformation and the derived fields from computeRelative transformation.

You create the following dataflow definition.

```
{
  "extractOppHistory": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "OpportunityHistory",
      "fields": [
        {"name": "OpportunityId"},

```

```

        {"name": "CreatedDate"},
        {"name": "StageName"},
        {"name": "Amount"},
        {"name": "CloseDate"}
    ]
}
},
"computeTrending": {
  "action": "computeRelative",
  "parameters": {
    "source": "extractOppHistory",
    "partitionBy": ["OpportunityId"],
    "orderBy": [
      {
        "name": "CreatedDate",
        "direction": "asc"
      }
    ]
  },
  "computedFields": [
    {
      "name": "OpportunityCreatedDate",
      "label": "Opportunity Created Date",
      "description": "Determines the date that the opportunity was first created.",
      "expression": {
        "sourceField": "CreatedDate",
        "offset": "first()",
        "default": "current()"
      }
    },
    {
      "name": "AmountPrev",
      "label": "Previous Amount",
      "description": "Determines the previous amount of the opportunity",
      "expression": {
        "sourceField": "Amount",
        "offset": "previous()",
        "default": "null"
      }
    },
    {
      "name": "CloseDatePrev",
      "label": "Previous Close Date",
      "description": "Determines the previous expected close date for the
opportunity",
      "expression": {
        "sourceField": "CloseDate",
        "offset": "previous()",
        "default": "1970-1-1"
      }
    },
    {
      "name": "AmountChange",
      "label": "Amount % Change",

```

```

    "description": "Determines percentage change from previous amount",
    "expression": {
      "sqlExpression": "(current(Amount)-previous(Amount))/previous(Amount)*100",

      "type": "Numeric",
      "scale": "2",
      "default": "null"
    }
  },
  {
    "name": "AmountChangeDirection",
    "label": "Amount Change Direction",
    "description": "Determines text to indicate direction of change",
    "expression": {
      "sqlExpression": "case when current(Amount)>previous(Amount) then \"Up\"
when current(Amount)<previous(Amount) then \"Down\" else \"No Change\" end",
      "type": "Text",
      "default": ""
    }
  }
]
}
},
"Register_OppportunityHistory_Dataset": {
  "action": "sfdcRegister",
  "parameters": {
    "alias": "SalesPipelineTrending1",
    "name": "Sales Pipeline Trending1",
    "source": "computeTrending"
  }
}
}
}

```

The dataflow runs and creates the dataset with the new derived fields.

Opportunity ID	Created Date	Amount	OpportunityCreatedDate	Previous Amount	Amount % Change	Amount Change Direction	Previous Close Date
006R0000001rerDIAQ	2017-09-11T18:49:11.000Z	38,000	2017-08-28T18:24:41.000Z	40,000	-5.0	Down	2013-05-06
006R0000001rerEIAQ	2017-08-28T18:24:41.000Z	140,000	2017-08-28T18:24:41.000Z	-	-	No Change	1970-1-1
006R0000001rerEIAQ	2017-08-28T18:24:41.000Z	140,000	2017-08-28T18:24:41.000Z	140,000	0	No Change	2013-03-07
006R0000001rerEIAQ	2017-08-28T18:24:41.000Z	140,000	2017-08-28T18:24:41.000Z	140,000	0	No Change	2013-04-05
006R0000001rerEIAQ	2017-09-11T18:47:39.000Z	120,000	2017-08-28T18:24:41.000Z	140,000	-14.0	Down	2013-04-05

Notice that Analytics partitions the records by opportunity ID and then sorts the records in ascending order based on the CreatedDate field within each partition. Analytics can now use the previous and next rows within each partition to determine changes in field values in the dataset.

IN THIS SECTION:

[computeRelative Parameters](#)

When you define a computeRelative transformation, you set the action attribute to `computeRelative`. You also specify the parameters for the input source, partition-by field, sort field, and derived field definitions.

computeRelative Parameters

When you define a `computeRelative` transformation, you set the `action` attribute to `computeRelative`. You also specify the parameters for the input source, partition-by field, sort field, and derived field definitions.

You can specify parameters in the following sections of the `computeRelative` node.

Parameters


The following table describes the parameters in the `parameters` section.

Parameter	Required?	Value
<code>source</code>	Yes	Node in the dataflow definition file that identifies the input source for this transformation.
<code>partitionBy</code>	Yes	API name of the field used to partition the records in the dataset. Specify one partition-by field only.
<code>orderBy</code>	Yes	Field used to sort the records within each partition and the sort order: ascending (<code>asc</code>) or descending (<code>desc</code>). Specify one sort field only. Example: <pre>"orderBy": [{ "name": "CreatedDate", "direction": "asc" }]</pre>
<code>computedFields</code>	Yes	A list of definitions for derived fields. Derived fields can be based on a source field or on a SAQL expression. Example showing derived fields based on a source field and on a SAQL expression: <pre>"computedFields": [{ "name": "PreviousAmount", "label": "Previous Amount", "description": "Previous amount of opportunity", "expression": { "sourceField": "Amount", "offset": "previous()", "default": "null" } }, { "name": "AmountChange", "label": "Amount % Change", "description": "Percentage change from previous amount", "expression": { "saqlExpression": "(current (Amount) -previous (Amount)) /previous (Amount) *100",</pre>

Parameter	Required?	Value
		<pre> "type": "Numeric", "scale": "2", "default": "null" } }]</pre> <p>See computedFields.</p>

computedFields



The following table describes the attributes in the `computedFields` section.

Parameter	Required?	Value
name	Yes	API name of the derived field to add to the dataset. The name must be unique in the dataset.  Note: If the name is not unique, the dataflow fails to run.
label	No	The display name of the derived field that appears in the Analytics user interface. Can be up to 255 characters. Defaults to the API name if not specified.
description	No	Description of the derived field for information only.
expression	Yes	Expression attributes used to calculate the value for the derived field. The expression can be based on input fields or other derived fields in the transformation. Example: <pre> "expression": { "sourceField": "CloseDate", "offset": "previous()", "default": "01-01-1970" }</pre> <p>See expression.</p>

expression

The following table describes the attributes in the `expression` section when creating a derived field based on a source field.

Parameter	Required?	Value
sourceField	Yes	API name of the input field from the source node that's used in the expression.
offset	Yes	The function used in the expression. You can use the following functions: current() Gets the value from the current record.

Parameter	Required?	Value
		<p>Example:</p> <pre>"offset": "current()"</pre> <p>first() Gets the value from the first record in the partition, like the first CreateDate for an opportunity.</p> <p>Example:</p> <pre>"offset": "first()"</pre> <p>next() Gets the value from the next record.</p> <p>Example:</p> <pre>"offset": "next()"</pre> <p>previous() Gets the value from the previous record.</p> <p>Example:</p> <pre>"offset": "previous()"</pre> <p> Note: Derived fields are computed in the order that they're defined. The calculation of a derived field can be based on the value from another derived field as long as it has already been defined. For example, <code>next()</code> can't access the value of a derived field in the next row.</p> <p> Tip: To get the correct results when using the <code>previous()</code> and <code>next()</code> functions, the <code>computeRelative</code> transformation requires you to sort the records.</p>
default	Yes (for numeric fields only)	<p>The default value if one can't be calculated. For example, you can specify a default value when no previous or next value exists. You can insert a constant value or <code>current()</code> as a default value.</p> <p>Examples:</p> <pre>"default": "3000-01-01T00:00:00.000Z"</pre> <pre>"default": "current()"</pre>


The following table describes the attributes in the `expression` section when creating a derived field based on a SAQL expression.

Parameter	Required?	Value
saqlExpression	Yes	SAQL expression used to calculate the value for the derived field. The expression can be based on input fields or other derived fields in the transformation. You


Parameter	Required?	Value
		<p>can use the offset functions <code>current()</code>, <code>first()</code>, <code>next()</code>, and <code>previous()</code> in the expression.</p> <p>Example to calculate the percentage change from the previous amount to the current amount:</p> <pre>"saqlExpression": "(current (Amount) -previous (Amount)) /previous (Amount) *100"</pre> <p>You can also use the SAQL case operator in the expression.</p> <p>Example to output <i>Up</i>, <i>Down</i>, or <i>No Change</i> values based on the change from the previous amount to the current amount:</p> <pre>"saqlExpression": "case when current (Amount) >previous (Amount) then \"Up\" when current (Amount) <previous (Amount) then \"Down\" else \"No Change\" end"</pre>
type	Yes	<p>Analytics field type associated with the field. Valid types are Numeric and Text.</p> <p>Example:</p> <pre>"type": "Text"</pre>
scale	No	<p>The number of digits to the right of the decimal point in a numeric value.</p> <p>Example:</p> <pre>"scale": 2</pre>
default	Yes (for numeric fields only)	<p>The default value if one can't be calculated.</p> <p>Example:</p> <pre>"default": "null"</pre>

delta Transformation


The delta transformation calculates changes in the value of a measure column in a dataset over a period of time. The delta transformation generates an output column in the dataset to store the delta for each record. Create deltas to make it easier for business analysts to include them in queries.

 **Note:** The `delta` transformation isn't supported when null measure handling is enabled and dataflows containing delta transformations fail. Use `computeRelative` and `computeExpression` transformations instead in your dataflows, to calculate changes in measure values over time. For an example, see [Enable Null Measure Handling](#) on page 87.

The delta transformation calculates each delta value by comparing the value in each record with the value in the previous record. Because records might not be sorted, the delta transformation orders the records before computing the delta values. To do this, the transformation sorts the data by the specified dimension, and then by the specified epoch date column.

 **Note:** When Analytics processes dates, it creates the following epoch date columns for each date processed:

Epoch Time Column	Description
<date_column_name>_sec_epoch	For example, if the date column is CloseDate, the generated epoch second column is CloseDate_sec_epoch. This column provides the number of seconds that have elapsed since January 1, 1970 (midnight UTC/GMT).
<date_column_name>_day_epoch	For example, if the date column is CloseDate, the generated epoch day column is CloseDate_day_epoch. This column provides the number of days that have elapsed since January 1, 1970 (midnight UTC/GMT).

 **Example:** Let's look at an example. You want to create an OppHistoryDelta dataset that contains opportunity history from the OpportunityHistory object and also calculates the deltas for opportunity amounts.

The OpportunityHistory object contains the following data.

OpportunityId	CloseDate	StageName	Amount
1	1/1/2014	New	100
2	1/1/2014	New	100
2	2/1/2014	ClosedWon	200
1	3/1/2014	ClosedWon	100

You create the following dataflow definition.

```
{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "OpportunityHistory",
      "fields": [
        { "name": "OpportunityId" },
        { "name": "CloseDate" },
        { "name": "StageName" },
        { "name": "Amount" }
      ]
    }
  },
  "Calculate_Delta": {
    "action": "delta",
    "parameters": {
      "dimension": "OpportunityId",
      "epoch": "CloseDate_day_epoch",
      "inputMeasure": "Amount",
      "outputMeasure": "DeltaAmount",
      "source": "Extract_Opportunities"
    }
  }
}
```



```

    }
  },
  "Register_Dataset": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "OppHistoryDelta",
      "name": "OppHistoryDelta",
      "source": "Calculate_Delta"
    }
  }
}

```


To calculate the delta values for each opportunity amount, the delta transformation sorts the records by the dimension (OpportunityId) first, and then by time (CloseDate_day_epoch) as shown here.

OpportunityId	CloseDate	StageName	Amount
1	1/1/2014	New	100
1	3/1/2014	ClosedWon	100
2	1/1/2014	New	100
2	2/1/2014	ClosedWon	200

After the records are sorted, for each dimension (OpportunityId), the transformation compares the previous value to the next value to determine the delta for each record. The transformation creates the following dataset.

OpportunityId	CloseDate	StageName	Amount	DeltaAmount
1	1/1/2014	New	100	0
1	3/1/2014	ClosedWon	100	0
2	1/1/2014	New	100	0
2	2/1/2014	ClosedWon	200	100

For the first record of each dimension, the transformation inserts '0' for the delta value.

 **Note:** If an opportunity contains multiple changes on the same day, you must sort the records on a shorter time interval. In this case, sort on CloseDate_sec_epoch column. Otherwise, records might not be sorted correctly, which means delta values will be incorrect.

IN THIS SECTION:

[delta Parameters](#)

When you define a delta transformation, you set the action attribute to `delta` and specify the parameters.

delta Parameters

When you define a delta transformation, you set the action attribute to `delta` and specify the parameters.

The following table describes the input parameters:


Parameter	Required?	Value
dimension	Yes	Dimension column in the dataset used to sort records when calculating the delta values.
epoch	Yes	Epoch date column in the dataset used to sort records within each dimension when calculating delta values.
inputMeasure	Yes	Measure column on which you want to calculate the delta.
outputMeasure	Yes	Name of the output column that contains the delta value.
source	Yes	Node in the dataflow definition file that contains the dataset to which you want to add the delta column.

SEE ALSO:

[delta Transformation](#)

digest Transformation

The digest transformation extracts replicated data in a dataflow. Use it to extract data replicated from your local Salesforce org, or data replicated through an external connection.

 **Example:** Here's an example. Let's say you're extracting opportunity data from your company's org in Arizona using a Salesforce external connection. To use this data in your dataflow, add a digest node specifying the connection name, object, and fields.

```
"Extract Arizona Opportunities": {
  "action": "digest",
  "parameters": {
    "connectionName": "Arizona_Sales",
    "object": "Opportunity",
    "fields": [
      {"name": "CloseDate"},
      {"name": "Amount"},
      {"name": "StageName"},
      {"name": "Name"}
    ]
  }
},
```

IN THIS SECTION:

[digest Parameters](#)

When you define a digest transformation, you set the action attribute to `digest` and specify the parameters.

digest Parameters

When you define a digest transformation, you set the action attribute to `digest` and specify the parameters.


The following table describes the input parameters:

Parameter	Required?	Value
connectionName	Yes	Name of the connection used to replicate the data.
object	Yes	The replicated object that you want to extract data from.
fields	Yes	An array of names of the fields that you want to extract.

dim2mea Transformation

The `dim2mea` transformation creates a new measure based on a dimension. The transformation adds the new measure column to the dataset. The transformation also preserves the dimension to ensure that existing lenses and dashboards don't break if they use the dimension.

If the transformation cannot create a measure from a dimension, the transformation populates the measure with the specified default value. If no default value is provided, the transformation inserts '0.'

 **Example:** Let's look at an example. Your Opportunity object contains a custom text field called `StageVal__c`, which contains the opportunity amount at a particular stage. Because this is a text field, Analytics loads this data as a dimension. However, you'd like to create a measure from this dimension to enable users to perform calculations on stage amount.

You create the following dataflow definition.

```
{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "AccountId" },
        { "name": "StageVal__c" }
      ]
    }
  },
  "Create_Measure_From_Dimension": {
    "action": "dim2mea",
    "parameters": {
      "dimension": "StageVal__c",
      "measure": "StageValue",
      "measureDefault": "0",
      "measureType": "long",
      "source": "Extract_Opportunities"
    }
  }
}
```

```

    }
  },
  "Register_The_Dataset": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "OpportunitiesWithConvertedMeasure",
      "name": "OpportunitiesWithConvertedMeasure",
      "source": "Create_Measure_From_Dimension"
    }
  }
}

```

IN THIS SECTION:

[dim2mea Parameters](#)

When you define a dim2mea transformation, you set the action attribute to `dim2mea` and specify the parameters.

dim2mea Parameters

When you define a dim2mea transformation, you set the action attribute to `dim2mea` and specify the parameters.

The following table describes the input parameters:

Parameter	Required?	Value
dimension	Yes	Dimension column in the dataset from which you want to create the measure.
measure	Yes	Name of the output measure. This column name must be unique within the dataset. Do not use the same name as the dimension because the transformation preserves the dimension in the dataset.
measureDefault	Yes	Default value for the measure if the transformation is unable to create a measure from a dimension.
measureType	Yes	Type of measure. Valid value: "long"
source	Yes	Node in the dataflow definition file that contains the dataset to which you want to add the measure.

SEE ALSO:

[dim2mea Transformation](#)

edgemart Transformation

The edgemart transformation gives the dataflow access to an existing, registered dataset, which can contain Salesforce data, external data, or a combination of the two. Use this transformation to reference a dataset so that its data can be used in subsequent transformations in the dataflow. You can use this transformation and the augment transformation together to join an existing dataset with a new dataset.


 **Example:** Let's look at an example. You would like to compare the final sales amount against the opportunity amount to determine if heavy discounts were offered to close deals. You previously created and registered the FinalSales dataset. The FinalSales dataset contains the final sale amount of each opportunity that was closed and won.

Table 2: FinalSales Dataset

OppID	UpdateDate	StageName	SaleAmount
1	1/1/2014	ClosedWon	100,000
2	11/1/2013	ClosedWon	150,000
3	2/1/2014	ClosedWon	200,000

You would now like to create a dataset that contains opportunity information from the Opportunity object. Then, you would like to join the data from the existing FinalSales dataset with the Opportunity dataset.

You create the following dataflow definition.

```
{
  "Extract_Opportunities": {
    "action": "sfcdigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" }
      ]
    }
  },
  "Extract_Final_Sales_Data": {
    "action": "edgemart",
    "parameters": { "alias": "FinalSales" }
  },
  "Combine_Opportunities_FinalSales": {
    "action": "augment",
    "parameters": {
      "left": "Extract_Opportunities",
      "left_key": [ "Id" ],
      "relationship": "Opportunity",
      "right": "Extract_Final_Sales_Data",
      "right_key": [ "OppID" ],
      "right_select": [ "SaleAmount" ]
    }
  },
  "Register_Opportunity_FinalSales_Dataset": {
    "action": "sfdcregister",
    "parameters": {
```

```

        "alias": "OpportunityVersusFinalSales",
        "name": "OpportunityVersusFinalSales",
        "source": "Combine_Opportunities_FinalSales"
    }
}
}

```

IN THIS SECTION:

[edgemart Parameters](#)

When you define an edgemart transformation, you set the action attribute to `edgemart` and specify the parameters.

edgemart Parameters

When you define an edgemart transformation, you set the action attribute to `edgemart` and specify the parameters.

The following table describes the input parameter:

Parameter	Required?	Value
alias	Yes	API name of the dataset from which you want to extract data. To determine the API name of a dataset, edit the dataset and view the system name.

SEE ALSO:


[edgemart Transformation](#)

export Transformation (Beta)

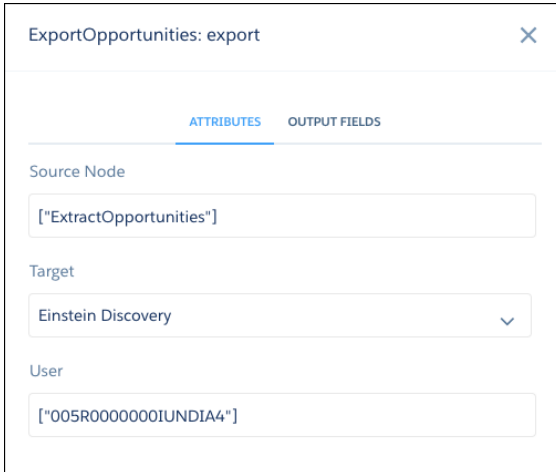
The export transformation creates a data file and a schema file from data in a specified source node in your dataflow. After the dataflow runs, Einstein Discovery users can access these files through the public API.

 **Note:** The export transformation is currently a beta feature that is production quality but has known limitations. To try it out, contact Salesforce.

When you add an export transformation to a dataflow, you specify a source and a target parameter. The source is the node in the dataflow that outputs the data you want to export, and the target is Einstein Discovery. You also specify a user, which determines who can access the data in Einstein Discovery.


 **Example:** Here's an example. Let's say your dataflow contains an `sfdcDigest` node, `ExtractOpportunities`, which extracts all fields from the Opportunity object. To make this data available in Einstein Discovery, add an export node to the dataflow, specifying the source node and a target of `EinsteinDiscovery`.

export Node in Dataflow Editor



export Node in Dataflow JSON

```
"ExportOpportunities": {
  "action": "export",
  "parameters": {
    "source": "ExtractOpportunities",
    "target": "EinsteinDiscovery",
    "userId": "005R0000000IUNDIA4"
  }
}
```

 **Note:** When you add an export node in the dataflow editor, you can search for the user by name in the User field.

IN THIS SECTION:

[export Parameters \(Beta\)](#)

Add an export transformation to a dataflow either in the dataflow editor, or directly in the JSON dataflow definition file. The parameters you specify are the same for both methods.

[export Parameters \(Beta\)](#)

Add an export transformation to a dataflow either in the dataflow editor, or directly in the JSON dataflow definition file. The parameters you specify are the same for both methods.

 **Note:** The export transformation is currently a beta feature that is production quality but has known limitations. To try it out, contact Salesforce.

To add an export transformation in the dataflow editor, click .

To add an export transformation in the JSON definition file, add a node and set the action attribute to `export`.

The following table describes the input parameters:

Parameter	Required?	Value
In dataflow editor: Source Node In dataflow JSON: <code>source</code>	Yes	Node in the dataflow that identifies the dataset that you want to export. This is the input source for this transformation.

Parameter	Required?	Value
In dataflow editor: Target In dataflow JSON: <code>target</code>	Yes	The destination for the exported data. In the dataflow editor, select <i>Einstein Discovery</i> . In the dataflow definition file, specify <code>EinsteinDiscovery</code> .
In dataflow editor: User In dataflow JSON: <code>userId</code>	Yes	The Id of the user who can access the data in Einstein Discovery. In the dataflow editor, you can search for the user by name in this field.

filter Transformation

The filter transformation removes records from an existing dataset. You define a filter condition that specifies which records to retain in the dataset.



Example: Let's look at an example. You would like to create a dataset that contains only opportunities that were Closed Won. First, you extract all opportunities from the Opportunity object. Next, you filter the records so that you only include opportunities with a Closed Won stage name.

You create the following dataflow definition.

```
{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    }
  },
  "Filter_Opportunities": {
    "action": "filter",
    "parameters": {
      "filter": "StageName:EQ:Closed Won",
      "source": "Extract_Opportunities"
    }
  },
  "Register_My_Won_Oppportunities_Dataset": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "MyWonOpportunities",
      "name": "MyWonOpportunities",
      "source": "Filter_Opportunities"
    }
  }
}
```


IN THIS SECTION:

[filter Parameters](#)

When you define a filter transformation, you set the action attribute to `filter` and specify the parameters.

[filter Expression Syntax](#)

You create a filter expression in the filter transformation based on one or more dimensions in a dataset.

filter Parameters

When you define a filter transformation, you set the action attribute to `filter` and specify the parameters.

The following table describes the input parameters:

Parameter	Required?	Value
filter	Yes	Filter expression that specifies which records to include in the new dataset. See filter Expression Syntax .
source	Yes	Node in the dataflow definition file that contains the dataset that you want to filter.

SEE ALSO:

[filter Transformation](#)

filter Expression Syntax

You create a filter expression in the filter transformation based on one or more dimensions in a dataset.



Note: String comparisons in a filter expression are case-sensitive.

You can use the following types of filter expressions:

Filter Expression Syntax	Description
dim:EQ:value	True if the dimension and value are equal. Example: <code>"filter": "StageName:EQ:Closed Won"</code>
dim:R:val0:val1	True if the left dimension falls within the specified range between val0 and val1. Example: <code>"filter": "EmployeeId:R:100:1000"</code>
dim:R:val	True if the dimension is greater than or equal to the value based on binary sort order. For example, this is true when the dimension is 'City' and the value is 'Anderson' because 'City' > 'Anderson'). Example: <code>"filter": "LastName:R:Li"</code>
dim:R::val	True if the dimension is less than or equal to the value based on binary sort order.

Filter Expression Syntax	Description
	Example: <code>"filter": "LastName:R::Levy"</code>
<code>dim:N:val</code>	True if the dimension and value are not equal. Example: <code>"filter": "RoleName:N:Manager"</code>
<code>dim:EQ:val1 val2</code>	True if the dimension equals values val1 or val2. This filter expression uses the logical OR operator (). You can compare the dimension value against more than two values. For example, to compare against three values, use the following syntax: <code>dim1:EQ:val1 val2 val3</code> . Example: <code>"filter": "Lead Status:EQ:Open Contacted"</code>
<code>dim1:EQ:val1,dim2:EQ:val2</code>	True if dimension dim1 equals value val1 and dimension dim2 equals value val2. This filter expression uses the logical AND operator (,). You can compare more than two dimensions. For example, to compare three dimensions, use the following syntax: <code>dim1:EQ:val1,dim2:EQ:val2,dim3:EQ:val3</code> . Example: <code>"filter": "Lead Status:EQ:Qualified,Rating:EQ:Hot"</code>

SEE ALSO:

[filter Transformation](#)

flatten Transformation

The flatten transformation flattens hierarchical data. For example, you can flatten the Salesforce role hierarchy to implement row-level security on a dataset based on the role hierarchy.

When you configure the flatten transformation to flatten a hierarchy, you specify the field that contains every node in the hierarchy and the field that contains their corresponding parent based on the hierarchy. The flatten transformation generates one record for each hierarchy node, which we refer to as the “self ID.” Each record contains two generated columns that store the hierarchy for each self ID node. One column contains a comma-separated list of all ancestors for each node in the hierarchy. The other column contains the hierarchy path.


See the Roles and RolePath columns in the following flattened dataset to see how ancestors are stored.

Role ID (Self ID)	Role Name	Parent Role ID	Roles	RolePath
1	Salesperson 1	10	10, 20, 30	\10\20\30
2	Salesperson 2	10	10, 20, 30	\10\20\30
3	Salesperson 3	11	11, 20, 30	\11\20\30
10	Regional Manager 1	20	20, 30	\20\30

Role ID (Self ID)	Role Name	Parent Role ID	Roles	RolePath
11	Regional Manager 2	20	20, 30	\20\30
20	Vice President 1	30	30	\30
21	Vice President 2	30	30	\30
30	CEO	Not applicable	Not applicable	Not applicable

You can also configure the flatten transformation to include the self ID node in the generated hierarchy columns. The following dataset shows the self ID in bold.

Role ID (Self ID)	Role Name	Parent Role ID	Roles	RolePath
1	Salesperson 1	10	1 , 10, 20, 30	\1\10\20\30
2	Salesperson 2	10	2 ,10, 20, 30	\2\10\20\30
3	Salesperson 3	11	3 ,11, 20, 30	\3\11\20\30
10	Regional Manager 1	20	10 ,20, 30	\10\20\30
11	Regional Manager 2	20	11 ,20, 30	\11\20\30
20	Vice President 1	30	20 ,30	\20\30
21	Vice President 2	30	21 ,30	\21\30
30	CEO	Not applicable	30	30

 **Example:** Let's look at an example. You want to create a dataset that contains all opportunities. For each opportunity, you want to include user and role information about the opportunity owner. Also, to implement row-level security based on the role hierarchy, each opportunity record must also contain a list of all ancestors above each opportunity owner based on the role hierarchy. To generate the list of ancestors, use the flatten transformation to flatten the role hierarchy.

You create the following dataflow definition file:

```
{
  "Extract_Opportunity": {
    "action": "sfcdigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    }
  }
},
```

```

"Extract_User": {
  "action": "sfdcDigest",
  "parameters": {
    "object": "User",
    "fields": [
      { "name": "Id" },
      { "name": "Name" },
      { "name": "Department" },
      { "name": "UserRoleId" }
    ]
  }
},
"Extract_UserRole": {
  "action": "sfdcDigest",
  "parameters": {
    "object": "UserRole",
    "fields": [
      { "name": "Id" },
      { "name": "Name" },
      { "name": "ParentRoleId" }
    ]
  }
},
"Flatten_UserRole": {
  "action": "flatten",
  "parameters": {
    "source": "Extract_UserRole",
    "self_field": "Id",
    "parent_field": "ParentRoleId",
    "multi_field": "Roles",
    "path_field": "RolePath",
    "include_self_id": false
  }
},
"Augment_User_FlattenUserRole": {
  "action": "augment",
  "parameters": {
    "left": "Extract_User",
    "left_key": [ "UserRoleId" ],
    "relationship": "Role",
    "right": "Flatten_UserRole",
    "right_key": [ "Id" ],
    "right_select": [
      "Id",
      "Name",
      "Roles",
      "RolePath"
    ]
  }
},
"Augment_Opportunity_UserWithRoles": {
  "action": "augment",
  "parameters": {
    "left": "Extract_Opportunity",

```

```

    "left_key": [ "OwnerId" ],
    "right": "Augment_User_FlattenUserRole",
    "relationship": "Owner",
    "right_select": [
      "Name",
      "Department",
      "Role.Id",
      "Role.Name",
      "Role.Roles",
      "Role.RolePath"
    ],
    "right_key": [ "Id" ]
  },
  "Register_OpportunityWithRoles_Dataset": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "OppRoles",
      "name": "OppRoles",
      "source": "Augment_Opportunity_UserWithRoles",
      "rowLevelSecurityFilter": "'Owner.Role.Roles' == \"\$User.UserRoleId\" || 'OwnerId'
== \"\$User.Id\""
    }
  }
}

```

To flatten the Salesforce role hierarchy, the flatten transformation uses the following input fields from the UserRole object.

Id

Id identifies each node in the Salesforce role hierarchy.

ParentRoleId

ParentRoleId identifies the parent as defined in the role hierarchy.

After traversing through each parent-child relationship in the UserRole object, the flatten transformation generates one record for each role ID. Each record contains all ancestor roles for each role in the hierarchy. The flatten transformation generates two output columns—Roles and RolePath—to store all ancestor roles for each role.

IN THIS SECTION:

[flatten Parameters](#)

When you define a flatten transformation, you set the action attribute to `flatten` and specify the parameters.


flatten Parameters

When you define a flatten transformation, you set the action attribute to `flatten` and specify the parameters.

The following table describes the input parameters:

Parameter	Required?	Value
include_self_id	No	Indicates whether to include the self ID node in the generated multi_field and path_field columns. Valid values are <code>false</code> (default) and <code>true</code> .

Parameter	Required?	Value
self_field	Yes	Name of the input field that identifies each node in the hierarchy.
parent_field	Yes	Name of the input field that identifies the direct parent of each node in the hierarchy. For example, the Regional Manager 1 role is the parent of the Salesperson 1 role in a role hierarchy.
multi_field	Yes	Name of the multi-value output field that contains a list of all ancestors in the hierarchy, in order from the lowest to the highest level. The flatten transformation creates this field and generates the list of ancestors for each node in the hierarchy. For example, for Salesperson 1 role, the hierarchy of ancestors is: <code>Sales Manager 1, Regional Manager 1, Vice President 1, CEO</code> .
path_field	Yes	A string representation of the multi-field field, separated by backslashes. This output field contains the hierarchical path of all ancestors in the hierarchy, in order from the lowest to the highest level. The flatten transformation creates this field and generates the ancestry path for each node in the hierarchy. For example, for a salesperson role in a role hierarchy, the value is: <code>Sales Manager 1\Regional Manager 1\Vice President 1\CEO</code> .
source	Yes	Node in the dataflow definition file that contains the hierarchical data that you want to flatten. This node is the input source for this transformation and it must contain the input fields mapped to self_field and parent_field.

 **Note:** By default, the multi_field and path_field fields are created as system fields, which aren't visible in the user interface. To make the fields appear in the user interface, set the `IsSystemField` metadata attribute to `false` for each field in the flatten transformation. For more information about metadata attributes, see [Overriding Metadata Generated by a Transformation](#).

SEE ALSO:


[flatten Transformation](#)

sfdcDigest Transformation

The sfdcDigest transformation generates a dataset based on data that it extracts from a Salesforce object. You specify the Salesforce object and fields from which to extract data. You might choose to exclude particular fields that contain sensitive information or that aren't relevant for analysis.

When you upload the dataflow definition file, Analytics validates access to Salesforce objects and fields based on the user profile of the Integration User. If the user profile does not have read access to a field or object, the upload fails.

At run time, Analytics runs the dataflow as the Integration User. Again, Analytics validates access to the objects and fields based on the profile of the Integration User. For example, if the dataflow tries to extract data from a custom field on which the Integration User does not have read access, the dataflow job fails.

-  **Note:** The Integration User is a preconfigured user that is created when Analytics is enabled in your organization. If you or the Integration User need permission on a Salesforce object or field, ask the administrator to grant access.

For more information about preconfigured users in Analytics, see the *Analytics Security Implementation Guide*.

-  **Example:** Let's look at an example. You would like to create a dataset that contains all opportunities from the Opportunity object. You create the following dataflow definition.

```
{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "AccountId" },
        { "name": "OwnerId" },
        { "name": "OpportunitySupportTeamMembers__c" }
      ]
    }
  },
  "Register_Opportunities_Dataset": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "Opportunities",
      "name": "Opportunities",
      "source": "Extract_Opportunities"
    }
  }
}
```

Considerations When Using the sfdcDigest Transformation

- Consider dataset storage limits when extracting data. For example, a dataset can contain a maximum of 5,000 fields, so be selective when choosing fields. See [Analytics Limits](#).
- The sfdcDigest transformation runs a SOQL query to extract data from a Salesforce object, and so is subject to SOQL limits. If the query exceeds any of these limits, it may return no results or cause the dataflow job to fail. For example, The length of the SOQL query cannot exceed 20,000 characters. To reduce the SOQL query length, consider breaking up the extract into two or more sfdcDigest transformations and then use the augment transformation to combine the results. For example, you might create one sfdcDigest transformation to extract half of the fields and create another sfdcDigest transformation to extract the remaining fields. See [SOQL and SOSL Limits](#).
- The sfdcDigest transformation can extract data from Salesforce Big Objects, but incremental extract isn't supported and filtering is possible only on primary key fields.

IN THIS SECTION:

[Filtering Records Extracted from a Salesforce Object](#)

Add a filter to the `sfdcDigest` transformation to extract a subset of all records from a Salesforce object. You can filter records to reduce the number of extracted and processed records, exclude records that contain irrelevant or sensitive data, and increase dataflow performance.

[Overriding Salesforce Field Metadata](#)

You can override the field metadata that the `sfdcDigest` transformation extracts from a Salesforce object to make the data appear differently in a dataset. For example, Analytics can add a default value to records that have missing values for a field.

[Unsupported Salesforce Objects and Fields in Analytics](#)

The `sfdcDigest` transformation can't extract data from all Salesforce objects and fields. Consider these limitations before configuring the extraction of Salesforce objects.

[sfdcDigest Parameters](#)

When you define an `sfdcDigest` transformation, you set the action attribute to `sfdcDigest` and specify the parameters for the object and fields that you want to extract. Optionally, you can also specify parameters to filter the records extracted from the Salesforce object.

Filtering Records Extracted from a Salesforce Object


Add a filter to the `sfdcDigest` transformation to extract a subset of all records from a Salesforce object. You can filter records to reduce the number of extracted and processed records, exclude records that contain irrelevant or sensitive data, and increase dataflow performance.


A filter consists of one or more filter conditions, where each filter condition compares a field value to a value. For example, `Amount >= 1000000`. You can also apply SOQL functions on the field value in a filter condition, like `CALENDAR_YEAR (CreatedDate) = 2011`. You can add multiple filter conditions using logical operators AND, OR, and NOT. You can also use a backslash (\) to escape double quotes included in strings.

The `sfdcDigest` transformation extracts all records for which the filter is true. If you configured the `sfdcDigest` transformation for incremental extraction, the filter applies to data extracted during the incremental run only—Analytics doesn't apply the filter to records that were previously loaded into the dataset. If you add an invalid filter, the dataflow fails at run time.

For each instance of `sfdcDigest`, you can use one of the following types of filters:

- Structured filter
- Advanced filter

 **Tip:** Are you trying to decide whether to use a filter in the `sfdcDigest` transformation or use a filter transformation? Use a filter transformation to filter records at any point in the dataflow. For example, you can add it after the dataflow joins two datasets. However, to reduce the number of rows processed in the dataflow and optimize dataflow performance, add the filter closest to the point at which records are extracted—when possible, add the filter in the `sfdcDigest` transformation.

 **Note:** Filtering records extracted from Salesforce Big Objects is supported only on primary key fields in the `sfdcDigest` transformation.

IN THIS SECTION:

[Structured Filter in sfdcDigest Transformation](#)

You define a structured filter using JSON syntax.

Advanced Filter in sfdcDigest Transformation

You define an advanced filter using a Salesforce Object Query Language (SOQL) WHERE clause expression. Use an advanced filter only if you are familiar with SOQL.

SEE ALSO:

[sfdcDigest Transformation](#)

Structured Filter in sfdcDigest Transformation

You define a structured filter using JSON syntax.

A structured filter uses the following JSON syntax for each filter condition.

```
{
  "field": "<field name>",
  "operator": "<operator>",
  "value": "<value>"|["<value 1>", "<value 2>"],
  "isQuoted": true|false}
```

The value can be a number, date, string, list of strings, or [date literal](#). Analytics automatically quotes strings unless you set `isQuoted` to true, which indicates that the string is already quoted.

You can use one of the following operators in a filter condition.

Operator	Comment
=	<p>Filter condition is true if the value in the field equals the specified value. String comparisons using the equals operator are case-insensitive.</p> <p>Example:</p> <pre>"filterConditions": [{ "field": "OwnerId", "operator": "=", "value": "a07B00000012HYu" }]</pre>
!=	<p>Filter condition is true if the value in the field does not equal the specified value.</p> <p>Example (using backslashes to escape double quotes in a string value):</p> <pre>"filterConditions": [{ "field": "Nickname__c", "operator": "!=", "value": "\"Sammy\"" }]</pre>

Operator	Comment
>	<p>Filter condition is true if the value in the field is greater than the specified value.</p> <p>Example:</p> <pre>"filterConditions": [{ "field": "Amount", "operator": ">", "value": "100000" }]</pre>
<	<p>Filter condition is true if the value in the field is less than the specified value.</p> <p>Example (using a date literal):</p> <pre>"filterConditions": [{ "field": "CloseDate", "operator": "<", "value": "THIS_MONTH", "isQuoted": false }]</pre>
>=	<p>Filter condition is true if the value in the field is greater than or equal to the specified value.</p> <p>Example:</p> <pre>"filterConditions": [{ "field": "Amount", "operator": ">=", "value": "100000" }]</pre>
<=	<p>Filter condition is true if the value in the field is less than or equal to the specified value.</p> <p>Example (using a SOQL function):</p> <pre>"filterConditions": [{ "field": "CALENDAR_YEAR (CreatedDate)", "operator": "<=", "value": "2015", "isQuoted": true }]</pre>

Operator	Comment
	<pre> }]</pre>
LIKE	<p>Filter condition is true if the value in the field matches the specified value. The LIKE operator is similar to the LIKE operator in SQL; it provides a mechanism for matching partial text strings and supports wildcards.</p> <ul style="list-style-type: none"> • The % and _ wildcards are supported for the LIKE operator. • The % wildcard matches zero or more characters. • The _ wildcard matches exactly one character. • The LIKE operator is supported for string fields only. • The LIKE operator performs a case-insensitive match. • The LIKE operator supports escaping of special characters % or _. Use a backslash (\) to escape special characters. <p>Example:</p> <pre> "filterConditions": [{ "field": "FirstName", "operator": "LIKE", "value": "Chris%" }]</pre>
IN	<p>Filter condition is true if the value in the field equals any one of the values in the specified list. You can specify a quoted or non-quoted list of values. If the list is quoted, set <code>isQuoted</code> to true.</p> <p>Example:</p> <pre> "filterConditions": [{ "field": "StageName", "operator": "IN", "value": ["Closed Won", "Closed Lost"] }]</pre>
NOT IN	<p>Filter condition is true if the value in the field does not equal any of the values in the specified list.</p> <p>Example:</p> <pre> "filterConditions": [{ "field": "BillingState", "operator": "NOT IN", "value": ["California", "New York"] }]</pre>

Operator	Comment
	<pre> }]</pre>
INCLUDES	<p>For picklist or multi-select picklist fields only. Filter condition is true if the value in the picklist field includes the specified value.</p> <p>Example:</p> <pre> "filterConditions": [{ "field": "BillingState", "operator": "INCLUDES", "value": ["California"] }]</pre>
EXCLUDES	<p>For picklist or multi-select picklist fields only. Filter condition is true if the value in the picklist field excludes the specified value.</p> <p>Example:</p> <pre> "filterConditions": [{ "field": "BillingState", "operator": "EXCLUDES", "value": ["California", "New York"] }]</pre>

Let's look at a few examples of structured filters.



Example: Let's look at an example with a basic structured filter. To perform pipeline analysis on opportunities in fiscal quarter 2 of fiscal year 2015, you create this dataflow definition file to create the relevant dataset.


```


{
  "Extract_Filtered_Opportunities": {
    "action": "sfcdigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "AccountId" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "OwnerId" },
        { "name": "FiscalYear" },
        { "name": "FiscalQuarter" },
        { "name": "SystemModstamp" }
      ]
    }
  }
}
```

```

    ],
    "filterConditions": [
      {
        "field": "FiscalYear",
        "operator": "=",
        "value": "2015"
      },
      {
        "field": "FiscalQuarter",
        "operator": "=",
        "value": "2"
      }
    ]
  },
  "Register_Opportunities_Dataset": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "Opportunities_2015Q2",
      "name": "Opportunities_2015Q2",
      "source": "Extract_Filtered_Opportunities"
    }
  }
}

```

 **Note:** If you do not specify a logical operator for multiple filter conditions—as is the case in this example—Analytics applies AND between the conditions.

 **Example:** Let's look at an example of a structured filter with a logical operator. To help forecast expected revenue, you create this dataflow to view all opportunities that have either closed or have greater than 90% probability of closing.

```

{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "AccountId" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "OwnerId" },
        { "name": "Probability" },
        { "name": "FiscalYear" },
        { "name": "FiscalQuarter" }
      ],
      "filterConditions": [
        {
          "operator": "OR",
          "conditions": [
            {
              "field": "StageName",

```

```

        "operator": "=",
        "value": "Closed Won"
      },
      {
        "field": "Probability",
        "operator": ">=",
        "value": "90"
      }
    ]
  }
}
],
},
"Register_Opportunities_Dataset": {
  "action": "sfdcRegister",
  "parameters": {
    "alias": "OpportunitiesExpectedToWin",
    "name": "OpportunitiesExpectedToWin",
    "source": "Extract_Opportunities"
  }
}
}
}

```



Example: Finally, let's look at an example of a structured filter with nested logical operators. You create this dataflow to view all opportunities that closed in the current fiscal quarter and are owned by either one of your two direct reports.

```

{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "AccountId" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "OwnerId" },
        { "name": "FiscalYear" },
        { "name": "FiscalQuarter" }
      ],
      "filterConditions": [
        {
          "operator": "AND",
          "conditions": [
            {
              "field": "CloseDate",
              "operator": "=",
              "value": "THIS_FISCAL_QUARTER",
              "isQuoted": false
            },
            {
              "operator": "OR",

```

```

        "conditions": [
          {
            "field": "OwnerId",
            "operator": "=",
            "value": "00540000000HfUz"
          },
          {
            "field": "OwnerId",
            "operator": "=",
            "value": "00540000000HfV4"
          }
        ]
      }
    ]
  },
  "Register_Opportunities_Dataset": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "DirectReport_Opportunities",
      "name": "DirectReport_Opportunities",
      "source": "Extract_Opportunities"
    }
  }
}

```

Advanced Filter in sfdcDigest Transformation

You define an advanced filter using a Salesforce Object Query Language (SOQL) WHERE clause expression. Use an advanced filter only if you are familiar with SOQL.



Example: Let's look at an example of an advanced filter. You want to extract only opportunity records that are owned by a specific user and that have either high value or a high probability of closing. You create this dataflow.

```

{
  "Extract_Filtered_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "AccountId" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "Probability" },
        { "name": "OwnerId" }
      ],
      "complexFilterConditions": "OwnerId = '00540000000HfUz' AND (Amount > 100000 OR Probability > 75)"
    }
  }
}

```

```

    },
    "Register_Opportunities_Dataset": {
      "action": "sfdcRegister",
      "parameters": {
        "alias": "FilteredOpportunities",
        "name": "FilteredOpportunities",
        "source": "Extract_Filtered_Opportunities"
      }
    }
  }
}

```

Overriding Salesforce Field Metadata

You can override the field metadata that the sfdcDigest transformation extracts from a Salesforce object to make the data appear differently in a dataset. For example, Analytics can add a default value to records that have missing values for a field.

You can add the following field parameters to the sfdcDigest transformation to override the field metadata:

- defaultValue
- type
- fiscalMonthOffset
- isYearEndFiscalYear
- firstDayOfWeek
- isMultiValue
- multiValueSeparator
- precision
- scale

For a description of each of these field parameters, see [Field Parameters](#). For information about using metadata attributes to configure dates, see [Date Handling in Datasets](#).

 **Example:** Let's look at an example. You would like to override metadata extracted from the Opportunity object.

You add the bold text in the following dataflow definition to override field metadata from the Opportunity object.

```

{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        {
          "name": "Amount",
          "defaultValue": 0,
          "precision": 18,
          "scale": 2
        },
        { "name": "StageName" },
        {
          "name": "CloseDate",

```



```

        "fiscalMonthOffset":9,
        "firstDayOfWeek":2,
        "isYearEndFiscalYear":true
    },
    { "name":"AccountId" },
    { "name":"OwnerId" },
    {
        "name": "OpportunitySupportTeamMembers__c",
        "type":"Text",
        "isMultiValue":true,
        "multiValueSeparator":",",
        "precision":255
    }
]
},
"Register_Opportunities_Dataset":{
    "action":"sfdcRegister",
    "parameters":{
        "alias":"Opportunities",
        "name":"Opportunities",
        "source":"Extract_Opportunities"
    }
}
}
}

```

SEE ALSO:

[sfdcDigest Transformation](#)

Unsupported Salesforce Objects and Fields in Analytics

The sfdcDigest transformation can't extract data from all Salesforce objects and fields. Consider these limitations before configuring the extraction of Salesforce objects.

For information about all Salesforce objects and fields, see the [Object Reference for Salesforce and Force.com](#).

Unsupported Objects

The sfdcDigest transformation can't extract data from these Salesforce objects.

- ActivityMetric
- ApexEmailNotification
- AuthProvider
- BrandTemplate
- ChatterConversation
- ChatterConversationMember
- ChatterMessage
- ConnectedApplication
- ContentFolderLink

- ContentWorkspace
- ContentWorkspaceDoc
- ContentWorkspaceMember
- ContentWorkspacePermission
- CopyExport
- CorsWhitelistEntry
- DataAssessmentFieldMetric
- DataAssessmentMetric
- DataAssessmentValueMetric
- DataHubSetupData
- DataHubSetupDefinition
- DirectMessage
- DirectMessageFeed
- DirectMessageMember
- EmailCapture
- EmailDomainKey
- EmailServicesAddress
- EmailServicesFunction
- EmailTemplate
- EnvironmentHub
- EnvironmentHubInvitation
- EnvironmentHubMemberRel
- EventType
- EventTypeParameter
- FeedPollChoice
- FeedPollVote
- KnowledgeArticle
- KnowledgeArticleVersion
- KnowledgeArticleVersionHistory
- KnowledgeArticleViewStat
- KnowledgeArticleVoteStat
- LeadChangeEvent
- LoginGeo
- LoginHistory
- ModelFactor
- NetworkActivityAudit
- NetworkModeration
- OrganizationProperty
- OrgWideEmailAddress
- PackageLicense

- PartnerNetworkSyncLog
- ReputationLevel
- ReputationLevelLocalization
- ReputationPointsRule
- SalesforcelqUser
- SampledEntity
- SandOmInfo
- SandOmInfoDetail
- SandOmObserver
- ScoreIntelligence
- SearchPromotionRule
- SecurityCustomBaseline
- SelfServiceUser
- SsoUserMapping
- TenantSecret
- TwoFactorInfo
- TwoFactorTempCode
- UserPackageLicense
- UserProvAccount
- UserProvAccountStaging
- UserProvisioningConfig
- UserProvisioningLog
- UserProvisioningRequest
- UserProvisioningRequestOwnerSharingRule
- UserProvisioningRequestShare
- UserProvMockTarget
- UserRecordAccess
- VerificationHistory
- VoiceUserLine
- VoiceUserLineOwnerSharingRule
- VoiceUserLineShare
- VoiceVendorLine
- VoiceVendorLineOwnerSharingRule
- VoiceVendorLineShare
- WebLink
- WebLinkLocalization

The `sfdcDigest` transformation cannot extract data from external objects created in Salesforce. External objects are similar to custom objects, except that they map to data located outside Salesforce.

If you include an unsupported or inaccessible object in the `sfdcDigest` transformation, the dataflow fails at run time with an error message.

Unsupported Fields

The sfdcDigest transformation can't extract data from these fields.

Object	Unsupported Fields
Account	CleanStatus
ActionPlanItem	ItemId
AuthSession	<ul style="list-style-type: none"> LoginGeoid LoginHistoryId
CaseArticle	KnowledgeArticleId
Contact	<ul style="list-style-type: none"> CanAllowPortalSelfReg CleanStatus
ContentDocument	ParentId
CustomPerson__p	Title
DocumentAttachmentMap	ParentId
EmailMessage	ActivityId
EmailRoutingAddress	EmailServicesAddressId
EnvironmentHubMember	EnvironmentHubId
ExternalEventMapping	EventId
InstalledMobileApp	ConnectedApplicationId
Lead	CleanStatus
KnowledgeArticle	MasterLanguage
Network	<ul style="list-style-type: none"> CaseCommentEmailTemplateId ChangePasswordEmailTemplateId ForgotPasswordEmailTemplateId WelcomeEmailTemplateId
Organization	<ul style="list-style-type: none"> SelfServiceEmailUserOnCaseCreationTemplateId SelfServiceNewCommentTemplateId SelfServiceNewPassTemplateId SelfServiceNewUserTemplateId WebToCaseAssignedEmailTemplateId WebToCaseCreatedEmailTemplateId WebToCaseEmailTemplateId WebToLeadEmailTemplateId

Object	Unsupported Fields
PermissionSet	<ul style="list-style-type: none"> PermissionsEditEvent PermissionsEditTask
PermissionSetLicense	<ul style="list-style-type: none"> MaximumPermissionsEditEvent MaximumPermissionsEditTask
Profile	<ul style="list-style-type: none"> PermissionsEditEvent PermissionsEditTask
ThirdPartyAccountLink	SsoProviderId
User	<ul style="list-style-type: none"> LastPasswordChangeDate UserPreferencesEnableVoicePilot
WorkBadge	RewardId
WorkBadgeDefinition	RewardFundId

If you include a field with an unsupported field in the `sfdcDigest` transformation, the dataflow ignores the field.

In addition, Salesforce recommends that you do not extract data from the `MayEdit` field of the `Account` object. Extracting data from this field significantly decreases performance and can cause the dataflow to fail.

Unsupported Field Types

The `sfdcDigest` transformation can't extract data from fields with these field types.

- base64
- composite (like address and location)
- data category group reference
- encrypted string

If you include a field with an unsupported field type in the `sfdcDigest` transformation, the dataflow ignores the field.

SEE ALSO:

[sfdcDigest Transformation](#)



sfdcDigest Parameters

When you define an `sfdcDigest` transformation, you set the action attribute to `sfdcDigest` and specify the parameters for the object and fields that you want to extract. Optionally, you can also specify parameters to filter the records extracted from the Salesforce object.

You can specify parameters in the following sections of the `sfdcDigest` node: `parameters`, `fields`, and `filterConditions`.

Parameters

The following table describes the parameters in the `parameters` section.


Parameter	Required?	Value
object	Yes	API name of the Salesforce object from which you want to extract data. This object is the input source for this transformation. The <code>sfdcDigest</code> transformation doesn't support extraction from all Salesforce objects.
incremental	No	<p>Performs an incremental extraction, which extracts only changes to the Salesforce object since the last dataflow run. Valid values: true or false.</p> <p> Note: Incremental extraction:</p> <ul style="list-style-type: none"> • Is available if you have enabled replication. • Isn't supported for Salesforce big objects.
fullRefreshToken	No	<p>Performs a one-time full extraction to synchronize the data in the dataset with data in the Salesforce object. Specify any value for this parameter.</p> <p>After the full extraction, the dataflow performs an incremental extraction each time thereafter even though the <code>fullRefreshToken</code> parameter is included in the dataflow definition. To run a full extraction again, change the value of the <code>fullRefreshToken</code> parameter to a different value.</p> <p> Note: Incremental extraction is available if you have enabled replication.</p>
fields	Yes	<p>An array of names of all fields from which you want to extract data from the specified Salesforce object. The <code>sfdcDigest</code> transformation doesn't support extraction from all field types.</p> <p>See Field Attributes.</p>
filterConditions	No	A filter that restricts the records extracted from the specified Salesforce object. The <code>sfdcDigest</code> transformation extracts all records from the Salesforce object for which

Parameter	Required?	Value
		the filter is true. You can specify a structured or advanced filter. See Filter Conditions Parameters.
complexFilterConditions	No	For advanced filters only. A SOQL WHERE clause used to filter records extracted from the specified Salesforce object.

Field Attributes

The following table describes the attributes in the `fields` section. It also describes optional attributes that you can provide to override the field metadata. You can override the metadata that the `sfdcDigest` transformation extracts from a Salesforce object to make the data appear differently in a dataset. For example, Analytics can add a default value to records that have missing values for a field. If you don't override the values, Analytics gets the values from Salesforce.

Attribute	Required?	Value
name	Yes	API name of the field in the Salesforce object that you want to include in the dataset. You can specify multiple fields.
defaultValue	No	For text and numeric fields that can be null. Default value that replaces a null value for the specified field.
type	No	Analytics field type associated with the specified field. Valid types are Text, Numeric, or Date. Any value, including numeric values, can be Text. For example, by default, fiscal quarter from Salesforce objects is Number. However, you can change it to Text. Specify a type to override the type determined by Analytics. Example: <pre>"type": "Text"</pre>
fiscalMonthOffset	No	For date fields only. The difference, in months, between the first month of the fiscal year and the first month of the calendar year (January). For example, if the fiscal year starts in January, the offset is 0. If the fiscal year starts in October, the offset is 9. Example: <pre>"fiscalMonthOffset": 9</pre>

Attribute	Required?	Value
		<p> Note: This attribute also controls whether Analytics generates fiscal date fields. To generate fiscal date fields, set <code>fiscalMonthOffset</code> to a value other than 0.</p> <p>For more information, see Date Handling in Datasets.</p>
isYearEndFiscalYear	No	<p>For date fields only. Indicates whether the fiscal year is the year in which the fiscal year ends or begins. Because the fiscal year can start in one calendar year and end in another, you must specify which year to use for the fiscal year.</p> <ul style="list-style-type: none"> • If true, then the fiscal year is the year in which the fiscal year ends. The default is true. • If false, then the fiscal year is the year in which the fiscal year begins. <p>Example:</p> <pre>"isYearEndFiscalYear": true</pre> <p>This field is relevant only when <code>fiscalMonthOffset</code> is greater than 0.</p> <p>For more information, see Date Handling in Datasets.</p>
firstDayOfWeek	No	<p>For date fields only. The first day of the week for the calendar year and, if applicable, fiscal year. Use 0 to set the first day to be Sunday, 1 to set the first day to be Monday, and so on. Use -1 to set the first day to be on January 1. The default is -1.</p> <p>Example:</p> <pre>"firstDayOfWeek": 0</pre> <p>For more information, see Date Handling in Datasets.</p>
isMultiValue	No	<p>For text fields only. Indicates whether the specified field has multiple values.</p> <p>Example:</p> <pre>"isMultiValue": false</pre>

Attribute	Required?	Value
multiValueSeparator	No	<p>For text fields only. Character used to separate multiple values in the specified field when isMultiValue equals true. This value defaults to a semicolon (;) if you do not specify a value and isMultiValue equals true. Set to null when isMultiValue equals false.</p> <p>Example:</p> <pre>"multiValueSeparator": ";"</pre>
precision	No	<p>The maximum number of digits in a numeric value, or the length of a text value. For numeric values: Includes all numbers to the left and to the right of the decimal point (but excludes the decimal point character). Value must be between 1 and 18, inclusive. For text values: Value defaults to 255 characters, and must be between 1 and 32,000 characters, inclusive.</p> <p>Example:</p> <pre>"precision": 10</pre>
scale	No	<p>The number of digits to the right of the decimal point in a numeric value. Must be less than the precision value. Value must be between 0 and 17 characters, inclusive.</p> <p>Example:</p> <pre>"scale": 2</pre>

Filter Conditions Parameters

The following table describes the structured filter parameters in the `filterConditions` section. These parameters do not apply to advanced filters.

Parameter	Required?	Value
field	No	<p>The field in the Salesforce object on which you want to apply a filter condition. Each filter condition in a structured filter uses the following syntax:</p> <pre>{ "field": "<field name>",</pre>

Parameter	Required?	Value
		<pre>"operator": "<operator>", "value": "<value>", "isQuoted": true false}</pre>
operator	No	<p>The purpose depends on the context.</p> <ul style="list-style-type: none"> operator can be used as a comparison operator—like =, <, and IN—that compares the field value against a constant value. operator can also be used as a logical operator (AND, OR, or NOT) that links multiple filter conditions together. <p>In the example below, the bold operator is the logical operator. The other instances of operator are comparison operators.</p> <pre>"filterConditions": [{ "operator": "OR", "conditions": [{ "field": "StageName", "operator": "=", "value": "Closed Won" }, { "field": "Probability", "operator": ">=", "value": "90" }] }]</pre>
value	No	The value used in a filter condition.
isQuoted	No	<p>Indicates whether you quoted the string value in a filter condition.</p> <p>Example with quoted values:</p> <pre>"filterConditions": [{</pre>

Parameter	Required?	Value
		<pre> "field": "StageName", "operator": "IN", "value": "('Closed Won', 'Closed Lost')", "isQuoted": true }] </pre> <p>Example with non-quoted values:</p> <pre> "filterConditions": [{ "field": "StageName", "operator": "IN", "value": ["Closed Won", "Closed Lost"], "isQuoted": false }] </pre> <p>If you don't include isQuoted for a filter on a string value, Analytics assumes that the string value is not quoted and adds the quotes for you.</p>
conditions	No	Use to specify a logical operator to link multiple filter conditions together.

SEE ALSO:

[sfdcDigest Transformation](#)

[Filtering Records Extracted from a Salesforce Object](#)


sfdcRegister Transformation

The sfdcRegister transformation registers a dataset to make it available for queries. Users cannot view or run queries against unregistered datasets.

You don't need to register all datasets. For example, you don't need to register an intermediate dataset that is used to build another dataset and does not need to be queried. In addition, you don't need to register datasets that are created when you upload external data because Analytics automatically registers these datasets for you.

Carefully choose which datasets to register because:

- The total number of rows in all registered datasets cannot exceed 250 million per platform license.
- Users that have access to registered datasets can query their data. Although, you can apply row-level security on a dataset to restrict access to records.

 **Example:** Let's look at an example. You create a dataflow that extracts opportunities from the Opportunity object. To register the dataset, name it "Opportunities," and apply row-level security on it, you add the `sfdcRegister` transformation as shown in the following dataflow definition file.

```
{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    }
  },
  "Register_Oppportunities_Dataset": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "Opportunities",
      "name": "Opportunities",
      "source": "Extract_Opportunities",
      "rowLevelSecurityFilter": "'OwnerId' == \"\$User.Id\""
    }
  }
}
```

IN THIS SECTION:

[sfdcRegister Parameters](#)



When you define an `sfdcRegister` transformation, you set the action attribute to `sfdcRegister` and specify the parameters.

sfdcRegister Parameters

When you define an `sfdcRegister` transformation, you set the action attribute to `sfdcRegister` and specify the parameters.

The following table describes the input parameters:

Parameter	Required?	Value
alias	Yes	API name of the registered dataset. This name can contain only underscores and alphanumeric characters, and must be unique among other dataset aliases in your organization. It must begin with a letter, not include spaces, not end with an underscore, and not contain two consecutive underscores. It also cannot exceed 80 characters.

Parameter	Required?	Value
name	Yes	<p>Display name of the registered dataset. The name cannot exceed 80 characters.</p> <p> Note: To change the name after you create the dataset, you must edit the dataset.</p>
source	Yes	<p>Node in the dataflow definition file that identifies the dataset that you want to register. This is the input source for this transformation.</p>
rowLevelSecurityFilter	No	<p>The predicate used to apply row-level security on the dataset when the dataset is first created.</p> <p>Example: "rowLevelSecurityFilter": "OwnerId" == "\$User.Id"</p> <p> Note: To change the predicate after you create the dataset, you must edit the dataset.</p> <p>When entering the predicate in the Register transformation of the dataflow JSON, you must escape the double quotes around string values.</p> <p>After the dataset is created, Analytics ignores its security predicate setting in the dataflow. To change the security predicate for an existing dataset, edit the dataset in the user interface.</p>

SEE ALSO:

[sfdcRegister Transformation](#)

sliceDataset Transformation

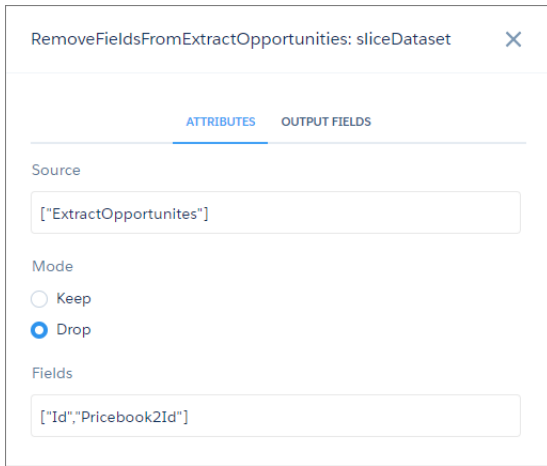
The sliceDataset transformation removes fields from a dataset in your dataflow, leaving you with a subset of fields for use in a new dataset or in other transformations. This allows you to create multiple datasets, each with different sets of fields from a single dataset.

The transformation includes the `mode` parameter, which lets you choose between two modes: `drop` or `select`. Set it to `drop` to remove the fields you specify. Set it to `select` to keep the fields you specify.



Example: Here's an example. Let's say your dataflow contains an `sfdcDigest` node, `ExtractOpportunities`, that extracts all fields from the Opportunity object. However, some of your users don't want Id fields in their Opportunities dataset. You resolve this by adding a sliceDataset node to your dataflow, specifying the source node, the fields you want to remove from that node, and `drop` mode.

sliceDataset Node in Dataflow Editor



sliceDataset Node in Dataflow JSON

```
{
  "RemoveFieldsFromExtractOpportunities":
  {
    "action": "sliceDataset",
    "parameters": {
      "source": "ExtractOpportunities",
      "mode": "drop",
      "fields": [
        {
          "name": "Id"
        },
        {
          "name": "Pricebook2Id"
        }
      ]
    }
  }
}
```


IN THIS SECTION:

[sliceDataset Parameters](#)

Add a sliceDataset transformation to a dataflow either in the dataflow editor, or directly in the JSON dataflow definition file. The parameters you specify are the same for both methods.

sliceDataset Parameters

Add a sliceDataset transformation to a dataflow either in the dataflow editor, or directly in the JSON dataflow definition file. The parameters you specify are the same for both methods.

To add a sliceDataset transformation in the dataflow editor, click .

To add a sliceDataset transformation in the JSON definition file, add a node and set the action attribute to `sliceDataset`.

The following table describes the input parameters:

Parameter	Required?	Value
source	Yes	Node in the dataflow definition file that identifies the dataset that you want to slice. This is the input source for this transformation.
mode	Yes	The action you want to take on the specified fields. Set it to <code>drop</code> to <i>remove</i> the fields. Set it to <code>select</code> to <i>keep</i> the fields.

Parameter	Required?	Value
fields	Yes	An array of names of the fields that you want to drop or select from the specified source node.

update Transformation

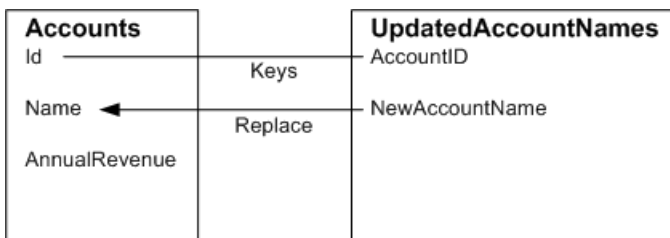
The update transformation updates the specified field values in an existing dataset based on data from another dataset, which we'll call the lookup dataset. The transformation looks up the new values from corresponding fields in the lookup dataset. The transformation stores the results in a new dataset.

When you create the transformation, you specify the keys that are used to match records between the two datasets. To dictate which field in the lookup dataset updates the field in the source dataset, you also map the corresponding fields from both datasets.



Example: Let's look at an example. You have an existing Accounts dataset that contains account information—Id, Name, and AnnualRevenue. Unfortunately, some of the account names in the dataset are now incorrect because of a series of mergers and acquisitions. To quickly update the account names in the dataset, you perform the following tasks.

1. Create a .csv file that contains the new account names and associated account IDs for accounts that have name changes.
2. Upload the .csv file to create a dataset called UpdatedAccountNames.
3. Create a dataflow definition file to update account names in the Accounts dataset by looking up the new account names in the UpdatedAccountNames dataset.



You create the following dataflow definition file.

```

{
  "Extract_AccountDetails": {
    "action": "sfcdigest",
    "parameters": {
      "object": "Account",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "AnnualRevenue" }
      ]
    }
  },
  "Extract_UpdatedAccountNames": {
    "action": "edgemart",
    "parameters": { "alias": "UpdatedAccountNames" }
  },
  "Update_AccountRecords": {

```

```

    "action": "update",
    "parameters": {
      "left": "Extract_AccountDetails",
      "right": "Extract_UpdatedAccountNames",
      "left_key": [ "Id" ],
      "right_key": [ "AccountID" ],
      "update_columns": { "Name": "NewAccountName" }
    }
  },
  "Register_UpdatedAccountRecords": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "Accounts",
      "name": "Accounts",
      "source": "Update_AccountRecords"
    }
  }
}

```



Example: Let's look at another example, where a composite key is used to match records between both datasets. In this case, you match records using the account ID and account name fields.

You create the following dataflow definition file.

```

{
  "Extract_AccountDetails": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Account",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "AnnualRevenue" }
      ]
    }
  },
  "Extract_UpdatedAccountNames": {
    "action": "edgemart",
    "parameters": { "alias": "UpdatedAccountNames" }
  },
  "Update_AccountRecords": {
    "action": "update",
    "parameters": {
      "left": "Extract_AccountDetails",
      "right": "Extract_UpdatedAccountNames",
      "left_key": [ "Id", "Name" ],
      "right_key": [ "AccountId", "NewAccountName" ],
      "update_columns": {
        "Name": "NewAccountName",
        "CreateDate": "NewCreateDate",
        "AnnualRevenue": "NewAnnualRevenue"
      }
    }
  },
  "Register_UpdatedAccountRecords": {

```



```

    "action": "sfdcRegister",
    "parameters": {
      "alias": "Accounts",
      "name": "Accounts",
      "source": "Update_AccountRecords"
    }
  }
}

```

IN THIS SECTION:

[update Parameters](#)


When you define an update transformation, you set the action attribute to `update` and specify the parameters.

update Parameters

When you define an update transformation, you set the action attribute to `update` and specify the parameters.

The following table describes the input parameters.

Parameter	Required?	Value
left	Yes	Node in the dataflow definition file that identifies the dataset that contains the records that you want to update.
right	Yes	Node in the dataflow definition file that identifies the lookup dataset that contains the new values.
left_key	Yes	Key column in the left dataset used to match records in the other dataset. If you use a composite key, the left and right keys must have the same number of columns in the same order. For an example, see update Transformation on page 167.
right_key	Yes	Key column in the right dataset used to match records in the other dataset. If you use a composite key, the left and right keys must have the same number of columns in the same order.
update_columns	No	An array of corresponding columns between the left and right datasets. Use the following syntax: <code>"update_columns": { "LeftColumn1": "RightColumn1", "LeftColumn2": "RightColumn2", ... "LeftColumnN":</code>

Parameter	Required?	Value
		<p>"RightColumnN" }. The value from right column replaces the value from the corresponding left column. The field types of the left and right column must match.</p> <p> Note: If you specify a column name that does not exist, the dataflow fails.</p> <p>If you do not specify this parameter, the transformation updates the left dataset by matching all columns in the right dataset with those in the left. In this case, the right column names must match exactly with the left column names. Otherwise, an error might occur.</p>

SEE ALSO:

[update Transformation](#)

Overriding Metadata Generated by a Transformation

Optionally, you can override the metadata that is generated by a transformation. You can override object and field attributes. For example, you can change a field name that is extracted from a Salesforce object so that it appears differently in the dataset. To override the metadata, add the overrides to the Schema section of the transformation in the dataflow definition file.

In the Schema section, you can override the metadata attributes for one object only.

The Schema section in this sample sfdcDigest transformation contains metadata overrides:

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available for an additional cost in: **Enterprise**, **Performance**, and **Unlimited** Editions

```
"Extract_Opportunities": {
  "action": "sfdcDigest",
  "parameters": {
    "object": "Opportunity",
    "fields": [
      { "name": "Name" },
      { "name": "Amount" }
    ]
  },
  "schema": {
    "objects": [
      {
        "label": "Sales Opportunities",
        "fields": [
          {
```

```

        "name": "Amount",
        "label": "Opportunity Amount"
      }
    ]
  }
}

```

Object Attributes

You can override the following object attributes.

Object Attribute	Type	Description
label	String	The display name for the object. Can be up to 40 characters. Example: <code>"label": "Sales Data"</code>
description	String	The description of the object. Must be less than 1,000 characters. Add a description to annotate an object in the dataflow definition file. This description is not visible to users in the Analytics user interface. Example: <code>"description": "The SalesData object tracks basic sales data."</code>
fields	Array	The array of fields for this object.

Field Attributes

You can override attributes of each specified dataset field.


Field Attribute	Type	Description
name	String	Name of the field in the dataset. Identifies the field that you want to override. Examples: <code>"name": "Amount"</code> <code>"name": "Role.Name"</code>
label	String	The display name for the field. Can be up to 255 characters. Example: <code>"label": "Opportunity Amount"</code>
description	String	The description of the field. Must be less than 1,000 characters.


Field Attribute	Type	Description
		<p>Add a description to annotate a field in the dataflow definition file. This description is not visible to users in the Analytics user interface.</p> <p>Example:</p> <pre>"description": "The Amount field contains the opportunity amount."</pre>
<code>isSystemField</code>	Boolean	<p>Indicates whether this field is a system field to be excluded from query results.</p> <p>Example:</p> <pre>"isSystemField": false</pre>
<code>format</code>	String	<p>The display format of the numeric value.</p> <p>Examples:</p> <pre>"format": "\$#,##0.00" (Numeric)</pre> <p>For more information about valid formats, see Numeric Formats.</p>

Numeric Formats

An example of a typical numeric value is \$1,000,000.99, which is represented as `$#,##0.00`. You are required to specify the precision and scale of the number. The format is specified by using the following symbols:

Symbol	Meaning
0	One digit. Use to add leading or trailing 0s, like <code>#,###.00</code> for \$56,375.00.
#	Adds zero or one digit
.	Default symbol used as the decimal separator. Use the <code>decimalSeparator</code> field to set the decimal separator to a different symbol.
-	Minus sign
,	Grouping separator
\$	Currency sign

 **Note:** The format for numeric values isn't used in data ingestion. It is used only to specify how numeric values are formatted when displayed in the UI. Also, you can't override date formats.

 **Example:** Let's consider an example where you want to override the following object and field attributes that the `sfdcDigest` transformation extracts from the Opportunity object.

Object/Field	Attribute Changes
Opportunity object	<ul style="list-style-type: none"> Change the object label to "Sales Opportunities" Add an object description

Object/Field	Attribute Changes
Id field	<ul style="list-style-type: none"> • Change the field label to "Opportunity Id" • Hide the field from queries
Amount field	<ul style="list-style-type: none"> • Change the field label to "Opportunity Amount" • Change the format to \$#,##0.00
CloseDate field	<ul style="list-style-type: none"> • Change the field label to "Closing Date"

To override the attributes, you add the Schema section with the override values to sfdcDigest in the dataflow definition file.

```
{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    },
    "schema": {
      "objects": [
        {
          "label": "Sales Opportunities",
          "description": "These are all sales opportunities.",
          "fields": [
            {
              "name": "Id",
              "label": "Opportunity Id",
              "isSystemField": true
            },
            {
              "name": "Amount",
              "label": "Opportunity Amount",
              "format": "$#,##0.00"
            },
            {
              "name": "CloseDate",
              "label": "Closing Date"
            }
          ]
        }
      ]
    }
  }
}
```

```

    }
  },
  "Register_Dataset_Opportunities": {
    "action": "sfdcRegister",
    "parameters": {
      "source": "Extract_Opportunities",
      "alias": "Opportunities",
      "name": "Opportunities"
    }
  }
}

```

! **Important:** Analytics removes Schema sections from all transformations except sfdcDigest when you add a dataflow to a package. If you intend to package a dataflow, we recommend that you specify field attributes in the transformation itself, instead of in a schema section. For example, this computeRelative transformation uses a label attribute to change a field's label.

```

"CalcAmountAfterdiscount": {
  "action": "computeExpression",
  "parameters": {
    "mergeWithSource": true,
    "source": "getOpps",
    "computedFields": [
      {
        "name": "DiscountedAmount",
        "label": "Discounted Amount",
        "type": "Numeric",
        "saqlExpression": "Amount * Discount_Percentage__c",
        "precision": 10,
        "scale": 2
      }
    ]
  }
},

```

Bring Data into Analytics

There are two main steps involved in integrating your data: loading and preparing. Loading is the process of bringing data into Analytics from its source, in a form that can be either explored right away or prepared further for later exploration.

The tool you choose to load your data depends on your data source. For example, you can load data from Salesforce objects with a dataflow, or load external data from a web-based data warehouse service with a connector. You can also load external data directly from a .csv file or from Microsoft Excel.

IN THIS SECTION:

[Load Salesforce Data with the Dataset Builder and the Dataflow](#)

Use the dataset builder to create a single dataset based on data from one or more related Salesforce objects. The dataset builder adds transformations to extract, augment, and register the data in a new or existing dataflow. The dataset is created the next time the selected dataflow runs, and refreshes each time the dataflow subsequently runs. You can edit the dataflow to add transformations before you create the dataset.

Trend Salesforce Data in Analytics

By creating trending Analytics dashboards that track key metrics over time, you can make sense of your growing, ever-changing datasets. Trending data in Analytics helps you discover hidden insights and allows you to share them with colleagues. When you create a trending dashboard based on a Salesforce report, Analytics generates a dataset and a dashboard based on the underlying Salesforce data.

Connect to Salesforce and External Data with Replication and Connectors

Use replication in Analytics to extract data from its source and load it into intermediate unregistered datasets. These replicated datasets are available for use in dataflows and dataset recipes. Replication has two main benefits. First, it optimizes your dataflows by extracting your Salesforce data in a separate job ahead of time. Second, replication comes with a host of connectors that let you connect to external data and replicate it, ready for use in your dataflows and recipes.

Load External Data from CSV and Microsoft® Excel

You can load external data directly into a dataset from a .csv file or from Microsoft Excel. The dataset can be explored right away in a lens, added to a dashboard, or prepared with other data in a dataflow or recipe.

Load Salesforce Data with the Dataset Builder and the Dataflow

Use the dataset builder to create a single dataset based on data from one or more related Salesforce objects. The dataset builder adds transformations to extract, augment, and register the data in a new or existing dataflow. The dataset is created the next time the selected dataflow runs, and refreshes each time the dataflow subsequently runs. You can edit the dataflow to add transformations before you create the dataset.

1. On the home page or on an app page, click **Create > Dataset**.
2. Select **Salesforce** as the data source, and then click **Continue**. The New Dataset dialog opens.

3. Enter a name for the dataset.

EDITIONS


Available in: Salesforce Classic and Lightning Experience

Available for an additional cost in: **Enterprise**, **Performance**, and **Unlimited** Editions


USER PERMISSIONS

To access the dataset builder:

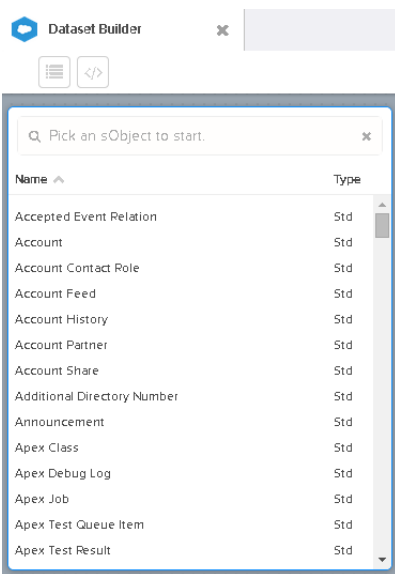
- Edit Analytics Dataflows


 **Note:** If you enter a dataset name that is already used, when you create the dataset, the dataset builder appends a number to the dataset name. For example, if you entered MyOpportunities, the dataset builder creates MyOpportunities1. The dataset name cannot exceed 80 characters.

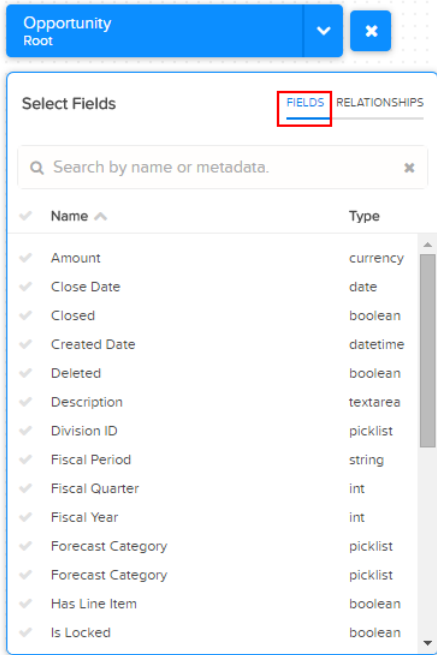
4. Select a dataflow to add the dataset transformations to. You can select an existing dataflow, or a new dataflow.
 - a. To add the transformations to an existing dataflow, select **Add to existing dataflow**, and then select the dataflow from the list.
 - b. To add the transformations to a new dataflow, select **Add to new dataflow**, and then enter a name for the new dataflow.

 **Note:** The option to add to a new dataflow is only available if you have enabled replication in your org.

5. Click **Next**.
The dataset builder opens inside the dataflow editor.




6. Select the root object.
The root object is the lowest level child object that you can add to the canvas. After you select the root object, you can add only parent objects of the root object—you can't add its child objects. To change the root object, refresh the page and start over.
7. Hover over the root object, and then click .
The Select Fields dialog box appears. By default, the Fields tab appears and shows all available object fields from which you can extract data.

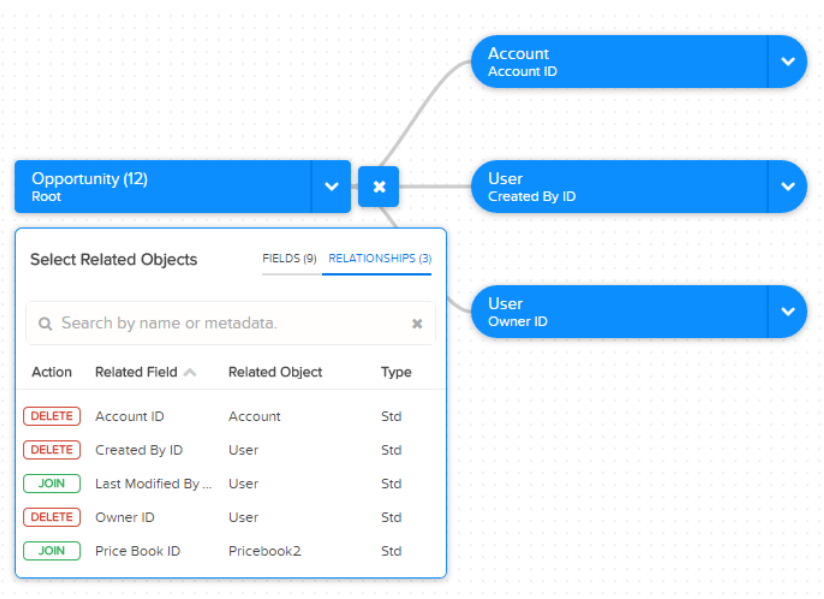


 **Note:** You can view this dialog box for any object included in the canvas.


- In the Fields tab, select the fields from which you want to extract data.
To locate fields more quickly, you can search for them or sort them by name or type.

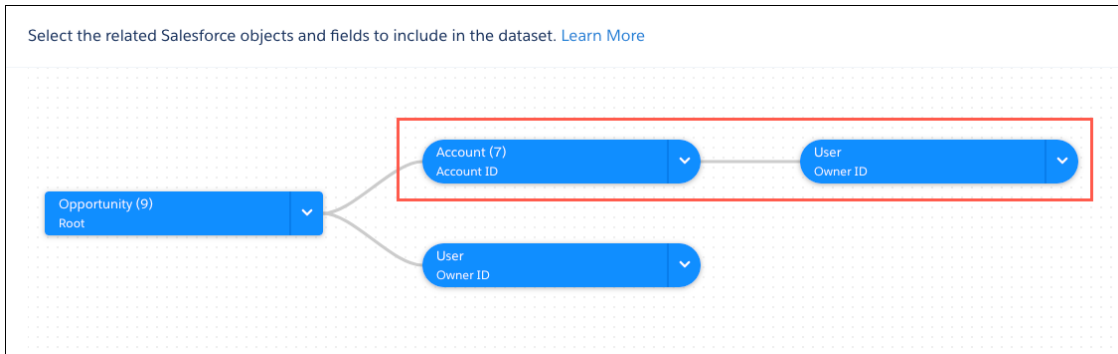
 **Important:** Select at least one field for each object that you add to the canvas. If you add an object and don't add any of its fields, the dataflow fails at run time.

- In the Relationships tab, click **Join** to add the related objects to the canvas.
When you add a related object, the related object appears in the canvas.



10. To remove a related object, click **Delete**.

 **Warning:** When you delete a related object, you also delete all objects that descend from the related object. For example, if you delete Account shown below, you delete the branch that contains Account and User.



11. For each related object, select the fields from which you want to extract data.

12. To move the entire diagram, select a white space in the canvas and drag it.
You might need to move the diagram to view a different section of the diagram.

13. When you have finished adding objects and fields, click **Next**.
The transformations for the new dataset are added to the dataflow you selected.

14. Select the app that will contain the dataset, if it's not already selected.

15. To open the dataset editor to view or edit the dataflow in that you added the transformations to, click **Edit Dataflow**. To run the dataflow now to create the dataset, click **Create Dataset**.

 **Note:** To edit the dataflow, you must select the Shared App for the dataset.

Trend Salesforce Data in Analytics

By creating trending Analytics dashboards that track key metrics over time, you can make sense of your growing, ever-changing datasets. Trending data in Analytics helps you discover hidden insights and allows you to share them with colleagues. When you create a trending dashboard based on a Salesforce report, Analytics generates a dataset and a dashboard based on the underlying Salesforce data.

Trending refers to data that is displayed over a timeline, allowing trends and patterns to emerge which can be difficult to recognize in a sea of information. If the relevant data is plotted over time, questions on sales cycles, performance, comparisons, seasonality, and more can be answered at a glance. Any data that can be visualized in time, such as opportunities or cases, can be trended. So can geographical data, such as quarterly sales in specific regions. In fact, any regularly updated dataset which has dates associated with it (a date or timestamp attribute for each row) can be trended.

IN THIS SECTION:

[Trend Salesforce Reports](#)

To trend data in Analytics, you trend a report that's collecting that data.

[Stop Trending Salesforce Reports](#)

The number of reports you can trend is limited. To remain under the limit so you can trend other reports, stop trending reports that are no longer needed.

[Share Trending Dashboards](#)

You can share a trended dashboard just as you can with any Analytics dashboard.

[Limits and Limitations for Trending Data in Analytics](#)

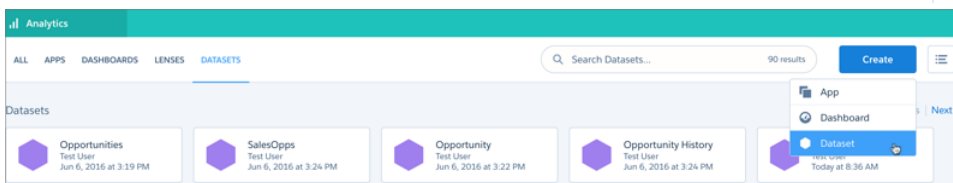
To prevent the performance of your org from degrading, certain limitations are placed on the size of the snapshots and the number of trended datasets each user can create.

Trend Salesforce Reports

To trend data in Analytics, you trend a report that's collecting that data.

Watch a Demo: [▶ Trend in Analytics](#)

1. Create a dataset.

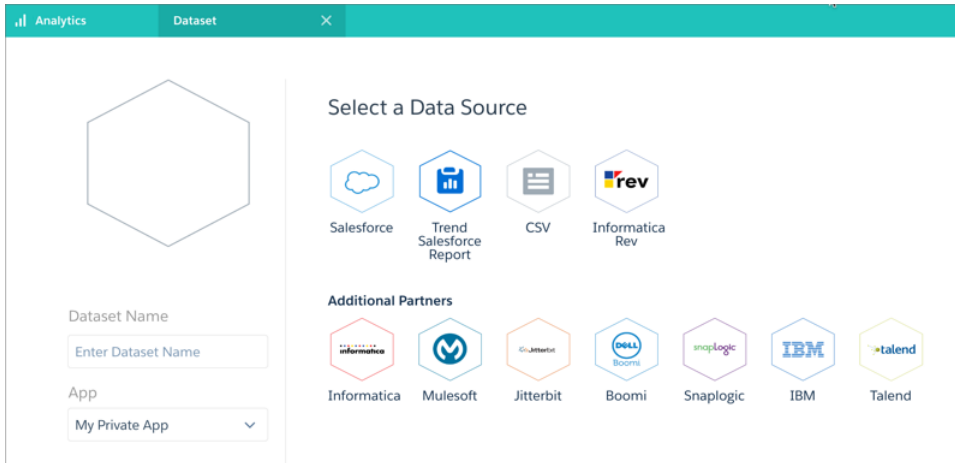


2. Choose **Trend Salesforce Report** from the available data sources.

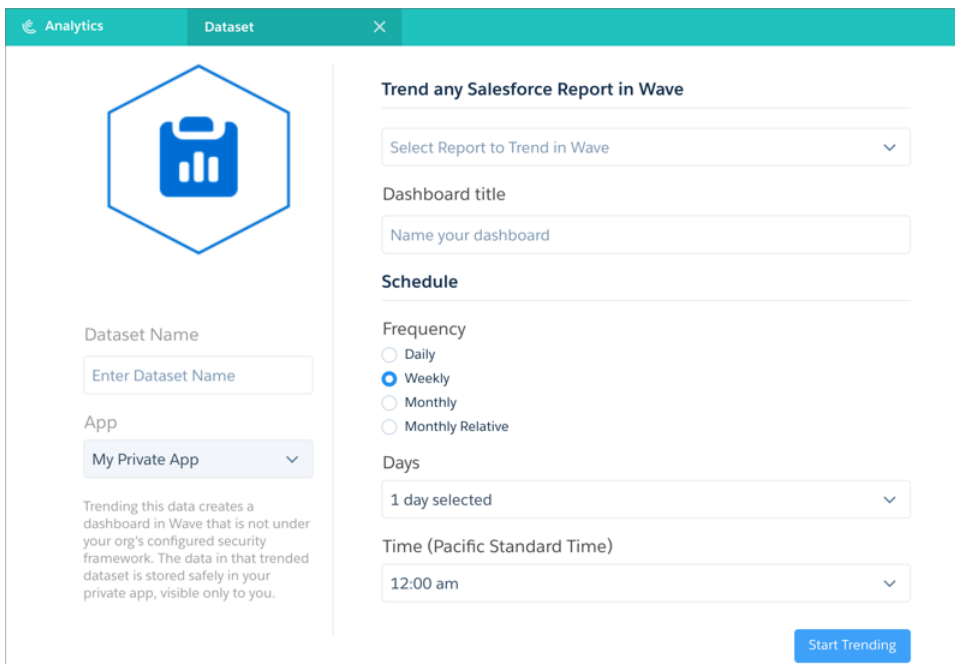
USER PERMISSIONS

To trend reports in Analytics:


- Use Analytics OR Use Analytics Templated Apps
- AND
- Trend Report Data in Analytics




3. Select a report.



If the report you want to trend does not exist, you must create it first.

 **Note:** Only the saved version of a report is trended. If you've made unsaved changes to a report, then trend the report, the changes are not reflected in the trending dashboard.

4. Enter a title for the trending dashboard and the new trending dataset.
5. Set a schedule for updating the dashboard. This sets the frequency of how often snapshots of report data are taken.

 **Note:**

- Once you set the schedule, it can't be changed.
- If you choose a schedule that updates on the 29th, 30th, or 31st of the month, no updates will occur on months that have too few days to meet that schedule.
- To avoid unwanted behavior during changes to daylight savings, don't choose 2 A.M. as an update time.

6. Choose a different app if you do not want to save the trending dataset in **My Private App**.

If you save the dataset to a shared app, all users who can view that app can view the dataset.

7. Click **Start Trending.**

When the new trending dashboard is ready, you'll receive an email with a link. Once the dashboard is ready, you can also begin to explore the associated dataset, which appears in the Analytics datasets list.

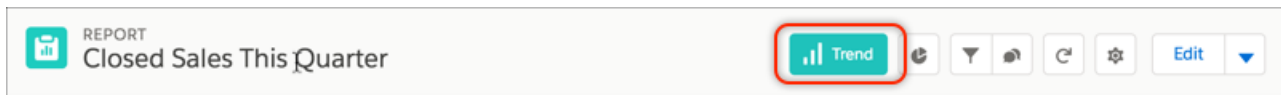
8. Connect to the new trending dashboard using the link in the notification email, or by going to the app in which you saved it (after receiving the notification email).



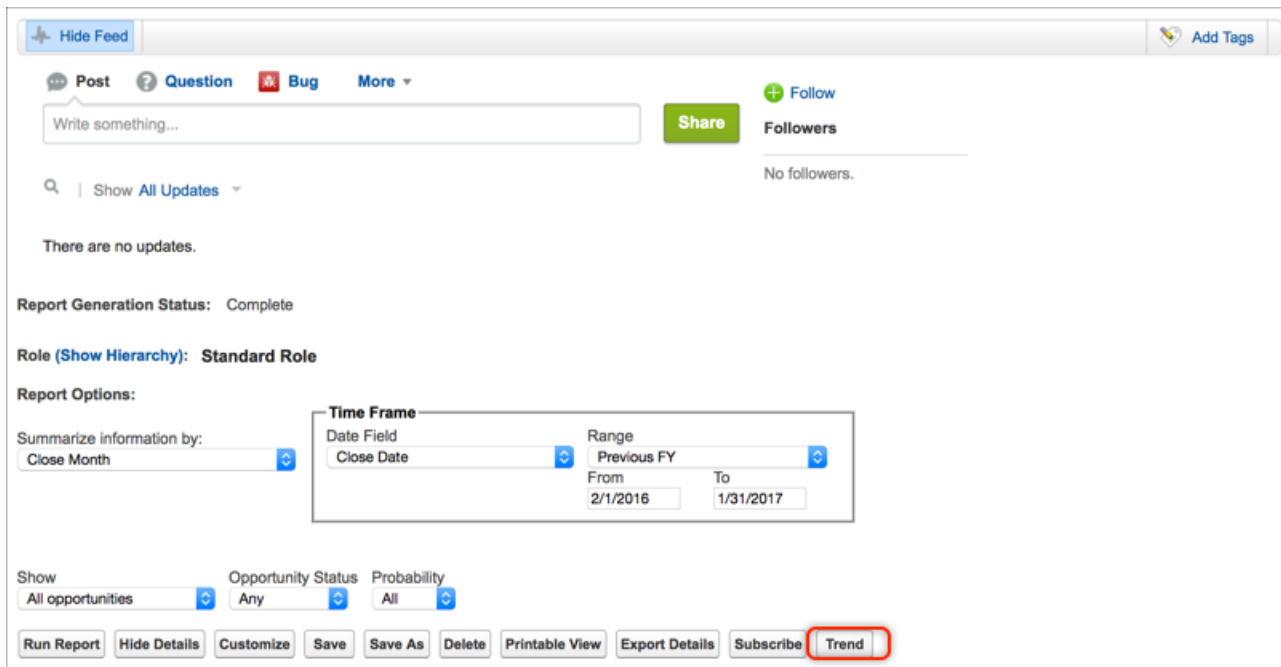
Note: At first, the trending dashboard displays only 1 data point. As snapshots are taken and added to the new Analytics trending dataset underlying the dashboard, more data points are added.

You can also trend any report directly by clicking **Trend** on that report.

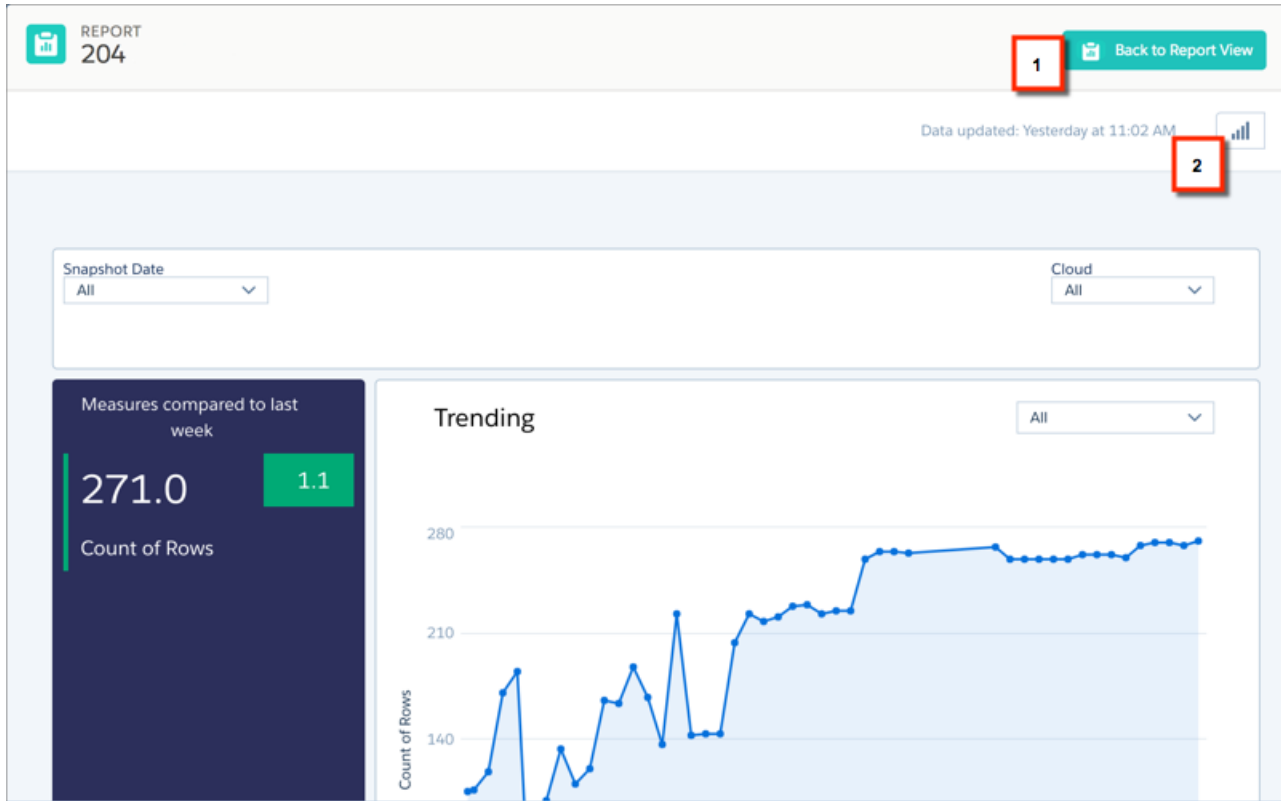
In Lightning Experience:



In classic Salesforce:



Once you start trending, the **Trend** button on the report becomes **View Trend**. If you click that button in Lightning Experience, an embedded dashboard appears.



To return to the report, click **Back to Report View** (1). To view the report in Analytics, click the Analytics button (2).

For best results with trending, follow these guidelines:

- Do not attempt to trend matrix reports. These reports do not have the required structure to be trended.
- Choose reports that have changes on a frequency matching the trending schedule you set up.
- Always clone the source reports into your personal folders. After you start trending, don't edit the reports. Keeping the report unchanged ensures a consistent view. If you plan to share trending dashboards, save them to view-only apps. This keeps the data consistent and prevents anomalies from appearing on the trending Analytics dashboard.
- To get focused, easily observable, and actionable insights, tightly scope source reports. For example, trend only new business deals closing in the current quarter rather than all opportunities. A broad scope makes it more difficult to spot trends.
- Group and summarize your reports in the report builder with key information before you start trending them.
- Do not create joined reports just for trending. Trending dashboards can't be created from joined reports.

Stop Trending Salesforce Reports

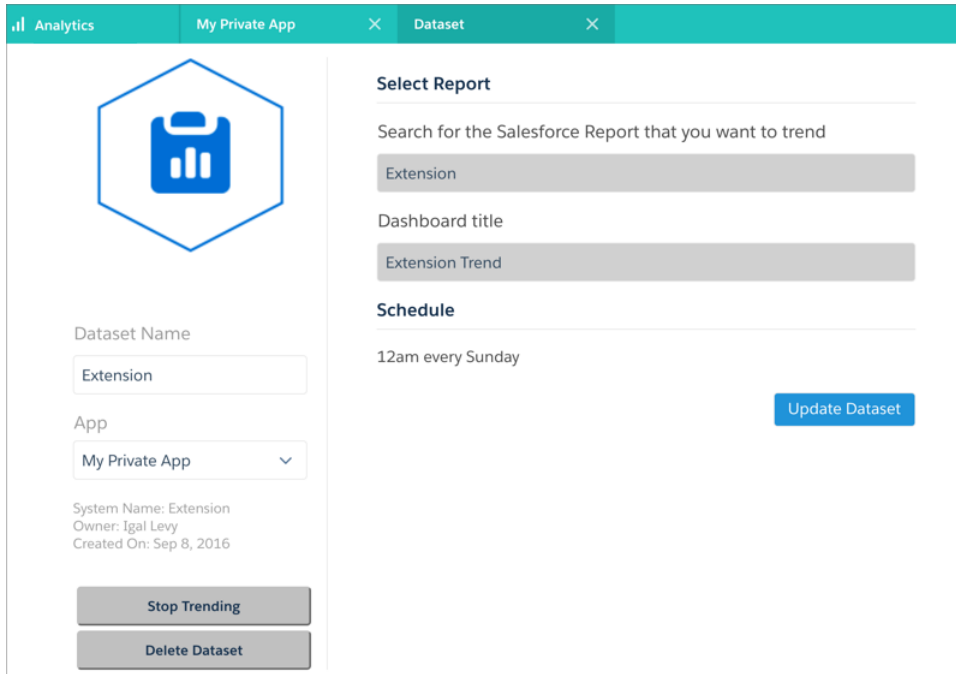
The number of reports you can trend is limited. To remain under the limit so you can trend other reports, stop trending reports that are no longer needed.

To stop trending from Analytics, open the trending dataset by choosing to edit it, then click **Stop Trending**.

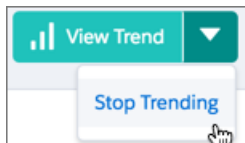
USER PERMISSIONS

To trend reports in Analytics:


- Use Analytics OR Use Analytics Templated Apps
AND
Trend Report Data in Analytics



To stop trending from Lightning Experience, go to the trending report and open the menu next to **View Trend** and choose **Stop Trending**.



To stop trending from classic Salesforce, go to the trending report and click **View Trend** on the report to open a dialog, then click **Stop Trending**.

 **Note:** If you stop trending, you cannot restart where the trending left off (there is no pause button). Trending the same report again creates a new dataset and a new trending dashboard.

Share Trending Dashboards

You can share a trended dashboard just as you can with any Analytics dashboard.

You can share a trending dashboard just as you share any dashboard. You can post an image of it to a feed, or download and share an image. You can also embed your trending Analytics dashboard as you would any other dashboard.

To share the dashboard directly using its URL, first share the trending dashboard's underlying snapshots dataset by saving it to an Analytics app that your target audience can access.

USER PERMISSIONS

To trend reports in Analytics:

- Use Analytics OR Use Analytics Templated Apps
- AND
- Trend Report Data in Analytics

Important: Sharing the trending Analytics dashboard or the underlying dataset could expose data to users who normally would not have access to that data.

It is possible to share trending Analytics dashboards with users who would normally be prevented from seeing data based on security settings. If you save a trending dashboard to any app that is not My Private App, then anyone with access to that app (and the underlying dataset) can view all data in that Analytics dashboard regardless of any sharing restrictions or field-level security that has been set.

Limits and Limitations for Trending Data in Analytics

To prevent the performance of your org from degrading, certain limitations are placed on the size of the snapshots and the number of trended datasets each user can create.

- Maximum number of trended datasets per user: 5
- Maximum number of rows per snapshot: 100,000
- Max total number of rows in a trended dataset: 5000000
- Maximum monthly number of rows for all snapshots per org: 40 million
- Trended datasets count towards the overall Analytics platform limits, including total number of rows

To control the impact that trending datasets have on general org-wide limits, configure these limits, available on the Analytics Settings page:

- **Max number of rows per snapshot** is an option to control the maximum number of rows that a trended report can have when a snapshot is taken. If the report exceeds the limit, the snapshot is not taken and an error email is sent to the user.
- **Max total number of rows in a trended dataset** is an option to limit the maximum number of rows that the Analytics dataset containing the snapshots can have. If the dataset exceeds the limit, the oldest snapshot is deleted from the dataset.
- **Enable automatic deletion of inactive datasets** is an option that is on by default. Trending dashboards that aren't being updated or accessed for the number of days configured in **Number of days to keep inactive datasets** are deleted. The default number of

days a trending dashboard can remain inactive is 100. The dashboard owner receives an email warning a week before deletion. When the dashboard and dataset are deleted, the owner receives an email confirmation.

These limits don't apply to admin users.

Once trending begins, do not change access rights to the underlying report or add or delete dimensions and measures. Changing the report or the access rights can cause an error or inaccuracies at the time a snapshot is taken.

Snapshots are taken every Sunday at midnight (local time), unless you set a different schedule when trending a report. Processing and surfacing the data requires more time, which can delay snapshots.

You cannot customize the XMD of trending datasets.

If trending is stopped and then restarted, a new snapshot dataset is created, with a new trending dashboard. The previously trended dataset is not included in the new dashboard. Data can be moved into the new dataset using the Salesforce data APIs.

The Wave dashboard designer is enabled by default for most orgs. Make sure that it remains enabled for your org. To render, trending dashboards rely on the Wave dashboard designer being enabled.

Users whose profiles have View Encrypted Data enabled can't create trended datasets because Analytics does not support encrypted data.

Roll out the capability gradually to your user base and observe data usage and performance. Stop trending datasets that are no longer needed for active use and delete the underlying trended datasets to recover storage limits.

Some situations can prevent a report that is trended in Analytics from successfully capturing the data for a particular run. These situations include, but are not limited to: jobs involving the User object, site switching, and instance maintenance. If a trended report attempts to run under these conditions, it will fail and the dataset will not have records added for that run. You cannot reschedule or run a trending job again; however, future runs that are not subject to these conditions will process as normal.

Connect to Salesforce and External Data with Replication and Connectors

Use replication in Analytics to extract data from its source and load it into intermediate unregistered datasets. These replicated datasets are available for use in dataflows and dataset recipes. Replication has two main benefits. First, it optimizes your dataflows by extracting your Salesforce data in a separate job ahead of time. Second, replication comes with a host of connectors that let you connect to external data and replicate it, ready for use in your dataflows and recipes.

IN THIS SECTION:

[Optimize Your Dataflows with Replication](#)

Replication decouples the extract of Salesforce data from your dataflows, letting you run it on a separate schedule. By scheduling these extracts ahead of time, your dataflow has less to do and runs faster. To lighten the load even more, replication extracts Salesforce data incrementally by default, meaning that only data that's changed gets extracted.














[Replicate Local and External Data with Analytics Connectors](#)

Analytics connectors give you an easy way to connect to data inside and outside of your Salesforce org, and bring it into Analytics.

Optimize Your Dataflows with Replication








Replication decouples the extract of Salesforce data from your dataflows, letting you run it on a separate schedule. By scheduling these extracts ahead of time, your dataflow has less to do and runs faster. To lighten the load even more, replication extracts Salesforce data incrementally by default, meaning that only data that's changed gets extracted.

Without replication, a dataflow performs a separate extract each time it needs data from a Salesforce object. Let's take a look at an example. Imagine your organization has three dataflows, extracting data from Salesforce objects as follows:

	Accounts	Contacts	Opportunities	Campaigns	Leads	Cases	Users
Default Dataflow							
Sales Analytics App Dataflow							
Service Analytics App Dataflow							

Every time these dataflows run, they have to extract all this Salesforce data. And the more data there is, the longer the dataflow takes to run. What's more, the dataflows are duplicating effort by performing separate extracts from the same object. For example, Accounts data is extracted by all three dataflows.

With replication, all of these extracts are performed as a separate process, which you can schedule to take place before your dataflows run.

	Accounts	Contacts	Opportunities	Campaigns	Leads	Cases	Users
Replication							

This replicated data is then available to all your dataflows, which run faster because they no longer have to extract any data—just load and transform.

IN THIS SECTION:

[Understand What Happens When You Enable Replication](#)

When you enable replication, Analytics looks at the `sfdcDigest` nodes in your existing **scheduled** dataflows to see which Salesforce objects and fields you're currently extracting. Using this information, Analytics enables replication for each of these objects to extract the data separately. Understanding exactly what happens when you enable replication helps you identify any additional actions that you might need to take to ensure replication runs successfully.

[Enable Replication](#)

Enable replication to decouple the extract of Salesforce data from your dataflows.

[Schedule, Run, and Monitor Replication](#)

You can schedule replication to run automatically, or run it manually, and monitor its progress, all in the data manager.

[Extract Data Incrementally in Replication](#)

By default, replication extracts data from each Salesforce object incrementally. Records are inserted, updated, or deleted to match changes in the object since the previous replication run. Because only changes are extracted, replication runs faster.

[Configure Replication Settings](#)

When a Salesforce object is enabled for replication, you can configure its replication settings to enable or disable fields for replication, add a filter to only replicate specific data, or disable replication for an object. You do all this through the data manager.

[Delete Replication for an Object](#)

Delete replication for an object in the data manager to exclude it from replication.

Add Objects and Fields to Replication

To add an object, add an sfdcDigest node for it to one of your dataflows. To add a field for an object, add it to an existing sfdcDigest node for the object in one of your dataflows. The new object or field is added automatically to replication when you upload the updated dataflow definition file. Alternatively, use the Salesforce Local connection.

Considerations When Creating or Updating Dataflows with Replication Enabled

If you have enabled replication, here are some things to keep in mind the next time you create or update one of your dataflows.

Considerations When Using Wizard-Based Analytics Apps with Replication

If you use wizard-based Analytics Analytics apps, such as Sales or Service Analytics, here are some things to consider before and after you enable replication.

Replication Limits and Limitations

Here are some things to consider when you're working with replication.

Understand What Happens When You Enable Replication

When you enable replication, Analytics looks at the sfdcDigest nodes in your existing **scheduled** dataflows to see which Salesforce objects and fields you're currently extracting. Using this information, Analytics enables replication for each of these objects to extract the data separately. Understanding exactly what happens when you enable replication helps you identify any additional actions that you might need to take to ensure replication runs successfully.

Here's what happens, and the action we recommend that you take.

Your Existing Dataflows Are Validated

Because replication is based on your existing dataflows, Analytics validates your scheduled dataflows to ensure that they are error free. Although dataflows with errors are not considered for replication, Analytics alerts you to any errors in sfdcDigest nodes when you enable replication.

Recommended Action

Before you enable replication, review you scheduled dataflows for errors. In particular, look out for incorrect object or field names in sfdcDigest nodes. If you see errors displayed when you enable replication, fix them in your dataflows before you continue. When you fix errors in a dataflow, Analytics automatically considers it for replication when you upload the dataflow definition file.

 **Important:** Analytics does not consider unscheduled dataflows when you enable replication. Make sure that any dataflow that you want to be considered is scheduled. See [Schedule a Dataflow](#).

Your Dataflows Are Processed in Order of Dataflow Creation Date

Analytics considers the sfdcDigest nodes in your dataflows in the order in which they were created. If there are multiple sfdcDigest nodes for the same object in your dataflows, they are merged. If there are conflicts with object-level parameters, the values from the most recently created dataflow are used for replication. Consider the following example dataflows, each containing an sfdcDigest node for the Opportunity object:

Dataflow A (Created 08/01/2016)	Dataflow B (Created 08/15/2016)
<pre>{ "Extract_OpportunitiesA": { "action": "sfdcDigest", "parameters": { "object": "Opportunity", "incremental": false, </pre>	<pre>{ "Extract_OpportunitiesB": { "action": "sfdcDigest", "parameters": { "object": "Opportunity", "incremental": true, </pre>

Dataflow A (Created 08/01/2016)	Dataflow B (Created 08/15/2016)
<pre> "fields": [{ "name": "Id" }, { "name": "Name" }, { "name": "StageName" }, { "name": "CloseDate" }, { "name": "AccountId" }, { "name": "OwnerId" }] } </pre>	<pre> "fields": [{ "name": "Id" }, { "name": "Name" }, { "name": "StageName" }, { "name": "CloseDate" }, { "name": "AccountId" }, { "name": "OwnerId" }] } </pre>

In the resulting replication for this object, the `incremental` parameter is set to `true`, from the most recently created dataset. This also applies to other object-level attributes, such as `fullRefreshToken` and `enablePKChunking`.

Recommended Action

Review your dataflows to ensure that object-level parameters are consistent across all `sfdcDigest` nodes for the same object.

All Fields in Multiple `sfdcDigest` Nodes for an Object Are Included in Replication

If your dataflows have multiple `sfdcDigest` nodes for the same object, each with a different set of fields, a superset of all these fields is included in replication. In addition, if the same field has different attributes, such as `type` or `isMultiValue`, the attributes from the most recently created dataflow are used for replication. Consider the following example dataflows, each containing an `sfdcDigest` node for the Opportunity object:

Dataflow A (Created 08/01/2016)	Dataflow B (Created 08/15/2016)
<pre> { "Extract_OpportunitiesA": { "action": "sfdcDigest", "parameters": { "object": "Opportunity", "fields": [{ "name": "Id"}, { "name": "Name" }, { "name": "StageName" }, { "name": "CloseDate", "fiscalMonthOffset": 9 }, { "name": "AccountId" }, { "name": "OwnerId" }] } } } </pre>	<pre> { "Extract_OpportunitiesA": { "action": "sfdcDigest", "parameters": { "object": "Opportunity", "fields": [{ "name": "Id"}, { "name": "Name" }, { "name": "StageName" }, { "name": "CloseDate", "fiscalMonthOffset": 3 }] } } } </pre>

In the resulting replication for this object, the `Id`, `Name`, `StageName`, `CloseDate`, `AccountId`, and `OwnerId` are included. The `fiscalMonthOffset` attribute for `CloseDate` is set to `3` from the most recently created dataflow.

Recommended Action


Review the fields in the `sfdcDigest` nodes of your dataflows. If the resulting replication includes fields that you don't require, you can disable them in the replication settings for that object (see [Configure Replication Settings](#)). If you have field attribute conflicts, ensure that the attributes you want to use for replication are in the most recently created dataflow.

Advanced Filters on `sfdcDigest` Nodes Are Included in Replication

If an `sfdcDigest` node includes a `complexFilterConditions` parameter to apply an advanced filter, Analytics adds this filter to the replication settings for that object. When there are multiple `sfdcDigest` nodes with complex filters for the same object, only the filter from the most recently created or updated dataflow is added to the replication settings. Analytics ignores structured filters applied through `filterConditions` parameters.

Recommended Action

After you enable replication, review each object's replication settings to verify that filters have been applied correctly (see [Configure Replication Settings](#)). To use multiple filters for an object, we recommend that you remove any filter from replication settings, and add the filters to the corresponding dataflow using the filter transformation (see [filter Transformation](#)).


 **Note:** If you have participated in the replication pilot program and have `sfdcDigest` node filters in your replication dataflow, these filters are not added to replication. Add these filters manually through the object's replication settings. See [Configure Replication Settings](#).

SEE ALSO:

[Configure the Dataflow Through the Definition File](#)
[sfdcDigest Transformation](#)
[Filtering Records Extracted from a Salesforce Object](#)


Enable Replication

Enable replication to decouple the extract of Salesforce data from your dataflows.

 **Important:** We recommend that you read [Understand What Happens When You Enable Replication](#) before you enable replication. This will help you identify any additional actions that you might need to take to ensure replication runs successfully.


To enable replication, perform the following steps.

1. From Setup, enter *Analytics* in the Quick Find box, then select **Settings**.
2. Select **Enable Replication**, and then click **Save**.

 **Important:** After you enable replication, make sure you run replication before your dataflows next run. Dataflows with `sfdcDigest` nodes fail until replication has run and completed for the first time. See [Schedule, Run, and Monitor Replication](#).

Schedule, Run, and Monitor Replication

You can schedule replication to run automatically, or run it manually, and monitor its progress, all in the data manager.

 **Important:** After you enable replication, make sure you run replication and it completes before your dataflows next run. Dataflows with `sfdcDigest` nodes fail until replication has run for the first time.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To enable replication:

- **Customize Application**

IN THIS SECTION:

[Schedule Replication](#)

Schedule replication to run automatically.

[Run Replication](#)

Run replication manually at any time in the data manager.

[Monitor Replication](#)

Monitor the progress of replication in the data manager.


Schedule Replication

Schedule replication to run automatically.

When you schedule replication, you schedule it to run for all your enabled objects at the same time. You cannot schedule separate replications for each object.

 **Note:** A replication run doesn't count towards your daily dataflow run limit.

To schedule replication, perform the following steps.

1. In Analytics, click the gear icon () and then click **Data Manager** to open the data manager.
2. In the data manager, click the Setup tab.
The Setup tab displays a list of objects enabled for replication.
3. Click **Edit Replication Schedule**.
The schedule dialog appears.
4. Make selections to schedule replication.
The schedule options for replication are the same as for dataflows. See [Schedule a Dataflow](#) for more about these options.

 **Note:** Email notifications aren't available for replication schedules.


5. Click **Save**.

Run Replication

Run replication manually at any time in the data manager.

 **Note:** A replication run doesn't count towards your daily dataflow run limit.

To run replication, perform the following steps.

1. In Analytics, click the gear icon () and then click **Data Manager** to open the data manager.
2. In the data manager, click the **Setup** tab.
The Setup tab displays a list of objects enabled for replication.
3. To run replication, perform one of these steps.
 - a. To run all replications including external objects replicated through connections, click **Run Replication Now**.
The Monitor tab of the data manager opens to display the replication of each object as a separate job.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To schedule replication:

- Edit Analytics Dataflows

EDITIONS


Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To run replication:


- Edit Analytics Dataflows

- b. To run a single replication, on the right of the replication click  and select **Run Replication**.
If you are running a local Salesforce replication, select either an incremental or a full extract when you're prompted.
The Monitor tab of the data manager opens to display the replication as a separate job.

Monitor Replication

Monitor the progress of replication in the data manager.

To monitor replication, perform the following steps.

1. In Analytics, click the gear icon () and then click **Data Manager** to open the data manager.
2. In the data manager, click the **Monitor** tab.
The Jobs View of the monitor displays information about your replication jobs.

Extract Data Incrementally in Replication

By default, replication extracts data from each Salesforce object incrementally. Records are inserted, updated, or deleted to match changes in the object since the previous replication run. Because only changes are extracted, replication runs faster.

 **Note:** A full extract is performed the first time replication runs for an object.

You can run a full extract for an object by updating the dataflow, or by selecting a full extract when you run replication for the object.

Run a Full Extract by Updating the Dataflow

To turn off incremental mode for a replicated object, add the `incremental` parameter to the object's `sfdcDigest` node in your dataflow, and set its value to `false`. For example:

```
{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "incremental": false,
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "StageName" },
        { "name": "CloseDate" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    }
  }
}
```

To force a one-time full extract for a replicated object, add the `fullRefreshToken` parameter to the object's `sfdcDigest` node, and give it a random value. For example:

```
{
  "Extract_Opportunities": {
    "action": "sfdcDigest",
```

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To monitor replication:

- Edit Analytics Dataflows

```



"parameters": {
  "object": "Opportunity",
  "fullRefreshToken": "bb",
  "fields": [
    { "name": "Id" },
    { "name": "Name" },
    { "name": "StageName" },
    { "name": "CloseDate" },
    { "name": "AccountId" },
    { "name": "OwnerId" }
  ]
}

```

The next time you need to force a full extract for this object, change the value in the `fullRefreshToken` parameter.

Run a Full Extract When You Run Replication for an Object

To run a full extract for a replicated Salesforce object, follow these steps.

1. In Analytics, click the gear icon () and then click **Data Manager** to open the data manager.
2. In the data manager, click the **Setup** tab.
The Setup tab displays a list of objects enabled for replication.
3. On the right of the replication you want to run, click  and select **Run Replication**.
4. Click **Run with full extract**.

The Monitor tab of the data manager opens to display the replication as a separate job.

Considerations When Using Incremental Extract with Replication

- If incremental mode is explicitly turned off in an `sfdcDigest` node, and not explicitly turned on in later nodes for the same object, it is not turned on when you enable replication. You have to manually turn it on by setting the `incremental` parameter to `true` in the dataflow.
- When you enable replication, incremental mode is not turned on for Salesforce objects that perform hard deletes on records, unless it's explicitly turned on in the dataflow.
- As a best practice, force a full refresh regularly, using the `fullRefreshToken` parameter, to ensure that all changes are picked up.
- Incremental extract isn't supported for Salesforce big objects.
- Formula fields can become out of sync with your replicated object in incremental mode. We recommend that you turn off incremental extracts for objects containing formula fields.
- If you make field changes in an `sfdcDigest` dataflow node, such as adding or removing fields, or changing attributes, Analytics triggers a full extract of data the next time replication runs.


SEE ALSO:

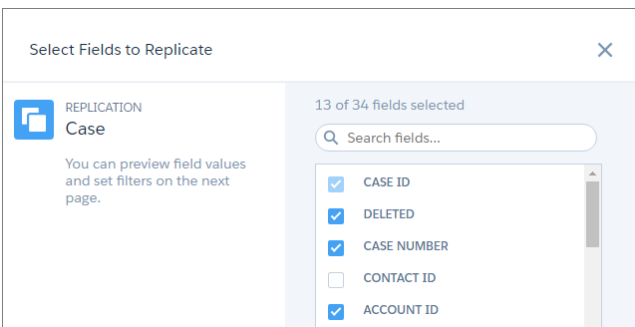
[Configure the Dataflow Through the Definition File sfdcDigest Transformation](#)

Configure Replication Settings


When a Salesforce object is enabled for replication, you can configure its replication settings to enable or disable fields for replication, add a filter to only replicate specific data, or disable replication for an object. You do all this through the data manager.

To configure replication settings, perform the following steps.

1. In Analytics, click the gear icon () and then click **Data Manager** to open the data manager.
2. In the data manager, click the Setup tab.
The Setup tab displays a list of objects enabled for replication. Salesforce objects from your local org are listed first.
3. To open an object's replication settings, click the object.
The field picker appears. Fields already enabled for replication are selected.



4. Select fields that you want to enable, or deselect them to disable.

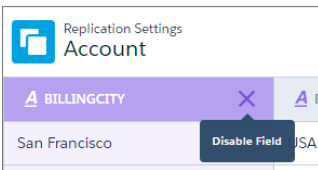
 **Note:** Consider the following when changing the fields enabled for replication.


- You can't disable replication for a field that's used in a dataflow, or disable replication for an object's Id field.
- New fields that you enable here are replicated separately from the dataflow, through the Salesforce Local connection.
- If a replication-enabled custom field is deleted in your org, replication flows for that object fail. Deselect deleted fields here to ensure replication runs successfully.

5. Click **Continue**.

The Preview Source Data page opens, showing a preview of the data in the selected fields.

6. You can disable replication for a field here too. Hover over the field's column header and click the cross that appears.



7. To filter the data that's replicated, click .

a. Enter a filter using a Salesforce Object Query Language (SOQL) WHERE clause expression. For example:

```
RecordType = 'B2B' AND Status = 'Open'
```

EDITIONS

Available in Salesforce Classic and Lightning Experience.


Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.


USER PERMISSIONS

To configure replication settings:

- Edit Analytics Dataflows

b. Click **Done**.

 **Note:** Your preview data does not reflect any filter you add. Filters are only applied when you save the replication settings.


8. To view a field's attributes, click the field's column header, and then click . The field attributes appear in a panel on the right. Here you can review the field's API name and type, and settings such as default value and precision.

 **Note:** Field attributes for local replications are read only.



9. To save the replication settings, click **Save**.


Delete Replication for an Object

Delete replication for an object in the data manager to exclude it from replication.

 **Note:** You can't delete replication for an object that's used in a dataflow or recipe.

To delete replication for an object, perform the following steps.

1. In Analytics, click the gear icon () and then click **Data Manager** to open the data manager.
2. In the data manager, click the Setup tab.
The Setup tab displays a list of objects enabled for replication.
3. Click the actions button () to the right of the object and then select **Delete Replication**.
A warning message appears.
4. Read the warning message carefully and then click **Delete**.

 **Note:** You can re-enable an object by adding an sfdcDigest node for it to your dataflow, or by using the Salesforce Local connection.

Add Objects and Fields to Replication

To add an object, add an sfdcDigest node for it to one of your dataflows. To add a field for an object, add it to an existing sfdcDigest node for the object in one of your dataflows. The new object or field is added automatically to replication when you upload the updated dataflow definition file. Alternatively, use the Salesforce Local connection.

SEE ALSO:

[Configure the Dataflow Through the Definition File sfdcDigest Transformation](#)

Considerations When Creating or Updating Dataflows with Replication Enabled

If you have enabled replication, here are some things to keep in mind the next time you create or update one of your dataflows.

- Analytics validates the dataflow definition file when you upload it. If you see errors displayed, correct them and upload the file again.
- Dataflow definition file uploads might take longer. This is because Analytics is validating the file and using the sfdcDigest nodes to define replication settings.
- If you remove an object's sfdcDigest node from the definition file, replication is not disabled for that object. If necessary, disable replication for an object on the Setup tab of the data manager. See [Delete Replication for an Object](#).

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To delete replication for an object:

- Edit Analytics Dataflows

- If you remove a field from an sfdcDigest node in the definition file, replication is not disabled for that field. If necessary, disable replication for the field in replication settings. See [Configure Replication Settings](#).
- If you add a field in the definition file, that field is enabled in the replication settings.
- If you unschedule the dataflow, Analytics does not disable replication for the objects and fields.

Considerations When Using Wizard-Based Analytics Apps with Replication

If you use wizard-based Analytics apps, such as Sales or Service Analytics, here are some things to consider before and after you enable replication.

Enabling Replication When You Are Already Using Analytics Apps

If you already have Analytics apps when you enable replication, it's important that replication includes all the Salesforce objects and fields used in these apps. If it doesn't, the affected Analytics app dataflows fail. Complete these steps to ensure all the required objects and fields are included.

1. Before you enable replication, set a recurring schedule on each of your Analytics app dataflows. Analytics considers objects and fields in only scheduled dataflows when you first enable replication.
2. After you enable replication, check replication settings to verify that all the required objects and fields have been included. See [Configure Replication Settings](#).
3. Run replication to ensure that all objects and fields in the Analytics app dataflows have been replicated.
4. Run your Analytics app dataflows to verify that they run to completion.
5. Schedule replication to run before all your dataflows, to keep your Analytics app data up to date.

Creating a New Wizard-Based Analytics App After Enabling Replication

When you create a wizard-based Analytics app, objects and fields from the new dataflow are automatically added to replication, if they're not already included. Complete these steps after you create an Analytics app.

1. Check replication settings to verify that all the required objects and fields have been included. See [Configure Replication Settings](#).
2. Run replication to ensure that all objects in the new dataflow have been replicated.
3. Run the new Analytics app dataflow.
4. Schedule the new Analytics app dataflow to run after replication.

Replication Limits and Limitations

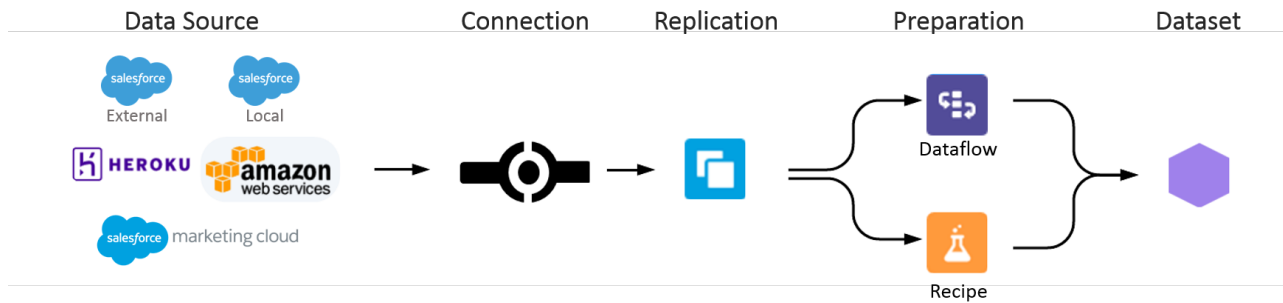
Here are some things to consider when you're working with replication.

- You can enable up to 50 objects for replication. If you are currently extracting more than 50 objects in your dataflows, contact Salesforce Customer Support before you enable replication.
- Replication only performs one extract per object. Keep this in mind if you need to perform multiple extracts from the same object. For example, if you need to extract both filtered and unfiltered data from an object.
- There is a known issue where replication does not generate notification emails.

Replicate Local and External Data with Analytics Connectors

Analytics connectors give you an easy way to connect to data inside and outside of your Salesforce org, and bring it into Analytics.

Use a connector to create a connection to a data source, such as another Salesforce org or an Amazon Redshift data warehouse. Then use that connection to replicate all the objects that you need from the source. You can then prepare the data in these replications, using a dataset recipe or a dataflow, to create your final dataset.



Seven types of connectors are available: one for bringing in data from your local org, and six for external data.

Analytics Connector Types and Example Use Cases

Let's look at how an example company, Blue Sky Solar, uses each connector. Blue Sky Solar sells and installs solar panels in California and Arizona.

Salesforce Local Connector

The Salesforce Local Connector is the default connector. If you're currently using replication for objects in your local Salesforce org, you are already using this connector. Blue Sky Solar already uses replication to bring its local California sales data into Analytics. The company uses the Salesforce Local connector to replicate additional objects without having to add them to the dataflow.

Salesforce External Connector

The Salesforce external connector lets you replicate data from other Salesforce orgs. To qualify for state issued grants, Blue Sky Solar operates as separate entities in Arizona and California. Each entity operates its own Salesforce org. Senior leadership wants to understand the state of the business across both entities. The company uses the Salesforce external connector to connect the California org Analytics instance to the Arizona org opportunity data. This data is then merged with the California Salesforce org opportunity data in Analytics to create a unified view of the opportunity pipeline.

Marketing Cloud Connector

Blue Sky Solar tracks prospects in Marketing Cloud. The company plans to enter the Southern California market and wants to launch a personalized marketing campaign. The Analytics Marketing Cloud connector allows the marketing team to load prospect data from previous campaigns into Analytics and use Analytics dashboards to target select companies and households.

Heroku Postgres Connector

Prospect customers interested in installing a solar system can download the Blue Sky Solar mobile app. The app helps the prospect identify suitable rooftop spaces for a solar system. This data is stored in a Heroku Postgres database, and the marketing team uses it for targeted campaigns. The Analytics Heroku Postgres connector lets the team copy this data into Analytics for analysis.

Amazon Redshift Connector

Each installed solar system constantly monitors the generated electricity. Blue Sky Solar has a Salesforce Community page that provides an account overview for each customer, using Analytics-driven widgets to show the generated electricity. The raw data is initially stored in Amazon Redshift and aggregated on the Amazon platform. The data is then brought into Analytics using the Amazon Redshift connector.

Microsoft Dynamics CRM Connector


Before migrating to Salesforce, Blue Sky Solar used Microsoft Dynamics 365 as its CRM solution. Not all data was made available in the Salesforce system, but it's not lost thanks to the new Microsoft Dynamics CRM connector. The company can now replicate this data in Analytics and make it available for use in lenses and dashboards.

Google BigQuery Connector

Hundreds of thousands of people visit the company's website every year. Using Google Analytics, the marketing team tracks online engagement and optimizes their website content daily. This data is made available in Google BigQuery and aggregated to provide key indicators for each visitor. The company can now replicate this data in Analytics and analyze it in lenses and dashboards.

 **Note:** External connectors perform a full extract of data every time that replication runs. Incremental extracts and filters aren't available.

Analytics connectors are enabled when you enable replication. If you haven't enabled replication, you can do it from Setup. Enter *Analytics* in the Quick Find box, then click **Settings**. Select **Enable Replication**, and then click **Save**.

 **Important:** There are a few things to consider before you enable replication. We recommend that you read [Understand What Happens When You Enable Replication](#) first.

IN THIS SECTION:

[Create a Remote Connection](#)

Create a remote connection to replicate external data.

[Enable Replication for an Object with a Connection](#)

Use a connection to enable replication for objects in the connected data source.

[Prepare Replicated Data in Dataflows and Recipes](#)

After replication has run, you can prepare replicated data in dataflows and recipes.


[Connectors Limits and Limitations](#)

Here are some things to consider when you're working with connectors.

Create a Remote Connection

Create a remote connection to replicate external data.

The steps you take to create a connection to an external data source are the same for all the remote connectors. However, each connector has specific requirements and settings.

1. In Analytics, click the gear icon () and then click **Data Manager** to open the data manager.
2. In the data manager, click the Setup tab.
The Setup tab displays a list of objects enabled for replication, organized by connector type.
3. Click **Set Up Replication**.
You see your available connections. A Salesforce Local connection is already set up, and other connections that you create appear here, too.
4. Click **Add Remote Connection**.
The available connectors appear.
5. Click the connector you need, and enter the settings for that type of connection.
All remote connections require these settings.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create a connection:

- Edit Analytics Dataflows

Parameter	Required?	Value
Connection Name	Yes	Identifies the connection. Use a suitable convention that lets you easily distinguish between different connections.
Developer Name	Yes	API name for the connection. This name is used in your dataflows to reference data extracted through this connection. For this reason, you can't edit the Developer Name after you create the connection.
Description	Yes	Description of the connection for internal use.

Use the links below to learn about the additional settings required for each type of connection.

- When you finish entering the settings, click **Save**.
The new connection appears on the select connection page, ready for use.

IN THIS SECTION:

[Salesforce External Connection Settings](#)

Review settings and requirements for creating a Salesforce External connection.

[Salesforce Marketing Cloud Connection Settings](#)

Review settings and requirements for creating a Salesforce Marketing Cloud connection.

[Amazon Redshift Connection Settings](#)

Review settings and requirements for creating an Amazon Redshift connection.

[Heroku Postgres Connection Settings](#)

Review settings and requirements for creating a Heroku Postgres connection.

[Microsoft Dynamics CRM Connection Settings](#)

Review settings and requirements for creating a connection to a Microsoft Dynamics 365 account.

[Google BigQuery Connection Settings](#)

Review settings and requirements for creating a Google BigQuery connection.


Salesforce External Connection Settings

Review settings and requirements for creating a Salesforce External connection.

In addition to the connection name, developer name, and description, provide these settings.

Setting	Required?	Value
Username	Yes	User name used to connect to external Salesforce org for replication of objects and fields.
Service URL	Yes	Login URL for the external org. This is completed for you, but you can change it if

Setting	Required?	Value
		the org is a sandbox org or uses a custom domain.
Password	Yes	Password for the user specified in Username. You may have to append the user's security token to the end of the password. For more information about obtaining a security token, see Reset Your Security Token .


 **Important:** The objects and fields available for replication in the external org are determined by the security settings of the user that you use to connect.

Salesforce Marketing Cloud Connection Settings

Review settings and requirements for creating a Salesforce Marketing Cloud connection.

In addition to the connection name, developer name, and description, provide these settings.

Setting	Required?	Value
Username	Yes	The Salesforce Marketing Cloud user name.
ClientSecret	Yes	The client secret of Salesforce Marketing Cloud required to generate a valid access token.
ClientId	Yes	The client ID of Salesforce Marketing Cloud required to generate a valid access token.
Salesforce Marketing Cloud Url	Yes	The URL used to connect to the Salesforce Marketing Cloud WSDL. This is already completed, but you can change it.
UTC Offset	No	Used to read data from Salesforce Marketing Cloud in a UTC offset time zone.
Password	Yes	The password for the Salesforce Marketing Cloud user name.

 **Important:** The objects and fields available for replication are determined by the security settings of the user that you use to connect.

 **Note:** The Salesforce Marketing Cloud connector supports these types of data extensions:

- System Data.Contact
- System Contact Linked Data Extension, and Child and Grandchild System Contact Linked Data Extensions
- Custom Contact Linked Data Extension, and Child and Grandchild Custom Contact Linked Data Extensions
- Non-Contact Linked Data Extension

Amazon Redshift Connection Settings

Review settings and requirements for creating an Amazon Redshift connection.

Before you create a new Amazon Redshift connection, consider these requirements.

- The Redshift cluster that you're connecting to must have SSL enabled. See [Configure Security Options for Connections](#) in Amazon Web Services documentation for more information about using SSL.
- The Amazon S3 bucket that you specify must be accessible by Salesforce and have the expected access policies.

In addition to the connection name, developer name, and description, provide these settings.

Setting	Required?	Value
Master Symmetric Key	No	Your Amazon S3 encryption key. This must be in a 256-bit AES encryption key in the Base64 format.
AWS Secret Access Key	Yes	Your Amazon secret access key.
Username	Yes	User name for your Amazon Redshift account.
Number Of Nodes in Cluster	Yes	The number of nodes in the Amazon Redshift cluster.
Schema	Yes	Your Amazon Redshift schema name. Only objects that exist within this schema are available for replication.
AWS Access Key ID	Yes	Your Amazon S3 bucket access key ID.
Cluster Node Type	Yes	Node type of the Amazon Redshift cluster.
S3 Bucket Name	Yes	The name of your Amazon S3 bucket.
JDBC URL	Yes	Your Amazon Redshift connection URL. See Obtain the JDBC URL in Amazon Web Services documentation for help obtaining this URL. Use the exact URL specified in the cluster database properties. Only the Redshift JDBC URL is supported.
Password	Yes	Password for your Amazon Redshift account.

 **Important:** The data available for replication in the Amazon Redshift account is determined by the Amazon S3 bucket you specify.

Heroku Postgres Connection Settings

Review settings and requirements for creating a Heroku Postgres connection.

In addition to the connection name, developer name, and description, provide these settings for the database you are connecting to.

 **Tip:** Go to the database in Heroku and click **View Credentials...** to view the settings you need.

Setting	Required?	Value
JDBC Connection URL	Yes	The URL used to connect to the database. Enter in the format: <i>jdbc:postgresql://host:port/database</i> For example: <i>jdbc:postgresql://ec1-23-45-67-89.compute-1.amazonaws.com:5432/sensors</i> Look for the host, port, and database details in the database credentials.
Username	Yes	The database user, found in the database credentials.
Schema	No	The name of the schema you want to use for the database. If no schema names have been specified for the database, you can enter <i>public</i> .
Password	Yes	The database password, found in the database credentials.

 **Note:** To access Heroku Postgres in Heroku Private Spaces, complete these steps before you create the connection.

1. Contact Heroku Support to activate Trusted IP ranges for data services in the space. Trusted IP ranges for data services is a beta feature.
2. Add the Salesforce IP ranges to the Trusted IP ranges in the space. See the [Salesforce IP Addresses & Domains](#) knowledge article for a list of Salesforce IP ranges.

 **Important:** The data available for replication is determined by the security settings of the user that you use to connect.

Microsoft Dynamics CRM Connection Settings

Review settings and requirements for creating a connection to a Microsoft Dynamics 365 account.

In addition to the connection name, developer name, and description, provide these settings.

Setting	Required?	Value
Username	Yes	User ID registered with Microsoft Dynamics CRM.
Organization Name	Yes	Microsoft Dynamics CRM organization name. Organization names are case sensitive.
Discovery Service URL	Yes	URL of the Microsoft Dynamics CRM service. Enter a URL in the format: <i><http/https>://<Application server name>:<port>/XRMSvc/2011/Discovery.svc</i>
Domain	Yes	Domain to which the user belongs. Enter the complete domain name. For example, <i>msd.sampledomain.com</i> .
Authentication Type	Yes	Authentication type for the connection. Enter <i>Office365</i>
Password	Yes	Password to authenticate the user specified in Username.


 **Important:** The data available for replication is determined by the security settings of the user that you use to connect.

Google BigQuery Connection Settings

Review settings and requirements for creating a Google BigQuery connection.

In addition to the connection name, developer name, and description, provide these settings.


 **Note:** When you create a service account with Google BigQuery, a JSON file of account properties is generated. Most of the connection settings you need are in this file.

Setting	Required?	Value
Schema	Yes	Name of the schema you are connecting to.
Service Account Key	Yes	Enter the <code>private_key</code> value from the JSON file.  Note: Don't include " <code>private_key</code> ": " <code>-----BEGIN PRIVATE KEY-----\n</code> " at the start of the key, and " <code>\n-----END PRIVATE KEY-----\n</code> " at the end.
Service Account ID	Yes	Enter the <code>client_email</code> value from the JSON file.
Storage Path	No	Path in Google Cloud Storage where the Secure Agent creates a local stage file to store the data temporarily. Enter the bucket name or the bucket name and folder name. For example, enter <code><bucket_name></code> or <code><bucket_name>/<folder_name></code> . This setting is required when you read a large volume of data.
Project ID	Yes	Enter the <code>project_id</code> value from the JSON file. If you have multiple projects with the same service account, enter the ID of the project containing the dataset that you want to connect to.

Enable Replication for an Object with a Connection

Use a connection to enable replication for objects in the connected data source.

The steps you take to use a connection to are the same for all connectors.

1. In Analytics, click the gear icon () and then click **Data Manager** to open the data manager.
2. In the data manager, click the Setup tab.
The Setup tab displays a list of objects enabled for replication, organized by connector type.
3. Click **Set Up Replication**.
You see your available connections.
4. Click the connection you need.
A list of objects available through the selected connected is displayed. Objects already enabled are not available for selection.
5. Click the object you want to enable for replication, and click **Continue**.
6. Select the fields you want to enable for replication, and click **Continue**.
7. On the Preview Source Data page, review the data.

EDITIONS


Available in Salesforce Classic and Lightning Experience.






Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create a connection:

- Edit Analytics Dataflows


8. If you are using the Salesforce Local connector, you can filter the data that's replicated. Click .
- Enter a filter using a Salesforce Object Query Language (SOQL) WHERE clause expression. For example:

```
RecordType = 'B2B' AND Status = 'Open'
```
 - Click **Done**.
-  **Note:** Your preview data does not reflect any filter you add. Filters are only applied when the replication dataflow runs.
9. To view or edit a field's attributes, click the field's column header, and then click .
- The field attributes appear in a panel on the right. You can edit a field's label and type, and settings such as default value and precision. Edit attributes to ensure that the data is consistent with data from other sources.
-  **Note:** Only changes to the field label appear in the preview data. Other changes are applied when you run the replication. Field attributes for local replications are read only.
-  **Note:** You can only change the field type to text, and only for measure and date fields. If you change a field to text and want to change it back, go back to the field selection screen. Then deselect and select the field. The original field type is restored when you continue to the preview screen.
10. When you finish, click **Save**.
- The new object appears on the Setup tab, with other objects using the same connector type.
-  **Important:** Objects that you enable for replication will be replicated the next time replication runs. To make the data available in a dataflow or recipe right away, run replication manually.

Prepare Replicated Data in Dataflows and Recipes

After replication has run, you can prepare replicated data in dataflows and recipes.

For dataflows, use the digest transformation to extract data from the replicated object.

In the dataflow editor, use the digest node button () to add the transformation to a dataflow. If you're working in the dataflow JSON, add a digest node to your dataflow definition file. See [digest Transformation](#) for more information.

To prepare replicated data in a recipe, go to the Datasets tab in the data manager. Open the Replicated Data tab, and select **Create New Recipe** from the actions list next to the data you want to prepare.

Data Manager

Monitor

Dataflows & Recipes

Datasets

Setup

Manage Datasets
View and manage datasets, and prepare them in recipes.

DATASETS **REPLICATED DATA**

NAME	CONNECTION NAME	LAST UPDATED	
User	SFDC_LOCAL	Today at 10:15 AM	▼
Opportunity	SFDC_LOCAL	Today at 10:15 AM	▼
Account	SFDC_LOCAL	Today a	▼

Create New Recipe
Delete Dataset

Note: You can also add replicated data as lookup data in a recipe.

Connectors Limits and Limitations

Here are some things to consider when you're working with connectors.

- You can create up to 20 connections, regardless of type. This limit does not include Salesforce local connections.
- Analytics can extract up to either 20 million rows or 10 GB from an object, depending on which limit is reached first.
- You can replicate data from up to 50 objects in Analytics. This total includes local and external objects.
- Incremental extracts and filters are only available with the Salesforce Local connector.
- Data read time for a connection depends on the connector type.

Note: Each external data source may have its own limits.

Load External Data from CSV and Microsoft® Excel

You can load external data directly into a dataset from a .csv file or from Microsoft Excel. The dataset can be explored right away in a lens, added to a dashboard, or prepared with other data in a dataflow or recipe.

IN THIS SECTION:

[Upload External Data from the User Interface](#)

Use the upload user interface to create a single dataset based on external .csv data. To refresh the data, you can overwrite the data in the dataset by uploading a new external data file.

[Einstein Analytics Connector for Excel](#)

The Salesforce Einstein Analytics Connector for Excel makes it easy to import data from Microsoft Excel 2013 to Analytics.

[External Data API](#)

You can use the External Data API to create a single dataset based on external data in the .csv format. You can also use the API to edit the dataset by uploading a new .csv file. When you edit the dataset, you can choose to overwrite all records, append records, update records, or delete records.


Upload External Data from the User Interface

Use the upload user interface to create a single dataset based on external .csv data. To refresh the data, you can overwrite the data in the dataset by uploading a new external data file.

When Analytics loads any data into a dataset, it also adds metadata about each column of data. For example, metadata can include the field type, precision, scale, and default value.

For external data, Analytics infers metadata about each column of data in the external data file unless you specify different metadata attributes in a metadata file. A *metadata file* is a JSON file that describes the structure of an external data file. For example, you can use a metadata file to explicitly set the field type and default value for a specific column of external data. If no metadata file is provided when you upload external data, Analytics treats every column as a dimension and sets the field type to 'Text.' This impacts the type of queries that can be placed on the dataset because you can't perform mathematical calculations on dataset columns with a Text field type. You can only perform mathematical calculations on dataset columns with a Numeric field type.

After you create a dataset based on an external data file, you can edit the dataset to apply a new metadata file. This enables you to change the metadata attributes of each column.

 **Note:** Analytics temporarily stores the uploaded CSV and metadata files for processing only. After a dataset is created, Analytics purges the files.


IN THIS SECTION:

[Create a Dataset with External Data](#)


You can either upload external data through the user interface or through the External Data API to create a dataset. When you upload an external data file, you can also provide a metadata file. A metadata file contains metadata attributes that describe the structure of the data in the external data file. If you upload a .csv from the user interface, Analytics automatically generates the metadata, which you can preview and change.

Create a Dataset with External Data

You can either upload external data through the user interface or through the External Data API to create a dataset. When you upload an external data file, you can also provide a metadata file. A metadata file contains metadata attributes that describe the structure of the data in the external data file. If you upload a .csv from the user interface, Analytics automatically generates the metadata, which you can preview and change.

 **Tip:** Analytics temporarily stores the uploaded CSV and metadata files for processing only. After the datasets are created, Analytics purges the files. If you want to use the files again later, keep a copy.

Before uploading external data files, review the format requirements and examples of the .csv and metadata files in the [Analytics External Data Format Reference](#).

 **Note:** You can also use the External Data API to upload external data files. Use the API to take advantage of additional features, like performing incremental extracts and performing append, delete, and upsert operations. For more information about the External Data API, see the [External Data API Developer's Guide](#).

1. On the home or app page, click **Create > Dataset**.
2. Select **CSV File** as the data source and click **Continue**.
3. Select the .csv file to upload by performing one of these steps.
 - a. Click **Select a file or drag it here**, then select the file and click **Open**.

EDITIONS


Available in Salesforce Classic and Lightning Experience.



Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To upload external data:

- Upload External Data to Analytics

- b. Drag the file into the file drop area.
4. Click **Next**.
5. In the Dataset Name field, enter a name for the dataset.
By default, Analytics uses the file name as the dataset name. The name cannot exceed 80 characters.
6. Select the app where the dataset will be created.
By default, Analytics selects your My Private App. To change an app, click the cross on it and select a different one.
7. In the File Properties Detected box, check that Analytics has correctly identified the properties of your file.
In most cases, Analytics correctly identifies your file properties. If it doesn't, your data may not load correctly and you will see unexpected results when you preview the data on the next screen. To edit the file properties, click  and select **Edit**.

 **Note:** Analytics also generates a data schema file for your data. This file contains properties such as field labels, field types, and settings. You can view and change these schema properties when you preview the data on the next screen. However, if you want to download the file first, or replace it with your own file, click  in the Data Schema File field.

8. Click **Next**.
The Edit Field Attributes screen appears. Here, you can preview the data, and view or edit the attributes for each field.



ACCOUNT NAME	OPPORTUNITY NAME	CLOSE DATE
Abata	10 Widgets	10/6/15
Abata	10 Widgets	10/6/15
Abata	10 Widgets	10/6/15
Abata	10 Widgets	10/6/15
Abata	10 Widgets	10/6/15
Abata	10 Widgets	10/6/15
Abata	10 Widgets	10/6/15

9. To view or change a field's attributes, either click the field in the list on the left, or click the field's column.
Field attributes appear in a panel on the right. The field attributes that you see are determined by the field type.
10. When you have finished editing field attributes, click **Next**.
The file is uploaded and the dataset is queued to be created.
11. Click **Got It**.

IN THIS SECTION:

[Rules for Automatic Generation of a Metadata File](#)

When you upload a CSV file from the user interface, Analytics automatically generates the metadata file as long as the CSV file meets certain requirements.

Monitor an External Data Upload

When you upload an external data file, Analytics kicks off a job that uploads the data into the specified dataset. You can use the data monitor to monitor and troubleshoot the upload job.

Rules for Automatic Generation of a Metadata File


When you upload a CSV file from the user interface, Analytics automatically generates the metadata file as long as the CSV file meets certain requirements.

To enable Analytics to generate the metadata file, a CSV file must meet the following requirements.

- The file type must be .csv, not .gz or .zip.
- The file must contain one row for the column header and at least one record.
- The CSV file must meet all Analytics requirements as mentioned in the [Analytics External Data Format Reference](#).

Analytics generates the metadata attributes for each CSV column based on the first 100 rows in the CSV file. Analytics uses the following rules to convert the CSV column names to field labels.

- Replaces special characters and spaces with underscores. For example, "Stage Name" becomes "Stage_Name."
- Replaces consecutive underscores with one underscore, except when column name ends with "__c." For example, "stage*&name" becomes "stage_name."
- Prefixes the field label with "X" when the first character of the column name is numeric. For example, "30Day" becomes "X30Day."
- Replaces the field name with "Column" + column number when all characters in the column name are not alphanumeric. For example, the fourth column name "&^*(&*(%" becomes "Column4."
- Deletes underscores at the beginning and end of the field label to ensure that it doesn't start or end with an underscore.
- Increments the derived field label if the label is the same as an existing label. For example, if "X2" already exists, uses "X21," "X22," "X23."

 **Tip:** You can download the generated metadata file to change the metadata settings, and then upload it to apply the changes. You can download the metadata file when you create or edit a dataset.

Monitor an External Data Upload

When you upload an external data file, Analytics kicks off a job that uploads the data into the specified dataset. You can use the data monitor to monitor and troubleshoot the upload job.

The Jobs view (1) of the data monitor shows the status, start time, and duration of each dataflow job and external data upload job. It shows jobs for the last 7 days and keeps the logs for 30 days.

EDITIONS

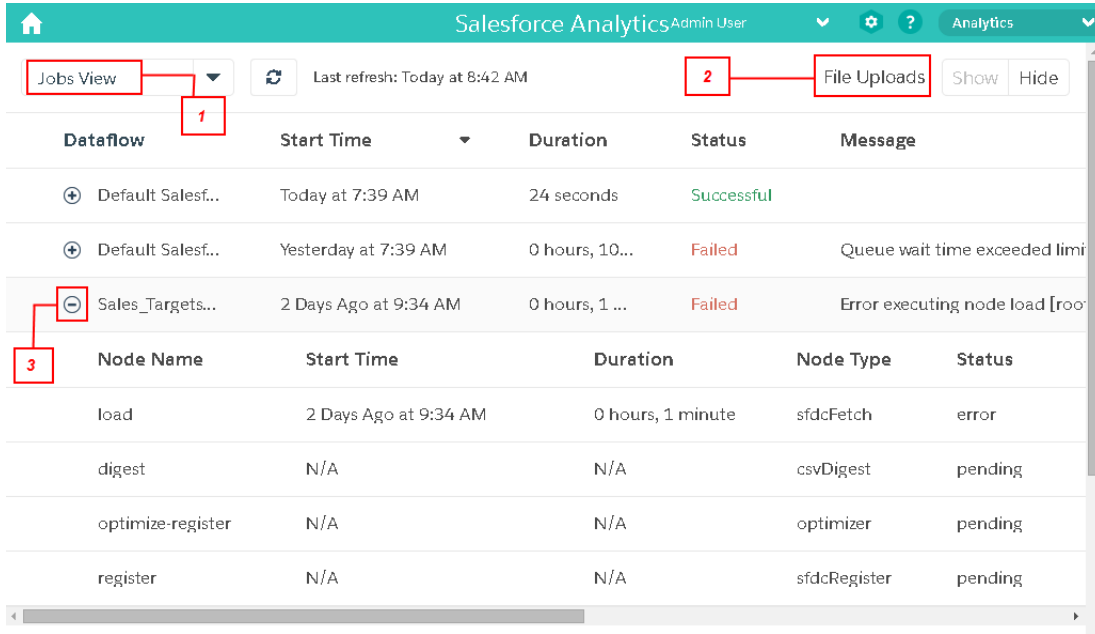
Available in Salesforce Classic and Lightning Experience.


Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.


USER PERMISSIONS


To access the data monitor:

- Edit Analytics Dataflows, Upload External Data to Analytics, or Manage Analytics




1. In Analytics, click the gear icon () and then click **Data Manager**. The data manager opens on the Monitor tab, with the Jobs view selected by default. The Jobs view displays dataflow and upload jobs. It displays each upload job name as <dataset_name upload flow>. You can hover a job to view the entire name.

 **Note:** To view external data upload jobs in the Jobs view, **Show** in the File Uploads field (2) must be selected. It's selected by default.

2. To see the latest status of a job, click the Refresh Jobs button (). Each job can have one of the following statuses.

Status	Description
Queued	The job is in queue to start.
Running	The job is running.
Failed	The job failed.
Successful	The job completed successfully.
Warning	The job completed successfully, but some rows failed.

3. To view the run-time details for a job, expand the job node (3). The run-time details display under the job. In the run-time details section, scroll to the right to view information about the rows that were processed.
4. To troubleshoot a job that has failed rows, view the error message. Also, click the download button (1) in the run-time details section to download the error log.

 **Note:** Only the user who uploaded the external data file can see the download button.

The screenshot shows the Wave Analytics interface. At the top, there's a header with 'Wave Analytics' and 'My Private App'. Below that, there's a 'Jobs View' dropdown and a refresh button with the text 'Last refresh: Today at 2:29 PM'. To the right, there are 'File Uploads' buttons labeled 'Show' and 'Hide'. The main table has columns: 'Dataflow', 'Start Time', 'Duration', 'Status', and 'Message'. One job is listed: 'Temp Upload ...' with a 'Warning' status and the message 'The job completed successfully, b'. Below this is a detailed error log table with columns: 'Status', 'Input Rows Processed', 'Input Rows Failed', 'Output Rows Processed', and 'Output Rows Failed'. The error log shows one 'warning' status with 11 'Output Rows Failed'. A red box highlights the number '1' in the 'Output Rows Failed' column, with a red arrow pointing to a dropdown icon. Another red box highlights the number '1' in the 'Output Rows Failed' column of the row above it.

Dataflow	Start Time	Duration	Status	Message
Temp Upload ...	Today at 2:26 PM	0 hours, 2 ...	Warning	The job completed successfully, b

Status	Input Rows Processed	Input Rows Failed	Output Rows Processed	Output Rows Failed
success	N/A	N/A	N/A	N/A
warning	N/A	N/A	11	1
success	N/A	N/A	N/A	N/A
success	N/A	N/A	N/A	N/A

The error log contains a list of failed rows.

The screenshot shows an Excel spreadsheet titled 'ExternalFileWorkflow06V4000000005mEAA_digest.csv'. The spreadsheet has columns A through F. Row 1 contains an error message in cell B1: 'error'. Row 2 contains data: '7 (column: Page_Views) strconv.ParseFloat: parsing "Text": invalid syntax' in column C, 'about:blank' in column D, 'Text' in column E, and '5/1/2015 No' in column F. Rows 3 and 4 are empty.

	A	B	C	D	E	F
1	row	error	File_Name	Page_Views	View_Date	Authenticated
2		7 (column: Page_Views) strconv.ParseFloat: parsing "Text": invalid syntax	about:blank	Text	5/1/2015	No
3						
4						

- To troubleshoot a failed job, view the error message and the run-time details.

Einstein Analytics Connector for Excel

The Salesforce Einstein Analytics Connector for Excel makes it easy to import data from Microsoft Excel 2013 to Analytics.

The Einstein Analytics Connector for Excel is available as an add-in for Excel 2013 on the desktop and Excel Online in Office 365. The Connector is available from the Office Add-In Store or your organization's private add-in catalog. After you install the Connector just point and click to import data from Excel to Analytics.

IN THIS SECTION:

[Install the Einstein Analytics Connector for Excel](#)

The Salesforce Einstein Analytics Connector for Excel gives you a fast, easy way to import data from Excel 2013 into Analytics.

Install the Einstein Analytics Connector for Excel

The Salesforce Einstein Analytics Connector for Excel gives you a fast, easy way to import data from Excel 2013 into Analytics.

If you use Excel 2013 on the desktop or Office 365, the Office Online version of Excel, the Einstein Analytics Connector for Excel gives you a great way to get your data into Analytics. After installing the Connector, you just select data from Excel, click **Submit Data**, and the Connector does the work for you, importing the data to Analytics and creating a dataset.

Here's how to install the Connector:

1. Open Excel, either on your desktop or in Office Online.
2. Click the **Insert** tab.
3. Click **Store**.
4. Search for the Einstein Analytics Connector for Excel, and click **Add** to install it.
5. Click **Log in to Salesforce**, and enter your Salesforce credentials to open the Connector.

Once you've installed the Connector, follow the instructions in the Connector window to create datasets from your Excel data. Opening the Connector automatically logs you in to Analytics. Click the Connector Help icon for complete information about using the app.

USER PERMISSIONS

To import data from Excel 2013 to Analytics:

- Upload External Data to Analytics

External Data API

You can use the External Data API to create a single dataset based on external data in the .csv format. You can also use the API to edit the dataset by uploading a new .csv file. When you edit the dataset, you can choose to overwrite all records, append records, update records, or delete records.

For more information about the External Data API, see the [Analytics External Data API Developer Guide](#).


Prepare Data in Analytics

Data preparation is the process of transforming your data into a form that's meaningful and valuable to the people exploring it. This preparation can include combining data from different sources, calculating new values, and cleaning data so that it's consistent and meaningful. Analytics gives you two ways to prepare your data: dataflow and dataset recipes.

The dataflow provides an end-to-end process that lets you load data from its source, prepare it, and output the results to one or more datasets.

A dataset recipe provides a data preparation process only. Use a recipe to prepare data from datasets and replications to create a single dataset.

So which one's right for you? Well, that depends on your skills and what you want to achieve. Here are a few key features unique to each tool to help you decide.

 **Note:** Dataflows and recipes are not mutually exclusive. Many people use both to meet more complex data preparation requirements.

Dataflow

Use a dataflow to extract data directly from Salesforce objects, replications, or existing datasets, and prepare it, all in the same process. A dataflow lets you apply the full range of Analytics transformations using a drag-and-drop dataflow editor. Or for even finer control, you can manually edit the underlying JSON code.

With a dataflow you can:

- Design complex data preparation flows with the visual dataflow editor.

- Edit the underlying JSON for fine control.
- Create or update multiple datasets at the same time.
- Create complex formulas to calculate new values using SAQL expressions.
- Perform calculations across rows to derive new data for trending analysis.
- Update values with values from other sources.
- Flatten hierarchical data for use in dataset security predicates.

Dataflows are great for advanced Analytics developers who prefer to work in a visual editor and those who prefer to work in the JSON.

Dataset Recipe

Use a dataset recipe as a standalone data preparation tool for single datasets, or use it to prepare data before or after it goes through your dataflow. A recipe guides you with suggestions and completes transformations settings for you based on your data.

With a recipe you can:

- Preview your data and how it changes as you prepare it.
- Quickly remove fields or change field labels.
- Get smart suggestions on how to transform your data.
- Analyze the quality of your data with column profiles and get smart suggestions on how to improve it.
- Bucket values without having to write complex SAQL expressions.
- Create calculated fields with a visual formula builder.
- Easily transform values to ensure data consistency, in a point-and-click transformation panel. You can bucket values, trim, split, and replace them, and change case. No formulas required!
- See the history of all your changes, and back up or move forward to replay it.

Recipes are great for Salesforce admins with no experience of integration, or for more experienced data wranglers who just want to get stuff done without learning about the dataflow.

Features at a Glance

Still unsure which tool to choose? Use this table to compare them side-by-side.

Feature	Dataflow	Dataset Editor
Graphical user interface	✓	✓
Edit underlying JSON code	✓	
Preview data		✓
Preview results of transformations		✓
Step forward and backward through transformations		✓
Create or update multiple datasets at a time	✓	
Smart transformation suggestions		✓
Column profiles to analyze data quality		✓

Feature	Dataflow	Dataset Editor
Data-cleaning transformations	Using SAQL expressions	Trim, Uppercase, Lowercase, Split, Substring, Replace, Extract
Calculate new vales from existing data	Using SAQL expressions	Using interactive formula builder
Bucket values	Using SAQL expressions	Through user interface
Augment columns from other datasets	✓	✓
Append rows from other datasets	✓	
Update values with values from another dataset	✓	
Calculate trending values across rows in a dataset	✓	
Flatten hierarchical data	✓	

IN THIS SECTION:

[Prepare Datasets with Recipes](#)

A dataset recipe is a user-interface tool that lets you take data from your existing datasets and replications, prepare it, and output the results to a new dataset. Use a recipe to combine data from multiple datasets or replications, bucket the data, add formula fields, and cleanse the data by transforming field values. You can remove fields and filter rows that you don't need, before you create the target dataset.

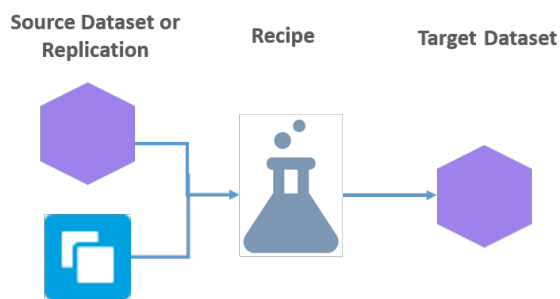
SEE ALSO:

[Create Datasets with the Dataflow](#)

Prepare Datasets with Recipes

A dataset recipe is a user-interface tool that lets you take data from your existing datasets and replications, prepare it, and output the results to a new dataset. Use a recipe to combine data from multiple datasets or replications, bucket the data, add formula fields, and cleanse the data by transforming field values. You can remove fields and filter rows that you don't need, before you create the target dataset.

A dataset recipe is simply a saved set of transformations, or steps, that you want to perform on a specific source dataset or replication. When you run a recipe, it applies the transformations and outputs the results to a new target dataset. You can schedule a recipe to run on a recurring basis to keep your target dataset up to date.



Use a recipe to combine data from different sources, and modify field values to ensure consistency in the new dataset you create. This new dataset can then be used as a standalone dataset for exploration or dashboard creation, or used in your dataflows or other recipes.

Here's what you can do with your source data in a recipe:

- Add fields from another dataset or replication.
- Remove fields.
- Filter rows.
- Add bucket fields.
- Add formula fields.
- Transform field values.

IN THIS SECTION:

[Create a Dataset Recipe](#)

Use a recipe to clean and combine data from multiple datasets or replications. Add bucket and formula fields, filter rows, and transform field values. You can then output the results to a new target dataset.

[Manage and Monitor Dataset Recipes](#)

View the status of your recipes and target datasets on the Dataflows & Recipes tab of the data manager. You can open recipes to update or run them, or delete them.

Create a Dataset Recipe

Use a recipe to clean and combine data from multiple datasets or replications. Add bucket and formula fields, filter rows, and transform field values. You can then output the results to a new target dataset.

 **Tip:** Before you get started, it's a good idea to think about the requirements for the target dataset you want to create. Consider these questions:

- Does the data you want to work with exist in a dataset or as a replicated object?
- If you are combining data, how is the data related?
- What fields do you want in the target dataset?
- Do you need to transform any field values?
- In what app are you going to create the target dataset?
- Do you need to control access to the data in the target dataset?

When you're ready, follow these steps to create a dataset recipe.

IN THIS SECTION:

[Start a Dataset Recipe](#)

To start a dataset recipe, perform the following steps.

[Set Preview Data in a Dataset Recipe](#)

A dataset recipe displays a preview of your data as you work. You can set the fields and number of rows that appear in this preview. If you are working with a large set of data, reducing the size of the preview speeds up the data refresh as you add steps to your recipe.

[Add Data in a Dataset Recipe](#)

Combine data in a recipe by adding fields from other datasets or replications.

[Clean and Prepare Data Intelligently with Column Profiles and Smart Suggestions](#)

The column profile gives you key insights into the quality of your data and suggests additional transformations to help you clean and prepare it. This profile is especially useful when you are combining data from different sources, where inconsistencies are often introduced.

[Add a Filter in a Dataset Recipe](#)

Filter data in a dataset recipe to remove rows that you don't need in your target dataset.

[Bucket a Measure Field in a Dataset Recipe](#)

Add a field to a dataset recipe to bucket values in a specified measure field.

[Bucket a Dimension Field in a Dataset Recipe](#)

Add a field to a dataset recipe to bucket values in a specified dimension field.

[Bucket a Date Field in a Dataset Recipe](#)

Add a field to a dataset recipe to bucket values in a specified date field.

[Add a Formula Field in a Dataset Recipe](#)

Add a formula field to calculate new values from measures in your recipe, using arithmetic operators and math functions.

[Transform Fields in a Dataset Recipe](#)

Data is not always consistent, especially when you combine data from different sources. In a dataset recipe, you can transform fields to ensure that values are consistent in your target dataset. Change case, split values to get just the parts you need, and replace incorrect values.

[Navigate Fields in a Dataset Recipe](#)

As you add data and transform fields, the number of fields in your recipe preview increases. This makes it harder to find the fields that you want to work with. Use the field navigator to quickly find the fields that you need, and hide the ones you don't.

[Navigate and Edit Recipe Steps](#)

As you prepare your data, each change you make appears as a recipe step on the left. Think of these steps as your recipe history. You can move back and forward through this history to see how the data looks at different stages of the recipe. If you don't like what you see, you can edit or remove any step.

[Save a Dataset Recipe](#)

If you're not ready to create the target dataset, save the recipe and come back to it later. Saving simply saves your steps without you having to create the dataset.


[Run a Dataset Recipe](#)

Run a new recipe to create a target dataset, or run an existing recipe to update a target dataset.

Start a Dataset Recipe


To start a dataset recipe, perform the following steps.

1. In Analytics, click the gear icon (⚙️) and then click **Data Manager** to open the data manager. The data manager opens in a new browser tab.
2. In the data manager, click the Dataflows & Recipes tab.
3. In the Dataflows & Recipes tab, click the Dataset Recipes subtab. The Dataset Recipes subtab displays a list of your existing recipes.
4. Click **Create Recipe**.
5. From the list of published datasets, click the one that contains the data you want to prepare. Alternatively, if you have enabled replication, you can click the **Replicated** tab to select a replication instead.

 **Note:** Make sure the replication you select has run and completed at least once.

You are prompted to enter a name for the recipe.

6. Enter a recipe name and then click **Continue**.

 **Note:** The recipe name you enter here is also used for the target dataset name.

The dataset recipe page opens, displaying a preview of the data from your selected dataset or replication.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS


To create a recipe:

- Edit Analytics Dataflows

Set Preview Data in a Dataset Recipe

A dataset recipe displays a preview of your data as you work. You can set the fields and number of rows that appear in this preview. If you are working with a large set of data, reducing the size of the preview speeds up the data refresh as you add steps to your recipe.

As you work in a dataset recipe, the size of your preview is always visible at the top of the page.

Data Manager		Leads with Geodata	
DATASET RECIPE Leads with Geodata		Recipe Preview for 3/3 Fields, 40 Rows 	
	ZIP	FIRST	HOUSEHOLD
	35064	Richard	

Click the  to view or change what you see in the preview.

RECIPE PREVIEW | Select fields to display from your base dataset ✕

Dataset Recipe
Leads with Geodata

- Selecting a smaller amount of data will allow you load and navigate the data at a faster speed.
- Selecting a smaller amount of data will allow you load and navigate the data at a faster speed.

3 out of 3 Fields

1

3 ZIP FIRST HOUSEHOLD


2

4 First rows in sort

Here's what you can do to set your recipe preview data:

1. Can't see a field in the list? Start typing the field name here to narrow down the list.
2. Not sure if you need a field in your preview? Click a field in the list to see a preview of its values here.
3. Don't need a field in your preview? Uncheck it here to remove it.
4. Want fewer rows in your preview? Choose to see the first 1000, 5000, or 10000 rows and select a field to sort them by.

Click **Apply** when you're done, to return to the recipe.


-  **Note:** The recipe preview can display up to 100 fields. If you remove a field from the preview, by default it's not included in the target dataset. However, you can reselect any field when you create the dataset.

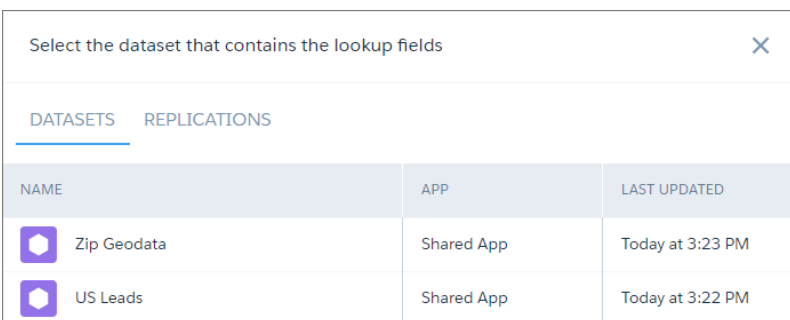
Add Data in a Dataset Recipe



Combine data in a recipe by adding fields from other datasets or replications.

When you add data to a recipe, you select the lookup dataset or replicated object that contains the fields you want to add. You also select the merge key fields to match the records in the existing and new data. For example, to add User fields to Opportunity records, use the User Id and Opportunity Owner Id fields as your merge keys.

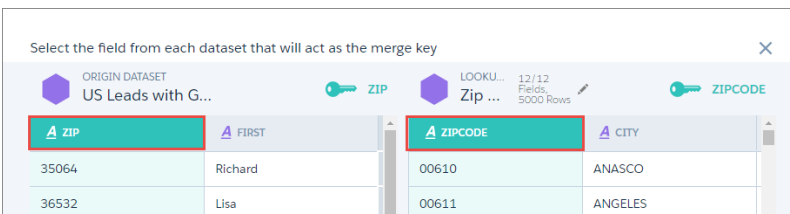
Let's look at another example here, to illustrate how you add data. Imagine you have started a recipe from a US Leads dataset, and you want to add demographic data based on zip code from another dataset. You can use the Zip Code field from each dataset as the merge keys.

1. On the dataset recipe page, click the Add Data button ().
2. Select either the Published or Replicated tab, and click the dataset or object you want to add.



Select the dataset that contains the lookup fields		
DATASETS REPLICATIONS		
NAME	APP	LAST UPDATED
 Zip Geodata	Shared App	Today at 3:23 PM
 US Leads	Shared App	Today at 3:22 PM


3. Analytics suggests merge keys if it can. To select your own, click a column header to select it as the merge key field in the origin dataset, and do the same in the lookup dataset.



Select the field from each dataset that will act as the merge key			
ORIGIN DATASET US Leads with G...		LOOKUP... Zip ...	
ZIP	FIRST	ZIPCODE	CITY
35064	Richard	00610	ANASCO
36532	Lisa	00611	ANGELES

4. To select additional merge keys, click **+Add Another**.

Use multiple merge keys to improve matching. For example, imagine you're adding contact information to lead data. Using names alone to match can result in duplicate matches when different leads have the same name. Use two merge keys to match on name and company to ensure you're matching the right data. You can use up to 5 merge keys.

 **Important:** Analytics datasets contain date and time component fields, such as Year, Quarter, and Month, that are derived automatically from existing date and time fields. Use of these component fields as merge keys isn't supported.

5. Click **Continue**.
6. Click the column header or column checkbox to select each field that you want to add.

EDITIONS

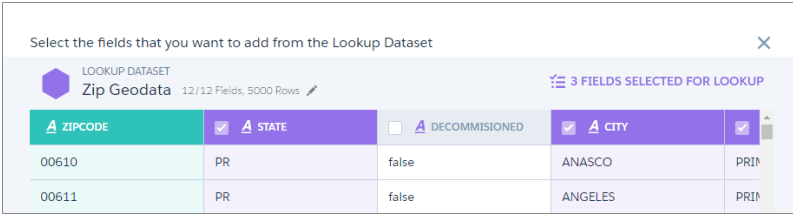
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.


USER PERMISSIONS

To create a recipe:

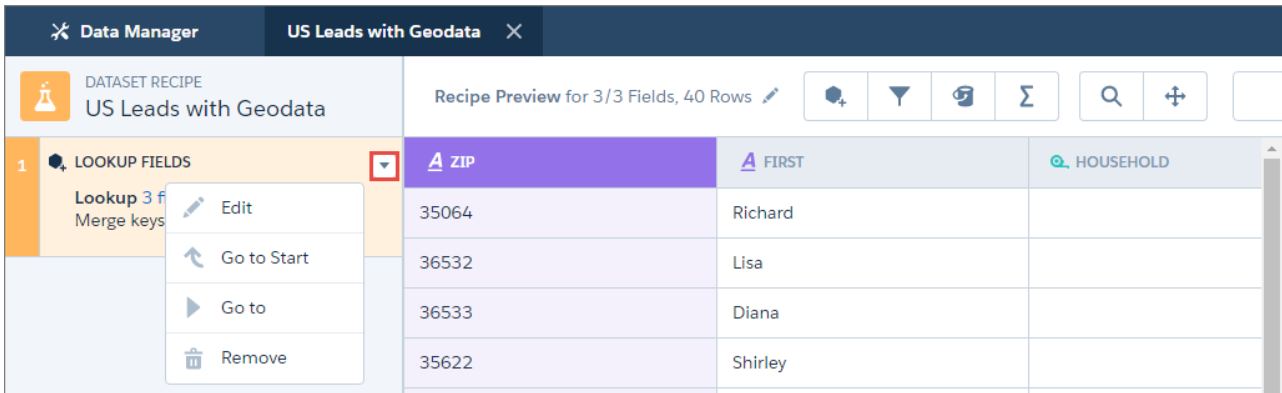
- Edit Analytics Dataflows




Then click **Continue**.

 **Note:** The lookup dataset preview can display up to 100 fields. Modify the preview or hide fields to ensure that you can see just the fields that you need. When you create the dataset, you can select all the lookup fields you want for the new dataset.

Each time you add data, a new step is created in your recipe, and the added fields appear in your recipe preview. Hover over a step and click  to access edit and remove options.



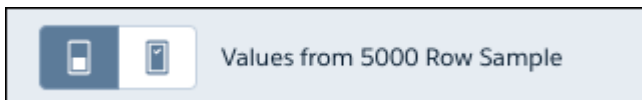
Clean and Prepare Data Intelligently with Column Profiles and Smart Suggestions

The column profile gives you key insights into the quality of your data and suggests additional transformations to help you clean and prepare it. This profile is especially useful when you are combining data from different sources, where inconsistencies are often introduced. Let's look at an example of how you can use the profile to review the quality of data in a set of leads. Select the column you want to analyze and click . The column profile opens on the right of the recipe.

Note: The sections that you see in the profile depend on the type of column.

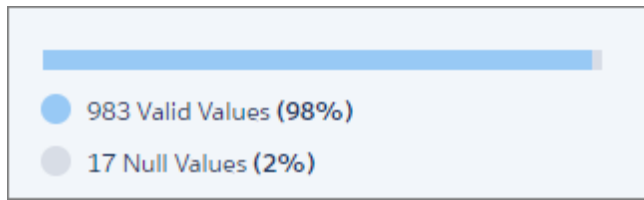
Here are the sections that you see in the column profile.

Sample Size



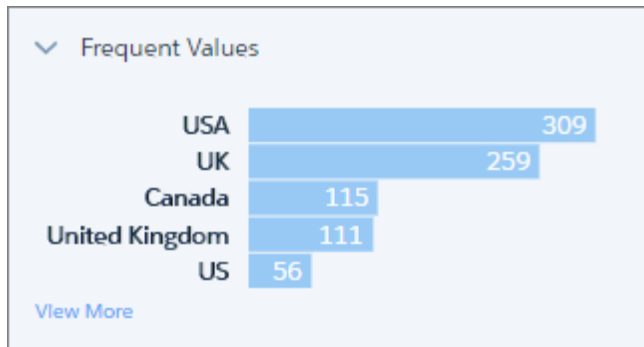
This section shows the number of rows in the sample. By default, the profile includes just the rows in your recipe preview. To use a larger sample, click .

Valid Values



This section gives you an idea of how the column is populated. A high proportion of null values can indicate lower quality data of limited usefulness in lenses and dashboards.

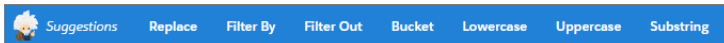
Frequent Values



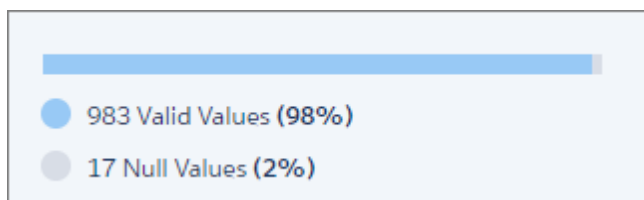
This section shows the count for each of the top five values in the column. To see the count for all values in the sample, click **View More**. This information gives you a quick insight into the variation in your data.

This example shows different values for the same country, which can impact grouping and filtering in a lens or dashboard.

For dimension and date columns, click one or more bars to see suggested transformations for those values in the Suggestions bar. In this example, if you select the US value, Analytics suggests replacing it or filtering it out.



String Length (Dimension Columns Only)

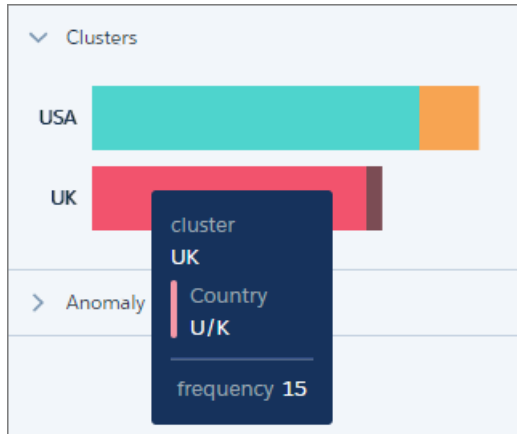


This section gives you a breakdown of the number of characters in dimension values. A wider variation than expected can indicate inconsistency issues with data from mixed sources.

Clusters (Dimension Columns Only)

Clusters are groupings of similar values presented as a stacked bar. To see which value a segment represents, hover over it.

In this example, Analytics has found instances of "USA" and "US", and "UK" and "U/K" in the Country column.



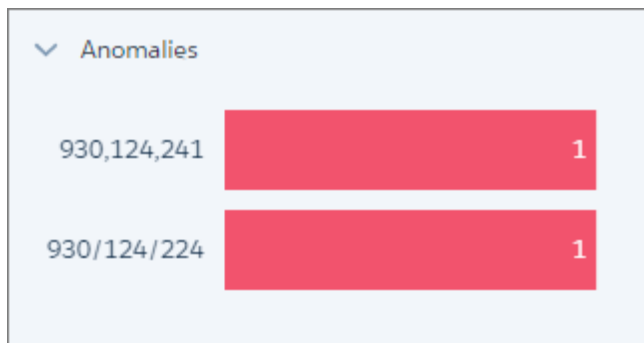
These values might be genuinely different, but they could also indicate inconsistencies in data from different sources, or simply typos.

Note: Clustering works best with English language values. Values in other languages can produce unexpected results.

To help you with your data cleansing, Analytics suggests the Bucket By Cluster transformation whenever it identifies clusters. This transformation works just like regular bucketing, but gets you started by suggesting the buckets and values.

You can add the transformation as is, or add more buckets and values.

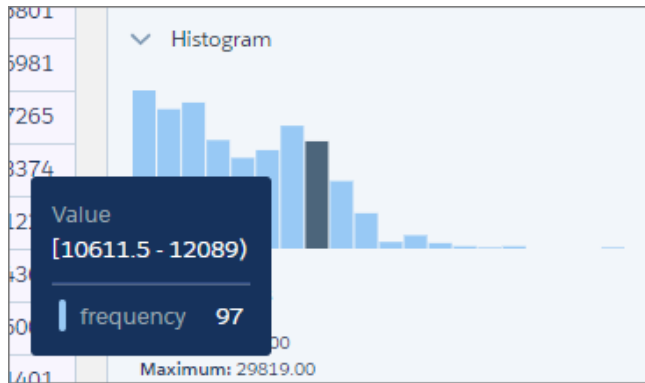
Anomalies (Dimension Columns Only)



This section displays values that are not consistent with other values in the column. In this example, Analytics has identified two values in a reference column that in which most values are in the format 123-456-789.

Again, to help you clean your data, Analytics suggests transformations when you click one or more bars. For example, you can replace the values or filter them out.

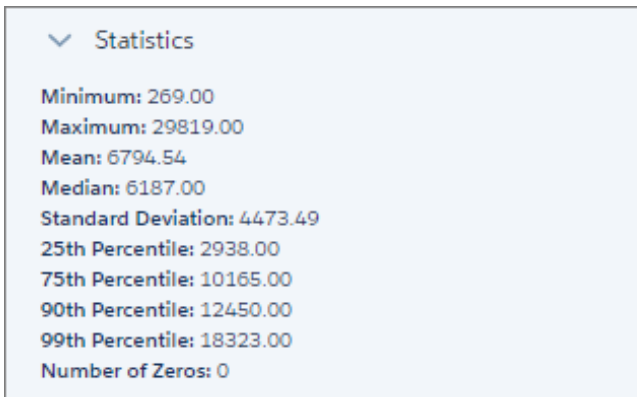
Histogram (Measure and Date Columns Only)



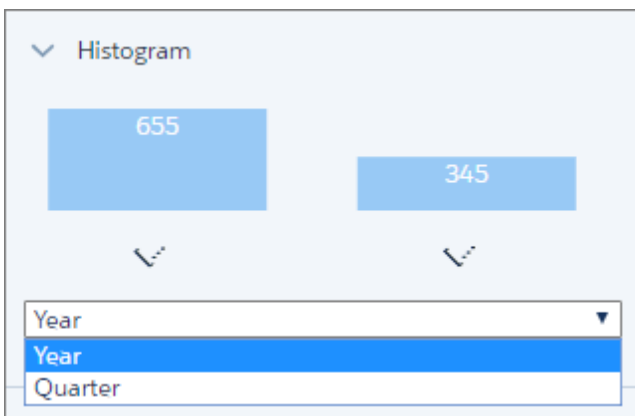
The histogram shows the distribution of values in a measure or date column. Each bar represents a predefined range, and the bar height shows the frequency of values falling within that range. Hover over a bar to see the range and frequency of the values it represents.

Use the histogram to see if the data falls within expected ranges. Low-frequency outlying values could indicate data inconsistencies or data that could impact aggregate calculations.

Measure columns also display statistical information that you can use in your data preparation.




With date columns, you can select the time frame for grouping values by year or by quarter.



Add a Filter in a Dataset Recipe

Filter data in a dataset recipe to remove rows that you don't need in your target dataset.

To add a filter to a dataset recipe, follow these steps.

1. On the column header of the field you want to filter by, click , and then select **Filter**. Filter settings appear in the Add Transformation panel below the preview data.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.


USER PERMISSIONS


To create a recipe:

- Edit Analytics Dataflows

2. In the first field, confirm the field to filter by, or click to select a different field from the list. You can select from any field in the recipe, even if it has been hidden.
3. In the second field, confirm the operator, or click to select a different one from the list.
4. In the third field, enter the filter value.

 **Note:** Filters in dataset recipes are case-sensitive.

5. To enter another condition, click  and repeat steps 2–4.
6. When you have added all your conditions, click **Add**. The filter appears as a step in the left pane of the recipe.


 **Note:** Filters in dataset recipes only filter rows that meet all conditions.

Bucket a Measure Field in a Dataset Recipe

Add a field to a dataset recipe to bucket values in a specified measure field.

A bucket field lets you create new values based on existing values in another field. For example, use a bucket field to categorize households as small, medium, or large, based on the number of people in the household.

No. of People in Household	Size Category
1–2	Small
3–5	Medium
6 or more	Large

1. On the column header of the measure field you want to bucket, click , and then select **Bucket**.
Bucket settings appear in the Add Transformation panel below the preview data.

Enter numeric ranges for new bucketed field ✕

Range for "Household"

■ Range1 <

Add>>

■ Range2 ≥

2. For Range1, enter a value and name for the first bucket. Rows with values below the Range1 value are assigned this bucket name. In this example, rows with values less than 3 are assigned a value of *Small* in the new bucket field.

■ Range1 <

The Range2 value populates with the value you enter for Range1.

3. If your bucket field has more than two buckets, click **Add>>** to add another range.
4. For each additional range you add, enter the range of values and the bucket name. Rows with values greater than or equal to the first value, and less than the second value are assigned the bucket name. In this example, rows with values 3, 4, or 5 are assigned a value of *Medium* in the new bucket field.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create a recipe:

- Edit Analytics Dataflows

Range2 3 - 6 Medium

- Repeat steps 4–5 to add any additional buckets that you need.
- For the final range, enter a value and bucket name. Rows with values greater than or equal to this value are assigned this bucket name. In this example, rows with values greater than or equal to 6 are assigned a value of *Large* in the new bucket field.

Range3 ≥ 6 Large

- When you have completed all the ranges, click **Add**. The new bucket field appears next to the source field in the recipe preview.

DATASET RECIPE US Leads with Geodata		Recipe Preview for 3/3 Fields, 40 Rows	
1	LOOKUP FIELDS Lookup 7 fields from 'Zip Geodata' Merge keys: 'Zip', 'Zipcode'	HOUSEHOLD	HOUSEHOLD RANGEBUCKET
2	FILTER ROWS Filter on 1 fields with 1 criteria	5	Medium
3	BUCKETED FIELD Bucket numbers into 3 ranges	2	Small
		4	Medium
		3	Medium
		5	Medium


Tip: You can use a bucket field to filter rows in a recipe.

Bucket a Dimension Field in a Dataset Recipe

Add a field to a dataset recipe to bucket values in a specified dimension field.

A bucket field lets you create new values based on existing values in another field. For example, use a bucket field to categorize products in support cases according to their type.

Product	Product Category
HVAC Ctrl, HeatWave, Home A/C	HVAC
Humidity Ctrl, Humidity Unit, Home Humidity	Humidity
Compressor, Condenser, Thermostat	Parts

- On the column header of the dimension field you want to bucket, click , and then select **Bucket**. Bucket settings appear in the Add Transformation panel below the preview data.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create a recipe:

- Edit Analytics Dataflows

Enter values to map to each bucket for your bucket field ✕

Bucket for Product	Values for Bucket1
1 <input type="text" value="Bucket1"/> +	After you entered a value, press "Tab" to add another <div style="border: 1px solid #ccc; height: 100px; width: 100%;"></div>
<input type="checkbox"/> Map remaining values to <input style="width: 50px;" type="text"/>	
Cancel Create Bucketed Field	

2. In the Bucket1 field, enter a name for the first bucket.
3. In the **Values for...** box, enter the values to be assigned to this bucket. Press Tab after each value to enter the next. In this example, rows containing *HVAC Ctrl*, *HeatWave*, or *Home A/C* product values are assigned a value of *HVAC* in the new bucket field.

Bucket for Product	Values for HVAC
1 <input type="text" value="HVAC"/> +	After you entered a value, press "Tab" to add another <div style="display: flex; gap: 5px;"> <input style="border: 1px solid #ccc; padding: 2px 5px;" type="text" value="HVAC Ctrl"/> ✕ <input style="border: 1px solid #ccc; padding: 2px 5px;" type="text" value="HeatWave"/> ✕ <input style="border: 1px solid #ccc; padding: 2px 5px;" type="text" value="Home A/C"/> ✕ </div>

4. To add more buckets, click + and repeat steps 2–3.
5. To bucket remaining values that you have not bucketed, select **Bucket remaining values** and enter a bucket for these values. If you don't select this option, rows with unbucketed values keep the same value in the new bucket field.
6. When you have completed all the buckets, click **Add**.
The new bucket field appears next to the source field in the recipe preview.


DATASET RECIPE Support Cases	Recipe Preview for 9/9 Fields, 2500 Rows ✎	
1 BUCKETED FIELD Bucket values into 3 categories	PRODUCT	PRODUCT TEXTBUCKET
	HeatWave	HVAC
	Humidity Ctrl	Humidity
	Compressor	Parts

💡 Tip: You can use a bucket field to filter rows in a recipe.

Bucket a Date Field in a Dataset Recipe

Add a field to a dataset recipe to bucket values in a specified date field.

A bucket field lets you create new values based on existing values in another field. For example, use a bucket field to categorize support cases according to the season they were opened.

1. On the column header of the date field you want to bucket, click , and then select **Bucket**. Bucket settings appear in the Add Transformation panel below the preview data. The default mode is Absolute, which lets you specify a date range and name for each bucket.

EDITIONS

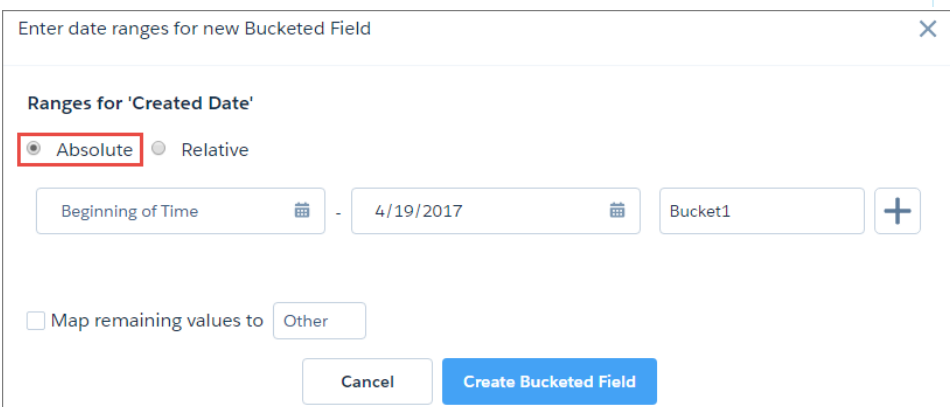
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create a recipe:

- Edit Analytics Dataflows



Enter date ranges for new Bucketed Field

Ranges for 'Created Date'

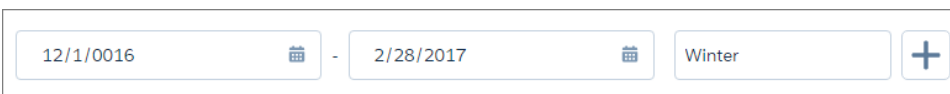
Absolute Relative

Beginning of Time - 4/19/2017 Bucket1 +


Map remaining values to Other

Cancel Create Bucketed Field

2. Enter a start date and end date for Bucket1, and enter a name for the bucket. In this example, you want each bucket to be a season, so you enter the date range for winter and enter the bucket name.



12/1/0016 - 2/28/2017 Winter +

3. To add more buckets, click  and repeat step 2.
4. To bucket remaining values that you have not bucketed, select **Bucket remaining values** and enter a bucket for these values. If you don't select this option, rows with unbucketed values keep the same value in the new bucket field.
5. When you have completed all the buckets, click **Add**. The new bucket field appears next to the source field in the recipe preview.

📅 CREATED DATE	🗑️ CREATED DATE DATEBUCKET
2017-02-22T23:51:17.000Z	Winter
2017-02-22T23:51:17.000Z	Winter
2017-02-22T23:51:17.000Z	Winter

In Relative mode, each bucket is a period of time relative to the date that the recipe runs. You can create bucket periods based on days, weeks, months, quarters, or even years. For example, create a bucket field from the case created date to categorize cases by when they were opened.

When you create a relative date bucket field, manually enter the start and end of each period, or use the sliders.

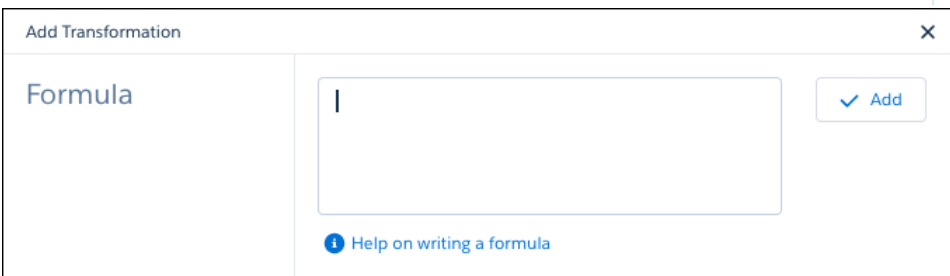
 **Tip:** You can use a bucket field to filter rows in a recipe.

Add a Formula Field in a Dataset Recipe

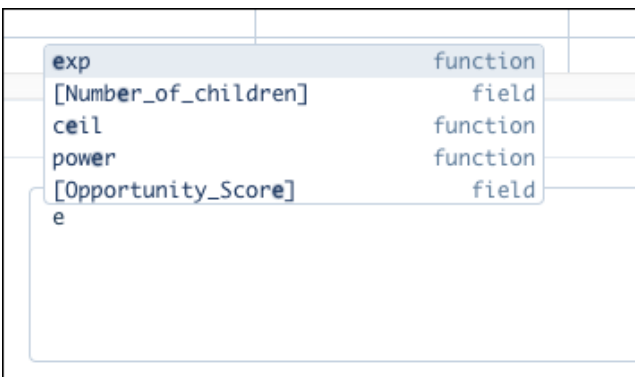
Add a formula field to calculate new values from measures in your recipe, using arithmetic operators and math functions.

A formula field lets you calculate new values based on existing values in measure fields. To help you, a formula builder suggests fields and functions as you type.

1. On a measure field column header, click , and then select **Formula**.
The formula builder appears in the Add Transformation panel below the preview data.



2. In the formula builder, start typing the formula.
As you type, the builder suggests matching math functions and measure fields.



exp	function
[Number_of_children]	field
ceil	function
power	function
[Opportunity_Score]	field
e	

3. To select a suggestion, either click it, or use your cursor up and down keys to select it and then press Enter or Tab.
4. Use your keyboard to enter parentheses, arithmetic operators, and numbers as needed.
5. When you have completed the formula, click **Add**.
The new formula field appears in the recipe preview.

EDITIONS

Available in Salesforce Classic and Lightning Experience.


Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create a recipe:

- Edit Analytics Dataflows

DATASET RECIPE US Leads with Geodata		Recipe Preview for 3/3 Fields, 40 Rows	
1	LOOKUP FIELDS Lookup 7 fields from 'Zip Geodata' Merge keys: 'Zip', 'Zipcode'	% OF US HOUSEHOLD AVG	52
2	FILTER ROWS Filter on 1 fields with 1 criteria		129
3	BUCKETED FIELD Bucket numbers into 3 ranges		65
4	COMPUTED FIELD round(2.58/[Household]*100,0)		86
			52
			65
			65

 **Tip:** You can bucket a formula field or reference it in other formulas in the recipe.

You can use the following math functions in a formula field. The arguments in each function can be either literal values or measure fields.


Function	Description	Format
abs	Calculates the absolute value of a number. The absolute value of a number is the number without its positive or negative sign.	<i>abs (number)</i>
ceil	Rounds a number up to the nearest integer.	<i>ceil (number)</i>
exp	Returns a value for e raised to the power of a number you specify.	<i>exp (number)</i>
floor	Returns a number rounded down to the nearest integer.	<i>floor (number)</i>
log	Returns the logarithm of a number in the base you specify.	<i>log (base, number)</i>
power	Raises a number to a power of a specified number.	<i>power (number, power)</i>
round	Returns the nearest number to a number you specify, constraining the new number by a specified number of digits.	<i>round (number, number of digits)</i>
sqrt	Returns the positive square root of a given number.	<i>sqrt (number)</i>
trunc	Truncates a number to an integer.	<i>trunc (number)</i>

When you select a measure column, Analytics suggests functions in the suggestion bar at the bottom of the recipe. When you select one of these functions, Analytics starts the formula for you, including arguments!

Transform Fields in a Dataset Recipe

Data is not always consistent, especially when you combine data from different sources. In a dataset recipe, you can transform fields to ensure that values are consistent in your target dataset. Change case, split values to get just the parts you need, and replace incorrect values.

When you transform a field, a new field is added with the new values to the right of the original field. You can choose to keep or remove the original field.

To transform a field, click  in the column header (1), and then click the transformation that you want to use. Alternatively, select a transformation from the Suggestions bar at the bottom of the recipe.

Transformation settings appear in the Add Transformation panel below the preview data.

Add Transformation - Close Date ✕

<h2 style="margin: 0;">Substring</h2>	<p>Starting Position <input style="width: 40px;" type="text" value="1"/></p> <p>String Length <input style="width: 40px;" type="text"/></p>	<div style="font-family: monospace; font-size: 0.9em;"> 09/11/2016 25/06/2017 09/07/2017 22/11/2016 20/07/2017 05/11/2016 </div>	<input checked="" type="checkbox"/> Add
---------------------------------------	---	---	---

Suggestions
Extract
Split
Substring
Replace

These are the field transforms you can apply.


Transform	Description	Example
Trim	Remove leading and trailing whitespaces.	Remove whitespaces to ensure values from one source are consistent with values from another source. " CA " becomes "CA".
Uppercase	Convert values in selected field to uppercase.	Correct US state values. ca becomes CA.
Lowercase	Convert values in selected field to lowercase.	Correct lead email addresses captured at a trade show. JSMITH@FORRESTER.COM becomes jsmith@forrester.com.
Split	Divide values into multiple parts at the delimiter and create a new field for each part.	Divide phone numbers into area code and number. Select the – delimiter to split 925–900 2123 into two new values 925 and 900 2123.

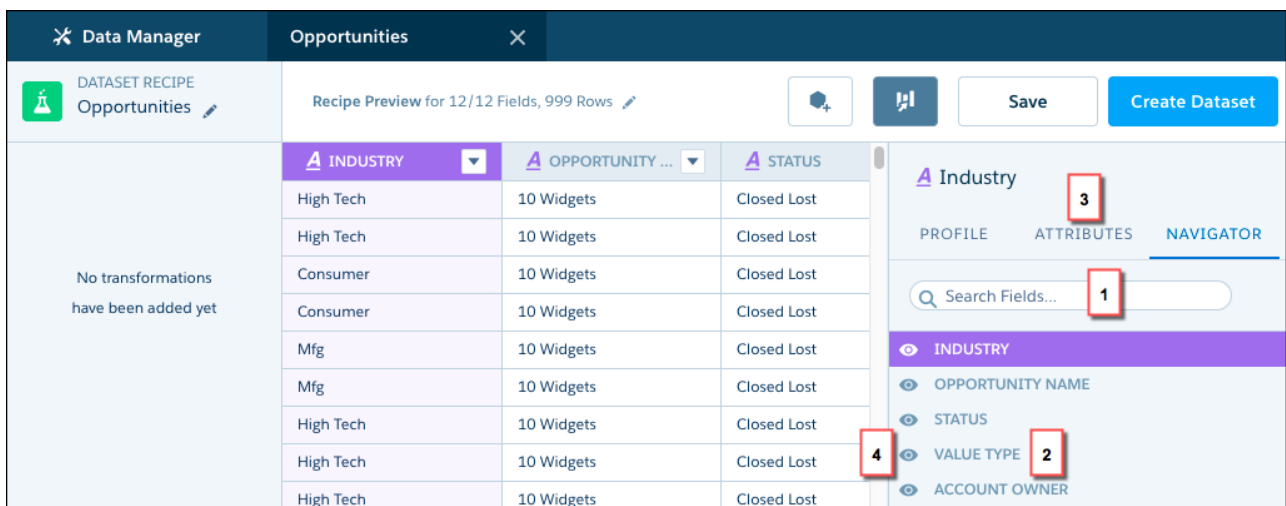
Transform	Description	Example
Substring	Starting at the character Position in a value, extract the number of characters in Length into a new field.	Extract the month from date values. Enter a Position of 4 and a Length of 2 to extract the month value 10 from the month value 2016-10-23.
Replace	Find a specific value in a field and replace it with a new value. A new field is created containing both replaced and unchanged values.	Make country values consistent. Find all instances of <i>US</i> and Replace them with <i>USA</i> .
Dim2Mea	Convert values in a dimension field to numerical values in a new measure field.	You use the Extract Date Component to extract the hour from the case created date. Use the Convert Dimension to Measure transformation to make the hour a measure for use in calculations.
Extract	Extract the selected component from a date field into a new field.	Extract the hour component from the case created date to analyze case creation by hour of the day.

Important: Analytics datasets contain date and time component fields, such as Year, Quarter, and Month, that are derived automatically from existing date and time fields. Transformations on these component fields are not supported.

Navigate Fields in a Dataset Recipe

As you add data and transform fields, the number of fields in your recipe preview increases. This makes it harder to find the fields that you want to work with. Use the field navigator to quickly find the fields that you need, and hide the ones you don't.


To open the field navigator in a recipe, click the column profile button (), and click the **Navigator** tab.



The screenshot shows the Data Manager interface for a dataset named 'Opportunities'. The main area displays a 'Recipe Preview for 12/12 Fields, 999 Rows' with a table of data. The table has columns for 'INDUSTRY', 'OPPORTUNITY ...', and 'STATUS'. The 'INDUSTRY' column contains values like 'High Tech', 'Consumer', and 'Mfg'. The 'OPPORTUNITY ...' column contains '10 Widgets', and the 'STATUS' column contains 'Closed Lost'. On the right side, there is a 'Field Navigator' panel with a search box labeled 'Search Fields...' (1). Below the search box, a list of fields is shown, including 'INDUSTRY', 'OPPORTUNITY NAME', 'STATUS', 'VALUE TYPE' (2), and 'ACCOUNT OWNER'. The 'Attributes' tab (3) is selected in the navigator. A red box (4) highlights a row in the data table.

To quickly find a field, start typing its name in the Search Fields box (1) to narrow down the list of fields. When you see the field that you want, click it (2) to see it highlighted in the recipe preview. To view or edit the field's metadata, click **Attributes** (3). Here you can edit the API names and labels of new fields you create in a recipe, and the labels of existing fields. If you decide you don't need to see the

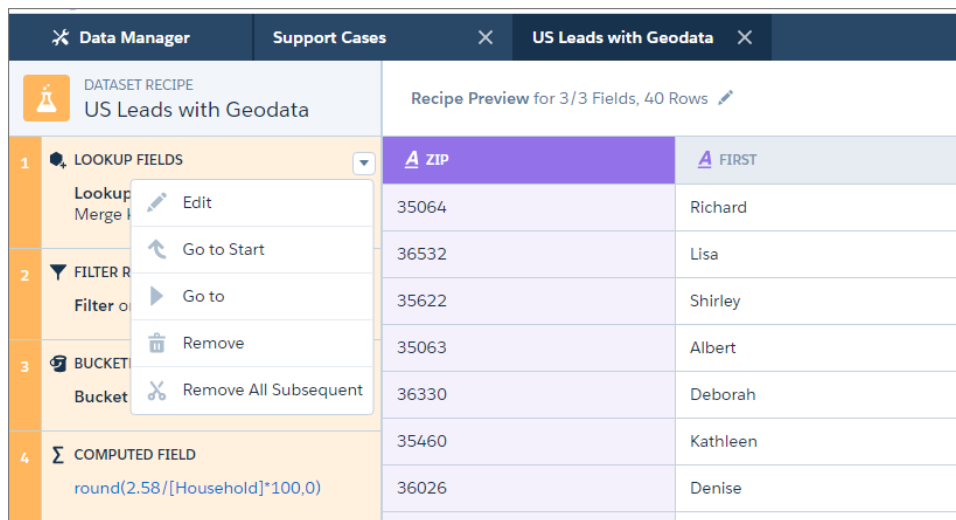
field, click the eye (4) to hide it. Click the eye again to show a field. You can also hide a field by hovering over its header in the preview, and clicking the eye.

 **Note:** If you hide a field in the navigator, by default it is not included when the recipe runs. However, you can choose to include the field when you run the recipe.

Navigate and Edit Recipe Steps


As you prepare your data, each change you make appears as a recipe step on the left. Think of these steps as your recipe history. You can move back and forward through this history to see how the data looks at different stages of the recipe. If you don't like what you see, you can edit or remove any step.


To access recipe step actions, hover over the step and click .

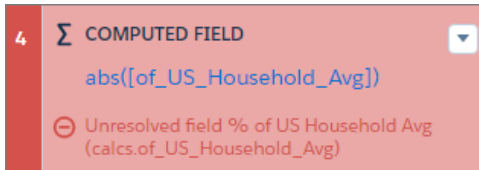


 **Note:** The actions available for each step depend on the step's position.

Here's what the actions do.

Action	Description
Edit	Edit the current step.  Tip: You can also edit a step by clicking any of the blue values.
Go to Start	Display the preview data as it was at the start of the recipe, before you added any steps. This action is only available for the first step.
Go to	Display the preview data as it was at the current step, before you added any subsequent steps.
Remove	Remove the current step.
Remove all Subsequent	Remove all steps after the current step.

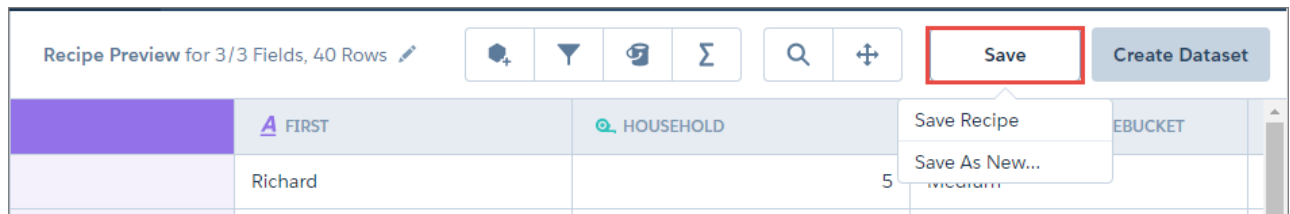
-  **Note:** Removing a step may cause subsequent steps to stop working. For example, if you remove a formula field step that is used in a later formula field, Analytics can't calculate the second formula. When this happens, the affected step appears in red, with an explanation of the error, alerting you to the need to edit the step.



Save a Dataset Recipe

If you're not ready to create the target dataset, save the recipe and come back to it later. Saving simply saves your steps without you having to create the dataset.

To save a recipe, click **Save**.




You have two options when saving a recipe.

Save Recipe

Save the recipe with the name you provided when you started. The recipe does not run. Use this option to save your progress.

Save As New...

Save a copy of your recipe with the same name you provided when you started. The copy opens in a new tab in the data manager. Use this option to try out different transformations in a recipe, without changing your original recipe.

-  **Important:** A recipe you create with the **Save As New** option has the same recipe name and target dataset name as the original recipe. We recommend that you run either the original recipe or the new recipe, but not both, to avoid creating target datasets with the same name.

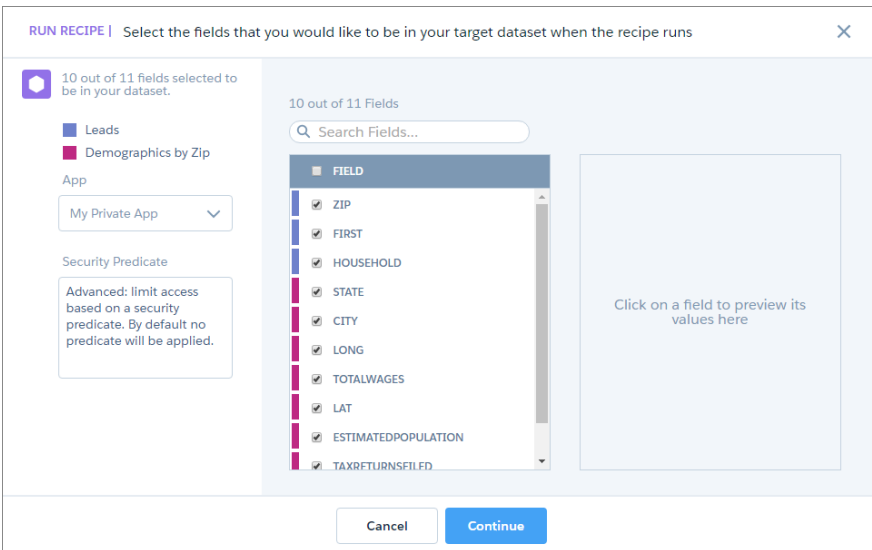
Open a saved recipe on the Prepare tab of the data manager to update it or run it. See [Manage and Monitor Dataset Recipes](#).

Run a Dataset Recipe

Run a new recipe to create a target dataset, or run an existing recipe to update a target dataset.

When you run a recipe, you select an app for the target dataset, enter a security predicate if necessary, and select the fields to include in your target dataset. You can run a recipe once only, or set it to run on a schedule.

1. On the dataset recipe page, click **Create Dataset**.
The Run Recipe dialog appears.




2. From the **App** picklist, select where you want to create the target dataset.
3. If required, enter a security predicate for the target dataset. See [Row-Level Security for Datasets](#).
4. In the list of fields, make sure the fields that you require are selected.

 **Note:** By default, fields that you have removed or hidden in the recipe preview are not selected. Make sure that you review these fields.

5. Click **Continue**.
6. Either select to run periodically, or this time only.
If you select to run this time only, click **Run Recipe** to finish.
If you select to run periodically, click **Schedule Recipe**, complete the schedule settings, and then click **Schedule and Run**.
Your recipe is queued to run.

Manage and Monitor Dataset Recipes

View the status of your recipes and target datasets on the Dataflows & Recipes tab of the data manager. You can open recipes to update or run them, or delete them.

To open the data manager in Analytics, click the gear icon () and then click **Data Manager**.

Click the Dataflows & Recipes tab, and then click the Dataset Recipes subtab. This subtab displays your recipes and their associated target datasets.

EDITIONS

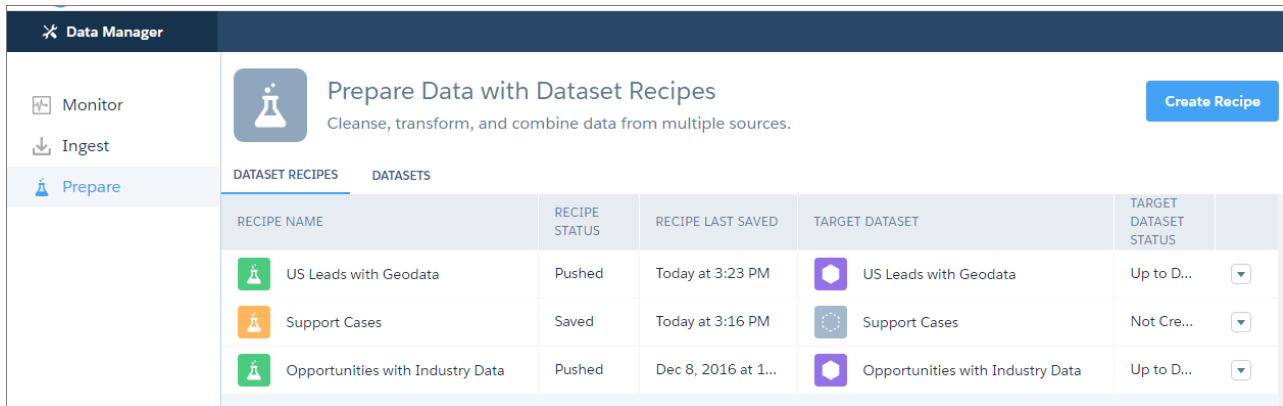
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create a recipe:

- Edit Analytics Dataflows



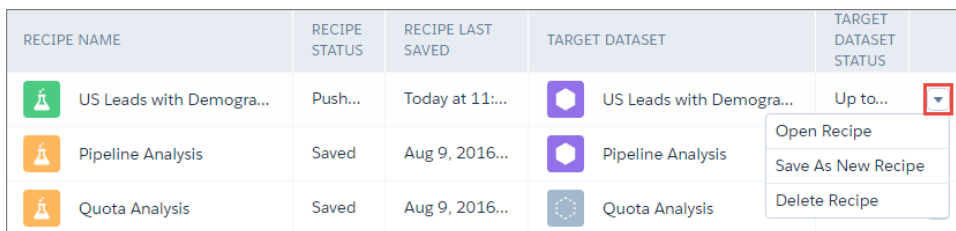
A recipe's icon and status indicate its current state.

Icon	Status	Explanation
	Pushed	New or updated recipe that has been run.
	Saved	New or updated recipe that has been saved but not run.


A target dataset's icon and status indicate its current state.

Icon	Status	Explanation
	Up to Date	The dataset has been created and is up to date.
	Not Up to Date	The dataset has been created, but is not currently up to date. This is because its recipe has been updated but not run, or is queued to run.
	Not Created	The dataset has not been created. This is because its recipe has been created but never run, or is queued to be run.

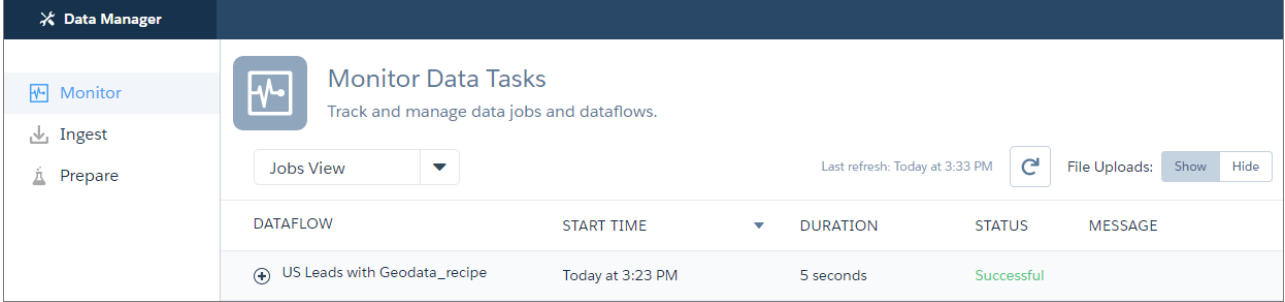
Open a recipe to update it or run it. Either click the recipe or open the actions menu and select **Open Recipe**.



You can also delete a recipe from here.

 **Note:** Deleting a recipe does not delete its target dataset.

Click the Monitor tab to view the progress of recipes that you have run. Recipes show as separate jobs in the Jobs View.



DATAFLOW	START TIME	DURATION	STATUS	MESSAGE
US Leads with Geodata_recipe	Today at 3:23 PM	5 seconds	Successful	

Manage Datasets

Edit a dataset to update its details or extended metadata, apply security, replace data, or restore it to a previous version.

IN THIS SECTION:

[Edit a Dataset](#)

Edit a dataset to change its name, app, security, or extended metadata (XMD). You can also replace data in a dataset, restore it to a previous version, or delete it. The dataset edit page also provides key information about when the dataset was created and last updated, and where it is used.

[Row-Level Security for Datasets](#)

If an Analytics user has access to a dataset, they have access to all records in the dataset, by default. However, you can implement row-level security on a dataset to restrict access to records. Some records might contain sensitive data that shouldn't be accessible by everyone.

[Predicate Expression Syntax for Datasets](#)

You must use valid syntax when defining the predicate expression.

[Delete a Dataset](#)

Delete unnecessary datasets from your My Private App or in shared apps on which you have at least Editor access. Removing datasets reduces clutter and helps you avoid reaching your org's limit for rows across registered datasets.

Edit a Dataset

USER PERMISSIONS

To view a dataset edit page:	Use Analytics AND Editor access to the dataset's app
To update a dataset name, app, and extended metadata:	Use Analytics AND Editor access to the dataset's app
To delete a dataset:	Use Analytics AND Editor access to the dataset's app
To upload and preview data:	Upload External Data to Analytics AND Editor access to the dataset's app
To edit a dataset security:	Edit Analytics Dataflows
To restore a dataset:	Edit Analytics Dataflows



EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

Edit a dataset to change its name, app, security, or extended metadata (XMD). You can also replace data in a dataset, restore it to a previous version, or delete it. The dataset edit page also provides key information about when the dataset was created and last updated, and where it is used.

You can edit a dataset from Analytics home or from the data manager.

- To edit a dataset from Analytics home, follow these steps.
 1. Hover over the dataset and click .
 2. Click **Edit**.
- To edit a dataset from the data manager, follow these steps.
 1. In the data manager, click the **Datasets** tab.
 2. On the right of the dataset, click .
 3. Click **Edit Dataset**.
- Edit the following settings, as needed.

Option	Description
Dataset name	Enter a new name if you'd like to change the name of the dataset. The name cannot exceed 80 characters.
App	Select a new app if you'd like to move the dataset to a different app.
Extended Metadata File	Specify an extended metadata file if you'd like to customize the formatting of dashboards associated with the dataset. Refer to <i>Extended Metadata (XMD) Reference</i> for information about extended metadata files.
Sharing Source	If you have enabled sharing inheritance, specify the object from which you want to inherit sharing for this dataset. You can't specify a sharing source for datasets

Option	Description
	<p>created from CSV files. When you select a sharing source, you must also add a security predicate. Analytics populates the Security Predicate field with the value <i>false</i>.</p> <p>See Salesforce Sharing Inheritance for Datasets.</p>
Security Predicate	<p>Add a security predicate if you'd like to apply row-level security on the dataset.</p> <p>For information about predicates, see Row-Level Security for Datasets.</p>

IN THIS SECTION:

[Update a Dataset's Extended Metadata](#)


A dataset's extended metadata (XMD) file allows you to customize the formatting of dashboards associated with the dataset. You can update the XMD file through the dataset's edit page.




[Restore a Dataset to a Previous Version](#)


Restoring a dataset rolls back its data to a previous version. Restore a dataset to reverse a recent update or to undo the results of a dataflow change.

Update a Dataset's Extended Metadata

A dataset's extended metadata (XMD) file allows you to customize the formatting of dashboards associated with the dataset. You can update the XMD file through the dataset's edit page.

 **Important:** An XMD file must use XMD 2.0 syntax and be no greater than 5 MB. Refer to *Extended Metadata (XMD) Reference* for information about extended metadata files and XMD 2.0 syntax.

1. On the Analytics page, click the **Datasets** tab. If you're in the data manager, click the **Datasets** tab there.
2. Hover over the dataset that you want to update, click , and then click **Edit**. If you're in the data manager, click **Edit Dataset**.
The dataset edit page opens.
3. Under Extended Metadata File, click , and then select **Download**. Download the current XMD file as a backup.
4. Under Extended Metadata File, click , and then select **Replace**. Select your new XMD file and click **Open**.
If the XMD file is not valid, you see an error message. Correct the syntax of the file and upload it again.

 **Note:** If the XMD file displays an error message when you open the dataset edit page, the current file is not valid.

EDITIONS

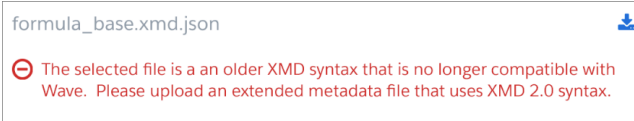
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To update a dataset's extended metadata:

- Use Analytics AND Editor access to the dataset's app



Perform step 3 to download the file, then convert it to XMD 2.0. Then perform step 4 to reupload the converted file and update the dataset.


Refer to *Extended Metadata (XMD) Reference* for information about converting extended metadata files to XMD 2.0 syntax.

Restore a Dataset to a Previous Version

Restoring a dataset rolls back its data to a previous version. Restore a dataset to reverse a recent update or to undo the results of a dataflow change.


Important: Restoring a dataset can impact the dashboards, lenses, and dataflows that use it. Refer to the usage information on the dataset's edit page to review the impacted assets before you restore.

1. On the Analytics page, click the **Datasets** tab. If you're in the data manager, click the **Datasets** tab there.

2. Hover over the dataset that you want to restore, click , and then click **Edit**. If you're in the data manager, click **Edit Dataset**.
The dataset edit page opens.

3. Click **Restore Dataset**.
The Restore Dataset dialog appears, displaying the two previous versions.

4. Click the version you want to restore.

 **Note:** To see older versions, click the **Show Older Versions** link. You can select older version to restore, but Analytics can't always restore them.

5. Click **Restore**.
The restore confirmation dialog appears.

6. Click **Restore**.
The dataset is queued to be restored.

7. To view the restore data job, click the **data monitor** link.

You see the restore data job on the Monitor tab of the data manager. If Analytics can't restore the dataset, the job fails. Try restoring a later version of the dataset.

Important: Restoring a dataset has no effect on associated dataflows or recipes. It's possible that when an associated dataflow or recipe next runs, it can undo the results of a restore.

Row-Level Security for Datasets

If an Analytics user has access to a dataset, they have access to all records in the dataset, by default. However, you can implement row-level security on a dataset to restrict access to records. Some records might contain sensitive data that shouldn't be accessible by everyone.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To restore a dataset:

- Edit Analytics Dataflows

To implement row-level security for a dataset, you can either define a security predicate, or you can turn on sharing inheritance and specify from which objects sharing rules should be migrated. Sharing inheritance works together with security predicates, where you specify a security predicate to take over for those users who fall outside the scope of sharing inheritance. Sharing inheritance currently supports Accounts, Opportunities, Orders, Cases, and custom objects.

IN THIS SECTION:

[Security Predicates for Datasets](#)

Applying a predicate to a dataset is more than just defining the predicate expression. You also need to consider how the predicate is dependent on the information in the dataset and where to define the predicate expression.

[Salesforce Sharing Inheritance for Datasets](#)

Use sharing inheritance to allow Analytics to use the same sharing rules for your datasets as Salesforce uses for your objects.

SEE ALSO:

[sfdcRegister Transformation](#)

[sfdcRegister Parameters](#)

Security Predicates for Datasets

Applying a predicate to a dataset is more than just defining the predicate expression. You also need to consider how the predicate is dependent on the information in the dataset and where to define the predicate expression.

Define a predicate for each dataset on which you want to restrict access to records. A *predicate* is a filter condition that defines row-level access to records in a dataset.

When a user submits a query against a dataset that has a predicate, Analytics checks the predicate to determine which records the user has access to. If the user doesn't have access to a record, Analytics does not return that record.



Note:

- Changes to security settings (`rowLevelSharingSource` or `rowLevelSecurityFilter`) in a dataflow have no effect on datasets that already exist. You must change those settings on the edit dataset page.
- When sharing inheritance is enabled, you can set the security predicate to 'false' to block all users not covered by sharing. In fact, this predicate is the default when sharing is enabled on existing datasets.

The predicate is flexible and can model different types of security policies. For example, you can create predicates based on:

- Record ownership. Enables each user to view only records that they own.
- Management visibility. Enables each user to view records owned or shared by their subordinates based on a role hierarchy.
- Team or account collaboration. Enables all members of a team, like an opportunity team, to view records shared with the team.
- Combination of different security requirements. For example, you might need to define a predicate based on the Salesforce role hierarchy, teams, and record ownership.

The type of security policy you implement depends on how you want to restrict access to records in the dataset.



Warning: If row-level security isn't applied to a dataset, any user that has access to the dataset can view all records in the dataset.

You can create a predicate expression based on information in the dataset. For example, to enable each user to view only dataset records that they own, you can create a predicate based on a dataset column that contains the owner for each record. If needed, you can load additional data into a dataset required by the predicate.

The location where you define the predicate varies.

- To apply a predicate on a dataset created from a dataflow, add the predicate in the **rowLevelSecurityFilter** field of the Register transformation. The next time the dataflow runs, Analytics will apply the predicate.
- To apply a predicate on a dataset created from an external data file, define the predicate in the **rowLevelSecurityFilter** field in the metadata file associated with the external data file. Analytics applies the predicate when you upload the metadata file and external data file. If you already created the dataset from a external data file, you can edit the dataset to apply or change the predicate.

IN THIS SECTION:

[Row-Level Security Example based on Record Ownership](#)

Let's look at an example where you create a dataset based on a CSV file and then implement row-level security based on record ownership. In this example, you will create a dataset that contains sales targets for account owners. To restrict access on each record in the dataset, you will create a security policy where each user can view only sales targets for accounts that they own. This process requires multiple steps that are described in the sections that follow.

[Row-Level Security Example based on Opportunity Teams](#)

Let's look at an example where you create a dataset based on Salesforce data and then implement row-level security based on an opportunity team. In this example, you will create a dataset that contains only opportunities associated with an opportunity team. To restrict access on each record in the dataset, you will create a security policy where only opportunity members can view their opportunity. This process requires multiple steps that are described in the sections that follow.

[Row-Level Security Example based on Role Hierarchy and Record Ownership](#)

Let's look at an example where you create a dataset based on Salesforce data and then implement row-level security based on the Salesforce role hierarchy and record ownership. In this example, you will create a dataset that contains all opportunities. To restrict access on each record in the dataset, you will create a security policy where each user can view only opportunities that they own or that are owned by their subordinates based on the Salesforce role hierarchy. This process requires multiple steps that are described in the sections that follow.

Row-Level Security Example based on Record Ownership

Let's look at an example where you create a dataset based on a CSV file and then implement row-level security based on record ownership. In this example, you will create a dataset that contains sales targets for account owners. To restrict access on each record in the dataset, you will create a security policy where each user can view only sales targets for accounts that they own. This process requires multiple steps that are described in the sections that follow.



Note: Although this example is about applying a predicate to a dataset created from a CSV file, this procedure can also be applied to a dataset that is created from Salesforce data.

IN THIS SECTION:

1. [Determine Which Data to Include in the Dataset](#)

First, determine what data you want to include in the dataset. For this example, you will create a Targets dataset that contains all sales targets.

2. [Determine Row-Level Security for Dataset](#)

Now it's time to think about row-level security. How will you restrict access to each record in this dataset?

3. [Add the Predicate to the Metadata File](#)

For a dataset created from a CSV file, you can specify the predicate in the metadata file associated with the CSV file or when you edit the dataset.

4. [Create the Dataset](#)

Now that you updated the metadata file with the predicate, you can create the dataset.

5. [Test Row-Level Security for the Dataset](#)

You must verify that the predicate is applied properly and that each user can see their own sales targets.

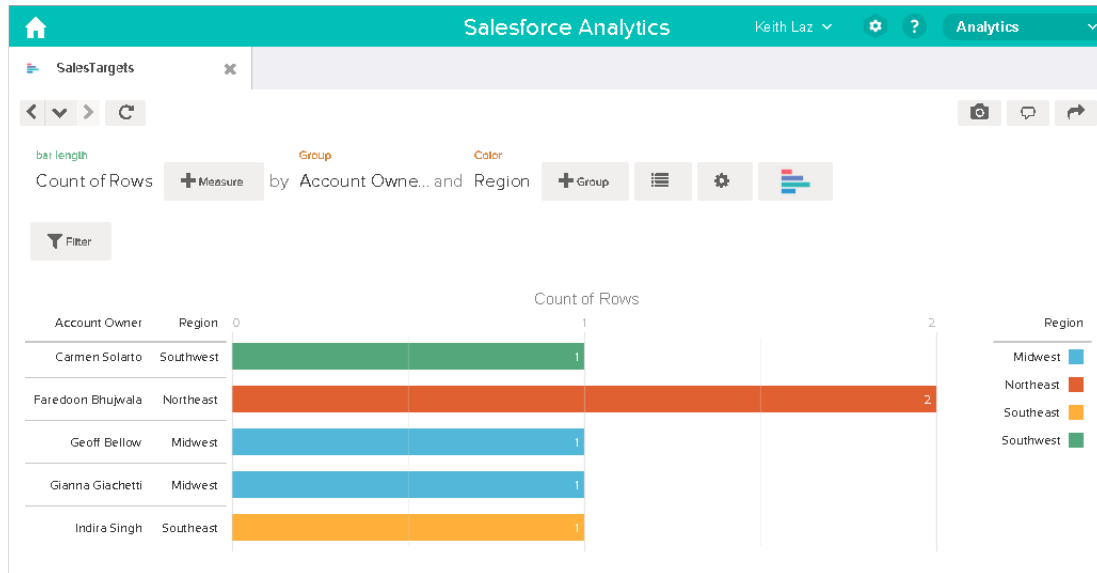
Determine Which Data to Include in the Dataset

First, determine what data you want to include in the dataset. For this example, you will create a Targets dataset that contains all sales targets.

You will obtain sales targets from the CSV file shown below.

AccountOwner	Region	Target	TargetDate
Tony Santos	Midwest	10000	1/1/2011
Lucy Timmer	Northeast	50000	1/1/2011
Lucy Timmer	Northeast	0	12/1/2013
Bill Rolley	Midwest	15000	1/1/2011
Keith Laz	Southwest	35000	1/1/2011
Lucy Timmer	Southeast	40000	1/1/2011

If you were to create the dataset without implementing row-level security, any user that had access to the dataset would be able to see the sales targets for all account owners. For example, as shown below, Keith would be able to view the sales targets for all account owners.




You need to apply row-level security to restrict access to records in this dataset.

Determine Row-Level Security for Dataset

Now it's time to think about row-level security. How will you restrict access to each record in this dataset?

You decide to implement the following predicate on the dataset.

```
'AccountOwner' == "$User.Name"
```

 **Note:** All predicate examples in this document escape the double quotes because it's required when you enter the predicate in the Register transformation or metadata file. This predicate implements row-level security based on record ownership. Based on the predicate, Analytics returns a sales target record when the user who submits the query on the dataset is the account owner.

Let's take a deeper look into the predicate expression:

- AccountOwner refers to the dataset column that stores the full name of the account owner for each sales target.
- \$User.Name refers to the Name column of the User object that stores the full name of each user. Analytics performs a lookup to get the full name of the user who submits each query.

 **Note:** The lookup returns a match when the names in AccountOwner and \$User.Name match exactly—they must have the same case.

Add the Predicate to the Metadata File

For a dataset created from a CSV file, you can specify the predicate in the metadata file associated with the CSV file or when you edit the dataset.

You must escape the double quotes around string values when entering a predicate in the metadata file.

In this example, you add the predicate to the metadata file shown below.

```
{
  "fileFormat": {
    "charsetName": "UTF-8",
    "fieldsDelimitedBy": ",",
    "fieldsEnclosedBy": "\"",
    "numberOfLinesToIgnore": 1 },
  "objects": [
    {
      "name": "Targets",
      "fullyQualifiedName": "Targets",
      "label": "Targets",
      "rowLevelSecurityFilter": "'AccountOwner' == \"$User.Name\"",
      "fields": [
        {
          "name": "AccountOwner",
          "fullyQualifiedName": "Targets.AccountOwner",
          "label": "Account Owner",
          "type": "Text"
        },
        {
          "name": "Region",
          "fullyQualifiedName": "Targets.Region",
          "label": "Region",
          "type": "Text"
        },
        {
          "name": "Target",
          "fullyQualifiedName": "Targets.Target",
          "label": "Target",
          "type": "Numeric",
          "precision": 16,
          "scale": 0,

```

```

        "defaultValue": "0",
        "format": null
    },
    {
        "name": "TargetDate",
        "fullyQualified_name": "Targets.TargetDate",
        "label": "TargetDate",
        "description": "",
        "type": "Date",
        "format": "dd/MM/yy HH:mm:ss",
        "isSystemField": false,
        "fiscalMonthOffset": 0
    }
  ]
}

```

Create the Dataset

Now that you updated the metadata file with the predicate, you can create the dataset.



Warning: If you wish to perform the steps in this sample implementation, perform the steps in a non-production environment. Ensure that these changes do not impact other datasets that you already created.

To create the dataset, perform the following steps.

1. In Analytics, go to the home page.
2. Click **Create > Dataset**
3. Click **CSV**.

The following screen appears.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.



USER PERMISSIONS

To upload a CSV and metadata file:

- Upload External Data to Analytics

4. Select the CSV file and metadata (schema) file.
5. In the **Dataset Name** field, enter “SalesTarget” as the name of the dataset.
6. Optionally, choose a different app where you want to store the dataset.
7. Click **Create Dataset**.

Analytics confirms that the upload is successful and then creates a job to create the dataset. You can view the SalesTarget dataset after the job completes successfully.

8. To verify that the job completes successfully, perform the following steps:
 - a. Click the gear icon () and then select **Data Monitor** to open the data monitor. By default, the Jobs View of the data monitor appears. It shows the statuses of dataflow and external data upload jobs.
 - b. Click the Refresh Jobs button () to view the latest statuses of the jobs.

Test Row-Level Security for the Dataset

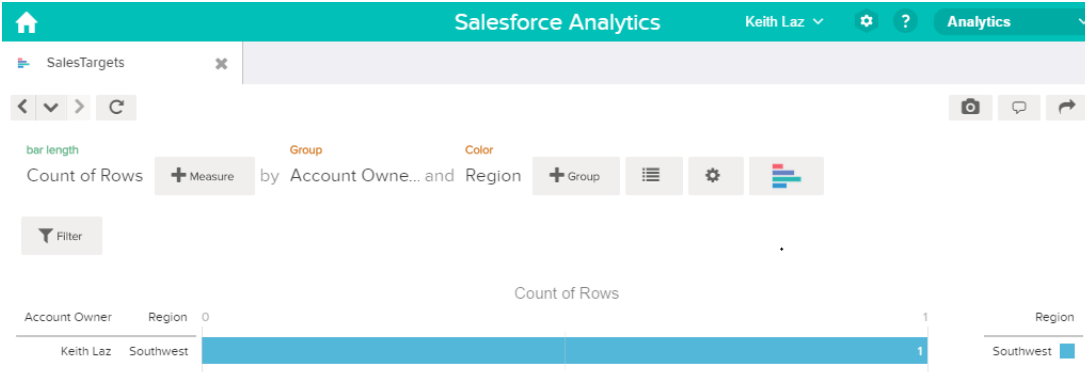
You must verify that the predicate is applied properly and that each user can see their own sales targets.

1. Log in to Analytics as Keith.
2. Open the SalesTargets dataset. As shown in the following lens, notice that Keith can see only his sales target.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.



Row-Level Security Example based on Opportunity Teams

Let's look at an example where you create a dataset based on Salesforce data and then implement row-level security based on an opportunity team. In this example, you will create a dataset that contains only opportunities associated with an opportunity team. To restrict access on each record in the dataset, you will create a security policy where only opportunity members can view their opportunity. This process requires multiple steps that are described in the sections that follow.

IN THIS SECTION:

1. [Determine Which Data to Include in the Dataset](#)

First, determine what data you want to include in the dataset. For this example, you will create an OppTeamMember dataset that contains only opportunities associated with an opportunity team.

2. [Design the Dataflow to Load the Data](#)

Now it's time to figure out how the dataflow will extract the Salesforce data and load it into a dataset. You start by creating this high-level design for the dataflow.

3. [Determine Row-Level Security for the Dataset](#)

Now it's time to think about row-level security. How will you restrict access to each record in this dataset?

4. [Modify the Dataflow Based on Row-Level Security](#)

It's now time to add the predicate in the dataflow definition file.

5. [Create the Dataset](#)

Now that you have the final dataflow definition file, you can create the dataset.

6. [Test Row-Level Security for the Dataset](#)

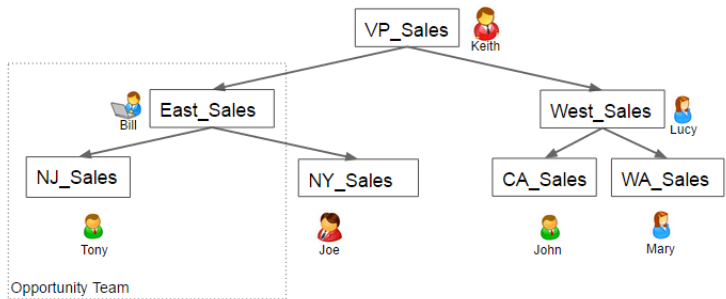
You must verify that the predicate is applied properly and that each user can see the appropriate opportunities.

Determine Which Data to Include in the Dataset

First, determine what data you want to include in the dataset. For this example, you will create an OppTeamMember dataset that contains only opportunities associated with an opportunity team.

You will obtain opportunities from the Opportunity object and the opportunity teams from the OpportunityTeamMember object. Both are Salesforce objects.

In this example, your Salesforce organization has the following opportunity team and users.



Your organization also contains the following opportunities, most of which are owned by Keith.

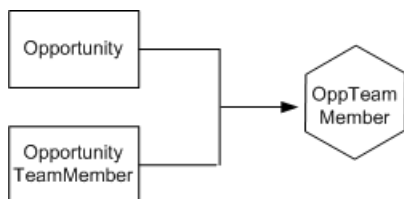
Action	Opportunity Name	Account Name	Amount	Close Date	Stage	Opportunity Owner Alias
<input type="checkbox"/> Edit Del +	Acc - 1000 Widgets	Acc_salesrep		9/4/2014	Prospecting	Tony
<input type="checkbox"/> Edit Del +	Acme - 1,200 Widgets	Acme	\$140,000.00	6/14/2012	Value Proposition	Keith
<input type="checkbox"/> Edit Del +	Acme - 200 Widgets	Acme	\$20,000.00	10/13/2012	Prospecting	Keith
<input type="checkbox"/> Edit Del +	Acme - 600 Widgets	Acme	\$70,000.00	8/10/2012	Needs Analysis	Keith
<input type="checkbox"/> Edit Del +	ESales_01	East_Sales_acc_01		9/4/2014	Prospecting	Bill
<input type="checkbox"/> Edit Del +	Global Media - 400...	Global Media	\$40,000.00	7/13/2012	Id. Decision Makers	Keith
<input type="checkbox"/> Edit Del +	salesforce.com - 1...	salesforce.com	\$100,000.00	6/14/2012	Negotiation/Review	Keith
<input type="checkbox"/> Edit Del +	salesforce.com - 2...	salesforce.com	\$20,000.00	8/12/2012	Value Proposition	Keith
<input type="checkbox"/> Edit Del +	salesforce.com - 50...	Global Media	\$50,000.00	5/12/2012	Closed Won	Keith
<input type="checkbox"/> Edit Del +	salesforce.com - 50...	Global Media	\$500,000.00	5/12/2012	Closed Won	Keith
<input type="checkbox"/> Edit Del +	West_Sales_01	West_Sales_Acc_01		9/4/2014	Prospecting	Lucy

Acc - 1000 Widgets is the only opportunity shared by an opportunity team. Bill is the Sales Manager for this opportunity. Tony is the opportunity owner.

Design the Dataflow to Load the Data

Now it's time to figure out how the dataflow will extract the Salesforce data and load it into a dataset.

You start by creating this high-level design for the dataflow.



EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

EDITIONS

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The dataflow will extract data from the Opportunity and OpportunityTeamMember objects, join the data, and then load it into the OppTeamMember dataset.

Now let's implement that design in JSON, which is the format of the dataflow definition file. A dataflow definition file contains transformations that extract, transform, and load data into a dataset.

Based on the design, you create the JSON shown below.

```
{
  "Extract_OppportunityTeamMember": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "OpportunityTeamMember",
      "fields": [
        { "name": "Name" },
        { "name": "OpportunityId" },
        { "name": "UserId" }
      ]
    }
  },
  "Extract_Oppportunity": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    }
  },
  "Augment_OppportunityTeamMember_Oppportunity": {
    "action": "augment",
    "parameters": {
      "left": "Extract_OppportunityTeamMember",
      "left_key": [
        "OpportunityId"
      ],
      "relationship": "TeamMember",
      "right": "Extract_Oppportunity",
      "right_key": [
        "Id"
      ],
      "right_select": [
        "Name", "Amount"
      ]
    }
  },
  "Register_Dataset": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "OppTeamMember",
      "name": "OppTeamMember",
    }
  }
}
```

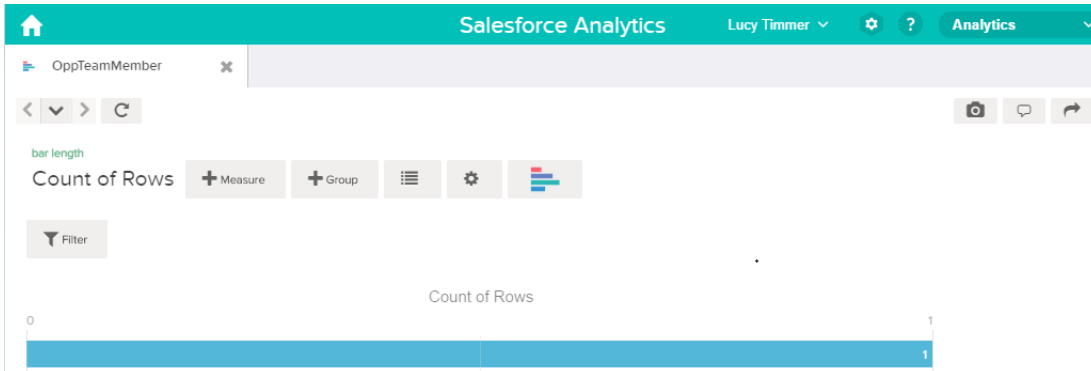
```

    "source": "Augment_OpportunityTeamMember_Opportunity",
    "rowLevelSecurityFilter": ""
  }
}
}

```

If you were to run this dataflow, Analytics would generate a dataset with no row-level security. As a result, any user that has access to the dataset would be able to see the opportunity shared by the opportunity team.

For example, as shown below, Lucy would be able to view the opportunity that belongs to an opportunity team of which she is not a member.



You need to apply row-level security to restrict access to records in this dataset.

Determine Row-Level Security for the Dataset

Now it's time to think about row-level security. How will you restrict access to each record in this dataset?

You decide to implement the following predicate on the dataset.

```
'UserId' == "$User.Id"
```

This predicate compares the UserId column in the dataset against the ID of the user running a query against the dataset. The UserId column in the dataset contains the user ID of the team member associated with each opportunity. To determine the ID of the user running the query, Analytics looks up the ID of the user making the query in the User object.

For each match, Analytics returns the record to the user.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

Modify the Dataflow Based on Row-Level Security

It's now time to add the predicate in the dataflow definition file.

You add the predicate to the Register transformation that registers the OppTeamMember dataset as shown below.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

```
{
  "Extract_OppportunityTeamMember": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "OppportunityTeamMember",
      "fields": [
        { "name": "Name" },
        { "name": "OppportunityId" },
        { "name": "UserId" }
      ]
    }
  },
  "Extract_Oppportunity": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Oppportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    }
  },
  "Augment_OppportunityTeamMember_Oppportunity": {
    "action": "augment",
    "parameters": {
      "left": "Extract_OppportunityTeamMember",
      "left_key": [
        "OppportunityId"
      ],
      "relationship": "TeamMember",
      "right": "Extract_Oppportunity",
      "right_key": [
        "Id"
      ],
      "right_select": [

```


```

        "Name", "Amount"
    ]
  }
},
"Register_Dataset": {
  "action": "sfdcRegister",
  "parameters": {
    "alias": "OppTeamMember",
    "name": "OppTeamMember",
    "source": "105_Augment_OpportunityTeamMember_Opportunity",
    "rowLevelSecurityFilter": "'UserId' == \"\$User.Id\""
  }
}
}
}


```

Create the Dataset

Now that you have the final dataflow definition file, you can create the dataset.

 **Warning:** If you wish to perform the steps in this sample implementation, verify that you have all required Salesforce objects and fields, and perform the steps in a non-production environment. Ensure that these changes do not impact other datasets that you already created. Also, always make a backup of the existing dataflow definition file before you make changes because you cannot retrieve old versions of the file.

To create the dataset, perform the following steps.

1. In Analytics, click the gear icon () and then select **Data Monitor** to open the data monitor. The Jobs view of the data monitor appears by default.
2. Select **Dataflow View**.
3. Click the actions list (1) for the dataflow and then select **Download** to download the existing dataflow definition file.

EDITIONS

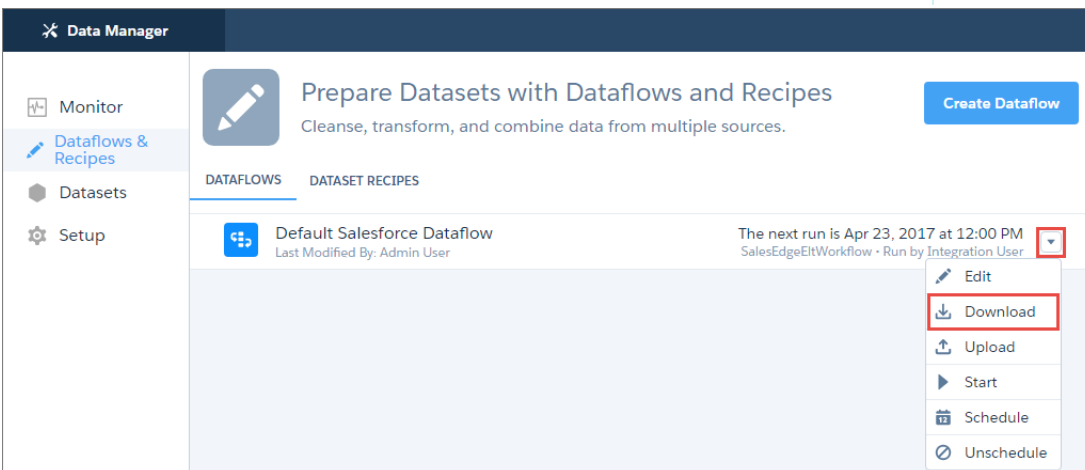
Available in Salesforce Classic and Lightning Experience.


Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To download, upload, run, and monitor a dataflow:

- Edit Analytics Dataflows



4. Open the dataflow definition file in a JSON or text editor.
5. Add the JSON determined in the [previous step](#).
6. Before you save the dataflow definition file, use a JSON validation tool to verify that the JSON is valid.
An error occurs if you try to upload the dataflow definition file with invalid JSON. You can find JSON validation tool on the internet.
7. Save and close the dataflow definition file.
8. In the Dataflow View of the data monitor, click the actions list for the dataflow and then select **Upload**.
9. Select the updated dataflow definition file and click **Upload**.
10. In the Dataflow View of the data monitor, click the actions list for the dataflow and then select **Run** to run the dataflow job.
11. Click the **Refresh Jobs** button () to view the latest status of the dataflow job.
You can view the OppTeamMember dataset after the dataflow job completes successfully.

 **Note:** If you are adding a predicate to a dataset that was previously created, each user must log out and log back in for the predicate to take effect.

Test Row-Level Security for the Dataset

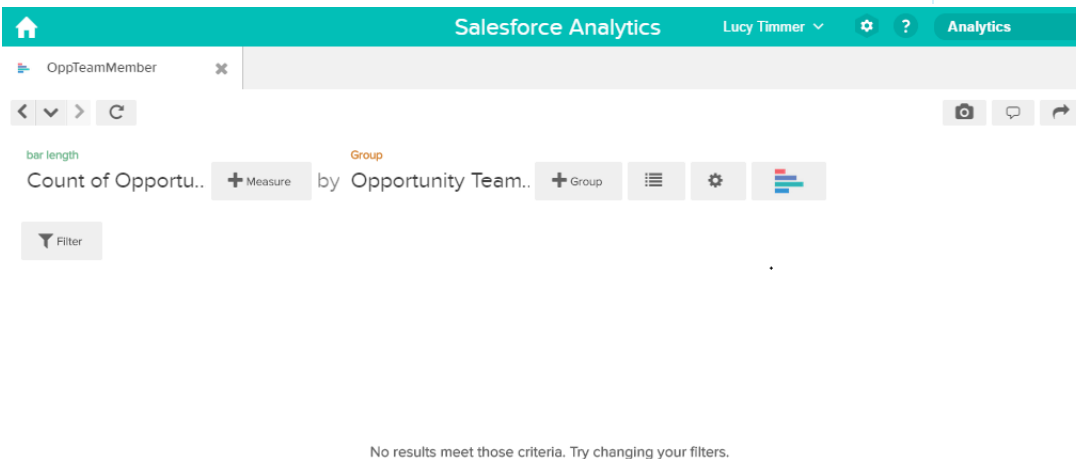
You must verify that the predicate is applied properly and that each user can see the appropriate opportunities.

1. Log in to Analytics as Lucy.
2. Open the OppTeamMember opportunity.
Notice that Lucy can't view the opportunity associated with the opportunity team anymore because she is not a member of the team.

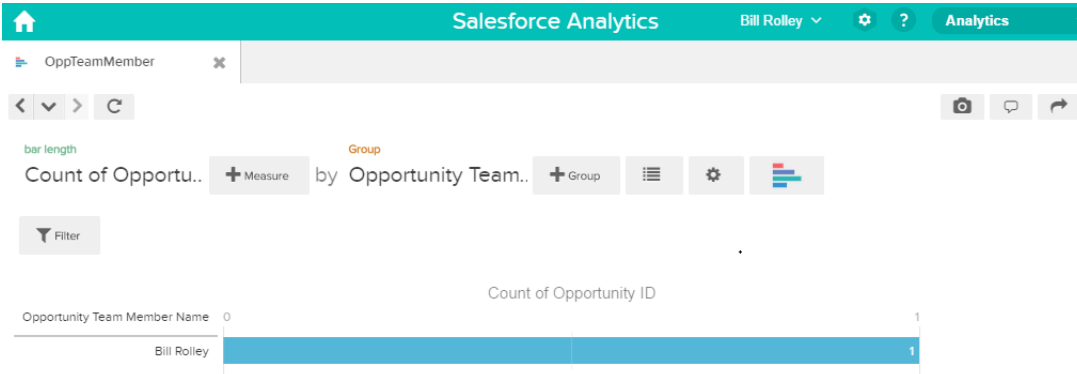
EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.



3. Log out and now log in as Bill.
Bill can view the opportunity that is shared by the opportunity team of which he is a member.



Row-Level Security Example based on Role Hierarchy and Record Ownership

Let's look at an example where you create a dataset based on Salesforce data and then implement row-level security based on the Salesforce role hierarchy and record ownership. In this example, you will create a dataset that contains all opportunities. To restrict access on each record in the dataset, you will create a security policy where each user can view only opportunities that they own or that are owned by their subordinates based on the Salesforce role hierarchy. This process requires multiple steps that are described in the sections that follow.

IN THIS SECTION:

1. [Determine Which Data to Include in the Dataset](#)

First, determine what data you want to include in the dataset. For this example, you will create the OppRoles dataset that contains all opportunities as well as user details about each opportunity owner, such as their full name, division, and title.

2. [Design the Dataflow to Load the Data](#)

Now it's time to figure out how the dataflow will extract the data and load it into a dataset. You start by creating this high-level design for the dataflow.

3. [Determine Row-Level Security for the Dataset](#)

Now it's time to think about row-level security. How will you restrict access to each record in this dataset?

4. [Modify the Dataflow Based on Row-Level Security](#)

Now it's time to modify the dataflow definition file to account for the predicate.

5. [Create the Dataset](#)

Now that you have the final dataflow definition file, you can create the dataset.

6. [Test Row-Level Security for the Dataset](#)

You must verify that the predicate is applied properly and that each user can see the appropriate opportunities.

SEE ALSO:

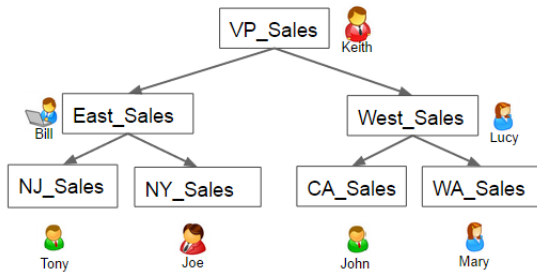
[flatten Parameters](#)

Determine Which Data to Include in the Dataset

First, determine what data you want to include in the dataset. For this example, you will create the OppRoles dataset that contains all opportunities as well as user details about each opportunity owner, such as their full name, division, and title.

You will obtain opportunities from the Opportunity object and user details from the User object. Both are objects in Salesforce.

In this example, your Salesforce organization has the following role hierarchy and users.



Also, your organization contains the following opportunities, most of which are owned by Keith.

Action	Opportunity Name	Account Name	Amount	Close Date	Stage	Opportunity Owner Alias
+	Acc - 1000 Widgets	Acc_salesrep		9/4/2014	Prospecting	Tony
+	Acme - 1,200 Widgets	Acme	\$140,000.00	6/14/2012	Value Proposition	Keith
+	Acme - 200 Widgets	Acme	\$20,000.00	10/13/2012	Prospecting	Keith
+	Acme - 600 Widgets	Acme	\$70,000.00	8/10/2012	Needs Analysis	Keith
+	ESales_01	East_Sales_acc_01		9/4/2014	Prospecting	Bill
+	Global Media - 400...	Global Media	\$40,000.00	7/13/2012	Id. Decision Makers	Keith
+	salesforce.com - 1...	salesforce.com	\$100,000.00	6/14/2012	Negotiation/Review	Keith
+	salesforce.com - 2...	salesforce.com	\$20,000.00	8/12/2012	Value Proposition	Keith
+	salesforce.com - 50...	Global Media	\$50,000.00	5/12/2012	Closed Won	Keith
+	salesforce.com - 50...	Global Media	\$500,000.00	5/12/2012	Closed Won	Keith
+	West_Sales_01	West_Sales_Acc_01		9/4/2014	Prospecting	Lucy

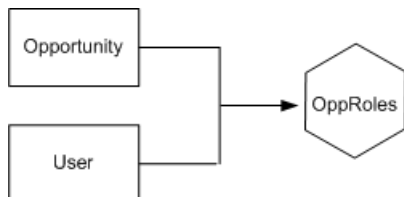
EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition.**

Design the Dataflow to Load the Data

Now it's time to figure out how the dataflow will extract the data and load it into a dataset. You start by creating this high-level design for the dataflow.



EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition.**

The dataflow will extract data from the Opportunity and User objects, join the data, and then load it into the OppRoles dataset.

Now let's implement that design in JSON, which is the format of the dataflow definition file. A dataflow definition file contains transformations that extract, transform, and load data into a dataset.

Based on the design, you create the JSON shown below.

```
{
  "Extract_Opportunity": {
    "action": "sfcdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    }
  },
  "Extract_User": {
    "action": "sfcdcDigest",
    "parameters": {
      "object": "User",
      "fields": [
        { "name": "Id" },
        { "name": "Username" },
        { "name": "LastName" },
        { "name": "FirstName" },
        { "name": "Name" },
        { "name": "CompanyName" },
        { "name": "Division" },
        { "name": "Department" },
        { "name": "Title" },
        { "name": "Alias" },
        { "name": "CommunityNickname" },
        { "name": "UserType" },
        { "name": "UserRoleId" }
      ]
    }
  },
  "Augment_Opportunity_User": {
    "action": "augment",
    "parameters": {
      "left": "Extract_Opportunity",
      "left_key": [
        "OwnerId"
      ],
      "right": "Extract_User",
      "relationship": "Owner",
      "right_select": [
        "Name"
      ],
      "right_key": [

```

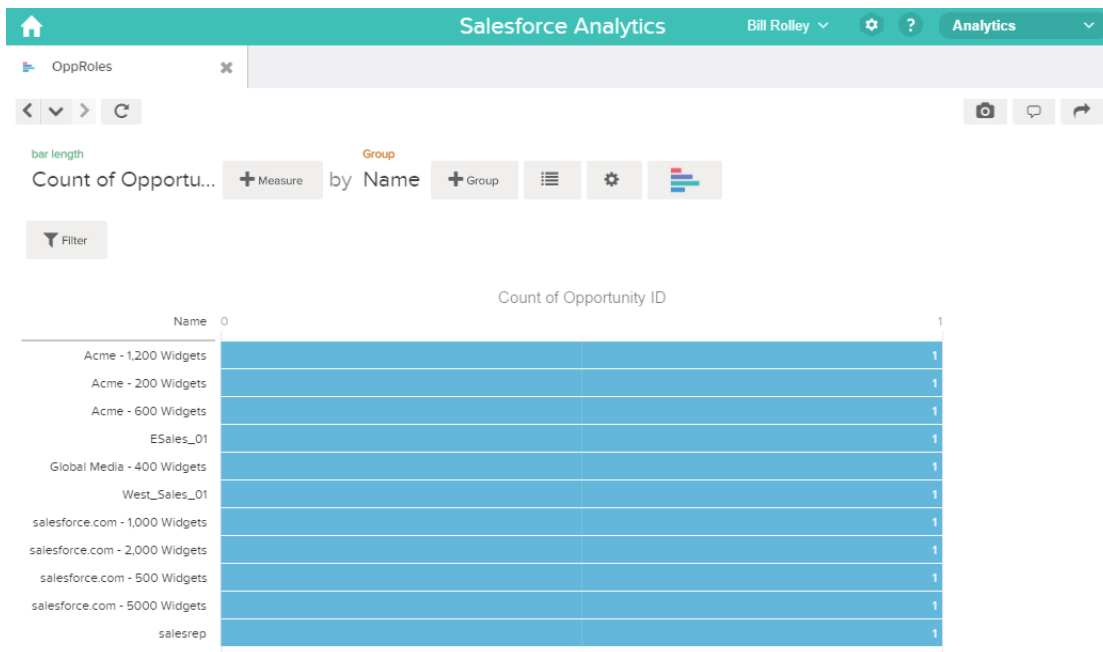


```

        "Id"
      ]
    }
  },
  "Register": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "OppRoles",
      "name": "OppRoles",
      "source": "Augment_Opportunity_User",
      "rowLevelSecurityFilter": ""
    }
  }
}

```

If you were to run this dataflow, Analytics would generate a dataset with no row-level security. As a result, any user that has access to the dataset would be able to view all opportunities. For example, as shown below, Bill would be able to view all opportunities, including those owned by his manager Keith.



You need to apply row-level security to restrict access to records in this dataset.

Determine Row-Level Security for the Dataset

Now it's time to think about row-level security. How will you restrict access to each record in this dataset?


You decide to implement the following predicate on the dataset.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

```
'ParentRoleIDs' == "$User.UserRoleId" || 'OwnerId' == "$User.Id"
```

 **Note:** The current dataflow doesn't contain logic to create a dataset column named "ParentRoleIDs." ParentRoleIDs is a placeholder for the name of a column that will contain this information. In the [next step](#), you will modify the dataflow to add this column to the dataset. This column name will change based on how you configure the dataflow.

Based on the predicate, Analytics returns an opportunity record if:

- The user who submits the query is a parent of the opportunity owner based on the Salesforce role hierarchy. Analytics determines this based on their role IDs and the role hierarchy.
- Or, the user who submits the query on the dataset is the opportunity owner.

Let's examine both parts of this predicate.

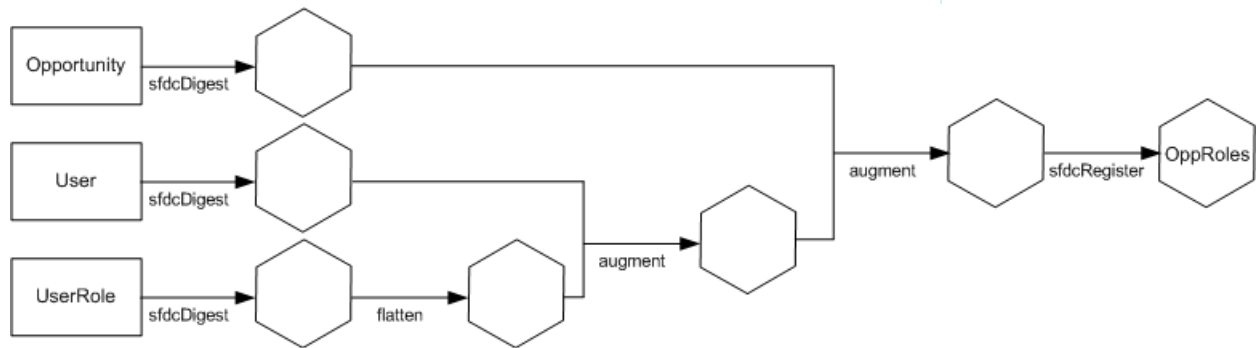
Predicate Part	Description
'ParentRoleIDs' == "\$User.UserRoleId"	<ul style="list-style-type: none"> • ParentRoleIDs refers to a dataset column that contains a comma-separated list of role IDs of all users above the opportunity owner based on the role hierarchy. You will create this dataset column in the next section. • \$User.UserRoleId refers to the UserRoleId column of the User object. Analytics looks up the user role ID of the user who submits the query from the User object.
'OwnerId' == "\$User.Id"	<ul style="list-style-type: none"> • OwnerId refers to the dataset column that contains the user ID of the owner of each opportunity. • \$User.Id refers to the Id column of the User object. Analytics looks up the user ID of the user who submits the query from the User object.

Modify the Dataflow Based on Row-Level Security

Now it's time to modify the dataflow definition file to account for the predicate.

In this scenario, you have to make changes to the dataflow based on the predicate.

- Add a column in the dataset that stores a comma-separated list of the role IDs of all parents for each opportunity owner. When you defined the predicate in the previous step, you temporarily referred to this column as "ParentRoleIDs." To add the column, you redesign the dataflow as shown in the following diagram:



The new dataflow design contains the following changes:

- Extracts the role IDs from the UserRole object.
 - Uses the Flatten transformation to generate a column that stores a comma-separated list of the role IDs of all parents of each user. When you determined the predicate in the previous step, you temporarily referred to this column as "ParentRoleIDs."
 - Link the new column to the OppRoles dataset.
- Add the predicate to the Register transformation that registers the OppRoles dataset.

You modify the dataflow as shown below.

```

{
  "Extract_Opportunity": {
    "action": "sfdcDigest",
    "parameters": {
      "object": "Opportunity",
      "fields": [
        { "name": "Id" },
        { "name": "Name" },
        { "name": "Amount" },
        { "name": "StageName" },
        { "name": "AccountId" },
        { "name": "OwnerId" }
      ]
    }
  },
  "Extract_User": {
    "action": "sfdcDigest",

```

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```


"parameters": {
  "object": "User",
  "fields": [
    { "name": "Id" },
    { "name": "Username" },
    { "name": "LastName" },
    { "name": "FirstName" },
    { "name": "Name" },
    { "name": "CompanyName" },
    { "name": "Division" },
    { "name": "Department" },
    { "name": "Title" },
    { "name": "Alias" },
    { "name": "CommunityNickname" },
    { "name": "UserType" },
    { "name": "UserRoleId" }
  ]
}
},
"Extract_UserRole": {
  "action": "sfdcDigest",
  "parameters": {
    "object": "UserRole",
    "fields": [
      { "name": "Id" },
      { "name": "ParentRoleId" },
      { "name": "RollupDescription" },
      { "name": "OpportunityAccessForAccountOwner" },
      { "name": "CaseAccessForAccountOwner" },
      { "name": "ContactAccessForAccountOwner" },
      { "name": "ForecastUserId" },
      { "name": "MayForecastManagerShare" },
      { "name": "LastModifiedDate" },
      { "name": "LastModifiedById" },
      { "name": "SystemModstamp" },
      { "name": "DeveloperName" },
      { "name": "PortalAccountId" },
      { "name": "PortalType" },
      { "name": "PortalAccountOwnerId" }
    ]
  }
}
},
"Flatten_UserRole": {
  "action": "flatten",
  "parameters": {
    "multi_field": "Roles",
    "parent_field": "ParentRoleId",
    "path_field": "RolePath",
    "self_field": "Id",
    "source": "Extract_UserRole"
  }
}
},
"Augment_User_FlattenUserRole": {
  "action": "augment",

```

```


    "parameters": {
      "left": "Extract_User",
      "left_key": [
        "UserRoleId"
      ],
      "relationship": "Role",
      "right": "Flatten_UserRole",
      "right_key": [
        "Id"
      ],
      "right_select": [
        "Roles",
        "RolePath"
      ]
    }
  },
  "Augment_Opportunity_UserWithRoles": {
    "action": "augment",
    "parameters": {
      "left": "Extract_Opportunity",
      "left_key": [
        "OwnerId"
      ],
      "right": "Augment_User_FlattenUserRole",
      "relationship": "Owner",
      "right_select": [
        "Name",
        "Role.Roles",
        "Role.RolePath"
      ],
      "right_key": [
        "Id"
      ]
    }
  },
  "Register": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "OppRoles",
      "name": "OppRoles",
      "source": "Augment_Opportunity_UserWithRoles",
      "rowLevelSecurityFilter": "'Owner.Role.Roles' == \"\$User.UserRoleId\" || 'OwnerId'
== \"\$User.Id\""
    }
  }
}

```


 **Note:** In this example, the dataset has columns Owner.Role.Roles and OwnerId. A user can view the values of these columns for each record to which they have access.

Create the Dataset

Now that you have the final dataflow definition file, you can create the dataset.

-  **Warning:** If you wish to perform the steps in this sample implementation, verify that you have all required Salesforce objects and fields, and perform the steps in a non-production environment. Ensure that these changes do not impact other datasets that you already created. Also, always make a backup of the existing dataflow definition file before you make changes because you cannot retrieve old versions of the file.

To create the dataset, perform the following steps.

1. In Analytics, click the gear icon () and then select **Data Monitor** to open the data monitor. The Jobs View of the data monitor appears by default.
2. Select **Dataflow View**.
3. Click the actions list (1) for the dataflow and then select **Download** to download the existing dataflow definition file.

EDITIONS

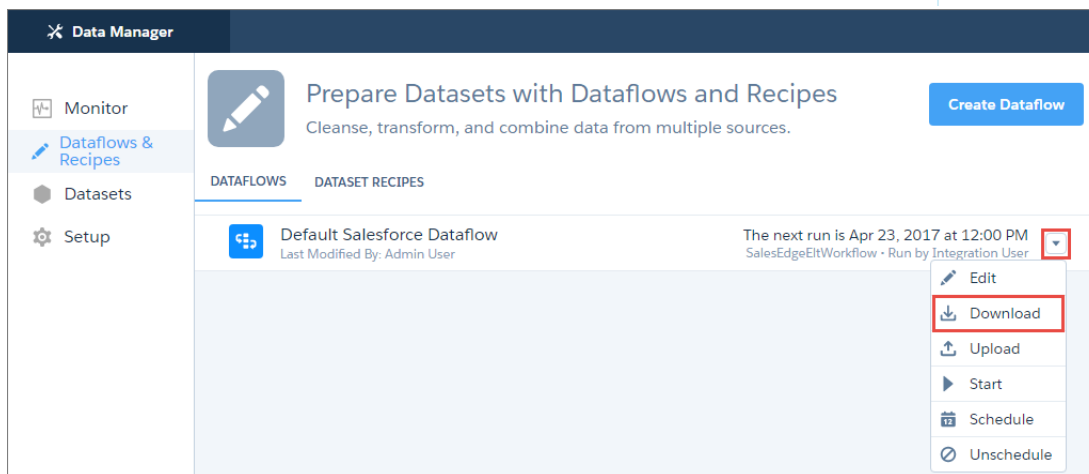
Available in Salesforce Classic and Lightning Experience.


Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To download, upload, run, and monitor a dataflow:

- Edit Analytics Dataflows



4. Open the dataflow definition file in a JSON or text editor.
5. Add the JSON determined in the [previous step](#).
6. Before you save the dataflow definition file, use a JSON validation tool to verify that the JSON is valid. An error occurs if you try to upload the dataflow definition file with invalid JSON. You can find JSON validation tool on the internet.
7. Save and close the dataflow definition file.
8. In the Dataflow View of the data monitor, click the actions list for the dataflow and then select **Upload**.
9. Select the updated dataflow definition file and click **Upload**.
10. In the Dataflow View of the data monitor, click the actions list for the dataflow and then select **Run** to run the dataflow job.
11. Click the **Refresh Jobs** button () to view the latest status of the dataflow job. You can view the OppRoles dataset after the dataflow job completes successfully.

Note: If you are adding a predicate to a dataset that was previously created, each user must log out and log back in for the predicate to take effect.

Test Row-Level Security for the Dataset

You must verify that the predicate is applied properly and that each user can see the appropriate opportunities.

1. Log in to Analytics as Bill.
2. Open the OppRoles opportunity.
Notice that Bill can't see his manager Keith's opportunities anymore. Now, he can see only his opportunity and his subordinate Tony's opportunity.

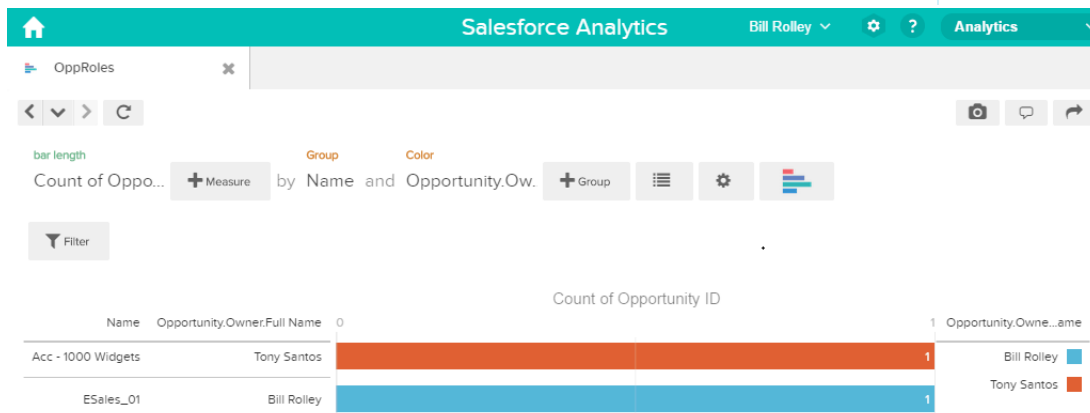
EDITIONS

Available in Salesforce Classic and Lightning Experience.

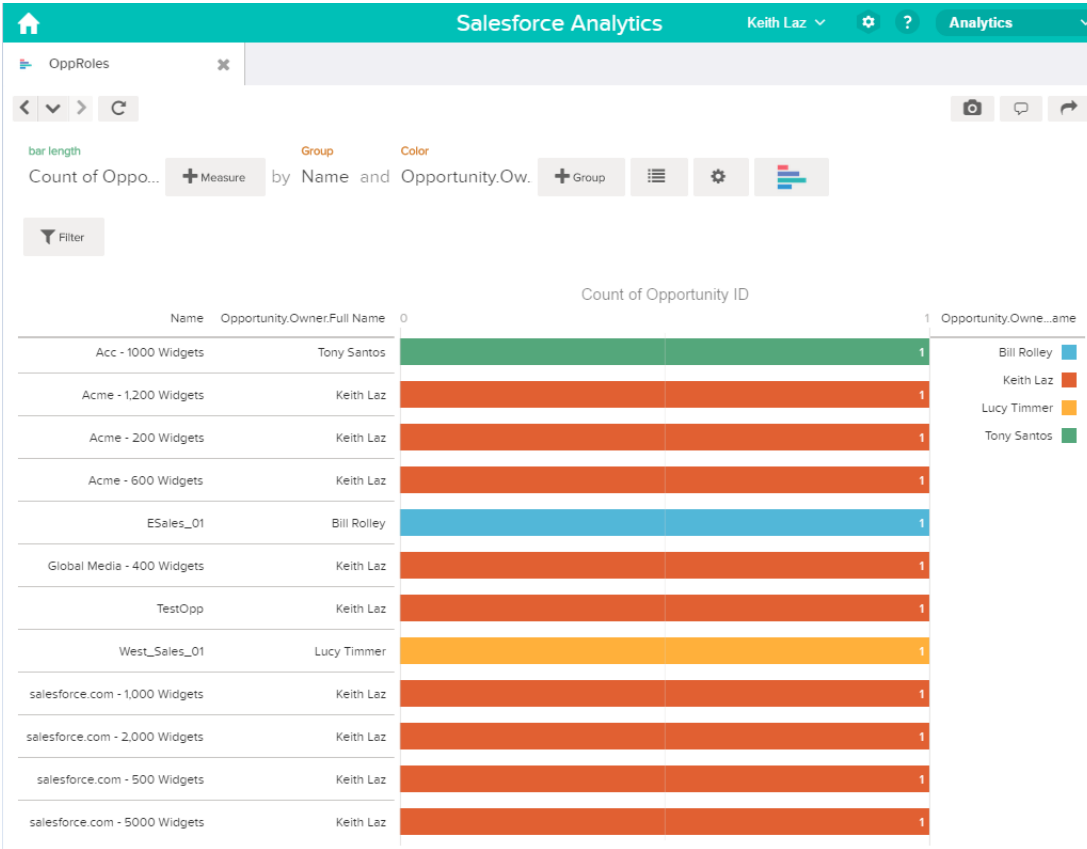
Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

-
-



3. Log out and now log in as Keith.
As expected, Keith can still see all opportunities.



Salesforce Sharing Inheritance for Datasets

Use sharing inheritance to allow Analytics to use the same sharing rules for your datasets as Salesforce uses for your objects.

As a Salesforce administrator, you have likely set up sharing rules to suit your user hierarchy, so users have access to data appropriate to their role. Your organization has invested a lot of time and money to get this right. But what about Analytics?

Analytics has long had its own row-level security solution: security predicates. Analytics administrators typically use predicates to carefully replicate their Salesforce security settings.

Sharing inheritance is supported in Analytics. For supported objects, administrators enable the sharing inheritance feature in Analytics, and specify which objects use it when creating your datasets during the ELT (Extract Load and Transform) process, or when editing existing datasets. Your Salesforce sharing settings will be honored in Analytics.

Assuming identical data, all Salesforce row-level security and sharing capabilities (including rules for Apex or custom sharing, and manual, hierarchy, role, group and team-based sharing) will be respected by the Analytics sharing inheritance feature, with the differences noted below.

Note:

- Changes to security settings (rowLevelSharingSource or rowLevelSecurityFilter) in a dataflow have no effect on datasets that already exist. You must change those settings on the edit dataset page.
- Sharing inheritance is supported with Accounts, Opportunities, Orders, Cases, and custom objects.
- There is a 2000 row limit for datasets using the sharing inheritance feature. For example, if a user can see more than 2000 Opportunity records via their access to Salesforce core, but the user does not have "view all data" permissions, then the backup

security predicate will take effect, regardless of how many rows are in the dataset or query result. So, if sharing inheritance is enabled, a backup 'default' security predicate must be defined.

- Calculated fields are treated as normal fields. Any row level security that might have been applied during the calculation (in Salesforce) will be ignored.
- You can inherit sharing settings from only one object, regardless of how many source objects are used in creating a dataset.

Refer to the [Sharing Settings](#) documentation for more information about sharing settings and rules.

IN THIS SECTION:

[Is Sharing Right For My Analytics Org?](#)

Sharing inheritance works with a subset of Salesforce objects. Try it first to see whether it is appropriate for your org.

[Setting Up Sharing Inheritance](#)

Setting up sharing inheritance in Analytics is straightforward. Enable it for your org, specify which datasets should inherit sharing rules, and set a default security predicate.

Is Sharing Right For My Analytics Org?

Sharing inheritance works with a subset of Salesforce objects. Try it first to see whether it is appropriate for your org.

As with any significant change to your security settings, we recommend that you thoroughly test in a sandbox environment before rolling sharing inheritance out to production. It is necessary to test against your org's security model and data. Test your particular use cases to make sure sharing inheritance works for you.

We support five of the most heavily used objects: Accounts, Opportunities, Orders, Cases, and custom objects. If you use other objects—such as Campaign, Idea, Site, and so on—those will still need to employ security predicates.

It's important to note that you must apply the sharing feature to each dataset. Sharing isn't automatically applied to all datasets. It isn't applied by default to new datasets. You must apply sharing to each dataset manually. A dataset using sharing must also have a 'default' security predicate defined.



Note:

- Changes to security settings (rowLevelSharingSource or rowLevelSecurityFilter) in a dataflow have no effect on datasets that already exist. You must change those settings on the edit dataset page.
- Sharing inheritance is supported with Accounts, Opportunities, Orders, Cases, and custom objects.
- There is a 2000 row limit for datasets using the sharing inheritance feature. For example, if a user can see more than 2000 Opportunity records via their access to Salesforce core, but the user does not have "view all data" permissions, then the backup security predicate will take effect, regardless of how many rows are in the dataset or query result. So, if sharing inheritance is enabled, a backup 'default' security predicate must be defined.
- Calculated fields are treated as normal fields. Any row level security that might have been applied during the calculation (in Salesforce) will be ignored.
- You can inherit sharing settings from only one object, regardless of how many source objects are used in creating a dataset.

Setting Up Sharing Inheritance

Setting up sharing inheritance in Analytics is straightforward. Enable it for your org, specify which datasets should inherit sharing rules, and set a default security predicate.

To enable sharing in Analytics, and to configure it for specific datasets, follow these steps.

1. In Setup, click in the quick find box and type *Analytics*.

2. Under Analytics, click **Settings**.
3. Select **Inherit sharing from Salesforce** and click **Save**.
4. For each dataset that you want to inherit sharing, specify the "source" object from which this sharing comes, and specify a default security predicate. You can do this in three ways.

Through the Dataflow (When Creating New Datasets Only)

Add the `rowLevelSharingSource` parameter to the `sfdcRegister` node parameters for the dataset. See the Analytics [sfdcRegister](#) help page for details.

The `rowLevelSharingSource` parameter takes a string, which should be the API name for the object from which sharing is inherited. In the following example, the parameter specifies that the Salesforce sharing rules on the Opportunity object should be inherited. Changes to security settings in a dataflow have no effect on datasets that already exist. You must change those settings on the edit dataset page.

```
"reg": {
  "action": "sfdcRegister",
  "parameters": {
    "source": "Opportunity_final",
    "name": "Opportunity w/ Account",
    "alias": "Oppty_w_Acct",
    "rowLevelSharingSource": "Opportunity",
    "rowLevelSecurityFilter": "'OwnerId' == \"\$User.Id\""
  }
},
```

When setting `rowLevelSharingSource`, the security predicate (`rowLevelSecurityFilter`) must be set too. In this example, when sharing limits are exceeded, the user still only gets to see those opportunities that he or she owns.

-  **Note:** You can set the security predicate to 'false' to block all users not covered by sharing. In fact, this predicate is the default when sharing is enabled on existing datasets.

Through the Dataset Edit Page (For Existing Datasets)

Edit the dataset, and enter the API name for the object in the **Sharing Source** field, and the default security predicate in the **Security Predicate** field.

Security


Sharing Source

Apply Salesforce sharing settings from **No sharing source** 

Security Predicate

None 

See [Edit a Dataset](#) on page 238 for help with editing a dataset.

-  **Note:** Consider the following when adding a sharing source through the dataset edit page.
- Sharing inheritance is not supported for datasets created from CSV files. Specifying a sharing source generates an error.
 - You can use either a security predicate, or sharing inheritance *and* a backup security predicate. If you use sharing inheritance, you must also specify a default predicate.

- You can set the security predicate to 'false' to block all users not covered by sharing. In fact, this predicate is the default when sharing is enabled on existing datasets.
- Specifying an incorrect name or an unsupported object generates an error. Account, Opportunity, Order, Case, and custom objects are supported.

Through the REST API (For Existing Datasets)

The `sharingSource` property on the `/wave/datasets/{datasetId}/versions/{versionId}` endpoint specifies the object from which sharing rules are inherited for that dataset version. The `predicate` property specifies the security predicate.

Predicate Expression Syntax for Datasets

You must use valid syntax when defining the predicate expression.

The predicate expression must have the following syntax:

```
<dataset column> <operator> <value>
```

For example, you can define the following predicate expression for a dataset:

```
'UserId' == "$User.Id"
```

You can create more complex predicate expressions such as:

```
('Expected_Revenue' > 4000 || 'Stage Name' == "Closed Won") && 'isDeleted' != "False"
```

Consider the following requirements for the predicate expression:

- The expression is case-sensitive.
- The expression cannot exceed 1,000 characters.
- There must be at least one space between the dataset column and the operator, between the operator and the value, and before and after logical operators. This expression is not valid: `'Revenue'>100`. It must have spaces like this: `'Revenue' > 100`.

If you try to apply a predicate to a dataset and the predicate is not valid, an error appears when any user tries to query the dataset.

IN THIS SECTION:

[Dataset Columns in a Predicate Expression](#)

You include at least one dataset column as part of the predicate expression.


[Values in a Predicate Expression](#)

The value in the predicate expression can be a string literal or number literal. It can also be a field value from the User object in Salesforce.

[Escape Sequences](#)

You can use the backslash character (\) to escape characters in column names and string values in a predicate expression.

[Character Set Support](#)

Analytics supports UTF-8 characters in dataset column names and values in a predicate expression. Analytics replaces non-UTF-8 characters with the UTF-8 symbol (). If Analytics has to replace a non-UTF-8 character in a predicate expression, users may experience unexpected query results.

[Special Characters](#)

Certain characters have a special meaning in Analytics.

Operators

You can use comparison operators and logical operators in predicate expressions.


Sample Predicate Expressions for Datasets

Review the samples to see how to structure a predicate expression.

Dataset Columns in a Predicate Expression

You include at least one dataset column as part of the predicate expression.


Consider the following requirements for dataset columns in a predicate expression:


- Column names are case-sensitive.
- Column names must be enclosed in single quotes ('). For example, `'Region' == "South"`
-  **Note:** A set of characters in double quotes is treated as a string rather than a column name.
- Single quotes in column names must be escaped. For example, `'Team\'s Name' == "West Region Accounts"`

Values in a Predicate Expression

The value in the predicate expression can be a string literal or number literal. It can also be a field value from the User object in Salesforce.

Consider the following requirements for each value type.

Value Type	Requirements	Predicate Expression Examples
string literal	Enclose in double quotes and escape the double quotes.	<ul style="list-style-type: none"> • <code>'Owner' == "Amber"</code> • <code>'Stage Name' == "Closed Won"</code>
number literal	Can be a float or long datatype. Do not enclose in quotes.	<ul style="list-style-type: none"> • <code>'Expected_Revenue' >= 2000.00</code> • <code>'NetLoss' < -10000</code>
field value	<p>When referencing a field from the User object, use the <code>\$User.[field]</code> syntax. Use the API name for the field.</p> <p>You can specify standard or custom fields of type string, number, or multi-value picklist.</p> <p>When you define a predicate for a dataset, you must have read access on all User object fields used to create the predicate expression.</p> <p>However, when a user queries a dataset that has a predicate based on the User object, Analytics uses the access permissions of the Insights Security User to evaluate the</p>	<ul style="list-style-type: none"> • <code>'Owner.Role' == "\$User.UserRoleId"</code> • <code>'GroupID' == "\$User.UserGroupId__c"</code> <p> Note: Supported User object field value types are string, number, and multi-value picklist. Other types (for example, boolean) are not supported.</p>

Value Type	Requirements	Predicate Expression Examples
	<p>predicate expression based on the User object.</p> <p> Note: By default, the Security User does not have access permission on custom fields of the User object.</p> <p>To grant the Security User read access on a field, set field-level security on the field in the user profile of the Security User.</p>	

Escape Sequences

You can use the backslash character (\) to escape characters in column names and string values in a predicate expression.


You can use the \' escape sequence to escape a single quote in a column name. For example:

```
'Team\'s Name' == "West Region Accounts"
```

You can use the following escape sequences for special characters in string values.


Sequence	Meaning
\b	One backspace character
\n	New line
\r	Carriage return
\t	Tab
\Z	CTRL+Z (ASCII 26)
\"	One double-quote character
\\	One backslash character
\0	One ASCII null character

Character Set Support

Analytics supports UTF-8 characters in dataset column names and values in a predicate expression. Analytics replaces non-UTF-8 characters with the UTF-8 symbol (). If Analytics has to replace a non-UTF-8 character in a predicate expression, users may experience unexpected query results.

Special Characters

Certain characters have a special meaning in Analytics.

Character	Name	Description
'	Single quote	Encloses a dataset column name in a predicate expression. Example predicate expression: <code>'Expected_Revenue' >= 2000.00</code>
"	Double quote	Encloses a string value or field value in a predicate expression. Example predicate expression: <code>'OpportunityOwner' == "Michael Vesti"</code>
()	Parentheses	Enforces the order in which to evaluate a predicate expression. Example predicate expression: <code>('Expected_Revenue' > 4000 'Stage Name' == "Closed Won") && 'isDeleted' != "False"</code>
\$	Dollar sign	Identifies the Salesforce object in a predicate expression.  Note: You can only use the User object in a predicate expression. Example predicate expression: <code>'Owner.Role' == "\$User.UserRoleId"</code>
.	Period	Separates the object name and field name in a predicate expression. Example predicate expression: <code>'Owner' == "\$User.UserId"</code>

Operators

You can use comparison operators and logical operators in predicate expressions.

IN THIS SECTION:

[Comparison Operators](#)

Comparison operators return true or false.


Logical Operators

Logical operators return true or false.

Comparison Operators

Comparison operators return true or false.

Analytics supports the following comparison operators.

Operator	Name	Description
==	Equals	True if the operands are equal. String comparisons that use the equals operator are case-sensitive. Example predicate expressions: <code>'Stage Name' == "Closed Won"</code>
!=	Not equals	True if the operands are not equal. String comparisons that use the not equals operator are case-sensitive. Example predicate expression: <code>'isDeleted' != "False"</code>
<	Less than	True if the left operand is less than the right operand. Example predicate expression: <code>'Revenue' < 100</code>
<=	Less or equal	True if the left operand is less than or equal to the right operand.
>	Greater than	True if the left operand is greater than the right operand.
>=	Greater or equal	True if the left operand is greater than or equal to the right operand.
in	Multi-value list filter	True if the left operand exists in the list of strings substituted for a multi-value picklist (field value). Example predicate expression: <code>'Demog' in ["\$User.Demographic__c"]</code> In this example, <code>Demographic__c</code> is of type <code>multiPicklistField</code> . During evaluation, the multi-value picklist field is substituted by a list of strings, with 1 string per user-selected item.  Note: Comma-separated lists are not supported within the square-bracket construct.

You can use the `<`, `<=`, `>`, and `>=` operators with measure columns only.

Logical Operators

Logical operators return true or false.

Analytics supports the following logical operators.

Operator	Name	Description
&&	Logical AND	True if both operands are true. Example predicate expression: 'Stage Name' == "Closed Won" && 'isDeleted' != "False"
	Logical OR	True if either operand is true. Example predicate expression: 'Expected_Revenue' > 4000 'Stage Name' == "Closed Won"

Sample Predicate Expressions for Datasets

Review the samples to see how to structure a predicate expression.

The samples are based on the following Opportunity dataset.

Opportunity	Expected_Rev	Owner	OwnerRoleID	Stage_Name	IsDeleted
OppA	2000.00	Bill	20	Prospecting	True
OppB	3000.00	Joe	22	Closed Won	False
OppC	1000.00	可爱的花	36	Closed Won	False
OppD	5000.00	O'Fallon	18	Prospecting	True
OppE		Joe	22	Closed Won	True

Let's take a look at some examples to understand how to construct a predicate expression.

Predicate Expression	Details
'OwnerRoleID' == "\$User.UserRoleId"	Checks column values in the User object.
'Expected_Rev' > 1000 && 'Expected_Rev' <= 3000	
'Owner' = "Joe" 'Owner' = "Bill"	
('Expected_Rev' > 4000 'Stage Name' == "Closed Won") && 'isDeleted' != "False"	Parentheses specify the order of operations.
'Stage Name' == "Closed Won" && 'Expected_Rev' > 70000	
'Owner' == "可爱的花"	String contains Unicode characters.
'Owner' == "O\'Fallon"	Single quote in a string requires the escape character.

Predicate Expression	Details
'Stage Name' == ''	Checks for an empty string.

Delete a Dataset

Delete unnecessary datasets from your My Private App or in shared apps on which you have at least Editor access. Removing datasets reduces clutter and helps you avoid reaching your org's limit for rows across registered datasets.

You can't delete a dataset that is used in a dashboard, lens, or dataflow. Before you delete a dataset, first remove references to it from dashboards and delete associated lenses.

If a dataflow transformation —like edgemart or sfdcRegister— references the dataset, you must remove the reference from the dataflow. For example, to delete the “Opportunities” dataset, you must remove the sfdcRegister transformation from the dataflow snippet shown below.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To delete a dataset:



- Use Analytics AND Editor access to the dataset's app


```
{
  ...
  "Register_Dataset": {
    "action": "sfdcRegister",
    "parameters": {
      "alias": "Opportunities",
      "name": "Opportunities",
      "source": "Extract_Opportunities"
    }
  },
  ...}
```

 **Tip:** Review the usage information on the dataset's edit page to see where the dataset is used.

Usage		
This dataset is used in these places		
Dashboards	Lenses	Dataflows
Dashboard	Last Accessed	
Opportunities	Aug 4, 2017 at 10:19 AM	


 **Warning:** You can't recover a deleted dataset.

1. To edit a dataset from Analytics home or an app page, follow these steps.
 - a. Hover over the dataset and click .
 - b. Click **Edit**.
2. To edit a dataset from the data manager, follow these steps.
 - a. In the data manager, click the **Datasets** tab.
 - b. On the right of the dataset, click .
 - c. Click **Edit Dataset**.
3. Click **Delete Dataset**.

If the dataset is in use, Analytics stops the deletion and shows a list of assets that reference the dataset. Click **Got It** and resolve these references before trying again.
4. Click **Delete Permanently**.
 -  **Important:** Analytics doesn't check if a dataset is used in recipes, or in lenses and dashboards that you don't have access to. Consider that after you delete the dataset, these assets will become unusable.

Datasets

A dataset is a collection of related data that is stored in a denormalized, yet highly compressed form. There are multiple ways to create datasets. You can also edit datasets after they've been created.

 **Tip:** To ensure that you do not reach the limit (250 million) for the maximum number of rows in all registered datasets, deleted unused datasets.

SEE ALSO:

[Create a Dataset with External Data](#)

[Edit a Dataset](#)

[Delete a Dataset](#)

Data Monitor

The data monitor provides options for you to manage jobs.

SEE ALSO:

[Start and Stop a Dataflow](#)

[Schedule a Dataflow](#)

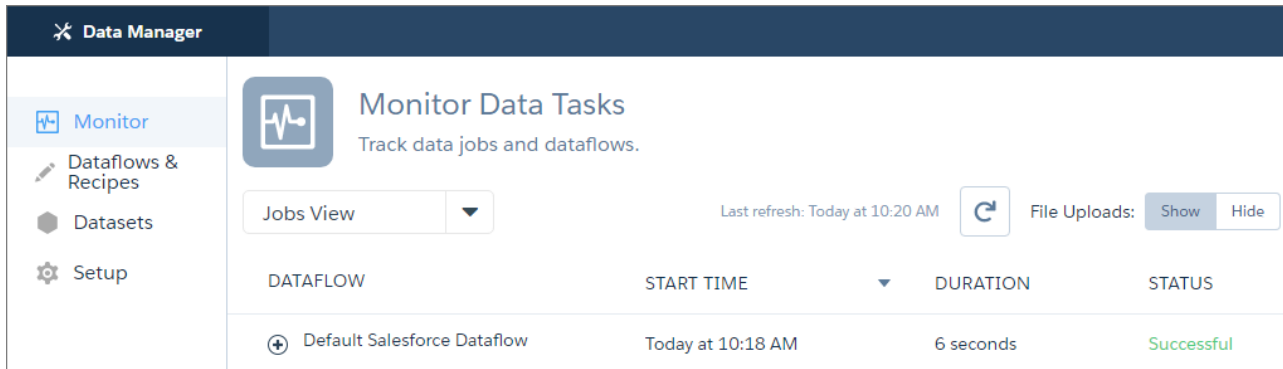
[Monitor a Dataflow Job](#)

[Monitor an External Data Upload](#)


Data Manager

The data manager is where you monitor your data jobs, prepare datasets with recipes and dataflows, and set up replication and connections.

To open the data manager in Analytics, click the gear icon () and then click **Data Manager**.



The screenshot shows the Data Manager interface. The left sidebar contains navigation options: Monitor (selected), Dataflows & Recipes, Datasets, and Setup. The main content area is titled "Monitor Data Tasks" with the subtitle "Track data jobs and dataflows." Below the title, there is a "Jobs View" dropdown menu, a "Last refresh: Today at 10:20 AM" indicator with a refresh button, and "File Uploads: Show Hide" buttons. A table displays the following data:

DATAFLOW	START TIME	DURATION	STATUS
 Default Salesforce Dataflow	Today at 10:18 AM	6 seconds	Successful

You land on the Monitor tab, where you can see the progress of your recipe, replication, and other dataflow jobs. The Dataflows & Recipes tab gives you access to your two key data preparation tools. Go to the Datasets tab to view your datasets and replicated data, and use them to create recipes. If you have replication enabled, the Setup tab is where you can view and update settings for your replication-enabled Salesforce objects, and set up connections to remote data.

SEE ALSO:

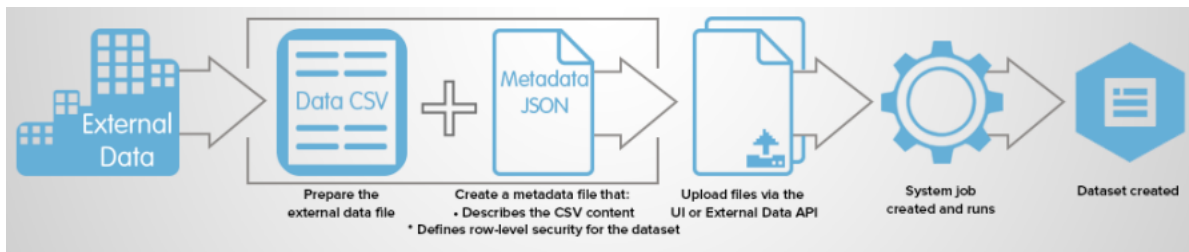
[Optimize Your Dataflows with Replication](#)

[Prepare Datasets with Recipes](#)

[Data Monitor](#)

External Data

You can integrate external data into Analytics to make the data available for queries from explorer and designer.



The External Data API enables you to upload external data files to Analytics. The External Data API can upload .csv files, and you can optionally specify the structure of your data by defining metadata in JSON format.

The External Data API is available in API version 31 and later.

The high-level steps for uploading external data by using the API are:

1. Prepare your data in CSV format, and then create a metadata file to specify the structure of the data.
2. Connect programmatically to your Salesforce organization.
3. Configure the upload by inserting a row into the InsightsExternalData object, and then set input values such as the name of the dataset, the format of the data, and the operation to perform on the data.
4. Split your data into 10-MB chunks, and then upload the chunks to InsightsExternalDataPart objects.

5. Start the upload by updating the `Action` field in the `InsightsExternalData` object.
6. Monitor the `InsightsExternalData` object for status updates, and then verify that the file upload was successful.

Explore and Visualize Your Data

When sifting through an overwhelming amount of business data, sometimes you know exactly what you're looking for. Other times you don't, but you recognize it when you see it. Salesforce Analytics gives you a fast, fluid way to discover the compelling stories within your data and to create the right visuals to tell your story.

After your data is uploaded, explore freely. Drill through the data by using interactive visualizations. Surface unexpected insights that can transform your business. Then let Analytics do the work of producing dynamic charts that look sharp and communicate volumes.

IN THIS SECTION:

[Learn to Use Explorer](#)

See what unexpected insights you can surface by interactively exploring and visualizing your data, using explorer tools.

[Explore Data with Tables](#)

You can use tables to get a view of the data that is close to the underlying dataset, and you can use tables to manipulate and extend the data to expose fresh insights. With values, compare, and pivot tables, Analytics explorer gives you options for both of those goals.

[Visualize Data With Charts](#)

If your goal is to understand vast amounts of business data, and to communicate that understanding with coworkers, partners, and customers, being able to visualize your data is critical. Analytics provides a chart for every need, each a means for illustrating key aspects of your business in just the right way.

[View and Configure Dataset Fields](#)

You can use the Dataset Fields feature to view, hide, and rename dataset fields. Users with view-only access to the dataset can view the names and API names of fields.

[Clone a Lens](#)

Build upon a visualization by cloning its containing lens to a new tab where you can continue exploring. You can save the original in its own tab.

[Save a Visualization](#)

Save your visualization as a lens.

[Share a Visualization](#)

Share a visualization with your colleagues by posting to Chatter, getting its unique URL, downloading a screenshot of it, or downloading its filtered data. A Chatter post provides an image and a link to the asset—lens, dashboard, or app—in Analytics. Colleagues with the link and access to the asset can drill down and explore the information that's presented. To share without giving access to the asset, use the download options.

Learn to Use Explorer

See what unexpected insights you can surface by interactively exploring and visualizing your data, using explorer tools.

IN THIS SECTION:

[View Your Data in a Lens](#)

When you look at data in an exploratory mode, you do so in a *lens*. A lens has several aspects: it's how you view data in a dataset, it's the place where you explore the data graphically, and it's the basis for building any dashboard.

[Group Your Data into Categories](#)

Group data to organize it so that the data is displayed in useful categories.

[Filter Your Data](#)

Apply filters in a lens to unclutter your chart and focus on the subset of data that's most relevant for your business unit, project, or management team.

[Change the Sort Order](#)

Choose whether data in your chart visualization is sorted ascending, sorted descending, or unsorted.

[Change the Chart Type](#)

Switch between chart types to see which visualization options tell the most compelling story for your data.

[Change Measures](#)

Your choice of measure defines your entire visualization and determines the scope of your exploration. For example, change the measure and the aggregation method from "Count of Opportunities" to "Sum of Amount." Then add a second measure to see 2 visualizations side by side.

[Drill Deeper Into Data](#)

You can drill deeper into your data to explore the underlying information and surface hidden insights.

[Focus on Selected Data](#)

You can focus your exploration by changing the view to include only specific data from an existing table or chart.

[Change the Chart Scale](#)

With some data, a chart displays values that range widely on an axis and make the visualization more difficult to understand. You can constrict the range's scale by applying a logarithmic scale. Scaling is available for certain charts only.

[Return to the Initial View](#)

Exploring your data can lead you down many paths. Not all of them are fruitful, and that's OK. To go back to the dashboard's original state, or just see those nifty animations again, you can use the reset option to quickly return to the initial view.

[View the Query Behind Your Lens](#)

Analytics uses Salesforce Analytics Query Language (SAQL) behind the scenes in lenses and dashboards to gather data for visualizations. You can view and edit the underlying SAQL query being written as you explore or copy it for use elsewhere.

[Clip a Lens to a Dashboard](#)

To include the lens in a dashboard, clip it. When you clip the lens, Analytics adds the query as a step to the most recently used dashboard. If a dashboard isn't open, Analytics adds the step to a new dashboard in Wave dashboard designer. After you add the step to the designer, you can apply it to a widget in the dashboard. The widget overrides the visualization settings of the lens—the widget determines how to display the results of the query.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

- Use Analytics

View Your Data in a Lens

When you look at data in an exploratory mode, you do so in a *lens*. A lens has several aspects: it's how you view data in a dataset, it's the place where you explore the data graphically, and it's the basis for building any dashboard.

From the home page, click a dataset or a lens. A lens opens in a new tab.

EDITIONS

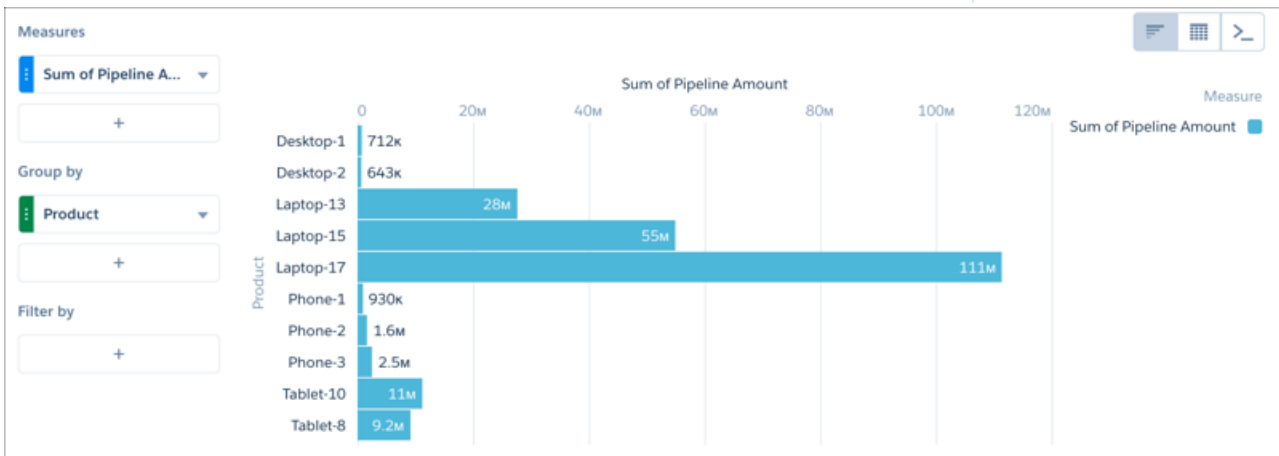
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

- Use Analytics



Group Your Data into Categories

Group data to organize it so that the data is displayed in useful categories.

For example, to look for seasonal patterns in your sales cycle, group opportunity data by the month when deals close.

1. Explore a dataset containing opportunity stages, pipeline amounts, and dates, setting the measure to pipeline amount.
2. Click the grouping plus button, select the opportunity stage date, then click month, the time dimension that you want to group by.

The dimensions in your data determine which categories you can group by.

EDITIONS

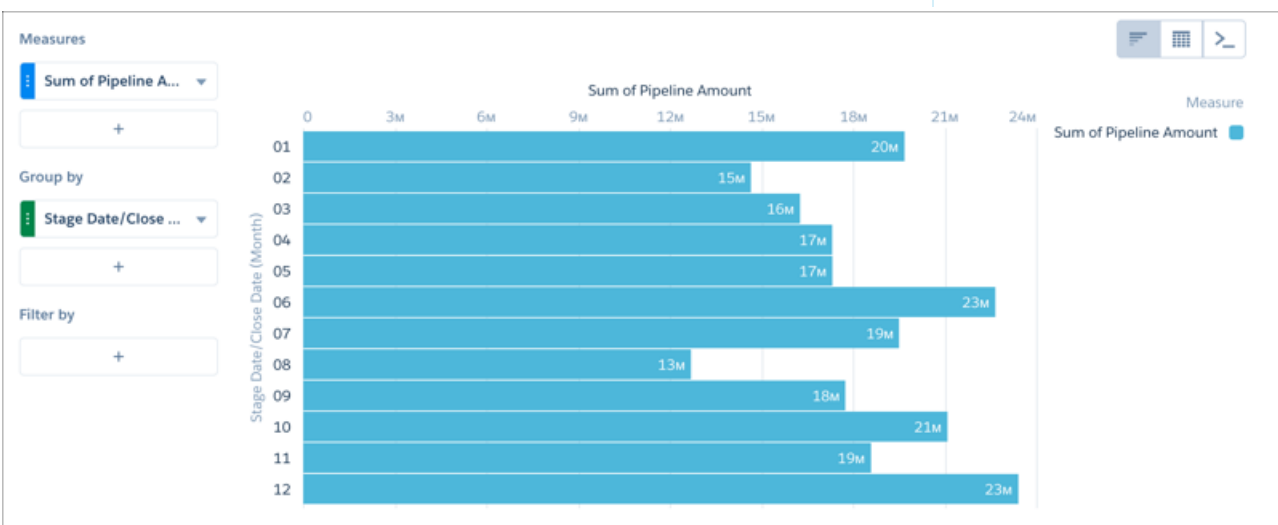
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

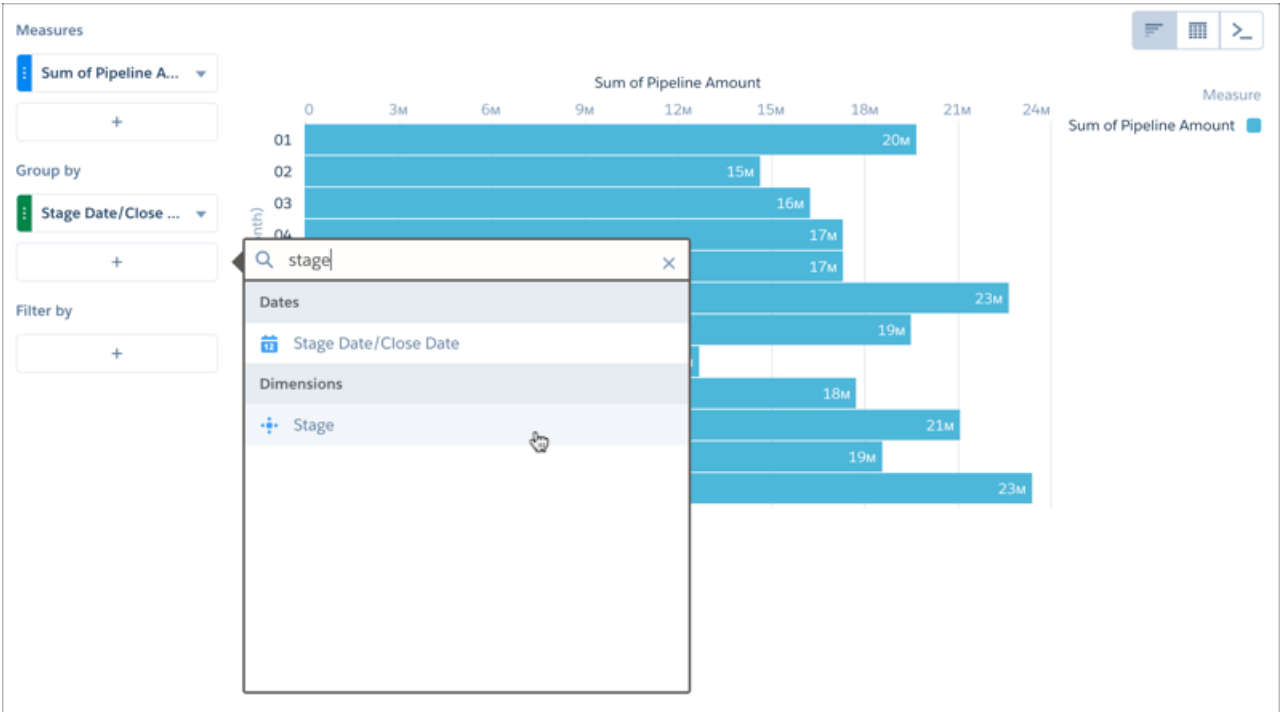
USER PERMISSIONS

To view visualizations:

- Use Analytics

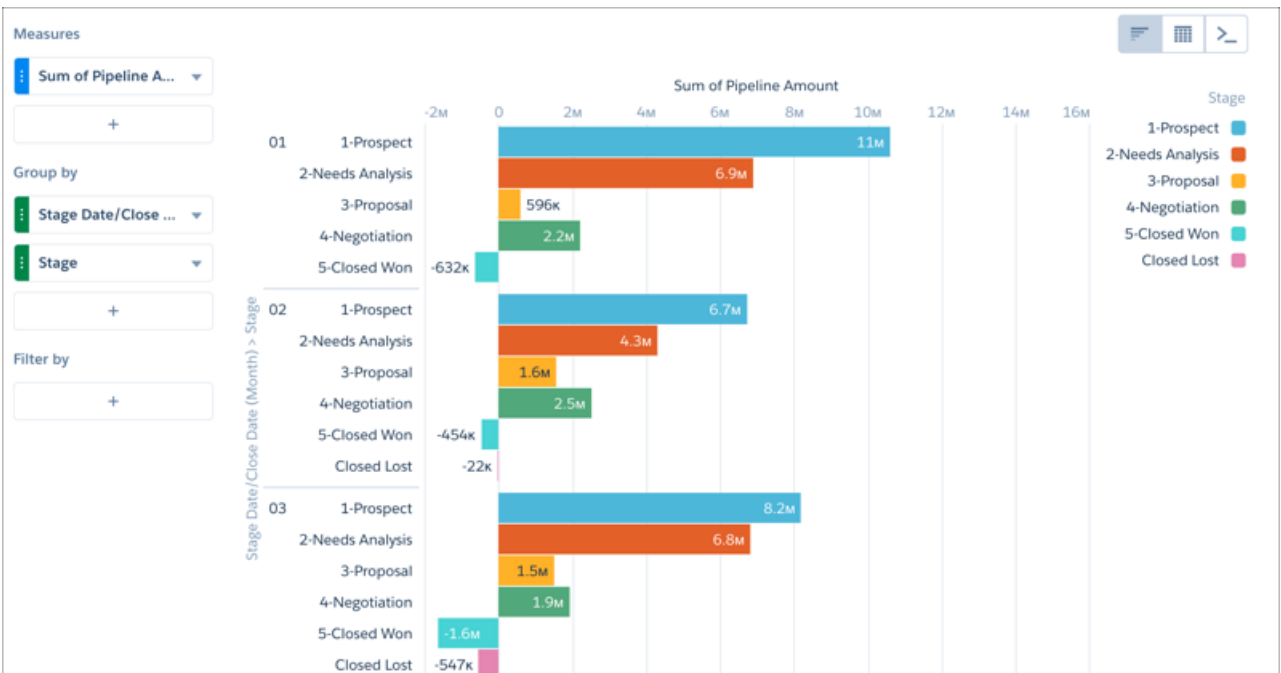


3. To find the second dimension that you want to group by, click the grouping plus button, then enter `stage` in the search field.



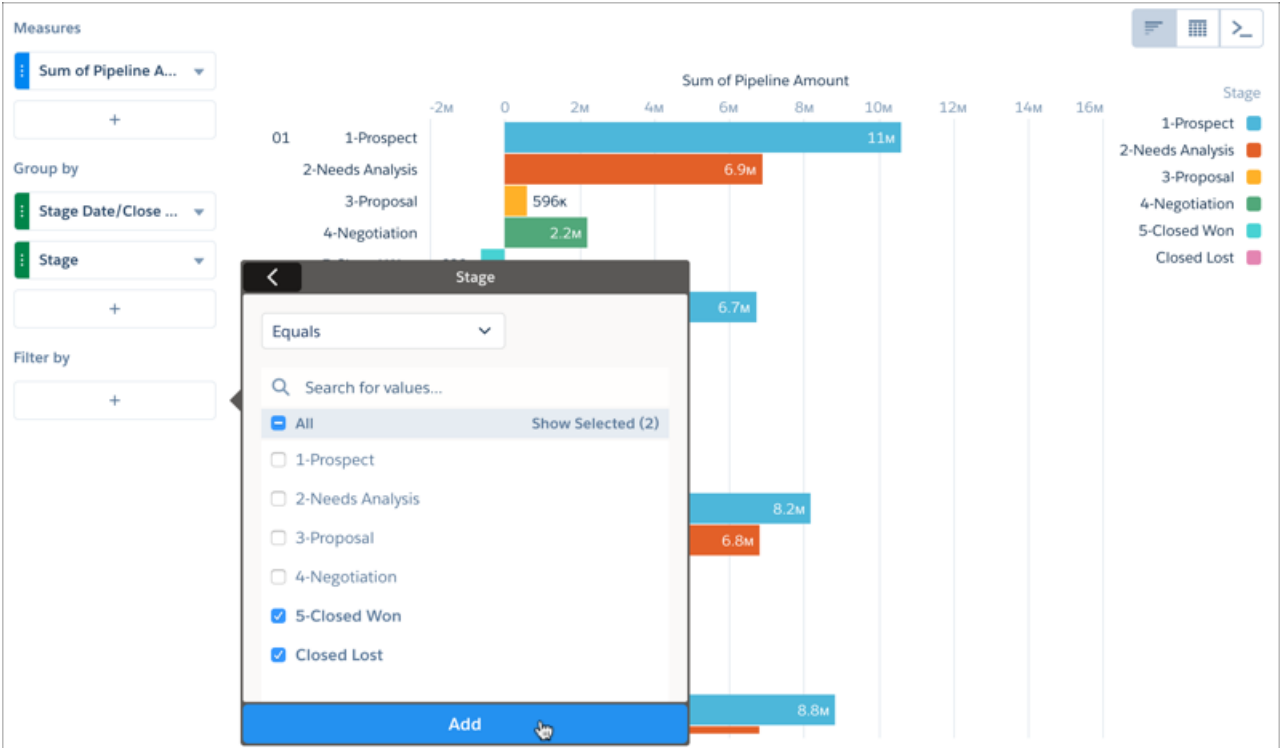
4. Click **Stage**, the second dimension you want to group by.

Pipeline amounts are shown grouped by stages, and stages are shown grouped by month. In this dataset, closed amounts are shown as negative numbers because those amounts fall out of the pipeline.

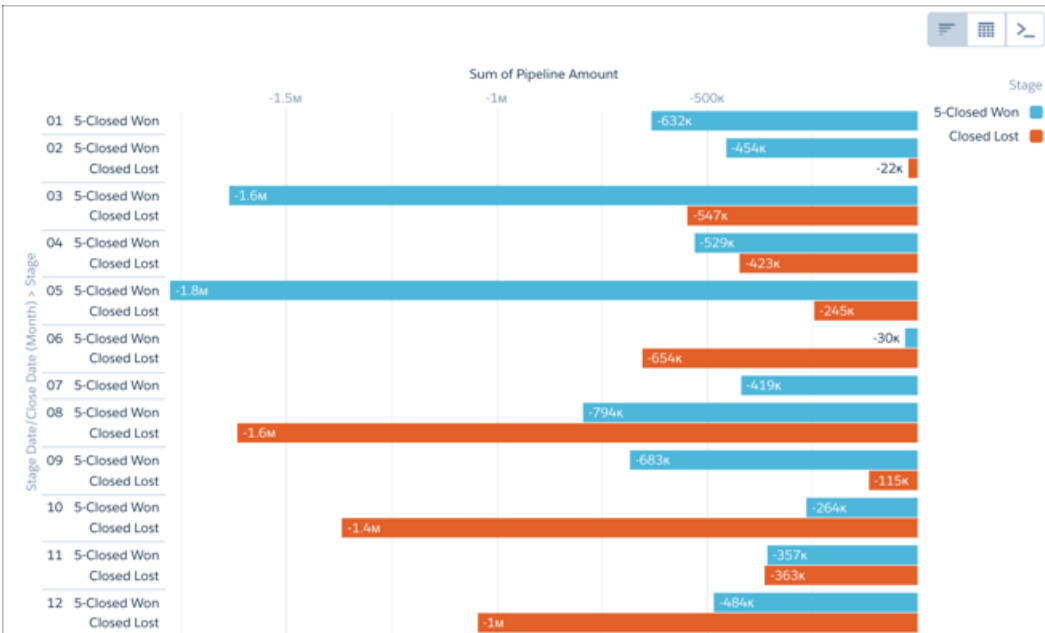


5. Click the filters plus button, then click the stage dimension.

- Set the filter to equal the closed stages only.

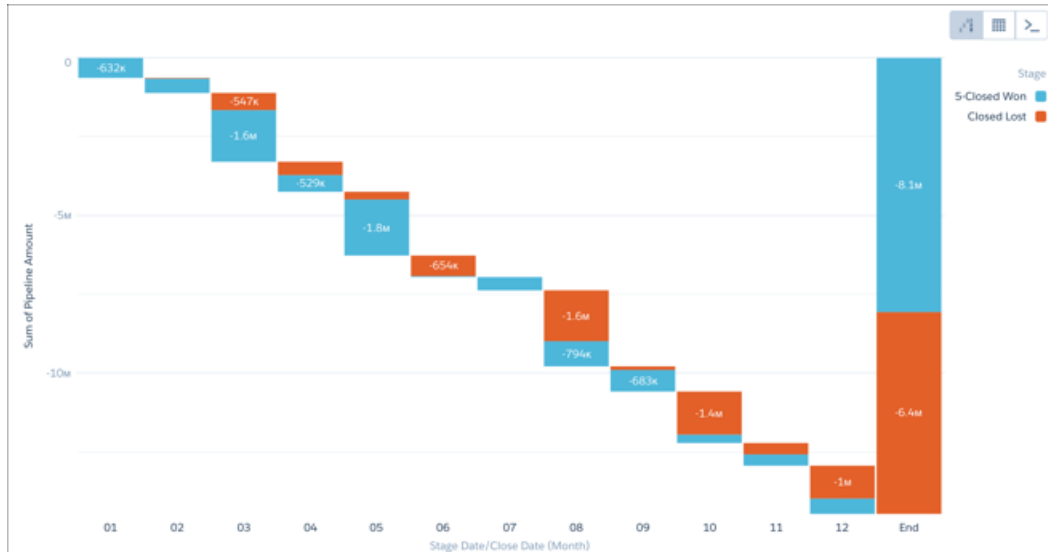


The resulting bar chart shows the information you're after, but it's not easy to interpret.



- Open the chart menu and select stacked waterfall.

The bar chart changes from a single bar to a waterfall chart that show the data grouped separately by month. It also provides an overall total for the year. You can now easily see how much each month has contributed in both lost and won closed deals.



Note: When a dimension is grouped, that dimension's null records are excluded from results, which affects the count of rows in a lens. To prevent the exclusion of null dimension records, assign a default value to those records.

Filter Your Data

Apply filters in a lens to unclutter your chart and focus on the subset of data that's most relevant for your business unit, project, or management team.

For example, limit the view of cities in sales territories to those with a substantial number of accounts.

1. Click the filters plus button.
In the filters dialog box, aggregated measures and measures are listed at the top, followed by dates and dimensions (the same ones available in the group-by panel).
2. In the filters dialog box, select the **Count of Rows** aggregated measure.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

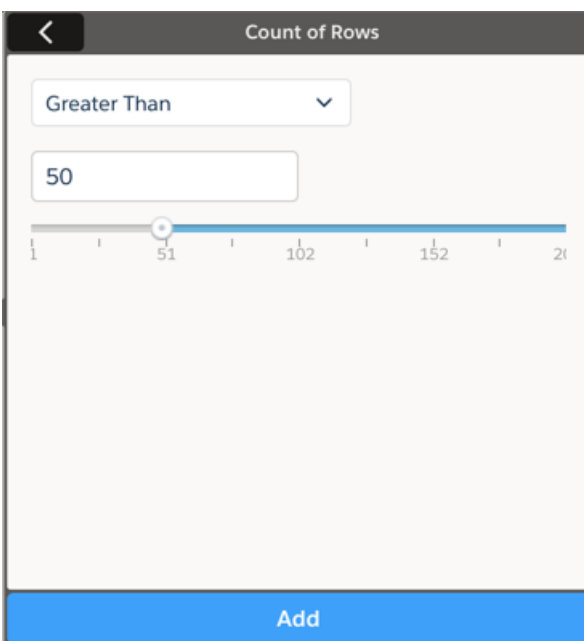
Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

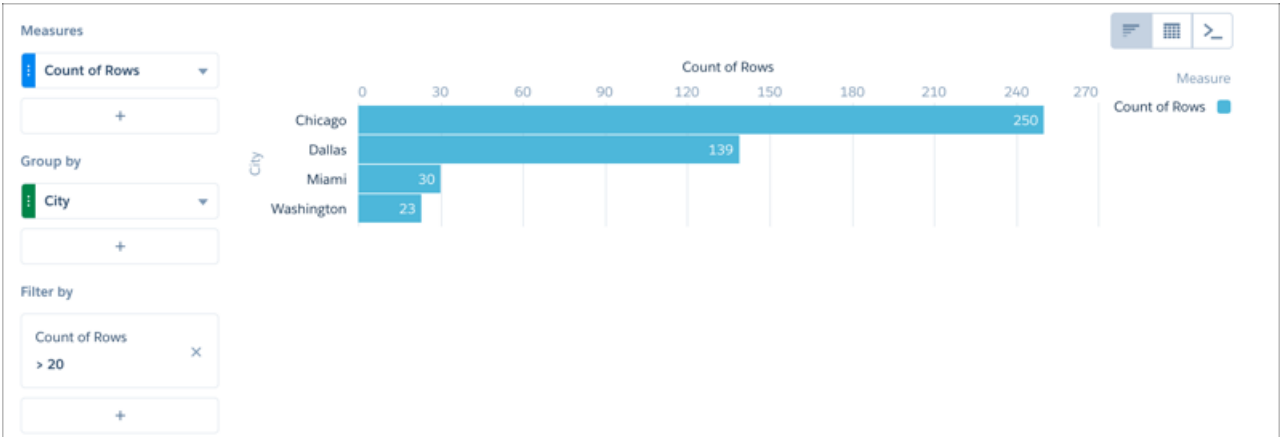
- To view visualizations:
- Use Analytics



3. Select **Greater Than** from the menu, and enter *20* in the value field.



4. Click **Add**.



Change the Sort Order

Choose whether data in your chart visualization is sorted ascending, sorted descending, or unsorted.

1. Click the actions menu for the measure you want to sort.

EDITIONS

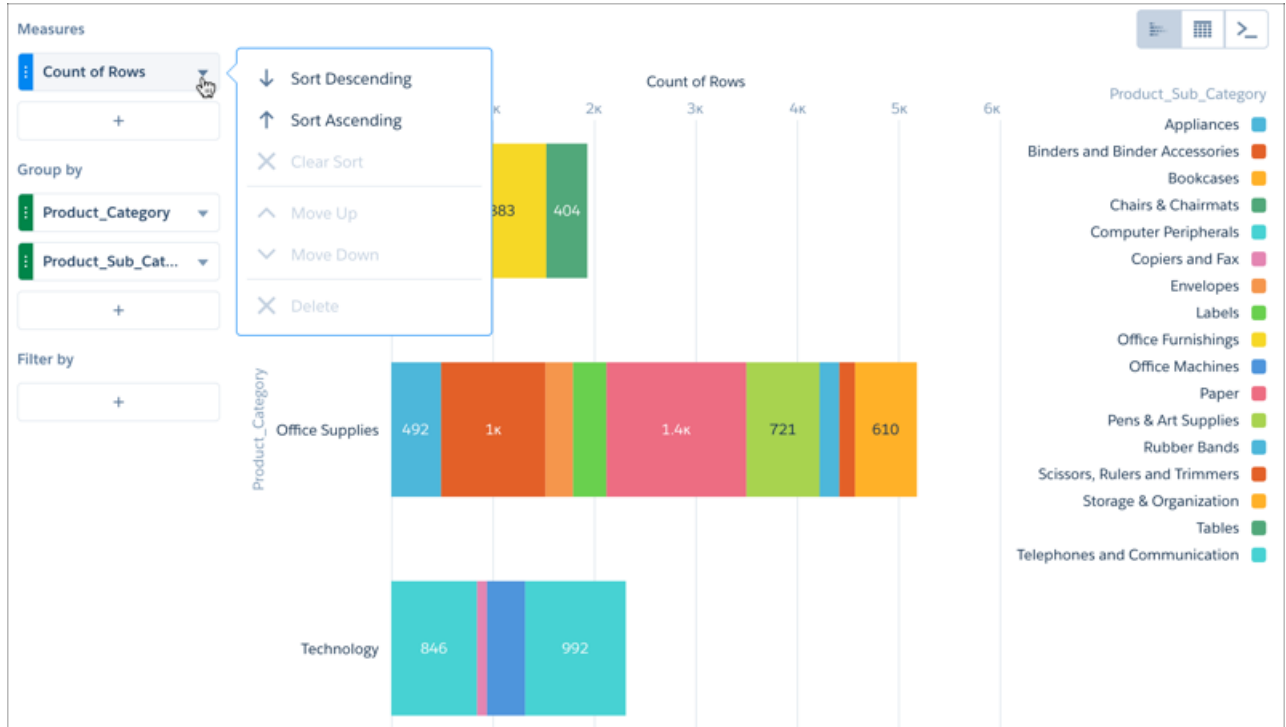
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

- Use Analytics



2. Select **Sort descending** or **Sort ascending**.

If the measure is already sorted, you can unsort it by selecting **Clear sort**.

Change the Chart Type

Switch between chart types to see which visualization options tell the most compelling story for your data.

1. Click the **Chart Mode** button.



A gallery of chart types that are available for this lens is displayed.

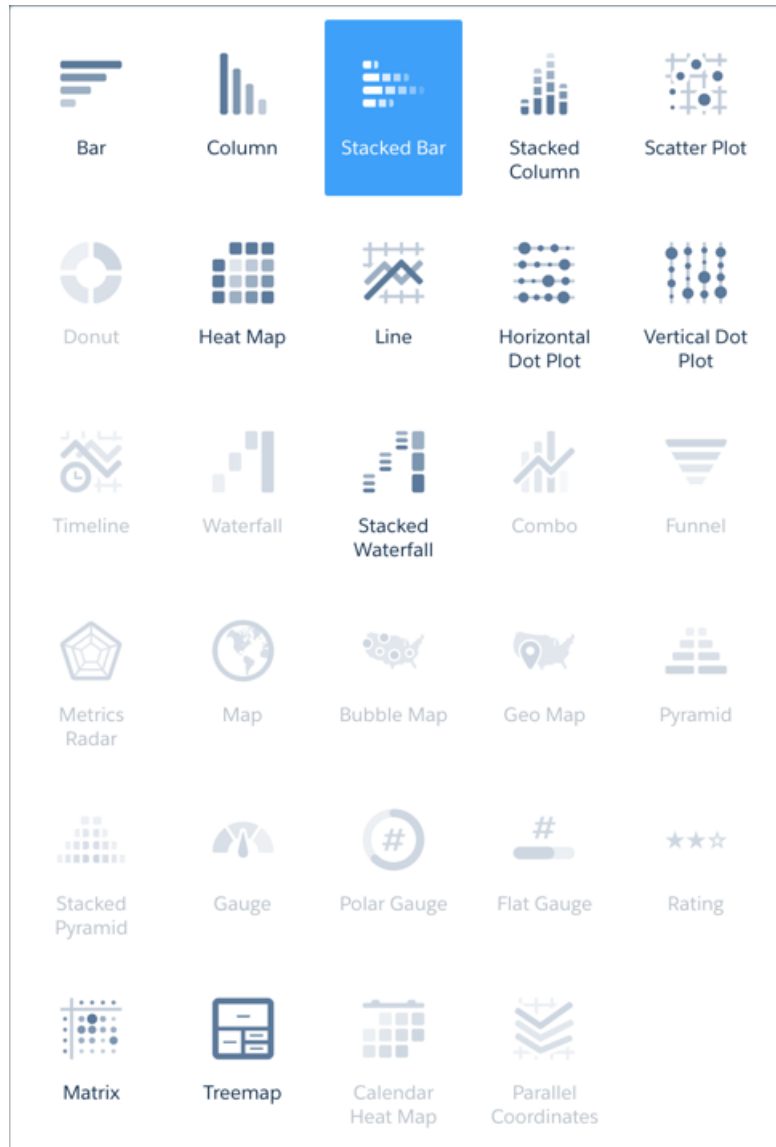
EDITIONS

Available in Salesforce Classic and Lightning Experience.

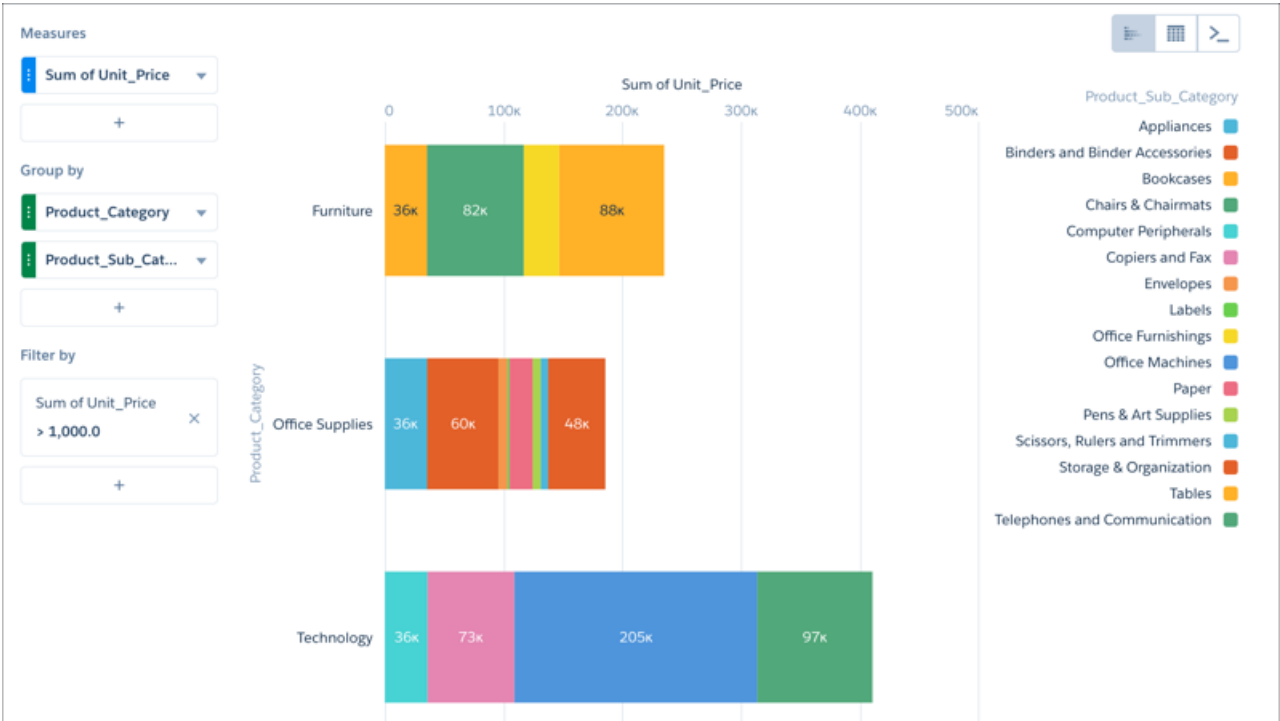
Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

- To view visualizations:
- Use Analytics



2. Hover over a chart type to see how many measures and dimensions that type of visualization requires. For example, a donut chart can have one measure and one or two dimensions.
3. Click a chart type, such as Stacked Bar. The chart visualization changes.



Change Measures

Your choice of measure defines your entire visualization and determines the scope of your exploration. For example, change the measure and the aggregation method from “Count of Opportunities” to “Sum of Amount.” Then add a second measure to see 2 visualizations side by side.

1. To explore it in a lens, click an Analytics dataset.
By default, the initial measure is Count of Rows.
2. To open the Measures selection menu, click **Count of Rows**.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

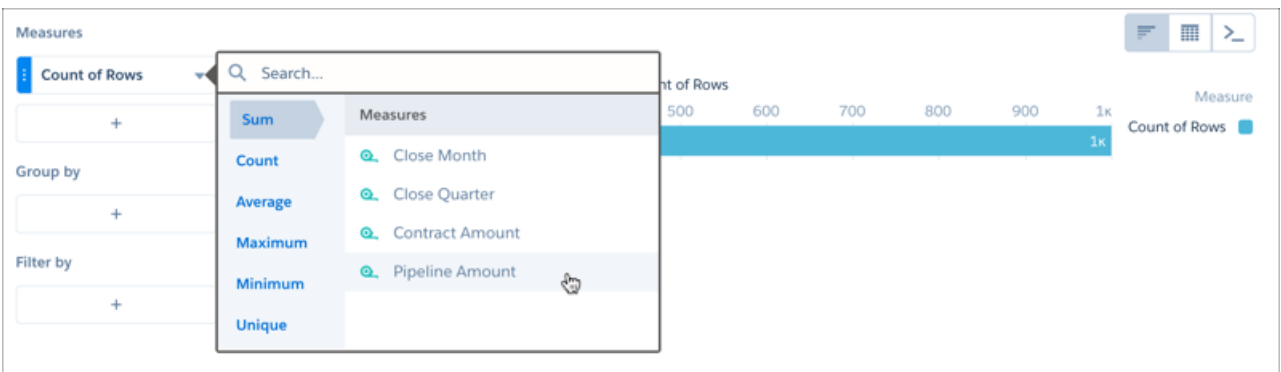
Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

- To view visualizations:
- Use Analytics

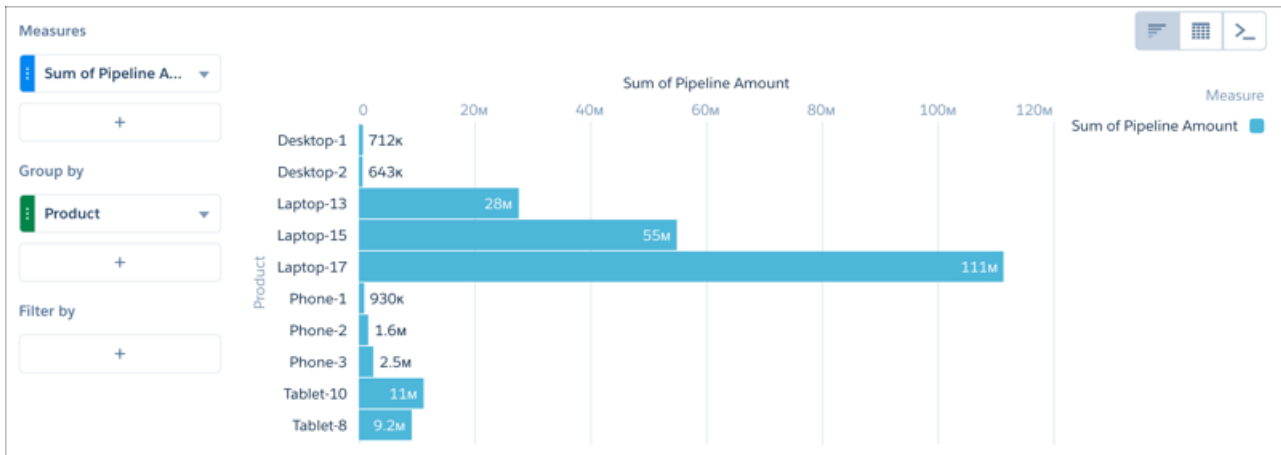


3. Click **Sum**, and click the measure you want to visualize.



Note: To count the number of unique occurrences of a measure or a dimension, click **Unique**, then select the measure or dimension you want to count.

After you group the data, the chart displays the chosen measure by group value.



Drill Deeper Into Data

You can drill deeper into your data to explore the underlying information and surface hidden insights.

1. Select the data you want to drill into by clicking datapoints in a chart or rows in a table.
For multiple selections, continue clicking, or click and drag to use a selection box. To deselect datapoints or rows, click them. To undo all selections, click the space just outside the datapoints or table.

 **Note:** Drill selections are not available in values tables.

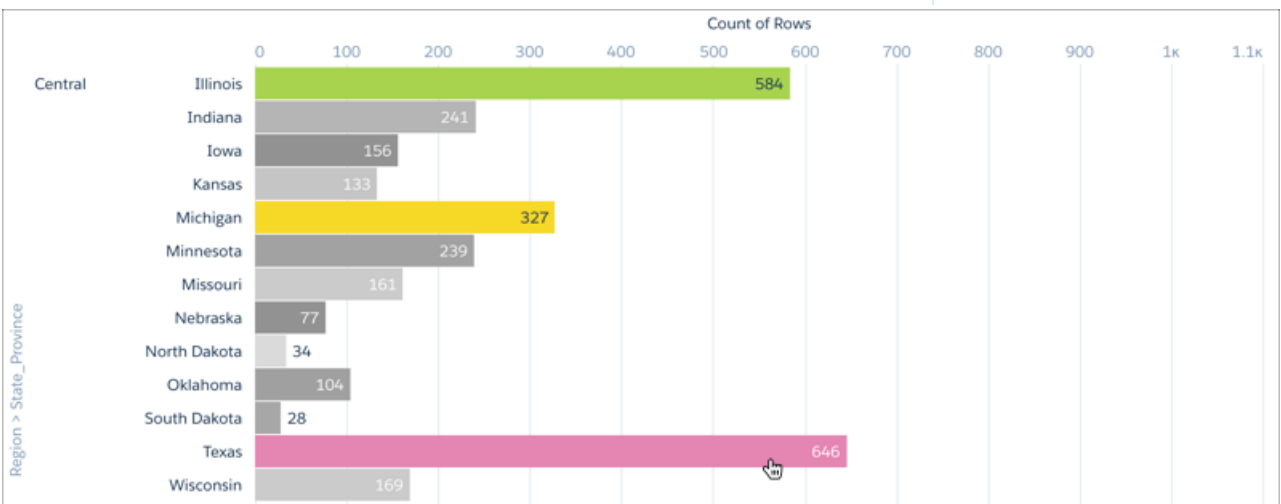
EDITIONS

Available in Salesforce Classic and Lightning Experience.

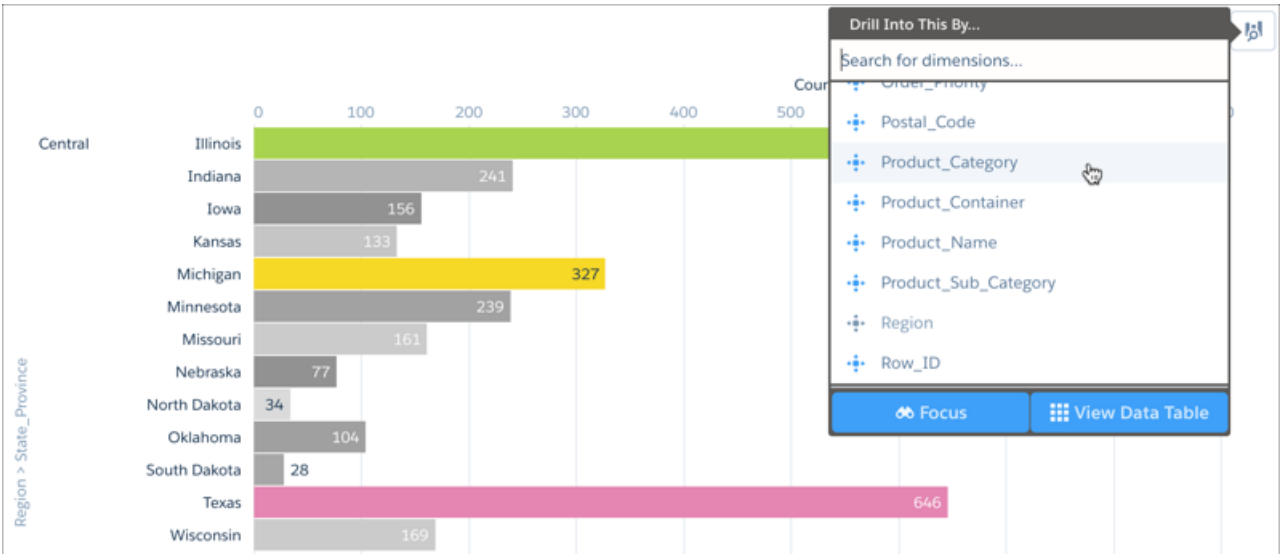
Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

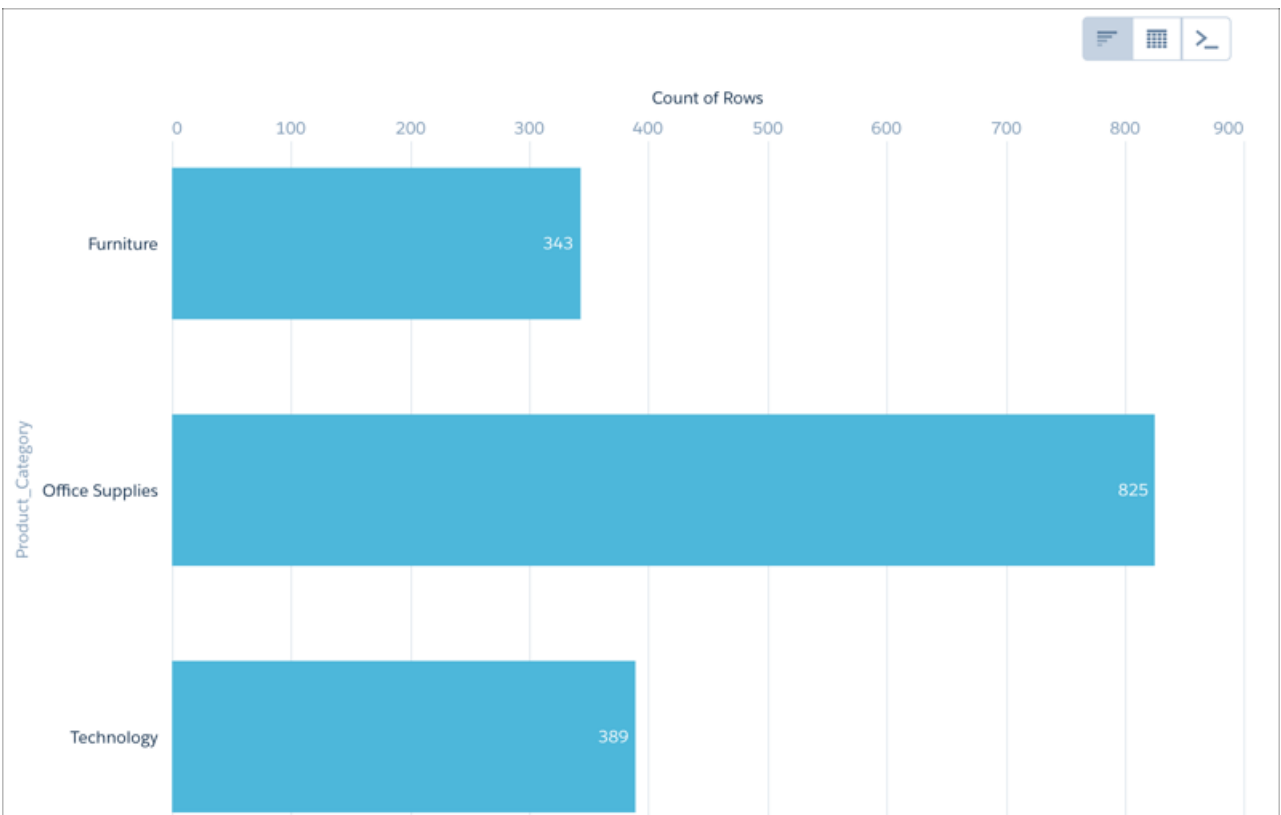
- To view visualizations:
- Use Analytics




2. To open the Drill Into This By... menu, right-click the data or click .



- To view the underlying data for a dimension, select it from the Drill Into This By... menu.
A new visualization grouped by the selected dimension and filtered by the selected data appears in place of the previous visualization.




To return to the previous table or visualization, click .

Focus on Selected Data

You can focus your exploration by changing the view to include only specific data from an existing table or chart.

1. Select the data you want to focus on by clicking datapoints in a chart or rows in a table.

For multiple selections, continue clicking, or click and drag to use a selection box. To deselect datapoints or rows, click them. To undo all selections, click the space just outside the datapoints or table.

 **Note:** Focus selections are not available in values tables.

EDITIONS

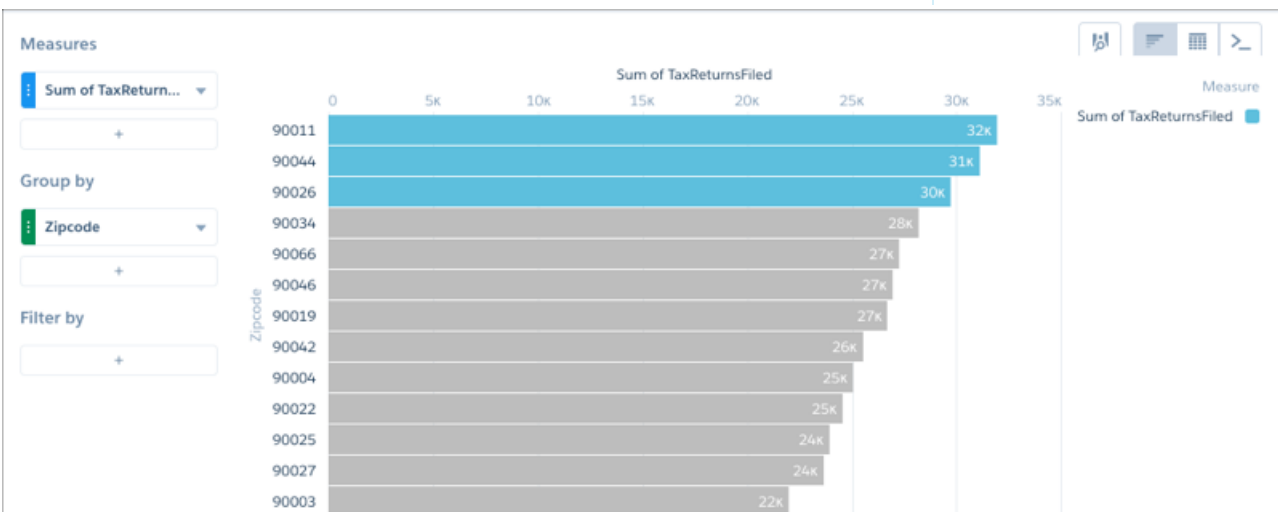
Available in Salesforce Classic and Lightning Experience.


Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

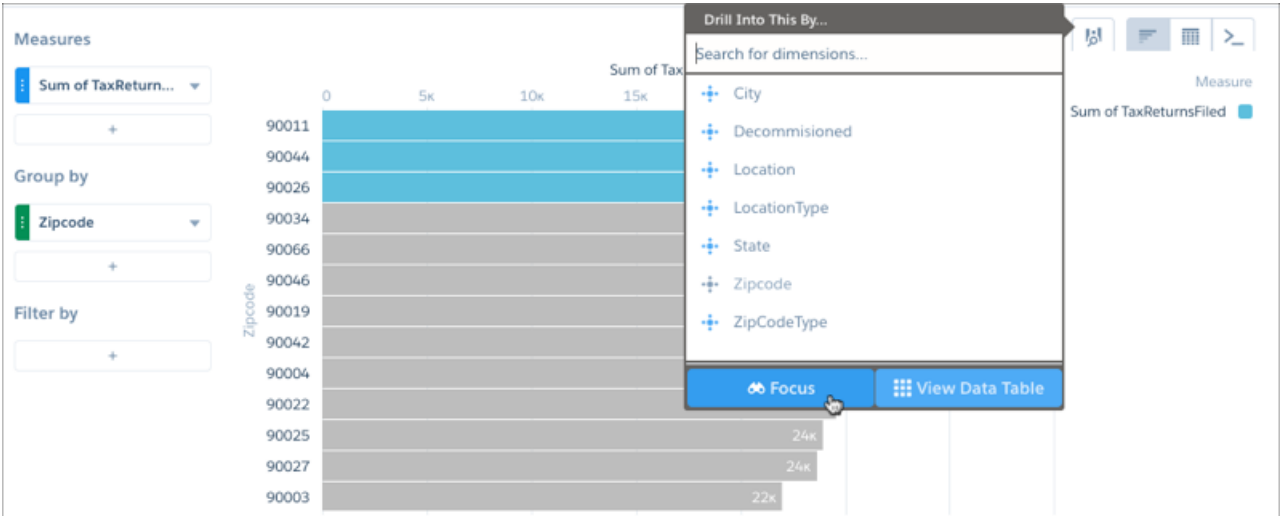
USER PERMISSIONS

To view visualizations:

- Use Analytics




2. To open the Drill Into This By... menu, right-click the data or click .



3. To view only the selected data, click **Focus**.


A new table or visualization based on the selected data appears in place of the previous table or visualization.



To return to the previous table or visualization, click .

Change the Chart Scale

With some data, a chart displays values that range widely on an axis and make the visualization more difficult to understand. You can constrict the range's scale by applying a logarithmic scale. Scaling is available for certain charts only.

1. To open the chart's properties, click .
2. Open the panel for the vertical axis, and click **Log Scale**.

Depending on the type of chart being used, the vertical axis, or y axis, could also be called the left or right axis.

EDITIONS

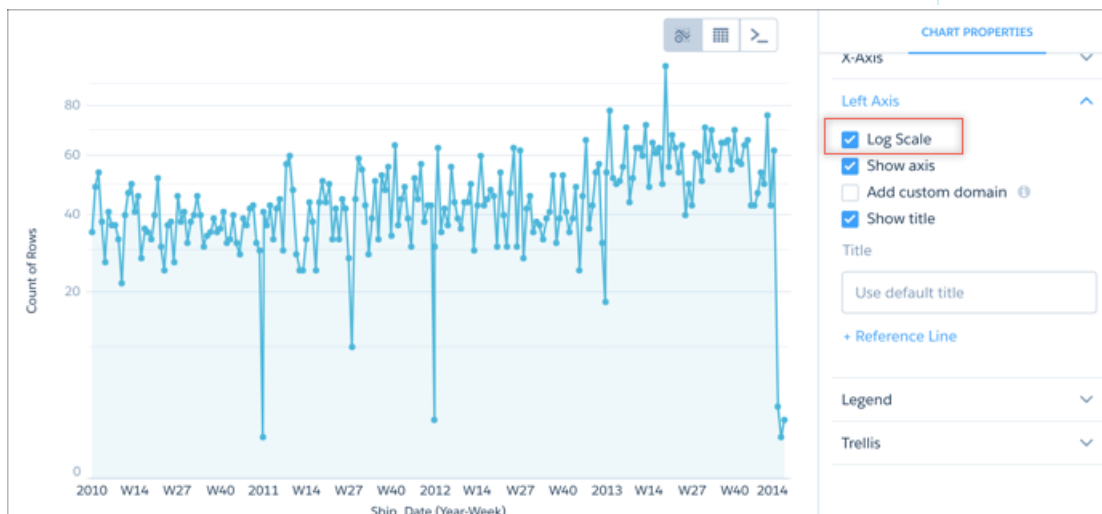
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

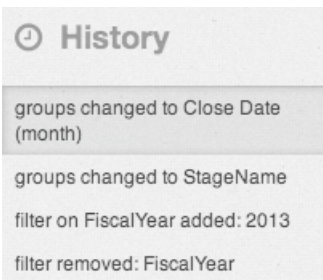
- Use Analytics



Return to the Initial View

Exploring your data can lead you down many paths. Not all of them are fruitful, and that's OK. To go back to the dashboard's original state, or just see those nifty animations again, you can use the reset option to quickly return to the initial view.

1. Click the **View History** button  in the header. A sidebar lists a history of all the actions that you've taken in the lens.



2. Select any item in the list to view the exploration at that point. Or use the undo and redo buttons (1) step backward and forward through the list.



3. To return to the initial state of your exploration, click the **Return to Initial View** button (2).

View the Query Behind Your Lens

Analytics uses Salesforce Analytics Query Language (SAQL) behind the scenes in lenses and dashboards to gather data for visualizations. You can view and edit the underlying SAQL query being written as you explore or copy it for use elsewhere.

1. Explore a dataset to get the visualization or table of data you want.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

- Use Analytics

EDITIONS

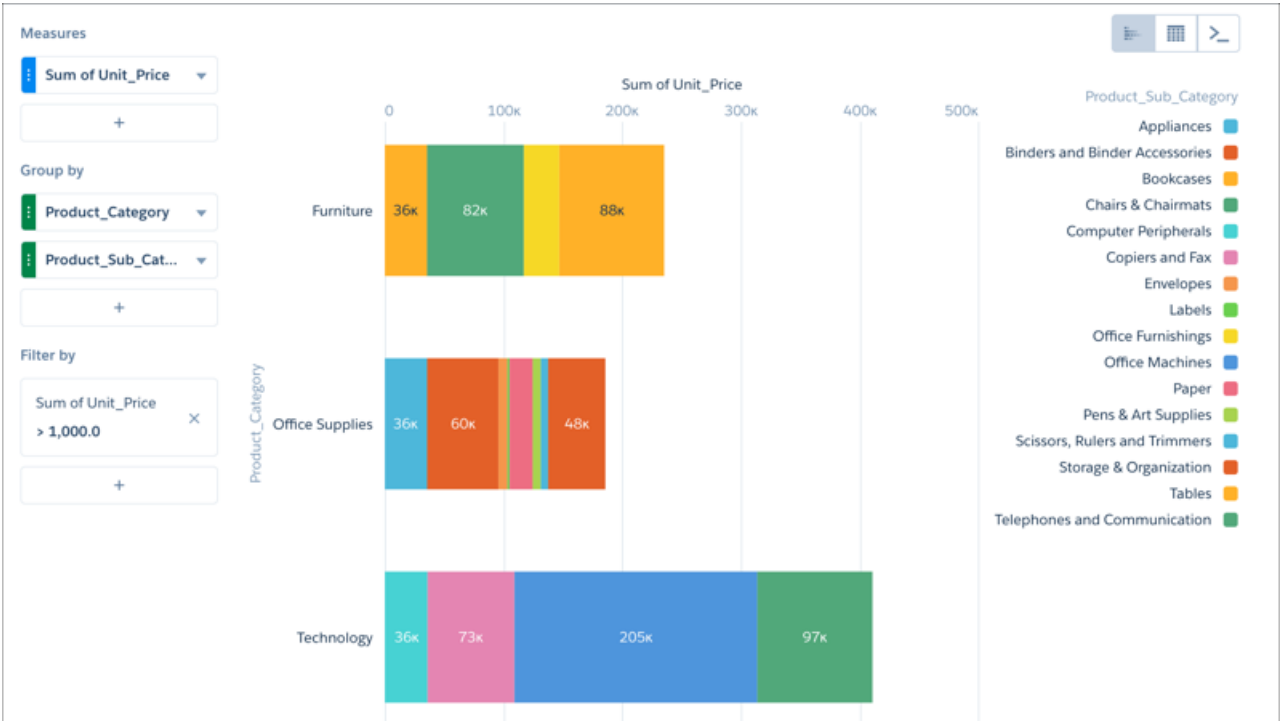
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

- Use Analytics



2. Click SAQL mode to view the query's SAQL code.

Product Sales

Query


```


1 q = load "SuperStoreSales5";
2 q = group q by ('Product_Category', 'Product_Sub_Category');
3 q = foreach q generate 'Product_Category' as 'Product_Category', 'Product_Sub_Category' as 'Product_Sub_Category', sum('Unit_Price')
  as 'sum_Unit_Price';
4 q = filter q by ('sum_Unit_Price' >= 1000) && ('sum_Unit_Price' <= 204548.11);
5 q = order q by ('Product_Category' asc, 'Product_Sub_Category' asc);
6 q = limit q 2000;
    
```

PRODUCT_CATEGORY	PRODUCT_SUB_CATEGORY	SUM OF UNIT_PRICE
Furniture	Bookcases	35,572
	Chairs & Chairmats	81,500
	Office Furnishings	29,836
	Tables	88,354
Office Supplies	Appliances	35,612

3. To change the query using SAQL, edit the SAQL and then click **Run Query**. Query results appear in a table below the SAQL editor.

If you run a SAQL query while exploring, explorer goes into a read-only state in chart and table modes. To return chart and table modes


to an editable state, click  and return to a point in the history before you entered SAQL mode.

 **Note:** If you save the lens with chart and table modes in read-only mode, they will remain in read-only mode. Your exploration history is not saved with the lens and cannot be used to undo the read-only state.

For more information about SAQL, see the [Analytics SAQL Reference](#).

Clip a Lens to a Dashboard

To include the lens in a dashboard, clip it. When you clip the lens, Analytics adds the query as a step to the most recently used dashboard. If a dashboard isn't open, Analytics adds the step to a new dashboard in Wave dashboard designer. After you add the step to the designer, you can apply it to a widget in the dashboard. The widget overrides the visualization settings of the lens—the widget determines how to display the results of the query.

1. Open the lens.
2. Click . Analytics creates a step based on query of the lens, and adds it to the step panel of the dashboard designer.
3. To save the step, save the dashboard.

 **Note:** Changes to the step properties don't affect the lens.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

Explore Data with Tables

You can use tables to get a view of the data that is close to the underlying dataset, and you can use tables to manipulate and extend the data to expose fresh insights. With values, compare, and pivot tables, Analytics explorer gives you options for both of those goals.

IN THIS SECTION:

[Manage the View of Data in a Values Table](#)

The values table displays all the columns in your dataset. You can customize the view of columns in a values table, and you can sort the row values using any column except for the index column.

[Navigate Compare Table Columns](#)

Create columns and navigate between existing ones using clicks or keystrokes.

[Create Calculated Columns Using the Compare Table](#)

Use the Compare Table to define custom formulas with columns of data. View measures side by side, and perform math across the table's columns and rows.

[Window Functions Available in the Compare Table](#)

The compare table's function menu provides UI-based access to useful window functions, saving you the time of having to write them in SAQL. Once you choose a function, you can edit the generated SAQL in the formula editor.

Use Raw Field Names in Explorer Formulas (Beta)

When writing compare-table formulas, you can reference measure and group (dimension) columns by name. Referencing measure and group columns by name lets you write more intuitive and easily understandable formulas.

Table Properties

Use table properties to control a table's appearance.

Manage the View of Data in a Values Table

The values table displays all the columns in your dataset. You can customize the view of columns in a values table, and you can sort the row values using any column except for the index column.

On the left-hand side of the values table are measure and dimension (grouping) tiles representing all the visible columns in your dataset. To move a measure or grouping, click and hold its tile, then drag the tile to a new position. Release the tile when the position indicator is in the correct position (1).

The screenshot shows a data table with columns: Country_code, Country, Region, Value, and Accounts. On the left, there is a 'Columns' panel with tiles for Country_code, Region, Value, and Accounts. Below the columns panel is a 'Filter by' section with filters for Accounts (> 999.0) and Value (> 25,000,000.0). The table has 8 rows of data. Red boxes with numbers 1 through 4 highlight specific UI elements: 1 is the 'x' button on the Country_code tile; 2 is the pencil icon in the 'Filter by' section; 3 is the 'x' button on the Value filter; 4 is the 'Country' column header.

	Country_code	Country	Region	Value	Accounts
1	chn	China	East Asia	29,754,009.0	2,051.0
2	eur	Europe	Europe	61,238,042.0	4,668.0
3	fra	France	Europe	28,746,829.0	2,303.0
4	ind	India	Asia	32,037,499.0	2,721.0
5	ita	Italy	Europe	26,340,986.0	1,722.0
6	jpn	Japan	East Asia	36,916,012.0	2,872.0
7	rus	Russian Federation	East Europe	27,387,456.0	1,847.0
8	usa	United States of America	North America	87,044,191.0	6,527.0

To remove a measure or grouping from the table, click the x button in its tile (1). To access the Edit Columns dialog, where you can hide or show any column, click the pencil button (2). You can also add, edit, or remove filters (3). To sort the rows by a column, click its heading cell until an arrow appears in the direction you want to sort (4).

Navigate Compare Table Columns

Create columns and navigate between existing ones using clicks or keystrokes.

You can navigate columns in the column editor using arrow buttons or your keyboard's left and right arrow keys.

		A	B	C
PRODUCT_CATEGORY	PRODUCT_NAME	COUNT OF ROWS	SUM OF PROFIT	PROFIT (LOSS) PER SALE
Furniture	12-1/2 Diameter Round Wall Clock	12	2,687.3685	\$223.95
	36X48 HARDFLOOR CHAIRMAT	2	-813.262	-\$406.63
	3M Hangers With Command Adhesive	4	45.7125	\$11.43
	3M Polarizing Light Filter Sleeves	5	626.0546	\$125.21
	3M Polarizing Task Lamp with Clamp Ar...	10	5,100.9404	\$510.09
	6" Cubicle Wall Clock, Black	5	-325.1779	-\$65.04
	9-3/4 Diameter Round Wall Clock	7	-173.5256	-\$24.79
	Advantus Employee of the Month Certifi...	7	468.4434	\$66.92
	Advantus Panel Wall Acrylic Frame	2	4,903.3071	\$2,451.65
	Advantus Panel Wall Certificate Holder - ...	5	-45.0217	-\$9
	Aluminum Document Frame	15	-442.7878	-\$29.52

EDITING COLUMN **B**

Name

Calculation
Formula $f(x)$

Format
Number (1,234)

Close Apply

When you reach the right-most column, the right arrow button becomes an add-column button. You can click the add-column button or use your keyboard's Enter key to add a formula column.

 **Note:** You can add up to 26 columns in the Compare Table.

		A	B	C
PRODUCT_CATEGORY	PRODUCT_NAME	COUNT OF ROWS	SUM OF PROFIT	PROFIT (LOSS) PER SALE
Furniture	12-1/2 Diameter Round Wall Clock	12	2,687.3685	\$223.95
	36X48 HARDFLOOR CHAIRMAT	2	-813.262	-\$406.63
	3M Hangers With Command Adhesive	4	45.7125	\$11.43
	3M Polarizing Light Filter Sleeves	5	626.0546	\$125.21
	3M Polarizing Task Lamp with Clamp Ar...	10	5,100.9404	\$510.09
	6" Cubicle Wall Clock, Black	5	-325.1779	-\$65.04
	9-3/4 Diameter Round Wall Clock	7	-173.5256	-\$24.79
	Advantus Employee of the Month Certifi...	7	468.4434	\$66.92
	Advantus Panel Wall Acrylic Frame	2	4,903.3071	\$2,451.65
	Advantus Panel Wall Certificate Holder - ...	5	-45.0217	-\$9
	Aluminum Document Frame	15	-442.7878	-\$29.52

EDITING COLUMN **C** +

Name

Calculation
Formula $f(x)$

Format
Currency with Cents (51,234.56)

Close Apply

You can also delete columns from the compare table by selecting **Delete** in the context of any measure or dimension.

Sum of #	average value per account
42,102	3,092.0291
6,025	4,182.1155
5,058	3,292.6327
5,608	2,071.1904
6,443	2,567.2426
17,725	4,000.9885
6,864	6,202.7197
5,078	3,187.4006
5,214	3,375.8452
6,726	3,905.248
7,014	3,511.9001
6,714	2,032.2225
52,454	3,381.9619
6,125	3,274.9159

Use the new **Close** button to exit the column editor without applying changes to the column.

Create Calculated Columns Using the Compare Table

Use the Compare Table to define custom formulas with columns of data. View measures side by side, and perform math across the table's columns and rows.

1. Select **Compare Table** from the table type gallery.



2. Add dimensions by clicking **+** in the **Group by** panel.

Note: Null values that occur in the data are displayed as minus signs ("-").

3. Change the first measure by clicking the initial selection ("Count of Rows"). Add more measures by clicking **+** in the **Measures** panel.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

- Use Analytics

The screenshot shows a data table with the following columns: Product_Category, Product_Sub_Category, Sum of Profit, and Avg of Discount. The table is filtered by 'Sum of Profit > 5,000.0' and grouped by 'Product_Category' and 'Product_Sub_Category'. The data is as follows:

Product_Category	Product_Sub_Category	Sum of Profit	Avg of Discount
Furniture	Chairs & Chairmats	165,348.8828	0.0501
	Office Furnishings	92,209.2259	0.0485
Office Supplies	Appliances	121,651.3914	0.0508
	Binders and Binder Accessories	226,572.523	0.0503
	Envelopes	46,133.2238	0.0492
	Labels	17,775.3205	0.0492
	Paper	35,361.6217	0.0492
	Storage & Organization	8,078.8047	0.0511
Technology	Computer Peripherals	87,917.8425	0.0486
	Copiers and Fax	129,156.684	0.0517
	Office Machines	168,072.8333	0.0507
	Telephones and Communication	297,950.5249	0.0478

4. To open the column's action menu, click the down arrow.

The screenshot shows the 'Avg of Discount' column's action menu open. The menu options are: Sort Descending, Sort Ascending, Sort Within Groups (Desc), Sort Within Groups (Asc), Clear Sort, Clone Column, Edit this Column, Add a Filter, Show as Bars, Show as Values, Move Up, Move Down, Hide, and Delete. The table data is partially visible in the background.


Product_Category	Sum of Profit	Avg of Discount
Chairmats	165,348.8828	0.0501
Office Furnishings	92,209.2259	0.0485
Appliances	121,651.3914	0.0508
Binder Accessories	226,572.523	0.0503
Envelopes	46,133.2238	0.0492
Labels	17,775.3205	0.0492
Paper	35,361.6217	0.0492
Storage & Organization	8,078.8047	0.0511
Computer Peripherals	87,917.8425	0.0486
Copiers and Fax	129,156.684	0.0517
Office Machines	168,072.8333	0.0507
Telephones and Communication	297,950.5249	0.0478

5. To open the column editor and enter a custom formula, select **Edit this Column** from a measure's action menu. If you want to preserve the original column, select **Clone Column** from the original column's action menu. You can edit the cloned column instead of the original.

In the column editor, you can enter SAQL formulas, including math functions, or choose a windowing function to calculate the values in the column. You can also name the column and choose a number format. If any of the formulas contain division by zero, the result is displayed as a minus sign ("-").


6. In the **Formula** field, create formulas using operators from this table.

Symbol	Examples	Calculation
+	A+B, A+100	Addition, applied per row.
-	A-B, A-100	Subtraction, applied per row.
/	A/B, A/100	Division, applied per row.
*	A*B, A*100	Multiplication, applied per row.
()	(B-A)/(A*100)	Parentheses for grouping operations.

 **Note:** Dimension columns are on the left and measure columns are on the right. The measure columns are identified in formulas as A, B, C, and so on, with A being the far-left measure column.

7. To use SAQL, enter it directly into the formula editor, then click **Apply** to see the result.

See the *Analytics SAQL Reference* for more information on writing SAQL.

 **Note:** Some SAQL functions cannot use letter references, such as A, B, C, etc., for columns. `percentile_desc` and `percentile_cont` functions, for example, require raw field names as arguments. See [Use Raw Field Names in Explorer Formulas \(Beta\)](#) for more information.

		A	B	C
Product_Category	Product_Sub_Category	Sum of Profit	Avg of Discount	Avg Discount in \$
Furniture	Chairs & Chairmats	165,348.8828	0.0501	\$8,289.99
	Office Furnishings	92,209.2259	0.0485	\$0
Office Supplies	Appliances	121,651.3914	0.0508	\$0
	Binders and Binder Accessories	226,572.523	0.0503	\$11,392.54
	Envelopes	46,133.2238	0.0492	\$2,271.04
	Labels	17,775.3205	0.0492	\$874.72
	Paper	35,361.6217	0.0492	\$1,741.41
	Storage & Organization	8,078.8047	0.0511	\$412.68
Technology	Computer Peripherals	87,917.8425	0.0486	\$0
	Copiers and Fax	129,156.684	0.0517	\$0
	Office Machines	168,072.8333	0.0507	\$8,524.33
	Telephones and Communication	297,950.5249	0.0478	\$14,236.75

EDITING COLUMN C +

Name

Calculation
Formula f(x) ▾

```

case
  when (A * B < 8000) and (A > 80000)
  then 0
  else (A * B)
end
        
```

Format

Close
Apply

- To use a function, choose the function editor and then choose one of the windowing functions from the menu. After you configure the function, click **Apply** to see the result.

		A	B	C	D
Product_Category	Product_Sub_Category	Sum of Profit	Avg of Discount	Avg Discount in \$	Avg Discount in %
Furniture	Chairs & Chairmats	165,348.8828	0.0501	\$8,289.99	12.6%
	Office Furnishings	92,209.2259	0.0485	\$0	7.03%
Office Supplies	Appliances	121,651.3914	0.0508	\$0	9.27%
	Binders and Binder Accessories	226,572.523	0.0503	\$11,392.54	17.26%
	Envelopes	46,133.2238	0.0492	\$2,271.04	3.52%
	Labels	17,775.3205	0.0492	\$874.72	1.35%
	Paper	35,361.6217	0.0492	\$1,741.41	2.69%
	Storage & Organization	8,078.8047	0.0511	\$412.68	0.62%
Technology	Computer Peripherals	87,917.8425	0.0486	\$0	6.7%
	Copiers and Fax	129,156.684	0.0517	\$0	9.84%
	Office Machines	168,072.8333	0.0507	\$8,524.33	12.81%
	Telephones and Communication	297,950.5249	0.0478	\$14,236.75	22.7%

EDITING COLUMN D +

Name

Calculation
Formula f(x) ▾

Percentage of Group i
 Column Reset Group
None ▾

Format
 ▾

Close
Apply

Switch to the formula editor to see the SAQL generated by the chosen function. You can edit the SAQL in the formula editor after generating it with a function as if you'd written it.

		A	B	C	D
Product_Category	Product_Sub_Category	Sum of Profit	Avg of Discount	Avg Discount in \$	Avg Discount in %
Furniture	Chairs & Chairmats	165,348.8828	0.0501	\$8,289.99	12.6%
	Office Furnishings	92,209.2259	0.0485	50	7.03%
Office Supplies	Appliances	121,651.3914	0.0508	50	9.27%
	Binders and Binder Accessories	226,572.523	0.0503	\$11,392.54	17.26%
	Envelopes	46,133.2238	0.0492	\$2,271.04	3.52%
	Labels	17,775.3205	0.0492	\$874.72	1.35%
	Paper	35,361.6217	0.0492	\$1,741.41	2.69%
	Storage & Organization	8,078.8047	0.0511	\$412.68	0.62%
Technology	Computer Peripherals	87,917.8425	0.0486	50	6.7%
	Copiers and Fax	129,156.684	0.0517	50	9.84%
	Office Machines	168,072.8333	0.0507	\$8,524.33	12.81%
	Telephones and Communication	297,950.5249	0.0478	\$14,236.75	22.7%

EDITING COLUMN **D**

Name
Avg Discount in \$

Calculation
Formula *f(x)*

A/sum(A) over ([..] partition by all)

Format
Percentage (12.34%)

Close Apply

Window Functions Available in the Compare Table

The compare table's function menu provides UI-based access to useful window functions, saving you the time of having to write them in SAQL. Once you choose a function, you can edit the generated SAQL in the formula editor.

Sliding Window

Sliding Window ⓘ

Column: A: Count of Opportunit... Function: Average

Start: -1 End: 0 Reset Group: None

Applies an aggregate function to the current row with respect to a configurable range of rows. The function can be reset on a grouping defined in the table. Use the sliding window for calculating values such as running totals and moving average.

Percentage of Group

Percentage of Group
 Percentage of Group ⓘ

Column: A: Count of Opportuniti... ▼

Reset Group: None ▼

Format: Percentage (12.34%) ▼

Calculates the percentage each row is of its group total, or of the grand total. The function can be reset on a grouping defined in the table.

Rank Within Group

Rank within Group ⓘ

Column: A: Count of Opportuniti... ▼

Function: Rank ▼

Order: Descending ▼

Reset Group: None ▼

Provides rank, dense rank, cumulative distribution, and row-number functions. Ranking can be reset on a grouping defined in the table. The Order menu determines the direction of ranking based on the values being ranked. Ascending ranks the lowest value as number 1, while descending ranks the highest value as number 1.

Period Over Period

Period Over Period
 Period Over Period ⓘ

Column: A: Count of Opportuniti... ▼

Compare: Year Over Year ▼

Calculate as: % Change ▼

Compares periods of time to calculate changes in values. For example, year-over-year sales, or quarter-over-quarter closed opportunities, can be calculated by choosing the column and setting the granularity of the time period.

INDUSTRY	CLOSE DATE (YEAR)	CLOSE DATE (MONTH)	A COUNT OF ROWS	B (A - SUM(A) OVER [-1;-1] PA...
Consumer	2015	10	1,584	0%
		11	1,737	9.66%
		12	1,566	-9.84%
	2016	01	1,725	10.15%
		02	1,440	-16.52%
		03	579	-59.79%
Fin Svcs	2015	10	5,130	0%
		11	6,171	20.29%
		12	6,423	4.08%
	2016	01	6,306	-1.82%
		02	5,586	-11.42%
		03	2,127	-61.92%
Healthcare	2015	10	2,097	0%

Edit Column ✕

Name

Alias

Calculation
 ▼

Period Over Period ⓘ

Column ▼ Compare ▼

Calculate as ▼ ▼ ▼

Format

Always group data by year first, then (optionally) grouped by a finer granulation of time if available. Compound dates, if available, can be used directly with the period-over-period function. Examples of compound dates include “2016-01” (month of January 2016) and “2016-1” (first quarter of 2016). Comparisons can be shown as percentages or units.

Change from Previous

Compares the value of the current row with that of the previous row and calculates the difference. For example, to calculate the growth in number of accounts between the first and fourth quarters, choose the column showing number of accounts from **Column**. To restrict that calculation to each country, choose the country column from **Reset Group**.

COUNTRY	CLOSE DATE (QUARTER)	A NUMBER OF ACCOUNTS	B ACCOUNT GROWTH
Ireland	1	1,080	-
	4	1,275	18.06%
Japan	1	135	-
	4	330	144.44%
South Africa	1	270	-
	4	255	-5.56%
Spain	1	300	-
	4	540	80%
USA	1	22,695	-
	4	29,400	29.54%
United Kingdom	1	8,250	-

Edit Column ✕

Name

Alias

Calculation
 ▼

Change from Previous ⓘ

Column ▼ Calculate as ▼

Reset Group ▼

Format


Running Total

Calculates the total value of the current row summed with all previous rows. For example, to calculate the monthly total of closed opportunities as a running total, choose the column showing closed opportunities from **Column**. To calculate that running total within each region, choose the region column from **Reset Group**.



REGION	STAGE NAME	CLOSE DATE (MONTH)	A	B
Northeast	7- Closed Won	01	35	35
		02	20	55
		03	5	60
		04	3	63
		05	34	97
		06	5	102
		07	35	137
		10	2	139
		11	4	143
		Northwest	7- Closed Won	01
02	17			34

Use Raw Field Names in Explorer Formulas (Beta)

When writing compare-table formulas, you can reference measure and group (dimension) columns by name. Referencing measure and group columns by name lets you write more intuitive and easily understandable formulas.

 **Note:** This release contains a beta version of access to raw column names in the formula editor, which means it's a high-quality feature with known limitations. Access to raw column names in the formula editor isn't generally available unless or until Salesforce announces its general availability in documentation or in press releases or public statements. We can't guarantee general availability within any particular time frame or at all. Make your purchase decisions only on the basis of generally available products and features. You can provide feedback and suggestions for access to raw column names in the formula editor in IdeaExchange or the Trailblazer Community.

You can use certain SAQL aggregate functions that require raw field names for arguments directly in the formula editor. These functions include `percentile_desc` and `percentile_cont`. You can also use the date function `daysBetween` in the formula editor.

 **Note:** You can use the date functions `year_last_day`, `quarter_last_day`, `week_last_day`, `quarter_days`, `day_in_week`, and `day_in_quarter` in the SAQL editor. Click  to access the SAQL editor.

See these examples for how to use SAQL functions with raw-field references in the formula editor. Also see the [Analytics SAQL Reference](#) for more information on SAQL functions.

```
sum (Amount) /100
percentile_cont (0.95) within group (order by 'LoadTime' asc)
regr_slope (Amount, Closed_On_epoch)
daysBetween (toDate (last (ModifiedDate_epoch), "yyyy-MM-dd"), now ())
```

```
coalesce(sum(Amount), 0)
len(first(Description))
```

Table Properties

Use table properties to control a table's appearance.

Choose a Table Theme

Click a theme to apply it to a table.

The screenshot displays a data table with the following columns: #, Country_code, Country, Region, Value, and Accounts. The table contains 8 rows of data. To the left of the table, there is a 'Columns' panel with checkboxes for 'Country_code', 'Country', 'Region', 'Value', and 'Accounts'. Below this is a 'Filter by' section with two filters: 'Accounts > 999.0' and 'Value > 25,000,00...'. To the right of the table is a 'TABLE PROPERTIES' panel with a 'Themes' section showing several theme preview tiles. Below the themes are expandable sections for 'Spacing', 'Header', 'Cells', 'Borders', 'Colors', and 'Other'.

#	Country_code	Country	Region	Value	Accounts
1	chn	China	East Asia	29,754,009.0	2,051.0
2	eur	Europe	Europe	61,238,042.0	4,668.0
3	fra	France	Europe	28,746,829.0	2,303.0
4	ind	India	Asia	32,037,499.0	2,721.0
5	ita	Italy	Europe	26,340,986.0	1,722.0
6	jpn	Japan	East Asia	36,916,012.0	2,872.0
7	rus	Russian Federation	East Europe	27,387,456.0	1,847.0
8	usa	United States of America	North America	87,044,191.0	6,527.0

Set the Spacing for Columns and Rows

To increase or decrease the whitespace in all cells, click a Cell Padding tile.

To set column width, select an option from the **Column Width** drop-down menu, then enter a value or values in **Width in Pixels**. If you choose **Fit to Widget**, all columns are brought into view.

State_Province	Product_Name	Avg of Shipping_Cost
California	"While you Were Out" Message Book, One Form ...	1.93
	#10 Self-Seal White Envelopes	5.25
	#10 White Business Envelopes,4 1/8 x 9 1/2	1.39
	#10- 4 1/8" x 9 1/2" Recycled Envelopes	8.29
	#10- 4 1/8" x 9 1/2" Security-Tint Envelopes	1.39
	Staples Highlighting Markers	0.71
	Staples Letter Opener	5
	Staples vLetter Openers, 2/Pack	1.32
	1/4 Fold Party Design Invitations & White Envelo...	5.96
	12 Colored Short Pencils	2.4
	12-1/2 Diameter Round Wall Clock	10.49
	1726 Digital Answering Machine	4.81
	210 Trimline Phone, White	11.28
	2180	8.99
	2190	5.63
	252	5.92
	282	4.23

Set Header Row Style

For the header row, you can set the cell background color, and the color and font size for text.

State_Province	Product_Name	Avg of Shipping_Cost
California	"While you Were Out" Message Book, One Form ...	1.93
	#10 Self-Seal White Envelopes	5.25
	#10 White Business Envelopes,4 1/8 x 9 1/2	1.39
	#10- 4 1/8" x 9 1/2" Recycled Envelopes	8.29
	#10- 4 1/8" x 9 1/2" Security-Tint Envelopes	1.39
	Staples Highlighting Markers	0.71
	Staples Letter Opener	5
	Staples vLetter Openers, 2/Pack	1.32
	1/4 Fold Party Design Invitations & White Envelo...	5.96
	12 Colored Short Pencils	2.4
	12-1/2 Diameter Round Wall Clock	10.49
	1726 Digital Answering Machine	4.81
	210 Trimline Phone, White	11.28
	2180	8.99
	2190	5.63
	252	5.92
	282	4.23

Set Body Row Text Attributes


For body rows, you can set the font size and color for text, and the number of text lines each row displays.

The screenshot shows a data table with the following columns: State_Province, Product_Name, and Avg of Shipping_Cost. The table is filtered by State_Province (California) and Product_Name. The right sidebar shows table properties for text color and size, and the number of lines per row.

State_Province	Product_Name	Avg of Shipping_Cost
California	"While you Were Out" Message Book, One Form per Page	1.93
	#10 Self-Seal White Envelopes	5.25
	#10 White Business Envelopes, 4 1/8 x 9 1/2	1.39
	#10- 4 1/8" x 9 1/2" Recycled Envelopes	8.29
	#10- 4 1/8" x 9 1/2" Security-Tint Envelopes	1.39
	Staples Highlighting Markers	0.71
	Staples Letter Opener	5
	Staples vLetter Openers, 2/Pack	1.32
	1/4 Fold Party Design Invitations & White Envelopes, 24 8-1/2" X 11" Cards, 25 Env./Pack	5.96
	12 Colored Short Pencils	2.4
	12-1/2 Diameter Round Wall Clock	10.49
	1726 Digital Answering Machine	4.81

The right sidebar shows the following settings:

- Themes: [Dropdown]
- Spacing: [Dropdown]
- Header: [Dropdown]
- Cells: [Dropdown]
- Text Color: [Color Picker]
- Text Size: [Dropdown, value: 12]
- Number of Lines per Row: [Dropdown, value: 2]
- Borders: [Dropdown]
- Colors: [Dropdown]

 **Note:** The value you choose in the **Number of Lines per Row** drop-down menu does not affect text wrapping. It sets the number of lines each row displays regardless of the length of the text in each cell.

Set Border Styles

To style the table's external border, choose a thickness from **Border Thickness** and a color from **Border Color**. For the remaining cell borders, choose colors from **Major Gridlines Color** and **Minor Gridlines Color**.

The screenshot shows a data table with columns: State_Province, Product_Name, and Avg of Shipping_Cost. The table is filtered for California. The 'TABLE PROPERTIES' panel is open to the 'Borders' section, showing 'Border Thickness' set to 1. Other options like 'Border Color', 'Major Gridlines Color', and 'Minor Gridlines Color' are visible but not selected.

State_Province	Product_Name	Avg of Shipping_Cost
California	"While you Were Out" Message Book, One Form per Page	1.93
	#10 Self-Seal White Envelopes	5.25
	#10 White Business Envelopes, 4 1/8 x 9 1/2	1.39
	#10- 4 1/8" x 9 1/2" Recycled Envelopes	8.29
	#10- 4 1/8" x 9 1/2" Security-Tint Envelopes	1.39
	Staples Highlighting Markers	0.71
	Staples Letter Opener	5
	Staples vLetter Openers, 2/Pack	1.32
	1/4 Fold Party Design Invitations & White Envelopes, 24 8-1/2" X 11" Cards, 25 Env./Pack	5.96
	12 Colored Short Pencils	2.4
	12-1/2 Diameter Round Wall Clock	10.49
	1726 Digital Answering Machine	4.81

Choose Colors for Body Rows

To set a background color for body rows, choose a color from **Table Background Color**. To alternate row colors, click **Alternate Row Colors**, then choose colors for the odd and even rows.

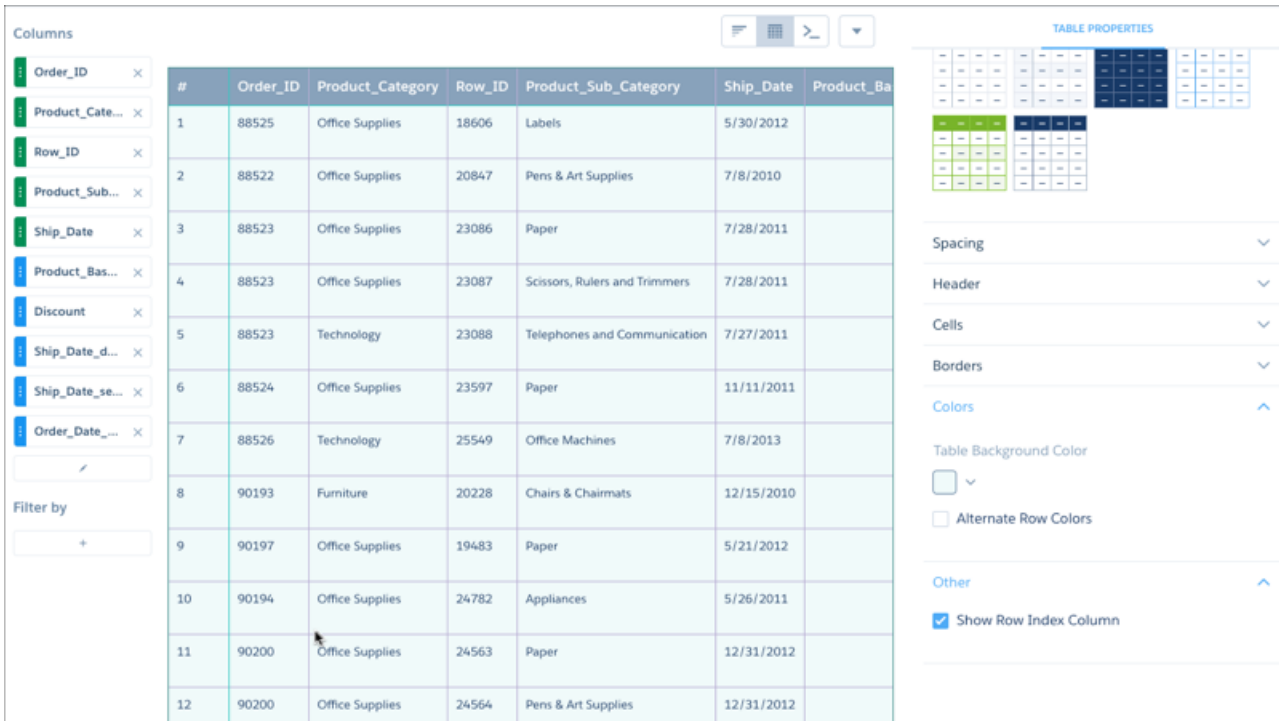
The screenshot shows a data table with columns: City, Customer_Segment, Count of Rows, and Sum of Profit. The 'TABLE PROPERTIES' panel is open to the 'Colors' section. The 'Table Background Color' is set to a light blue-grey. The 'Alternate Row Colors' checkbox is checked, and 'Odd Row Color' and 'Even Row Color' are both set to a light blue-grey.

City	Customer_Segment	Count of Rows	Sum of Profit
Aberdeen	Corporate	6	2,411.8977
Abilene	Home Office	1	3.384
	Small Business	6	1,433.1664
Abington	Small Business	1	-34.088
Acton	Small Business	1	14.4058
Addison	Corporate	4	25.4713
Adrian	Consumer	5	84.9955
Agawam	Small Business	1	-114.2
Aiken	Consumer	3	131.1246
	Corporate	3	-226.4314
	Small Business	2	-787.122
Akron	Consumer	7	626.6891
Alamogordo	Consumer	3	2,719.8122
	Small Business	5	3,624.7704

 **Note:** Rows in dimension columns retain the table background color even if you use alternate row colors.

Add an Index Column to Values Tables

To add or remove an index column from a values table, click **Show Row Index Column**.



#	Order_ID	Product_Category	Row_ID	Product_Sub_Category	Ship_Date	Product_Ba
1	88525	Office Supplies	18606	Labels	5/30/2012	
2	88522	Office Supplies	20847	Pens & Art Supplies	7/8/2010	
3	88523	Office Supplies	23086	Paper	7/28/2011	
4	88523	Office Supplies	23087	Scissors, Rulers and Trimmers	7/28/2011	
5	88523	Technology	23088	Telephones and Communication	7/27/2011	
6	88524	Office Supplies	23597	Paper	11/11/2011	
7	88526	Technology	25549	Office Machines	7/8/2013	
8	90193	Furniture	20228	Chairs & Chairmats	12/15/2010	
9	90197	Office Supplies	19483	Paper	5/21/2012	
10	90194	Office Supplies	24782	Appliances	5/26/2011	
11	90200	Office Supplies	24563	Paper	12/31/2012	
12	90200	Office Supplies	24564	Pens & Art Supplies	12/31/2012	

TABLE PROPERTIES


- Spacing
- Header
- Cells
- Borders
- Colors
 - Table Background Color
 - Alternate Row Colors
- Other
 - Show Row Index Column

Add a Summary Row

Values and compare tables can display column totals for measure columns. To display the summary row, select **Show Summary** from the Options menu.

Customer_ID	Sum of Sales	Avg of Discount	Sum of Profit
Summary	8,951,931.32	0.0496	1,312,442.3994
10	206.95	0.06	142.7955
100	228.27	0.06	-230.34
1000	432.44	0.03	-0.74
1002	2,101.11	0.045	1,180.4493
1003	1,404.09	0	968.8221
1005	962.61	0.04	547.2128
1006	552.53	0.035	-65.3988
1008	25.37	0.01	17.5053
1009	7,026.44	0.055	772.8646
101	1,838.64	0.095	1,042.9845
1010	29.1	0.08	20.079
1011	14.17	0.07	-25.9282

To hide the summary row, select **Hide Summary** from the Options menu.

 **Note:** Summary values are derived from the underlying dataset, which may not correspond to the data as displayed in the table. Whether a column total makes sense depends on the measure being totaled. In addition, if any filters have been set, summary values are derived from the filtered dataset.

Visualize Data With Charts

If your goal is to understand vast amounts of business data, and to communicate that understanding with coworkers, partners, and customers, being able to visualize your data is critical. Analytics provides a chart for every need, each a means for illustrating key aspects of your business in just the right way.

Analytics charts are integrated with the Analytics tools you already use to explore data. Start with a dataset, explore with a lens, clip it to Wave dashboard designer, and create a stunning dashboard.

IN THIS SECTION:

[Chart Properties](#)

To create the best visualizations for presenting your data, use chart properties to configure Analytics charts in Wave dashboard designer.

[Trellis Views](#)

Using a trellis view with charts lets you visualize more information in chart types that are normally limited in a non-trellis view.

[Add Icons to Analytics Charts](#)

Bar charts (but not stacked bars), dot-plot charts, and line charts can have icons along with dimension values as labels. Polar gauge charts can include icons in their centers.

[Chart Suggestions](#)

Using a sophisticated algorithm that analyzes your lens's composition, explorer suggests chart types that can better communicate the essential message your data is communicating.

Bar Charts

Use a bar chart to provide a quick visual comparison of related values. Use a stacked bar chart to show groups within each bar.

Column Charts

Use a column chart (also called vertical bar chart) to show relative counts of things, such as leads or dollars. Use a stacked column chart to show groups within each bar.

Combo Charts

Use a combo chart to display two related series of data, such as discrete grouped values as vertical bars overlaid with a line chart representing an average value.

Calendar Heat Map Charts

Calendar heat maps are useful for visualizing recurring discrete activities, such as closing accounts, over long periods of time. In this chart, you can easily change the granularity of the time-based grouping, such as from month to week or day.

Donut Charts

Use a donut chart when you have a grouping and want to show not only the proportion of a single value for each group member against the total, but also the total amount itself. If you remove the donut's center by selecting **0%** from the **Center Size** menu, this visualization is commonly referred to as a pie chart.

Dot Plot Charts

Horizontal and vertical dot plots use the size and coloring of bubbles to display multiple dimensions and measures. Use dot plots to visualize related data to compare performance or locate unusual values.

Funnel Charts

Use a funnel chart to visualize sequential data that can be broken up into stages, such as a sales cycle.

Gauge Charts

Use gauge charts to track progress along a single measure, such as how much revenue has been realized versus the target.

Heat Maps

Use a heatmap to visually enhance high and low-value data when there's a single measure and multiple dimensions.

Line Charts

Use a line chart when you have one important grouping representing an ordered set of data and one or more values to show.

Map Charts

Use a map if you have data with a geographical component that can shade areas in proportion to mapped values, allowing for visual pop-out of high-value areas. The map chart is found in the Wave dashboard designer and classic designer.

Bubble Map Charts

Use a bubble map chart to visually indicate measure values in specified geographical areas.

Geo Map Charts

Geo maps allow you to visualize data that contains geographical coordinates (latitude and longitude). Using coordinates allows you to place visual data elements more precisely on map charts.

Custom Map Charts

Using map charts that can shade areas in proportion to mapped values allows for visual pop-out of high-value areas. You can use custom maps with geographical units or to illustrate any type of area that can be represented by polygons. Custom map charts can be used in the Wave dashboard designer and classic designer.

Matrix Charts

Use matrix charts (new in Wave dashboard designer) to create a table that represents measures visually, allowing you to quickly spot extreme values.

Origami Charts

Use an origami chart to create a striking horizontal visualization for easily identifying high and low-value data when there's a single measure and a single grouping.

Parallel Coordinates Charts

Use a parallel coordinates chart when you have multiple measures and a single grouping. Parallel coordinate charts are useful for displaying how data elements in a grouping stack up against each other.

Pyramid Charts

Use a pyramid chart to visually highlight relative sizes of stacked dimension values.

Radar Charts

Use radar charts to display a small dataset with one dimension and at least three measure columns.

Rating Charts

Use a rating chart to get a sense of how well a measured quality, such as customer satisfaction, is meeting expectations.

Sankey Charts

Use a sankey chart to visualize the distribution of a measure from one grouping to another grouping.

Scatter Charts

Use a scatter chart to visualize correlation between two groups of data.

Timeline Charts

A timeline chart is a line chart with one axis dedicated to a time dimension. Use a timeline chart to show how a value changes over time.

Treemap Charts

Use treemaps to visualize hierarchical quantitative data, where containing rectangles designate relationship using color, and "leaf" rectangles represent quantity using area.

Waterfall Charts

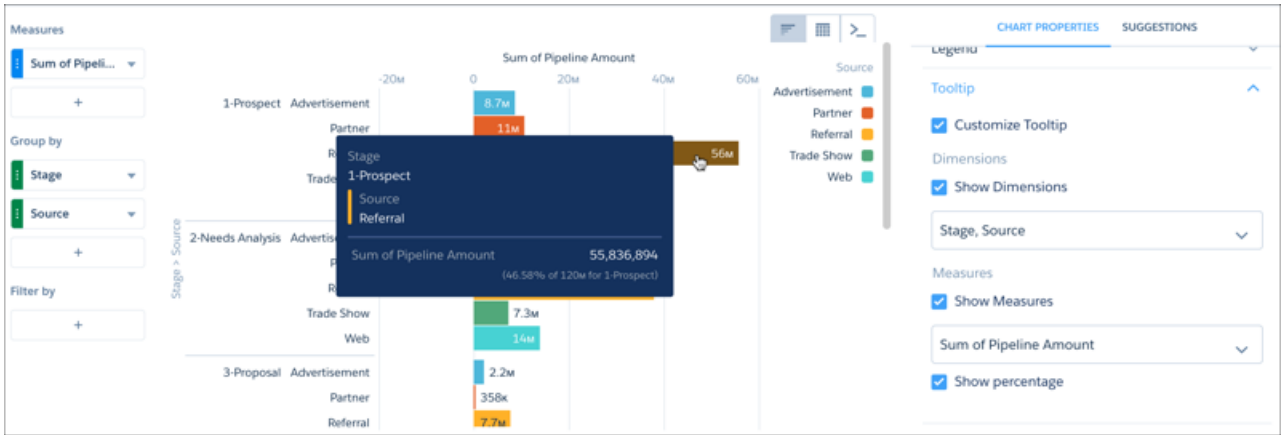
Use a waterfall chart to show the cumulative effect of sequentially introduced positive or negative values with breakdowns of value totals. Also known as "flying bricks" or "Mario" charts. To include breakdowns of value totals, use a stacked waterfall chart.

Chart Properties

To create the best visualizations for presenting your data, use chart properties to configure Analytics charts in Wave dashboard designer. Generally applicable information about customizing charts can be found here. Charts are a type of Analytics widget. For details about configuring widgets, including charts, see [Widget Properties for Analytics Dashboards](#)

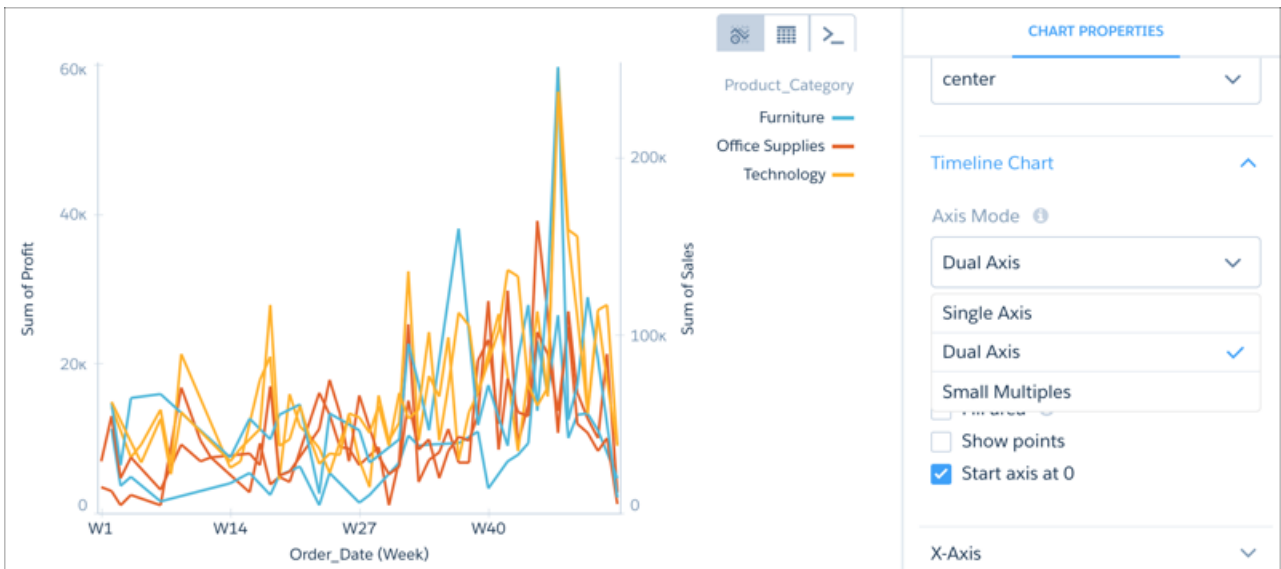
Customize Chart Tooltips

You can customize the tooltip that appears when the pointer hovers over a data point on your chart. You can choose what data it displays. Any chart that has tooltips can have customized tooltips. To customize tooltips, open the Tooltip panel in Chart Properties, then choose which of the chart's dimensions (groupings) and measures to show in the tooltip. You can even display what percentage the value of the data point is out of the total for its grouping.

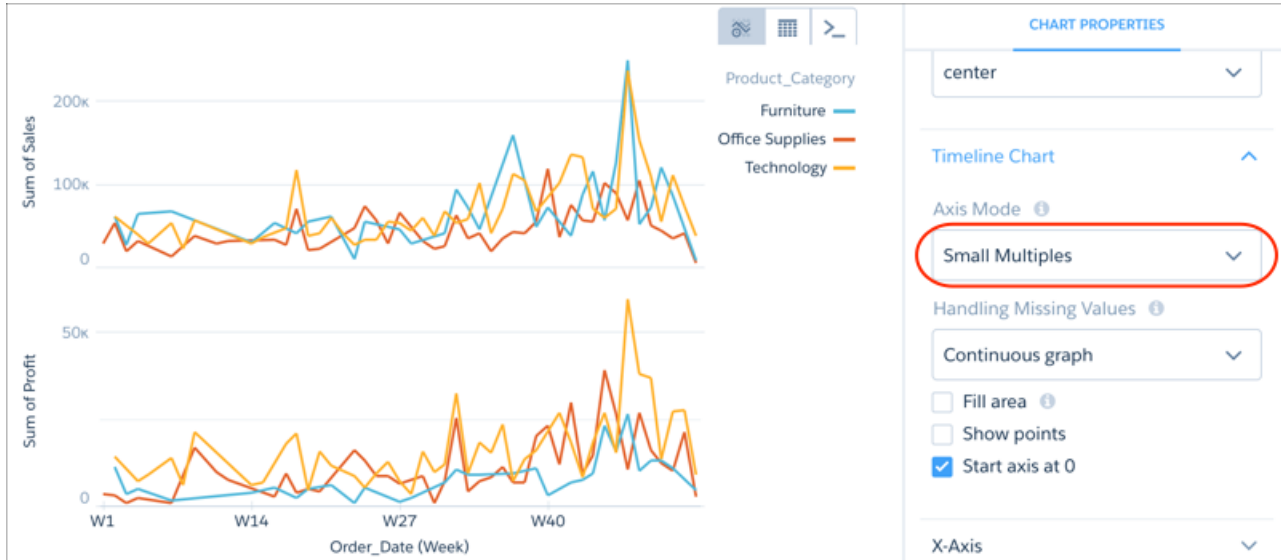


Small Multiples

Charts that can display multiple measures are sometimes hard to read.

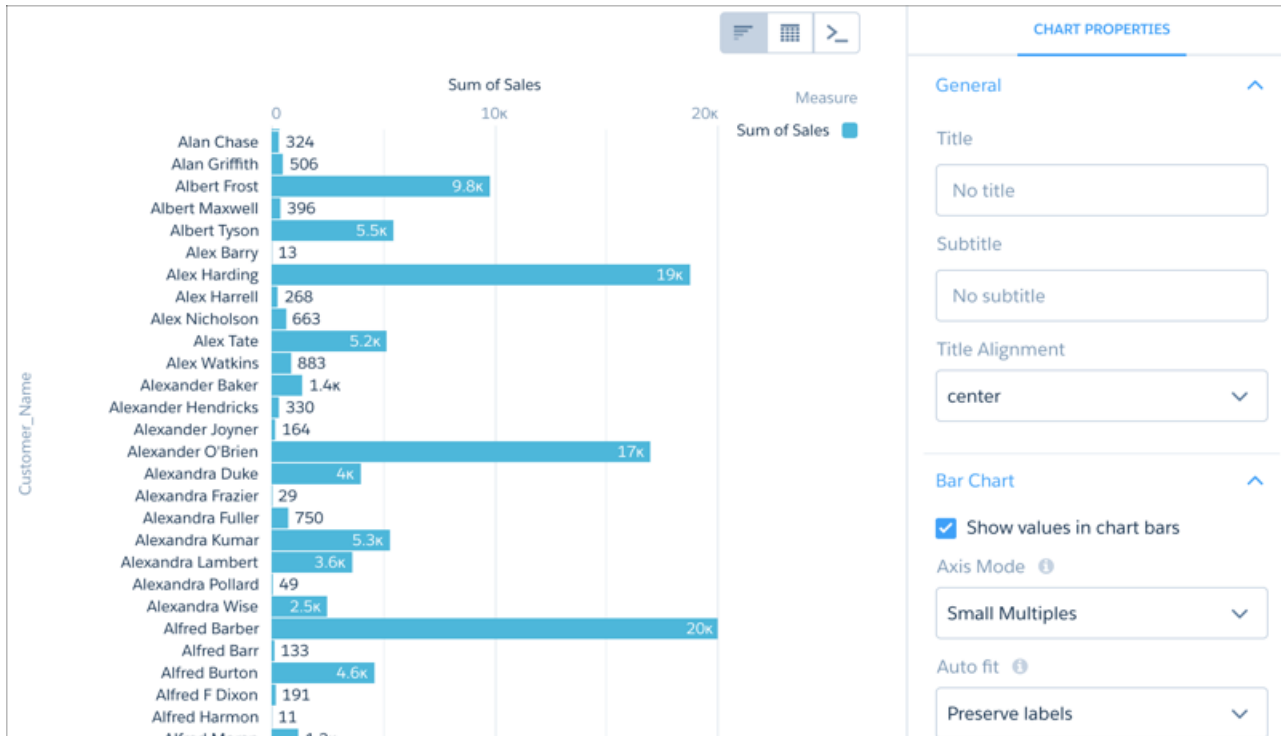


Select **Small Multiples** from Axis Mode to separate the measures and make the chart easier to understand.



Color Bins for Values

A chart that shows a great variation in values can make it difficult to visually categorize values. In this chart, for example, categorizing customer accounts by sales amounts is a challenge because there's a large range of values.



One approach is to sort the values so they can be visually scanned from one end of the value range to the other. But you can also create precise categories by specifying color bins for value ranges. To do so, click **Bin Values**, then enter values for the following fields:

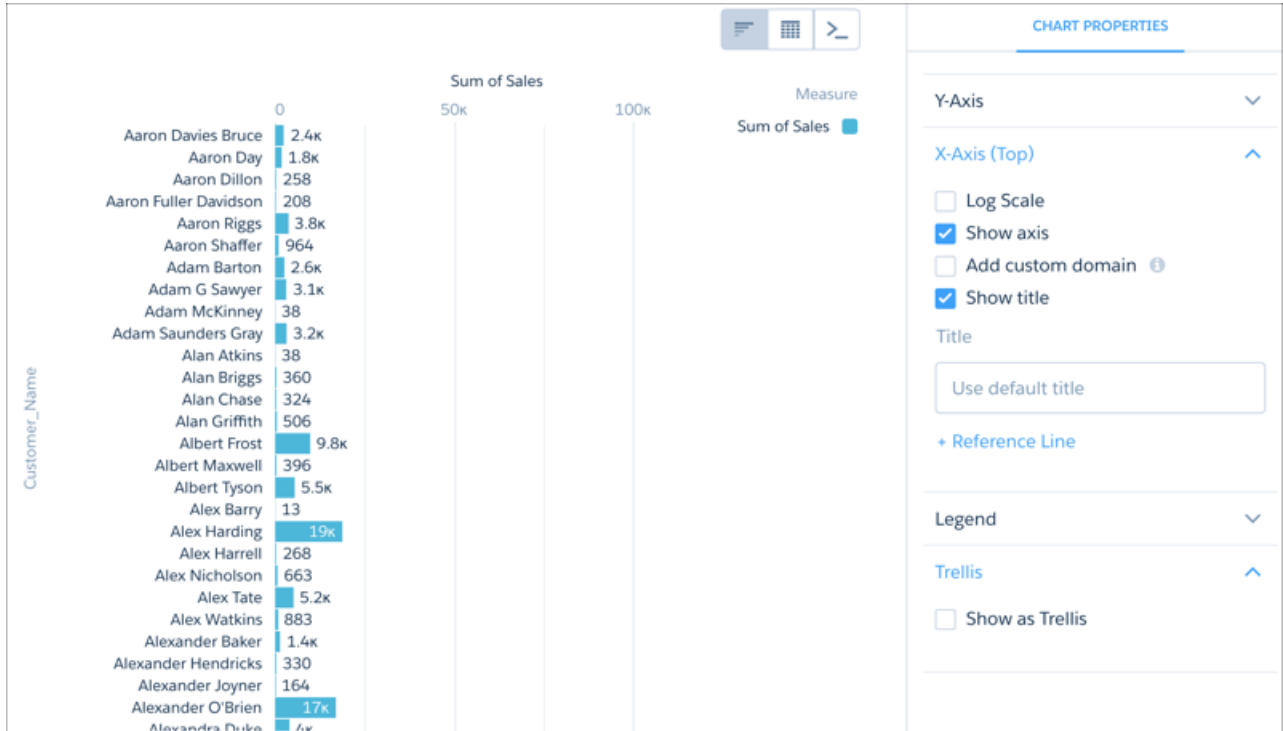
- Low Value – Values in the chart below this value have the Low Range color.

- High Value – Values in the chart above this value have the High Range color.
- Low Range – Legend label and color for the low range.
- Mid Range – Legend label and color for the middle range. The middle range is between the low value and the high value.
- High Range – Legend label and color for the high range.

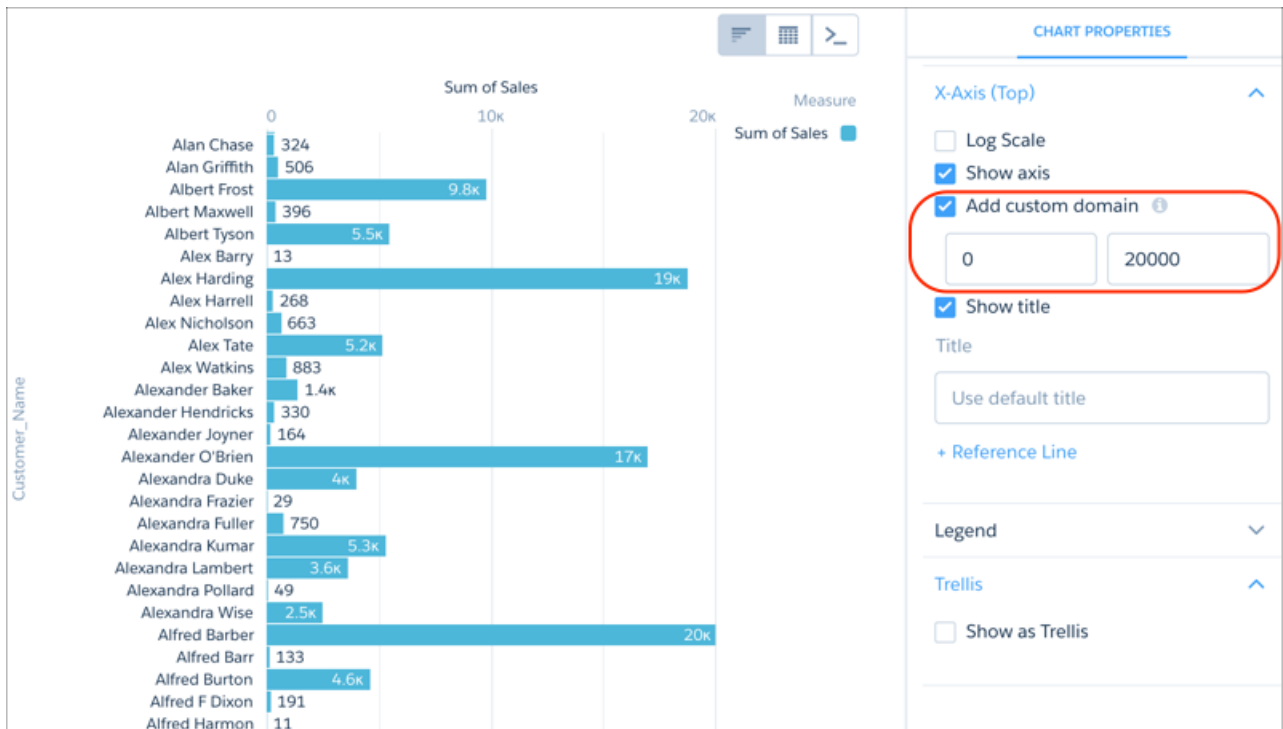


Custom Domain

If the domain on the chart is too large, chart elements can be difficult to view, like the bars in this chart.

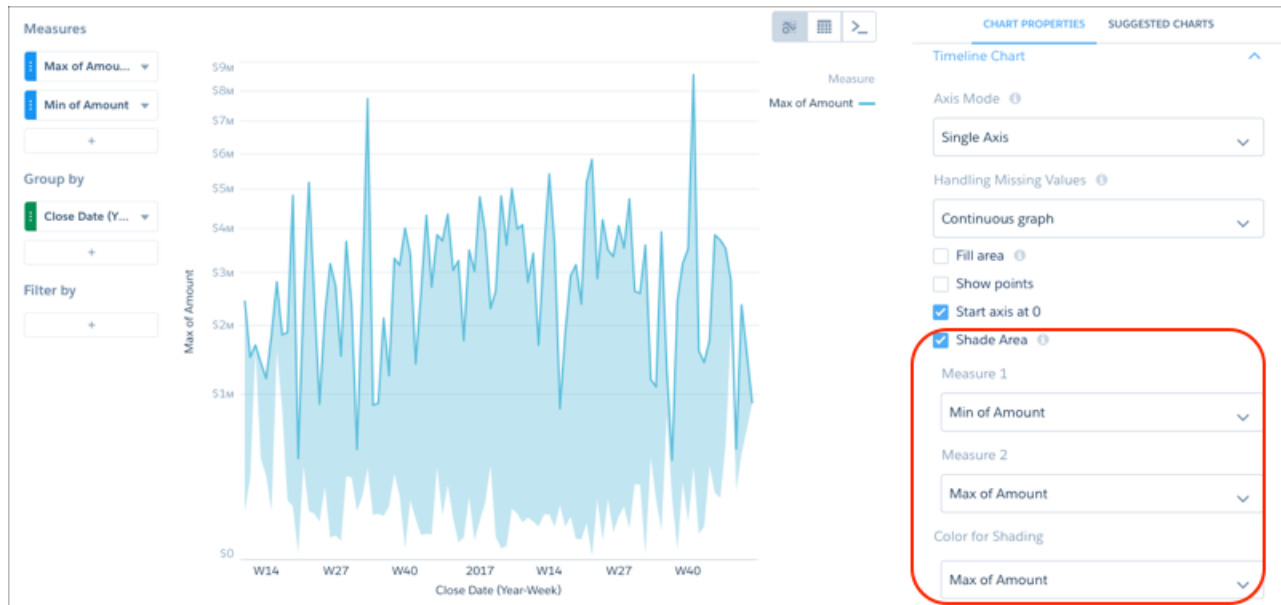


Set a custom domain to restrict the view to values that bring smaller values into view. Click **Add custom domain**, then set the domain's bounds by entering minimum and maximum values.



Fill the Area Between Lines

You can shade the area between lines in line and timeline charts to accentuate the spread between 2 measures. To show the spread between minimum and maximum values of closed opportunities in a timeline chart, for example, click **Shade Area**. Then choose the measures from the **Measure 1** and **Measure 2** menus, and pick a color for the shading from **Color for Shading**.



To focus on the shading, and not the lines, the chart hides the lines and legend for measures specified in **Measure 1** and **Measure 2**, unless you select them in the **Color of Shading** field.

Note: The colors of the measures are based on the theme in the legend. The measure colors can change when you select the shade color or if lines are removed from the chart.

Use Dashed Lines for Effect

To differentiate a measure in a line or timeline chart, use a dashed line. To contrast the line representing the average between the minimum and maximum values of closed opportunities in a timeline chart, for example, click **Use Dashed Lines**, then choose the measure for the average from the multiselect menu below it.



To make other measure lines dashed instead of solid, select them from the same menu.

Add Multiple Reference Lines to Charts

You can use any number of reference lines to mark up a chart, such as when you indicate points of reference on a timeline before and after a predictive line.

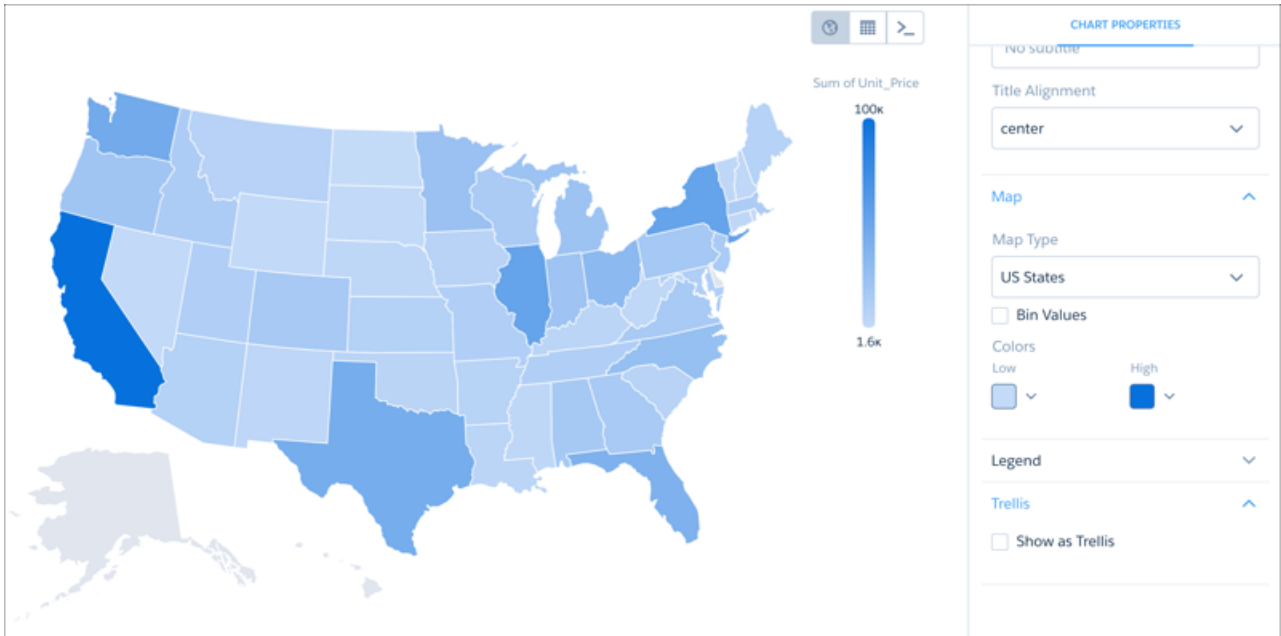


SEE ALSO:

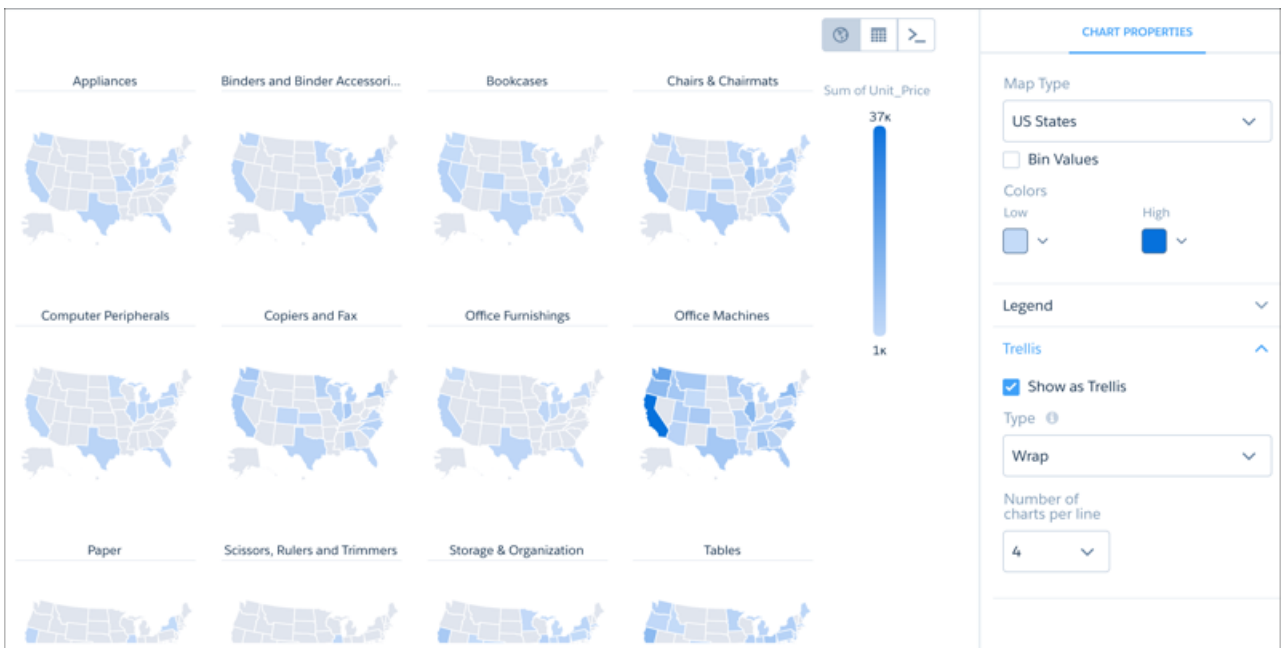
[Widget Properties for Analytics Dashboards](#)

Trellis Views

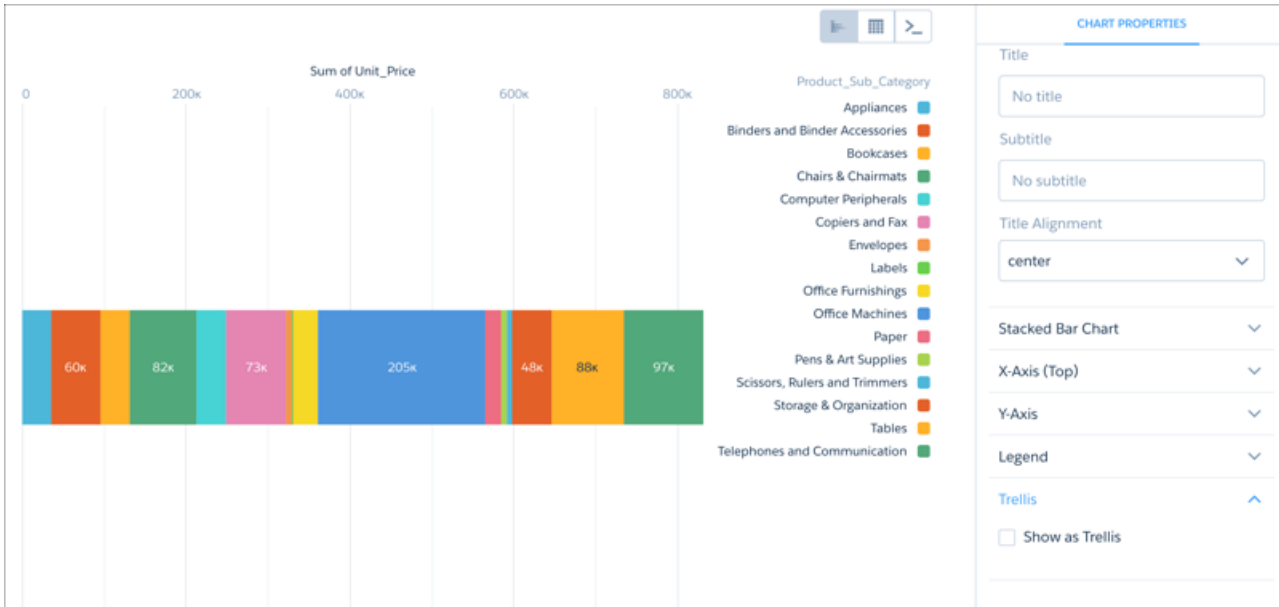
Using a trellis view with charts let's you visualize more information in chart types that are normally limited in a non-trellis view. Regular map charts, for example, can display 1 grouping. This map of the United States shows a sum grouped by state.



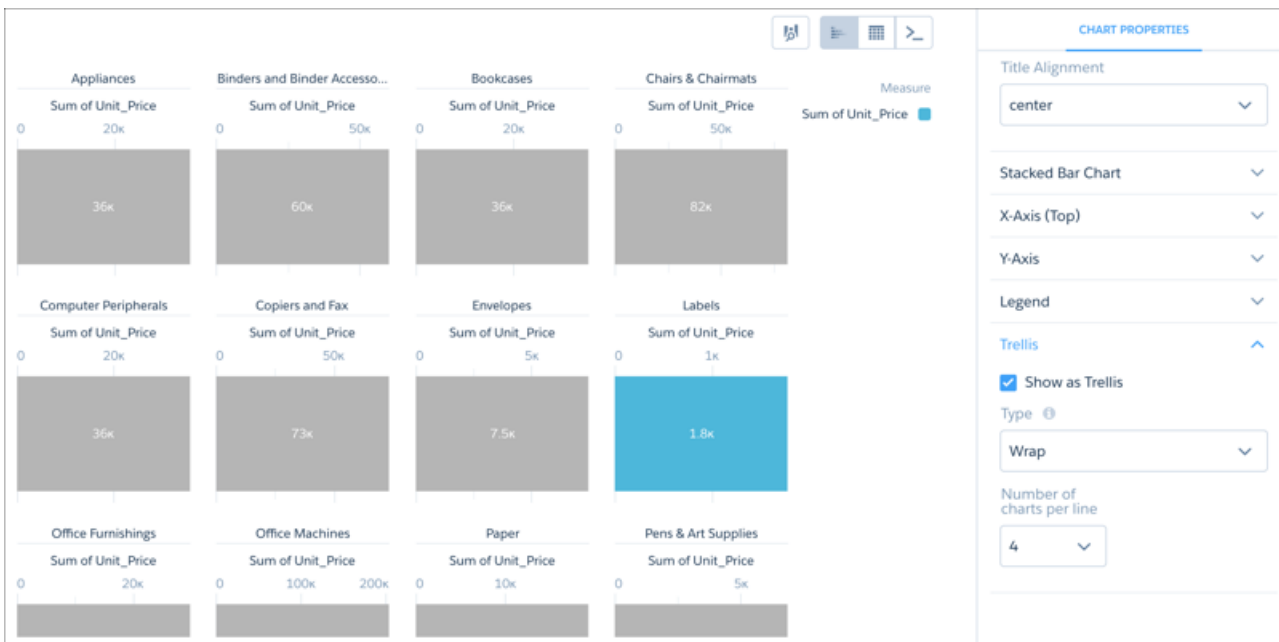
In trellis view, more groupings can be added. This trellis of maps of the United States shows a sum grouped by states *and* by product type.



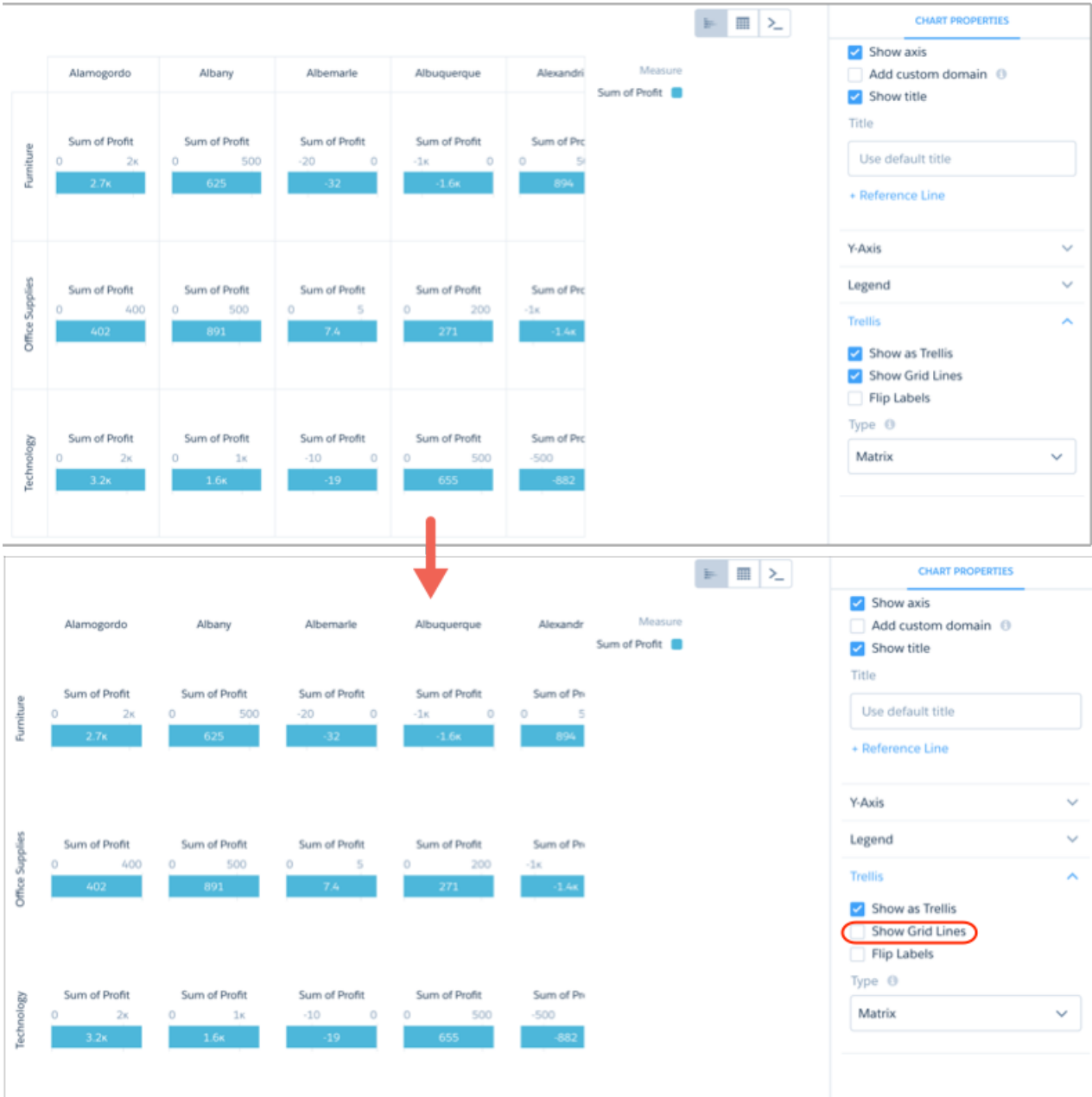
Trellis view can also be used to visualize values that may otherwise be difficult to see in a chart. For example, some of the values shown by this stacked bar chart are difficult to pick out.



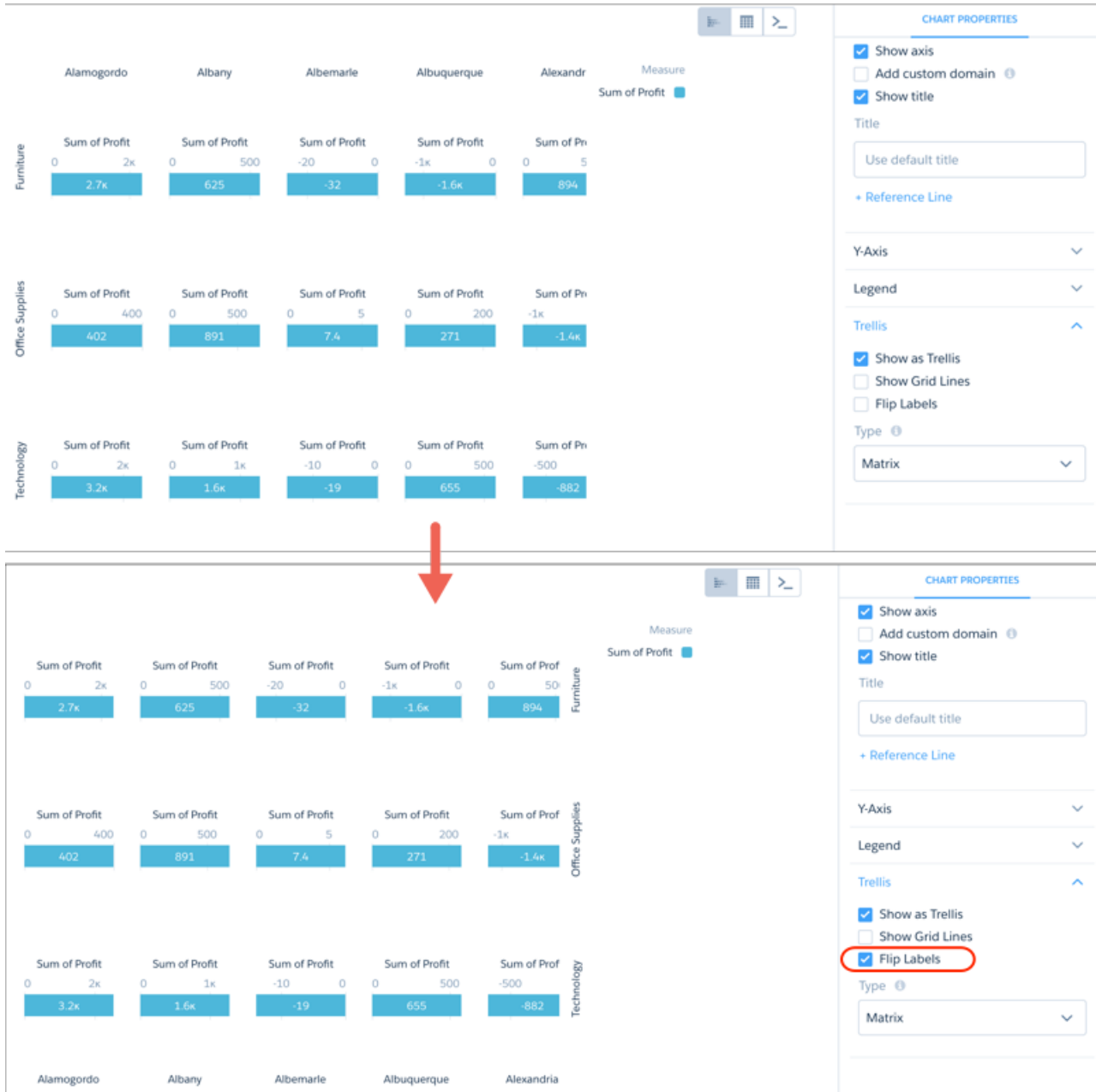
By using trellis view, you can separate the values so that smaller values can be picked out more easily.



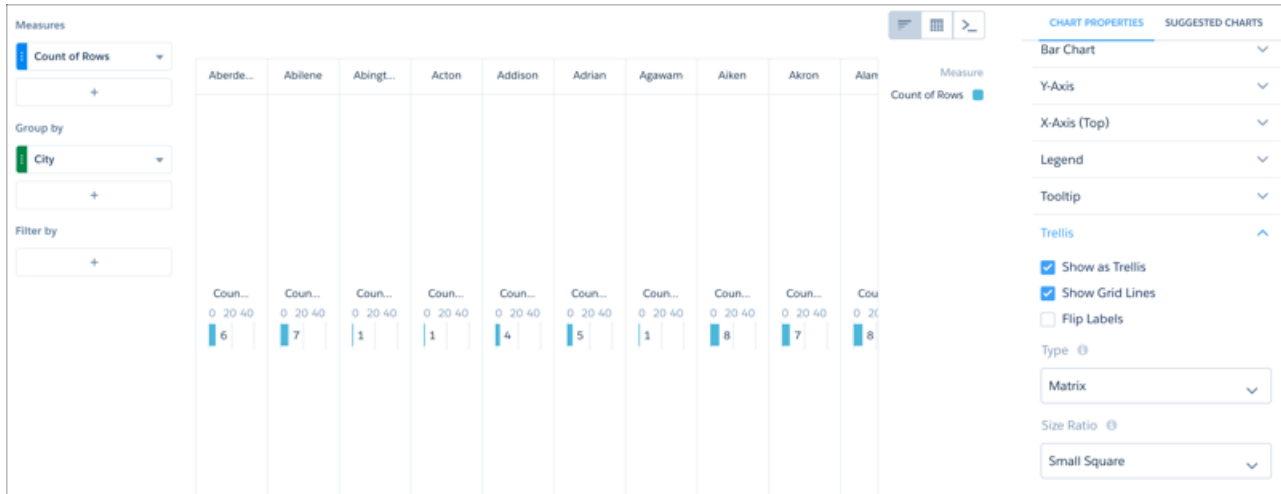
In any trellis view except for Wrap, you can remove the grid lines.



You can also move the labels to the other side of the chart.



Visualizing a large number of charts in a trellis can create a view that is difficult to read.



Adjust the matrix type and the size ratio to create a trellised chart that is easier to view and understand.



Add Icons to Analytics Charts

Bar charts (but not stacked bars), dot-plot charts, and line charts can have icons along with dimension values as labels. Polar gauge charts can include icons in their centers.

To add icons to a chart, use a dataset with an ungrouped URL dimension whose values are URLs to the icon images. For example, each row in the following dataset has a URL that points to a flag image stored in your org:

```
Country, Country_code, Region, flag_img_url, Accounts, Value
Australia, aus, South Pacific, https://myorg.content.force.com/file-asset/flagaustaliapng, 1898, 22930651
China, chn, East Asia, https://myorg.content.force.com/file-asset/flagchinapng, 2051, 29754009
```

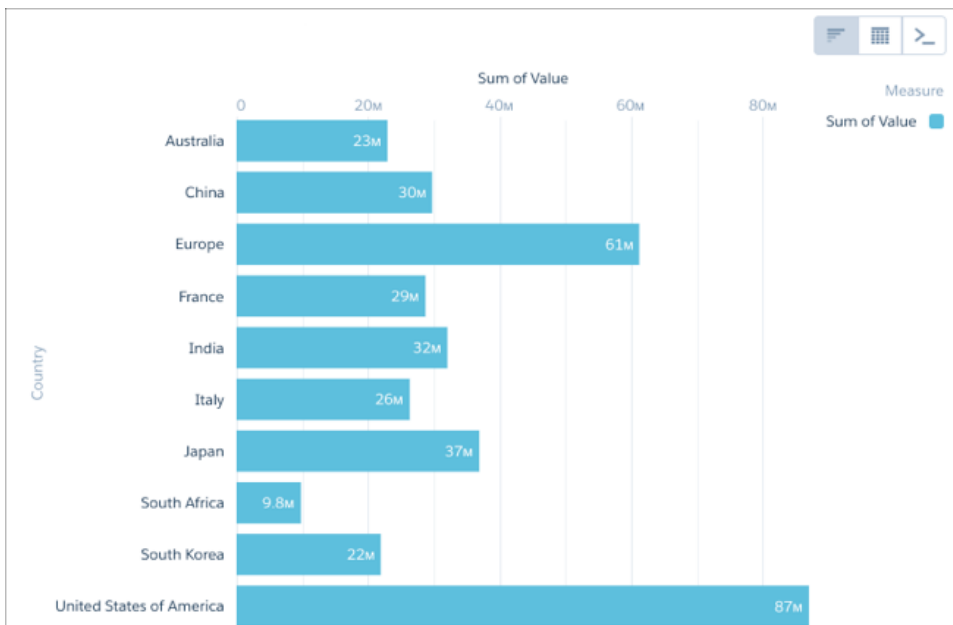
```

Europe,eur,Europe,https://myorg.content.force.com/file-asset/flageuropepng,4668,61238042
France,fra,Europe,https://myorg.content.force.com/file-asset/flagfrancepng,2303,28746829
India,ind,Asia,https://myorg.content.force.com/file-asset/flagindiapng,2721,32037499
Italy,ita,Europe,https://myorg.content.force.com/file-asset/flagitalypng,1722,26340986
Japan,jpn,East Asia,https://myorg.content.force.com/file-asset/flagjapanpng,2872,36916012
Russian Federation,rus,East
Europe,https://myorg.content.force.com/file-asset/flagrussiapng,1847,27387456
South
Africa,zaf,Africa,https://myorg.content.force.com/file-asset/flagsouthafricapng,879,9794857
South Korea,kor,East
Asia,https://myorg.content.force.com/file-asset/flagsouthkoreapng,1643,21934785
United States of America,usa,North
America,https://myorg.content.force.com/file-asset/flagusapng,6527,87044191

```

After you upload the dataset to Analytics, explore the dataset using *only one* grouping. Then edit the SAQL query to add the image URLs to the result set.

1. Explore the dataset to visualize the data you want to view in chart mode.



2. Switch to SAQL mode and edit the query using a non-grouping SAQL function such as `first()`.

Query
Run Query

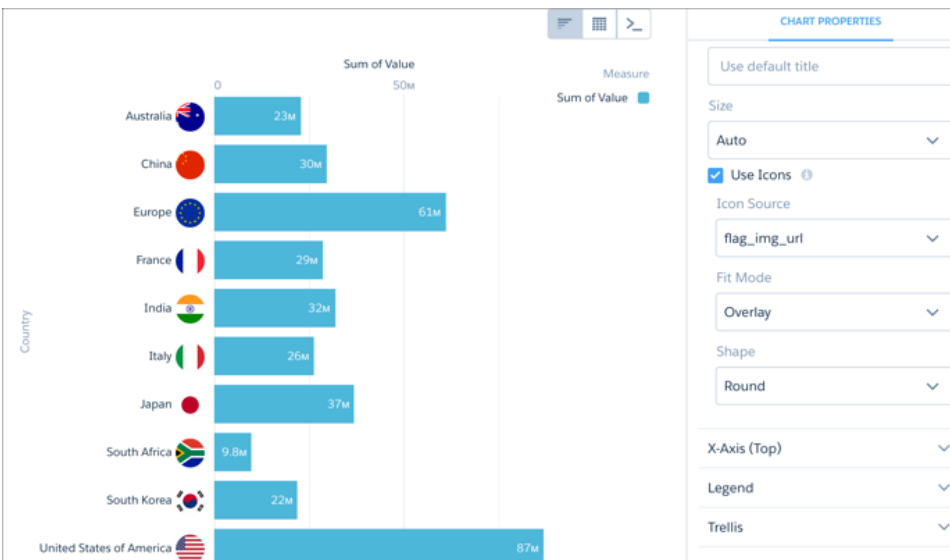
```

1 q = load "worldwide_accounts_overview";
2 q = group q by 'Country';
3 q = foreach q generate 'Country' as 'Country', first('flag_img_url') as 'flag_img_url', sum('Value') as 'sum_Value';
4 q = order q by 'Country' asc;
5 q = limit q 2000;
        
```

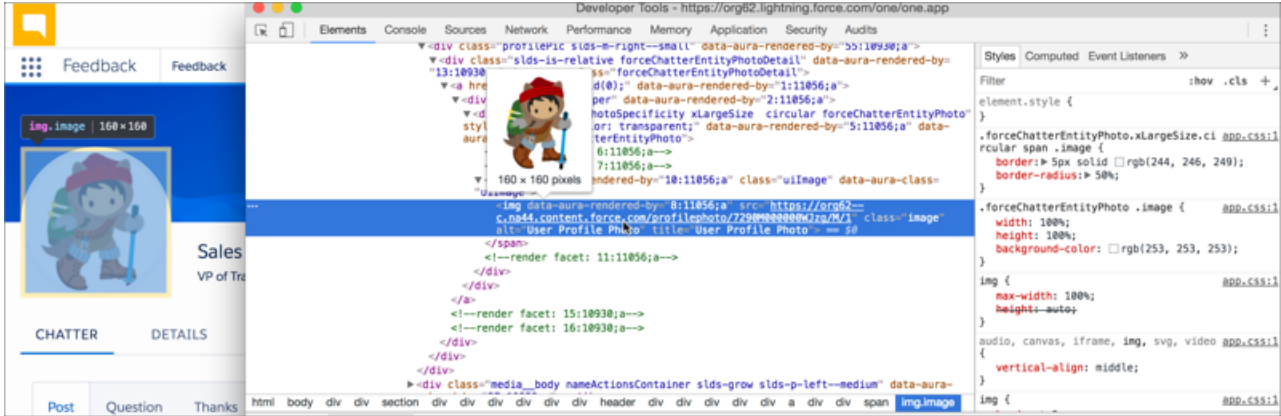
COUNTRY	FLAG_IMG_URL	SUM OF VALUE
Australia	https://gus-c.gus.content.force.com/file...	22,930,651
China	https://gus-c.gus.content.force.com/file...	29,754,009
Europe	https://gus-c.gus.content.force.com/file...	61,238,042
France	https://gus-c.gus.content.force.com/file...	28,746,829
India	https://gus-c.gus.content.force.com/file...	32,037,499

3. Return to chart mode, then click the gear menu to open the chart properties.
4. Click **Use Icons**, then select the name of the dimension containing the icon URLs from the **Icon Source** menu. Use the **Fit Mode** and **Shape** menus to adjust the icons' appearance.

Note: The **Use Icons** menu contains the name of every non-grouped dimension used in your query, even if these dimensions do not contain image URLs.



To use Chatter profile images, use your browser's development tools to find the image's underlying URL.



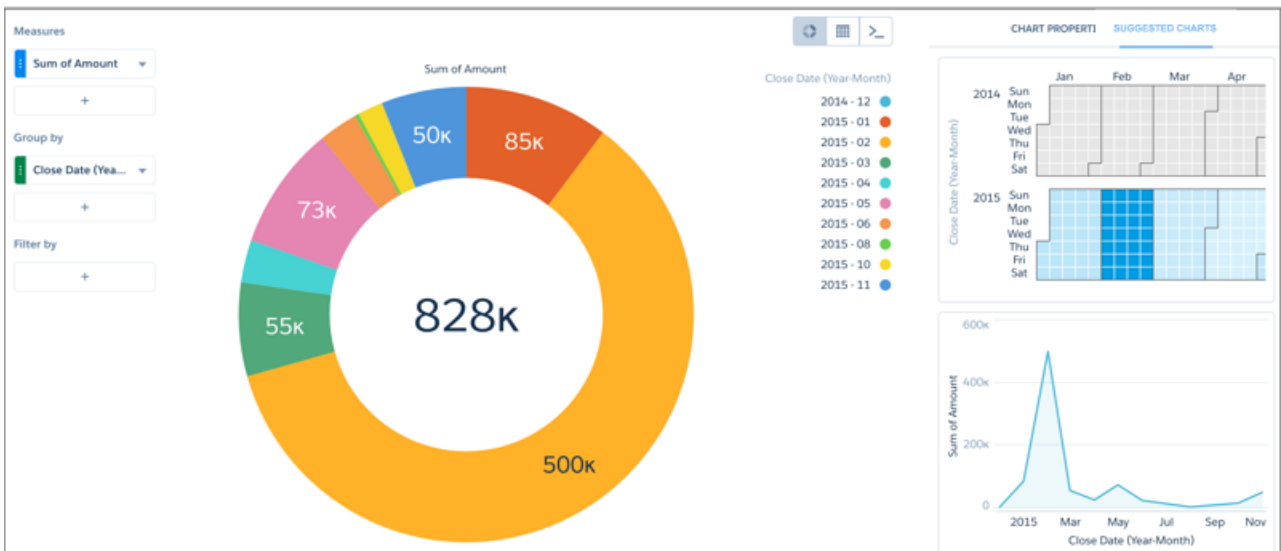
Once you've collected the URLs, add them to a column in your dataset before uploading the dataset to Analytics.

```
name,url_src,num_accts,value_accts,territory
astro,https://org62--c.na44.content.force.com/profilephoto/7290M00000WJzg/M/1,829,1309742,North America
...
```

Chart Suggestions

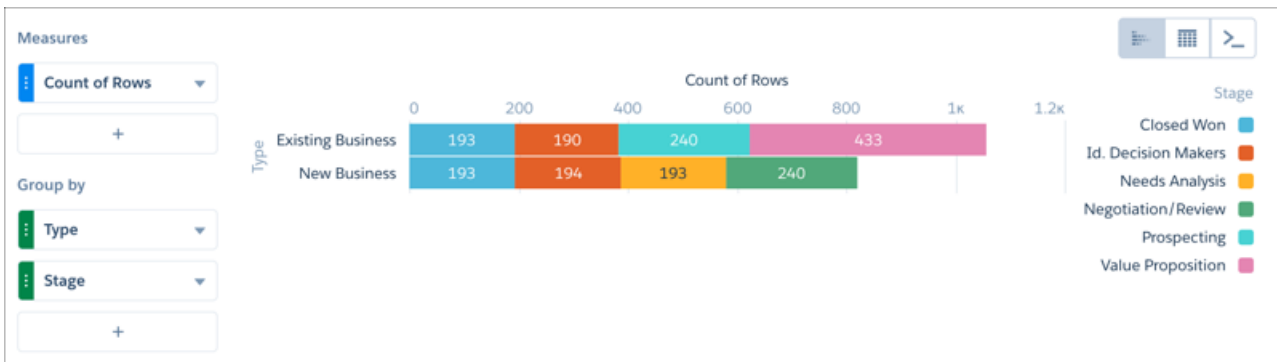
Using a sophisticated algorithm that analyzes your lens's composition, explorer suggests chart types that can better communicate the essential message your data is communicating.

To view suggested charts, click the gear menu in chart mode, then click **Suggested Charts**.



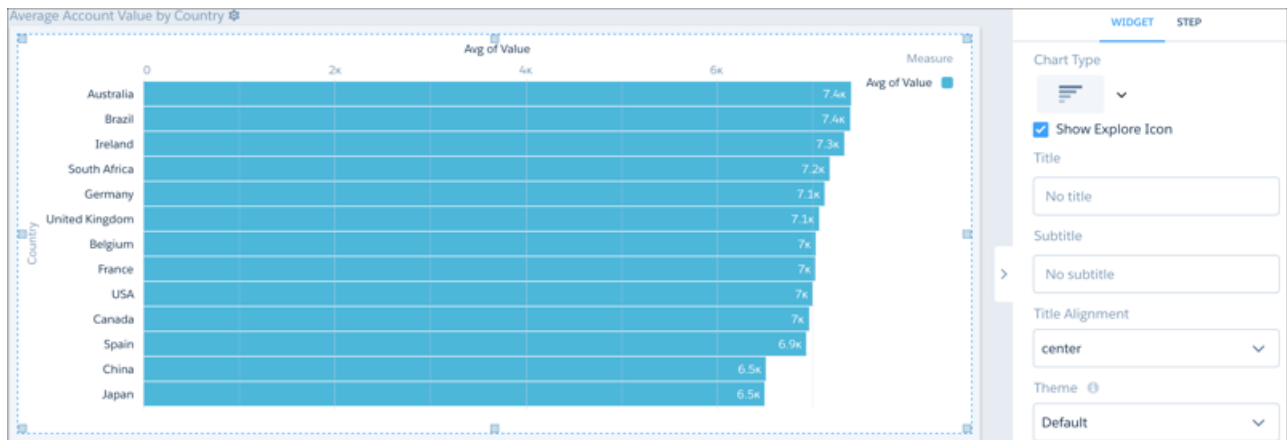
Bar Charts

Use a bar chart to provide a quick visual comparison of related values. Use a stacked bar chart to show groups within each bar.

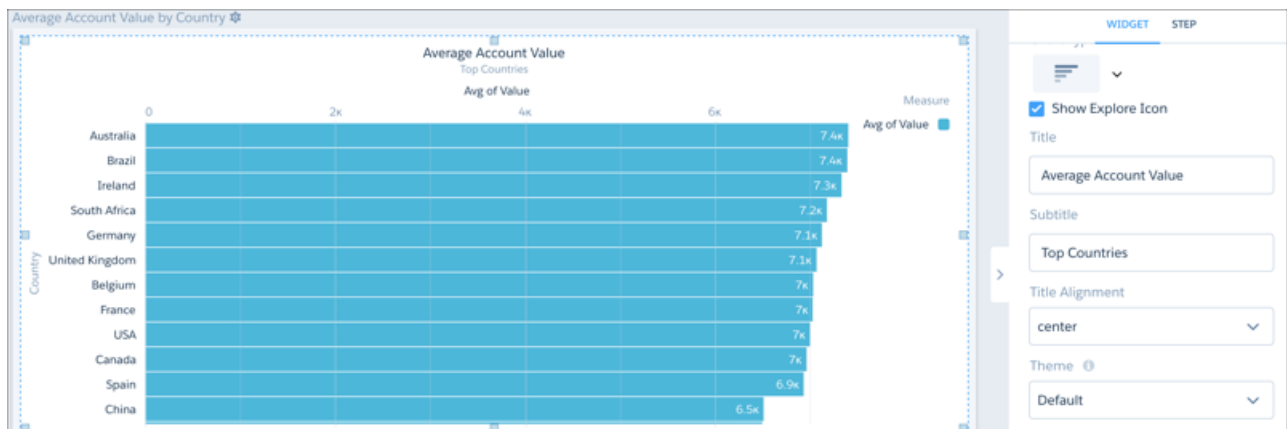


Optimize the Fit of a Horizontal Bar Chart

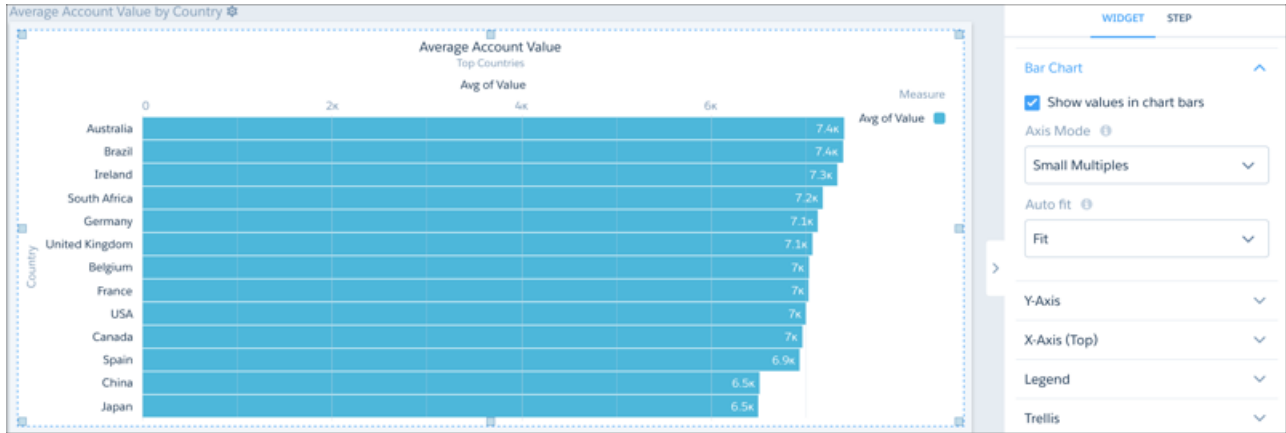
Using the auto-fit feature, you can fit a bar chart into a crowded dashboard without the necessity of long scroll bars or loss of information. You create a lens with a bar chart showing a list of top countries, then clip it to a dashboard you are building.



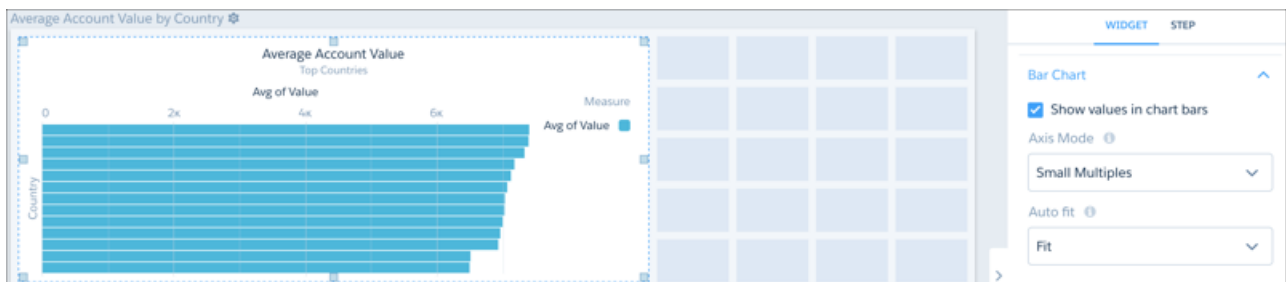
But after you add a title and subtitle, the lower bars drop out of view.



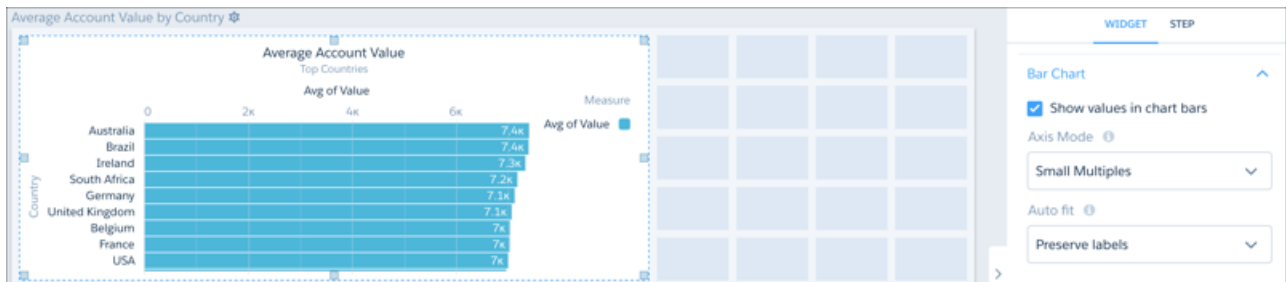
To bring all the bars back into view, choose **Fit** from **Auto fit**.



If you resize the bar chart while arranging the dashboard, you could lose the labels.

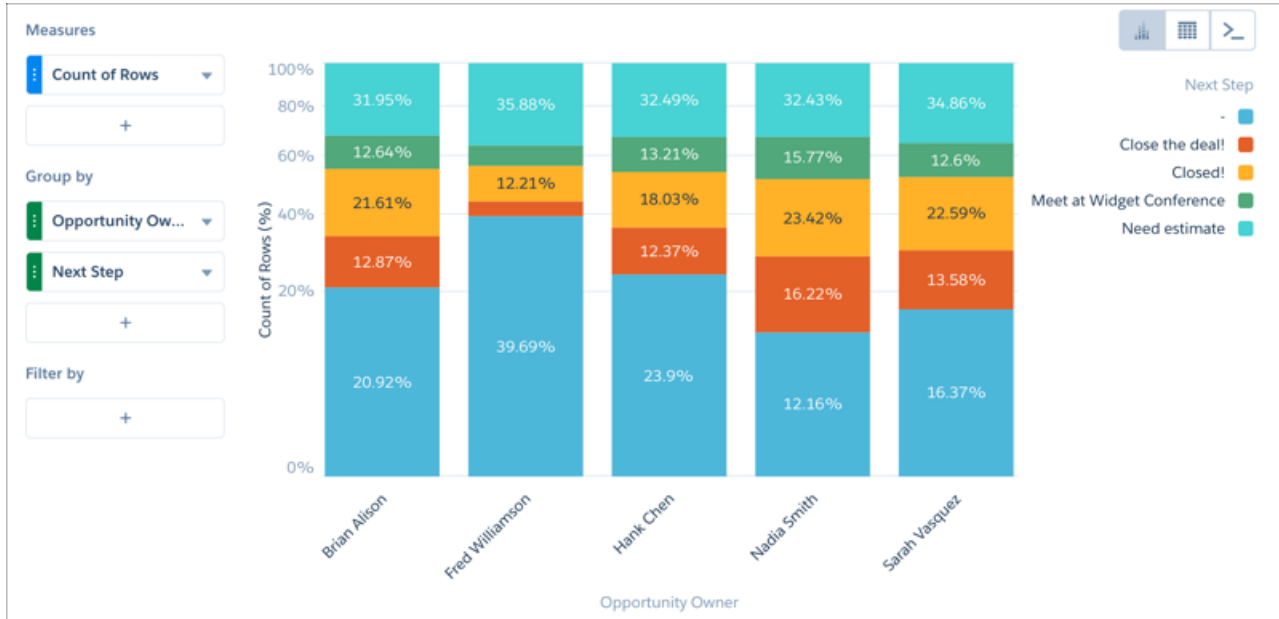


To restore the labels, choose **Preserve labels** from **Auto fit**.



Column Charts

Use a column chart (also called vertical bar chart) to show relative counts of things, such as leads or dollars. Use a stacked column chart to show groups within each bar.



Combo Charts

Use a combo chart to display two related series of data, such as discrete grouped values as vertical bars overlaid with a line chart representing an average value.

Calendar Heat Map Charts

Calendar heat maps are useful for visualizing recurring discrete activities, such as closing accounts, over long periods of time. In this chart, you can easily change the granularity of the time-based grouping, such as from month to week or day.

To use a calendar heat map, set a measure and group by a date dimension.



Donut Charts

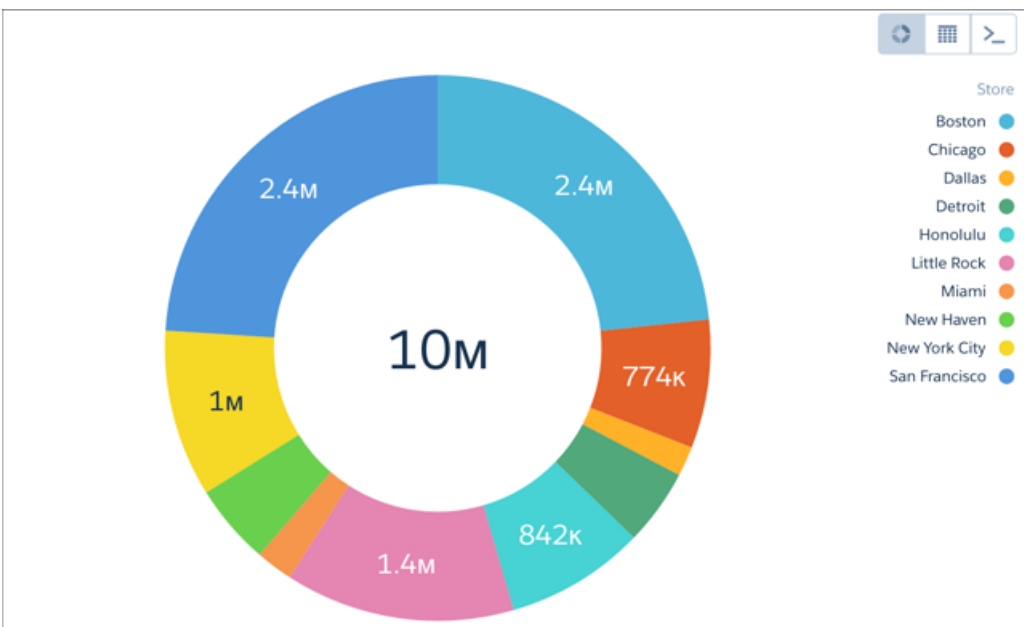
Use a donut chart when you have a grouping and want to show not only the proportion of a single value for each group member against the total, but also the total amount itself. If you remove the donut's center by selecting **0%** from the **Center Size** menu, this visualization is commonly referred to as a pie chart.

Create a Donut Chart

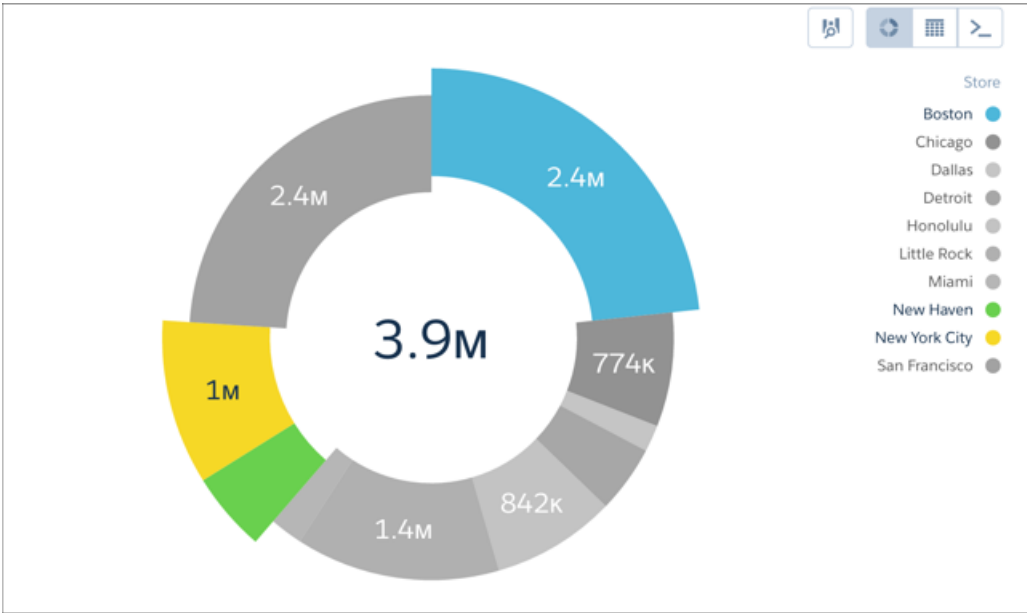
Donut charts are useful visualizations when the dimension grouping has a small enough number of values to make it readable.

For example, showing income using store data that covers a limited number of locations can be visualized effectively using a donut chart.

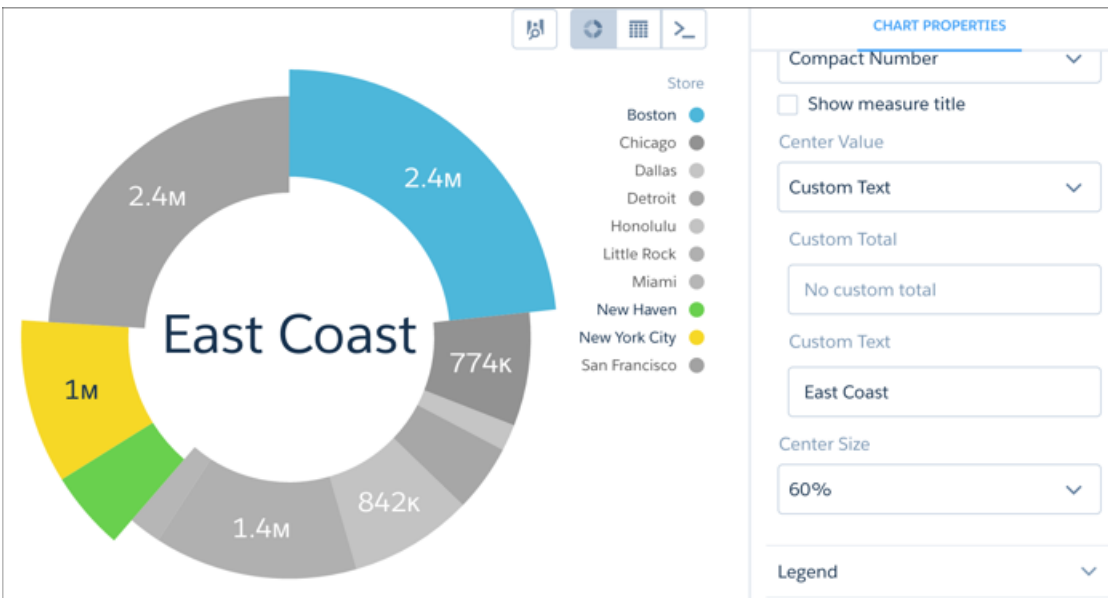
1. In Analytics, create a lens by exploring your store dataset.
2. In the Group by panel, group the data by city.
3. In the Measures panel, change Count of Rows to a measure that shows receipts.
4. Select **Donut** from the chart menu.



5. Click individual slices to highlight them.
The total in the center changes to reflect the total of the selected slices.



- Open the gear menu, select **Custom Text** from the Center Value menu, then enter custom text in the Custom Text field.



Dot Plot Charts

Horizontal and vertical dot plots use the size and coloring of bubbles to display multiple dimensions and measures. Use dot plots to visualize related data to compare performance or locate unusual values.

A dot plot chart can have up to two measures and four groupings. The measures and groupings are visualized in different ways, depending on their sorted position.



In a horizontal dot plot, bubbles are plotted along the x-axis to indicate their first-measure value (1). The first measure is used in the x-axis domain, but in a vertical dot plot, it would be used as the y-axis range. Bubble diameter indicates the value of the second measure, with a legend to the right of the chart (2). All groupings except for the last are used as dimension columns, grouped in the order they are sorted (3). These groupings form the chart's rows. Color represents the final grouping, with a legend to the right of the chart (4).
 If a dot plot has only one grouping, that grouping is displayed as a dimension column.



Funnel Charts

Use a funnel chart to visualize sequential data that can be broken up into stages, such as a sales cycle.

Gauge Charts

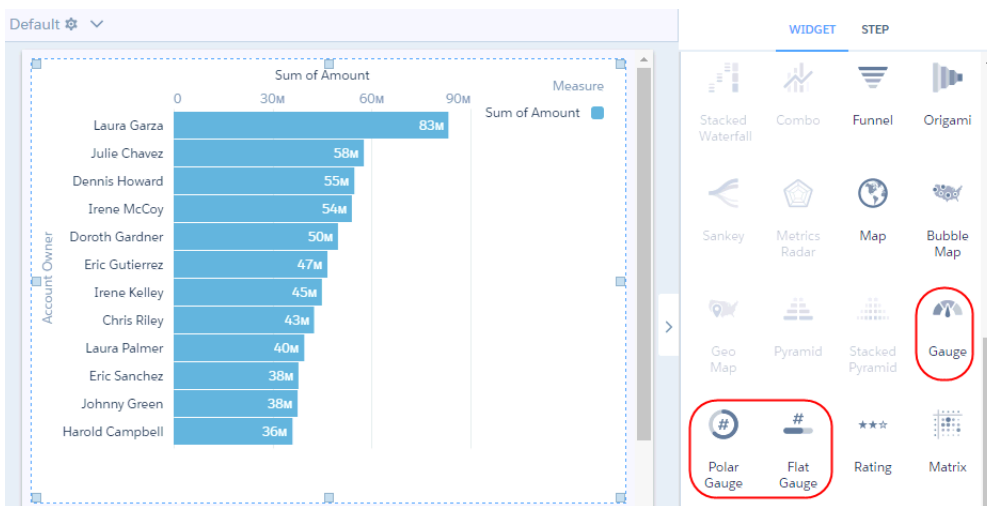
Use gauge charts to track progress along a single measure, such as how much revenue has been realized versus the target.

Create a Gauge Chart

If you've set goals for, as an example, average value for each account manager, gauge charts are a good choice for showing how close you are to that goal.

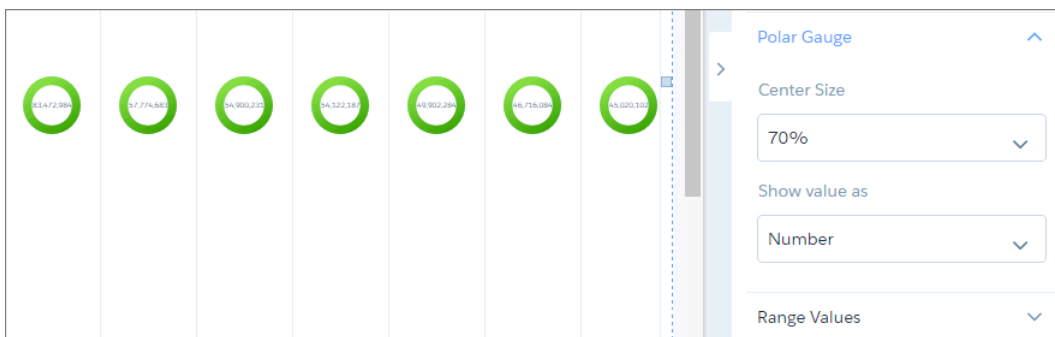
You've got a dataset with account information. Now you want to present it in a chart that shows how close each account is in reaching the associated goal. Each gauge chart can display 1 value per account manager, and highlight value ranges.

1. In Analytics, create a lens using the accounts dataset, sort the results in descending order, and then clip it to Wave dashboard designer.

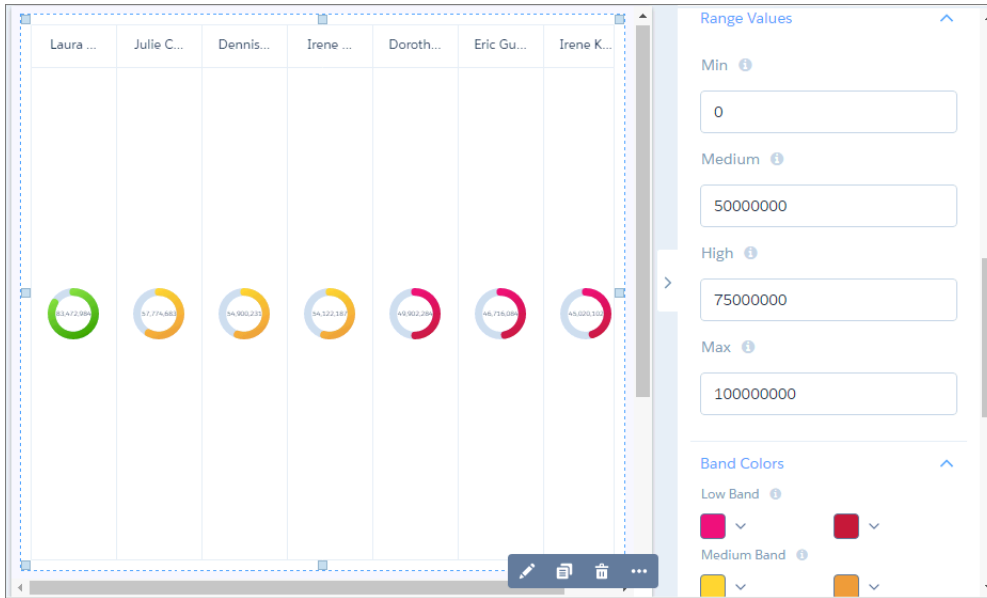


2. Change the chart type to **Polar Gauge** (round).
A gauge (angular) and flat gauge (linear) are also available.

3. Adjust the size of the center and set the number style.

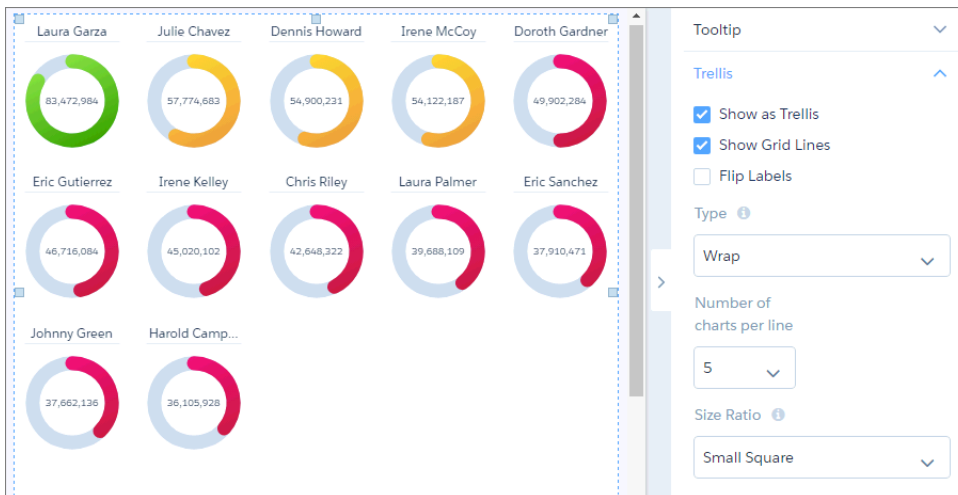


4. Set the breakpoint values and associated band colors.



The breakpoints set the range values where the color bands transition. The maximum is \$100 million, which is the goal. Account managers are in the green if they hit at least \$75 million. They're in the yellow if they hit between \$50 and \$75 million. Otherwise, they're in the red.

- Set the **Trellis** type to **Wrap** so the charts are easier to view all at once without having to scroll.



The color-band configuration makes it easy to spot which managers are performing well and which can use some help. It's also easy to see how close they are relative to hitting their goal.

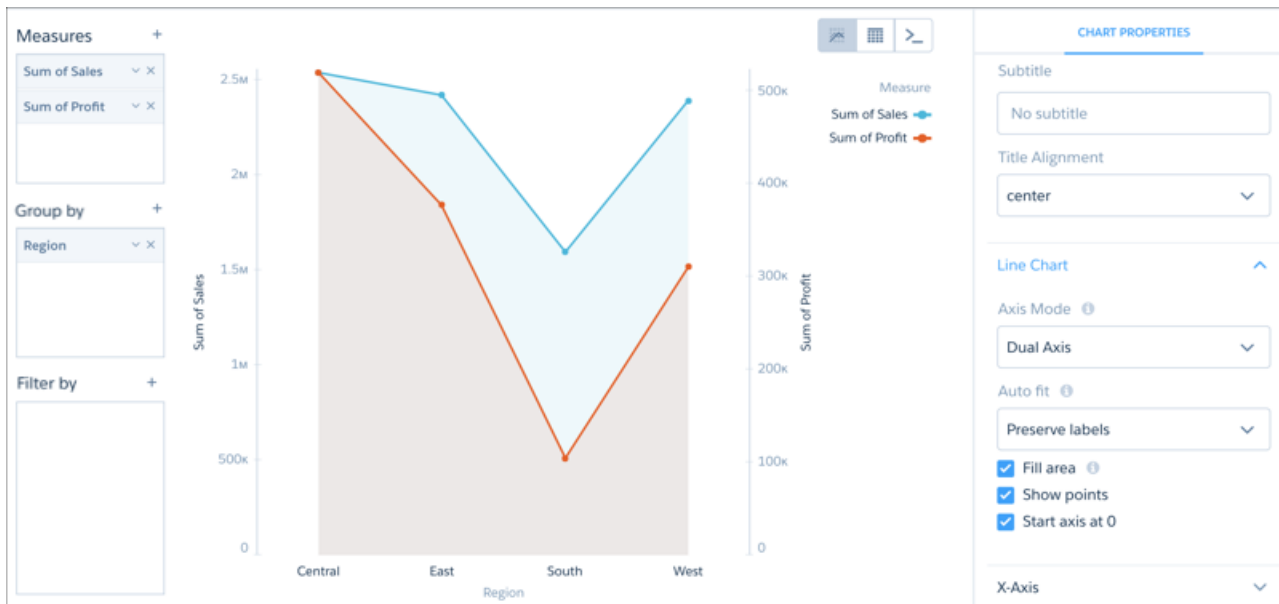
Heat Maps

Use a heatmap to visually enhance high and low-value data when there's a single measure and multiple dimensions.

Line Charts

Use a line chart when you have one important grouping representing an ordered set of data and one or more values to show.

Line charts are useful for comparing the value of measures, such as sales and profit totals, over a series of categories (grouped dimensions) such as sales territories.



Map Charts

Use a map if you have data with a geographical component that can shade areas in proportion to mapped values, allowing for visual pop-out of high-value areas. The map chart is found in the Wave dashboard designer and classic designer.

Data for map charts must contain geographical names corresponding to the geographical entities represented on the map. Analytics map charts are not case-sensitive, but specific codes or names for geographical entities such as US states and world countries are expected.

For maps of the USA, each row of data must contain a single field identifying the state by its two-letter postal code (recommended) or its full common name. A row with data linked to the state of California, for example, must have an identifying field with "CA" or "California", but not "Calif".

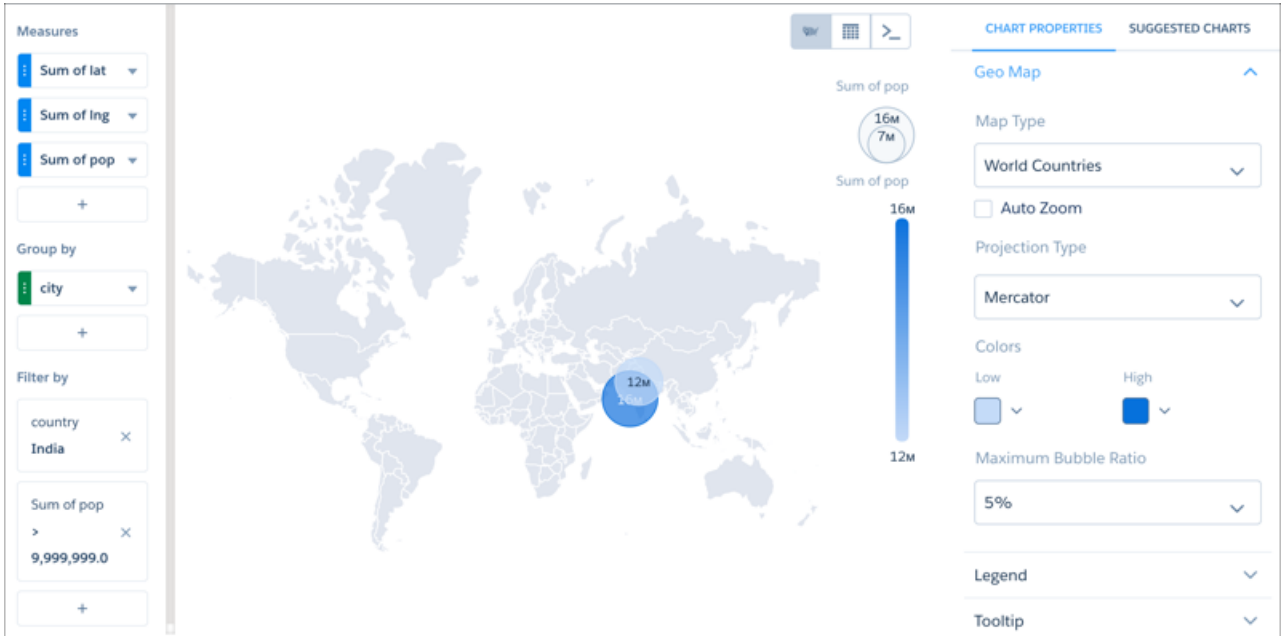
For global maps, the identifying country names must follow ISO 3166-1 (alpha 3) three-letter code (recommended) or be spelled out using the country names set by ISO 3166-1 (alpha 3). A row with data linked to the United Kingdom, for example, must have an identifying field with "GBR" or "United Kingdom", but not "Great Britain".

Properties of Maps

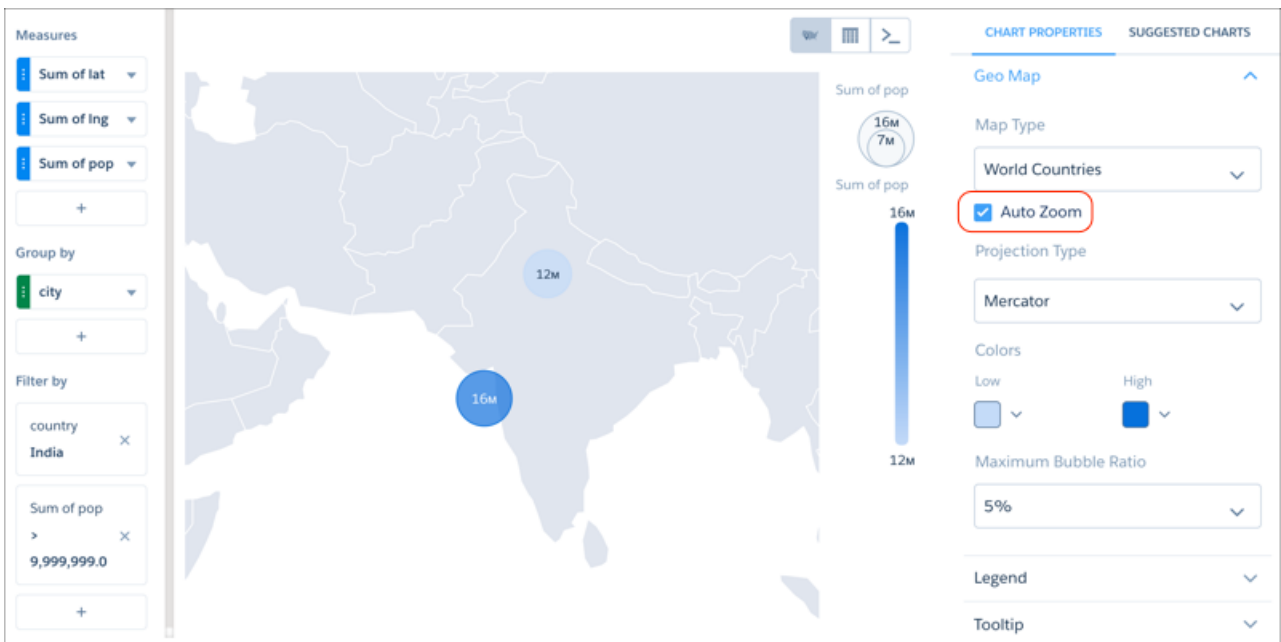
The map chart is configured with the properties in the Wave dashboard designer. These properties have equivalent JSON properties.

Configure Maps to Auto-Zoom on Selected Areas

When you select datapoints in a particular geographical area of your map chart, the data in that area is highlighted.



With auto-zoom, the map chart both highlights the data and zooms in the geographical area.

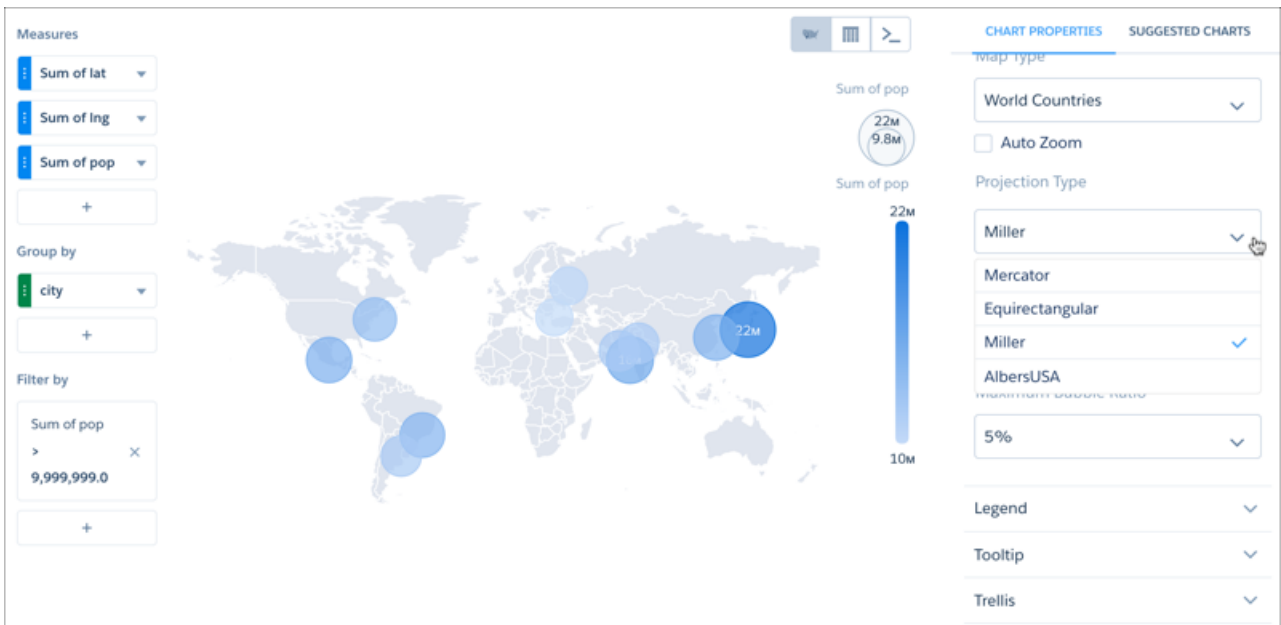


Any filtering that occurs on the visualized data can trigger auto-zoom, including faceting in dashboards, allowing you to create dynamic maps.



Set the Map Projection Type for Map Charts

A map projection is a method for representing shapes from the curved surface of the Earth (or any other curved surface) using shapes on a flat surface. Some map projection types preserve the accuracy of shape outlines while sacrificing the correct representations of area sizes, while others preserve relative size but distort the outlines. You can apply the projection of your choice using the Projection Type menu.



JSON Representation Map Chart

This is an example map JSON with a United States map.

```
{
  "visualizationType": "choropleth",
  "step": "step_newmap",
  "map": "US States",
  "legend": {
    "show": false,
    "inside": false,
    "showHeader": true,
    "position": "right-top"
  },
  "title": {
    "label": "",
    "subtitleLabel": "",
    "align": "center"
  },
  "theme": "wave",
  "lowColor": "#C5DBF7",
  "highColor": "#1674D9",
  "trellis": {
    "enable": false,
    "type": "x",
    "chartsPerLine": 4
  }
}
```

Other available values for the `map` property are:

"World Countries", "Americas", "North America", "South America", "Central America", "Caribbean", "Europe", "Eastern Europe", "Northern Europe", "Southern Europe", "Western Europe", "Central Europe", "Scandinavia", "Asia", "South Asia", "South East Asia", "East Asia", "Australasia", "Africa", "East Africa", "Middle Africa", "North Africa", "Southern Africa", "Western Africa", "EMEA", "APAC".

Bubble Map Charts

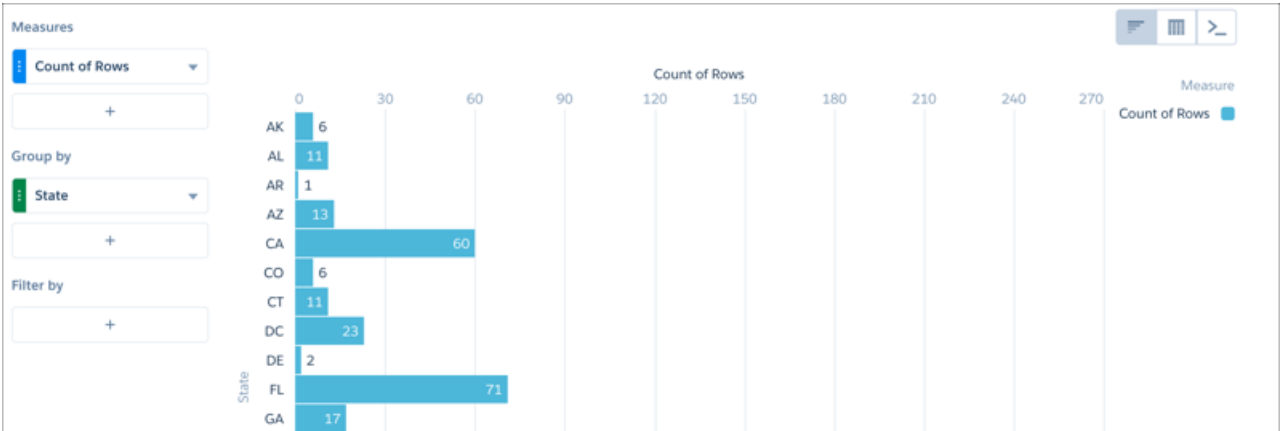
Use a bubble map chart to visually indicate measure values in specified geographical areas.

Create a Bubble Map Chart

Analytics bubble-map charts use the same maps available to map charts, giving you another choice representing measure values on the map.


For example, you can use bubbles instead of color saturation alone to indicate the number of opportunities in the pipeline for each state in the United States.

1. In Analytics, group the data by state, then change the measure.



- Clip the lens to Wave dashboard designer.
- Choose **Bubble Map** from **Chart Type**, then choose **US States** from **Map Type**.

Chart Type

 ▼

Title

Subtitle

Title Alignment

▼

Theme ⓘ

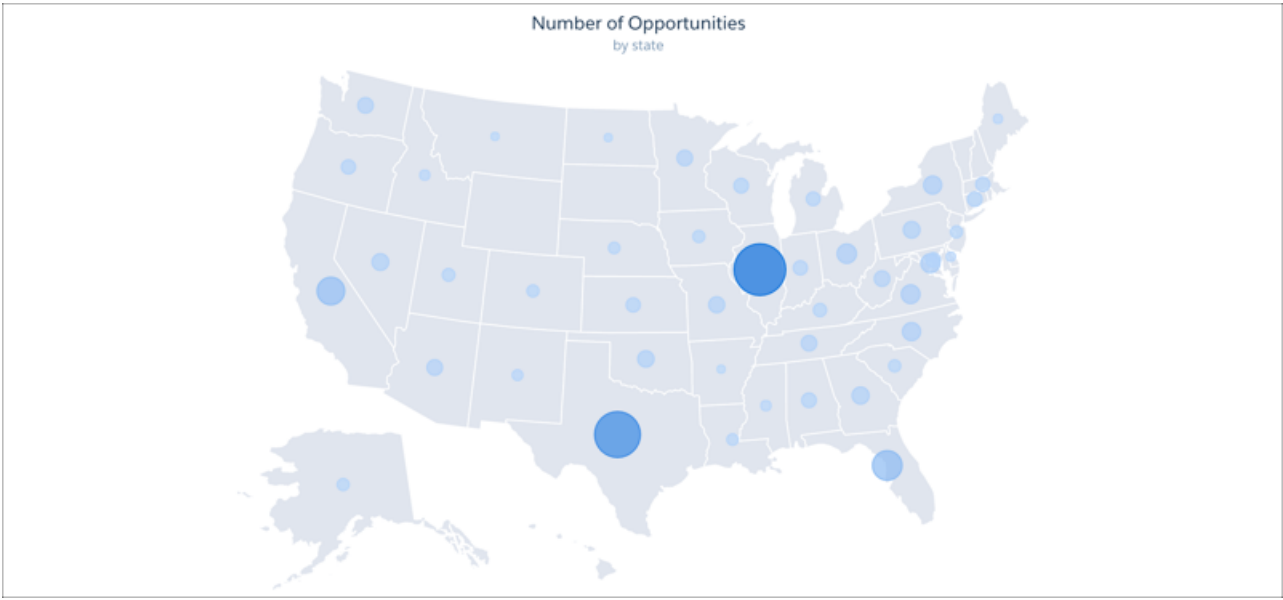
▼

Bubble Map ▲

Map Type

▼

- Enter a title for the chart and make other adjustments as necessary.



Geo Map Charts

Geo maps allow you to visualize data that contains geographical coordinates (latitude and longitude). Using coordinates allows you to place visual data elements more precisely on map charts.

Create a Geo Map Chart

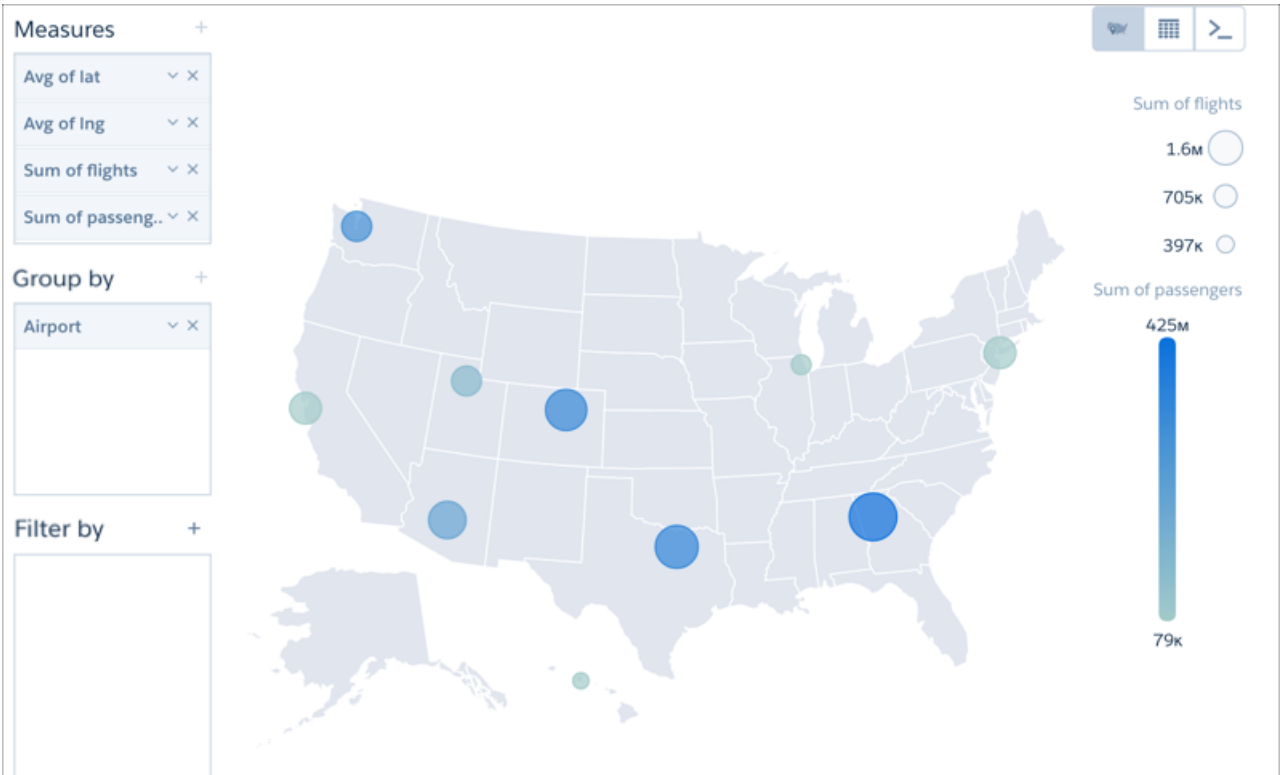
A dataset with geographical location data, such as U.S. states, can be overlaid on a U.S. map. The bubbles representing data will appear centered on the state areas. However, if the locations are tied to particular areas in those states, coordinates can be used to locate the bubbles more accurately.

For example, with airline data tied to particular airports, use airport latitude and longitude coordinates to visualize the data at each airport's actual location. The dataset could look like the following:

```
Airport,Year,Quarter,lat,lng,flights,passengers
JFK,2014,1,40.639751,-73.778925,120000,67276
SFO,2014,1,37.618972,-122.374889,30000,7383
ORD,2014,1,41.978603,-87.904842,50000,90908
HNL,2014,1,21.318681,-157.922428,10000,5262
ATL,2014,1,33.640411,-84.419853,217089,24044724
DFW,2014,1,32.89748,-97.040443,169955,15888600
DEN,2014,1,39.849312,-104.673828,141381,13368128
SEA,2014,1,47.443546,-122.301659,84283,10585134
SLC,2014,1,40.758701,-111.876183,81238,5285402
PHX,2014,1,33.457439,-111.727386,107615,10533665
JFK,2014,2,40.639751,-73.778925,170000,77276
SFO,2014,2,37.618972,-122.374889,40000,8383
ORD,2014,2,41.978603,-87.904842,50000,100908
HNL,2014,2,21.318681,-157.922428,11000,6262
ATL,2014,2,33.640411,-84.419853,227089,34044724
DFW,2014,2,32.89748,-97.040443,170955,25888600
DEN,2014,2,39.849312,-104.673828,151381,23368128
```

```
SEA, 2014, 2, 47.443546, -122.301659, 85283, 20585134
SLC, 2014, 2, 40.758701, -111.876183, 82238, 6285402
PHX, 2014, 2, 33.457439, -111.727386, 117615, 11533665
JFK, 2014, 3, 40.639751, -73.778925, 210000, 87276
SFO, 2014, 3, 37.618972, -122.374889, 50000, 9383
ORD, 2014, 3, 41.978603, -87.904842, 50000, 90908
HNL, 2014, 3, 21.318681, -157.922428, 12000, 7262
ATL, 2014, 3, 33.640411, -84.419853, 237089, 35044724
DFW, 2014, 3, 32.89748, -97.040443, 180955, 26888600
DEN, 2014, 3, 39.849312, -104.673828, 161381, 24368128
SEA, 2014, 3, 47.443546, -122.301659, 95283, 22585134
SLC, 2014, 3, 40.758701, -111.876183, 92238, 6585402
PHX, 2014, 3, 33.457439, -111.727386, 127615, 13533665
JFK, 2014, 4, 40.639751, -73.778925, 220000, 117276
SFO, 2014, 4, 37.618972, -122.374889, 60000, 7000
ORD, 2014, 4, 41.978603, -87.904842, 50000, 90908
HNL, 2014, 4, 21.318681, -157.922428, 13000, 8262
ATL, 2014, 4, 33.640411, -84.419853, 247089, 36044724
DFW, 2014, 4, 32.89748, -97.040443, 190955, 27888600
DEN, 2014, 4, 39.849312, -104.673828, 171381, 25368128
...
```

1. In Analytics, create a lens by exploring your airport dataset.
2. In the Measures panel, add latitude and longitude as the first measures, as averages.
Latitude and longitude must be added as averages, in that order, ahead of any other measures.
3. Add other measures, such as sum of passengers and flights.
4. In the Group by panel, group the data by airport.
5. Select **Geo Map** from the chart menu.



Custom Map Charts

Using map charts that can shade areas in proportion to mapped values allows for visual pop-out of high-value areas. You can use custom maps with geographical units or to illustrate any type of area that can be represented by polygons. Custom map charts can be used in the Wave dashboard designer and classic designer.

Use a custom map if you have data with a geographical component that doesn't match any of the standard maps provided by Analytics charts, such as custom regions. Other areas that can be represented with GeoJSON, such as stadium seat sections, city blocks, or floor plans, can also be represented as a map in Analytics. Data is overlaid on a custom map using either an id or name property as a key.

Custom map charts in Analytics can be created from GeoJSON with a geometry type of Polygon or MultiPolygon. See the [reference section](#) on page 347 for more information.

Create a Custom Map Chart

Create a custom map by uploading a GeoJSON file containing the data that defines the map. The maximum supported file size is 10 MB.

1. While logged in to your Salesforce org, navigate to the URL formed by appending `/analytics/wave/web/custommap.apexp` to your org's base URL.

For example, if your org's base URL is "https://na30.salesforce.com", go to

`https://na30.salesforce.com/analytics/wave/web/custommap.apexp`.

2. Click **New**.

Back to Analytics

Quick Find / Search...

Expand All | Collapse All

Administer

- ▶ Manage Users
- ▶ Manage Apps
- ▶ Manage Territories
- ▶ Company Profile
- ▶ Security Controls
- ▶ Domain Management
- ▶ Translation Workbench
- ▶ Data Management
- ▶ Mobile Administration
- ▶ Desktop Administration
- ▶ Email Administration
- ▶ Google Apps
- ▶ Wave Analytics
- ▶ Data.com Administration

Build

- ▶ Customize
- ▶ Create
- ▶ Develop

Lightning App Builder

Custom Map List View

New Edit Delete

Available list of GeoJSONs

GeoJSON Name	GeoJSON Label
polyBrazil_jname	polyBrazil_jlabel
floorPlan	Floor Plan

Available list of Maps

Map Name	Map Label
polyBrazil_mname	polyBrazil_miabel
myFloorPlan	my floor plan

The insertion window for a new custom map appears. It has 2 panels, one for the GeoJSON and one for the map itself.

EclairNG Custom Map

Insert Custom Map Definitions

Enter a GeoJSON Definition and Associated Map Params

GeoJSON Label*	<input type="text"/>
GeoJSON Definition*	<input type="button" value="Choose File"/> No file chosen
GeoJSON Name*	<input type="text"/>
<input type="button" value="Insert"/>	

Bounding Box Top	<input type="text"/>
Bounding Box Bottom	<input type="text"/>
Bounding Box Right	<input type="text"/>
Bounding Box Left	<input type="text"/>
Map Label*	<input type="text"/>
Map Name*	<input type="text"/>
Projection*	--None--
GeoJSON	--None--
<input type="button" value="Insert Map"/>	
▼ Results	

- Fill in the required fields (shown in red) in the GeoJSON section and choose the GeoJSON file to load.

GeoJSON Label*	<input type="text" value="sales_territories"/>
GeoJSON Definition*	<input type="button" value="Choose File"/> sales_territories.json
GeoJSON Name*	<input type="text" value="sales_territories"/>
<input type="button" value="Insert"/>	

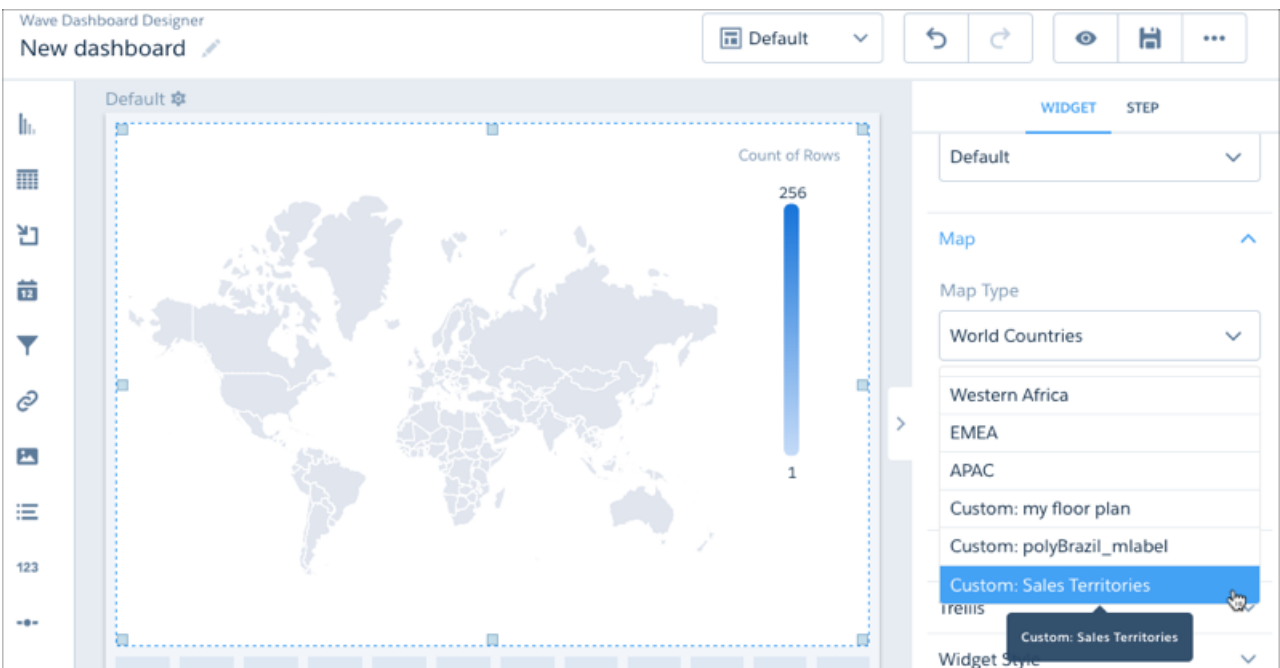
The GeoJSON name and label are used in the custom-map administration screens.

- Click **Insert** and look for a confirmation message in the Results section.
- Fill in the required fields (shown in red) in the map section.
The map name and label are used in Analytics.
- Choose a projection based on the type of geo data you are uploading, and choose the GeoJSON definition you created.

Bounding Box Top	<input type="text"/>
Bounding Box Bottom	<input type="text"/>
Bounding Box Right	<input type="text"/>
Bounding Box Left	<input type="text"/>
Map Label*	Sales Territories
Map Name*	Sales Territories
Projection*	Mercator
GeoJSON	sales_territories

Mercator is most suitable for traditional geographical maps. Use AlbersUSA for a map of the United States of America that includes Hawaii and Alaska near the rest of the United States. Use Equirectangular for simple geometric shapes such as floor plans, city blocks, or zip-code areas.

7. Click **Insert Map** and look for a confirmation message in the Results section.
8. To see the map, navigate to Analytics, choose the map chart, and click **Map Type**.



You must have appropriate step data clipped to the Wave dashboard designer to enable map charts. With trellis off, 1 measure and 1 grouping are required.

Properties of Custom Maps

Proper formatting of the underlying GeoJSON is critical for successfully overlaying data onto a custom map. For improved presentation, it may be necessary to adjust the map's bounding-box coordinates to zoom in on the overlaid areas.

GeoJSON Structure

Standard GeoJSON typically has a structure that contains feature blocks similar to the following:


```
{
  "type": "Feature",
  "geometry": {
    "type": "MultiPolygon",
    "coordinates": [
      [125.6, 10.1],
      [126.1, 11.0], ...
    ]
  },
  "id": "SI",
  "properties": {
    "name": "Sandwich Islands",
    "property1": "value1"
  }
}
```

Each feature block defines a shape, or map area. To correctly overlay data onto the map, the data must have a column with values uniquely matching one of the properties in the GeoJSON. For example, if the data has values in a column called `Country_Code`, then each feature block in the GeoJSON should have a property called `id` with values that exactly match values in `Country_Code`. The feature block with `"id": "SI"` would match a row in the data that has `SI` in the `Country_Code` column, and that data can then be overlaid on the area defined by that feature block. To overlay the data on the matching areas, you'll have to group on `Country_Code` when exploring the dataset in Analytics.

The `id` property is required, and it has to be at the same level as `properties` in the GeoJSON. Often, however, it's a child of `properties`:

```
{
  "type": "Feature",
  "geometry": {
    "type": "MultiPolygon",
    "coordinates": [
      [125.6, 10.1],
      [126.1, 11.0], ...
    ]
  },
  "properties": {
    "name": "Sandwich Islands",
    "id": "SI",
    "property1": "value1"
  }
}
```

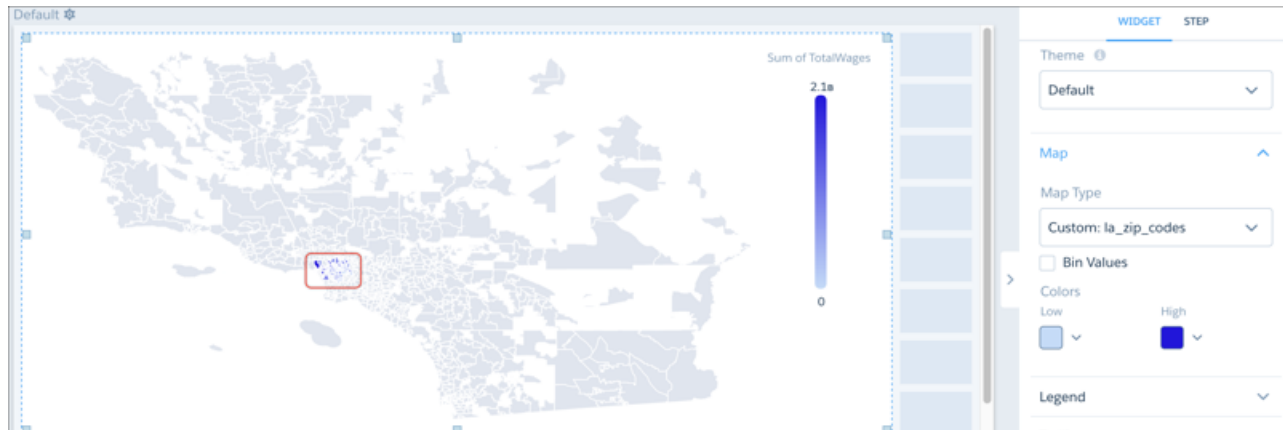
Sometimes `id` doesn't exist at all, and must be created. In either case, the original GeoJSON must be edited to contain the `id` property at the level of the `properties` property. In a single feature block, doing that is trivial, but a large GeoJSON file could contain hundreds of GeoJSON feature blocks. Using a script is recommended.

 **Note:** For GeoJSON that lacks an `id` property, Analytics falls back to using the values in `properties.name`. If your GeoJSON has a property called `name` under `properties`, and `name` has values that match a column in your data, it can be used instead of `id`. Do not change the position of `name`. It must remain a child of `properties`.

Bounding Boxes

You can "zoom" into a map area by redefining the area of the map to display. This is done by giving the boundaries of the new area in terms of coordinates. These coordinates are called a bounding box. A bounding box limits the map to the shapes within the coordinates, or borders, of the bounding box.

When you create a map from a GeoJSON without a bounding box, every defined shape is displayed as an area on the map. For example, the following map of zip codes in the Los Angeles area does not use a bounding box:



The areas of interest, where data has been overlaid on the map, are indicated by the red rectangle. To make the map more readable, the view should zoom in on the zip-code areas that have data. The coordinates (in this case, latitude and longitude) bordering the area of interest can be found using a GeoJSON tool that gives the coordinates of the areas in the map. A second map is then created from the original GeoJSON, this time with bounding-box coordinates that were found:

EclairNG Custom Map

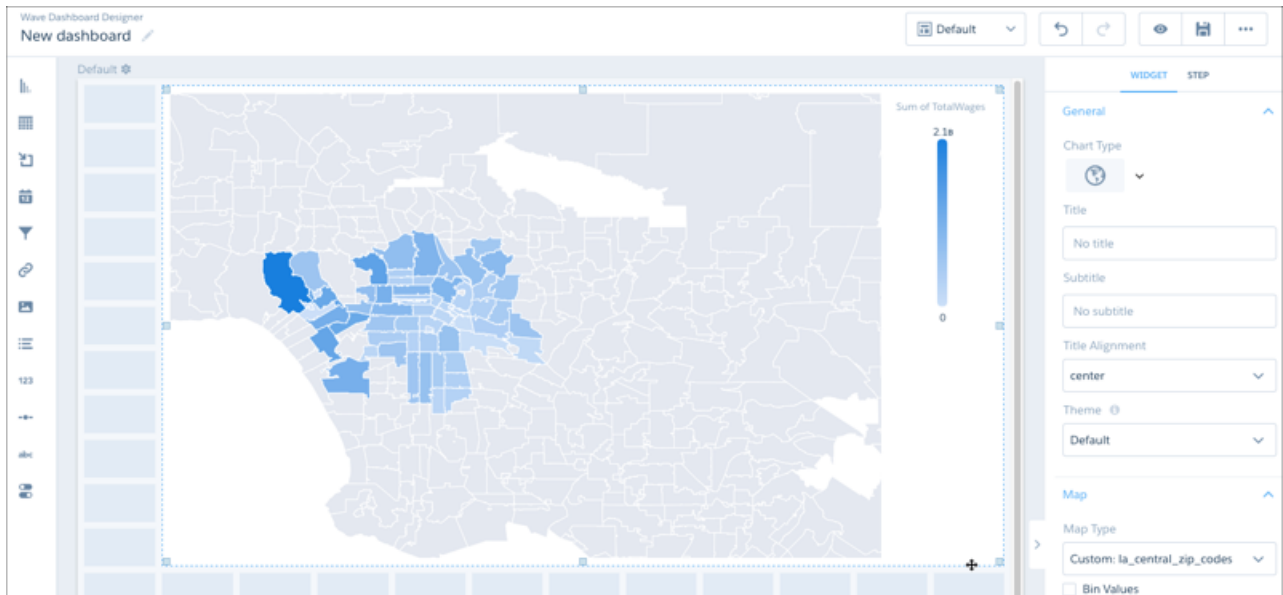
Insert Custom Map Definitions

Enter a GeoJSON Definition and Associated Map Params

GeoJSON Label*	<input type="text"/>
GeoJSON Definition*	<input type="button" value="Choose File"/> No file chosen
GeoJSON Name*	<input type="text"/>
<input type="button" value="Insert"/>	

Bounding Box Top	<input type="text" value="34.2"/>
Bounding Box Bottom	<input type="text" value="33.85"/>
Bounding Box Right	<input type="text" value="-117.65"/>
Bounding Box Left	<input type="text" value="-118.65"/>
Map Label*	<input type="text" value="la_central_zip_codes"/>
Map Name*	<input type="text" value="la_central_zip_codes"/>
Projection*	<input type="text" value="Equirectangular"/>
GeoJSON	<input type="text" value="la_zip_codes"/>
<input type="button" value="Insert Map"/>	

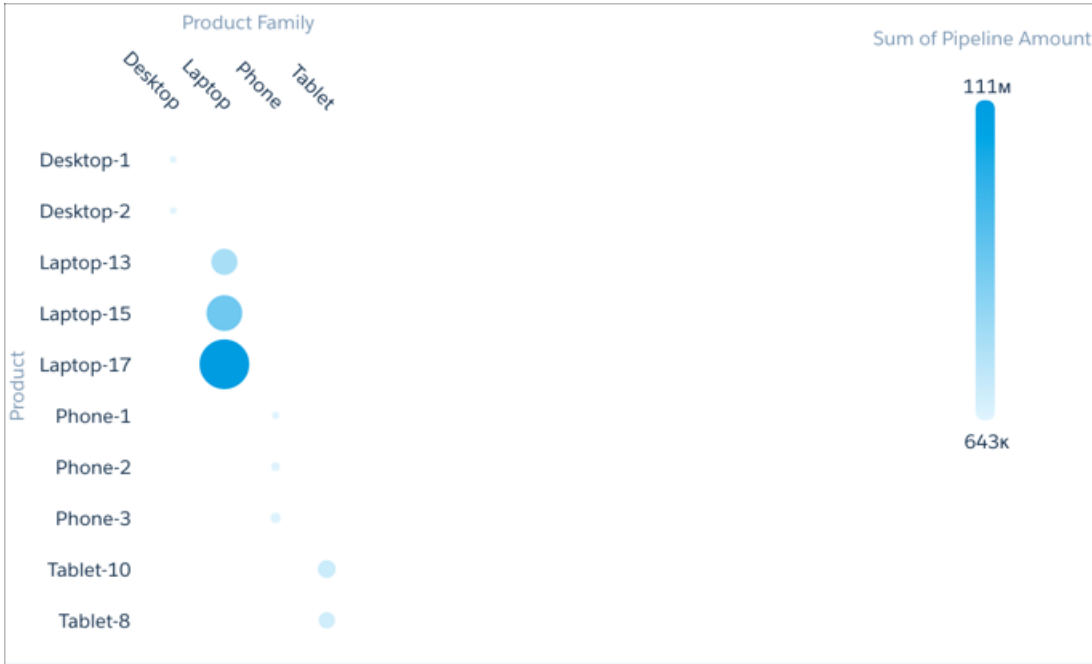
When viewed in Analytics, this new map is zoomed in on the area of interest:



Matrix Charts

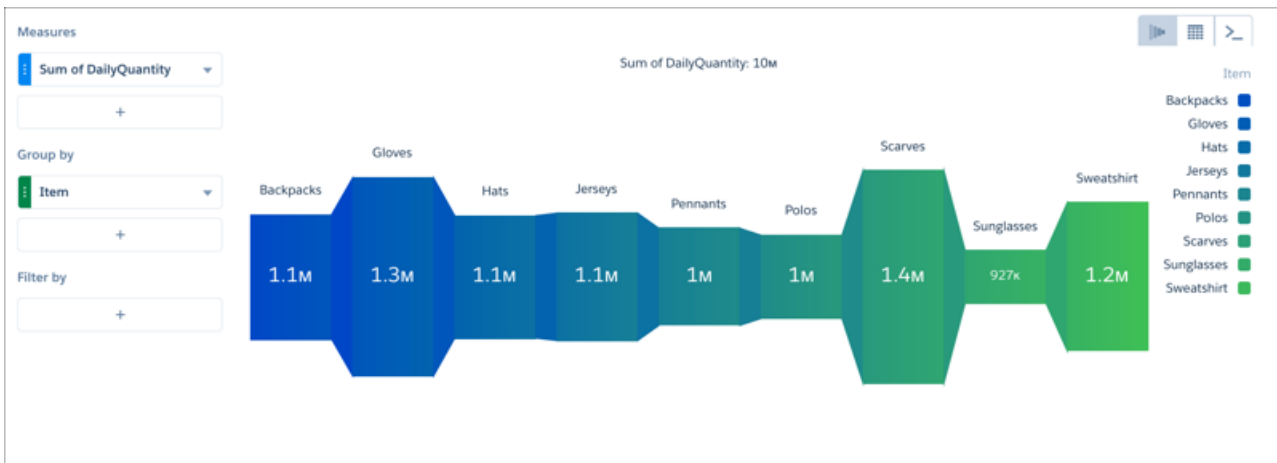
Use matrix charts (new in Wave dashboard designer) to create a table that represents measures visually, allowing you to quickly spot extreme values.

For example, you can show which product families are generating the most opportunities.



Origami Charts

Use an origami chart to create a striking horizontal visualization for easily identifying high and low-value data when there's a single measure and a single grouping.



Parallel Coordinates Charts

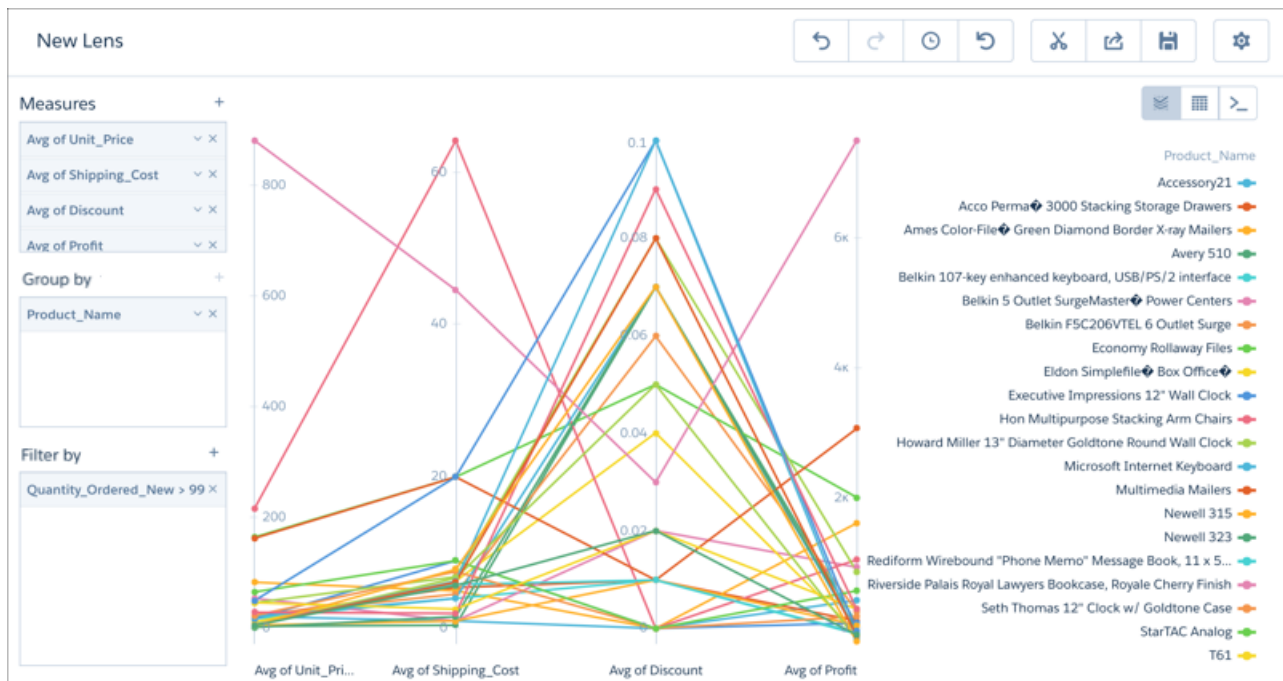
Use a parallel coordinates chart when you have multiple measures and a single grouping. Parallel coordinate charts are useful for displaying how data elements in a grouping stack up against each other.

Create a Parallel Coordinates Chart

If you're trying to spot outliers or patterns based on related metric factors, parallel coordinates charts can help tease those out.

For example, you have product pricing data but you aren't sure why some higher-volume products are more profitable than others.

1. In Analytics, create a lens by exploring your product-pricing dataset.
2. Select **Parallel Coordinates** from the chart menu.
3. In the Measures panel, add the measures you're interested in.
For exploring product pricing, you could add average unit cost, discount, shipping cost, and profit.
4. In the Group by panel, add the relevant grouping.
Product name or ID would be a likely grouping in this example.
5. Add filters to leave out data that you're not interested in.
In this example, add a filter to display only products that exceed a minimum volume.



The parallel coordinates chart shows that higher discounts aren't adding up to higher profits.

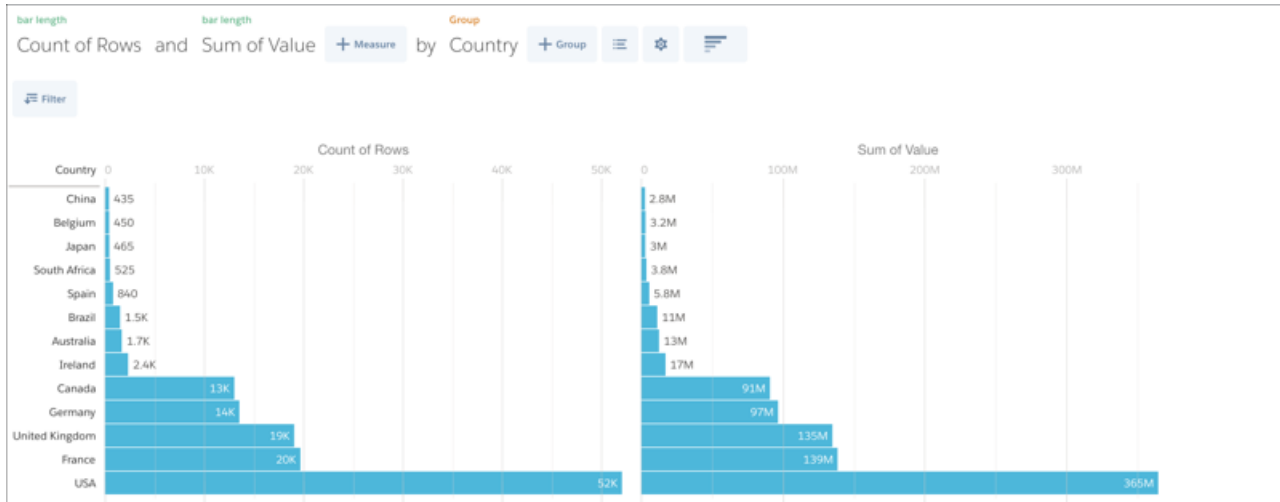
Pyramid Charts

Use a pyramid chart to visually highlight relative sizes of stacked dimension values.

Create a Pyramid Chart

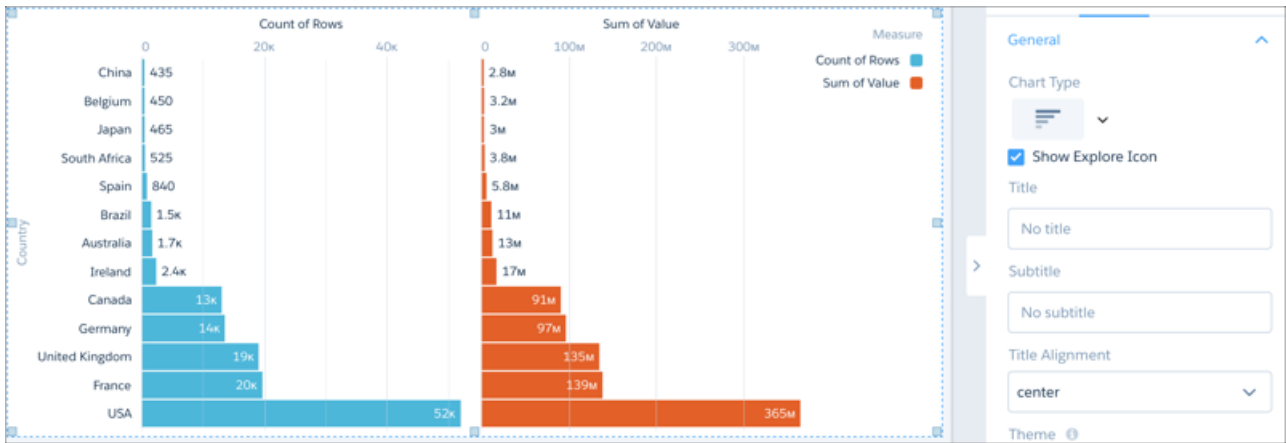
A pyramid chart is a good choice for presenting related measures for one particular dimension, such as accounts and account values in a particular category.

For example, you're interested in looking at the overall value and number of accounts in countries where your company does business. A bar chart can show that data in order, but it's not necessarily a compelling or easy-to-read visualization.



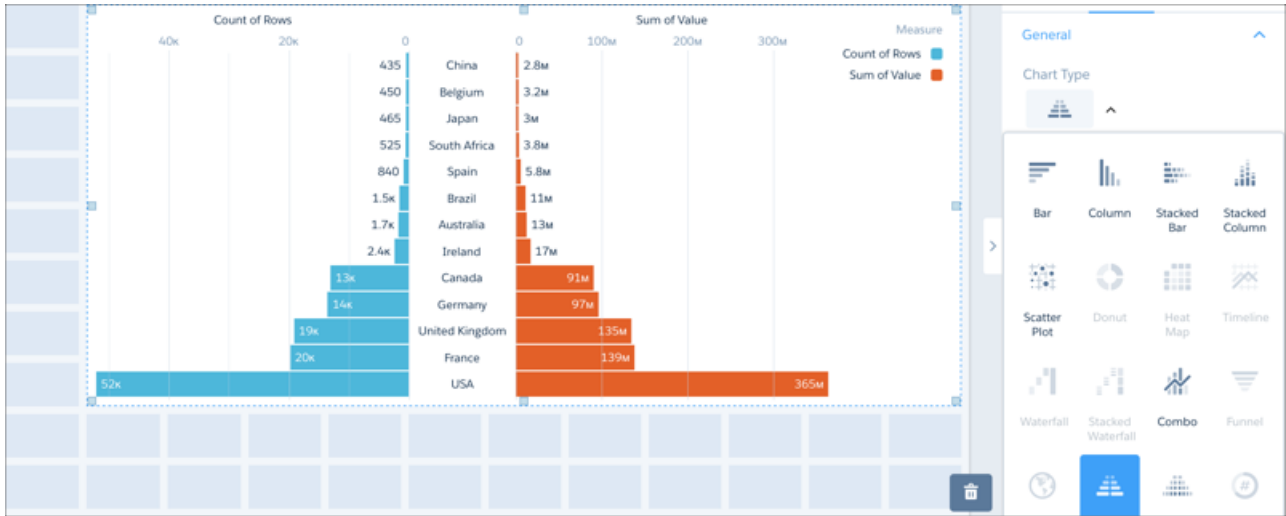
Changing it to a pyramid chart improves both overall appearance and readability.

1. Clip the bar chart to Wave dashboard designer.

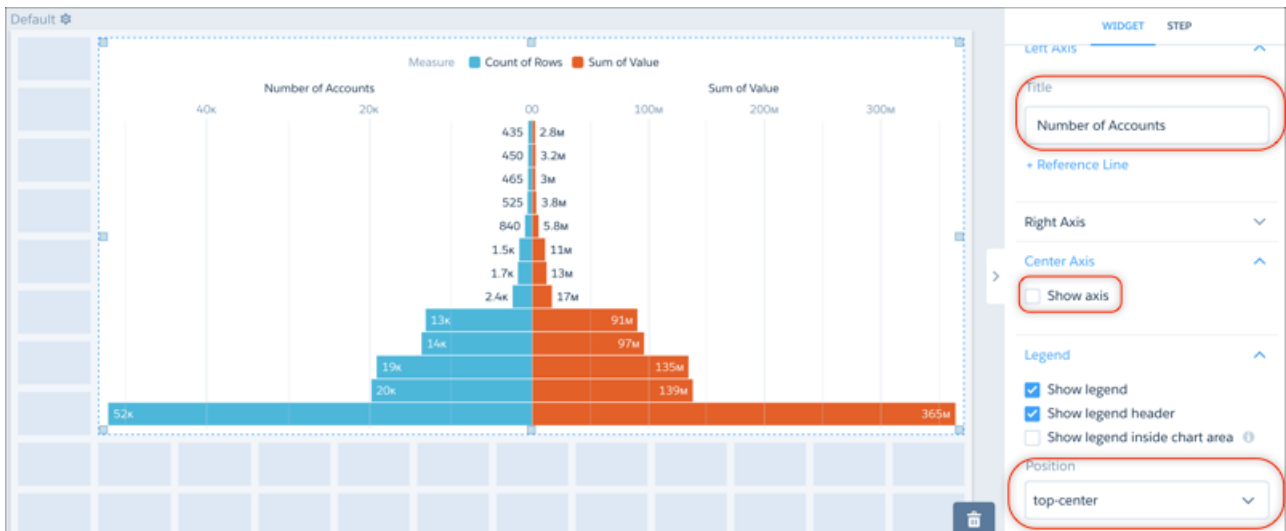


A different color is automatically applied to the bars for the second measure.

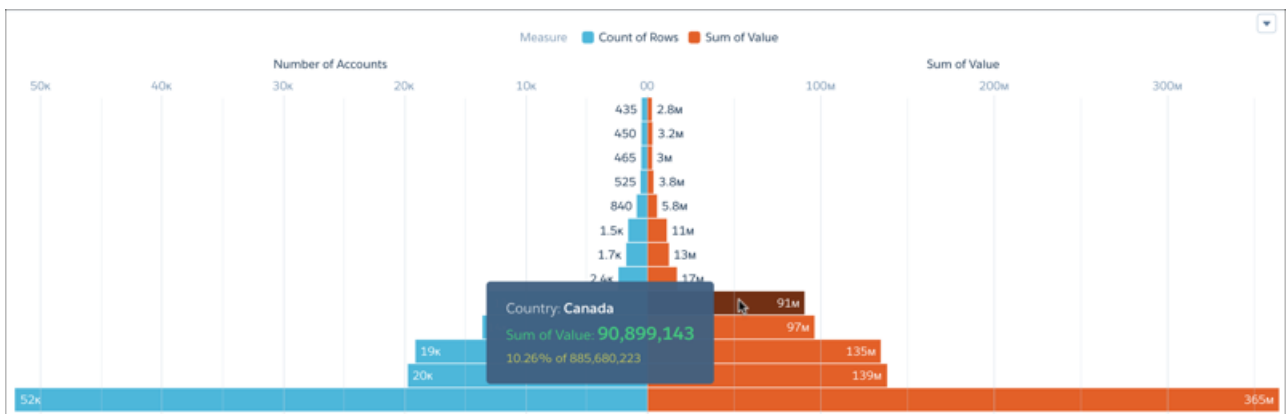
2. Change the chart type to pyramid.



3. Edit the title of the left axis, remove the center axis, and position the legend at top-center.



These adjustments improve the pyramid's appearance, but the loss of the country names for the center axis could make it a little less clear. However, when the chart is saved to a dashboard, floating the pointer over a bar reveals an informative tooltip.



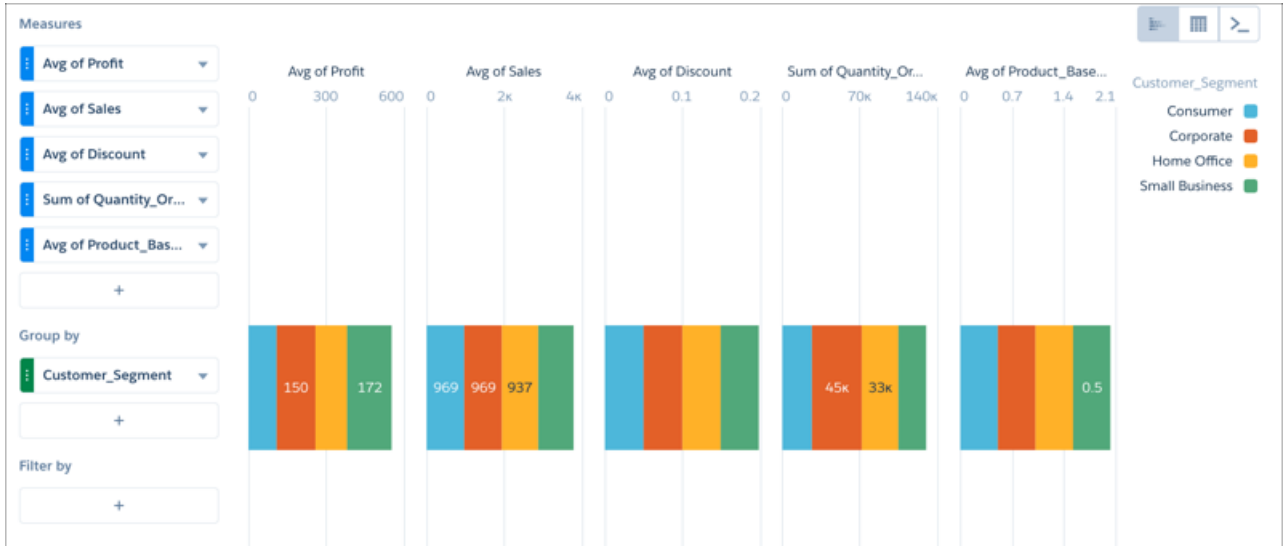
Radar Charts

Use radar charts to display a small dataset with one dimension and at least three measure columns.

Create a Radar Chart

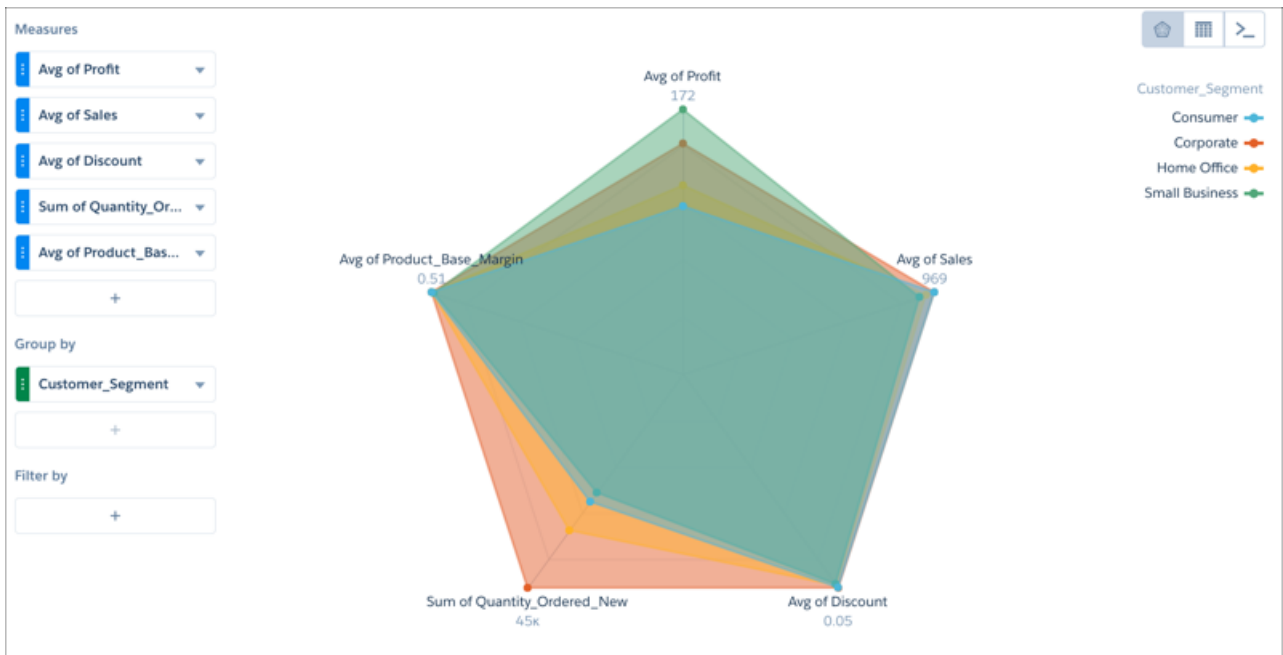
A radar chart is useful when you're trying to visually represent a dimension along three or more measure axes which have different scales. For example, if your business tracks key metrics for specific product segments, you want to visualize the product segments along with those metrics.

1. In Analytics, group the data by product segment, then add the measures that reflect the key metrics.

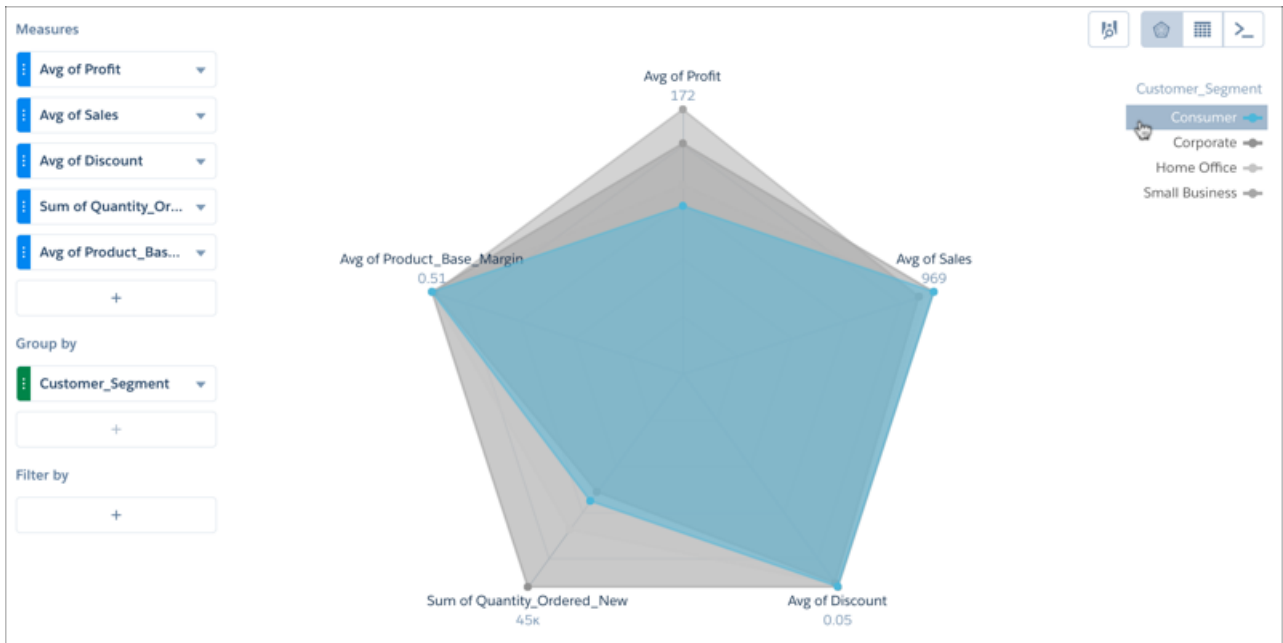


Using a stacked bar chart to compare the product segments along the chosen measures, it's difficult to evaluate the performance of the different segments relative to each other.

2. Select **Metrics Radar** from **Chart Type**.



- To view a specific grouping, click it in the legend.



Rating Charts

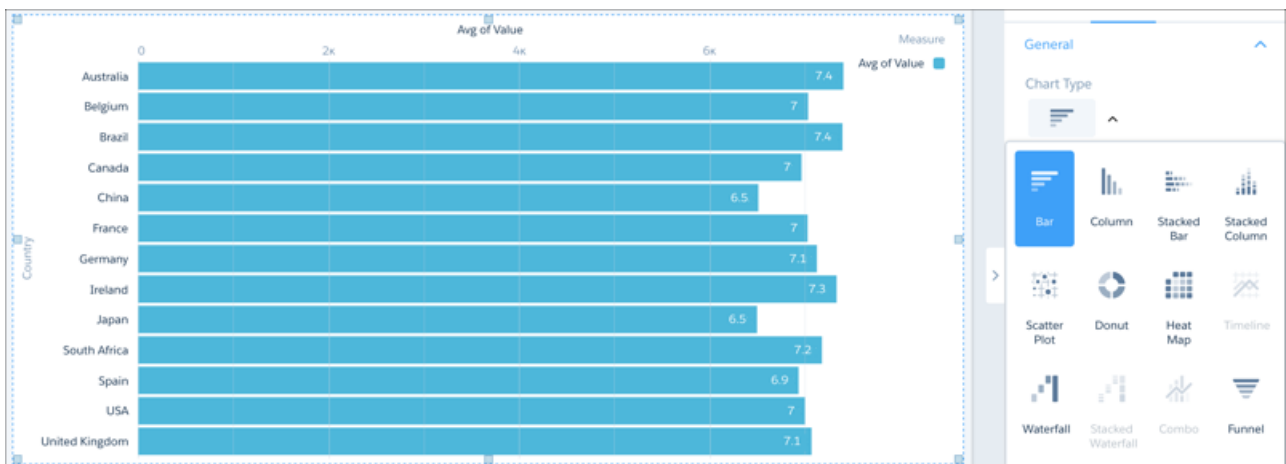
Use a rating chart to get a sense of how well a measured quality, such as customer satisfaction, is meeting expectations.

Create a Rating Chart

If you've set a goal for, as an example, customer satisfaction in each of the countries where your company operates, rating charts are a good choice for showing how close you are to that goal.

You've collected, averaged, and loaded the data from the surveys. Now you want to present it in a way that makes sense for customer satisfaction scores. Each rating chart can display 1 value per country, and highlight value ranges.

- In Analytics, create a lens using your customer-satisfaction dataset, then clip it to Wave dashboard designer.

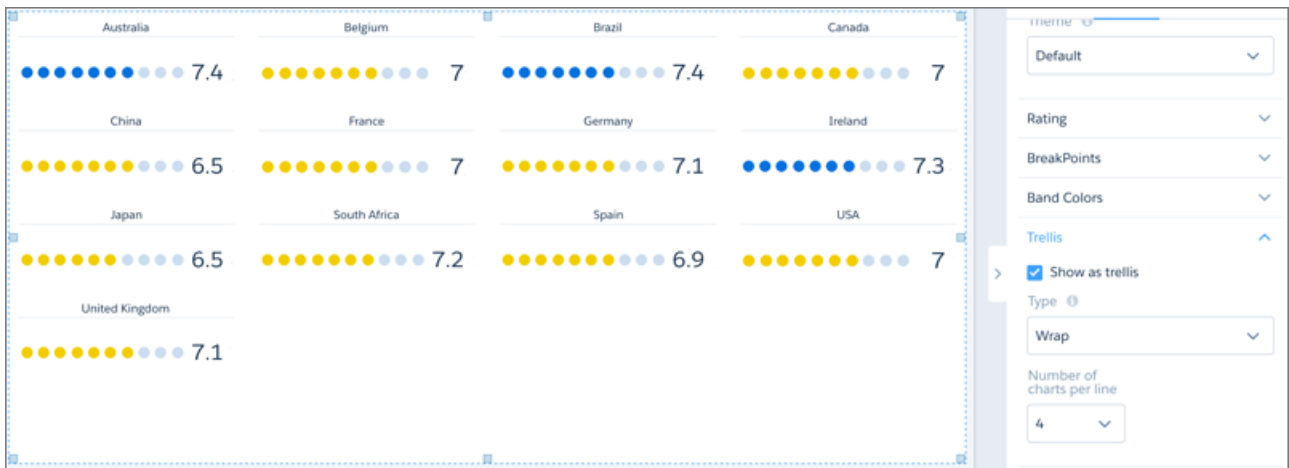


- Change the chart type to **Rating**.
- Set the breakpoint values and associated band colors.



The breakpoints set the range values where the color bands transition. The maximum is 10, and you'd like to exceed 7.2 in each country.

- Set the **Trellis** type to **Wrap** so the charts are easier to view all at once without having to scroll.

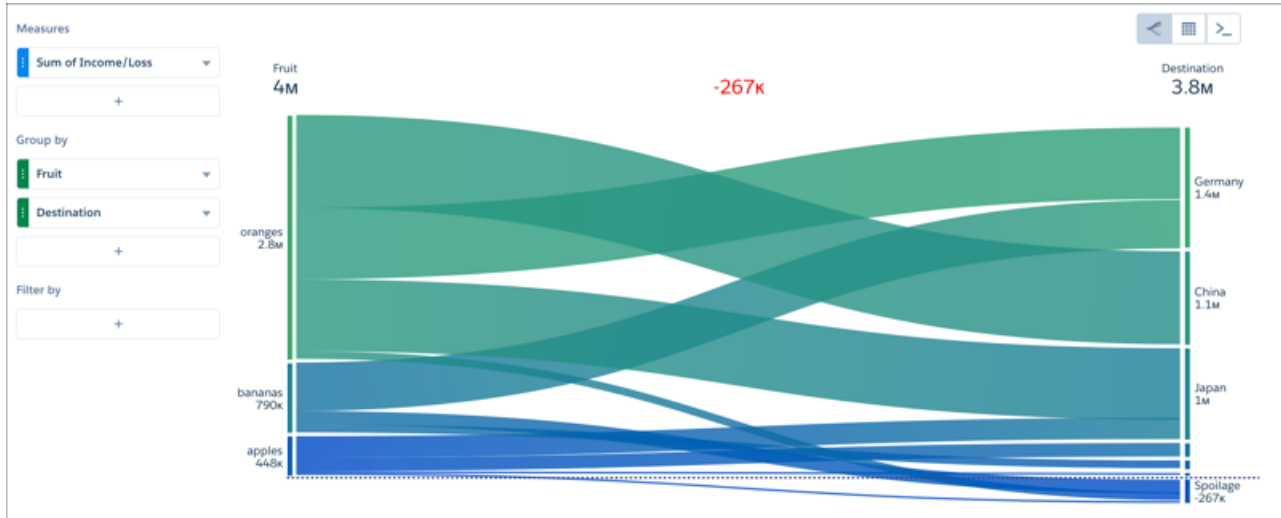


Values above 7.2 are easy to spot due to the two-color configuration of the rating chart. It's also easy to see which countries are close to the desired value.

Sankey Charts

Use a sankey chart to visualize the distribution of a measure from one grouping to another grouping.

Sankey charts can visualize measures with negative numbers, and display the difference in value between the starting and ending groupings.



Scatter Charts

Use a scatter chart to visualize correlation between two groups of data.

Timeline Charts

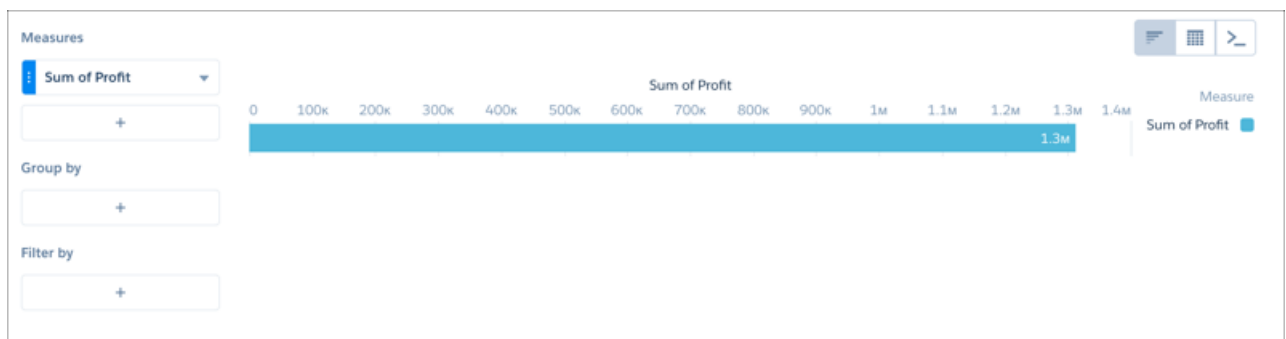
A timeline chart is a line chart with one axis dedicated to a time dimension. Use a timeline chart to show how a value changes over time.

Create a Timeline Chart

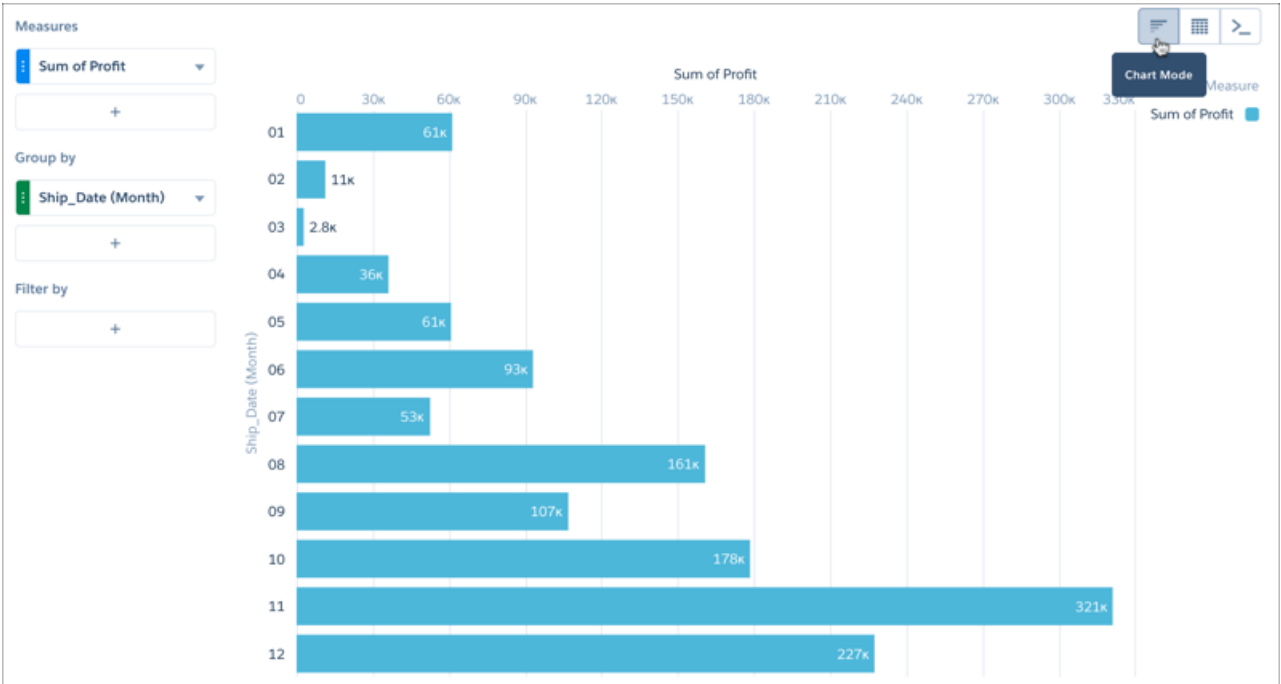
For example, a timeline chart can show how profit is doing for the year.

Exploring a year's worth of data, you want to visualize not just the total profit, but how profits changes from month to month.

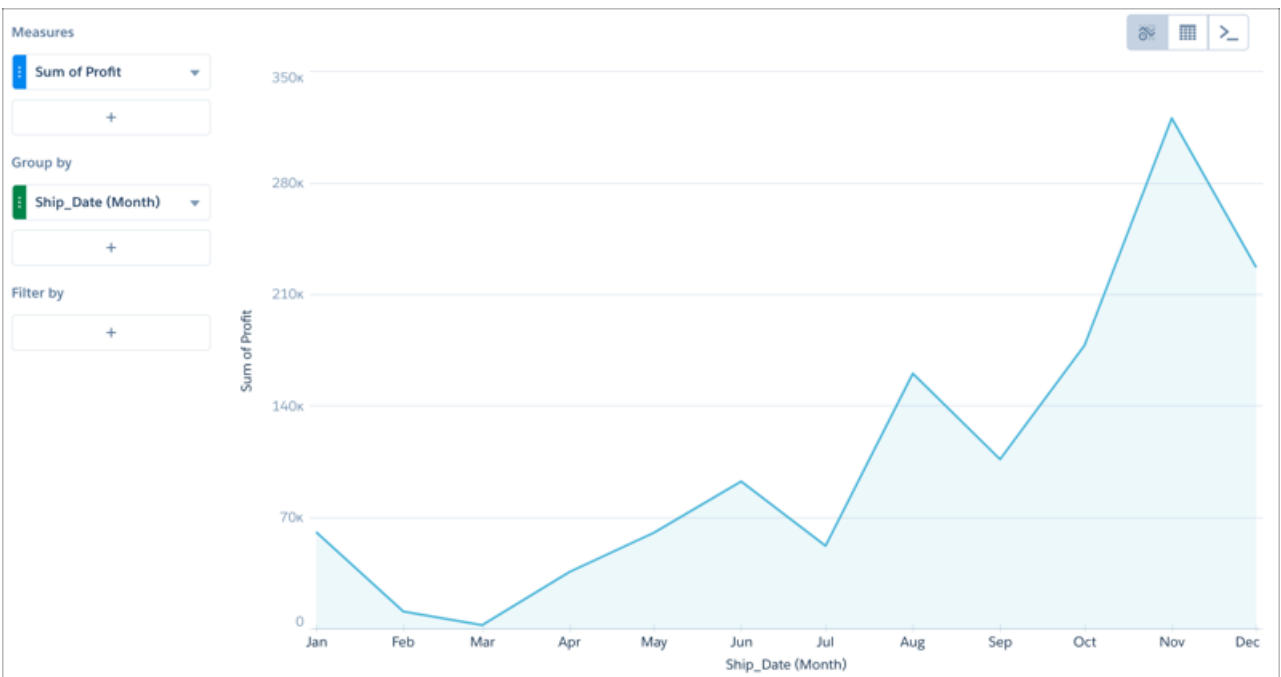
1. In Analytics, click the dataset to explore it in a lens, and set the measure to show the total profit.



2. Group by a date that has the granularity you're interested in. Grouping by month, you get 12 bars.
3. Select the timeline chart from chart mode.



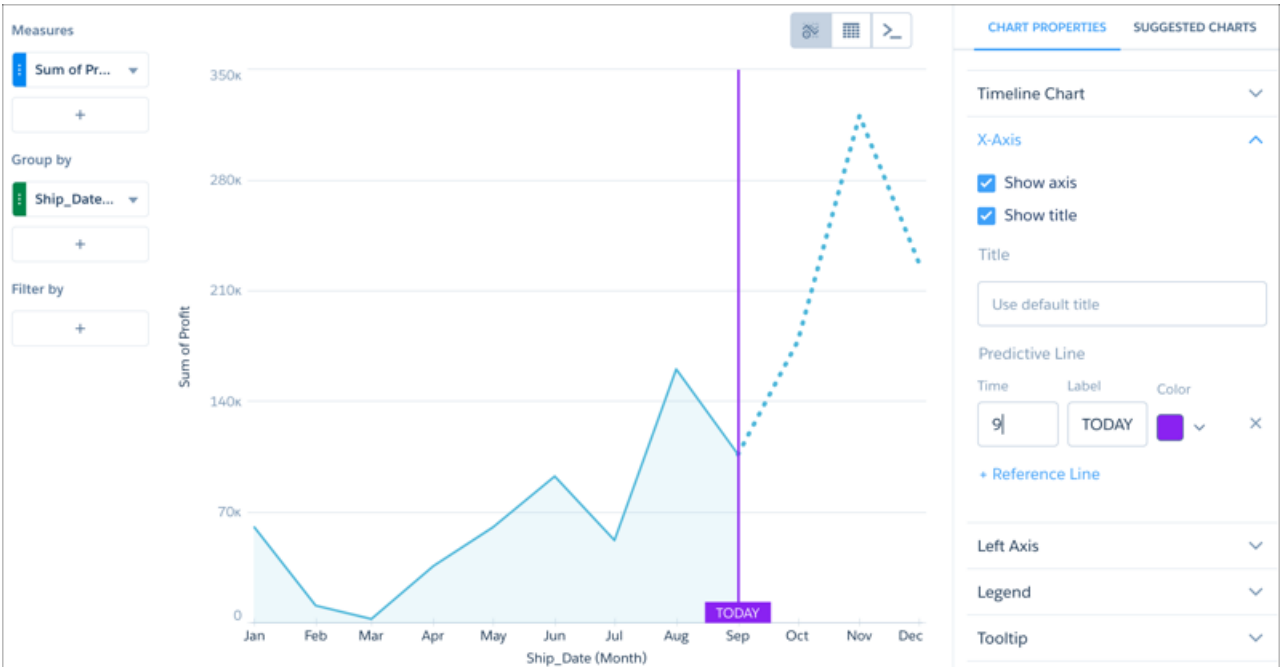
The timeline chart appears as a line chart, with the time dimension shown along the x axis.



4. To open the chart properties menu and configure chart properties, click the gear menu. You can add titles, set the behavior for missing values, and set other properties that affect the appearance of the chart.
5. If some of the dataset includes predictions of future profits, click **Predictive Line** under X-Axis in the charts properties panel. Using a predictive line provides a visual cue notifying viewers that the data is in the future.

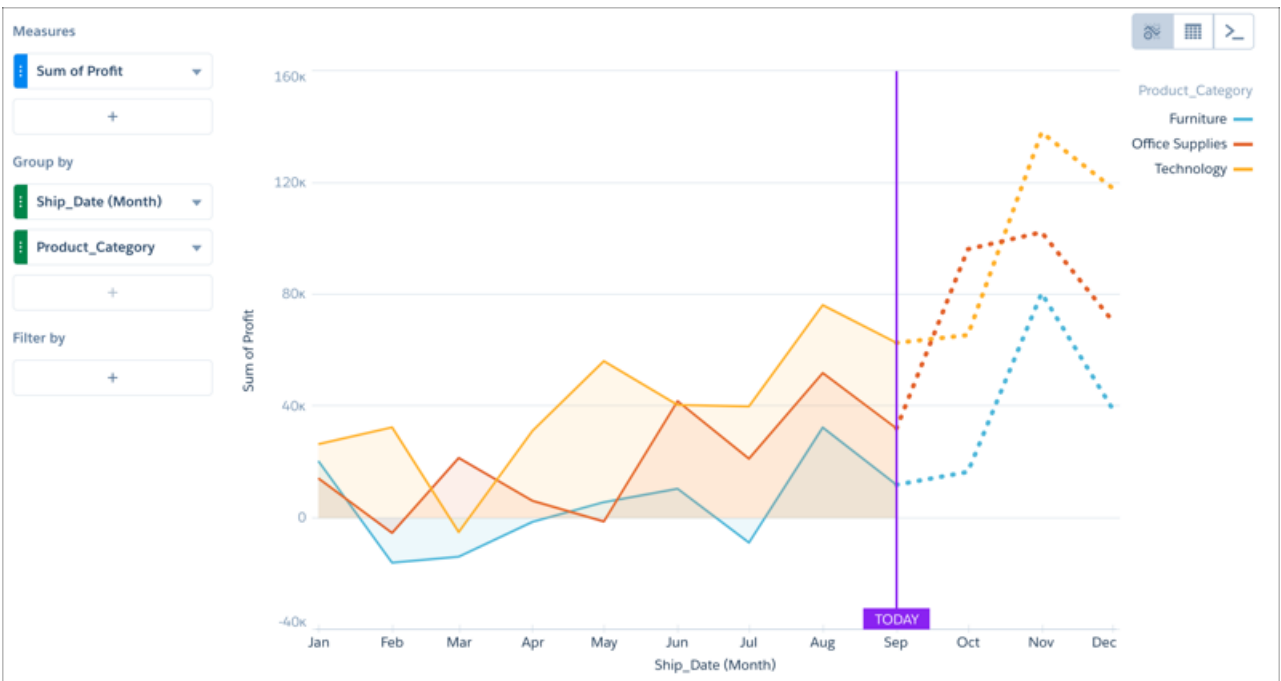
6. Set the position of the predictive line by specifying the date in **Time**.

The numerical date you specify should match the group-by date elements. For example, if you group by month and want the predictive line to start just after September, enter 9. You can also specify a label in **Label** for the line, and a color.



7. Add a second grouping.

With a second group-by dimension, you can view the predictive lines for individual categories



Treemap Charts

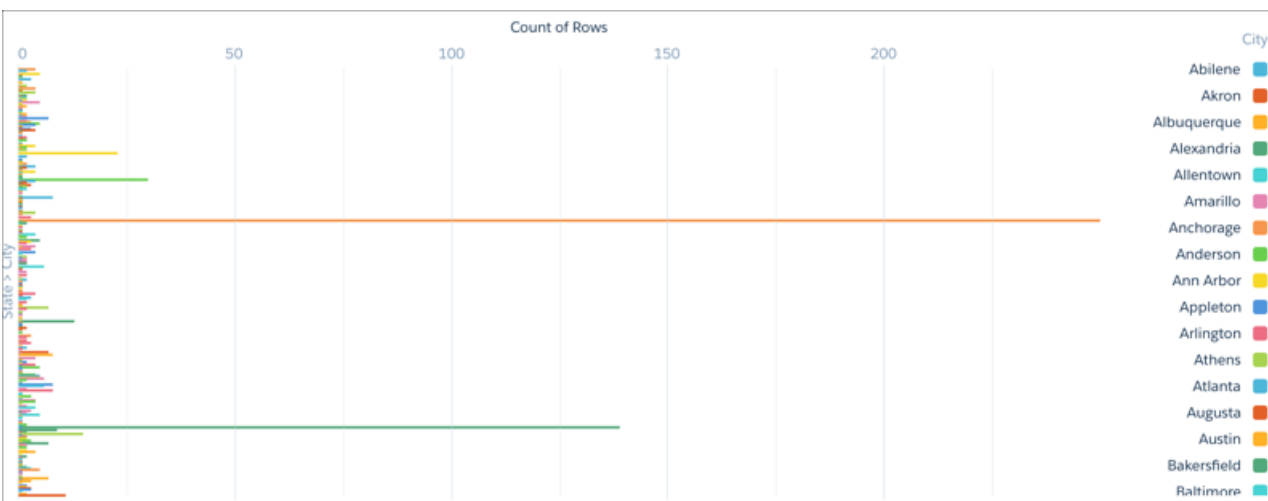
Use treemaps to visualize hierarchical quantitative data, where containing rectangles designate relationship using color, and "leaf" rectangles represent quantity using area.

Create a Treemap Chart

Treemap charts are especially useful for visualizing groupings that are difficult to organize well using other types of charts.

For example, you can show the number of opportunities by city in each state in a way that reveals top markets.

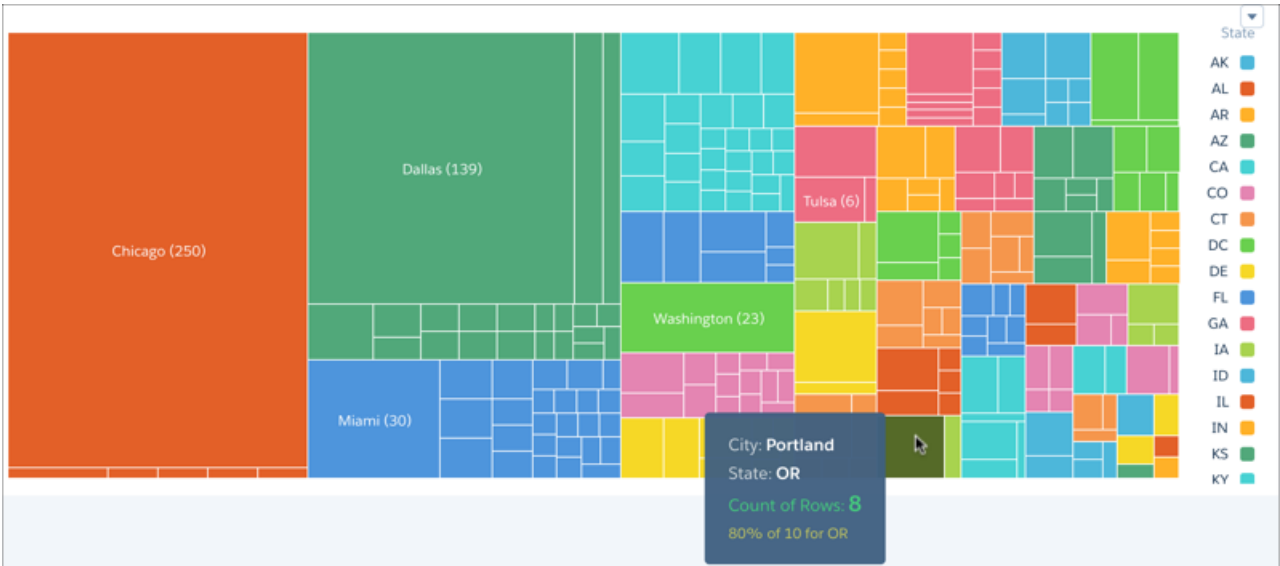
1. In Analytics, group opportunities by state, then group by city.
2. Clip the lens to Wave dashboard designer, then view the resulting chart in the dashboard.



With the groupings in a bar chart, it's both difficult to take in the entire bar chart in a glance or quickly locate top markets.

3. Choose **Treemap** from **Chart Type**.

In the treemap chart, high-value cities are easy to spot. Using tooltips, you can view details for any rectangle representing a city.



Waterfall Charts

Use a waterfall chart to show the cumulative effect of sequentially introduced positive or negative values with breakdowns of value totals. Also known as "flying bricks" or "Mario" charts. To include breakdowns of value totals, use a stacked waterfall chart.

View and Configure Dataset Fields

You can use the Dataset Fields feature to view, hide, and rename dataset fields. Users with view-only access to the dataset can view the names and API names of fields.

1. To open the Dataset Fields panel for a dataset, click **Dataset Fields** while exploring the dataset.

EDITIONS

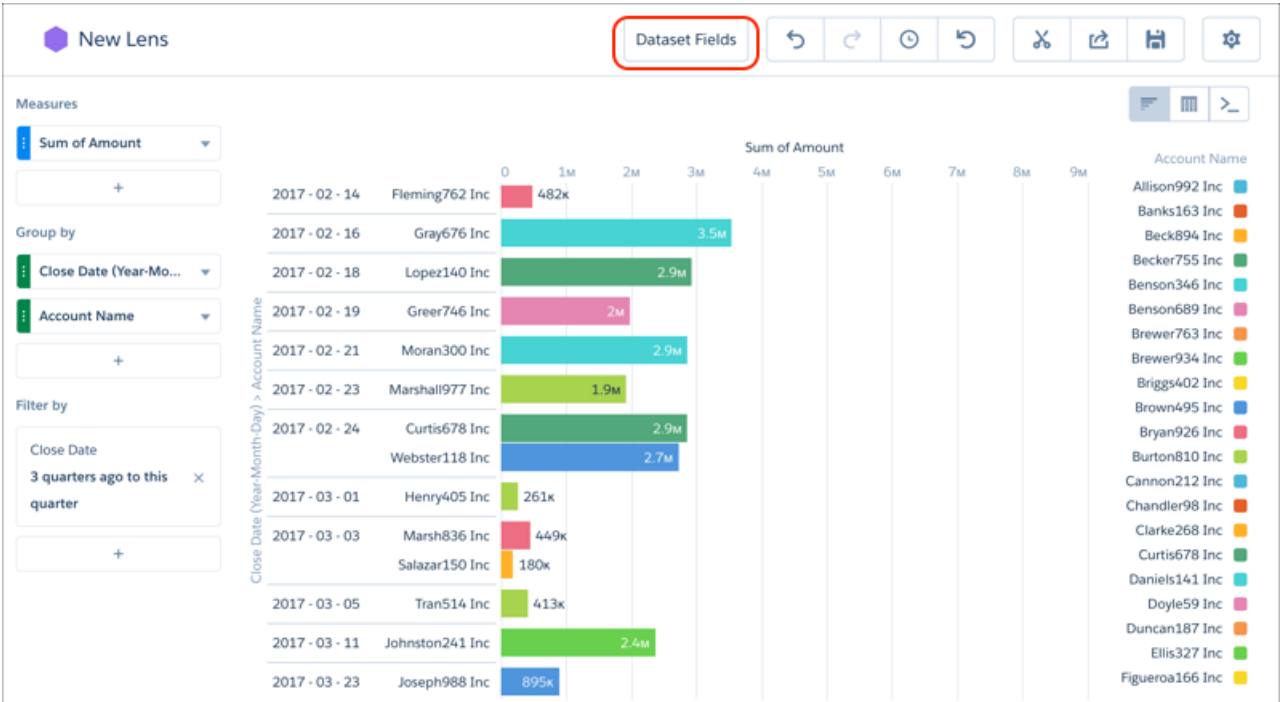
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

- Use Analytics



2. To reveal a field's context menu, hover over the right edge of the field.

DTC Opportunity

Search fields...

Show Hidden Fields (0)

Show Field API Names

Dimensions

- Account Name
- Account Owner
- Account Type
- Billing Country
- Billing State/Province
- Close_Date
- Close_Date_Day
- Close_Date_Hour
- Close_Date_Minute
- Close_Date_Month
- Close_Date_Quarter
- Close_Date_Second
- Close_Date_Week
- Close_Date_Year

New Lens Dataset Fields

Measures: Sum of Am...

Group by: Close Date (...), Account Na...

Filter by: Close Date, 3 quarters ago to this

Close Date (Year-Month-Day)	Account Name	Sum of Amount
2016 - 10 - 01	Watkins561 Inc	100k
2016 - 10 - 03	Summers987 Inc	156k
2016 - 10 - 05	Fitzgerald503 Inc	2.2M
	Norris77 Inc	1M
2016 - 10 - 06	Thompson136 ...	847k
2016 - 10 - 07	Herrera637 Inc	3.5M
	Jefferson859 Inc	219k
	Lynch943 Inc	2.1M
	Rodriguez626 L...	476k
	Shelton873 Inc	105k
2016 - 10 - 08	Cannon212 Inc	278k
2016 - 10 - 09	Doyle59 Inc	40k
2016 - 10 - 13	Nguyen156 Inc	605k
	Rios384 Inc	858k
	Webb165 Inc	37k

Cancel Save

3. Click the arrow to reveal the context menu.

The screenshot shows the Analytics interface for the 'DTC Opportunity' dataset. On the left, the 'Dataset Fields' list is open, showing a search bar and checkboxes for 'Show Hidden Fields (0)' and 'Show Field API Names'. Below this is a list of dimensions: Account Name, Account Owner, Account Type, Billing Country, Billing State/Province, Close_Date, Close_Date_Day, Close_Date_Hour, Close_Date_Minute, Close_Date_Month, Close_Date_Quarter, Close_Date_Second, Close_Date_Week, and Close_Date_Year. A context menu is open over 'Billing_Country', showing options: Rename, Hide, and Copy API Name. The main view shows a bar chart titled 'Sum of Amount' with a y-axis ranging from 0 to 6M. The chart displays data for various accounts and dates, with the highest value being 3.5M for Herrera637 Inc on 2016-10-07.

Close Date (Year-Month-Day)	Account Name	Sum of Amount
2016 - 10 - 01	Watkins561 Inc	100k
2016 - 10 - 03	Summers987 Inc	156k
2016 - 10 - 05	Fitzgerald503 Inc	2.2M
	Norris77 Inc	1M
2016 - 10 - 06	Thompson136 ...	847k
2016 - 10 - 07	Herrera637 Inc	3.5M
	Jefferson859 Inc	219k
	Lynch943 Inc	2.1M
	Rodriguez626 L...	476k
	Shelton873 Inc	105k
2016 - 10 - 08	Cannon212 Inc	278k
2016 - 10 - 09	Doyle59 Inc	40k
2016 - 10 - 13	Nguyen156 Inc	605k
	Rios384 Inc	858k
	Webb165 Inc	37k

4. Select **Rename** to rename the field's visible name.

Instead of using the menu, you can click any field's name to edit it. You can copy the field's API name, but you cannot change it. To display every field's API name in the Dataset Fields list of fields, click **Show Field API Names**.

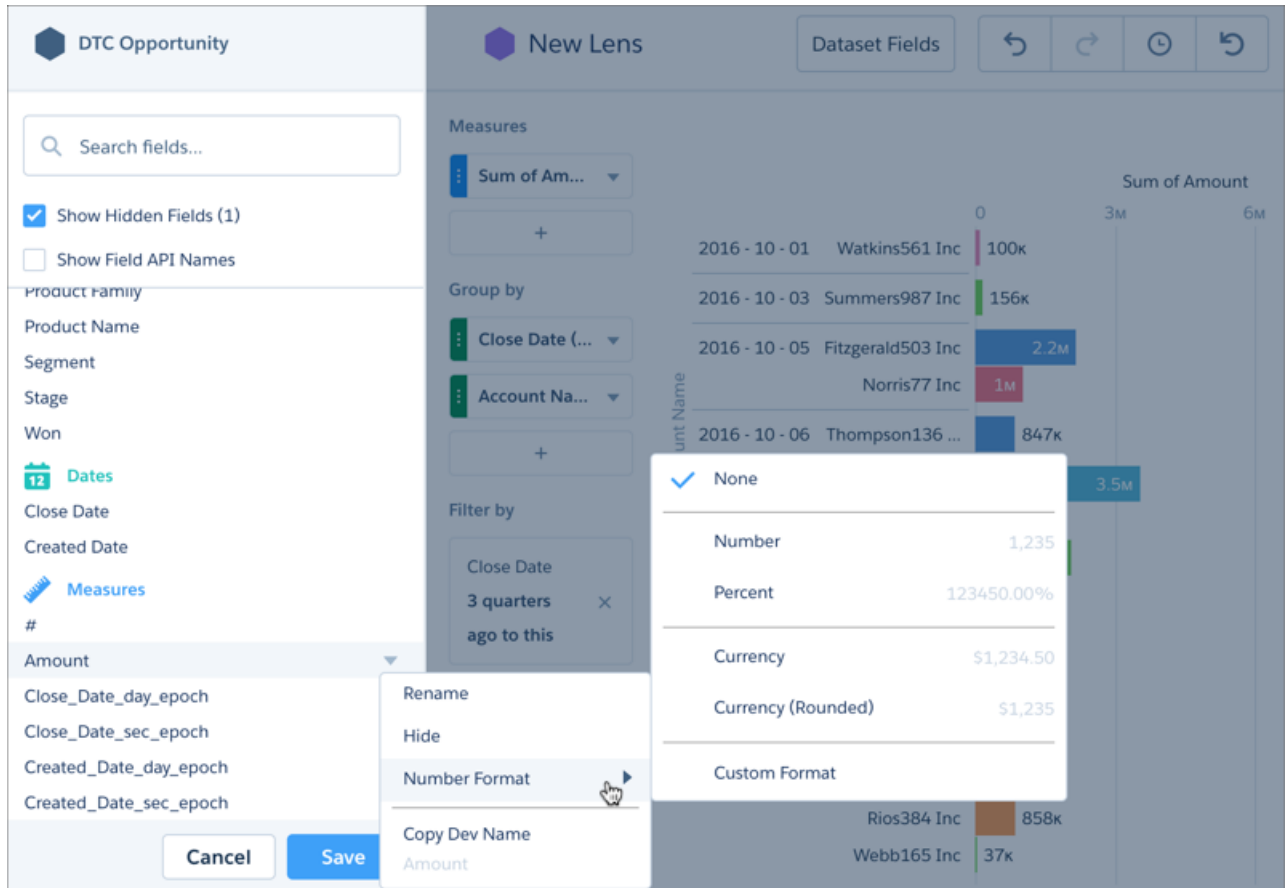
5. To hide a field, select **Hide** from its context menu.

The field is hidden from the Dataset Fields list of fields, and hidden from users who explore the dataset, and hidden from all lenses or dashboards that currently use the dataset. However, the field is still accessible via lens and dashboard JSON, Analytics REST API, and SAQL queries. To view hidden fields in the Dataset Fields list, click **Show Hidden Fields**.

The screenshot displays the 'New Lens' configuration interface. On the left, under 'Dimensions', 'Billing Country' is highlighted with a red circle. The main visualization area shows a bar chart titled 'Sum of Amount' grouped by 'Close Date' and 'Account Name'. The chart includes a 'Filter by' section set to '3 quarters ago to this'. The data points are as follows:

Close Date (Year-Month-Day)	Account Name	Sum of Amount
2016 - 10 - 01	Watkins561 Inc	100k
2016 - 10 - 03	Summers987 Inc	156k
2016 - 10 - 05	Fitzgerald503 Inc	2.2M
	Norris77 Inc	1M
2016 - 10 - 06	Thompson136 ...	847k
2016 - 10 - 07	Herrera637 Inc	3.5M
	Jefferson859 Inc	219k
	Lynch943 Inc	2.1M
	Rodriquez626 I...	476k
	Shelton873 Inc	105k
2016 - 10 - 08	Cannon212 Inc	278k
2016 - 10 - 09	Doyle59 Inc	40k
2016 - 10 - 13	Nguyen156 Inc	605k
	Rios384 Inc	858k
	Webb165 Inc	37k

- For measures, you can choose to apply a number format.



Clone a Lens

Build upon a visualization by cloning its containing lens to a new tab where you can continue exploring. You can save the original in its own tab.

1. Click an existing Analytics lens to open it.
If you're using a new, unsaved lens, you must save it before it can be cloned.
2. Select **Clone in a New Tab** from the More menu.

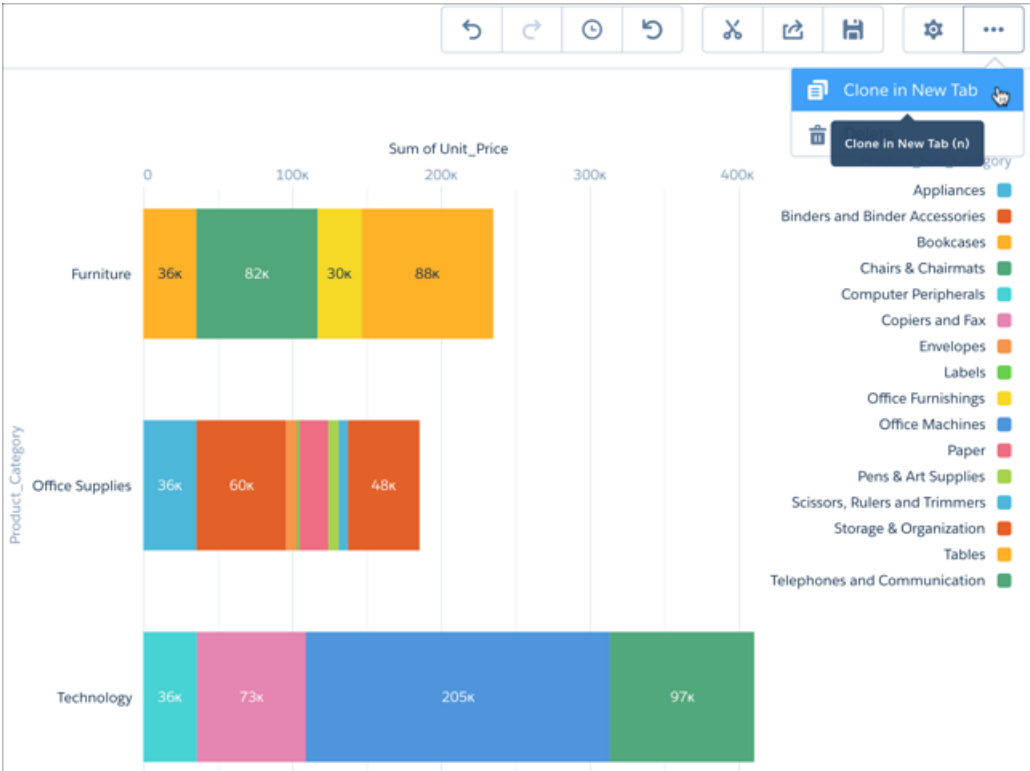
EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

- To view visualizations:
- Use Analytics



A new, unsaved copy of the cloned lens opens in a new tab.

Save a Visualization

Save your visualization as a lens.

1. Click the **Save** icon.



2. Enter a title and a description for your lens, and select the app to save it in.
3. Click **Save**.

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USER PERMISSIONS

To view visualizations:

- Use Analytics

Share a Visualization

Share a visualization with your colleagues by posting to Chatter, getting its unique URL, downloading a screenshot of it, or downloading its filtered data. A Chatter post provides an image and a link to the asset—lens, dashboard, or app—in Analytics. Colleagues with the link and access to the asset can drill down and explore the information that’s presented. To share without giving access to the asset, use the download options.

1. Click **Share**.



2. Click the tab for the sharing method that you want:
 - a. **Post to Feed** posts to Chatter an image and the link to the lens, dashboard, or app. Select **User** or **Group** feed, enter the name, and then type your comment. You can also remove the image from your post by hovering over it and clicking the **x**. Note that posted images are public.
 - b. **Get URL** provides a unique URL to the asset. Copy the link and then paste it wherever you want to share it.
 - c. **Download** gives you options to share a visualization without giving access to it. You can download it as an image (.png) or as filtered data in Microsoft® Excel® (.xlsx) or comma-separated values (.csv) format.

3. If applicable, click **Give Access** to set the level of sharing access.

4. Click **Done**.



Note: To share a visualization, you must give access to the app that contains it. Lenses, datasets, and dashboards within the default Shared App are accessible to all Analytics users, unless administrators have restricted access. All other apps are private unless someone with Manager access to the app has shared it with a specific user, group, or role.

Build Analytics Dashboards

Build an Analytics dashboard to continuously monitor key metrics of your business, analyzing the results by key dimensions, like region, products, and time period. Add interactive charts that synthesize information into an easy-to-read format. To complement the charts, add tables that show record-level details. Add filters to allow dashboard viewers to change the focus of the results. Create customized layouts to optimize the display of a dashboard on different types of devices, like mobile phones, tablets, and desktops.

Watch a Demo: [Build Interactive Analytics Dashboards \(English Only\)](#)

Get Hands-On Training with Trailhead: [Analytics Dashboard Building Basics](#)



Note: For you to create and edit dashboards with the Wave dashboard designer, the admin must enable it in Analytics setup—it’s enabled by default—and must grant you the Create and Edit Analytics Dashboards user permission.

This section discusses how to build dashboards with the Wave dashboard designer. The Wave dashboard designer is the newer designer that offers additional features to help you build dashboards more quickly and easily. Use a template to create a dashboard with a predefined design. Use the wizards to quickly build widgets. Use drag-and-drop, snap-to-grid, and browser reflow to effortlessly add,

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To view visualizations:

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position, and align widgets in a dashboard. (For information about building dashboards with classic designer, see [Build a Dashboard with the Classic Designer](#).)

IN THIS SECTION:

1. [Create an Analytics Dashboard with a Template](#)

Each template has a unique layout with empty widgets (widgets without steps), sections, and a color scheme. To populate the widgets with your data, use the widget wizards. To create your own layout, choose the blank template.

2. [Create Dashboard Pages \(Beta\)](#)

Split a dashboard into multiple, smaller chunks, called “pages,” to improve performance and make mobile dashboards less cluttered. Share widgets, steps, global filters, and selections across pages to keep the same focus as you go from one page to the next. For example, a selection in one page also filters the results of the other pages. When you open a page, Analytics calculates results for the widgets on that page only.

3. [Add Widgets to the Dashboard](#)

Widgets are the basic building blocks of a dashboard. In the Wave dashboard designer, you can add different widgets to perform functions. For example, widgets can calculate key performance indicators, filter dashboard results, visualize your data using interactive charts, and show record-level details in tables.

4. [Manage Steps for Widgets](#)

Steps return results that are displayed in widgets. For example, a number widget displays the result of a calculation—that calculation is defined in a step. Steps can query a data source, like a dataset or a Salesforce object. They can also be a static list of user-defined values—a static step. You can reuse each step in multiple widgets. In addition to clipping a lens from an exploration, you can use the following ways to create steps in the Wave dashboard designer: use the widget wizard or create it manually.

5. [Make the Dashboard Widgets Interactive](#)

Analytics dashboards have unique features that allow you to make the widgets interactive. For example, widgets in the dashboard can be filtered to show only results for the region that’s selected in a list widget. Or, when the value of a number widget can change to red when it falls below a threshold.

6. [Set Initial Selections in the Dashboard](#)

If the Analytics dashboard contains selection-based filter widgets or charts, you can set initial selections that are applied when the dashboard first opens. For example, you can select a bar in a bar chart and set that as the initial selection. If the underlying step for the bar chart is faceted, other widgets with faceted steps are filtered based on this initial selection. While viewing the dashboard, a user can change the selection in the chart to filter the results differently or remove the selection and filters altogether.

7. [Generate Unique Analytics Dashboard Layouts for Different Devices](#)

After you add widgets to the dashboard, optimize the layout for each device on which the dashboards can be viewed. For example, you can remove widgets from a mobile phone layout to reduce the dashboard size for the smaller screen. You can also move widgets around in one layout and it doesn’t affect the other layouts.

8. [Optimize Dashboard Performance](#)

Before you finalize the dashboard, run a performance check on the dashboard and its steps to ensure that everything is running optimally. The dashboard inspector identifies different types of bottlenecks, like query issues and redundant queries, and provides recommendations to improve performance. Because dashboard layouts can contain different widgets (and steps), run the inspector on each layout. If a dashboard contains multiple pages, run the inspector on each page. The inspector provides results only for the current page.

9. [Keyboard Shortcuts for Analytics Dashboards and Lenses](#)

You can do some basic actions from your keyboard. The dashboard designer shortcuts vary based on whether you are using the classic designer or Wave dashboard designer.

SEE ALSO:

[What Is a Dashboard?](#)

[Best Practices for Building Your Own Analytics Dashboard](#)

[Convert Your Classic Designer Dashboard to Wave Dashboard Designer](#)

[Key Differences Between the Classic Designer and Wave Dashboard Designer](#)

[Grant Users Access to the Wave Dashboard Designer and Classic Designer](#)

Create an Analytics Dashboard with a Template

Each template has a unique layout with empty widgets (widgets without steps), sections, and a color scheme. To populate the widgets with your data, use the widget wizards. To create your own layout, choose the blank template.

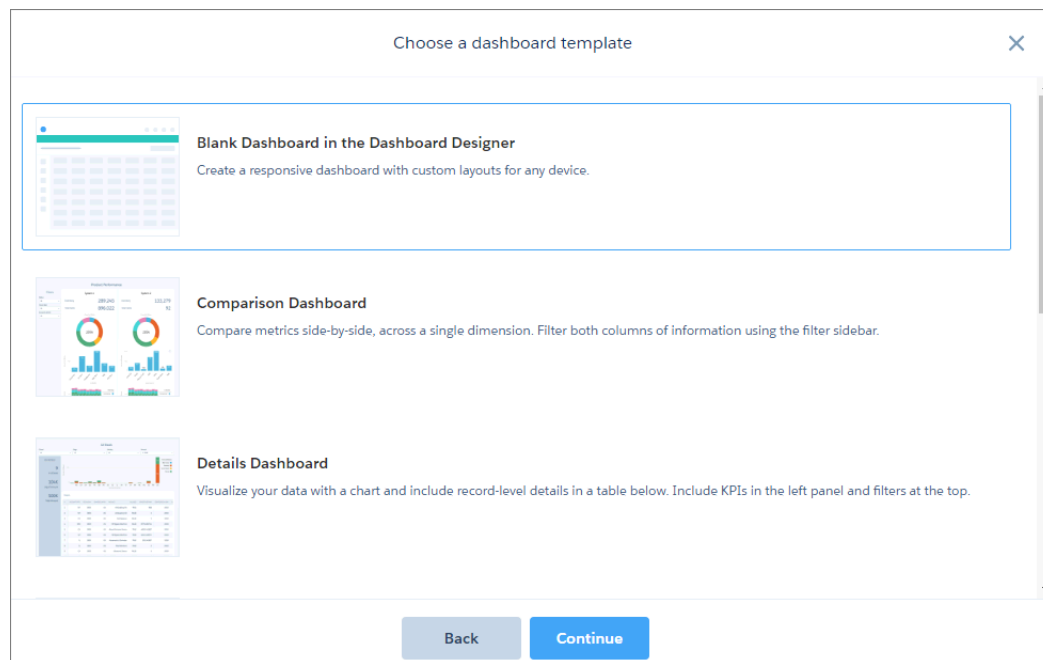
Watch a Demo: [🎥 Quickly Create Wave Dashboards with Templates \(English Only\)](#)

1. From the home page, select **Create > Dashboard**.

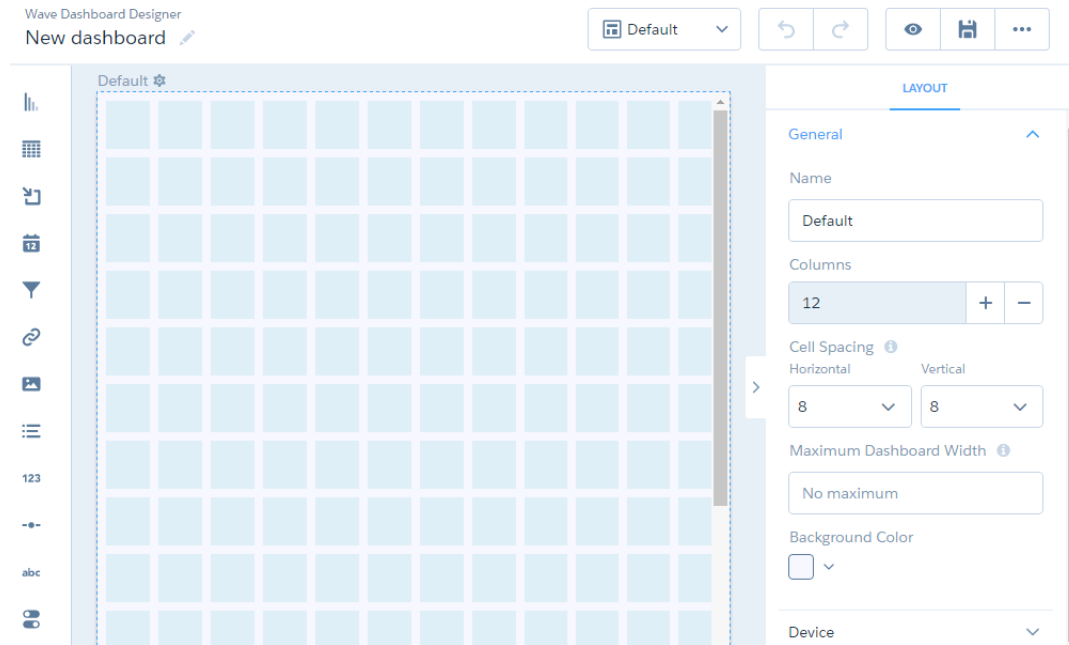
USER PERMISSIONS

To create a dashboard:




- Create and Edit Analytics Dashboards



2. Select a template, and then click **Continue**.
For example, select **Blank Dashboard in the Dashboard Designer**.



In addition to the blank template, you can choose a template with a prebuilt dashboard design. These templates are built for Wave dashboard designer only.

3. To edit the dashboard, click .
4. If you selected a prebuilt template, you can add a step to each widget by clicking the icon inside an empty widget. A wizard guides you through adding the step. When you complete the wizard, Analytics populates the widget based on the results of the step. Analytics also adds the step to the step panel.
5. To save the dashboard to an app, click .
6. Enter a title and description, and then select the app in which you want to save the dashboard. The permissions on the app determine each user's access to the dashboard. To ensure that the right users have the right access to the dashboard, review the app permissions.
7. Click **Save**.
8. Click  and then click **Dashboard Properties** to set the default widget properties. When you create a widget, you can specify whether the widget uses the default properties. Use defaults to ensure that the background and borders of all widgets are consistent.

IN THIS SECTION:

[Dashboard Properties](#)

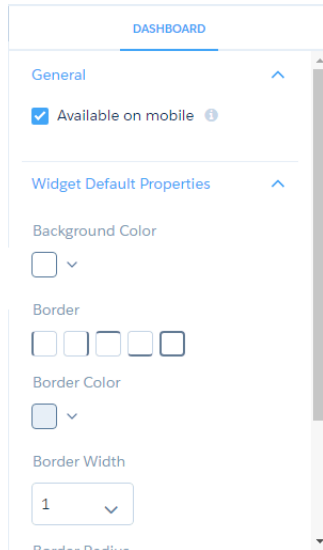
These properties apply to a Wave designer dashboard. Some of them are the default widget properties that you can apply to each widget to ensure a consistent appearance.

[Best Practices for Building Your Own Analytics Dashboard](#)

Follow best practices to design and build useful, effective Analytics dashboards, while minimizing rework and addressing potential gaps.

Dashboard Properties

These properties apply to a Wave designer dashboard. Some of them are the default widget properties that you can apply to each widget to ensure a consistent appearance.



General

Select **Available on mobile** to show this dashboard in the Einstein Analytics mobile app. When not selected, mobile users can't access this dashboard. Use this option to hide dashboards that don't perform well on the mobile app.

Widget Default Properties

Property	Description
Background Color	Default background color for widgets
Border	Default border around widgets
Border Color	Default color for widget borders
Border Width	Default width of widget borders (in pixels)
Border Radius	Default roundness of the corners of widget borders

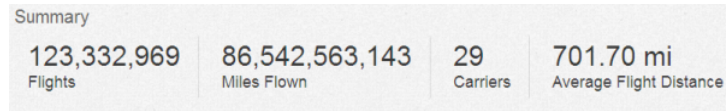
Best Practices for Building Your Own Analytics Dashboard

Follow best practices to design and build useful, effective Analytics dashboards, while minimizing rework and addressing potential gaps.

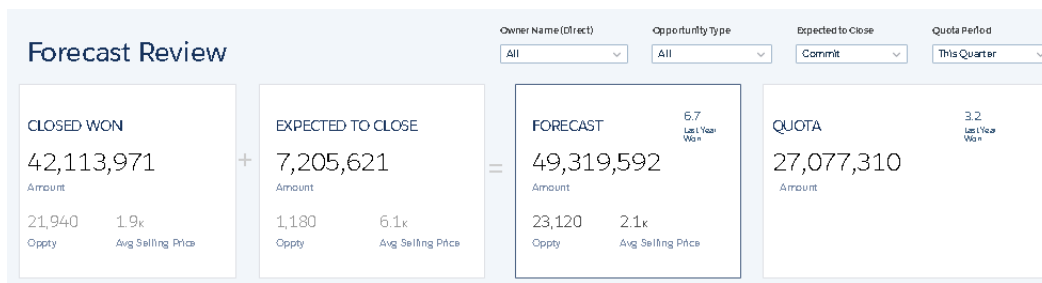
- Before you build the dashboard, take into account the following design best practices:
 - Sketch your dashboard on paper or a whiteboard before you start building.
 - Prioritize elements, top left to bottom right. With languages that are read left to right, people start by looking at the top left corner and working their way down. Consider the audience's language and design for it. If your audience has limited time or attention, place important elements where they will be noticed.

- Place high-level, easy-to-read, actionable widgets near the top left, and place widgets with supporting information lower. For example, place numbers that display a single measure, such as revenue for the current quarter, high and to the left.

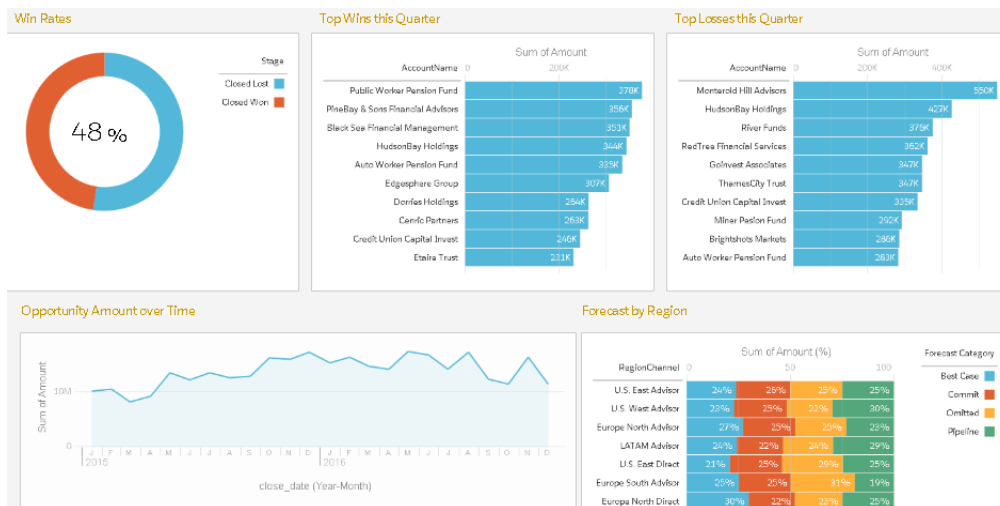
Highlight facts that the audience wants to know at a glance.



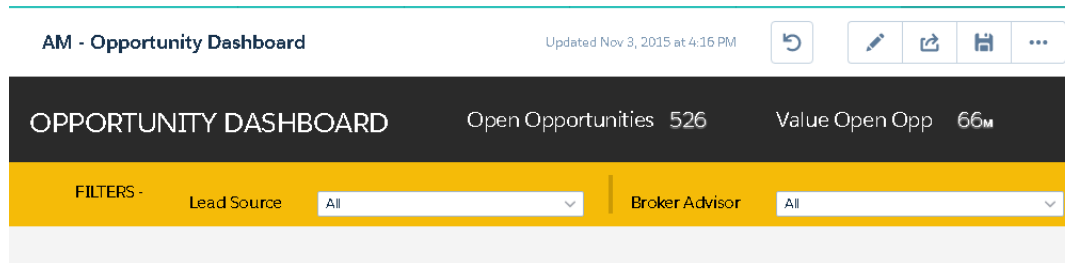
- Group filters together at the top or left so that they are quickly noticeable. You can use a container widget to section them off in the dashboard.
- Keep in mind that a chart in Analytics is primarily a way to ask questions, not a way to illustrate a conclusion. A good dashboard invites the audience to drill down and seek ever more focused and useful information.
- Choose chart types based on the characteristics of the data, not for look or variety. For example, if most of your charts display value changes over time, it's OK if they're all line graphs.
- If a chart seems to need a lengthy caption or title, reconsider whether the chart is doing its job. Well-chosen data often speaks for itself.
- Use container widgets to frame and organize related elements in the dashboard.



- While you build the dashboard:
 - Apply labels to sections and charts to annotate the dashboard.



- Use colors to define sections.



- Don't clutter the dashboard—leave some empty space. If needed, break a dashboard into a series of dashboards, using link widgets to help the user navigate them.
- After you build the dashboard:
 - Have users review the dashboard before making it final. You can post a dashboard to Chatter to get feedback. Users can annotate the widgets in the dashboard to have conversations about the content.

SEE ALSO:

[Build Analytics Dashboards](#)

[Build a Dashboard with the Classic Designer](#)

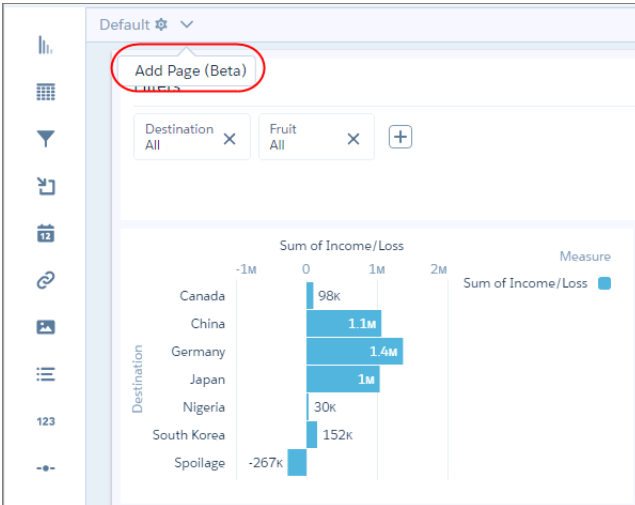
Create Dashboard Pages (Beta)


Split a dashboard into multiple, smaller chunks, called “pages,” to improve performance and make mobile dashboards less cluttered. Share widgets, steps, global filters, and selections across pages to keep the same focus as you go from one page to the next. For example, a selection in one page also filters the results of the other pages. When you open a page, Analytics calculates results for the widgets on that page only.

- 📌 **Note:** The Winter '18 release contains a beta version of the pages feature, which means it's a high-quality feature with known limitations. This feature isn't generally available unless or until Salesforce announces its general availability in documentation or in press releases or public statements. We can't guarantee general availability within any particular time frame or at all. Make your purchase decisions only on the basis of generally available products and features. You can provide feedback and suggestions for this feature in the [IdeaExchange](#).

Pages apply to the layout in which they're created. After you enable pages for a dashboard layout, you can't disable it. When you create a layout, all pages in the current layout are copied to the new layout.

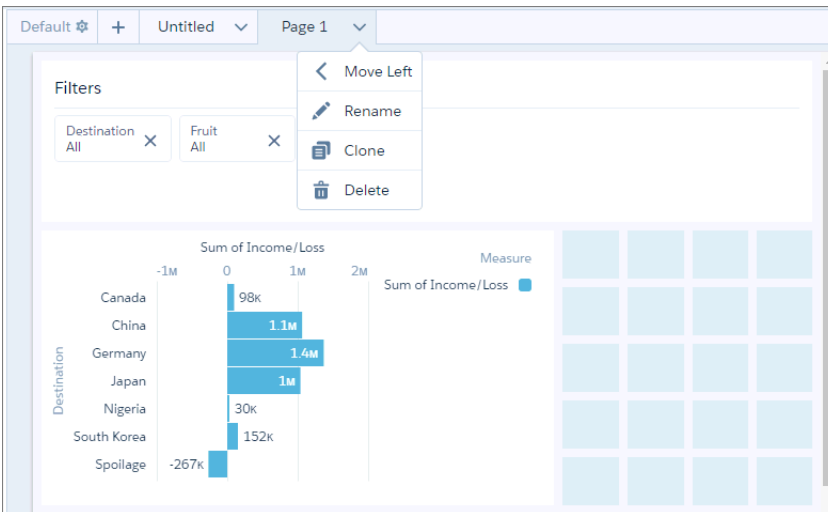
1. To enable pages for a dashboard, edit the dashboard, and then click **Add Page (Beta)** from the Layouts menu. Analytics adds a tab for the first page.




2. To add more pages, click .

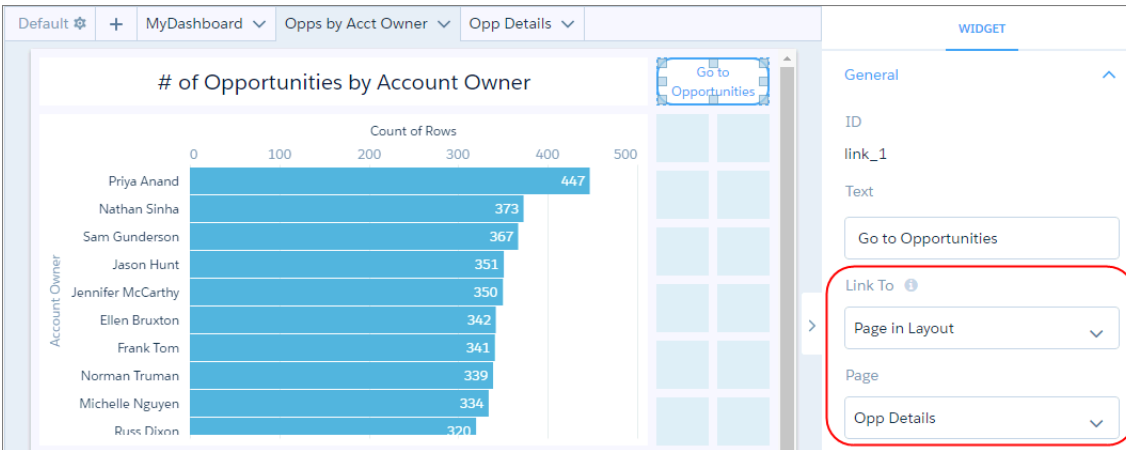
You can add up to five pages per dashboard per layout. Each page appears as a tab while editing the dashboard. When you preview a page, it looks just like a dashboard.

3. To perform an action on a page, like rename, clone, and delete, click the down arrow next to the page name and then select the action.



 **Note:** If you delete a page, Analytics also deletes its widgets from the dashboard if they aren't used in other pages or layouts. If they're used in other layouts, but not in other pages of the current layout, Analytics removes them from the current layout.

4. To change the order in which the pages appear in the Analytics mobile app, use the **Move Left** and **Move Right**. Mobile dashboard viewers swipe to navigate through the sequence of pages in the dashboard.
5. For non-mobile-app users, like the ones using a desktop browser, add link widgets to enable viewers to navigate through the pages. In the link widget properties, select **Page in Layout** in the Link To field and then select the page name in the Page field.



6. Save the dashboard to save changes to pages.

IN THIS SECTION:

[Manage Widgets on a Page](#)

You can move widgets to another page. To share them and their steps across pages, add them to other pages. If you no longer need a widget, delete it from the page.

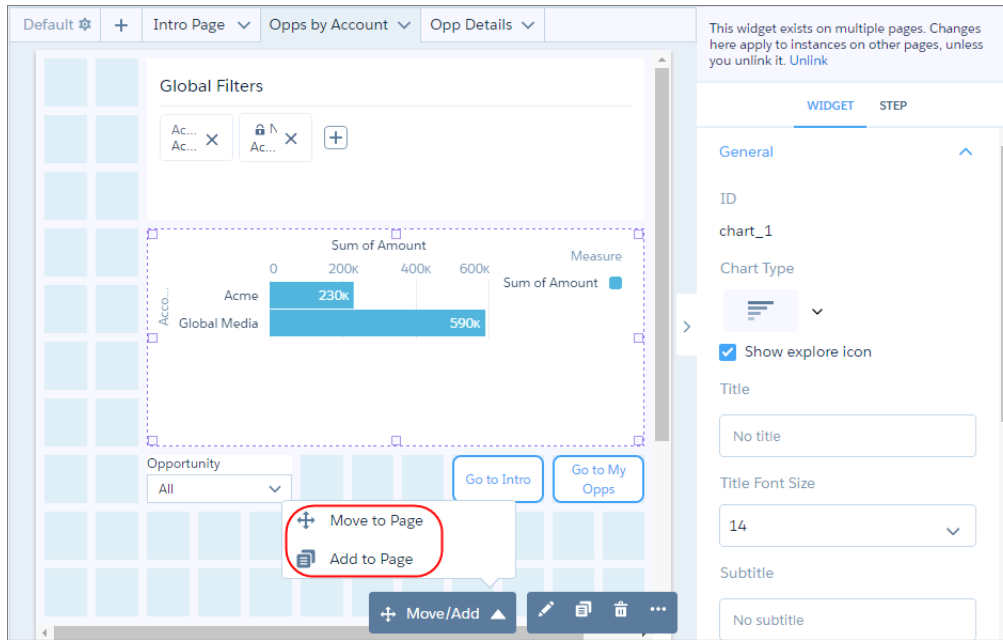
SEE ALSO:

[Add a Link Widget to Link to Other Assets](#)

Manage Widgets on a Page

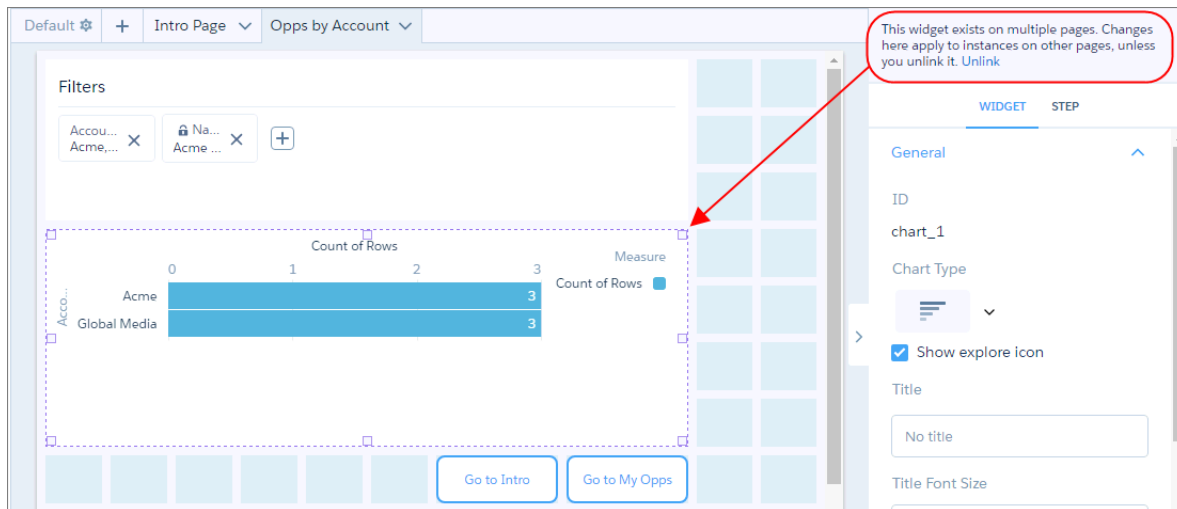
You can move widgets to another page. To share them and their steps across pages, add them to other pages. If you no longer need a widget, delete it from the page.

1. To move a widget to another page, select the widget, click **Move/Add** in the widget actions menu, and then click **Move to Page**.



2. To add a widget to another page, select **Add to Page**.

When you add a widget from one page to another, Analytics adds an instance of the same widget. If you change a widget property on one page, it affects all instances on other pages. If a widget is used in multiple pages, Wave dashboard designer highlights the widget in purple and adds a banner in the right pane when you select it.



3. To make a widget work independently from other instances, select the widget, and then click **Unlink** in the banner.

4. To delete a widget from the page, select the widget, and then press the Delete key.

If you delete a widget from a page:

- and the widget is used in other pages, Analytics removes the widget only from the current page.
- and the widget isn't used in other pages but is used in other layouts, Analytics removes it from the page and current layout.
- and the widget isn't used in other pages or layouts, Analytics deletes it from the dashboard.

- To save your changes, save the dashboard.

Add Widgets to the Dashboard

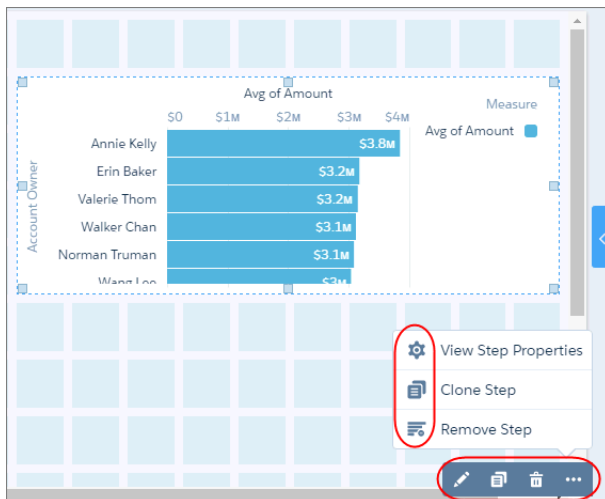
Widgets are the basic building blocks of a dashboard. In the Wave dashboard designer, you can add different widgets to perform functions. For example, widgets can calculate key performance indicators, filter dashboard results, visualize your data using interactive charts, and show record-level details in tables.

Watch a Demo: [▶ Get to Know Wave Dashboard Widgets \(English Only\)](#)

Widgets that display data require a step. A widget determines how to use or display the results returned by a step. For example, a step calculates the average opportunity amount, grouped by region. A bar chart widget displays the results in a bar chart format with each bar showing the average opportunity amount for a region. If the step is faceted, when you select a bar in the chart, other widgets are filtered, showing results for only the selected region.

Most widgets have a wizard that you can use to build the widget, including the underlying step. You can also build your own step and apply it to a widget. Multiple widgets can use the same step, unless it's a date or range widget. In that case, no other widgets can use the step.

Clone widgets to create similar looking components in an Analytics dashboard. For example, you can clone chart widgets and change the chart type to get a different view of the same results. You can also quickly create three number widgets and swap out their steps to show total open, total won, and total lost opportunity amounts. To swap out a step, remove the step from the widget and then add a new step to it. To clone widgets, remove steps, clone steps, and view step properties, select the widget while editing the dashboard, and then click the appropriate button.



To configure how a widget appears, set the properties in the Widget tab. For example, you can show data values and the axis title for a chart widget. You can also apply default properties to ensure that widgets look consistent, like having the same border and background color.

To configure how the widget behaves, set step properties in the Step tab. For example, you can choose which measure to display in the widget when its step contains multiple measures. Changes to step properties impact all widgets that are built on the step.

IN THIS SECTION:

[Add Number Widgets to Include Key Metrics](#)

Key metrics help you track critical measurements of your business. You can add other widgets to the Analytics dashboard to filter the key metric results to focus on a particular area. For example, you can show the total number of open cases or total opportunity amount for the last quarter or the northern region.

[Add Chart Widgets to Visualize Data](#)

Charts in an Analytics dashboard allow you to visually summarize and trend your data. For example, a donut chart can show the distribution of opportunities across industry type.

[Add a Global Filter Panel Widget to Filter Data from the Dashboard](#)

The panel can contain multiple global filters. Use a global filter to apply the same filter to multiple steps in the dashboard. For example, a dashboard has two charts comparing two sales reps' performance. To compare apples to apples, both charts must have the same filters. When possible, use a global filter instead of a selection-based filter to improve dashboard performance. If configured, users can change a global filter while viewing the dashboard.

[Add Selection-Based Filter Widgets to Enable Users to Filter the Results](#)

Users viewing the dashboard can make selections in these types of widgets, which filter the results of other faceted widgets. Selection-based filter widgets give users the ability to slice and dice the data to view results from different angles. For example, the dashboard viewer can select a region in a list widget to focus the dashboard results on a specific sales location. Unlike with a filter defined in a step's query, the viewer can filter the results differently (by making another selection) or remove the filter altogether.

[Add a Table Widget to Show Record Details and Create Calculated Columns](#)

You can add different types of tables to an Analytics dashboard. To view record-level details, add a values table. A values table can show record-level details, like how long a case has been open and who owns it. To create custom columns in a table based on calculations from existing fields, add a compare table. If the underlying step contains at least one grouping, you can create a pivot table.

[Add a Container Widget to Create Sections in the Dashboard](#)

Use a container in an Analytics dashboard to group related widgets. For example, you can use a container widget to create a filter panel on the left side of the dashboard to store all selection-based filter widgets. To distinguish the filter panel from the rest of the dashboard, you can apply a background color and border to the container. When you move this widget, the contained widgets also move while maintaining their spacing and alignment.

[Add an Image Widget to Display Graphics in the Dashboard](#)

You can include company logos to brand the Analytics dashboard, icons to categorize results, or graphics to animate the dashboard.

[Add Text Widgets to Label Parts of the Dashboard](#)

Label your Analytics dashboard so that users understand what they are looking at. You can also add text that describes the dashboard or provides usage information for widgets.

[Add a Link Widget to Link to Other Assets](#)

Instead of packing all possible key performance metrics, charts, and tables into a single dashboard, break up the content into multiple dashboards. Then use link widgets to tie the dashboards together. Dashboard viewers appreciate not having to figure out what to focus on in a busy dashboard. Also, use links to create analysis paths for users to follow or to link related assets, like dashboards, pages, steps, lenses, and even web pages.

[Widget Properties for Analytics Dashboards](#)

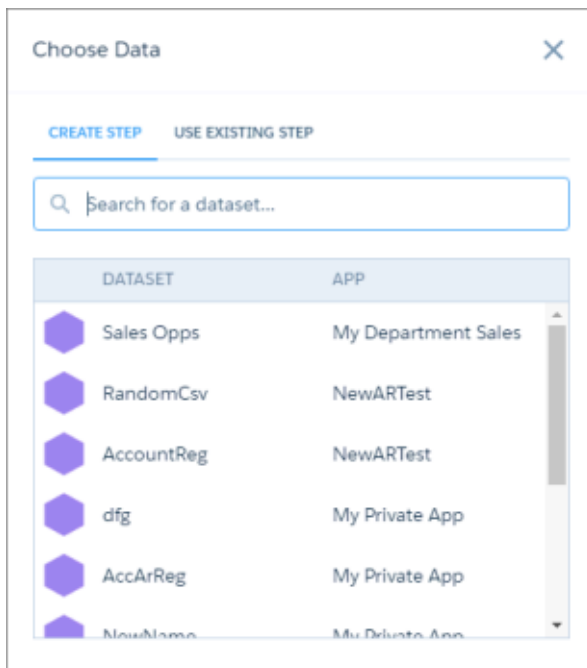
Widget properties define how widgets appear in the Analytics dashboard. For example, you can apply labels, backgrounds, and borders. To make widgets look consistent, you can set up default widget properties in the layout and then assign them to each widget. Widget properties vary based on the widget type and the designer used to create them. The properties listed here apply only to widgets created in the Wave dashboard designer.

Add Number Widgets to Include Key Metrics

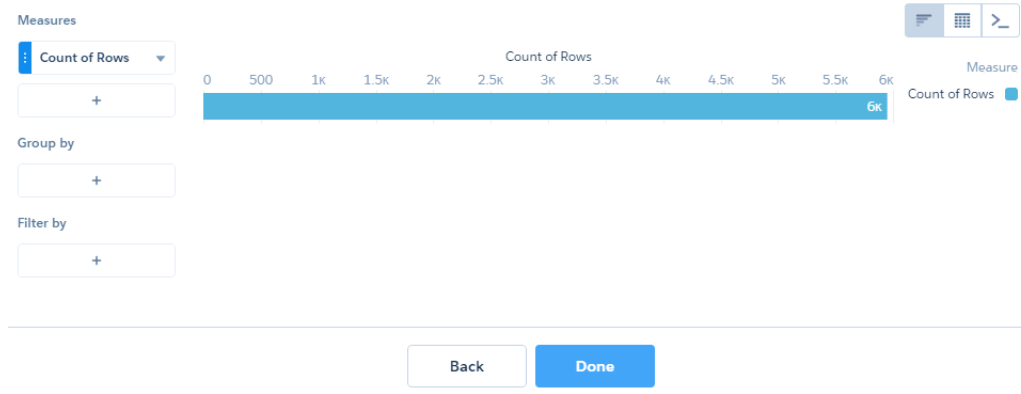
Key metrics help you track critical measurements of your business. You can add other widgets to the Analytics dashboard to filter the key metric results to focus on a particular area. For example, you can show the total number of open cases or total opportunity amount for the last quarter or the northern region.

The number widget requires a step that has at least one measure. If the step has multiple measures, you can choose which measure to display in the widget properties—by default, the first measure shows. If you include groupings, the widget displays the measure for the first group in the first defined grouping.

1. Drag the number widget to the dashboard canvas.
2. To open the wizard, click the button inside the widget.
 - One of the following screens appears.
 - The Choose Data screen appears, showing the most recently used datasets first. Select the dataset in the Create Step tab or select an existing step in the Use Existing Step tab.

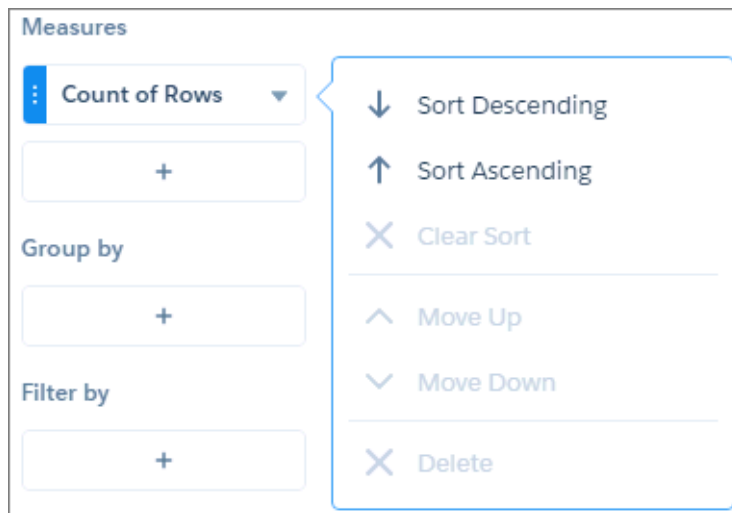


- The explorer appears, showing a bar chart with the Count of Rows measure. Analytics selects the dataset that you used to create the previous step. To use a different dataset or an existing step, click **Back**.

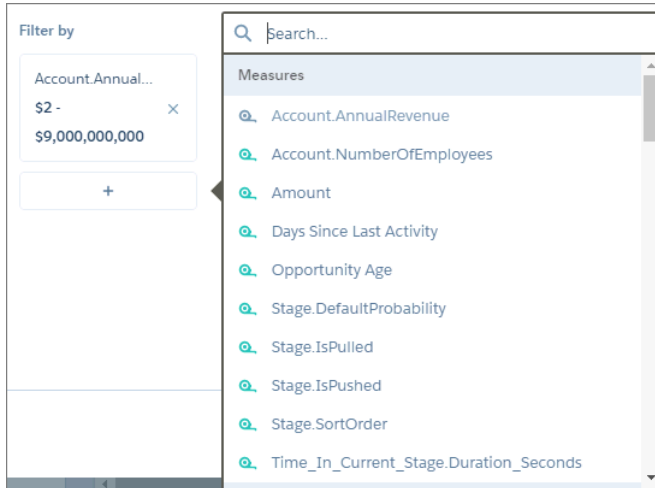


3. To create a step:

- a. In the explorer, click **Untitled Step** and enter the step label.
Analytics creates the step ID from the label. After you create the step, you can't change the step ID. Analytics refers to steps by their ID so dashboards don't break if you change the labels.
- b. To add a measure, click + under Measures.
To change a measure, select the measure and then choose a new one. To sort, reorder, or delete a measure, click the down arrow to the right of the measure and select the option.



- c. To add a filter, click + under Filter by, and then select the field to filter by.
You can add multiple filters. To delete the filter, click x .

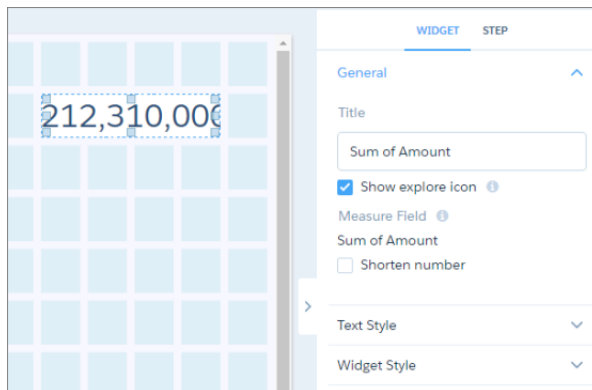


d. Click **Done**.

Analytics adds the step to the steps panel, making it available for use by other widgets in the dashboard. In addition, the widget shows the calculated measure.

4. To change the widget and step properties, select the widget.


The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.



5. To customize the appearance of the widget, set the widget properties.

When you set a property, the widget immediately shows the effects of your change.

6. To show and set the step properties, click **Step** in the right panel.

7. To preview your changes to the dashboard, click .

8. Save the dashboard.

SEE ALSO:

[Widget Properties for Analytics Dashboards](#)

[Step Properties for Analytics Dashboards](#)

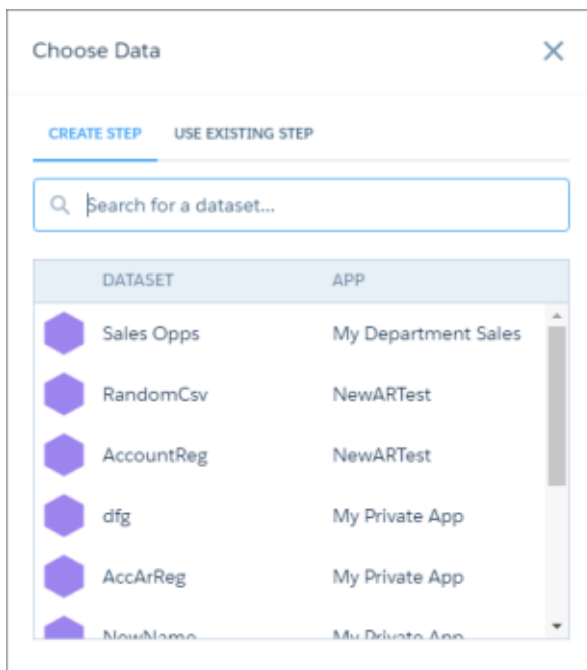
[Manage Steps for Widgets](#)

Add Chart Widgets to Visualize Data

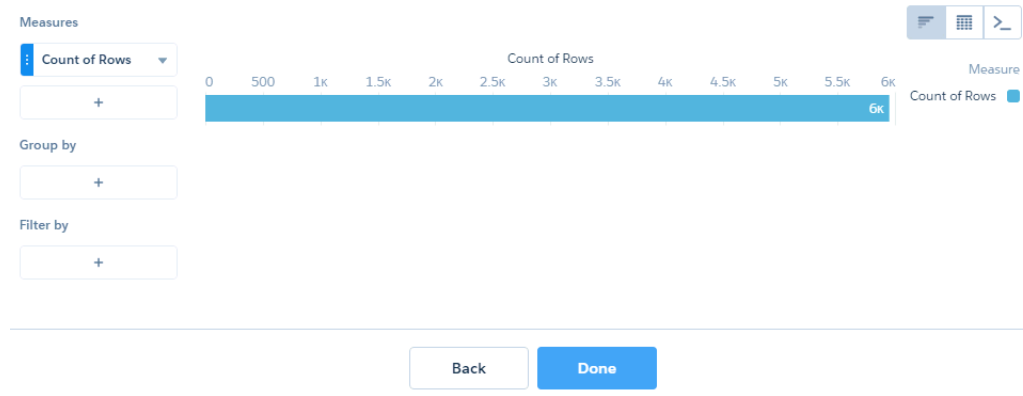
Charts in an Analytics dashboard allow you to visually summarize and trend your data. For example, a donut chart can show the distribution of opportunities across industry type.

Analytics supports multiple chart types. Each type has unique widget properties and step requirements. For details about each chart type, see [Visualizing Data With Charts](#).

1. Drag the chart widget to the dashboard canvas.
2. To open the wizard, click the button inside the widget.
 - One of the following screens appears.
 - The Choose Data screen appears, showing the most recently used datasets first. Select the dataset in the Create Step tab or select an existing step in the Use Existing Step tab.



- The explorer appears, showing a bar chart with the Count of Rows measure. Analytics selects the dataset that you used to create the previous step. To use a different dataset or an existing step, click **Back**.



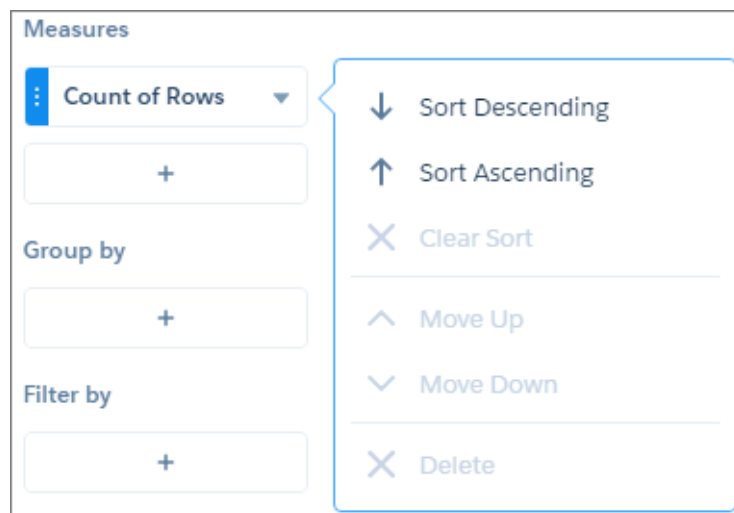
3. To create a step:

- a. In the explorer, click **Untitled Step** and enter the step label.

Analytics creates the step ID from the label. After you create the step, you can't change the step ID. Analytics refers to steps by their ID so dashboards don't break if you change the labels.

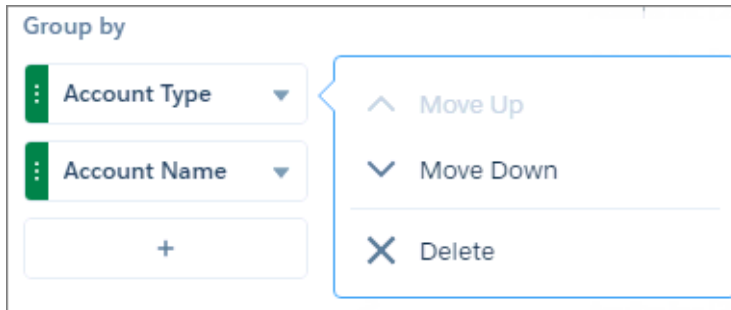
- b. To add a measure, click + under Measures.

To change a measure, select the measure and then choose a new one. To sort, reorder, or delete a measure, click the down arrow to the right of the measure and select the option.

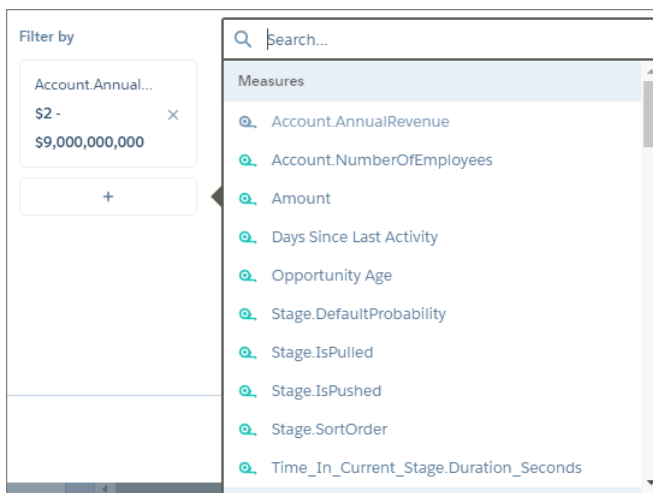



- c. To group the measures by a date or dimension, click + under Group by, and then select the field.

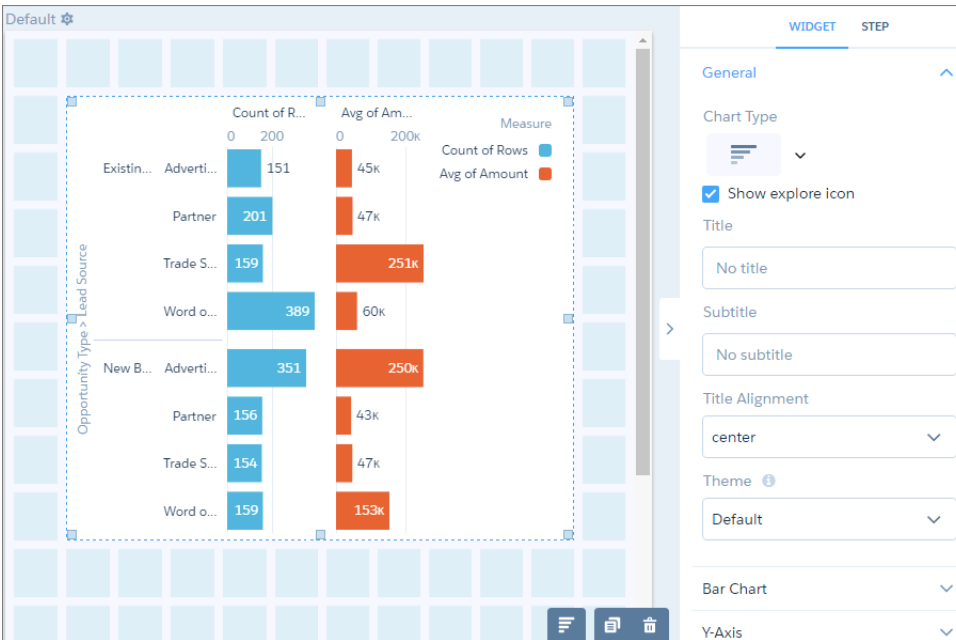
You can add multiple groupings. To change a grouping, click the grouping and select a new field. To reorder or delete a grouping, click the down arrow to the right of the grouping and then select the option.



- d. To add a filter, click **+** under Filter by, and then select the field to filter by. You can add multiple filters. To delete the filter, click **x**.




- e. To change the chart type, click  and then select the new one. Although Analytics saves the chart type with the step, you can override the chart type at the widget level by specifying a different chart in the widget properties. Setting the chart type at the widget level is useful when you use the same step for multiple widgets, but want to display the results differently in each widget.
- f. Click **Done**. Analytics adds the step to the steps panel, making it available for use by other widgets in the dashboard. In addition, the widget shows the results in a bar chart.
4. To change the widget and step properties, select the widget. The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.



- To customize the appearance of the widget, set the widget properties.
For example, select a different chart type in the Chart Type widget property.

- To show and set the step properties, click **Step** in the right panel.
For example, to enable this widget to filter other faceted widgets, select **Broadcast selections as facets**.

While viewing the dashboard, a user can select a segment of a chart to filter the results of other faceted widgets. To allow the viewer to make single or multiple selections, configure this widget's step properties. You can specify whether selections are optional or required. You can also set an initial selection that applies when the dashboard opens. While viewing the dashboard, viewers can undo the selection or change the selection to filter the results differently. For information about setting an initial selection, see [Set Initial Selections in the Dashboard](#).

- To preview your changes to the dashboard, click  .
- Save the dashboard.

IN THIS SECTION:

[Project the Same Step Results Differently in Charts and Tables](#)

If charts and tables use the same step, each widget can show a different set of fields from the step results. You can also specify a different field order for each widget. For example, to change the measure that appears on each axis in a scatter plot, reorder the measures for that widget.

SEE ALSO:

[Widget Properties for Analytics Dashboards](#)

[Step Properties for Analytics Dashboards](#)

[Manage Steps for Widgets](#)

Project the Same Step Results Differently in Charts and Tables

If charts and tables use the same step, each widget can show a different set of fields from the step results. You can also specify a different field order for each widget. For example, to change the measure that appears on each axis in a scatter plot, reorder the measures for that widget.

If charts and tables use the same step, each widget can show a different set of fields from the step results. You can also specify a different field order for each widget. For example, to change the measure that appears on each axis in a scatter plot, reorder the measures for that widget.

The following compare table step shows multiple measures grouped by a dimension. The Expected Amount measure is calculated based on the other two measures: Amount * Probability.

Calculate Expected Amount

Dataset Fields

↶
↷

Measures

- ⋮ Sum of Amount ▼
- ⋮ Max of Probab... ▼
- ⋮ Expected Amo... ▼

+

Group by

- ⋮ Name ▼

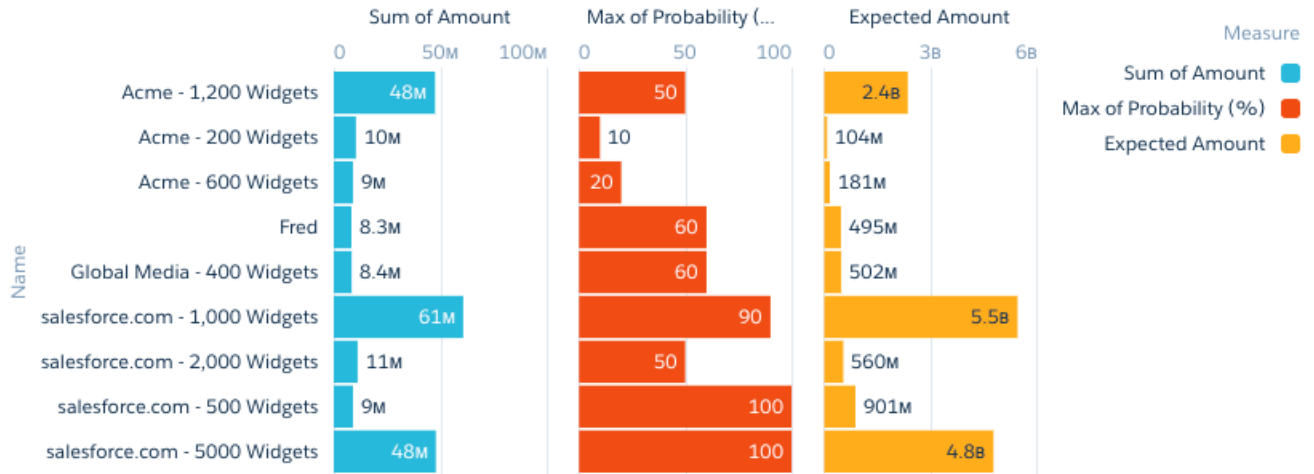
+

Filter by

Access filters from each measure's menu.

Name	Sum of Amount	Max of Probability (%)	Expected Amount
Acme - 1,200 Widgets	47,500,000	50	2,375,000,000
Acme - 200 Widgets	10,400,000	10	104,000,000
Acme - 600 Widgets	9,030,000	20	180,600,000
Fred	8,250,000	60	495,000,000
Global Media - 400 Widgets	8,360,000	60	501,600,000
salesforce.com - 1,000 Widgets	60,700,000	90	5,463,000,000
salesforce.com - 2,000 Widgets	11,200,000	50	560,000,000
salesforce.com - 500 Widgets	9,010,000	100	901,000,000
salesforce.com - 5000 Widgets	47,860,000	100	4,786,000,000

The following compare table step shows multiple measures grouped by a dimension. The Expected Amount measure is calculated based on the other two measures: Amount * Probability.



To show only the Expected Amount and Name fields for this widget, edit the widget and then select **Hide** for the other measures. (To show a hidden field, select **Show**. To reorder a field, select **Move Up** or **Move Down**.)

Calculate Expected Amount

Dataset Fields

↶
↷

Measures

- ... Sum of Amount
- ... Max of Probab...
- ... Expected Amo...

+

Group by

- ... Name

+

Filter by

Access filters from each measure's menu.

- ↓ Sort Descending
- ↑ Sort Ascending
- ⌵ Sort Within Groups (Desc)
- ⌶ Sort Within Groups (Asc)
- ✕ Clear Sort

- + Clone Column
- ✎ Edit this Column
- ⌵ Add a Filter

- ☰ Show as Bars
- 📄 Show as Values

- ⬆ Move Up
- ⬇ Move Down
- 🔌 Hide

- ✕ Delete

	Sum of Amount	Max of Probability (%)	Expected Amount
	47,500,000	50	2,375,000,000
	10,400,000	10	104,000,000
	9,030,000	20	180,600,000
	8,250,000	60	495,000,000
	8,360,000	60	501,600,000
	60,700,000	90	5,463,000,000
	11,200,000	50	560,000,000
	9,010,000	100	901,000,000
	47,860,000	100	4,786,000,000

Update


The following screenshot shows two charts based on the same step. The second chart shows the effect of hiding the other two measures.



The **Show** and **Hide** options are only available for `aggregateflex` (for compare tables) and `sql` step types. To show or hide fields for tables or charts based on other step types, configure the widget properties in the dashboard JSON. Add a `columns` attribute and specify the API names of the fields that you want to appear in the widget.

```
"chart_2": {
  "parameters": {
    "columns": [ "Name", "C" ],
    "visualizationType": "hbar",
    "step": "Amount_Prob_1",
    ...
  },
  "type": "chart",
  ...
}
```

Consider the following guidelines when configuring the `columns` JSON property.

- If fields are listed in `columns` and you add a measure or grouping to the step, the new field doesn't appear in the widget until you add it to `columns`.
 - If `columns` is not specified in the widget properties or is set to an empty array, the widget shows all fields available in the step results.
 - Analytics ignores fields specified in `columns` that don't exist in the step. If none of the fields in `columns` exist in the step, the widget doesn't show any fields.
 - The order in which you specify fields in `columns` is the order in which they appear in the widget.
-  **Note:** There are two ways to show, hide, or reorder columns. Do it by editing the step or editing the widget. If you perform these actions at the step level, your changes impact all widgets that use the step and can break widgets that use the step. For example, a widget breaks if you hide a required measure.

SEE ALSO:

[Add Chart Widgets to Visualize Data](#)

[Add a Table Widget to Show Record Details and Create Calculated Columns](#)

Add a Global Filter Panel Widget to Filter Data from the Dashboard

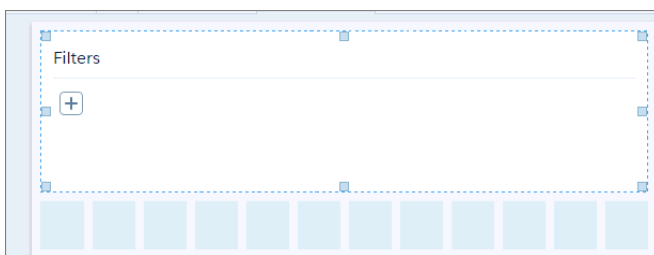
The panel can contain multiple global filters. Use a global filter to apply the same filter to multiple steps in the dashboard. For example, a dashboard has two charts comparing two sales reps' performance. To compare apples to apples, both charts must have the same filters. When possible, use a global filter instead of a selection-based filter to improve dashboard performance. If configured, users can change a global filter while viewing the dashboard.

Each global filter must be based on a single measure, dimension, or date field. You can't create a composite filter based on multiple fields, like Region="West" and Industry="CPG."

Global filters only apply to widgets that accept them. To apply global filters to a widget, select **Apply global filters** in the step properties of the widget. By default, Analytics applies global filters to all widgets that have steps that are based on the same dataset.

1. Drag the global filter panel widget to the dashboard canvas.

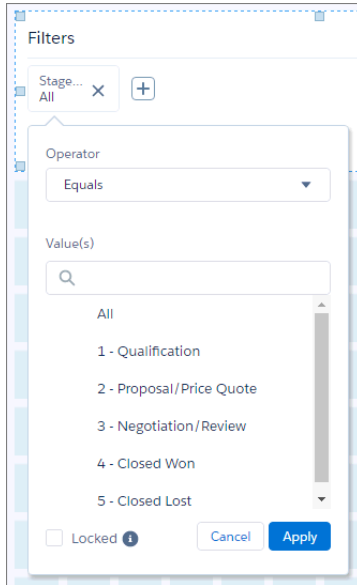
An empty panel appears in the designer.



 **Note:** If the dashboard contains a global filter created before Winter '18, a pop-up message asks if you want Analytics to convert it to the new version. If you agree, Analytics converts all global filters to the new design, showing all global filters in a panel. During the conversion, Analytics doesn't add unsupported global filters to the new global filter panel widget. Unsupported global filters are composite filters and invalid ones that reference datasets or fields that don't exist. If you don't convert to the new design, you can continue to use the legacy global filter, but can't add global filters to the dashboard.

2. To add a global filter to the panel:

- a. Click **+**.
- b. Select a dataset field and click **Create**.
To use a different dataset, click **Change Dataset**.
- c. Select the filter operator and field values.



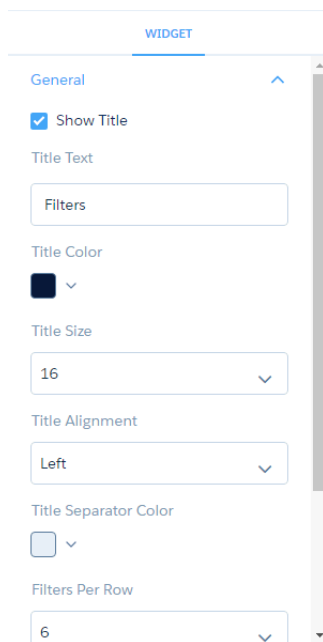
- d. To prevent users viewing the dashboard from changing the global filter, select **Locked**.


The Locked option also ensures that incoming filters passed from a linked dashboard don't override the global filter. If the global filter is locked and the incoming filter is defined on the same field, Analytics ignores the incoming filter. If it's unlocked, the incoming filter overrides the global filter defined in the dashboard.

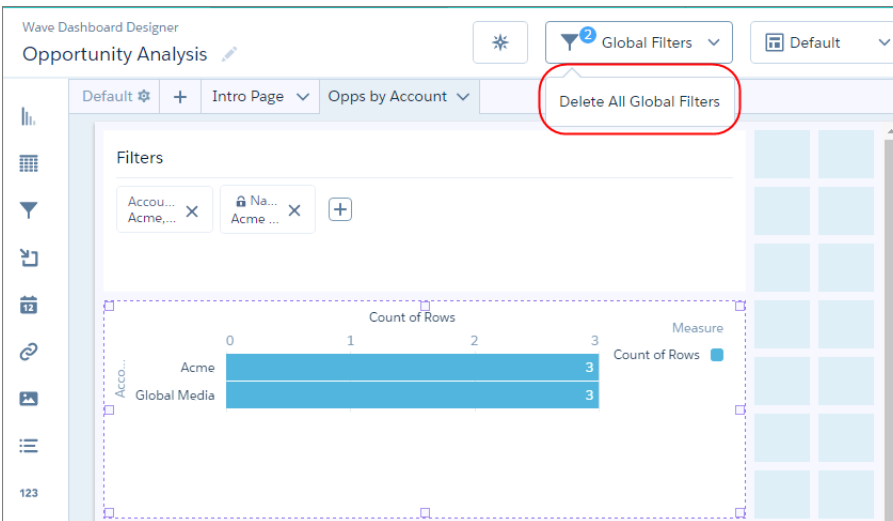
- e. Click **Apply**.

- 3. To change the widget properties, click the widget.


The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.



4. To customize the appearance of the widget, set the widget properties.
When you set a property, the widget immediately shows the effects of your change.
5. To edit a global filter in the panel, click it.
6. To delete a global filter from the panel, click .
7. To delete all global filters from the dashboard, while editing the dashboard, click the down arrow inside the Global Filters button, and then click **Delete All Global Filters**.



 **Note:** If you delete the global filter panel widget, Analytics removes the panel from the dashboard, but the global filters still apply. To delete the global filters, use this procedure.

8. To preview your changes to the dashboard, click .
9. Save the dashboard.

SEE ALSO:

[Widget Properties for Analytics Dashboards](#)

[Step Properties for Analytics Dashboards](#)

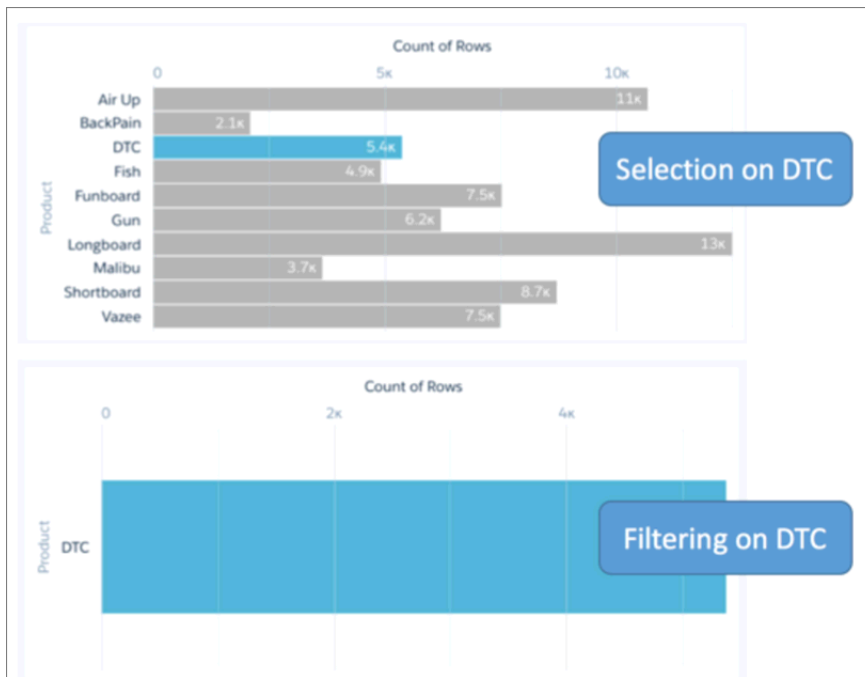
[Manage Steps for Widgets](#)

Add Selection-Based Filter Widgets to Enable Users to Filter the Results

Users viewing the dashboard can make selections in these types of widgets, which filter the results of other faceted widgets. Selection-based filter widgets give users the ability to slice and dice the data to view results from different angles. For example, the dashboard viewer can select a region in a list widget to focus the dashboard results on a specific sales location. Unlike with a filter defined in a step's query, the viewer can filter the results differently (by making another selection) or remove the filter altogether.

A selection-based filter is different from a query filter. When a selection is made, all values in the step's original query still appear in the widget, just with particular values highlighted. However, a query filter modifies the step's query, reducing the number of results that appear in the widget. A global filter is a query filter that can be applied to multiple steps in a dashboard.

The following illustration shows the difference between a selection and a query filter on the same step.



You can create different types of selection-based filter widgets based on measure, date, and dimension fields. You can also set an initial selection for each of them. For example, when the viewer opens the dashboard, the date widget can select last year, by default, to show dashboard results for last year only.

IN THIS SECTION:

[Add a Date Widget to Filter Dashboard Results Based on a Date](#)

A date filter widget allows dashboard viewers to filter the Analytics dashboard results based on a selected date range. The range can use relative dates based on UTC (like last month) or absolute dates (like 1/15/2016). For example, you can add a date widget to filter support cases, showing only cases that closed this month or last month.

[Add a List Widget to Filter Dashboard Results Based on a Dimension](#)

A list filter widget allows dashboard viewers to filter the Analytics dashboard results based on a dimension. For example, a list widget can filter results based on a particular case status or region.

[Add a Range Widget to Filter Dashboard Results Based on a Measure](#)

A range widget allows dashboard viewers to filter the Analytics dashboard results based on a range of values for a measure. For example, a range widget can show only opportunities with amounts between \$100,000 and \$900,000.

[Add a Toggle Widget to Filter Dashboard Results Based on a Dimension](#)

A toggle widget allows dashboard viewers to filter the Analytics dashboard results based on a date or dimension. For example, a toggle widget can show results based on a specific record type.

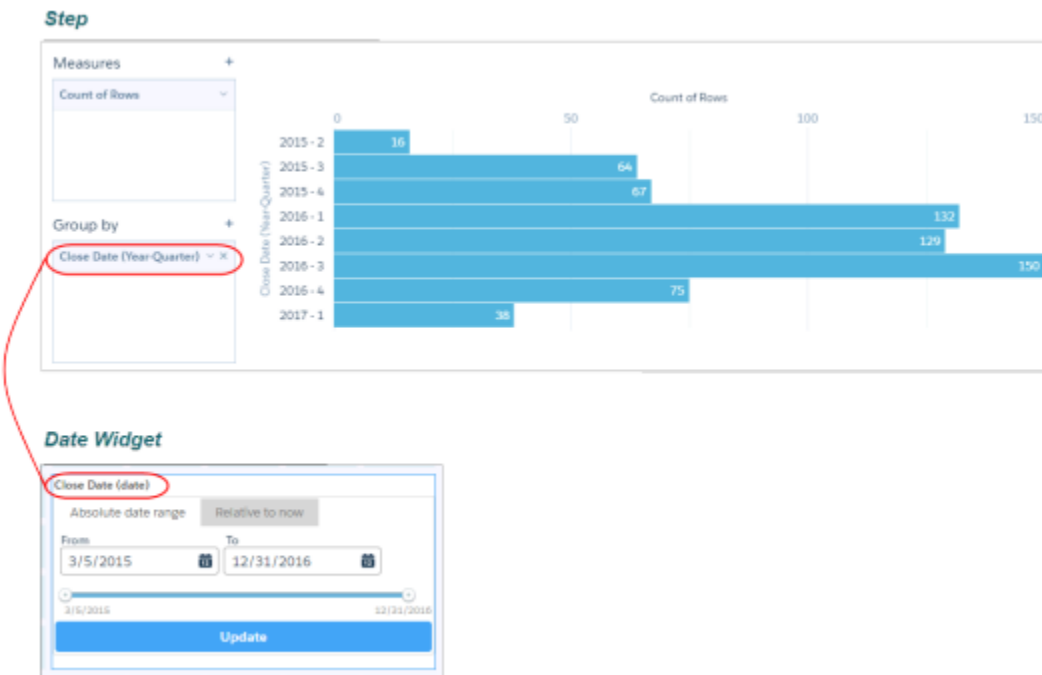
SEE ALSO:

[Set Initial Selections in the Dashboard](#)

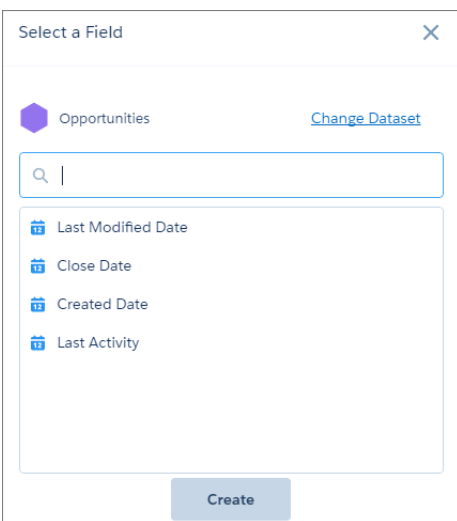
Add a Date Widget to Filter Dashboard Results Based on a Date

A date filter widget allows dashboard viewers to filter the Analytics dashboard results based on a selected date range. The range can use relative dates based on UTC (like last month) or absolute dates (like 1/15/2016). For example, you can add a date widget to filter support cases, showing only cases that closed this month or last month.

The date widget requires a step that has a single grouping based on a date field.



1. Drag the date widget to the dashboard canvas.
2. To open the wizard, click the button inside the widget.
The Select a Field screen appears, showing a list of all date fields in the specified dataset.



3. To use a different dataset, click **Change Dataset**.

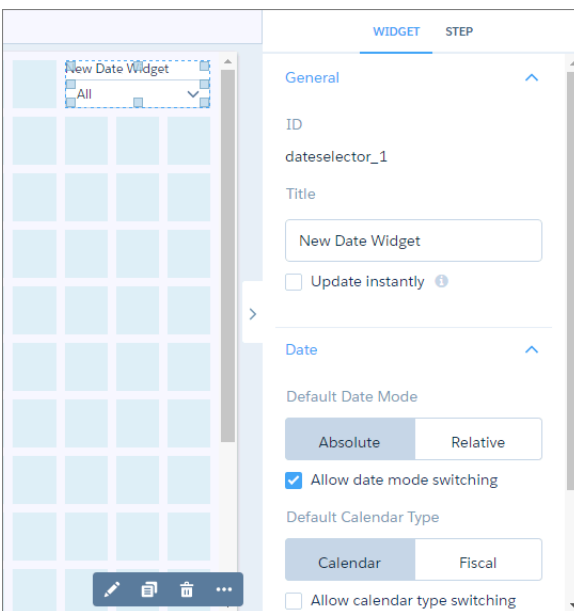
4. Select the field that you want to filter on.

5. Click **Create**.

Behind the scenes, Analytics creates a step grouped by the field that you selected. Analytics adds the step to the steps panel, making it available for use by other widgets in the dashboard. When viewing the dashboard, the widget shows the absolute date range, which spans from the minimum to the maximum values of the date field. Analytics doesn't apply any selections to the widget, by default.

6. To change the widget and step properties, select the widget.

The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.



7. To customize the appearance of the widget, set the widget properties.

When you set a property, the widget immediately shows the effects of your change.

8. To show and set the step properties, click **Step** in the right panel.

For example, to enable this widget to filter other faceted widgets, select **Broadcast selections as facets**.

9. To preview your changes to the dashboard, click .

10. Save the dashboard.

You can set an initial selection that applies when the dashboard opens. The selected range filters other faceted widgets. While viewing the dashboard, viewers can change the selection to filter the results differently. For information about setting an initial selection, see [Set Initial Selections in the Dashboard](#).

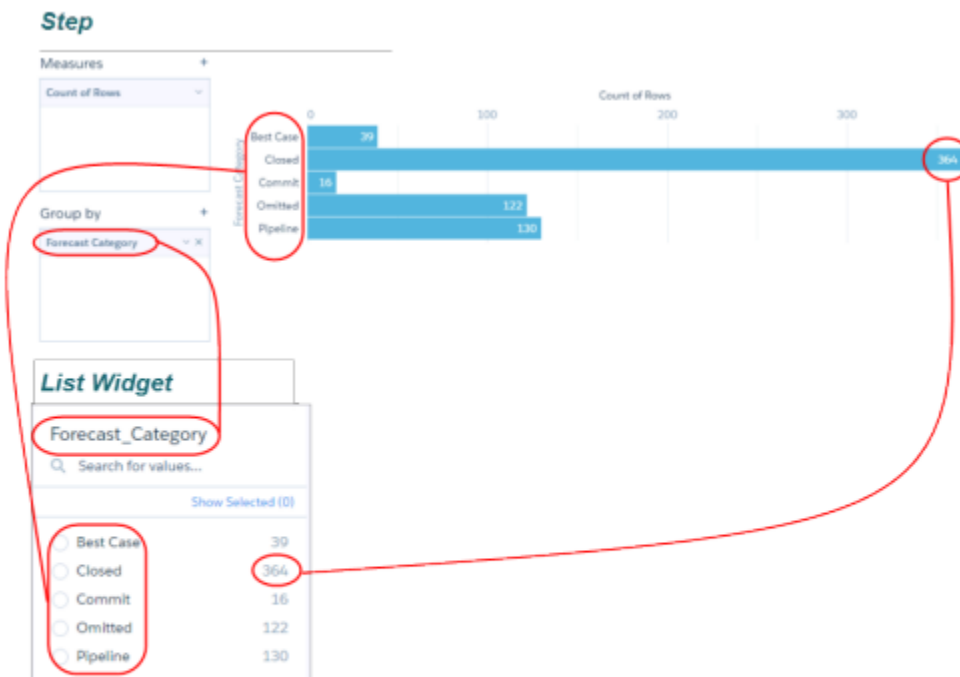
SEE ALSO:


- [Widget Properties for Analytics Dashboards](#)
- [Step Properties for Analytics Dashboards](#)
- [Manage Steps for Widgets](#)

Add a List Widget to Filter Dashboard Results Based on a Dimension

A list filter widget allows dashboard viewers to filter the Analytics dashboard results based on a dimension. For example, a list widget can filter results based on a particular case status or region.

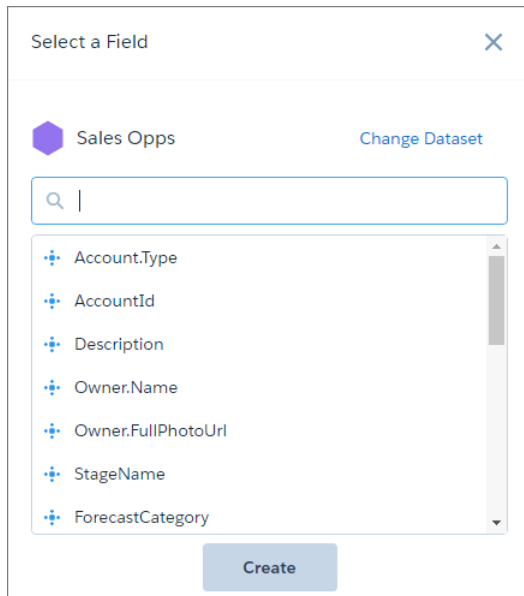
The list widget requires a step that has a single grouping based on a dimension. The values of the grouping appear as the values in the list.



 **Note:** You can also create a static step to specify a custom list of values for the list widget. For more information, see [Create a Static Step with Custom Values](#).

1. Drag the list widget to the dashboard canvas.
2. To open the wizard, click the button inside the widget.

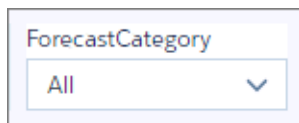
The Select a Field screen appears, showing a list of all dimension fields in the specified dataset.



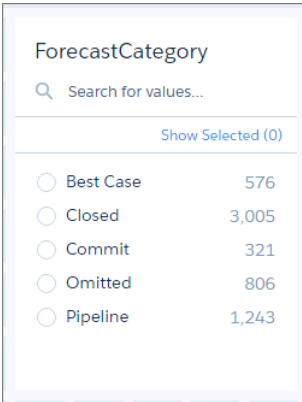
3. To use a different dataset, click **Change Dataset**.
4. Select the field that you want to filter on.
5. Click **Create**.

 **Tip:** To create a user-defined list of values instead of using values from a dataset, click **Customize**.

Behind the scenes, Analytics creates a step grouped by the field that you selected. Analytics adds the step to the steps panel, making it available for use by other widgets in the dashboard. In addition, by default, the list widget is collapsed and Analytics doesn't apply any selections to the widget.



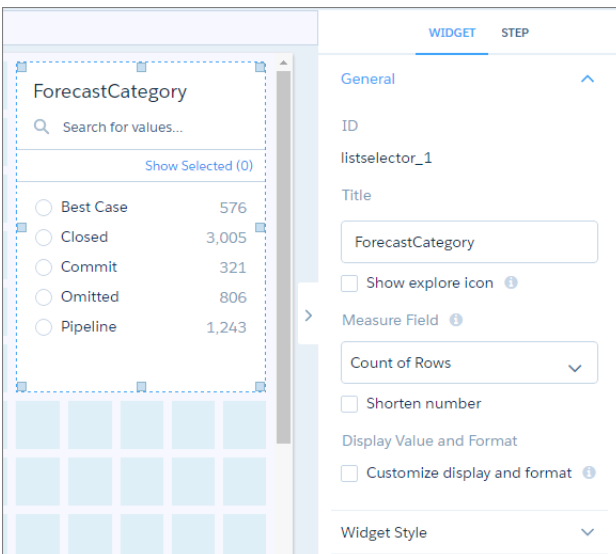
6. To expand the list and show more values, increase the size of the widget.



 **Note:** If you don't expand the list, when a user views the dashboard, they can select the drop-down arrow to see the values in the list.

- To change the widget and step properties, select the widget.

The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.




- To customize the appearance of the widget, set the widget properties.

When you set a property, the widget immediately shows the effects of your change.

- To show and set the step properties, click **Step** in the right panel.

For example, to enable this widget to filter other faceted widgets, select **Broadcast selections as facets**.

While viewing the dashboard, a user can select a dimension in this widget to filter other faceted widgets. To allow the viewer to make single or multiple selections, configure this widget's step properties. You can specify whether selections are optional or required. You can also set an initial selection that applies when the dashboard opens. While viewing the dashboard, viewers can undo the selection or change the selection to filter the results differently. For information about setting an initial selection, see [Set Initial Selections in the Dashboard](#).

10. To preview your changes to the dashboard, click .
11. Save the dashboard.

SEE ALSO:

- [Widget Properties for Analytics Dashboards](#)
- [Step Properties for Analytics Dashboards](#)
- [Manage Steps for Widgets](#)

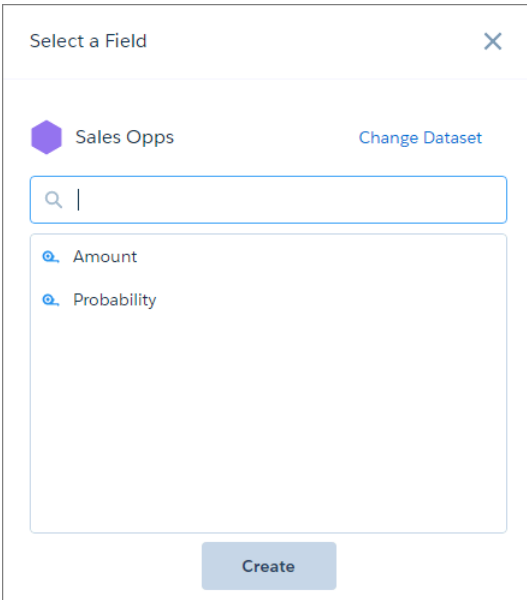
Add a Range Widget to Filter Dashboard Results Based on a Measure

A range widget allows dashboard viewers to filter the Analytics dashboard results based on a range of values for a measure. For example, a range widget can show only opportunities with amounts between \$100,000 and \$900,000.

The range widget requires a step that has a single measure and no groupings.



1. Drag the range widget to the dashboard canvas.
2. To open the wizard, click the button inside the widget.
The Select a Field screen appears, showing a list of all measure fields in the specified dataset.



3. To use a different dataset, click **Change Dataset**.

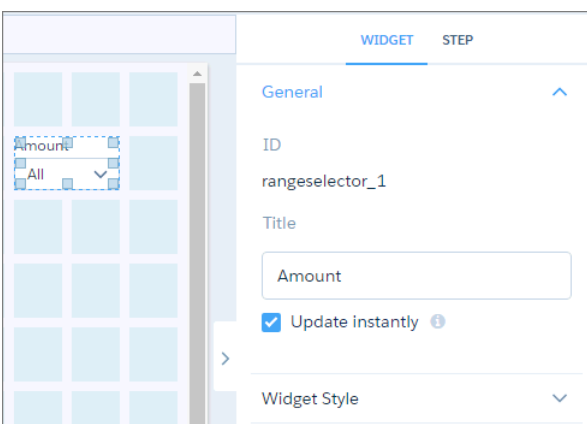
4. Select the field that you want to filter on.

5. Click **Create**.

Behind the scenes, Analytics creates a step with the measure that you selected. Analytics adds the step to the steps panel, making it available for use by other widgets in the dashboard. Analytics doesn't apply any selections to the widget.

6. To change the widget and step properties, select the widget.

The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.




7. To customize the appearance of the widget, set the widget properties.

When you set a property, the widget immediately shows the effects of your change.

8. To show and set the step properties, click **Step** in the right panel.

For example, to enable this widget to filter other faceted widgets, select **Broadcast selections as facets**.

9. To preview your changes to the dashboard, click  .
The default range shown is the minimum to the maximum values of the measure.
10. Save the dashboard.

You can set an initial selection that applies when the dashboard opens. The selected range filters other faceted widgets. While viewing the dashboard, viewers can change the selection to filter the results differently. For information about setting an initial selection, see [Set Initial Selections in the Dashboard](#) .

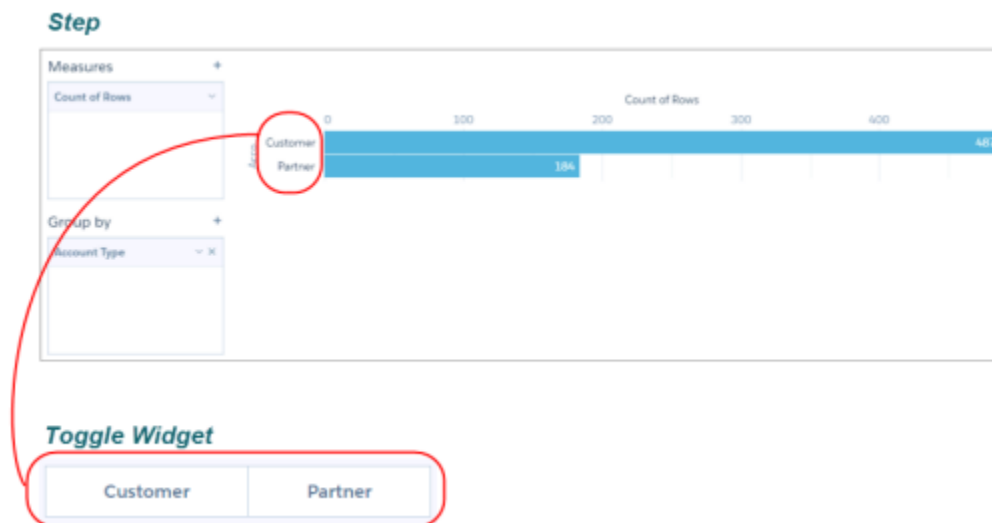
SEE ALSO:


- [Widget Properties for Analytics Dashboards](#)
- [Step Properties for Analytics Dashboards](#)
- [Manage Steps for Widgets](#)

Add a Toggle Widget to Filter Dashboard Results Based on a Dimension

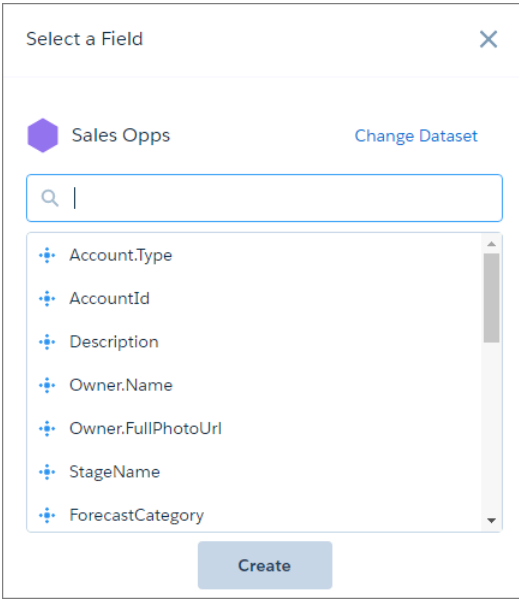
A toggle widget allows dashboard viewers to filter the Analytics dashboard results based on a date or dimension. For example, a toggle widget can show results based on a specific record type.

The toggle widget requires a step that has a single grouping based on a dimension. The values of the grouping appear as the toggle options.



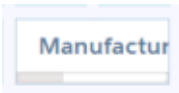
 **Note:** You can also create a static step to specify a custom list of values for the toggle widget. For more information, see [Create a Static Step with Custom Values](#).

1. Drag the toggle widget to the dashboard canvas.
2. To open the wizard, click the button inside the widget.
The Select a Field screen appears, showing a list of all dimension fields in the specified dataset.



3. To use a different dataset, click **Change Dataset**.
4. Select the field that you want to filter on.
5. Click **Create**.

Behind the scenes, Analytics creates a step grouped by the field that you selected. Analytics adds the step to the steps panel, making it available for use by other widgets in the dashboard. Analytics doesn't apply any selections to the widget.

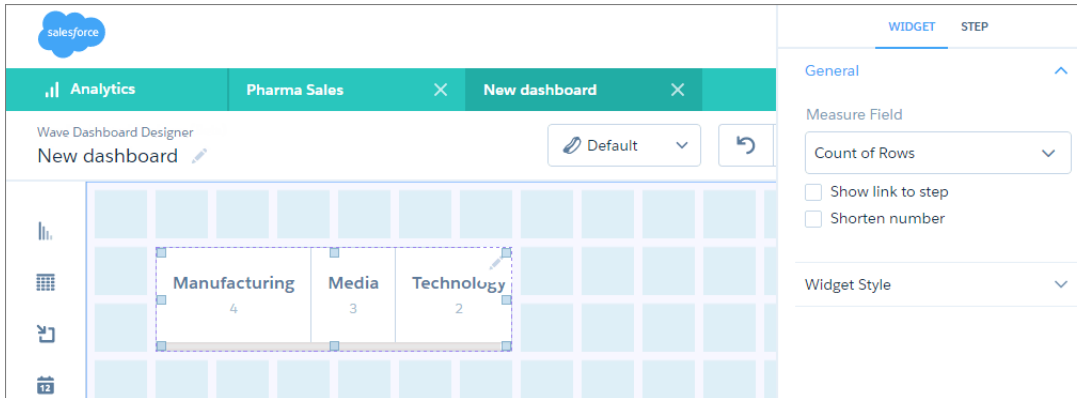



6. If needed, increase the size of the widget to show the display names of all toggle options.



7. To change the widget and step properties, select the widget.

The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.



8. To customize the appearance of the widget, set the widget properties.
When you set a property, the widget immediately shows the effects of your change.
9. To show and set the step properties, click **Step** in the right panel.
For example, to enable this widget to filter other faceted widgets, select **Broadcast selections as facets**.
While viewing the dashboard, a user can select a toggle option in this widget to filter other faceted widgets. To allow the viewer to make single or multiple selections, configure this widget's step properties. You can specify whether selections are optional or required. You can also set an initial selection that applies when the dashboard opens. While viewing the dashboard, viewers can undo the selection or change the selection to filter the results differently. For information about setting an initial selection, see [Set Initial Selections in the Dashboard](#).
10. To preview your changes to the dashboard, click .
11. Save the dashboard.

SEE ALSO:

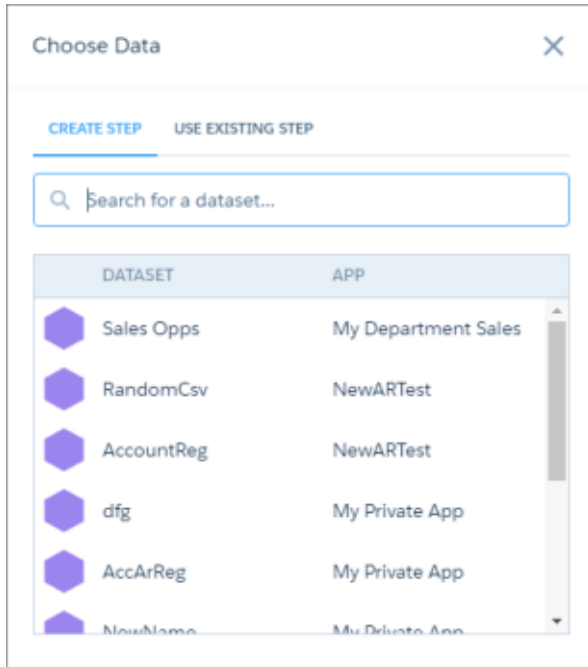
- [Widget Properties for Analytics Dashboards](#)
- [Step Properties for Analytics Dashboards](#)
- [Manage Steps for Widgets](#)

Add a Table Widget to Show Record Details and Create Calculated Columns

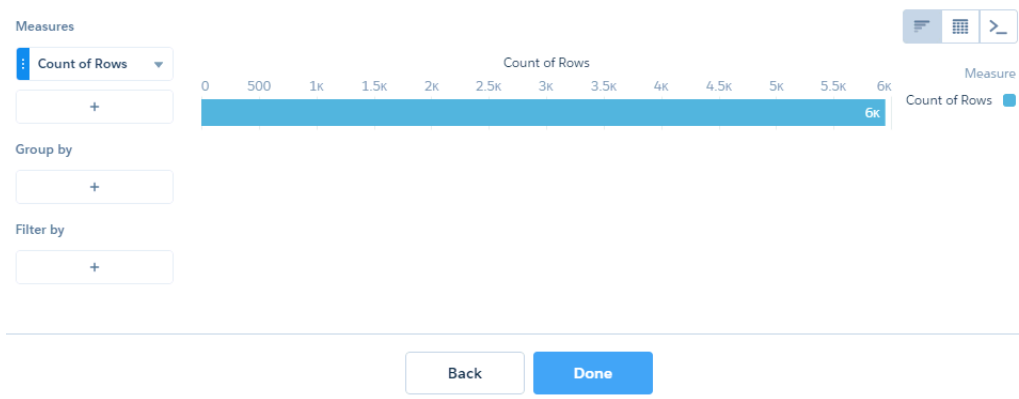
You can add different types of tables to an Analytics dashboard. To view record-level details, add a values table. A values table can show record-level details, like how long a case has been open and who owns it. To create custom columns in a table based on calculations from existing fields, add a compare table. If the underlying step contains at least one grouping, you can create a pivot table.


The steps vary depending on the type of table you create. For a values table, choose which dataset fields to show as columns. For a compare table, select which dataset fields to show as columns and define the calculations for custom columns. For a pivot table, define at least one grouping. The values of the last grouping appear as columns.

1. Drag the table widget to the dashboard canvas.
2. To open the wizard, click the button inside the widget.
One of the following screens appears.
 - The Choose Data screen appears, showing the most recently used datasets first. Select the dataset in the Create Step tab or select an existing step in the Use Existing Step tab.



- The explorer appears, showing a bar chart with the Count of Rows measure. Analytics selects the dataset that you used to create the previous step. To use a different dataset or an existing step, click **Back**.



3. To create a step:
 - a. In the explorer, click **Untitled Step** and enter the step label. Analytics creates the step ID from the label. After you create the step, you can't change the step ID. Analytics refers to steps by their ID so dashboards don't break if you change the labels.
 - b. .
 - c. Select  and then choose the table type.

Values table

Use to show dataset fields as columns. You can add, remove, and reorder columns. You can also add filters.

Columns

#	Close Date	Opportunity Name	Opportunity Owner	Forecast Category	Stage
1	2015-04-29	Opportunity for Bryan [1]	Sam Gunderson	Omitted	Closed Lost
2	2014-06-07	Opportunity for Farmer [2]	Nathan Sinha	Closed	Closed Won
3	2014-12-04	Opportunity for Allison [3]	Leslie Pham	Closed	Closed Won
4	2014-07-17	Opportunity for Owen [4]	Leslie Pham	Closed	Closed Won
5	2013-08-15	Opportunity for Byrd [5]	Nathan Sinha	Omitted	Closed Lost
6	2013-04-23	Opportunity for Norton [6]	Jennifer McCarthy	Closed	Closed Won
7	2016-07-31	Displaytech - Add-On Business - 15K	Ellen Bruxton	Omitted	Negotiation/Review
8	2016-08-24	Opportunity for Reed [8]	Wang Lee	Pipeline	Qualification
9	2016-05-12	Opportunity for Griffith [9]	Valerie Thom	Omitted	Closed Lost
10	2014-10-24	Opportunity for Bush [10]	Bill Johnson	Closed	Closed Won
11	2015-08-18	Opportunity for Bennett [11]	Jennifer McCarthy	Omitted	Closed Lost
12	2015-02-26	Opportunity for Gordon [12]	Wang Lee	Closed	Closed Won

Compare table

Use to add calculated columns to the table. By default, the table shows the previously selected measure as the first column. You can add measures and filters, and group by dimensions. To add a calculated column, click the down arrow next to a measure, and select **Clone Column** and then edit the new column.

Account_Type_Account_1

Account_Type_Account_1

Measures

- Count of Rows

Group by

- Account Type
- Account Source
- Billing Country
- Account Name

Filter by

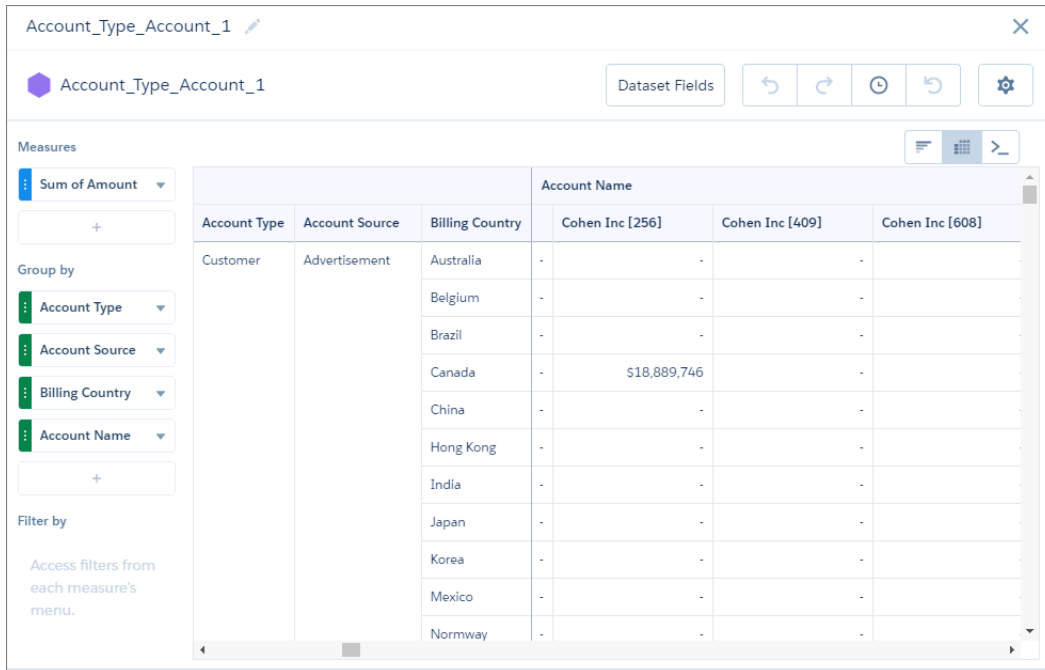
Access filters from each measure's menu.

Billing Country	Account Name	Count of Rows
Australia	Chandler Inc [627]	8
	May Inc [1039]	1
	Sharp Inc [465]	5
	Walsh Inc [662]	2
	Wells Inc [744]	3
Belgium	Estrada Inc [459]	5
	Gregory Inc [123]	5
Brazil	Carroll Inc [652]	5
	Newman Inc [1]	6
	Richardson Inc [...]	8
Canada	Atkins Inc [61]	3
	Castillo Inc [367]	9

For more information, see [Creating Calculated Columns Using a Compare Table](#).

Pivot table

Use to show groupings on the x- and y-axes. The last grouping determines the columns, and the other groupings determine the rows. The pivot table shows the first specified measure in the table cells.



d. To show totals in a values or compare table, click and then select **Show Summary**.

e. To increase the number of records that appear in a values table, click and change the `limit` parameter in the SAQL query.

Note: By default, the query for a values table widget returns up to 100 results. For more information about the `limit` parameter, see [Analytics SAQL Reference](#).

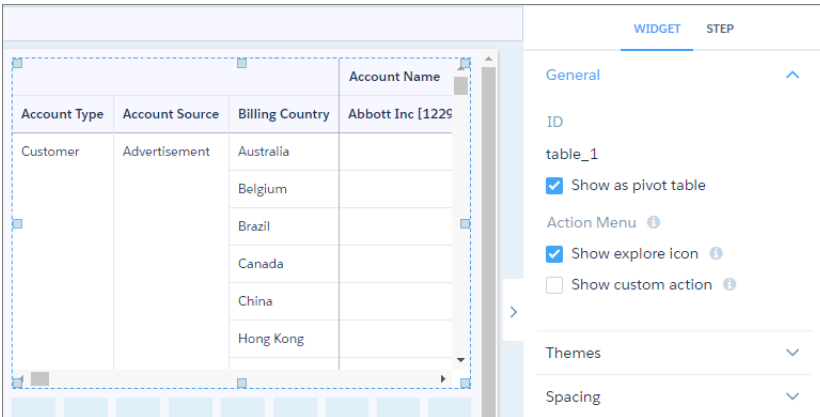



f. Click **Done**.

The widget shows the table and results. Analytics adds the step to the steps panel.

- To change the widget and step properties, select the widget.

The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.



- To customize the appearance of the widget, set the widget properties.
The widget properties vary based on the table type.
- To show and set the step properties, click **Step** in the right panel.
- To preview your changes to the dashboard, click  .
- Save the dashboard.

SEE ALSO:

- [Widget Properties for Analytics Dashboards](#)
- [Step Properties for Analytics Dashboards](#)
- [Manage Steps for Widgets](#)
- [Project the Same Step Results Differently in Charts and Tables](#)

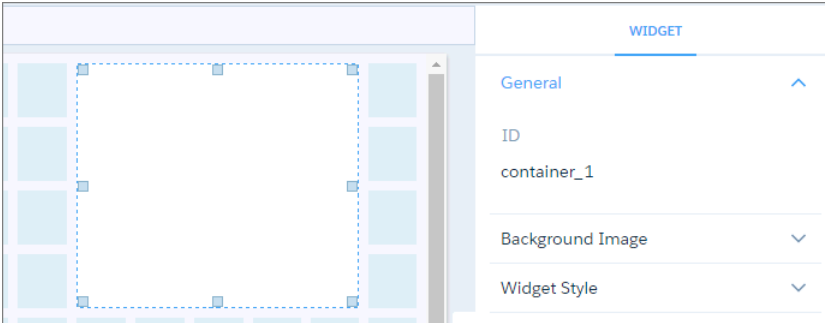
Add a Container Widget to Create Sections in the Dashboard


Use a container in an Analytics dashboard to group related widgets. For example, you can use a container widget to create a filter panel on the left side of the dashboard to store all selection-based filter widgets. To distinguish the filter panel from the rest of the dashboard, you can apply a background color and border to the container. When you move this widget, the contained widgets also move while maintaining their spacing and alignment.

You can place any widget inside a container widget, except another container widget.

- Drag the container widget to the dashboard canvas.
An empty container appears.
- To change the widget properties, select the widget.

The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.



3. To customize the appearance of the widget, set the widget properties.
For example, apply a background color or image.
4. Drag other widgets inside the container.
You can increase the size of the container to fit more widgets.
5. To preview your changes to the dashboard, click .
6. Save the dashboard.

SEE ALSO:



[Widget Properties for Analytics Dashboards](#)

Add an Image Widget to Display Graphics in the Dashboard

You can include company logos to brand the Analytics dashboard, icons to categorize results, or graphics to animate the dashboard.

To upload image files to Analytics, Chatter must be enabled in the org.

You can also add images as backgrounds for container widgets and layouts. Analytics in a web browser supports .svg, .png, .jpeg, .jpg, .gif, .bmp. The Analytics mobile app supports all these file types, except .svg.

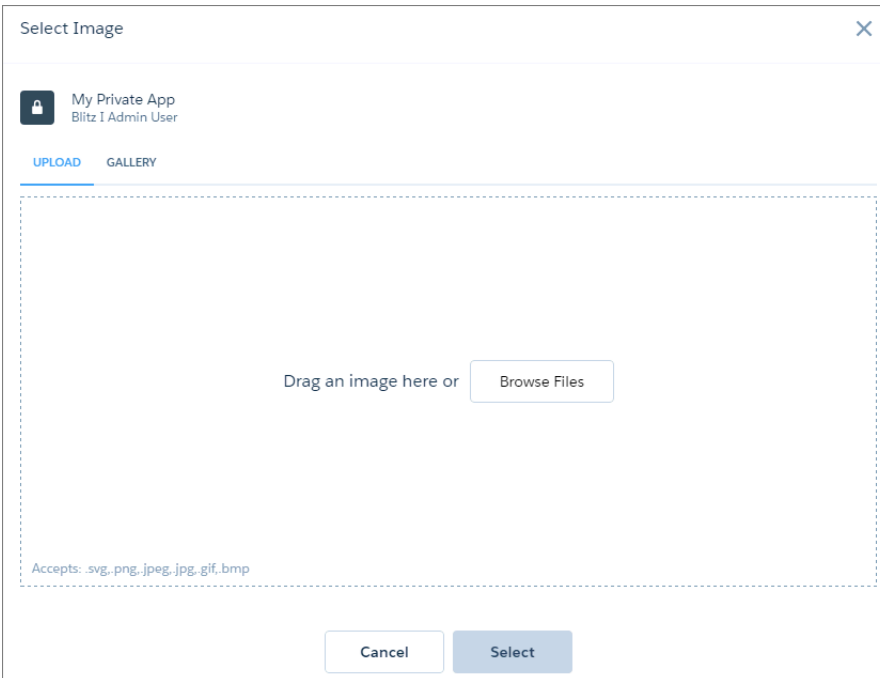
 **Tip:** To overlay one image on top of another, place an image widget inside a container widget. To display a background image for the entire dashboard, add a background image in the layout properties. Click  in the upper left corner to show the layout properties.

1. Drag the image widget to the dashboard canvas.
2. Click **Image** inside the image widget.

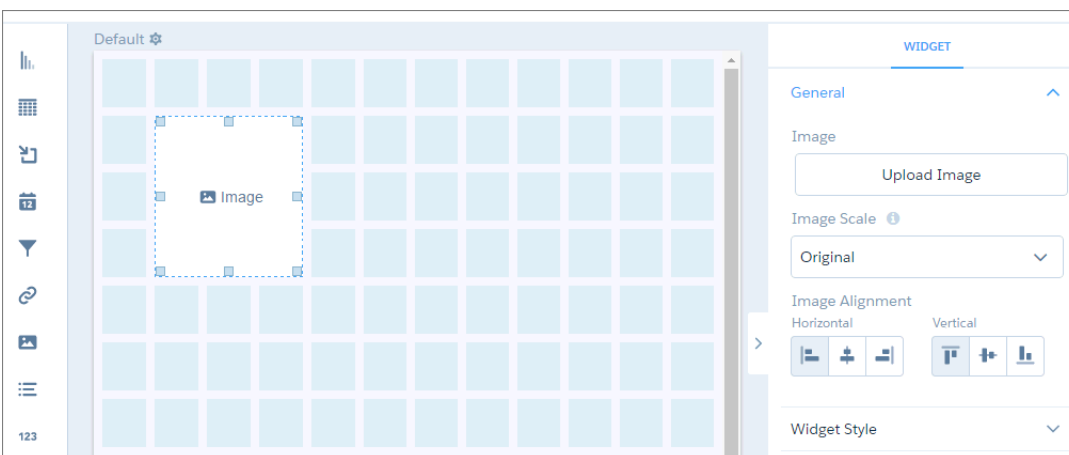
USER PERMISSIONS

To add images to Analytics dashboards:

- Create Analytics Applications
- Create and Edit Analytics Dashboards



- To upload a new image, click **Browse Files**. Or, select an uploaded image from the Gallery tab. Analytics uploads images to the gallery for the app displayed at the top left corner of the screen. Each image file must be no more than 2 GB.
- To change the widget properties, select the widget. The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.



- To preview your changes to the dashboard, click  .

6. Save the dashboard.

SEE ALSO:

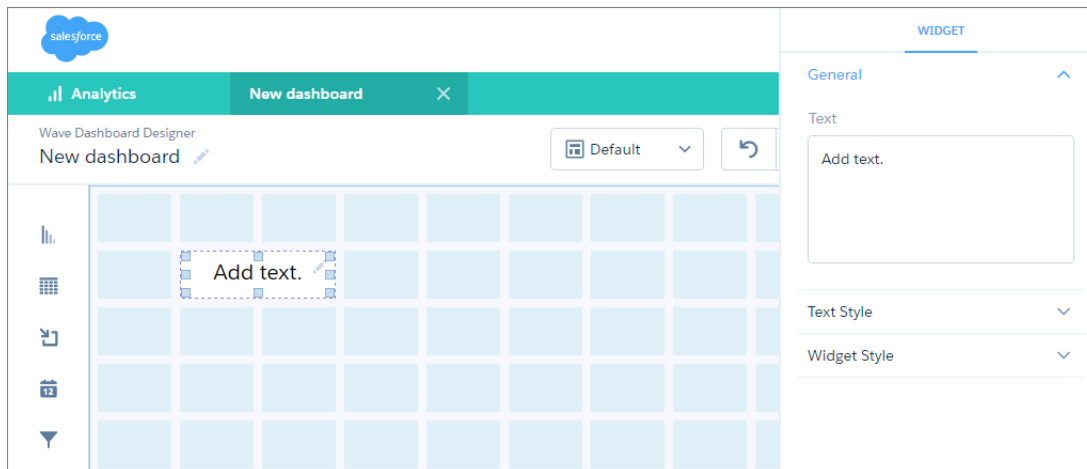
[Widget Properties for Analytics Dashboards](#)


Add Text Widgets to Label Parts of the Dashboard

Label your Analytics dashboard so that users understand what they are looking at. You can also add text that describes the dashboard or provides usage information for widgets.

1. Drag the text widget to the dashboard canvas.
2. To change the widget properties, select the widget.

The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.



3. To customize the appearance of the widget, set the widget properties. For example, enter the text that you want to appear in this widget.
4. To preview your changes to the dashboard, click  .
5. Save the dashboard.

SEE ALSO:

[Widget Properties for Analytics Dashboards](#)

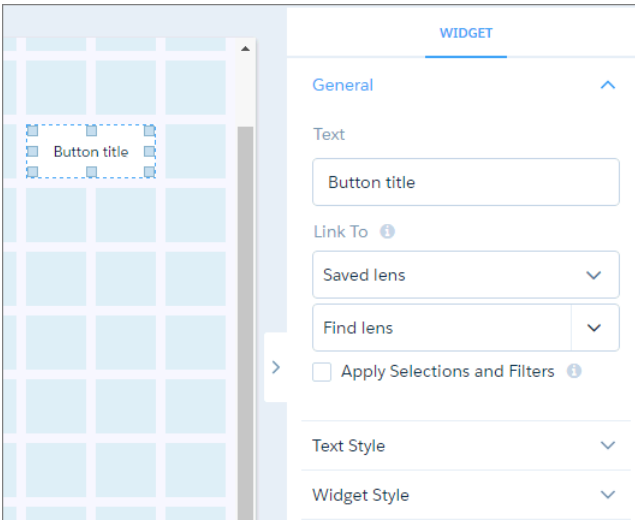
Add a Link Widget to Link to Other Assets

Instead of packing all possible key performance metrics, charts, and tables into a single dashboard, break up the content into multiple dashboards. Then use link widgets to tie the dashboards together. Dashboard viewers appreciate not having to figure out what to focus on in a busy dashboard. Also, use links to create analysis paths for users to follow or to link related assets, like dashboards, pages, steps, lenses, and even web pages.

1. Drag the link widget to the dashboard canvas.

- To change the widget properties, select the widget.


The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.



- In the Text field, enter the label that appears on the link widget.
- In the Link To field, select whether you want to link to a step, lens, dashboard, page, or URL, and then select the asset. If you link to a dashboard that has multiple pages, the link opens the first page of the dashboard.
- To pass global filters and selection-based filters (also called facets) to a linked Analytics asset, select **Apply Selections and Filters**.

Analytics passes selections in chart, list, toggle, range, and date widgets as selections in the linked asset if they apply. For example, you select North America in a list widget based on the Region dataset field. Analytics applies that same selection to faceted steps in the linked dashboard that have a grouping based on the Region field in the same dataset.

Analytics passes global filters as filters to a linked asset as long as the filters apply. Analytics ignores a global filter if the linked asset doesn't use the dataset on which the global filter is defined. If the global filter is locked and the incoming filter is defined on the same field, Analytics ignores the incoming filter. If it's unlocked, the incoming filter overrides the global filter defined in the dashboard.

When you open a linked dashboard, the passed global filters appear as external filters. To view the external filters, click  as highlighted in the screenshot. The External Filters panel shows filters passed from linked dashboards (and filters preconfigured in embedded dashboards). You can remove external filters while viewing the dashboard.

My Opportunities + Follow Data updated: Today at 10:30 AM

EXTERNAL FILTERS
The filters below have been carried over from the previous dashboard.

- Account Id Name: Acme, Global Media
- Name: Acme - 1,200 Widgets, Acme - 200 Wi...

Clear All

#	Name	Opportunity Type	Owner	Status	Amount	Probability (%)	Close Date	Lead Source
1	Acme - 1,200 Widgets	Existing Business	Test			50.0	2013-06-04	Trade Show
2	Acme - 200 Widgets	Existing Business	Test			10.0	2013-10-03	Word of mouth
3	Acme - 600 Widgets	New Business	Test			20.0	2013-07-31	Trade Show
4	Global Media - 400 Widgets	New Business	Test			60.0	2013-07-03	Partner
5	salesforce.com - 500 Widgets	Existing Business	Test User	Closed Won	50,000.0	100.0	2013-05-02	Advertisement
6	salesforce.com - 5000 Widgets	New Business	Test User	Closed Won	500,000.0	100.0	2013-05-02	Advertisement

Note: To pass a filter selection to a linked asset, the asset must contain a query based on the same dataset and grouping used to define the filter.



To pass a filter selection based on a static step to a linked asset, the static step must be linked to the dataset using a data source connection. Also, the linked asset must contain a query based on the same dataset and grouping used to define the data source connection.



6. If the link is to a URL, enter the following properties.

Destination

Enter the full URL. The URL field supports http or https. It doesn't support passing Salesforce parameters in the URL, like Salesforce object or Analytics dataset fields.

Link Tooltip

Enter a description of the link or the URL so users know where the link takes them.

WIDGET

General ^

ID
link_4

Text

Link To ?

Destination ?

Link Tooltip

Text Style v

7. To customize the appearance of the widget, set the widget properties.
8. To preview your changes to the dashboard, click .
9. Save the dashboard.

SEE ALSO:


[Widget Properties for Analytics Dashboards](#)

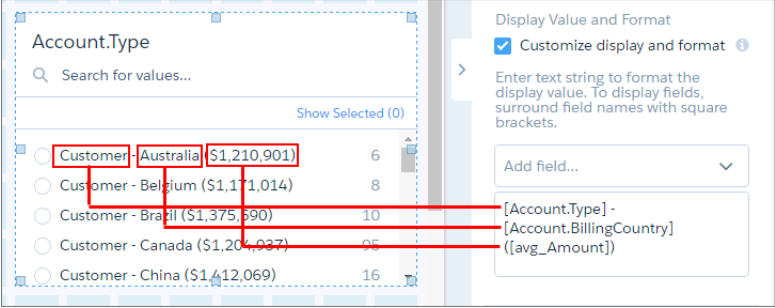
Widget Properties for Analytics Dashboards

Widget properties define how widgets appear in the Analytics dashboard. For example, you can apply labels, backgrounds, and borders. To make widgets look consistent, you can set up default widget properties in the layout and then assign them to each widget. Widget properties vary based on the widget type and the designer used to create them. The properties listed here apply only to widgets created in the Wave dashboard designer.

Analytics groups widget properties into sections. After the first section (“General”), the remaining sections are listed in alphabetical order.

General

Property	Description
Chart Type	Select the type of chart to visualize the data.
Show as pivot table	Indicates whether the table is pivoted. A pivot table requires the underlying step to have at least one grouping. Analytics pivots the table on the last defined grouping. Disabled, by default.
Show Explore Icon	Allow dashboard viewers to click a link in the widget to open the underlying step in explorer.  Note: This option only applies widgets based on steps in compact form. You can't explore widgets that are built on SAQL form steps.
Title	Title of the widget.
Subtitle	Subtitle of the chart. Appears below the title in a smaller font.
Title Alignment	Horizontal alignment of the title.
Title Color	Color of title.
Title Size	Font size of title.
Title Separator Color	Color of the line that separates the widget title from the global filters.
Filters Per Row	Number of global filters to show per row in the global filter panel.
Theme	Set a color scheme for the chart.
Update instantly	Instantly update the dashboard results based on a filter selection. Otherwise, you have to click Update to apply the filter.
Measure Field	The measure to show in the widget. You can use this field to specify the measure to show when multiple measures are defined in the underlying step. You can also use this option to not show the measure in the widget.
Shorten number	Display shortened numbers, rounded to the nearest tenths place. For example, when shortened, 1,111,556 appears as 1.1 M and 111,045 appears as 111.0 K.
Text	Widget label.
Link To	Link to a dashboard, lens, step, page, or URL. If the dashboard contains no pages, the option to link to a page doesn't appear.
Page	Specify the page that you want the link widget to link to.
Destination	The URL of the page that the link widget links to.

Property	Description
Link Tooltip	Enter a tooltip that appears when the user hovers over the link. For example, if the link is to a website, enter the URL as the tooltip so the user knows where the link takes them.
Customize display and format	<p>Customize the display values for a list or toggle widget. The widget can display values from multiple fields. For example, a list widget can show sales rep and region, with values like SalesRepA-West, SalesRepB-West, and SalesRepC-North—allowing you to filter on both fields. You can also display measures as part of the value, and format the display. Click Add field... dropdown, select a grouping or measure defined in the step query. You can insert more characters directly into the editor box to format the display. For instance, you can add parentheses to enclose the measure value as shown here.</p> 
Apply Selections and Filters	<p>Analytics passes selections in chart, list, toggle, range, and date widgets as selections in the linked asset if they apply. For example, you select North America in a list widget based on the Region dataset field. Analytics applies that same selection to faceted steps in the linked dashboard that have a grouping based on the Region field in the same dataset.</p> <p>Analytics passes global filters as filters to a linked asset as long as the filters apply. Analytics ignores a global filter if the linked asset doesn't use the dataset on which the global filter is defined. If the global filter is locked and the incoming filter is defined on the same field, Analytics ignores the incoming filter. If it's unlocked, the incoming filter overrides the global filter defined in the dashboard.</p>
Image	The file name of the image. The image must be available in the gallery of the Analytics app that contains the dashboard. This property applies to image widgets created during or after Spring '17.
Image ID	15-character ID of the image. The image must be uploaded to the Documents tab of Salesforce and the Externally Available Image option must be enabled. This property applies to image widgets created before Spring '17.
Image Scale	Indicate how to fit the image.
Image Alignment	Horizontal and vertical alignment of the image.
Show custom action	Show the widget properties that you set to show custom bulk actions on a table widget's action menu.
Custom Action Label	Display label for the button in the table widget's action menu. The dashboard viewer clicks the button to execute the action.
Visualforce Page Name	Name of the Visualforce page that defines the bulk action.

Property	Description
Visualforce Namespace Prefix	Optional. Namespace prefix of the Visualforce page that defines the bulk action.

Background Image

Property	Description
Image	The file name of the image. The image must be available in the gallery of the Analytics app that contains the dashboard. This property applies to container widgets created during or after Spring '17.
Image ID	15-character ID of the image. The image must be uploaded to the Documents tab of Salesforce with the Externally Available Image option enabled. This property applies to container widgets created before Spring '17.
Image Scale	Indicate how to fit the image.
Image Alignment	Horizontal and vertical alignment of the image.

Band Colors

Property	Description
Low Band	The color range for the low band.
Medium Band	The color range for the medium band.
High Band	The color range for the high band.

BreakPoints

Property	Description
Min	Minimum value of the low color band.
Medium	The value separating the low and medium colors.
High	The value separating the medium and high colors.
Max	Maximum value of the high color band.

Center Axis, Left Axis, X-Axis, Y-Axis

Property	Description
Start axis at zero	Start the axis at 0.
Show axis	Show the axis.
Show title	Show the title of the axis.

Property	Description
Title	Enter title of the axis. The default title is the name of the dimension for x-axis or names of the measures for y-axis. Multiple measures appear as a comma-separated list.
Reference Line	Show a reference line, which you can use to show a threshold, boundary, or reference point in the chart. For x-axis, it's a vertical line. For y-axis, it's a horizontal line.

Chart Details

Property	Description
Compute total	Computes the total based on all segments of the waterfall or stacked waterfall chart.
Show values in chart bars	Show the measure value of each bar in the chart.
Normalize values	Show stacked groups as a percentage of the total.
Axis Mode	Specify how multiple measures appear in the chart. You can select one of the following values: Single Axis Show all measures on the same axis. Dual Axis Show the first measure on its own axis and the remaining measures on a separate axis. Small Multiples Show each measure in a separate graph.
Auto fit	Fit entire chart inside the widget. Else, if needed, scroll to see the remainder of the chart. You can select one of the following values: None No scaling is applied. Scroll bars appear for charts larger than the widget. Fit Scale the chart to exactly fit the widget. Preserve labels Scale the chart to fit the widget while preventing labels from overlapping. Scroll bars appear for charts larger than the widget.
Handling Missing Values	Specify whether to connect data points regardless of missing data. You can select one of the following values: connect Show a continuous graph, ignoring missing values. disconnect Show gaps in the graph where values are missing.
Fill area	Fill area under the timeline chart.
Show points	Show data points on the line.

Property	Description
# of stem segments	The number of values that appear in the funnel's stem.
Icon	Icon used in the ratings chart.
Number of icons	Number of icons that appear for each rating.
Show value as	Specify how to show values. You can select one of the following choices: None Do not show values. Number Show as numbers. Compact Number Show compact form of numbers, summarized using letter suffixes. Percentage Show as percentages of the total.
Show max value	Show the maximum measure value in each rating.
Show values on left	Show the measure value on the left of each rating. Default is on the right.
Show measure title	Show the title of the measure in the chart.
Show measure axes	Show the axes for measures in the chart.
Show total in title	Show the total in the measure title.
Show total in center	Show the total of the measure in the center of the donut chart.
Center Size	The percentage of the donut chart or polar gauge used to create the center circle.
Map Type	Select the type of map.
Colors	Depending on the chart type, specifies the colors of the low and high values, or colors for the start, total, positive, and negative values.

Date

Property	Description
Default Date Mode	Specify whether the date widget displays absolute or relative dates, by default.
Allow date mode switching	Indicates whether the dashboard viewer can switch between absolute and relative dates in the date widget.
Default Calendar Type	Specifies whether the date widget displays dates using the calendar or fiscal year, by default.
Allow calendar type switching	Indicates whether the dashboard viewer can switch between the fiscal and calendar year in the date widget.

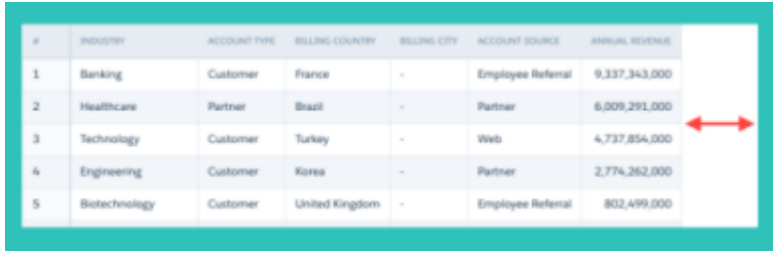
Filter Style


Property	Description
Field Color	Color of the field name.
Value Color	Color of the field value.
Background Color	Color of the filter background.
Border Color	Color of the filter border.
Border Radius	Radius of filter border.

Legend

Property	Description
Show legend	Show the chart legend.
Show legend header	Show legend header.
Show legend inside chart area	Show legend inside the chart area to reduce space required for the legend. The legend might overlap with the chart.
Position	Location of legend inside the chart widget.

Table Options

Property	Description
Column Size	<p>You can set the table column size to:</p> <p>Fit to Data Dynamically set the column widths based on the length of the data. You can also set a minimum and maximum width to ensure that the column isn't too wide or narrow.</p> <p>Fixed Width Set each column to the same width.</p> <p>Fit to Widget Fit the columns to the size of the widget. Use this setting to ensure that no empty space appears at the right side of the table, as shown here.</p> 

Property	Description
Column Width	The width of each column in the table. Configure the widths to minimize whitespace and ensure widget alignment in a dashboard. If you selected Fit to Data in Column Size, specify the minimum and maximum column widths to ensure that the columns aren't too wide or narrow.
Show Totals	Shows the totals for all measures across the top of a compare or values table.  Note: The Show Totals option appears in the widget properties only if the Show Totals option is set in the step.

Text Style

Property	Description
Text Color Color	Color of the text.
Text Size Size	Size of the text.
Number Color	Color of the number.
Number Size	Size of the number.
Title Color	Color of the title.
Title Size	Size of the title.
Alignment	Horizontal alignment of the text.

Trellis

Property	Description
Show as trellis	Create separate graphs based on groupings.
Type	Select the type of trellis, which affects how the graphs appear. You can select one of the following values: Horizontal Separate horizontally, with a graph for each value in the first grouping. Vertical Separate vertically, with a graph for each value in the first grouping. Matrix Display graphs in a table, with the first grouping in columns and the second grouping in rows. Wrap Display graphs line-by-line for each value in the first grouping, wrapping at the value set in the per-line setting.
Number of charts per line	Number of charts per line when the trellis wraps to multiple lines.

Widget Style

Property	Description
Use defaults	Use the default widget properties defined in the dashboard properties.
Background Color	Background color of the widget.
Border	Border around the widget.
Border color	Color of the widget border.
Border Width	Width of the widget border (in pixels).
Border Radius	Roundness of the corners of the widget border.

Manage Steps for Widgets

Steps return results that are displayed in widgets. For example, a number widget displays the result of a calculation—that calculation is defined in a step. Steps can query a data source, like a dataset or a Salesforce object. They can also be a static list of user-defined values—a static step. You can reuse each step in multiple widgets. In addition to clipping a lens from an exploration, you can use the following ways to create steps in the Wave dashboard designer: use the widget wizard or create it manually.

Watch a Demo: [▶ Use Steps to Build Wave Dashboard Widgets \(English Only\)](#)

The widget wizard creates a basic step that meets the minimum requirements for the widget. If you need a more robust step, like one that has a customized SAQL query, manually create your own. The method you choose depends on how much flexibility you need.

Because step IDs, like “Amount_1,” are not always descriptive, add a step label. For example, to clarify the “Amount_1” step, you can add the label “Won Opportunity Amount.” Specify the label while you create the step because Analytics generates the step ID based on the label. After creating the step, you can’t change the ID, unless you edit the JSON.

IN THIS SECTION:

[Query and Static Steps](#)

Widgets that display data require steps. A widget displays the results returned by a step. For example, a step calculates the average opportunity amount, grouped by region. The widget displays the results in a bar chart format with each bar showing the average amount for a region. In the Wave dashboard designer, most widgets have a wizard that you can use to build the widget and its step. You can also build your own step and attach it to a widget.

[Create a Step with the Explorer](#)

Instead of using a widget wizard to create the step, you can build your step from scratch.

[Create a Step with the SAQL Editor](#)

Use the SAQL editor to customize the query of a step. SAQL query steps are more robust than steps created by widget wizards and in the Chart and Table modes of the explorer. For example, you can write a SAQL query that retrieves results from multiple datasets.

[Create a Static Step with Custom Values](#)

Use static steps to apply user-defined values to filters, groups, measures, sort order, and limits of other step queries. For example, you can create a toggle widget that filters case records based on the following user-defined values: High Priority Cases, Medium Priority Cases, and Low Priority Cases. To enable these custom values to filter your data, you map them to your data using a binding.

[Find a Step](#)

You can find all steps defined in the dashboard in the steps panel. The panel organizes steps into categories and provides a search bar to help you locate your steps faster.

[Edit a Step](#)

When you edit a step, you can change the step details, like the query and step label. These changes affect all widgets that use the step. You can also change the visualization properties, like chart type. Depending on the method that you use to edit the step, Analytics handles visualization changes differently.

[Clone a Step](#)

Clone a step to quickly create a step based on an existing one. Cloning is useful when you can reuse an existing step with just a few tweaks.

[Modify the Step Results Based on the Dashboard Viewer](#)

You can modify a step query based on the user viewing the dashboard. For example, you can filter opportunity records to show only those opportunities owned by this user.

[Optimize a Step](#)

Steps can slow down your dashboard. Run a performance check on the steps to ensure that they're running optimally. Analytics identifies query bottlenecks and provides recommendations to improve step performance.

[Troubleshoot Unexpected Step Results](#)

If you have questions a step's results, review the query details to learn how Analytics determines the results. Compare the original query defined in the step to the final query executed by Analytics. If the step is faceted or the dashboard contains global filters, Analytics applies extra filters to query. If the query contains a binding, use the bindings tracer to verify the binding results.

[Step Properties for Analytics Dashboards](#)

Step properties define the query that returns results to display in the widget. These properties also specify how the widget behaves and interacts with other widgets in the Analytics dashboard. The properties apply to dashboards created in the Wave dashboard designer only.

SEE ALSO:

[Make the Dashboard Widgets Interactive](#)

Query and Static Steps

Widgets that display data require steps. A widget displays the results returned by a step. For example, a step calculates the average opportunity amount, grouped by region. The widget displays the results in a bar chart format with each bar showing the average amount for a region. In the Wave dashboard designer, most widgets have a wizard that you can use to build the widget and its step. You can also build your own step and attach it to a widget.

In the Wave dashboard designer, a "lens" and a "step" are similar, but not the same. They both contain queries used to calculate results. However, unlike a step, a lens can be saved as a standalone asset in an app. For example, you can save a lens that displays opportunity trends as a timeline chart.

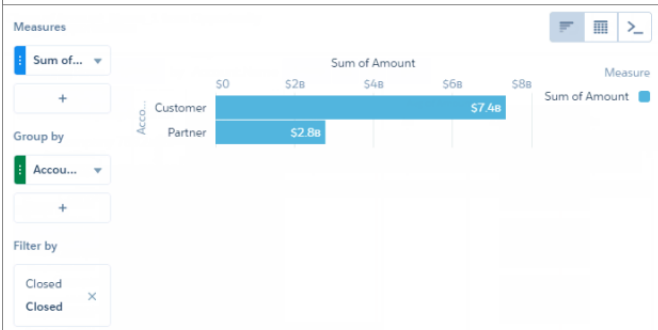
You can build a widget using one of the following types of steps.

Query Step

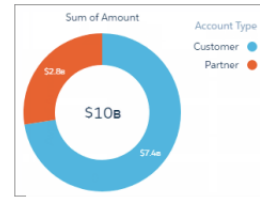
Most steps are query steps. A query step contains a query against a data source. The type of query is based on the data source. For instance, Analytics can execute a SAQL query against one or more datasets or a soql query against a Salesforce object. Analytics provides multiple ways to create query steps.

You can use the Chart mode or Table mode of the explorer to query a single dataset. You can calculate measures, group results by dates and dimensions, and filter records based on dataset fields. Here's an example of an explorer-built step that populates a chart widget.

Step (in Chart Mode)



Widget



To create more robust SAQL query steps, use the SAQL mode of the explorer. For example, you can create a SAQL query based on multiple datasets, which isn't possible using in Table and Chart modes. The following chart widget shows the results from the step's SAQL query. For more information about SAQL queries, see the [Analytics SAQL Reference](#).

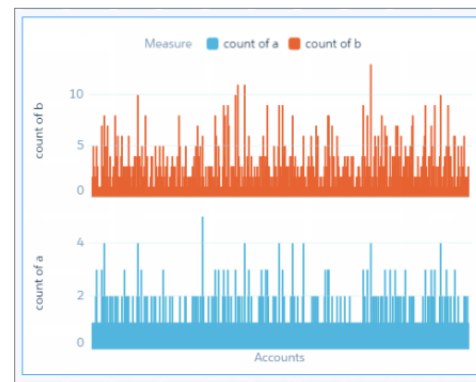
Step (in SAQL Editor)

```

1 a = load "0Fb000000000e2CAQ/0Fc00000001mcCA";
2 b = load "0Fb000000000e2CAQ/0Fc00000001mcCA";
3 c = cognop a by 'Account.Name', b by 'Opportunity.Account.Name';
4 c = foreach c generate b['Opportunity.Account.Name'] as 'Name', count(a) as 'count of a', count(b) as 'count of b';
5 c = limit c 2000;
    
```

NAME	COUNT OF A	COUNT OF B
Abbott358 Inc	1	2
Abbott372 Inc	1	5
Adams335 Inc	1	3
Adkins42 Inc	1	2
Adkins907 Inc	2	2
Agulla070 Inc	3	5
Allen182 Inc	1	3
Allison992 Inc	1	1
Alvarez45 Inc	1	1

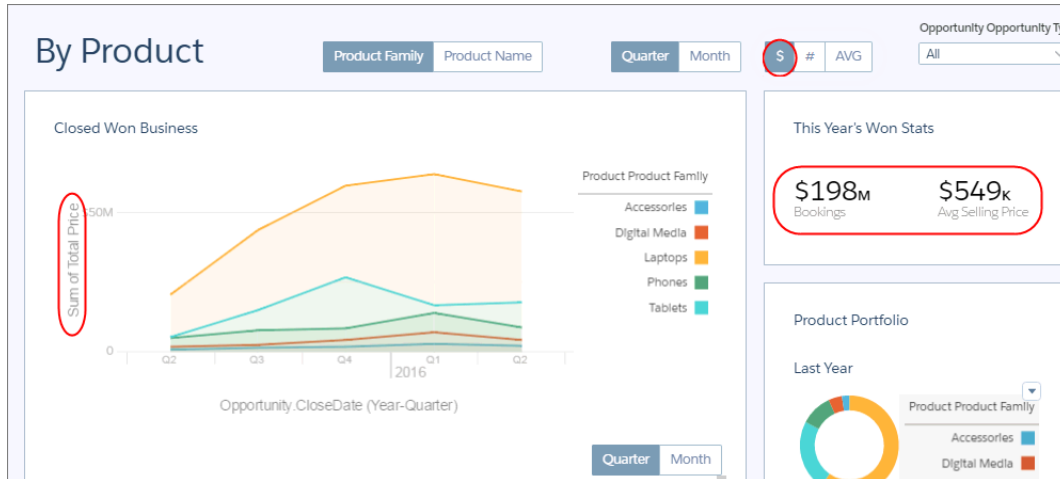
Widget



Analytics creates different step types based on the widget type. Some step types have a limit on the number of results that they can return. For more information about all step types, including those not available in the explorer, see the [Analytics Dashboard JSON Reference](#).

Static Step

A static step is more rare. It doesn't query data. Instead, the step provides a static list of user-defined values. For example, a toggle widget can show static values "\$," "#," and "AVG." To make the toggle widget interact with other widgets in the dashboard, use data source linking to connect the static step with other faceted steps. Or bind the static values to the steps of other widgets in your dashboard. For instance, you can bind "\$" and "#" to show different measures: "\$" to show the value of opportunities, and "#" to show the number of opportunities. In this example, "\$" is selected in the toggle widget, and the dashboard shows the value of opportunities.



For more information, see [Create a Static Step with Custom Values](#).

SEE ALSO:

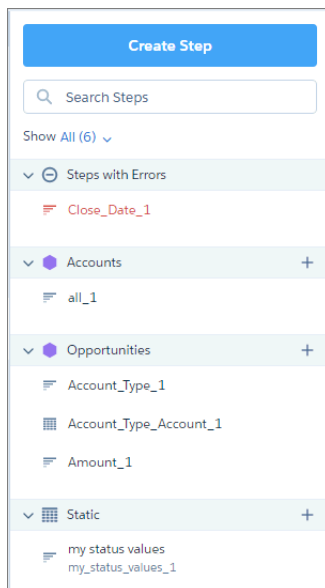
- [Manage Steps for Widgets](#)
- [Create a Step with the Explorer](#)
- [Create a Step with the SAQL Editor](#)
- [Create a Static Step with Custom Values](#)

Create a Step with the Explorer

Instead of using a widget wizard to create the step, you can build your step from scratch.

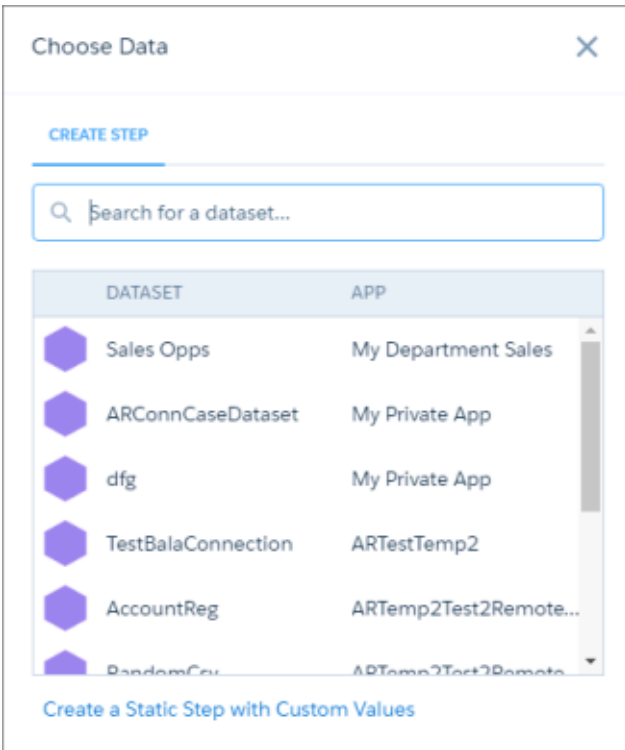
One way to create a step with explorer is to clip an exploration to a dashboard. (For information about this method, see [Clip a Lens to a Dashboard](#).) You can also create the step from the dashboard designer, which is covered here.

1. To open the steps panel, click an empty space in the dashboard canvas in the Wave designer.

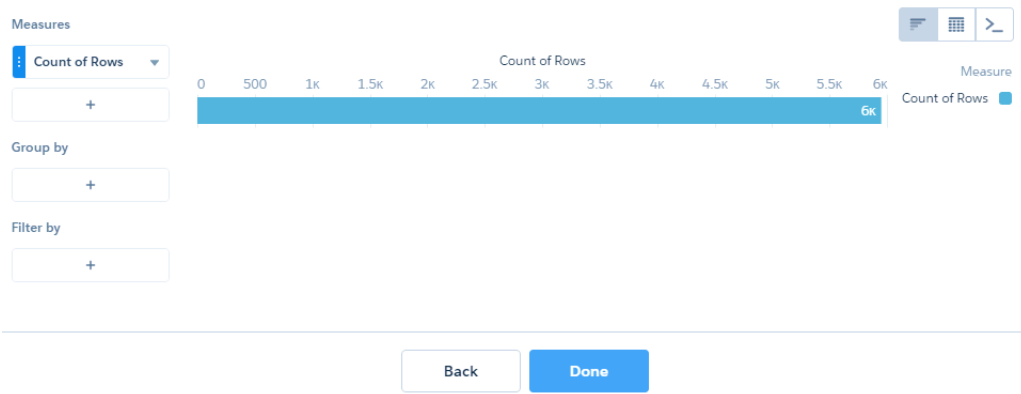


 **Tip:** Click **+** next to a section in the steps panel to add a step of that type. This feature is available for all steps, except `apex`, `soql`, and multiple-dataset steps.

2. Click **Create Step**.



3. Select the dataset that contains the data that you want to include in the step. Enter the name of the dataset in the search box if your dataset isn't easy to find.
The explorer appears, showing the Count of Rows measure, by default.

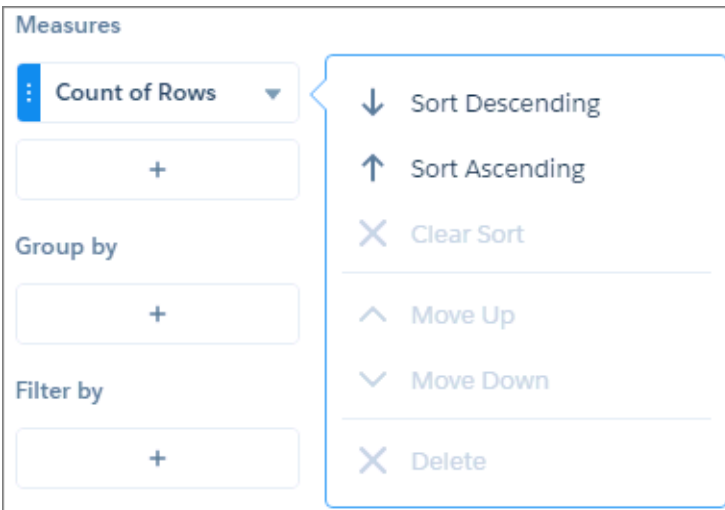


4. In the explorer, click **Untitled Step** and enter the step label.

Analytics creates the step ID from the label. After you create the step, you can't change the step ID. Analytics refers to steps by their ID so dashboards don't break if you change the labels.

- To add a measure, click **+** under Measures.

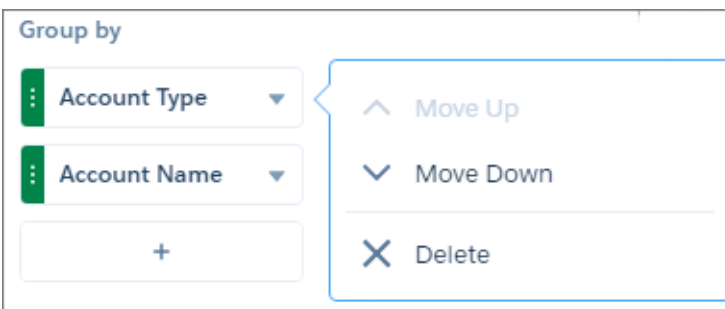
To change a measure, select the measure and then choose a new one. To sort, reorder, or delete a measure, click the down arrow to the right of the measure and select the option.



You can add as many measures as needed.

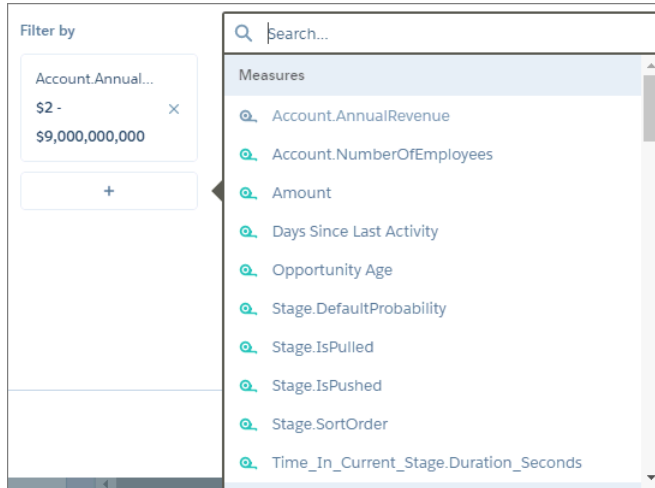
- To group the measures by a date or dimension, click **+** under Group by, and then select the field.




You can add multiple groupings. To change a grouping, click the grouping and select a new field. To reorder or delete a grouping, click the down arrow to the right of the grouping and then select the option.

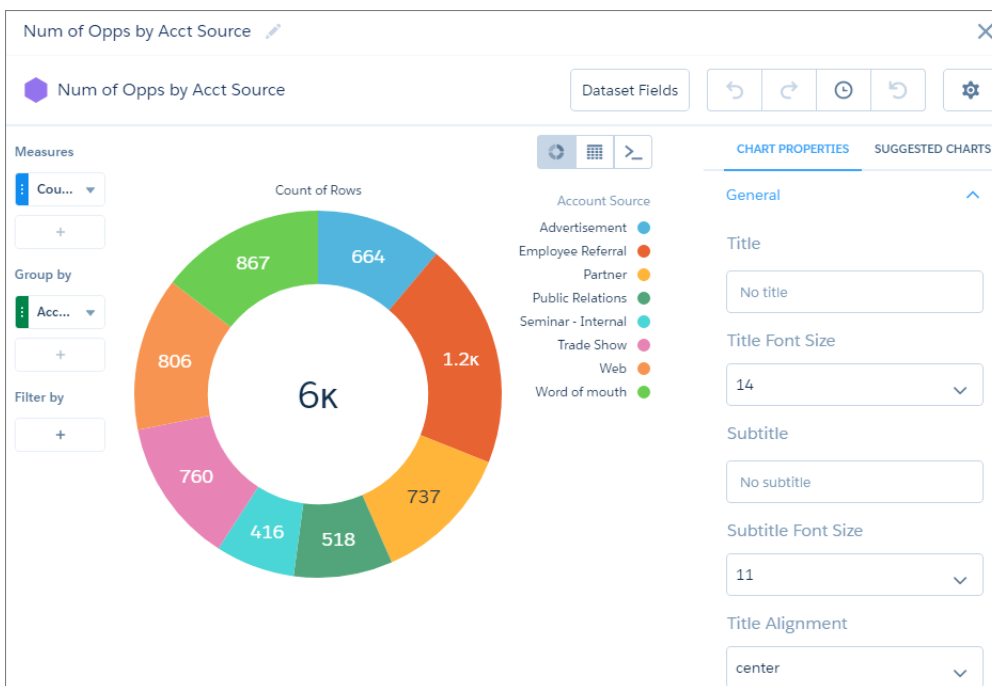



- To add a filter, click **+** under Filter by, and then select the field to filter by.

You can add multiple filters. To delete the filter, click **x**.




8. To change the chart or table type for the step, click  or , respectively.
9. To set the widget properties at the step-level, click .



 **Note:** If you drag this step to the dashboard designer canvas, Analytics displays the step results as the chart specified while creating the step. To display the widget differently in the dashboard than what was specified at the step level, edit the dashboard and set the widget properties there. The widget properties override the step settings.

For more information about chart widgets, see [Add Chart Widgets to Visualize Data](#) . For more information about table widgets, see [Add a Table Widget to Show Record Details and Create Calculated Columns](#) .

10. To write a custom SAQL query, click  .
For more information, see [Create a Step with the SAQL Editor](#) .
11. Click **Done**.

Analytics adds the step to the steps panel, making it available for use by other widgets in the dashboard.


12. Save the dashboard.

SEE ALSO:

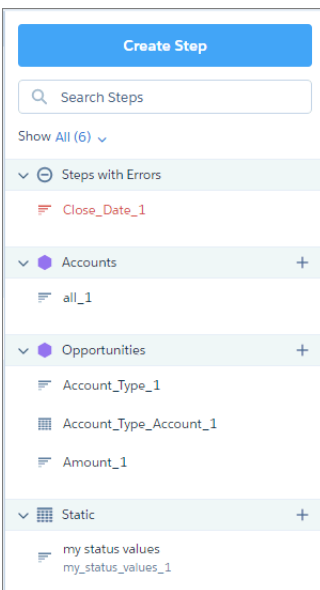
[Step Properties for Analytics Dashboards](#)

Create a Step with the SAQL Editor

Use the SAQL editor to customize the query of a step. SAQL query steps are more robust than steps created by widget wizards and in the Chart and Table modes of the explorer. For example, you can write a SAQL query that retrieves results from multiple datasets.

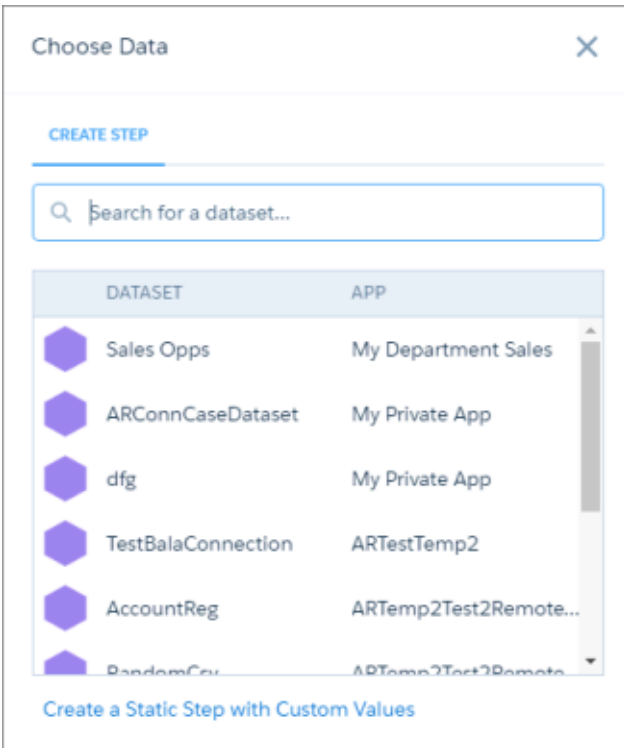
 **Note:** If you modify the SAQL query using the SAQL editor, you can no longer add dimensions, measures, and filters if you switch back to the table or chart view. However, you can still change the visualization parameters.

1. To open the steps panel, click an empty space in the dashboard canvas in the Wave designer.

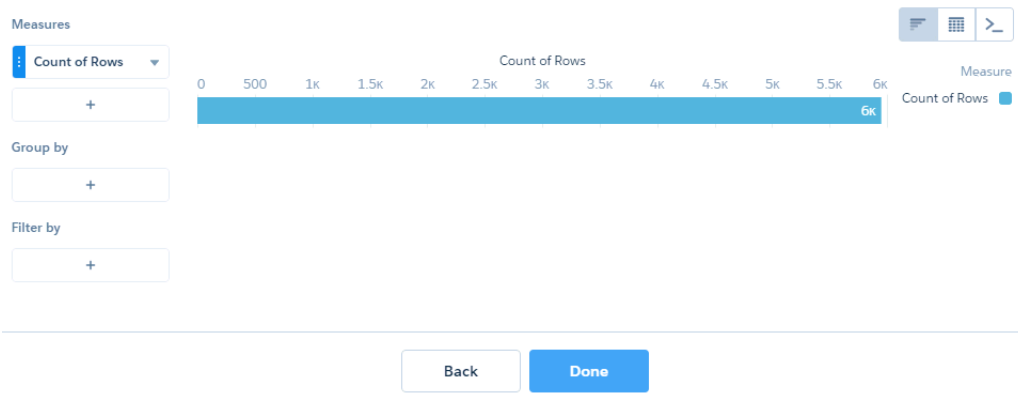



 **Tip:** Click **+** next to a section in the steps panel to add a step of that type. This feature is available for all steps, except `apex`, `sql`, and multiple-dataset steps.

2. Click **Create Step**.



3. Select the dataset that contains the data that you want to include in the step. Enter the name of the dataset in the search box if your dataset isn't easy to find.
The explorer appears, showing the Count of Rows measure, by default.



4. In the explorer, click **Untitled Step** and enter the step label.
Analytics creates the step ID from the label. After you create the step, you can't change the step ID. Analytics refers to steps by their ID so dashboards don't break if you change the labels.
5. To write a custom SAQL query, click .
The SAQL editor appears, showing the current SAQL query.

The screenshot shows the 'Untitled Step' editor for 'DTC Opportunity'. The query editor contains the following SAQL code:

```

1 q = load "DTC_Opportunity_SAMPLE";
2 q = group q by ('Industry', 'Account_Type');
3 q = foreach q generate 'Industry' as 'Industry', 'Account_Type' as 'Account_Type', count() as 'count';
4 q = order q by ('Industry' asc, 'Account_Type' asc);
5 q = limit q 2000;

```

Below the query editor is a table with the following data:

INDUSTRY	ACCOUNT TYPE	COUNT OF ROWS
Agriculture	Customer	18
	Partner	10
Apparel	Customer	28
	Partner	22

At the bottom of the editor are 'Back' and 'Done' buttons.

6. Edit the SAQL query, as needed.

The SAQL editor provides contextually smart, auto-completion suggestions. For more information about SAQL queries, see the *Analytics SAQL Reference*.

7. Click **Run Query** to validate the query.

The **Done** button enables if the query is valid.

8. Click **Done**.

Analytics adds the step to the steps panel, making it available for use by other widgets in the dashboard.

9. Save the dashboard.

SEE ALSO:

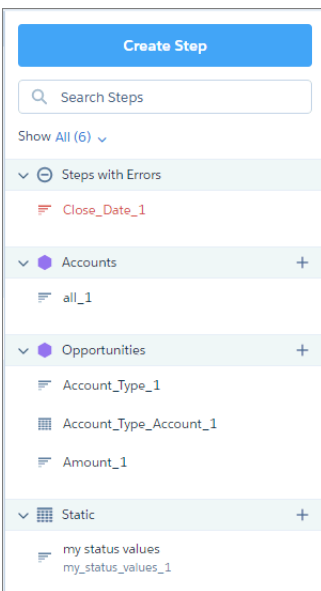
[Step Properties for Analytics Dashboards](#)

Create a Static Step with Custom Values

Use static steps to apply user-defined values to filters, groups, measures, sort order, and limits of other step queries. For example, you can create a toggle widget that filters case records based on the following user-defined values: High Priority Cases, Medium Priority Cases, and Low Priority Cases. To enable these custom values to filter your data, you map them to your data using a binding.

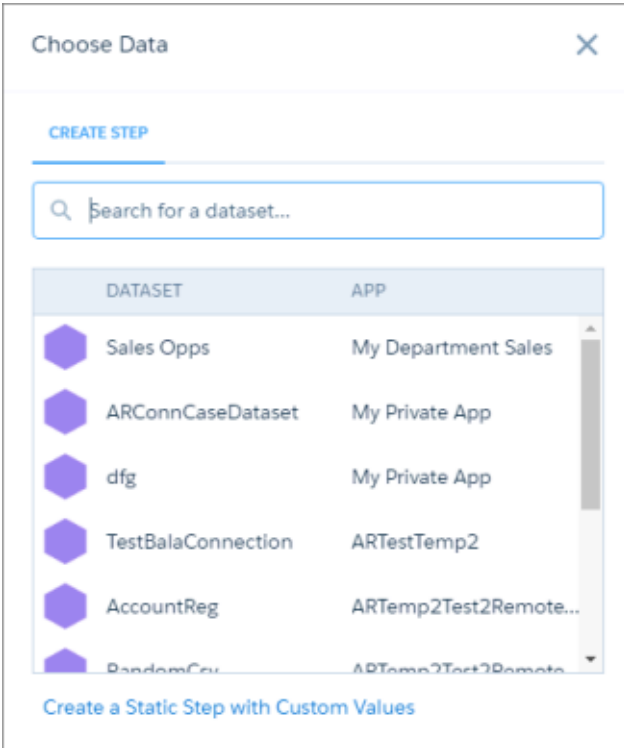


1. To open the steps panel, click an empty space in the dashboard canvas in the Wave designer.

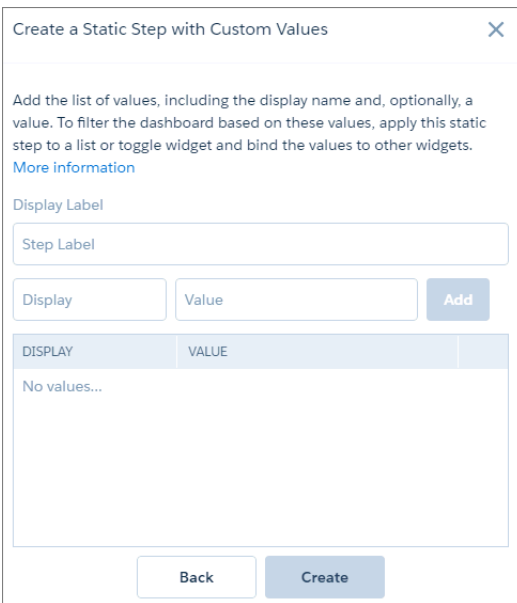


Tip: Click + next to a section in the steps panel to add a step of that type. This feature is available for all steps, except apex, soql, and multiple-dataset steps.


2. Click **Create Step**.




3. Click **Create a Static Step with Custom Values**.



4. In Display Label, enter the step label.
Analytics creates the step ID from the label. After you create the step, you can't change the step ID. Analytics refers to steps by their ID so dashboards don't break if you change the labels.
5. Add the list of values, including the display name and value for each.

 **Note:** The display name appears in the associated widget. Values are optional, but if included, you can bind them to other steps. For example, you can create a binding that filters other steps based on the selected custom value.

6. Click **Create**.
Analytics adds the step to the steps panel, making it available for use by other widgets in the dashboard.
7. To apply this static step to a list or toggle widget:
 - a. Drag the list or toggle widget from the widget toolbar to the dashboard canvas.
 - b. Drag the static step on top of the widget.
The widget shows the custom display values as selection options.
 - c. To change the widget and step properties, select the widget.
The Widget panel groups the widget properties into sections. So that you don't accidentally overlook any properties, expand any collapsed sections.
 - d. To customize the appearance of the widget, set the widget properties.
 - e. To preview your changes to the dashboard, click  .
 - f. Save the dashboard.

If you applied the static step to a list or toggle widget, you can see the widget in the dashboard. But it's not tied to any other widgets. To specify how a selection in this step affects other widgets, bind the custom values of the static step to the steps of the other widgets. For example, create a binding that filters the other widgets based on the selected static value in the list or toggle widget. For more information about binding static steps, see the [Analytics Bindings Developer Guide](#).

SEE ALSO:

[Step Properties for Analytics Dashboards](#)

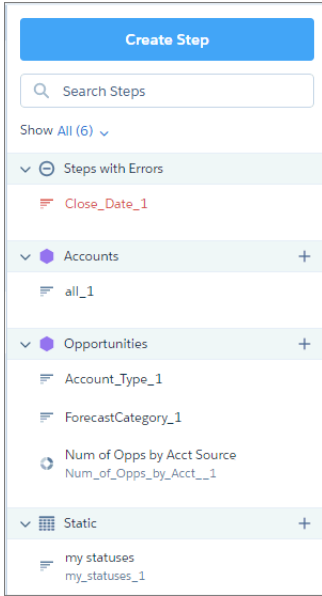
[Widget Properties for Analytics Dashboards](#)

[Step Properties for Analytics Dashboards](#)

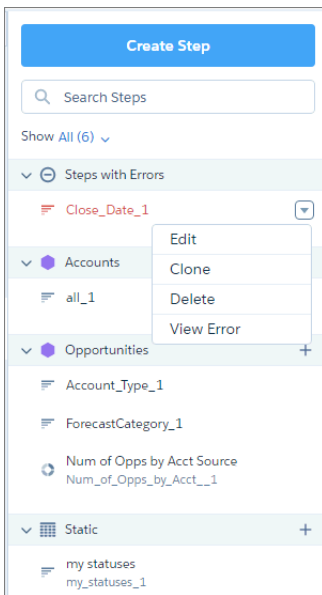
Find a Step

You can find all steps defined in the dashboard in the steps panel. The panel organizes steps into categories and provides a search bar to help you locate your steps faster.

The steps panel categorizes steps by dataset name and step type. It also contains a special category for erroneous steps. Categories and steps are listed in alphabetical order. You can collapse each category.



Hover over the step and click the down arrow to view actions that you can perform on the step. For instance, in the Steps with Errors section, click **View Error** to understand what's wrong with the step.



Edit a Step

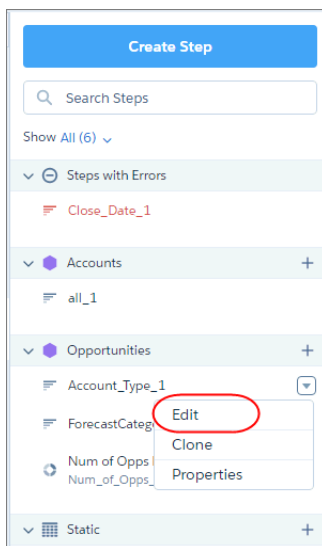
When you edit a step, you can change the step details, like the query and step label. These changes affect all widgets that use the step. You can also change the visualization properties, like chart type. Depending on the method that you use to edit the step, Analytics handles visualization changes differently.

You can use the following methods to change a step.

Method	Handling Visualization Changes
Edit the step from the step panel	Analytics saves the visualization changes in the step, but doesn't apply them to existing widgets that use the step.
Double-click the widget	Analytics saves the visualization changes in the step and applies them to the widget. Analytics doesn't apply them to other widgets that use the step.

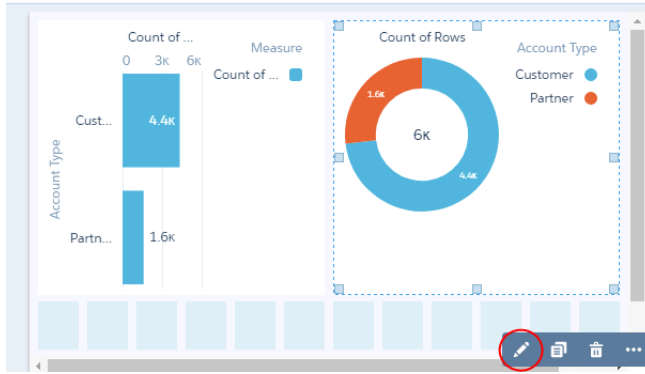
Consider the following limitations before editing a step.

- You can edit only steps with step types `aggregate`, `aggregateflex`, `saql`, and `grain`. If you edit an `aggregate` or `aggregateflex` step type that contains a SAQL query in the `piqq1` JSON attribute, Analytics converts the step type to `saql`. To learn about the implications of converting between these step types, see [Considerations When Converting Step Types](#).
 - You can't edit a step that contains a binding or that's used in a global filter widget created before Winter '18.
- Open the dashboard in edit mode.
 - Use one of the following methods to edit the step.
 - To edit the step from the steps panel, hover over the step, click the down arrow, and then click **Edit** in the step actions menu.



- Double-click the widget in the dashboard.

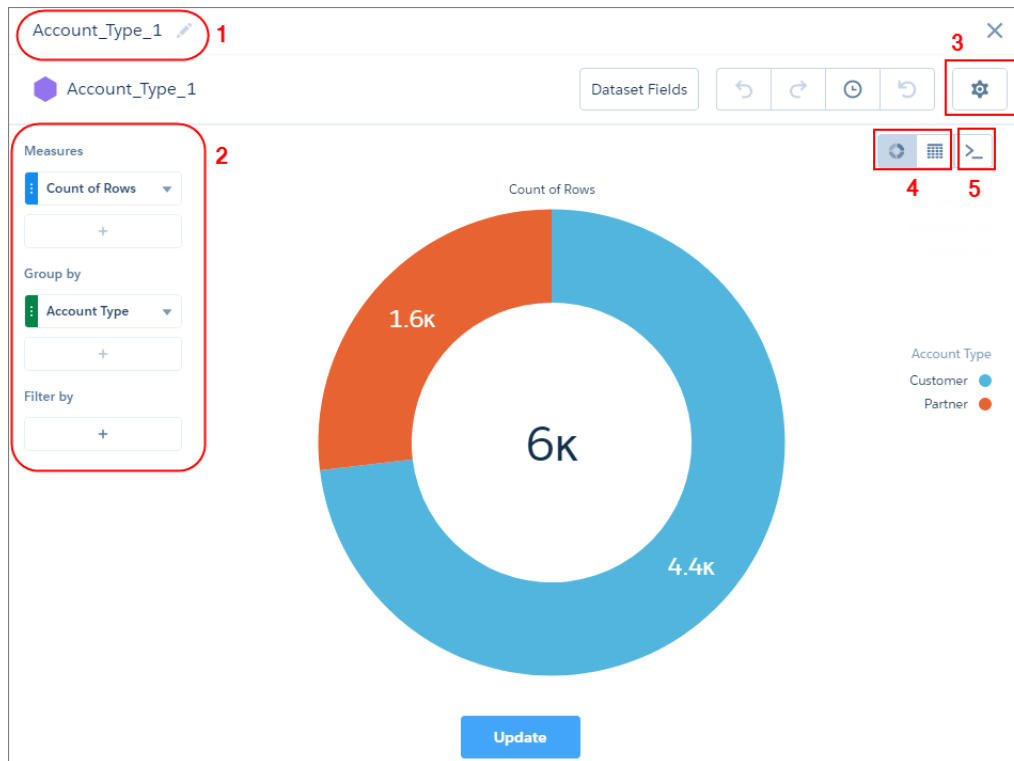
You can also select the widget and click  in the widget actions menu.



3. Make your changes.

You can change the following details:

- Step label (1)
- Step query (2)
- Visualization properties (3)
- Chart type and table type (4)
- SAQL query (5)



 **Note:** For information about **Dataset Fields**, go [View and Configure Dataset Fields](#).

4. Click **Update**.

- To save your changes, save the dashboard.

IN THIS SECTION:

[Considerations When Converting Step Types](#)

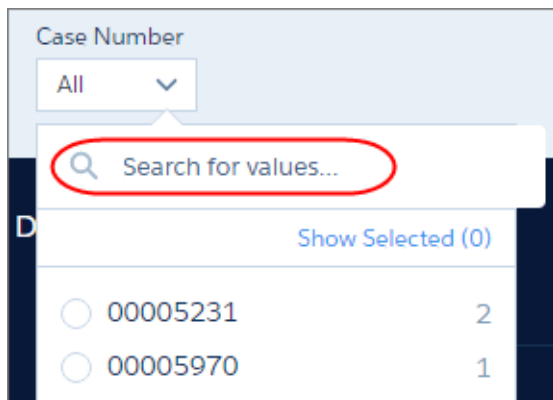
Analytics treats step types differently. Before you convert an `aggregate` or `aggregateflex` step type to `saql`, review the following implications.

Considerations When Converting Step Types

Analytics treats step types differently. Before you convert an `aggregate` or `aggregateflex` step type to `saql`, review the following implications.

Unlike the `aggregateflex` step type, the `saql` step type provides limited support when the actual number of query results exceeds the limit that a query can return.

- When performing a search in a list widget, a `saql` step type doesn't find values that aren't returned in the first batch of query results.



- Analytics doesn't apply initial selections for a `saql` step type if the selected value isn't returned in the first batch of query results. For example, you set an initial selection on the Account Name field. When you open the dashboard, assume the corresponding widget shows only 2,000 of 100,000 accounts. If the initial selection isn't one of the 2,000 returned accounts, Analytics doesn't apply the initial selection to the dashboard.

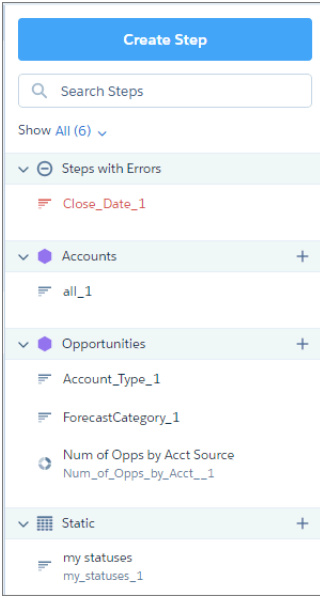
For more information about how to use the `limit` JSON parameter to configure the maximum number of results that each step type can return, see [steps Properties for Wave Designer Dashboards](#).

Clone a Step

Clone a step to quickly create a step based on an existing one. Cloning is useful when you can reuse an existing step with just a few tweaks.

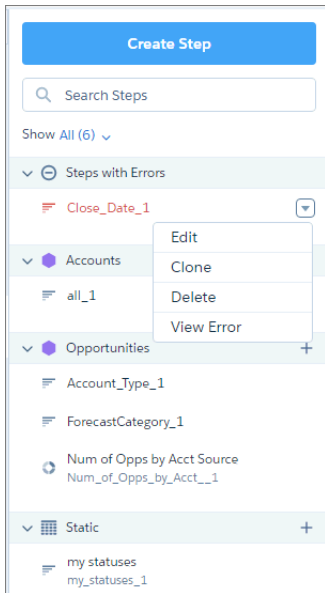
- Note:** You can't clone a SAQL query step for a single compare table column or a static step.

- To open the steps panel, click an empty space in the dashboard canvas in the Wave designer.



 **Note:** You can't apply grayed-out steps to widgets. But you can clone them and view their properties.


2. To show all steps, select **All** in the Show field.
3. Hover over the step that you want to clone, and then click the down arrow.



4. Select **Clone**.
The step opens in the explorer, where you can easily modify it. If the step was created using SAQL, the clone opens in the SAQL editor instead.
5. Edit the step label.
The default label has "Clone of " prepended to the original step label
6. Make your changes to the clone.
7. Click **Done**.

Analytics adds the step to the steps panel, making it available for use by other widgets in the dashboard.

8. Save the dashboard.

 **Note:** When you clone a step and edit its SAQL query, the resulting JSON doesn't always reflect the functions applied to measures. After you run and save the SAQL, the function is changed to `count`. For example, if the original step contained this `measures` array:

```
"query": {
  "measures": [
    ["max", "DailyActiveUsers"]
  ]
}
```

and the SAQL was edited, run, and saved, the updated JSON contains this `measures` array instead:


```
"query": {
  "measures": [
    ["count", "*", "max_DailyActiveUsers"]
  ]
}
```

This discrepancy has no effect on the data viewed in the dashboard.

Modify the Step Results Based on the Dashboard Viewer

You can modify a step query based on the user viewing the dashboard. For example, you can filter opportunity records to show only those opportunities owned by this user.

You can specify user tokens in any query parameter in `saql`, `soql`, and `aggregateflex` step types. The syntax to specify a token is: `!{user.<User object field name>}`. Valid tokens are: `user.Id`, `user.name`, `user.roleid`, and `user.rolename`.

 **Tip:** Because names aren't always unique, consider using IDs when specifying a user token.

This `saql`-type step adds the `user.Id` token as a query filter so that opportunity owners viewing the dashboard see only their opportunities.

```
"My_Opportunities_1": {
  "type": "saql",
  "label": "My Opportunities",
  "query": "q = load \"opportunity\";\nq = filter q by 'OwnerId' == \"!{user.Id}\";\nq = group q by 'Account.Type';\nq = foreach q generate 'Account.Type' as 'Account.Type', count() as 'count';\nq = order q by 'count' desc;\nq = limit q 1000;",
  "datasets": [
    {
      "id": "0FbB000000017QxKAI",
      "name": "opportunity",
      "label": "Opportunities",
      "url": "/services/data/v41.0/wave/datasets/0FbB000000017QxKAI"
    }
  ],
  "useGlobal": true,
  "isGlobal": false,
}
```



```

"broadcastFacet": true,
"receiveFacet": true,
"selectMode": "single",
"numbers": [],
"groups": [],
"strings": [],
"visualizationParameters": {
    ....
},
},

```

SEE ALSO:

[Set Initial Selections in the Dashboard](#)

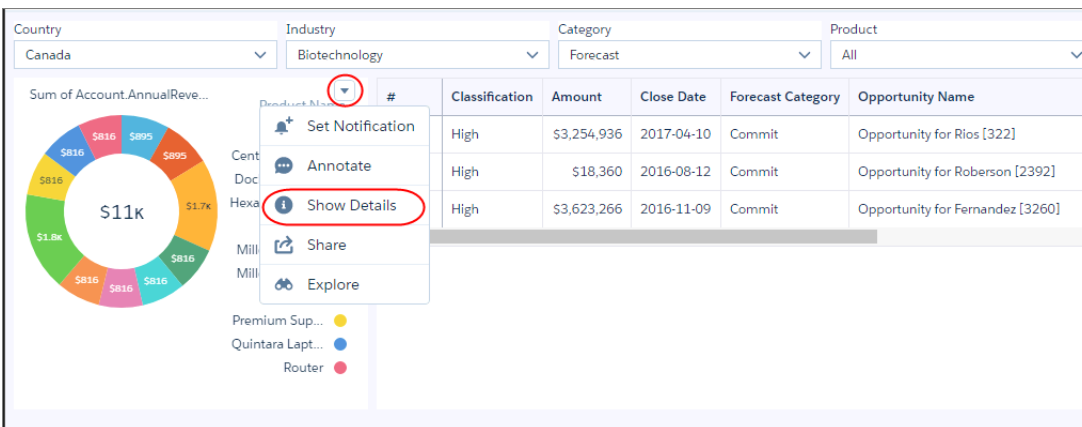
Optimize a Step

Steps can slow down your dashboard. Run a performance check on the steps to ensure that they're running optimally. Analytics identifies query bottlenecks and provides recommendations to improve step performance.

1. Open the dashboard in view mode.

Because Analytics analyzes step performance for the current layout only, ensure that you're viewing the dashboard in the right layout. Performance can differ from one layout to another because layouts can have different widgets and interactions. If the dashboard contains multiple pages, Analytics provides performance analysis for the current page.

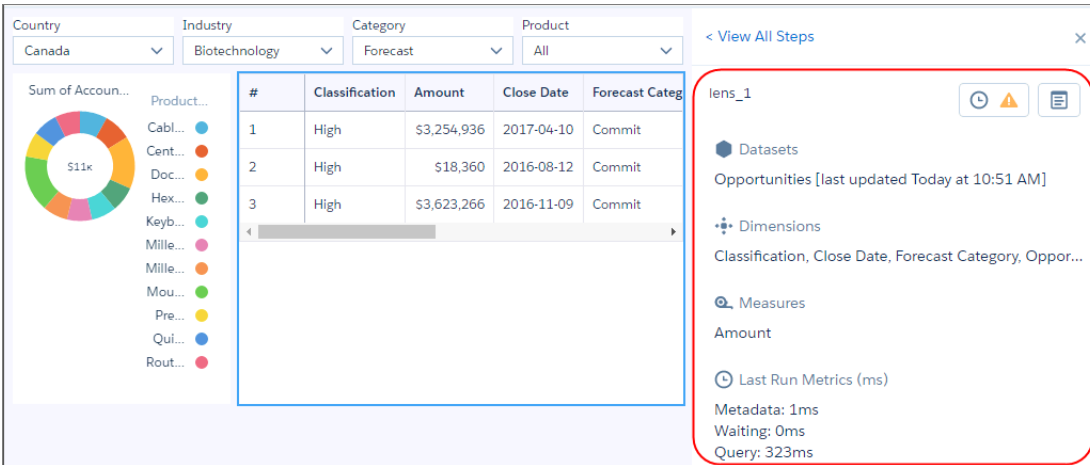
2. Click the drop-down arrow for the widget that uses the step that you want to analyze.



3. Select **Show Details** for the widget.

Tip: To see the Show Details option for a list widget, enable the "Show explorer icon" widget property. The Show Details option doesn't show for link, image, container, global filter panel, and text widget types because they don't have steps.

The step details summarize different parts of the query, like measures, filters, groupings, and the dataset on which its built.



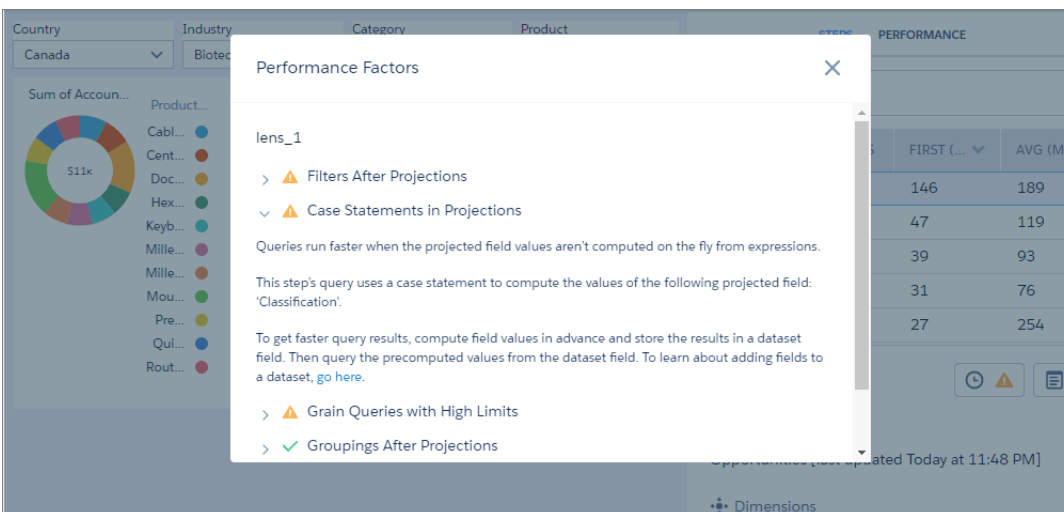
The Last Run Metrics section identifies other factors that contribute to the total time required to populate the results of a step.

Last Run Metric	Description
Metadata	Time that Analytics took to retrieve the extended metadata.
Waiting	Time that Analytics took to resolve the bindings.
Query	Time that Analytics took to run the query.

If Analytics identifies a performance issue with the step, it shows a warning icon (⚠) next to the View Performance Details button (⌚), as the previous screenshot shows.

- To view the performance issues and suggestions for resolving them, click ⌚ .

The Performance Factors section shows all factors by which the step is evaluated. Ignore the factors with a green checkmark (✓) because these issues don't apply to the step.

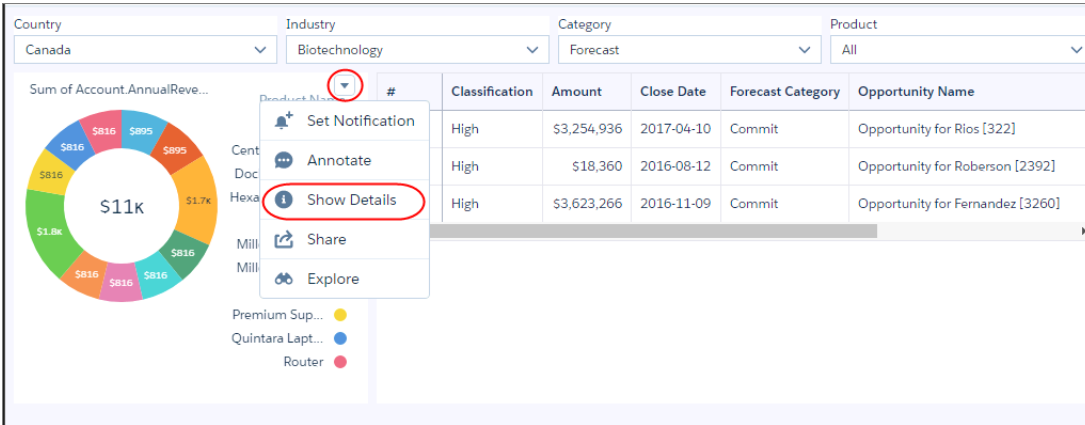


- Expand each factor with a warning icon to learn how to improve the step's performance.

Troubleshoot Unexpected Step Results

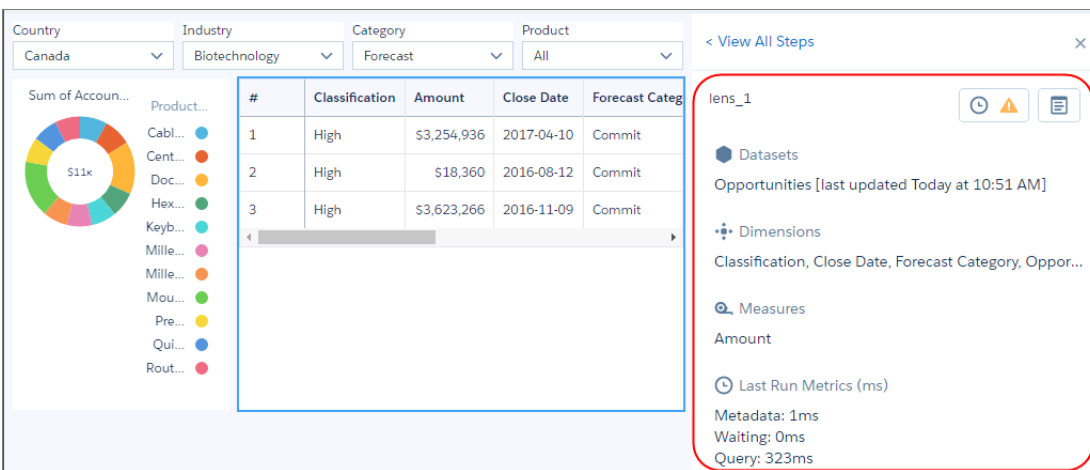
If you have questions a step's results, review the query details to learn how Analytics determines the results. Compare the original query defined in the step to the final query executed by Analytics. If the step is faceted or the dashboard contains global filters, Analytics applies extra filters to query. If the query contains a binding, use the bindings tracer to verify the binding results.


- Open the dashboard in view mode.
- Click the drop-down arrow for the widget that uses the step that you want to analyze.



- Select **Show Details** for the widget.

Tip: To see the Show Details option for a list widget, enable the "Show explorer icon" widget property. The Show Details option doesn't show for link, image, container, global filter panel, and text widget types because they don't have steps.



- To compare the original query against the final one, click .

Analytics modifies step queries based on interactions with other widgets. It adds filters based on faceting and global filters, and can modify the query based on bindings. The final step in the following example has three filters added to the original query.

Original Query

```

1 q = load "opportunity";
2 q = foreach q generate (case when 'Amount' < 5000000 then "High" when 'Amount' < 20000000 then "Med" else
   "#Low" end) as 'Classification', 'Amount' as 'Amount', 'CloseDate' as 'CloseDate',
   'ForecastCategoryName' as 'ForecastCategoryName', 'Name' as 'Name', 'Owner.Name' as 'Owner.Name',
   'StageName' as 'StageName';
3 q = filter q by 'Classification' == "High";
4 q = limit q 10000;
    
```

Final Query

```

1 q = load "opportunity";
2 q = filter q by 'Account.BillingCountry' in ["Canada"];
3 q = filter q by 'ForecastCategory' in ["Forecast"];
4 q = filter q by 'Account.Industry' in ["Biotechnology"];
5 q = foreach q generate case when ('Amount' < 5000000) then "High" when ('Amount' < 20000000) then "Med"
   else "#Low" end as 'Classification', 'Amount' as 'Amount', 'CloseDate' as 'CloseDate',
   'ForecastCategoryName' as 'ForecastCategoryName', 'Name' as 'Name', 'Owner.Name' as 'Owner.Name',
   'StageName' as 'StageName';
6 q = filter q by 'Classification' == "High";
7 q = limit q 10000;
    
```

- If the step query has a binding, review the bindings trace to understand how Analytics resolves the binding.

BINDINGS TRACE	RESULT
coalesce(cell(Numbers.selection, 0, "value"), cell(Numbers.result, 0, "value"))	5
coalesce(*, *).asObject()	5
coalesce(cell(*, *, *), cell(*, *, *))	5
cell(Numbers.selection, 0, "value")	null
cell(Numbers.result, 0, "value")	5

The easiest way to understand the bindings trace is to start from the bottom. In this example, you can see the results of both `cell` binding functions. You can also see that the `coalesce` function uses the results from the second `cell` function. The final result of the entire binding, which appears at the top, shows 5.

Step Properties for Analytics Dashboards

Step properties define the query that returns results to display in the widget. These properties also specify how the widget behaves and interacts with other widgets in the Analytics dashboard. The properties apply to dashboards created in the Wave dashboard designer only.

Property	Description
Display Label	Step label. Use to provide a descriptive label for the step.
Broadcast selections as facets	Controls whether the step's selections are broadcasted as facets. For more information about faceting, see Filter the Dashboard Results with Faceting .
Apply filters from faceting	Controls whether the step listens for broadcasted facets and applies them as filters.

Property	Description
Apply global filters	Apply the global filters to this step. This option is only available for steps that query datasets.
Selection Type	Indicate whether dashboard viewers can make one or multiple selections in the associated widget. You can also specify whether selections are required. If a selection is required, set an initial selection in the Initial Selections step property. If a selection is required but not set, Analytics selects the first value in the list.
Initial Selections	Show the initial selections that are applied when the dashboard opens. For information about setting initial selections, see Set Initial Selections in the Dashboard .

Make the Dashboard Widgets Interactive

Analytics dashboards have unique features that allow you to make the widgets interactive. For example, widgets in the dashboard can be filtered to show only results for the region that's selected in a list widget. Or, when the value of a number widget can change to red when it falls below a threshold.

Watch a Demo: [▶ Make Wave Dashboards Interactive \(English Only\)](#)

IN THIS SECTION:

[Filter the Dashboard Results with Faceting](#)

Faceting is the simplest and most common way to specify interactions between widgets. Widgets can be linked simply by enabling faceting in their associated steps. When the underlying steps are faceted, selections made on chart, date, list, range, and toggle widgets automatically filter other widgets in the dashboard. For example, when you select a rep in the Sales Rep list widget, Analytics filters the dashboard's table widget based on the rep.

[Dynamically Modify the Query, Initial Selection, and Widgets with Bindings](#)

Compared to facets, bindings are more programmatic, and provide more ways to specify interactions. Bindings can dynamically modify a step query, set an initial filter selection, or change a widget's appearance. For example, you can change the measure in a step query based on a selection in a static step. You can initially filter a region-based dashboard based on the country of the logged-in user. Or, you can change the color of the metric in a number widget based on whether its value is high, medium, or low. Each binding is unidirectional, meaning it affects other steps, but other steps don't affect it.

SEE ALSO:

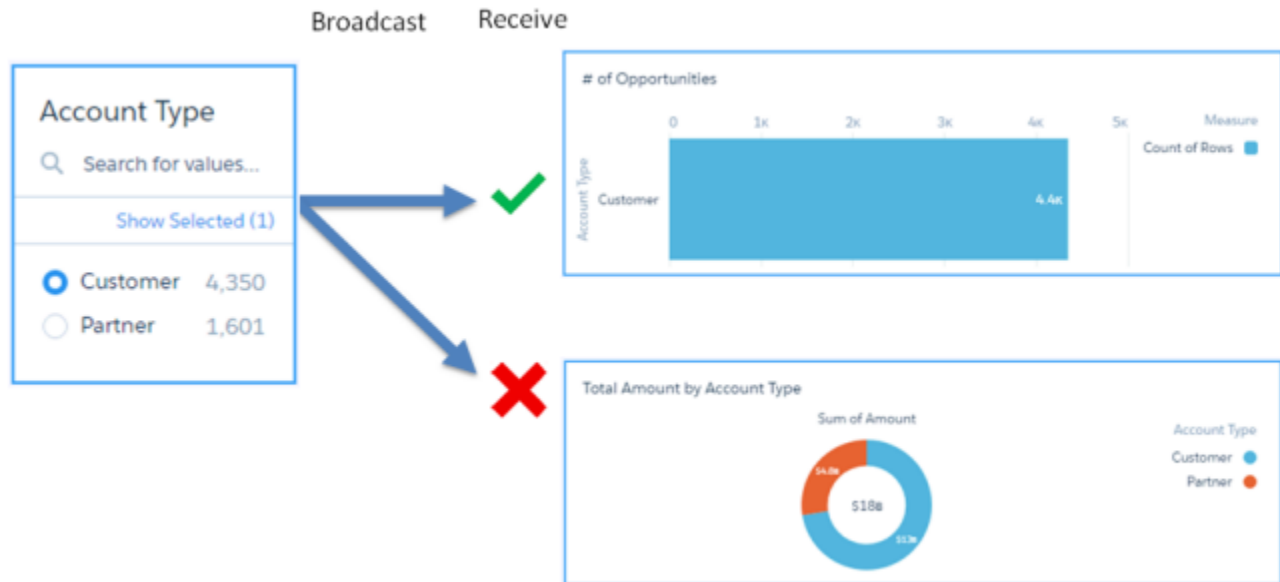
[Manage Steps for Widgets](#)

Filter the Dashboard Results with Faceting

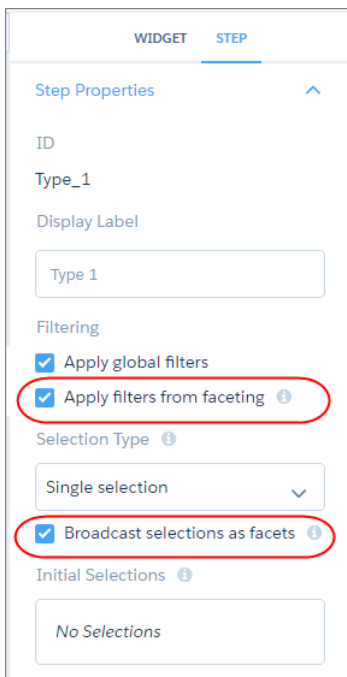
Faceting is the simplest and most common way to specify interactions between widgets. Widgets can be linked simply by enabling faceting in their associated steps. When the underlying steps are faceted, selections made on chart, date, list, range, and toggle widgets automatically filter other widgets in the dashboard. For example, when you select a rep in the Sales Rep list widget, Analytics filters the dashboard's table widget based on the rep.

By default, steps from the same dataset are faceted together. To facet steps between different data sources—like different datasets or static steps—first [connect them](#) on page 447. Steps with a cogrouping that query multiple datasets only facet steps based on the first dataset specified in the `datasets` field in the dashboard JSON.

The following diagram illustrates how two faceting options, **Broadcast selections as facets** and **Apply filters from faceting**, work together to filter results. When a selection is made in the Account Type widget, Analytics broadcasts that selection to any step that receives facets. Analytics filters the “# of Opportunities” widget because **Apply filters from faceting** is enabled. The “Total Amount by Account Type” widget isn’t filtered because **Apply filters from faceting** is disabled.



1. Click to edit the dashboard.
2. Select the widget that uses the step. The panel shows the widget properties.
3. Click **Step** to view the step properties.



4. Set the following faceting options. By default, they're enabled.

Broadcast selections as facets

Controls whether the step's selections are broadcasted as facets.

Apply filters from faceting

Controls whether the step listens for broadcasted facets and applies them as filters.

 **Note:** Keep the following considerations in mind when configuring faceting for steps.

- The **Apply filters from faceting** option appears as read only for the `staticflex` step type because other steps can't faceted it.
- The **Broadcast selections as facets** and **Apply filters from faceting** options appear as read only for the `apex` and `sql` step types because they don't support faceting.
- The **Broadcast selections as facets** and **Apply filters from faceting** options appear as read only for the `aggregate`, `grain`, and `static` step types because they don't support these options. To change the faceting behavior for these step types, edit the `isFacet` property in the dashboard JSON. For a list of the supported faceting JSON properties for each step type, see the *Analytics Dashboard JSON Reference*.

5. To save the changes, save the dashboard.

IN THIS SECTION:

[Configure Cross-Dataset Faceting with Connected Data Sources](#)

By default, steps from the same dataset are faceted—automatically filtering each other. To facet steps from different datasets or even static steps in a Wave designer dashboard, connect them using common fields between them.



SEE ALSO:

[Add Selection-Based Filter Widgets to Enable Users to Filter the Results](#)

Configure Cross-Dataset Faceting with Connected Data Sources

By default, steps from the same dataset are faceted—automatically filtering each other. To facet steps from different datasets or even static steps in a Wave designer dashboard, connect them using common fields between them.

 **Note:** You can't connect static steps that specify date and measure ranges.

1. Click  to edit the dashboard.
2. Click  and then select **Connect Data Sources**.
3. Click **New Connection**.

New Connection
✕

Connection Name

Data Source 1

Choose Data Source 1

Connects To

Data Source 2

Choose Data Source 2

Back

Save

4. Enter a name for the connection.
5. Click **Choose Data Source 1** to select the first data source. For each data source, select a dataset or a static step used in the dashboard.
6. Choose one field from the data source so that Analytics can match records between the specified sources.

Note: Faceting only works on the fields used to define the connection. For example, the connection in the following screenshot is based on the StageName field. As a result, the StageName list widget is faceted to the bar chart. If a selection is made in the Account.Type list widget, faceting doesn't happen—the results are not filtered. To enable faceting on the Account.Type field, define another connection based on this field using the same data sources.

Connection Name

Data Source 1

+
+
ServiceOpportunity3: StageName

Connects To

Data Source 2

+
+
opportunity1: StageName

StageName

Closed Won

Data source: opportunity1

Account.Type

All

Data source: opportunity1

Sum of Amount

Data source: ServiceOpportunity3

7. Click **Choose Data Source 2** to select the second source, and then choose a field.
8. To add another data source, click **Add Data Source**. This option appears after you connect two data sources. You can connect two or more data sources.

448

- Click **Save**.


Dynamically Modify the Query, Initial Selection, and Widgets with Bindings

Compared to facets, bindings are more programmatic, and provide more ways to specify interactions. Bindings can dynamically modify a step query, set an initial filter selection, or change a widget's appearance. For example, you can change the measure in a step query based on a selection in a static step. You can initially filter a region-based dashboard based on the country of the logged-in user. Or, you can change the color of the metric in a number widget based on whether its value is high, medium, or low. Each binding is unidirectional, meaning it affects other steps, but other steps don't affect it.

For more information about bindings, see [Analytics Bindings Developer Guide](#)


Set Initial Selections in the Dashboard

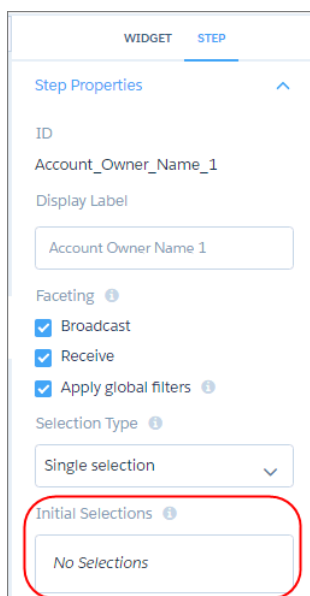
If the Analytics dashboard contains selection-based filter widgets or charts, you can set initial selections that are applied when the dashboard first opens. For example, you can select a bar in a bar chart and set that as the initial selection. If the underlying step for the bar chart is faceted, other widgets with faceted steps are filtered based on this initial selection. While viewing the dashboard, a user can change the selection in the chart to filter the results differently or remove the selection and filters altogether.

 **Note:** If a step is configured to require a selection, don't forget to select the initial selection. Otherwise, the first value is selected.

Set the initial selection for widgets that require it. If you don't, Analytics selects the first value when the dashboard opens.

Analytics ignores the selection if it can't find the initial selection value in the step results when opening the dashboard. This issue can occur when the underlying step for the filter selection widget has a `saql` step type and not all results are returned. (This issue doesn't happen for other step types.) For more information about query limits for a `saql` step type, see [saql Step Type Properties](#).

- While editing the dashboard, click  and then select **Pick Initial Selections**. Analytics previews the dashboard.
- Make selections in chart, list, toggle, date, and range widgets.
- Click **Done**. Analytics saves the selections as start values for the widget steps. You can view the initial selections in the step properties.



IN THIS SECTION:[Dynamically Set Initial Selections Based on the Dashboard Viewer](#)

You can set initial filter selections to show information that's relevant to the logged in user. For example, you can filter a sales dashboard such that each sales rep views only their sales opportunities and performance. You can set initial filter selections based on the user ID, user name, role ID, or role name of the logged in user.

SEE ALSO:[Add Selection-Based Filter Widgets to Enable Users to Filter the Results](#)[Modify the Step Results Based on the Dashboard Viewer](#)

Dynamically Set Initial Selections Based on the Dashboard Viewer

You can set initial filter selections to show information that's relevant to the logged in user. For example, you can filter a sales dashboard such that each sales rep views only their sales opportunities and performance. You can set initial filter selections based on the user ID, user name, role ID, or role name of the logged in user.

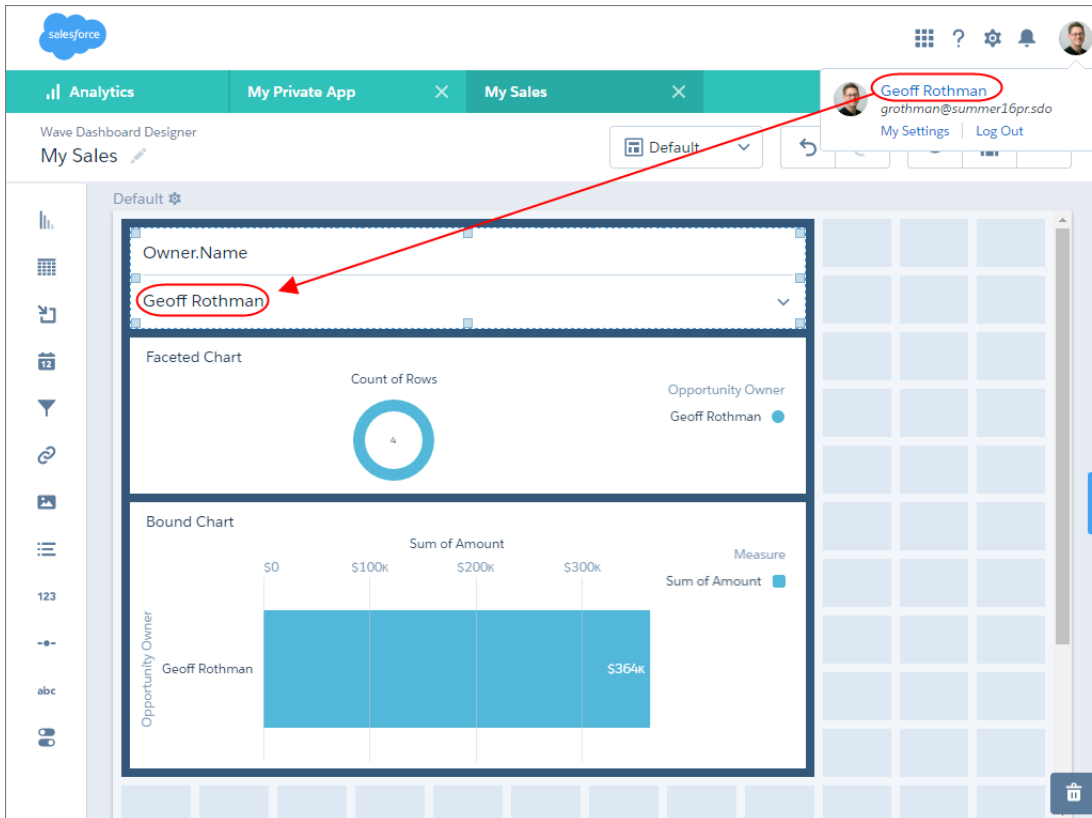
You can set initial selections based on the following Salesforce user tokens: `user.id`, `user.name`, `user.rollename`, and `user.roleid`. At runtime, Analytics retrieves the values of these tokens from Salesforce environment variables—these values don't come from datasets.



Tip: To set the initial selection based on other user attributes of the logged-in user, like their country, use a binding based on a user token. For more information, see the [Analytics Bindings Developer Guide](#).



Example: When the dashboard opens, you want it to dynamically filter charts based on the name of the currently logged in user.



To add the filter, create a list widget and then, in the dashboard JSON, add an initial filter selection based on the `user.name` token in the widget's step (`Owner_Name_1`). This selection filters the following charts:

- Donut chart because its step (`Owner_Name_3`) is faceted with step `Owner_Name_1`.
- Bar chart because its step (`Owner_Username_3`) contains a binding based on step `Owner_Name_1`.

See the bold text in the following dashboard JSON to see how to set the initial filter, as well as facet and bind the steps.

```
{
  "label": "My Sales",
  "state": {
    "gridLayouts": [
      ...
    ],
    "layouts": [],
    "steps": {
      "Owner_Name_1": {
        "datasets": [
          {
            "id": "0FbB00000000pNNKAY",
            "label": "Opportunities",
            "name": "opportunity",
            "url": "/services/data/v38.0/wave/datasets/0FbB00000000pNNKAY"
          }
        ]
      },
      "isFacet": true,

```

```

    "isGlobal": false,
    "query": {
      "measures": [
        [
          "count",
          "*"
        ]
      ],
      "groups": [
        "Owner.Name"
      ]
    },
    "selectMode": "multi",
    "start": [
      "{User.Name}"
    ],
    "type": "aggregateflex",
    "useGlobal": false,
    "visualizationParameters": {
      "options": {}
    }
  },
  "Owner_Name_3": {
    "datasets": [
      {
        "id": "0FbB0000000pNNKAY",
        "label": "Opportunities",
        "name": "opportunity",
        "url": "/services/data/v38.0/wave/datasets/0FbB0000000pNNKAY"
      }
    ],
    "isFacet": true,
    "isGlobal": false,
    "query": {
      "measures": [
        [
          "count",
          "*"
        ]
      ],
      "groups": [
        "Owner.Name"
      ],
      "order": [
        [
          -1,
          {
            "ascending": false
          }
        ]
      ]
    },
    "selectMode": "single",

```

```

        "type": "aggregateflex",
        "useGlobal": true,
        "visualizationParameters": {
            "visualizationType": "hbar",
            "options": {}
        }
    },
    "Owner_Username_3": {
        "datasets": [
            {
                "id": "0FbB00000000pNNKAY",
                "label": "Opportunities",
                "name": "opportunity",
                "url": "/services/data/v38.0/wave/datasets/0FbB00000000pNNKAY"
            }
        ],
        "isFacet": false,
        "isGlobal": false,
        "query": {
            "measures": [
                [
                    "sum",
                    "Amount"
                ]
            ],
            "groups": [
                "Owner.Name"
            ],
            "filters": [
                [
                    "Owner.Name",
                    "{{column(Owner_Name_1.selection,
[\\"Owner.Name\\"]).asObject()}}",
                    "in"
                ]
            ],
            "order": [
                [
                    -1,
                    {
                        "ascending": false
                    }
                ]
            ]
        },
        "selectMode": "multi",
        "type": "aggregateflex",
        "useGlobal": true,
        "visualizationParameters": {
            "visualizationType": "hbar",
            "options": {}
        }
    }
}

```

```

},
"widgetStyle": {
  "backgroundColor": "#FFFFFF",
  "borderColor": "#E6ECF2",
  "borderEdges": [],
  "borderRadius": 0,
  "borderWidth": 1
},
"widgets": {
  "listselector_2": {
    "parameters": {
      "compact": false,
      "expanded": true,
      "exploreLink": false,
      "instant": true,
      "measureField": "count",
      "step": "Owner_Name_1",
      "title": "Owner.Name"
    },
    "type": "listselector"
  },
  "chart_2": {
    "parameters": {
      "autoFitMode": "fit",
      "showValues": true,
      "legend": {
        "showHeader": true,
        "show": true,
        "position": "right-top",
        "inside": false
      },
      "axisMode": "sync",
      "visualizationType": "hbar",
      "exploreLink": true,
      "title": {
        "label": "Bound Chart",
        "align": "left",
        "subtitleLabel": ""
      },
      "trellis": {
        "enable": false,
        "type": "x",
        "chartsPerLine": 4
      },
      "measureAxis2": {
        "showTitle": true,
        "showAxis": true,
        "title": ""
      },
      "measureAxis1": {
        "showTitle": true,
        "showAxis": true,
        "title": ""
      }
    },
  },

```

```

        "theme": "wave",
        "step": "Owner_Username_3",
        "dimensionAxis": {
            "showTitle": true,
            "showAxis": true,
            "title": ""
        }
    },
    "type": "chart"
},
"chart_4": {
    "parameters": {
        "visualizationType": "pie",
        "exploreLink": true,
        "title": {
            "label": "Faceted Chart",
            "align": "left",
            "subtitleLabel": ""
        },
        "step": "Owner_Name_3",
        "theme": "wave",
        "legend": {
            "show": true,
            "showHeader": true,
            "inside": false,
            "position": "right-top"
        },
        "trellis": {
            "enable": false,
            "type": "x",
            "chartsPerLine": 4
        },
        "showMeasureTitle": true,
        "showTotal": true,
        "inner": 70
    },
    "type": "chart"
},
"container_1": {
    "type": "container",
    "parameters": {
        "documentId": "",
        "fit": "original",
        "alignmentX": "left",
        "alignmentY": "top"
    }
}
},
"datasets": [
    {
        "id": "0FbB00000000pNNKAY",
        "label": "Opportunities",
        "name": "opportunity",
    }
]

```

```

      "url": "/services/data/v38.0/wave/datasets/0FbB0000000pNNKAY"
    }
  ]
}

```

For information about editing the dashboard JSON, see the [Analytics Dashboard JSON Reference](#).

Generate Unique Analytics Dashboard Layouts for Different Devices

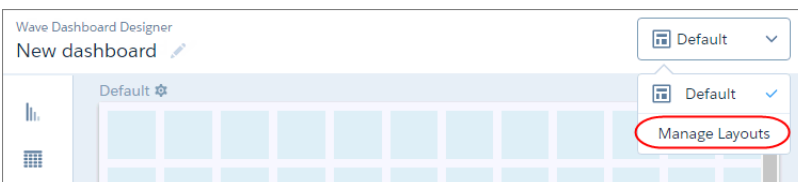
After you add widgets to the dashboard, optimize the layout for each device on which the dashboards can be viewed. For example, you can remove widgets from a mobile phone layout to reduce the dashboard size for the smaller screen. You can also move widgets around in one layout and it doesn't affect the other layouts.

Watch a Demo: [▶ Optimize Wave Dashboards for Devices with Layouts \(English Only\)](#)

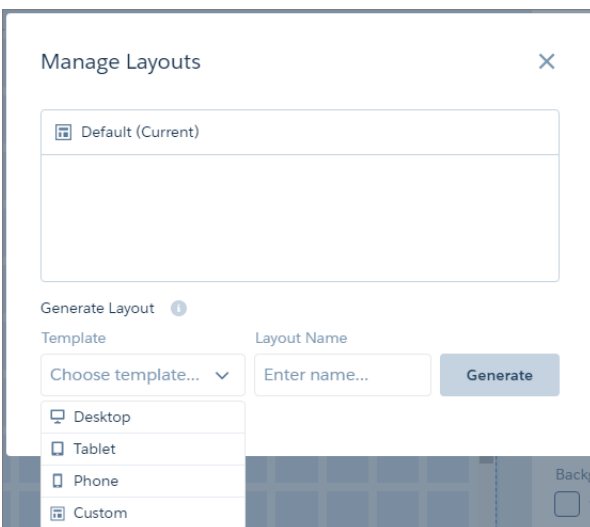
When you generate a new layout, Analytics adds the widgets from the currently selected layout to the new layout. If the current layout contains multiple pages, Analytics also copies the pages to the new layout.

Note: Although you can add all chart types to a mobile layout, some aren't supported on mobile devices. For more information, see [Analytics mobile limitations](#).

1. Open in the Wave designer dashboard.
2. Because each layout can contain different widgets, open the layout that contains the widgets that you want to include in your new layout.
3. From the Layouts menu, select **Manage Layouts**.




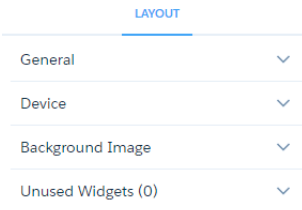
4. Select the layout template, and enter a unique layout name.



Each layout template comes with predefined layout properties that you can change.

5. Click **Generate**.

The layout properties appear for the new layout. If needed, click  to show the Layout panel.



6. In the Layout panel, expand the following sections and change the default properties, if needed.

General

Set the layout name, designer grid settings, and background color.

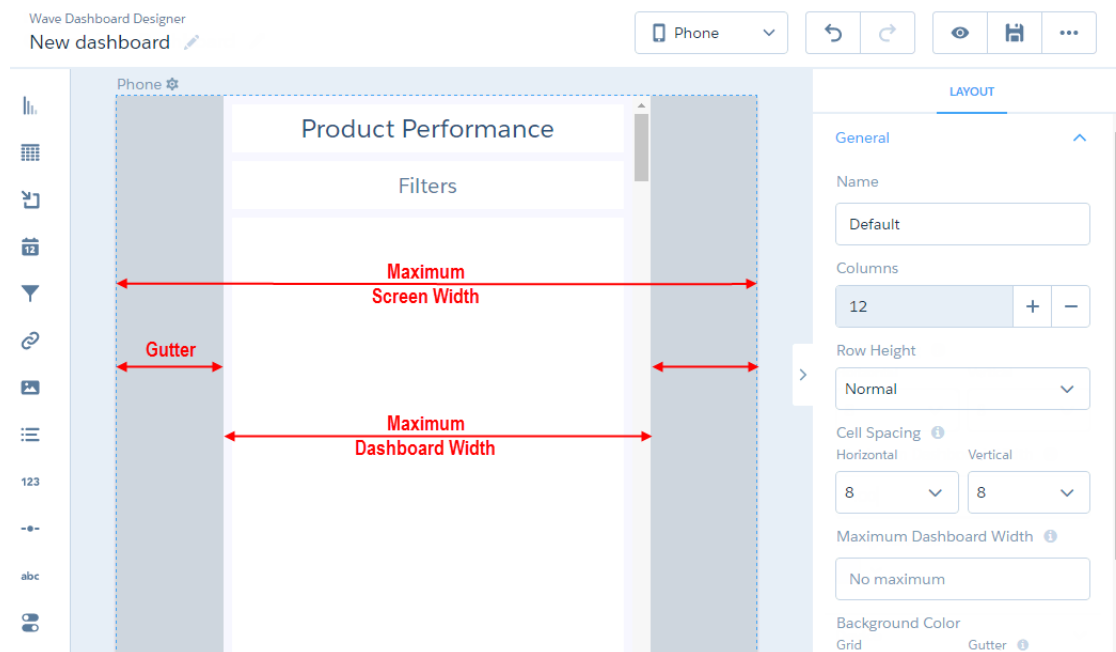
Device


Specify information about the devices that can use this layout. For more information about how Analytics uses these properties to choose the right layout, see [Rules for Choosing a Layout for a Device](#).

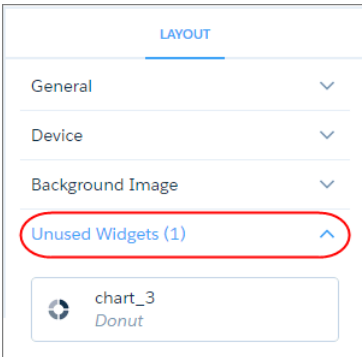
Background Image

To apply a background image to the entire dashboard when this layout is used, enter the details about the background image. You don't have to include a background image.

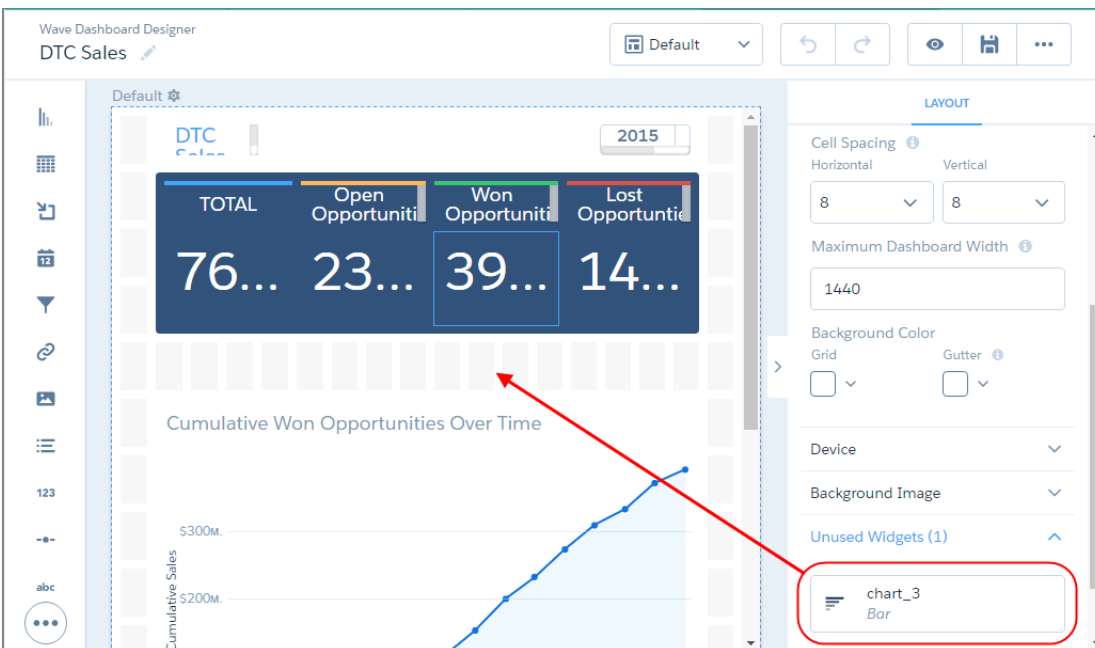
The designer previews the dashboard and layout based on the layout property settings. The designer updates the preview in real time so that you can see how your changes affect the display. If you shrink the maximum dashboard width, the designer shows you how the dashboard fits when using this layout. If needed, the designer rearranges the widgets to fit the new size.





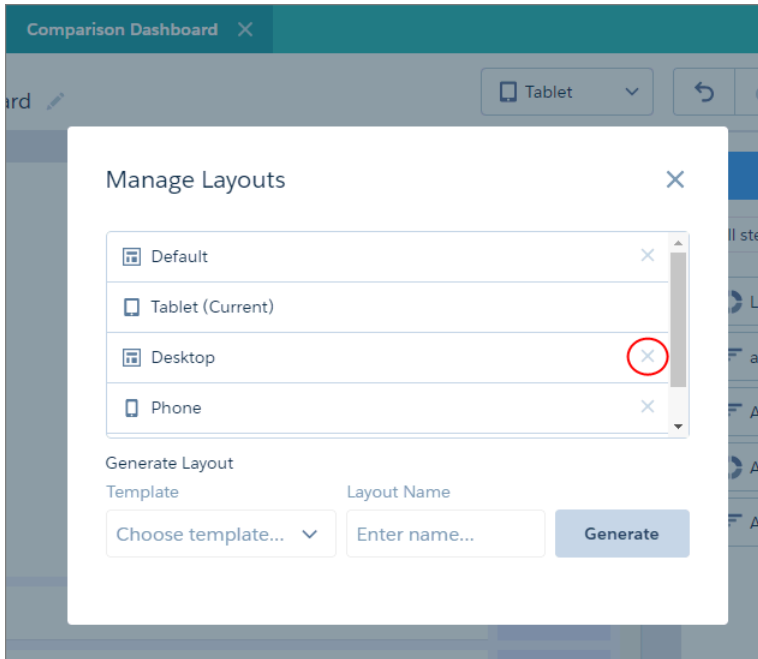
7. Rearrange the widgets, if needed.
8. To hide a widget from the layout, select the widget, and click . If you hide a widget, it appears in the Unused Widgets section of the layout properties.



9. To add an unused widget to the layout, drag the widget from the Unused Widgets section to the canvas.



10. To create a widget, drag the widget from the widget toolbar to the canvas.
 -  **Note:** Analytics adds the widget only to the current layout. To add the widget to another layout, open the other layout and drag the widget from the “Unused Widgets” section of the layout properties.
11. To save your layout changes, save the dashboard.
12. To delete a layout, in the Layouts menu, click **Manage Layouts**, and then click  next to the layout.



 **Note:** You can't delete the layout that's currently open. To delete the current layout, switch to another one first.

IN THIS SECTION:

[Layout Properties for Analytics Dashboards](#)

Layout properties specify the layout name, designer grid settings, background settings, and requirements for devices that can use this layout. The properties apply only to dashboards created in the Wave dashboard designer.

[Rules for Choosing a Layout for a Device](#)

If multiple layouts are defined for a dashboard, Analytics chooses the optimal layout when displaying the dashboard on a device. To determine the optimal layout, Analytics uses the device properties specified for each layout.

Layout Properties for Analytics Dashboards

Layout properties specify the layout name, designer grid settings, background settings, and requirements for devices that can use this layout. The properties apply only to dashboards created in the Wave dashboard designer.

General Properties

These general properties apply to the specified layout.

Property	Description
Name	Name of the layout.
Columns	Number of columns in the Wave designer grid. Increase the number of columns to increase the precision in the layout.
Row Height	Height of the rows in the Wave designer grid. Values are Normal and Fine . When using the Fine option, the vertical spacing is set

Property	Description
	to 0 and can't be changed. Analytics determines the default sizes of widgets based on number of columns and the row height to ensure that the widgets are readable and retain their relative sizes.
Cell Spacing	Horizontal and vertical spacing (in pixels) between cells in the Wave designer grid.
Maximum Dashboard Width	Maximum width (in pixels) that the dashboard can use. If needed, Analytics rearranges the existing dashboard widgets based on this setting in the layout.
Background Color	You can set the background color of the following areas. Grid Color of the Wave designer grid. Gutter Color of the gutter that appears when the device's screen is wider than the dashboard's maximum width.

Device Properties

Analytics uses these values to choose the optimal layout for the device accessing the dashboard.

Property	Description
Screen Width	Width of the devices supported by this layout. Specify the minimum and maximum width (in pixels).
Orientation	Orientation of the devices supported by this layout.
Platform	Platform of the devices supported by this layout.

Background Image Properties

Property	Description
Image	The file name of the image. The image must be available in the gallery of the Analytics app that contains the dashboard. This property applies to background images created during or after Spring '17.
Image ID	15-character ID of the image. The image must be uploaded to the Documents tab of Salesforce with the Externally Available Image option enabled. This property applies to background images created before Spring '17.
Image Scale	Indicate how to fit the image in the background.
Image Alignment	Horizontal and vertical alignment of the background image.

Rules for Choosing a Layout for a Device

If multiple layouts are defined for a dashboard, Analytics chooses the optimal layout when displaying the dashboard on a device. To determine the optimal layout, Analytics uses the device properties specified for each layout.

Analytics uses the following rules when determining which layout to use for a device.

1. A layout is eligible for use when the device accessing the dashboard meets all the device properties set in the Layout panel.
2. If more than one layout is eligible, the one with the most device properties set is used. If there's a tie, the most recently defined layout is used.
3. If no layouts are eligible with the device, the first defined layout is used.

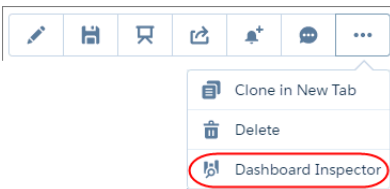
Optimize Dashboard Performance

Before you finalize the dashboard, run a performance check on the dashboard and its steps to ensure that everything is running optimally. The dashboard inspector identifies different types of bottlenecks, like query issues and redundant queries, and provides recommendations to improve performance. Because dashboard layouts can contain different widgets (and steps), run the inspector on each layout. If a dashboard contains multiple pages, run the inspector on each page. The inspector provides results only for the current page.

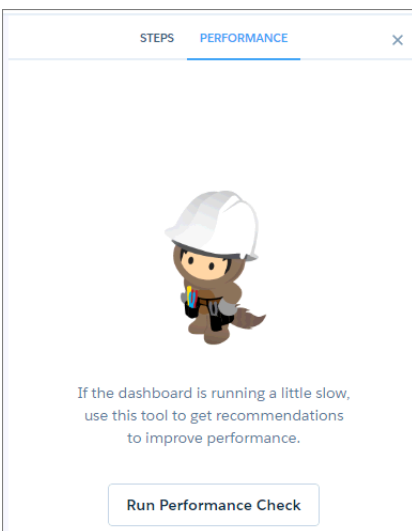
1. While browsing the app, open the dashboard in view mode.

The dashboard inspector is not available while running the app, editing the dashboard, or previewing an embedded dashboard outside of Analytics.

2. To open the dashboard inspector, click  and then **Dashboard Inspector**.

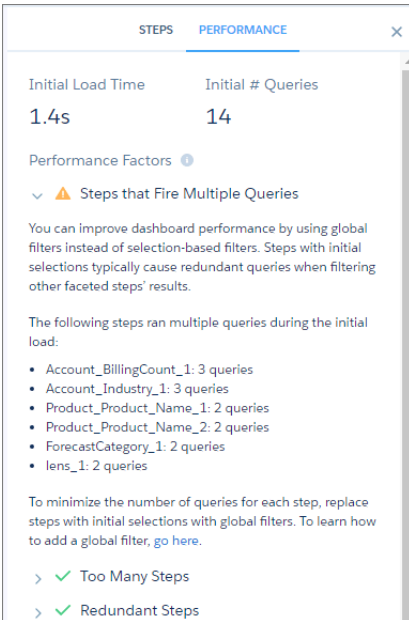



3. To review the dashboard-level performance, open the Performance tab in the dashboard inspector.




4. Click **Run Performance Check**.

The Performance Factors section shows all factors by which the dashboard is evaluated.



 **Note:** If your dashboard contains multiple pages, the dashboard inspector shows results for the current page being viewed.

5. If a warning icon () appears next to a factor, expand the factor to learn how to fix the issue to improve the dashboard's performance.

Ignore the factors with a green checkmark () because these issues don't apply to the dashboard.

6. To analyze the performance of all steps in the dashboard, click the Steps tab, and then select each step.


The dashboard inspector shows the results for the selected step. For more information about step performance, see [Optimize a Step](#)

Keyboard Shortcuts for Analytics Dashboards and Lenses

You can do some basic actions from your keyboard. The dashboard designer shortcuts vary based on whether you are using the classic designer or Wave dashboard designer.

Lens Keyboard Shortcut	Description
L	Clip to dashboard designer
S	Save
N	Clone in new tab
D	Delete
Ctrl+E (Windows) Cmd+E (macOS)	Open JSON Editor

Classic Designer Keyboard Shortcut	Description
Arrow keys	Move the widget in 10-pixel increments.
Ctrl+Arrow keys (Windows) Cmd+Arrow keys (macOS)	Move the widget in 1-pixel increments.
Shift+Arrow keys	Resize the widget by 10 pixels.
Ctrl+Shift+Arrow keys (Windows) Cmd+Shift+Arrow keys (macOS)	Resize the widget by 1 pixel.
X	Delete the widget from the canvas.
[Put the widget beneath other widgets.
]	Put the widget on top of other widgets.

Wave Dashboard Designer Keyboard Shortcut	Description
Arrow keys	Move the widget when editing the dashboard.
C	Share the dashboard when viewing it.
D	Delete the dashboard.
E	Toggle between previewing or editing the dashboard.
S	Save the dashboard.
X	Redo the change.
Z	Undo the latest change.
Delete	Delete the selected widgets while editing the dashboard.
Drag+Shift	Reflow other widgets down when dragging a widget in the dashboard canvas.  Note: Drag the widget before you press Shift .
Ctrl+Click (Windows) Cmd+Click (Mac OS)	Select multiple widgets while editing the dashboard.
Ctrl+A (Windows) Cmd+A (Mac OS)	Select all widgets in the canvas while editing the dashboard.


JSON Editor Keyboard Shortcut	Description
Ctrl+E (Windows) Cmd+E (Mac OS)	View dashboard with changes to JSON.
Ctrl+3 (Windows) Cmd+3 (Mac OS)	Disregard changes and load the original JSON.
Ctrl+F (Windows) Cmd+F (Mac OS)	Search (RegExp, case-sensitive, or whole-word searches available).
Ctrl+F twice (Windows) Cmd+F twice (Mac OS)	Search and replace (RegExp, case-sensitive, or whole-word searches available).

SEE ALSO:

[Convert Your Classic Designer Dashboard to Wave Dashboard Designer](#)

Build a Dashboard with the Classic Designer

The classic designer is the legacy designer that enables you to build basic Analytics dashboards.

 **Note:** Although you can build a dashboard in the classic designer, Salesforce.com recommends using the new Wave dashboard designer, which supports more features and is easier to use. The new designer replaces the classic designer.

IN THIS SECTION:

1. [Key Differences Between the Classic Designer and Wave Dashboard Designer](#)
Consider the following differences between the classic designer and the Wave dashboard designer.
2. [Convert Your Classic Designer Dashboard to Wave Dashboard Designer](#)
To take advantage of its new features, convert dashboards created in the classic designer to the Wave dashboard designer.
3. [Create the Dashboard in Classic Designer](#)
When you create an Analytics dashboard, you can apply a prepackaged layout or start with a blank canvas to create your own layout. To build the dashboard, you can use the classic designer or the new Wave dashboard designer. In this example, we'll use the classic designer.
4. [Add Key Performance Indicators to the Analytics Dashboard](#)
Sometimes, a single number can provide a quick and critical measurement of the business. For example, the total number of open support cases and number of new support cases open this week are key metrics that a service manager would find useful. Add Number widgets to provide key indicators to a dashboard.
5. [Add Visualizations to the Analytics Dashboard](#)
Add charts to visualize and interact with the data to tell a story about it. Each chart is based on the underlying query in a lens.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

6. [Facet Widgets to See Data from Multiple Angles](#)
Widgets that come from the same dataset are faceted by default. Faceting means that when you filter one widget, all the related widgets in the Analytics dashboard are filtered in the same way. You can turn faceting on or off for each widget.
7. [Add Images to the Analytics Dashboard](#)
Add images to your dashboard to help your audience with context and to make the dashboard more fun to read. For example, if your dashboard is designed to help track sales of multiple products, consider distinguishing the products by their logos.
8. [Link to Lenses and Other Dashboards](#)
Use links to tie an Analytics dashboard to related lenses and dashboards. This widget is useful when you want to break up analysis across multiple assets, rather than cramming it all into a single dashboard. It's also useful for creating pathways to analyze your data.
9. [See Details About a Widget's Lens](#)
To ensure that a widget in an Analytics dashboard is showing the right data, review details about the widget's lens.
10. [Filter or Remove Clipped Lenses from the Analytics Dashboard](#)
Curate the clipped lenses in a dashboard to reduce clutter. You can filter the list of clipped lenses to see which ones aren't used and then remove them from your dashboard. (This help topic applies to dashboards built in classic designer only.)

SEE ALSO:

- [Convert Your Classic Designer Dashboard to Wave Dashboard Designer](#)
- [What Is a Dashboard?](#)
- [Best Practices for Building Your Own Analytics Dashboard](#)
- [Keyboard Shortcuts for Analytics Dashboards and Lenses](#)
- [Key Differences Between the Classic Designer and Wave Dashboard Designer](#)
- [Build a Dashboard with the Classic Designer](#)
- [Build a Dashboard with the Classic Designer](#)

Key Differences Between the Classic Designer and Wave Dashboard Designer

Consider the following differences between the classic designer and the Wave dashboard designer.

- The Wave dashboard designer provides a user interface for creating layouts for different types of devices. With the classic designer, you have to set up mobile layouts using the dashboard JSON.
- The Wave dashboard designer provides wizards that walk you through creating widgets, with their underlying steps created behind the scenes. With the classic designer, you have to manually create the lenses in explorer, clip them, and then apply them to widgets. (A "step" in the Wave dashboard designer is the same as a "lens" in the classic designer.)
- The Wave dashboard designer uses snap-to-grid, letting you quickly position, align, and resize widgets. In the classic designer, you specify pixels to define each widget's position and size.
- You can create steps, including static steps, from within the Wave dashboard designer. In classic designer, you have to clip the lens from explorer to the designer or build the step using JSON.
- The Wave dashboard designer allows you to hide steps and properties to give you more workspace when designing a dashboard. This isn't possible in the classic designer.
- The Wave dashboard designer has a single table widget that can be used to create a values table or compare table. The classic designer has a separate widget for each type of table.
- Unlike the box widget in the classic designer, the container widget in the Wave dashboard designer groups widgets, which allows you to move them all at once.
- Only dashboards built with the Wave dashboard designer support annotations and notifications.

- Only the classic designer and explorer support the following chart types: parallel coordinates, horizontal dot plot, vertical dot plot, and matrix. When clipped to the Wave dashboard designer, these chart types convert to a bar chart.

SEE ALSO:

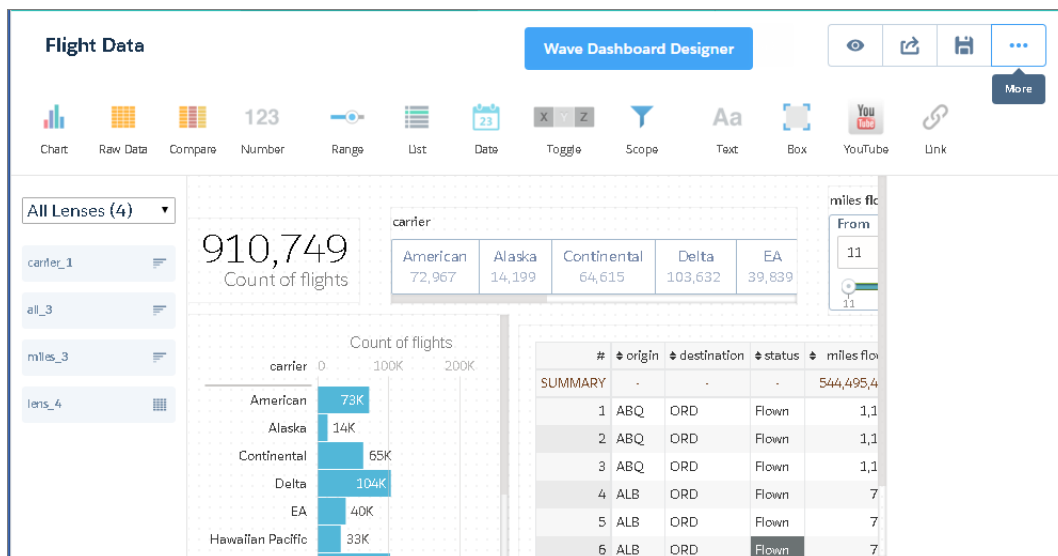
[Build Analytics Dashboards](#)

[Build a Dashboard with the Classic Designer](#)

Convert Your Classic Designer Dashboard to Wave Dashboard Designer

To take advantage of its new features, convert dashboards created in the classic designer to the Wave dashboard designer.

When editing the dashboard, click the **Wave dashboard designer** button to convert it to the new designer.



When you convert a dashboard to the new designer, Analytics makes a copy of the dashboard. Before you delete the original version of the dashboard, know that you can't open the new version in the classic designer. Any changes that you make in the new designer can't be converted back to the classic designer.

IN THIS SECTION:

[Considerations Before Converting to the Wave Dashboard Designer](#)

Although dashboards created in the classic designer and Wave designer have a similar look and feel, they use different run-time engines and have different JSON syntax. When you convert a dashboard to the Wave designer, certain elements of your dashboard might not convert correctly. You might need to make some manual changes to preserve the original behavior.

SEE ALSO:

[Build Analytics Dashboards](#)

Considerations Before Converting to the Wave Dashboard Designer

Although dashboards created in the classic designer and Wave designer have a similar look and feel, they use different run-time engines and have different JSON syntax. When you convert a dashboard to the Wave designer, certain elements of your dashboard might not convert correctly. You might need to make some manual changes to preserve the original behavior.

Widgets

The following widget issues can arise when you convert a classic dashboard to Wave designer.

- Wave designer resizes and rearranges widgets to fit them into a grid and to ensure that no widgets (except containers) overlap. After conversion, you can use the snap-to-grid feature in Wave designer to quickly resize and rearrange widgets. You can also add more columns to the grid and decrease the row width to get better precision when laying out the widgets.
- Wave designer converts the following chart types to bar charts because it doesn't support them: calendar heatmap, parallel coordinates, horizontal dot plot, vertical dot plot, and matrix.
- Wave designer removes YouTube and Box widgets because it doesn't support them.
- Wave designer drops the setting for the **Allow Filtering by** step property. After the conversion, you can reapply the setting to the **Selection Type** widget property. The name and location of the property is different in Wave designer..

Steps

The following step issues can arise when you convert a classic dashboard to Wave designer.

- If you specify the compare table step query in SAQL form, you can't specify custom labels for compare table columns. To specify custom labels, the step must be in compact form. You can specify the column label in the `header` attribute, as shown here.

```

"query": {
  "columns": [{
    "query": {
      "groups": [ "Product" ],
      "measures": [
        [
          "count",
          "*"
        ]
      ]
    },
    "header": "Number of rows"
  }]
}

```

- The step breaks in the following cases:
 - A field in a static step doesn't have a consistent format across all rows in the step. For instance, if a "value" field is defined as an array, then every row in the step must define "value" as an array.

For example, this step is valid:

```

"values": [
  {
    "display": "Amount",
    "value": { "Type": "sum('SplitAmount') " }
  },
  {
    "display": "Percentage",
    "value": { "Type": "avg('SplitAmount') " }
  }
]

```


The following step is not valid.

```
"values": [
  {
    "display": "Amount",
    "value": { "Type": "sum('SplitAmount') " }
  },
  {
    "display": "Percentage",
    "value": [],
    "Type": "avg('SplitAmount') "
  }
]
```

- A `grain` step contains SAQL. Wave designer doesn't support SAQL in `grain` steps. To fix this issue, manually convert the `grain` step in the dashboard JSON to an `aggregateflex` step using [this process](#). Wave designer supports SAQL queries in the other types of steps, like `aggregateflex`.
- A `multi` step for a compare table contains a column-level SAQL query. While converting the dashboard, Wave designer converts `multi` steps to `aggregate` steps because it doesn't support `multi` steps. However, it can't convert `multi` steps that have a column-level SAQL query. To fix this issue, re-create the step as shown here.



- A `multi` step contains bindings. During conversion, the Wave designer generates the `measures` and `groupings` sections in the dashboard JSON using the metadata in the `columns` definitions of the original `multi` step. However, if the metadata contains bindings, Wave designer can't resolve them to determine what values to add to the new step. In this case, Wave designer adds the step query, but not the values for the `measures` and `groupings` sections. To fix the step, determine which measures and groupings are being defined in the bindings specified in the query, and add them to the `measures` and `groupings` sections.

 **Note:** If the step contains no measures, you still must specify `"measures": []`.

Mobile Layouts

Mobile layouts created in classic designer dashboards are dropped when the dashboard is converted to Wave designer. To fix this issue, re-create the layouts again using the layouts user interface in the Wave designer.

Start Values and Selections

The following issues with start values and selections can occur when you convert a classic dashboard to Wave designer.

- When invoking an embedded dashboard, you can specify criteria to be passed as selections. If you set a selection value for a step and that value doesn't exist in the step's result set, the selection isn't applied. This behavior is different from classic designer, which blindly applies this invalid selection, resulting in no data returned.
- If a step returns more than 2,000 results, a configured start value for the step or a manually coded selection value for an embedded dashboard might not be set. Specifically, if the start or selection value isn't one of the initial 2,000 results returned by the step, the value isn't found and, therefore, not set. To reduce the chance of this happening, increase the query limit up to 10,000 in the step definition. For more information about the `limit` parameter in a step query, see the [Analytics SAQL Reference](#).

Bindings

The following binding issues can arise when you convert a classic dashboard to Wave designer. If a binding doesn't work after the conversion, the dashboard doesn't render. If this issue occurs, contact Salesforce Customer Support.

- Wave designer dashboards run on the new runtime engine, which has a new bindings syntax. When converted to Wave designer, the dashboard bindings are not updated with the new syntax. The new runtime engine can process a subset of the original bindings syntax. It can process bindings that set measure selections, groupings, filters, sort order, or limits based on string or numeric values in steps. Other bindings might not work after conversion. To resolve invalid bindings, rewrite the bindings using the new bindings syntax.
- The new runtime engine is stricter when evaluating bindings defined using the old bindings syntax. If a binding isn't well formed, the step returns an error.

For example, an error occurs if the binding contains redundant parentheses. The outermost binding function can't be enclosed in parentheses, as shown here.

```
"measures": "{ (value (field (selection (Select_Graph), 'compact'))) } }
```

The following error occurs in this case.

```
"(value (field (selecti -^ Expecting 'FUNCTION', got '('."
```

To fix this issue, remove the outermost set of parentheses, as illustrated here.

```
"measures": "{ { value (field (selection (Select_Graph), 'compact')) } }
```

- When defining date ranges in a static step, use a double array, as shown here.

```
"step_days": {
  "values": [{
    "display": "30 Days",
    "value": [
      [
```

```

        "day",
        0
      ],
      [
        "day",
        365
      ]
    ]
  ],
  ...
}

```

Here's the binding that references the static step.

```

"filters": [
  [
    "OpportunityServices__c.CloseDate",
    "{{selection(step_days)}}",
    ">=<="
  ]
]

```

Because the selection binding is defined inside an array, the following example throws an error.

```

"step_days": {
  "values": [{
    "display": "30 Days",
    "value": [
      [
        "day",
        -30
      ],
      [
        "day",
        0
      ]
    ]
  }],
  ...
}

```

Here's the binding that references the static step above.

```

"filters": [
  [
    "OpportunityServices__c.CloseDate",
    [ "{{selection(step_days)}}" ],
    ">=<="
  ]
]

```

SEE ALSO:

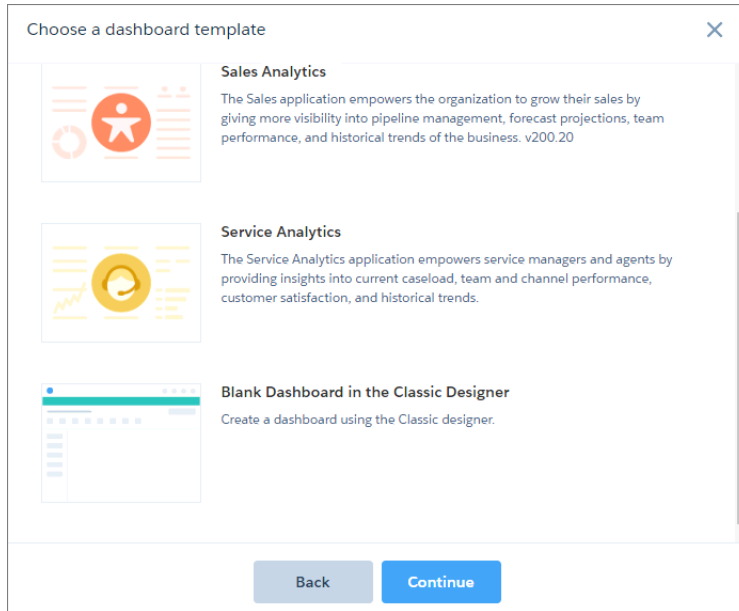
[Convert Your Classic Designer Dashboard to Wave Dashboard Designer](#)

Create the Dashboard in Classic Designer

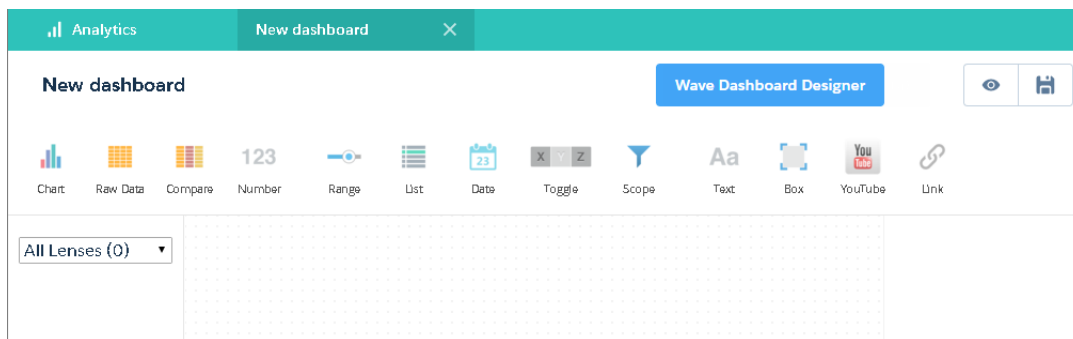
When you create an Analytics dashboard, you can apply a prepackaged layout or start with a blank canvas to create your own layout. To build the dashboard, you can use the classic designer or the new Wave dashboard designer. In this example, we'll use the classic designer.

This topic is about creating dashboards in Analytics. For information on creating dashboards for reports, review the article [Create a Salesforce Classic Dashboard](#).

1. From the home page, click **Create > Dashboard**.
The layout templates appear.




2. Choose a layout template, or select an option to create a blank dashboard in the classic designer or Wave dashboard designer. The layout templates create dashboards in the Wave dashboard designer. In this case, we'll create a blank dashboard using the classic designer.
3. Select **Blank Dashboard in the Classic Designer**, and then click **Continue**.
If you haven't previously declined to use the Wave dashboard designer, the "Ready for Wave Dashboard Designer?" pop-up appears.
4. Select **Not Now**.
The classic designer opens.

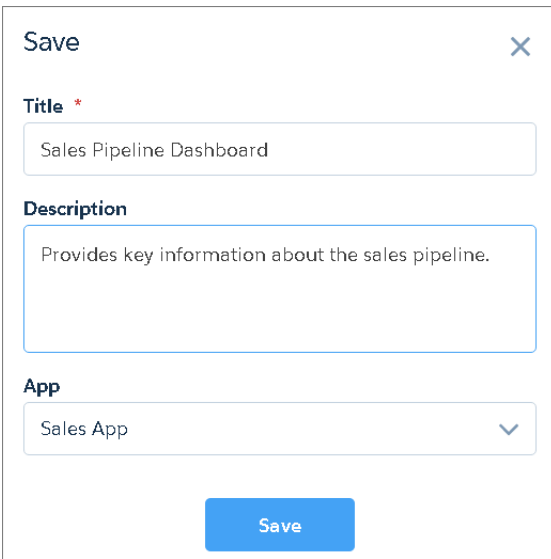


USER PERMISSIONS

To create a dashboard:

- Create and Edit Analytics Dashboards

5. Click  to save the dashboard to an app.



The image shows a 'Save' dialog box with the following fields:


- Title ***: Sales Pipeline Dashboard
- Description**: Provides key information about the sales pipeline.
- App**: Sales App


A blue 'Save' button is located at the bottom of the dialog.

6. Click **Save**.

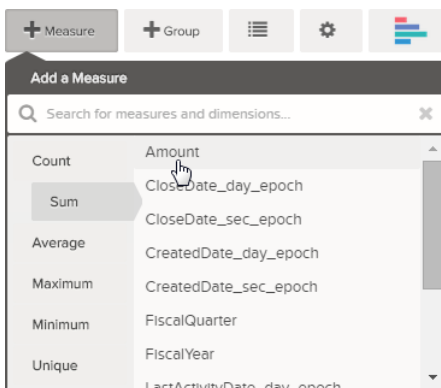
Add Key Performance Indicators to the Analytics Dashboard


Sometimes, a single number can provide a quick and critical measurement of the business. For example, the total number of open support cases and number of new support cases open this week are key metrics that a service manager would find useful. Add Number widgets to provide key indicators to a dashboard.



-  **Note:** This topic covers how to add a number widget using classic designer. For information about how to do this with Wave dashboard designer, see [Add Number Widgets to Include Key Metrics](#).

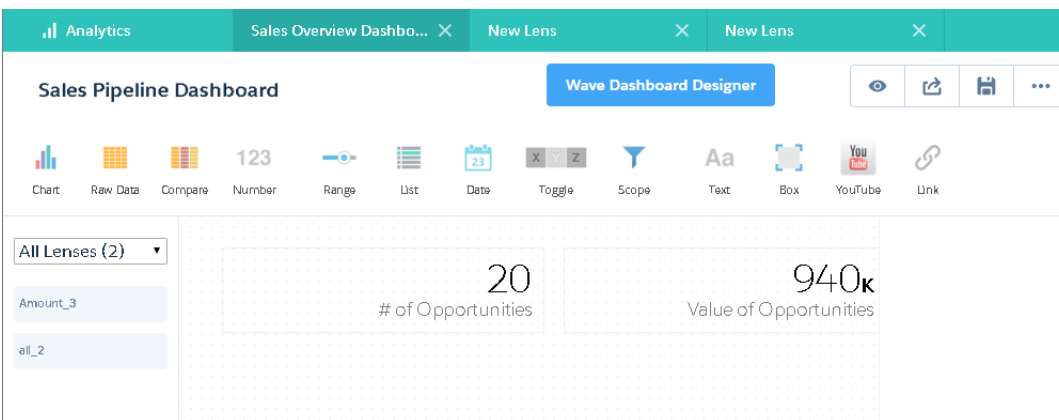
1. To add a key performance indicator to a classic designer dashboard, open the Opportunities dataset, and click  to calculate the total value of all opportunities in the pipeline.

- a. In the measure picker, select `Sum` from the left column.
- b. Pick a dataset field from the right column that you would like to sum. In this case, select `Amount`.



-  **Note:** Don't add any groupings. A number, by definition, consists of just one group. Later, you will add a chart that shows the value for different groupings.

2. While we're here, let's add another kind of measure to bring more context to the story that we're telling with this dashboard. For example, you can select `COUNT of iswon` to get the number of successfully closed deals.
3. Click  to clip this lens to the classic designer.
 -  **Tip:** If you have multiple dashboards, the lens is clipped to whichever dashboard you had open last.
4. In the classic designer, click the number widget (`123`) to create an empty number widget, and then select the first clipped lens that contains a sum of amount. The number that appears in the number widget is the first measure (on the far left) that you specified in the lens.
5. To choose a different measure from the lens or configure other useful properties, select the Number widget and set the properties in the Widget Properties section.
 - a. Give the widget a title. The default title, which is taken from the field name, is sometimes too cryptic for the audience.
 - b. For a large number, select **Shorten number** to reduce the length of the display. Doing so turns a number such as `2,148,352` into the more readable `2M`.
6. Using the same procedure, add another number widget based on the second clipped lens that provides a count of won deals. Your dashboard now contains the two number widgets.




Add Visualizations to the Analytics Dashboard

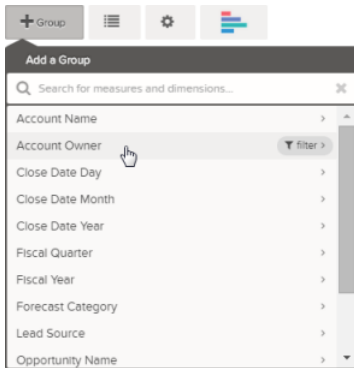
Add charts to visualize and interact with the data to tell a story about it. Each chart is based on the underlying query in a lens.


 **Note:** This topic covers how to add a chart using classic designer. For information about how to do this with Wave dashboard designer, see [Add Chart Widgets to Visualize Data](#).

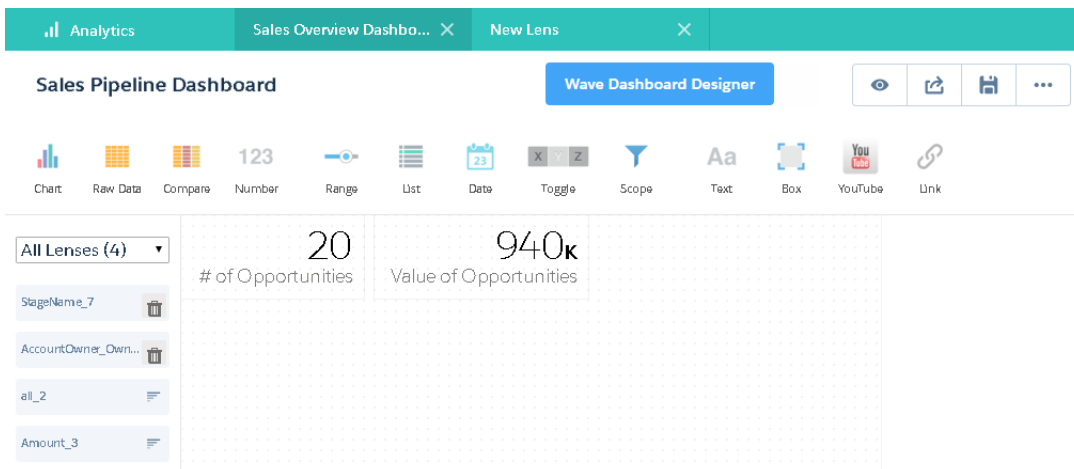
In the next steps, we'll create two interactive charts in the classic designer dashboard that let the audience analyze the sales pipeline. The first will analyze the pipeline by account owner. The second will analyze it by stage. Both charts are based on an Opportunities lens, which contains a count of the number of opportunities and no groupings.

1. Verify that the Sales Pipeline dashboard is open.
 - You must have the dashboard open to clip lenses to it.
 -  **Note:** If no dashboard is open, Analytics creates a dashboard.
2. From the home page, open the Opportunities lens.

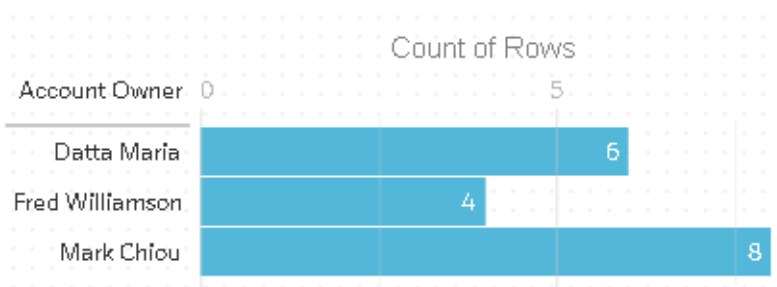
- Group the data by Account Owner.



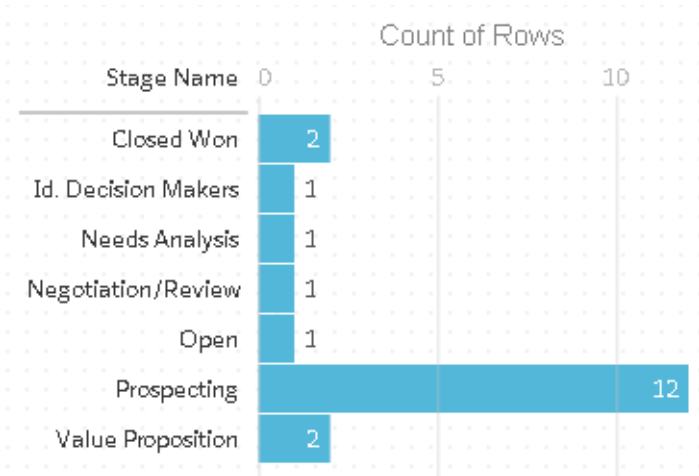
- Click  to clip the lens to the dashboard.
- Change the Account Owner grouping to a Stage Name grouping.
To change a grouping, click the grouping and then select the new grouping.
- Clip the lens to the dashboard.
Now that you have both lenses clipped to the dashboard, let's build charts based on them.
- View the Sales Pipeline dashboard in the classic designer.



- In the classic designer, click the chart widget, and then select the first clipped lens that contains number of opportunities grouped by account owner.
The chart shows of the results from the underlying query in the clipped lens.

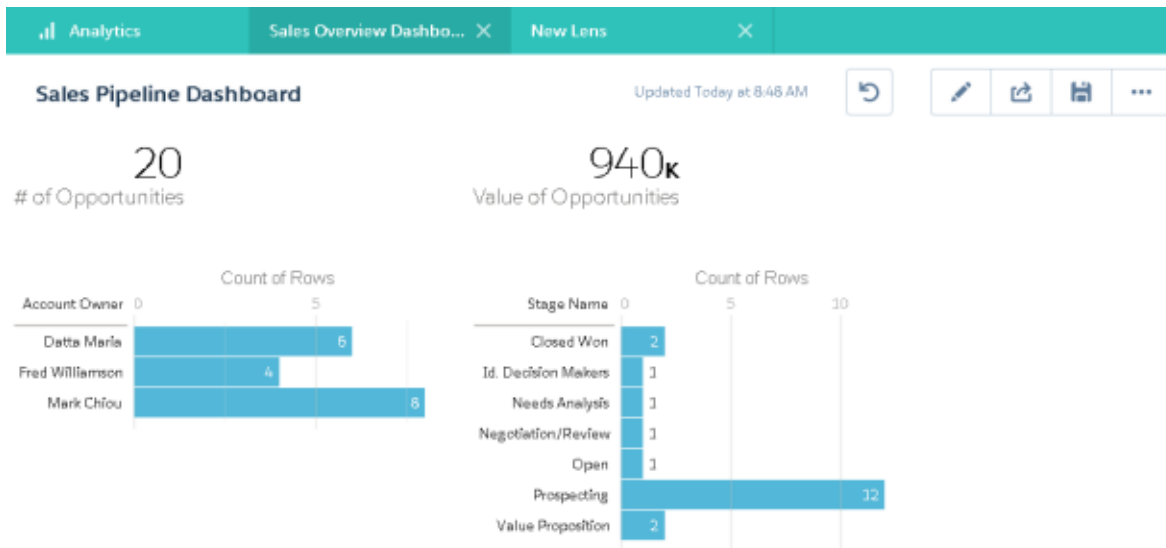


9. Create another chart based on the other clipped lens—the one grouped by stage name. The new chart widget shows how many opportunities are in each stage.



10. Click to view the dashboard in presentation mode.

Now you're looking at the audience's view of your dashboard, and you're ready to ask some questions.



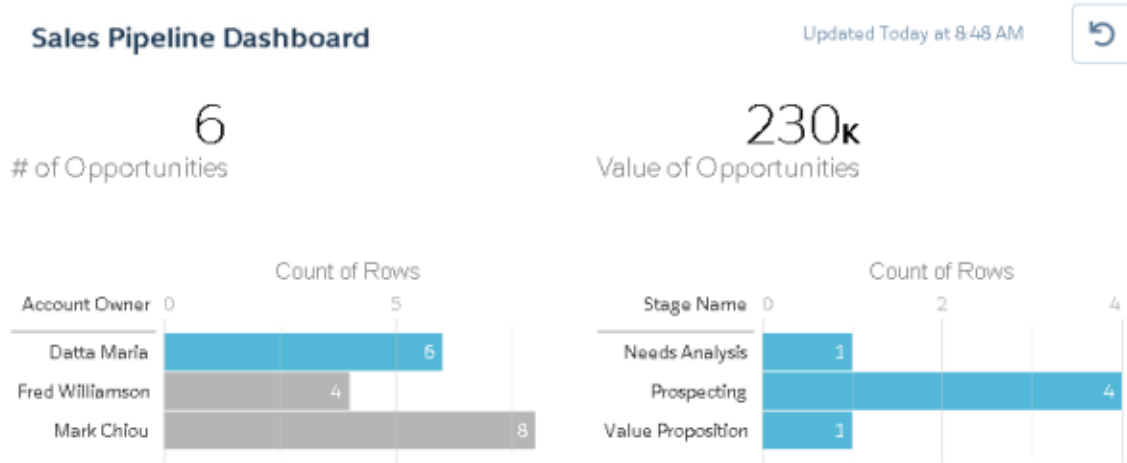
Facet Widgets to See Data from Multiple Angles

Widgets that come from the same dataset are faceted by default. Faceting means that when you filter one widget, all the related widgets in the Analytics dashboard are filtered in the same way. You can turn faceting on or off for each widget.

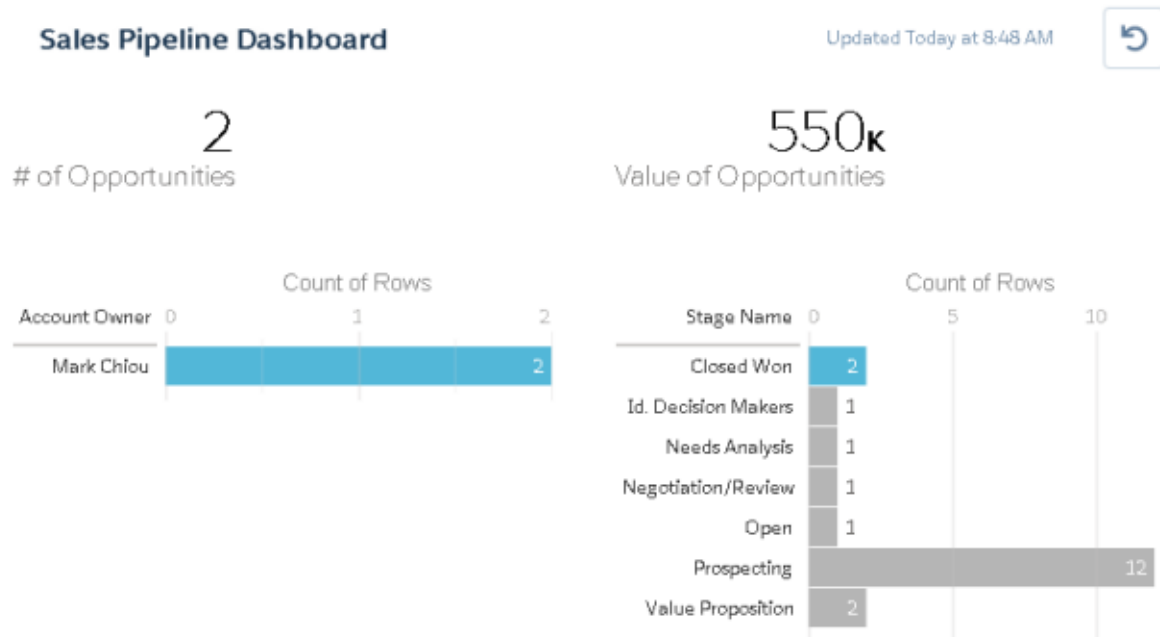
Note: This topic covers how to facet widgets in a classic designer dashboard. For information about faceting in a Wave designer dashboard, see [Filter the Dashboard Results with Faceting](#).

Let's look at how faceting works with the number and chart widgets that we added to our classic designer dashboard.

1. In the Sales Pipeline dashboard, click the first bar in the chart that shows the number of opportunities grouped by account owner. Notice that first bar is now highlighted and the results of the other widgets changed. Because of faceting, the number widgets and the other chart now show the results for the selected account owner only. Each of your widgets shows the same set of data from a different angle. Widgets created from the same dataset are faceted, by default.



2. Click the first bar again to remove the filter based on the account owner. Notice that the results are now shown for all account owners.
3. In the chart that shows the number of opportunities grouped by stage name, click the first bar. The Account Owners chart changes to show the values of the deals that each salesperson has in the selected stage. Because Mark is the only one that has deals in this stage, only he appears in the Account Owners chart.




4. To disable faceting for a particular widget, clear the **Facet this lens** option in the lens properties.


 **Tip:** You can use bindings to facet widgets created from different datasets. For more information, see the [Analytics Dashboard JSON Reference](#).

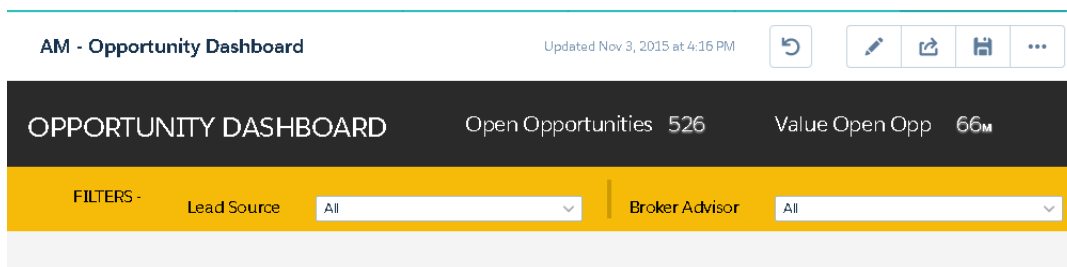
Add Images to the Analytics Dashboard

Add images to your dashboard to help your audience with context and to make the dashboard more fun to read. For example, if your dashboard is designed to help track sales of multiple products, consider distinguishing the products by their logos.

 **Note:** This topic covers how to add an image widget using classic designer. For information about how to do this with Wave dashboard designer, see [Add an Image Widget to Display Graphics in the Dashboard](#).

1. Upload the image that you want to use to Documents and select the “Externally Available Image” option. If you don’t select the option, the image will not appear in the dashboard.
2. Copy the record ID for the document in the URL in the address bar.
3. In the dashboard, click the box widget and paste the record ID into the **Image Document ID** field in widget properties.

 **Note:** You can also use the box widget to shade a section of the dashboard or add a background color to the dashboard. For example, you can use colored areas to highlight key metrics and filters.



To do this, don’t include an image and set the background color in the **Background Color** field of the widget properties.

SEE ALSO:

[Uploading and Replacing Documents](#)

Link to Lenses and Other Dashboards

Use links to tie an Analytics dashboard to related lenses and dashboards. This widget is useful when you want to break up analysis across multiple assets, rather than cramming it all into a single dashboard. It’s also useful for creating pathways to analyze your data.

 **Note:** This topic covers how to add a link widget using classic designer. For information about how to do this with Wave dashboard designer, see [Add a Link Widget to Link to Other Assets](#).


1. In the dashboard, click the link icon.
2. In the widget properties, specify the link properties, such as the ones listed here.

Destination Type

Specify whether the link widget leads to a saved lens, saved dashboard, or new lens.

Destination

Specify the lens or dashboard asset to link to.

-  **Note:** If you try to create a Link widget in a dashboard that has not been saved in Spring '16 and you don't see the asset in the picklist, open the asset first, and then look for the asset in the picklist.

Include Dashboard State

When enabled, the selections made in widgets with faceted steps are transferred to the linked lens or dashboard. When transferring dashboard states, Analytics verifies that the destination has lenses that are compatible with the lenses from the source dashboard.

-  **Note:** Analytics doesn't transfer a dashboard state in the following cases.

- The source lens isn't faceted.
- The destination lens uses a different dataset than the source lens.
- When linking to another dashboard, the destination lens uses different groupings than the source lens. If the link destination is a lens, then groupings don't prevent dashboard state from being transferred.

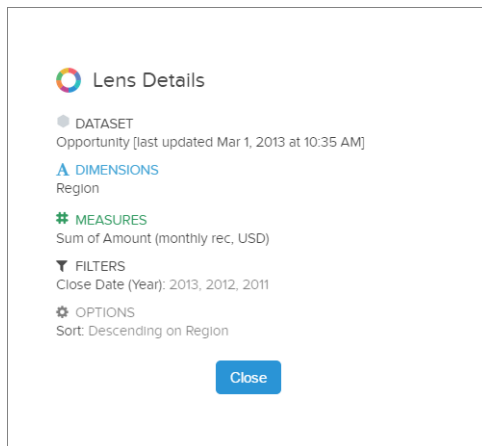
Text

The link label that you click to access the linked asset.

See Details About a Widget's Lens

To ensure that a widget in an Analytics dashboard is showing the right data, review details about the widget's lens.

1. When viewing a classic designer dashboard in presentation mode, not edit mode, hover over a widget and click .



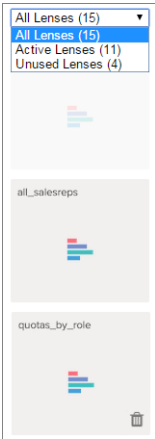
Lens details display.

2. Review the dataset and applied dimensions, measures, filters, and other details about the widget's lens.

Filter or Remove Clipped Lenses from the Analytics Dashboard

Curate the clipped lenses in a dashboard to reduce clutter. You can filter the list of clipped lenses to see which ones aren't used and then remove them from your dashboard. (This help topic applies to dashboards built in classic designer only.)

1. From the clipped lens menu, filter by **All Lenses**, **Active Lenses**, or **Unused Lenses**.



2. Optionally, if a lens isn't used, then you can remove it from your dashboard by clicking .

If the lens is saved to Analytics, then it's still available and can be opened from Lenses after being removed from your dashboard.

Embed and Customize Analytics

Extend Analytics everywhere throughout your business. The Analytics visualizations you've built are more powerful when you share them across your Salesforce experience by integrating them into custom pages, Visualforce pages, community sites, and more. In addition, custom menus in lenses and dashboards allow you to perform common Salesforce actions directly from Analytics.

IN THIS SECTION:

[Embed Dashboards Everywhere](#)

Embed Analytics dashboards in every Salesforce experience. From embedded dashboards, users can explore and click to linked assets. If you set them up with a Share icon, embedded dashboards offer Post to Feed and Download sharing options.

[Add Actions to Analytics Lenses and Dashboards](#)

Let users take action on insights directly from Analytics. Add actions to charts and tables in lenses and dashboards.

[Integrate Analytics into Salesforce with an Analytics Tab](#)

Access your Analytics home and run Analytics apps from a tab within Salesforce Classic or Lightning Experience.

[Customize Analytics Dashboards using JSON](#)

Configure advanced features in Analytics dashboards using JSON.

[Format Measures and Display Elements with Analytics Extended Metadata \(XMD\)](#)

Set up your data and customize dashboard elements with Analytics Extended Metadata.


Embed Dashboards Everywhere

Embed Analytics dashboards in every Salesforce experience. From embedded dashboards, users can explore and click to linked assets. If you set them up with a Share icon, embedded dashboards offer Post to Feed and Download sharing options.

Compare the options for embedding dashboards.

User Interface	Where	How	Component
Lightning Experience only	Home, record, and app home pages	Component in the Lightning App Builder	Wave Dashboard (wave:waveDashboard)
Salesforce Classic only	Record detail page	Component in the enhanced page layout editor	Wave Analytics Asset
Lightning Experience and Salesforce Classic	Any page	Visualforce page component	wave:dashboard
Salesforce App	Lightning app page or Visualforce tab	Lightning app builder or Visualforce page component	Wave Dashboard (wave:waveDashboard) or wave:dashboard
Communities	Customer Service (Napili) page or Visualforce page	Component in Community Builder or Visualforce component on a Force.com community page	Wave Dashboard (forceCommunity:waveDashboard) or wave:dashboard

Embedded Analytics dashboards can include these features.

- Annotations, notifications, and full-screen presentation
- Sharing and downloading options
- Record actions menus
- Global filters
- Links to other Analytics dashboards
- Link to the native app , whether it's Analytics Studio on desktop or Analytics Mobile (available for Analytics users but not Community users)

Embedded Analytics dashboards have these limitations.

- The option to explore datasets in Analytics isn't included.
- The charts don't include hover-over information (tooltips).
- Some filters, such as date selectors, are difficult to set.

IN THIS SECTION:

[Embed Analytics Dashboards in Lightning Pages](#)

Add Analytics dashboard components to Lightning home pages, record pages, and app home pages to provide interactive visualizations of your data. Users can drill in and explore the dashboard within the frame on the Lightning page or in an Analytics window.

[Embed Analytics Dashboards in Salesforce Classic Pages](#)

Add an Analytics dashboard to a detail page layout. On an account detail page, for example, you can include a dashboard of service issues associated with the account. Users can drill in, apply filters, and explore in the dashboard as if they were viewing it in an Analytics window.

[Add an Analytics Dashboard to a Visualforce Page](#)

By embedding an Analytics dashboard into a Visualforce page, you can provide an interactive presentation of your data. Users can drill in and explore the dashboard within the frame on the Visualforce page or in a new window in Analytics.

[Whitelist Trusted Sites for Embedded Dashboards](#)

Embed Analytics in any web page or web-based app. By specifying your trusted sites in the Analytics whitelist, you can include embedded Analytics dashboards in websites and apps outside of Salesforce servers.

[View Embedded Dashboards on Mobile Devices](#)

Add Analytics dashboard components to Visualforce pages in Salesforce websites accessed by mobile users, including Communities. Or add Analytics dashboard components to Lightning app pages. Embedded Analytics dashboards can responsively select layouts optimized for any device—including phones and tablets.

[Share Analytics with Communities](#)

With Analytics for Communities, external users can view apps shared with them via Analytics dashboards embedded in their community. You can embed dashboards using Community Builder or Visualforce pages.

Embed Analytics Dashboards in Lightning Pages

Add Analytics dashboard components to Lightning home pages, record pages, and app home pages to provide interactive visualizations of your data. Users can drill in and explore the dashboard within the frame on the Lightning page or in an Analytics window.

To add a dashboard to your Lightning page, follow these steps.

1. Go to the Lightning App Builder, click **New**, and follow the prompts to create a new Lightning page.
2. Select **Wave Dashboard** from the list of components.
3. From the Dashboard dropdown list, select the dashboard to display.



Note: (For Developers) In the code, the dashboard name is represented with the dashboard ID. If configuring the component programmatically, you can use either the dashboardId attribute or the developerName attribute. The developerName can be requested through the API.

4. From the layout drop-down list, select the type of screen where your Lightning page will be viewed.

EDITIONS

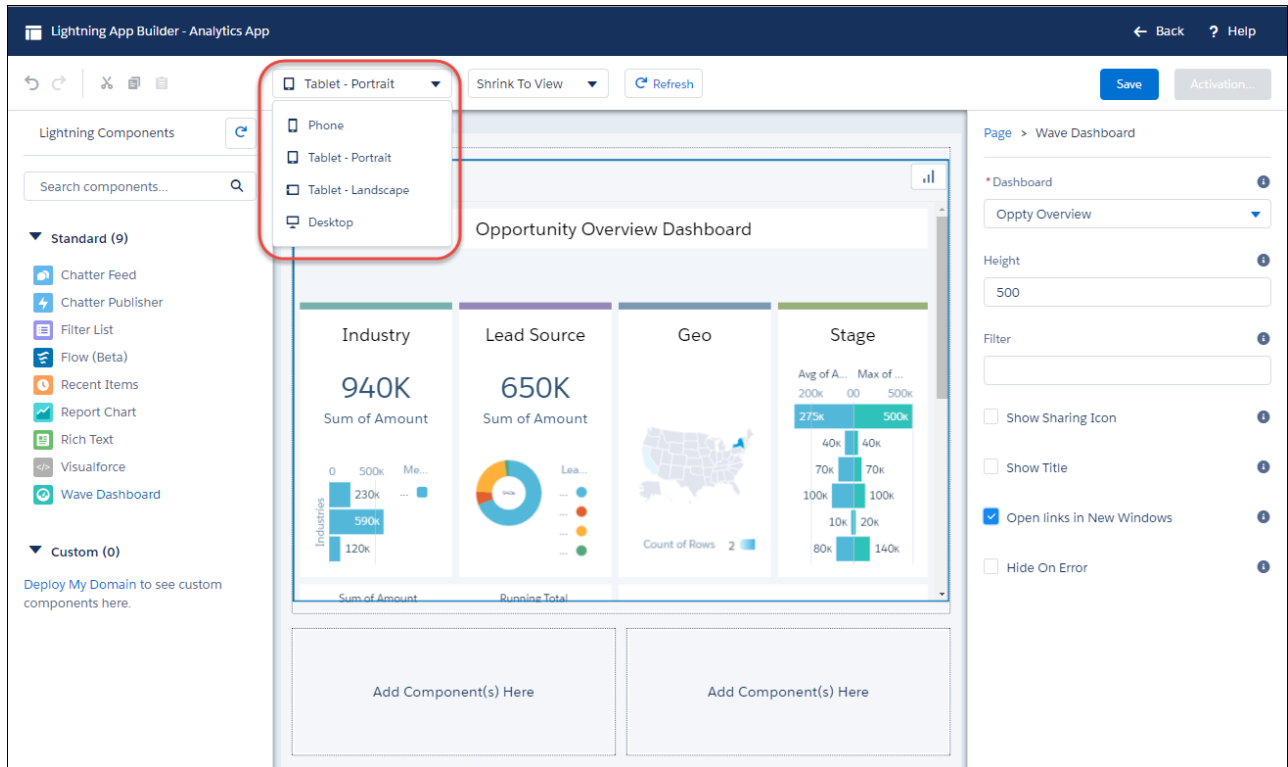
Available in: Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To view embedded Analytics dashboards:

- Analytics Platform permission set license with Use Analytics permission



5. Configure the attributes of the embedded Analytics dashboard:

- The **Show Sharing Icon** option lets you include the Share icon on the dashboard. If the icon is present, users can click to open the Share dialog, where they can post to Chatter and download images and data.
- The **Show Title** checkbox gives you control over the visibility of the dashboard title.
- The **Show Header** lets you control the visibility of the dashboard header. If selected, the dashboard is displayed with a header bar that includes the Open in Analytics icon and the date and time that the dashboard's data was updated. The header bar will also appear if either Show Sharing Icon or Show Title is selected.
- With the **Open Links in New Windows** attribute, you can specify where links from the dashboard to other assets are opened.
- The **Hide On Error** checkbox gives you control over whether the Analytics dashboard appears if there is an error (such as the dashboard can't be found).
- With the **Filter** attribute, you can set up the embedded dashboard to show only the data that's relevant for the record being viewed. The **Filter** attribute links data fields in the dashboard to the object's fields. For example, the filter here applies the name of the account on the record page as a filter so that the dashboard shows only information related to that account name:

```
{'datasets':{'account': [{'fields': ['Name'], 'filter':{'operator': 'matches', 'values': ['$Name']}]}}}
```

The example above shows a filter that causes the embedded dashboard to appear with only the filtered data showing. Here's an example that applies the account name as a selection within a dashboard that shows all of its data:

```
{'datasets' : {'account': [ {'fields': ['Name'], 'selection': ['$Name']}]}}
```

Refer to the table to understand the notation for the **Filter** attribute.



Tip: This is a new syntax as of Spring '17. The previous syntax, noted [here](#), is still supported.

Notation	Description	Notes
datasets	Analytics dataset	Where to find it: On the Analytics home page, select Edit on the dataset. The System Name is in the left panel of the edit page for the dataset. (If your org has namespaces, include the namespace prefix and two underscores before the dataset system name.)
fields	Dimension or Measure in the Analytics dataset	Where to find it: Click the Explore icon to open the widget. Then select Show SAQL from the Options menu. For dimension names, look for “group by” statements. For measure names, look for statements with functions such as “sum” or “stddev.”
values	Field in the Salesforce object, or a specific value	Where to find it: In Setup, find the object you want, and select Fields. Use the Field Name (also known as the API Name). For custom fields, use the name with “__c” at the end.
selection	With the selection option, the dashboard is shown with all its data, and the specified dimension values are highlighted	The selection option can be used alone or with the filter option. Selection takes dimension values only. To use this option, the dashboard must include a list, date, or toggle widget that groups by the specified dimension. If a selection specifies a value that doesn't exist, or the dashboard doesn't include a list, date, or toggle widget that groups by the specified dimension, then the selection input is ignored and the dashboard appears with all its data and no selection.
filter	With the filter option, the dashboard is shown with only filtered data	The filter option can be used alone or with the selection option. Filter takes dimension or measure values.
operator	Use with the filter option	Supported operators for dimensions: in, not in, matches Supported operators for measures: ==; !=; >=; >; <=; <

Use this syntax for filtering on dimensions.

```
{'datasets' : {'dataset1': [ {'fields': ['field1'], 'selection': ['$value1', '$value2']},
{'fields': ['field2'], 'filter': { 'operator': 'operator1', 'values': ['$value3', '$value4']}}]}}
```

Use this syntax for filtering on measures.

```
{'datasets' : {'dataset1': [ {'fields': ['field1'], 'selection': ['$value1', '$value2']},
{'fields': ['field2'], 'filter': { 'operator': 'operator1', 'values': [[value3]]}}]}}
```



Note: The above syntax is new in Spring '17. The previous syntax continues to be supported, and it works the same as the new selection option. For reference, here's the previous syntax:

```
{ 'datasetSystemName1': {'field1': ['$value1']}, 'datasetSystemName2': {'field1':
 ['$value1', '$value2'], 'field2': ['$value3']} }
```

For example:

```
{'opportunity': {'AccountId': ['$Id']}}
```

For information about working with the Lightning App Builder, start on the [Lightning App Builder](#) overview page.

Embed Analytics Dashboards in Salesforce Classic Pages

Add an Analytics dashboard to a detail page layout. On an account detail page, for example, you can include a dashboard of service issues associated with the account. Users can drill in, apply filters, and explore in the dashboard as if they were viewing it in an Analytics window.

EDITIONS

Available in: Salesforce Classic

Available in: **Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

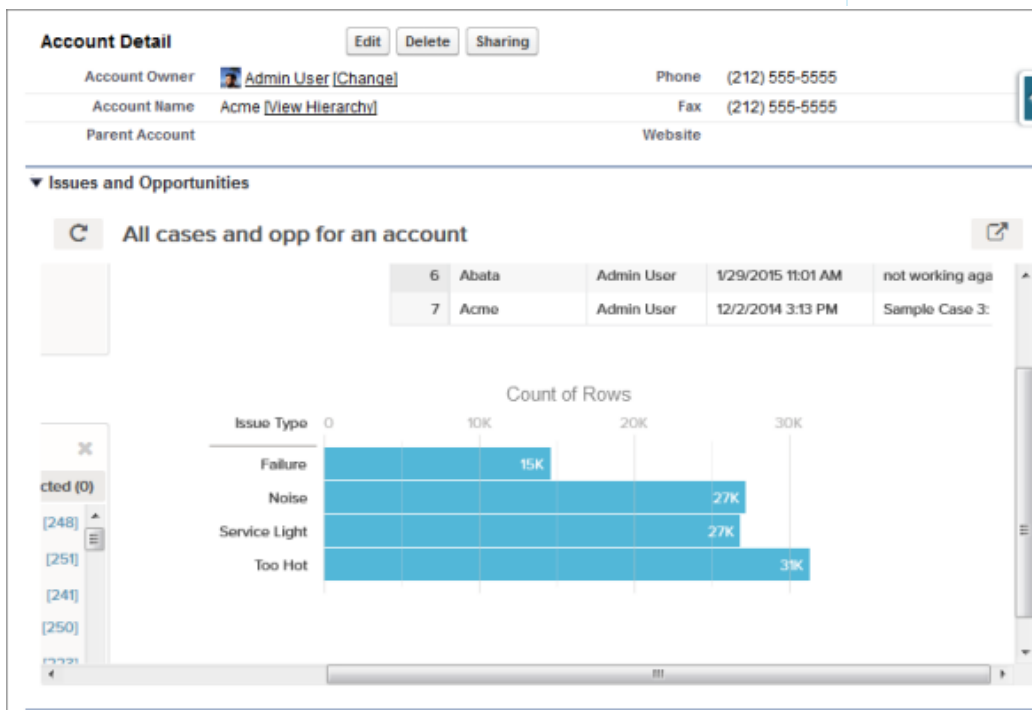
USER PERMISSIONS

To customize page layouts:

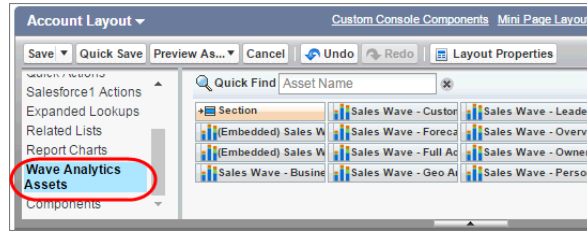
- Customize Application


To view embedded Analytics dashboards:

- Analytics Platform permission set license with Use Analytics permission



1. In the enhanced page layout editor, select Wave Analytics Assets in the left column of the palette.



2. Drag an item from the list of available dashboards to a detail section on the page layout.
3. After the dashboard is positioned in the layout, you can change properties such as height by double-clicking the element or clicking the wrench icon next to it ().

Additional properties of Analytics Assets:

- The `Show Title` checkbox gives you control over the visibility of the dashboard title.
- The `Show Sharing Icon` option lets you include the Share icon on the dashboard. If the icon is present, users can click to open the Share dialog, where they can post to Chatter and download images and data.
- The `Show Header` option lets you control the visibility of the dashboard header. If selected, the dashboard is displayed with a header bar that includes dashboard information and icon controls. The header bar will also appear if either `Show Sharing Icon` or `Show Title` is selected.
- The `Hide on error` checkbox gives you control over whether the Analytics asset appears if there is an error (such as the dashboard can't be found).
- Dashboards include the date and time when they were last refreshed.

To set up the dashboard to show only the data that's relevant for the record being viewed, use field mapping. Field mapping links data fields in the dashboard to the object's fields. For example, the field mapping here applies the name of the account on the record page as a filter so that the dashboard shows only information related to that account name:

 A screenshot of the 'Asset Properties' dialog box. It contains the following fields and options:


- Width (in pixels or %):
- Height (in pixels):
- Show Title
- Show Sharing Icon
- Show Header
- Hide on error
- Field mapping [i](#)

 The field mapping text area contains the following JSON:


```
{
  "datasets": {
    "Account": [
      {
        "fields": ["Name"],
        "filter": {
          "operator": "matches",
          "values": ["$Name"]
        }
      }
    ]
  }
}
```

 At the bottom are 'OK' and 'Cancel' buttons.

Refer to the table to understand the notation for adding the field mapping property.

 **Tip:** This is a new syntax as of Spring '17. The previous syntax, noted [here](#), is still supported.


Notation	Description	Notes
datasets	Analytics dataset	Where to find it: On the Analytics home page, select Edit on the dataset. The System Name is in the left panel of the edit page for the dataset. (If your org has namespaces, include the namespace prefix and two underscores before the dataset system name.)
fields	Dimension or Measure in the Analytics dataset	Where to find it: Click the Explore icon to open the widget. Then select Show SAQL from the Options menu. For dimension names, look for “group by” statements. For measure names, look for statements with functions such as “sum” or “stddev.”
values	Field in the Salesforce object, or a specific value	Where to find it: In Setup, find the object you want, and select Fields. Use the Field Name (also known as the API Name). For custom fields, use the name with “__c” at the end.
selection	With the selection option, the dashboard is shown with all its data, and the specified dimension values are highlighted	The selection option can be used alone or with the filter option. Selection takes dimension values only. To use this option, the dashboard must include a list, date, or toggle widget that groups by the specified dimension. If a selection specifies a value that doesn't exist, or the dashboard doesn't include a list, date, or toggle widget that groups by the specified dimension, then the selection input is ignored and the dashboard appears with all its data and no selection.
filter	With the filter option, the dashboard is shown with only filtered data	The filter option can be used alone or with the selection option. Filter takes dimension or measure values.
operator	Use with the filter option	Supported operators for dimensions: in, not in, matches Supported operators for measures: ==; !=; >=; >; <=; <

The field mapping follows this format:

```
{
  "datasets": {
    "dataset1": [
      {"fields": ["field1"],
        "selection": ["$selection1", "$selection2"],
        "filter": {"operator": "operator1", "values": [{"value1", "value2"}, {"value3",
"value4"}]}
      },
      {"fields": ["field2", "field3"],
        "selection": ["$selection3", "$selection4"]
      }
    ],
    "dataset2": [
      {"fields": ["field4"],
        "filter": {"operator": "operator2", "values": ["value5"]}
      }
    ]
  }
}
```

```
}

```

 **Note:** Use this syntax for filtering on dimensions.

```
"filter": {"operator": "operator1", "values": ["$value1"]}
```

Use this syntax for filtering on measures.

```
"filter": {"operator": "operator1", "values": [[value1]]}
```

For example, if the dashboard has a dataset named Service with the dimensions Account and Industry, this field mapping would show the dashboard with all its data but the record's account ID and industry would be highlighted:

```
{
  "datasets": {
    "service": [
      {"fields": ["AccountId"],
        "selection": ["$Id"]
      },
      {"fields": ["Industry"],
        "selection": ["$Industry"]
      }
    ]
  }
}
```

With this field mapping, the dashboard would appear with just the record's account ID and industry data:

```
{
  "datasets": {
    "service": [
      {"fields": ["AccountId"],
        "filter": {"operator": "matches", "values": ["$Id"]}
      },
      {"fields": ["Industry"],
        "filter": {"operator": "in", "values": ["$Industry"]}
      }
    ]
  }
}
```


Here's another example with two datasets and a combination of selections and filters. This field mapping will show the dashboard with only data that is not in ExistingOpps but is in TX, AL, and DE, with revenue that is greater than or equal to 1000000. In addition, the dashboard will show Retail1, Wholesale1, and TX highlighted.

```
{
  "datasets": {
    "Opportunities": [
      {"fields": ["OpptyName"],
        "selection": ["$Retail1", "$Wholesale1"],
        "filter": {"operator": "not in", "values": ["$ExistingOpps"]}
      },
      {"fields": ["State", "Country"],
        "selection": ["$TX"],
        "filter": {"operator": "in", "values": [{"$TX"}, {"$AL"}, {"$DE"}]}
      }
    ]
  }
}
```

```

    }
  ],
  "Accounts": [
    {"fields": ["Revenue"],
     "selection": [],
     "filter": {"operator": ">=", "values": [[1000000]]}
    }
  ]
}
}

```

 **Note:** The above syntax is new in Spring '17. The previous syntax continues to be supported, and it works the same as the new selection option. For reference, here's the previous syntax:

```

{
  "dataset1": {
    "field1": ["$value1"]
  },
  "dataset2": {
    "field2": ["$value2"],
    "field3": ["$value3"]
  }
}

```

For example, if the dashboard shows data from a dataset named Service, with the dimensions Account and Industry, the field mapping would be defined like this:

```

{
  "service": {
    "AccountId": ["$Id"],
    "Industry": ["$Industry"]
  }
}

```

Be aware of these limits and limitations:

- You can add one dashboard per page layout.
- Analytics dashboards aren't supported in the original page layout editor. If you open and then save a layout with an Analytics dashboard in the original page layout editor, the dashboard is deleted.

For information about working with the enhanced page layout editor, see [Customizing Page Layouts with the Enhanced Page Layout Editor](#).

Add an Analytics Dashboard to a Visualforce Page

By embedding an Analytics dashboard into a Visualforce page, you can provide an interactive presentation of your data. Users can drill in and explore the dashboard within the frame on the Visualforce page or in a new window in Analytics.

To add a dashboard to your Visualforce page, configure the `<wave:dashboard>` component. You can add one dashboard per Visualforce page. However, the dashboard can include links to other dashboards or Analytics assets.

Here are two examples. Note that the dashboard is identified by the `dashboardId`, which is an 18-character code beginning with 0FK. You can find the `dashboardId` at the end of the URL when viewing a dashboard. An alternative way to identify the dashboard is by its `developerName`, which can be requested through the API.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view embedded Analytics dashboards:

- Analytics Platform permission set license with Use Analytics permission OR Analytics for Communities permission set license with View Analytics on Communities pages permission

```
<apex:page sidebar="true" standardController="Opportunity">

  <wave:dashboard dashboardId="0FKB000000006Y7OAI"
    showTitle="true"
    height="800px"
    openLinksInNewWindow="true"
    filter="{ 'datasets' : { 'opportunity': [ { 'fields':['Id'], 'selection':
[ '{!Opportunity.Id}' ] ] } } }"/>

</apex:page>
```

```
<apex:page standardController="case">

  <wave:dashboard dashboardId="0FKxx000000000uGAA"
    height="1000px"
    showTitle="false"
    showSharing="true"
    openLinksInNewWindow="false"
    hideOnError="true"
    filter="{ 'datasets' : { 'ServiceCase4': [ { 'fields':['Id'], 'selection':
[ '{!case.Id}' ] ], { 'fields':['OwnerId'], 'filter': { 'operator':'in', 'values':
[ '{!case.OwnerId}', '{!case.Product__c}' ] } ] } } }"/>

</apex:page>
```

- The `showTitle` attribute gives you control over the visibility of the dashboard title.
- The `showSharing` attribute lets you include the Share icon on the dashboard. If the icon is present, users can click to open the Share dialog, where they can post to Chatter and download images and data.
- The `showHeader` attribute lets you control the visibility of the dashboard header. If true, the dashboard is displayed with a header bar that includes the Open in Analytics icon and the date and time that the dashboard's data was updated. The header bar will also appear if either `showSharing` or `showTitle` is true.
- With the `openLinksInNewWindow` attribute, you can specify where links from the dashboard to other assets are opened.
- The `hideOnError` attribute gives you control over whether an Analytics asset appears if there is an error (such as the dashboard can't be found).
- The `width` attribute specifies the width of the dashboard, in pixels or percent. Pixel values are simply the number of pixels, for example, 500. Percentage values specify the width of the containing HTML element and must include the percent sign, for example, 20%. If the specified width is too large for the device, the maximum device width is used.
- With the `filter` attribute, you can either select or filter on dataset fields at run time. For example, this attribute can be used to set up the embedded dashboard to show only the data that's relevant for the record being viewed by linking data fields in the dashboard to an object's fields. Filters are configured with JSON strings.

Use this syntax for filtering on dimensions.

```
filter="{ 'datasets' : { 'dataset1': [ { 'fields': [ 'field1' ], 'selection': [ '!value1', '!value2' ] }, { 'fields': [ 'field2' ], 'filter': { 'operator': 'operator1', 'values': [ '!value3', '!value4' ] } ] } } }
```


Use this syntax for filtering on measures.

```
filter="{ 'datasets' : { 'dataset1': [ { 'fields': [ 'field1' ], 'selection': [ '!value1', '!value2' ] }, { 'fields': [ 'field2' ], 'filter': { 'operator': 'operator1', 'values': [ [value3] ] } ] } } }
```

For example:

```
filter="{ 'datasets' : { 'Sales': [ { 'fields': [ 'Region', 'Stage' ], 'selection': [ [ 'West', 'Prospecting' ], [ 'North', 'Qualification' ] ] } ] } }
```


Refer to the table to understand the notation for the `filter` attribute.

 **Tip:** This is a new syntax as of Spring '17. The previous syntax, noted [here](#), is still supported.

Notation	Description	Notes
datasets	Analytics dataset	Where to find it: On the Analytics home page, select Edit on the dataset. The System Name is in the left panel of the edit page for the dataset. (If your org has namespaces, include the namespace prefix and two underscores before the dataset system name.)
fields	Dimension or Measure in the Analytics dataset	Where to find it: Click the Explore icon to open the widget. Then select Show SAQL from the Options menu. For dimension names, look for "group by" statements. For measure names, look for statements with functions such as "sum" or "stddev."
values	Field in the Salesforce object, or a specific value	Where to find it: In Setup, find the object you want, and select Fields. Use the Field Name (also known as the API Name). For custom fields, use the name with "__c" at the end.

Notation	Description	Notes
selection	With the selection option, the dashboard is shown with all its data, and the specified dimension values are highlighted	The selection option can be used alone or with the filter option. Selection takes dimension values only. To use this option, the dashboard must include a list, date, or toggle widget that groups by the specified dimension. If a selection specifies a value that doesn't exist, or the dashboard doesn't include a list, date, or toggle widget that groups by the specified dimension, then the selection input is ignored and the dashboard appears with all its data and no selection.
filter	With the filter option, the dashboard is shown with only filtered data	The filter option can be used alone or with the selection option. Filter takes dimension or measure values.
operator	Use with the filter option	Supported operators for dimensions: in, not in, matches Supported operators for measures: ==; !=; >= ; > ; <= ; <

 **Note:** In Visualforce, values must have the format `object.field`.


 **Note:** To filter on a field that contains special characters, use Visualforce's JSENCODE function in the filter to replace special characters with encoded values.

For example, this syntax applies the name of the account in the Visualforce page as a selection on the dashboard:

```
filter="{ 'datasets': { 'Account': [ { 'fields': [ 'Name' ], 'selection': [ '!Account.Name' ] ] } } }
```

This example syntax applies the name of the account in the Visualforce page as a filter so that the dashboard shows only the filtered data:

```
filter="{ 'datasets': { 'Account': [ { 'fields': [ 'Name' ], 'filter': { 'operator': 'matches', 'values': [ '!Account.Name' ] } ] } } }
```

 **Note:** The above syntax is new in Spring '17. The previous syntax continues to be supported, and it works the same as the new selection option. For reference, here's the previous syntax:

```
filter="{ 'datasetSystemName1': { 'field1': [ '!value1' ] }, 'datasetSystemName2': { 'field1': [ '!value1', '!value2' ], 'field2': [ '!value3' ] } }
```

For example:

```
filter="{ 'opportunity': { 'Id': [ '!Opportunity.Id' ] } }
```

and

```
filter="{ 'ServiceCase4': { 'Id': [ '!case.Id' ], 'OwnerId' : [ '!case.OwnerId' ], 'Product__c' : [ '!case.Product__c' ], 'Reason' : [ '!case.Reason' ] } }
```

For more information about embedding Analytics, see the [Visualforce Developer Guide Standard Component Reference](#).

Whitelist Trusted Sites for Embedded Dashboards

Embed Analytics in any web page or web-based app. By specifying your trusted sites in the Analytics whitelist, you can include embedded Analytics dashboards in websites and apps outside of Salesforce servers.

First, add an Analytics dashboard component to your site, using [Visualforce embedding](#), [Lightning App Builder](#), or Lightning Out. This code sample shows how to add an Analytics dashboard component via Lightning Out.

```
$Lightning.use("wave:waveApp", function() {
    $Lightning.createComponent("wave:waveDashboard", {
        dashboardId: "0FKxx00000006bOGAQ"
    }, "app");
}, url, accessToken)
```

Second, set up a whitelist using the Content Security Policy (CSP). See [Set Up a Whitelist of Trusted Sites for Embedded Analytics Dashboards](#).

The whitelist for embedded Analytics includes the following by default:

- *.salesforce.com:*
- *.force.com:*
- Your org's custom domain.

View Embedded Dashboards on Mobile Devices

Add Analytics dashboard components to Visualforce pages in Salesforce websites accessed by mobile users, including Communities. Or add Analytics dashboard components to Lightning app pages. Embedded Analytics dashboards can responsively select layouts optimized for any device—including phones and tablets.

Dashboards built in the Wave dashboard designer are responsive to any screen size. If you've created a tablet, phone, watch, or custom layout in the Wave dashboard designer, the dashboard automatically optimizes to fit your screen. For more information, see [Generate Unique Analytics Dashboard Layouts for Different Devices](#).

When your dashboard has the right layouts, embed it via Visualforce or the Lightning app builder. Note that for the Salesforce app, only Lightning app pages are supported. See [Lightning Pages](#) for more information.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.


USER PERMISSIONS

To view Analytics:

- Use Analytics

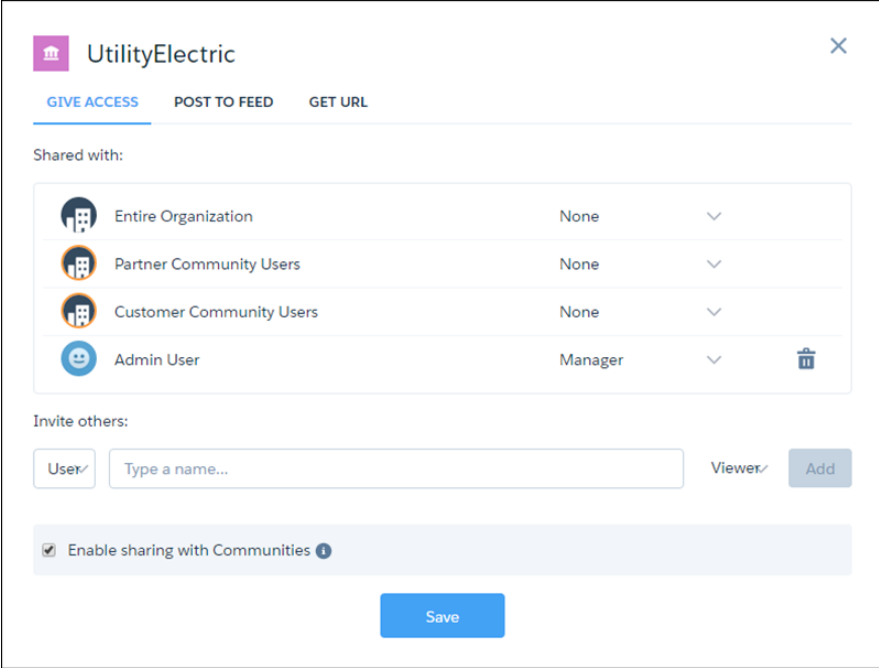
Share Analytics with Communities

With Analytics for Communities, external users can view apps shared with them via Analytics dashboards embedded in their community. You can embed dashboards using Community Builder or Visualforce pages.

 **Note:** Only users with a Customer Community Plus or Partner Community license can use this feature. This feature is supported in communities but not in portals.


Here are the high-level steps for setting up Analytics for Communities.

1. Enable Analytics for Communities and set up community members. See [Enable Analytics for Communities](#).
2. Create Analytics dashboards and save them in an Analytics app that you can share with your community.
3. Embed your Analytics dashboards using either [Community Builder](#) or [Visualforce](#).
4. From the Analytics app containing your dashboards, select **Share**.
5. In the Share dialog, select **Enable sharing with Communities**.



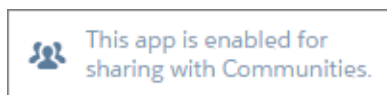
The screenshot shows a share dialog for 'UtilityElectric' with the following elements:

- Buttons: GIVE ACCESS, POST TO FEED, GET URL
- Section: Shared with:

Entire Organization	None	▼
Partner Community Users	None	▼
Customer Community Users	None	▼
Admin User	Manager	▼ 
- Section: Invite others:

User: Viewer:
- Checkbox: Enable sharing with Communities ⓘ
- Button: Save

When an app is enabled for sharing with external users, a message appears to let you know at a glance. You can easily check and change the sharing status of apps.



6. Invite community partners and customers to share the app by entering their names and clicking **Add**. Community members in the sharing list are highlighted in orange to distinguish them as external users, and Viewer is the only access available for them.

EDITIONS

Available in: Salesforce Classic and Lightning Experience.

Available for an extra cost in: **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in: **Developer Edition**.

USER PERMISSIONS

To create, customize, or activate a community:

- Create and Set Up Communities

AND is a member of the community they're trying to update

To modify Analytics settings:

- Analytics Platform permission set license with Manage Analytics permission

To view, explore, and share embedded Analytics dashboards:


- Analytics for Communities permission set license with View Analytics on Communities pages permission

 **Note:** Security is enforced at these levels.

- By role, group, or user, via the Sharing dialog.
- At the Analytics app level, via the **Enable sharing with Communities** checkbox.
- At the org setup level, via security predicates.

Community users can view dashboards embedded in their community, and they can explore lenses, facets, and links in the embedded dashboards. Community users can't access the Analytics home page or create, update, or delete any Analytics asset. They also can't upload data. This table summarizes differences between internal Analytics users and external Community users.

	Analytics Users	Community Users
Access, Explore, and Facet Dashboards and Lenses	✓	✓
Create, Update, and Delete Dashboards and Lenses	✓	
Share Dashboards and Lenses	✓	✓
Access the Analytics Studio	✓	
Access Analytics Prebuilt Apps	✓	
Analyze Large Datasets	✓	✓
Benefit from Security Predicates	✓	✓
Annotate Dashboard Widgets	✓	✓
Use Custom Action Menus	✓	
Access Analytics from Mobile Devices	✓	

 **Note:** Access to the Analytics REST API is limited to the GET method with these endpoints:

- /wave/folders/<folder ID> (Access to folders shared with the community)
- /wave/dashboards/<dashboard ID or API Name> (Access to dashboards belonging to a folder shared with the community)
- /wave/lenses/<lens ID or API Name> (Access to lenses belonging to a folder shared with the community)
- /wave/datasets/<dataset ID> (Access to datasets belonging to a folder shared with the community)

IN THIS SECTION:

[Use Community Builder to Embed Analytics Dashboards in Communities](#)

Add Analytics via the Wave Dashboard component available in the Customer Service (Napili) template.

[Use Visualforce to Embed Analytics Dashboards in Communities](#)

Share Analytics with external users via Analytics dashboards embedded in their community.

[Collaborate on Analytics Dashboards in Communities with Annotations](#)

Foster an environment of open communication sparked by Analytics dashboards embedded in communities. With annotations, partners and customers can converse in Chatter feeds on individual dashboard widgets. Annotations are available whether dashboards are embedded via Visualforce or the Community Builder.

Use Community Builder to Embed Analytics Dashboards in Communities

Add Analytics via the Wave Dashboard component available in the Customer Service (Napili) template.

To add Analytics to your community, follow the high-level steps in [Share Analytics with Communities](#). When you're ready to embed a dashboard, use the following procedure.

1. Select the **Wave Dashboard** component in Community Builder.

EDITIONS

Available in: Salesforce Classic and Lightning Experience.

Available for an extra cost in: **Enterprise, Performance,** and **Unlimited** Editions. Also available in: **Developer Edition**.

USER PERMISSIONS

To create, customize, or activate a community:

- Create and Set Up Communities

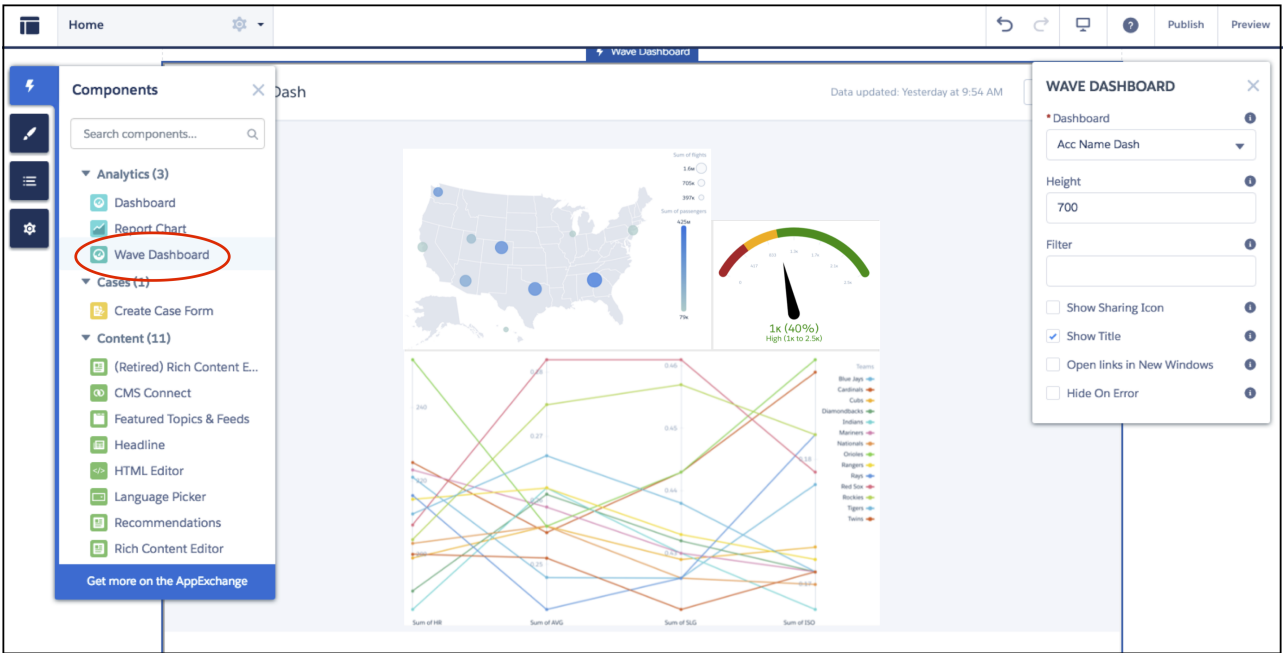
AND is a member of the community they're trying to update

To modify Analytics settings:

- Analytics Platform permission set license with Manage Analytics permission

To view, explore, and share embedded Analytics dashboards:

- Analytics for Communities permission set license with View Analytics on Communities pages permission



- From the Dashboard dropdown list, select the dashboard to display.

Note: (For Developers) In the code, the dashboard name is represented with the dashboard ID. If configuring the component programmatically, you can use either the `dashboardId` attribute or the `developerName` attribute. The `developerName` can be requested through the API.

- Configure the attributes of the embedded Analytics dashboard.

- Height**—Specify the height of the dashboard, in pixels. The default is 300.
- Show Sharing Icon**—Add the Share icon on the dashboard. Users can click the icon to open the Share dialog, where they can post to Chatter and download images and data.
- Show Title**—Control the visibility of the dashboard title.
- Show Header**—Control the visibility of the dashboard header. If selected, the dashboard is displayed with a header bar that includes the Open in Analytics icon and the date and time that the dashboard’s data was updated. The header bar will also appear if either Show Sharing Icon or Show Title is selected.
- Open Links in New Windows**—Specify where links from the dashboard to other assets are opened.
- Hide On Error**—Control whether the Analytics dashboard appears if there is an error, such as the dashboard can’t be found.
- Filter**—Configure the embedded dashboard to show only the data that’s relevant for the record being viewed. The **Filter** attribute links data fields in the dashboard to the object’s fields. In this example, the dashboard is filtered by the account name on the record page and shows only data related to that account name.

```
{'datasets':{'account': [{'fields':['Name'], 'filter':{'operator': 'matches', 'values': ['$Name']}]}}}
```

This example applies the account name as a selection. With the selection option, the dashboard displays all its data, and the specified values are highlighted.

```
{'datasets' : {'account': [ {'fields': ['Name'], 'selection': ['$Name']}]}}
```

- Refer to the table to understand the notation for the **Filter** attribute.

Notation	Description	Notes
datasets	Analytics dataset	Where to find it: On the Analytics home page, select Edit on the dataset. The System Name is in the left panel of the edit page for the dataset. (If your org has namespaces, include the namespace prefix and two underscores before the dataset system name.)
fields	Dimension or Measure in the Analytics dataset	Where to find it: Click the Explore icon to open the widget. Then select Show SAQL from the Options menu. For dimension names, look for “group by” statements. For measure names, look for statements with functions such as “sum” or “stddev.”
values	Field in the Salesforce object, or a specific value	Where to find it: In Setup, find the object you want, and select Fields. Use the Field Name (also known as the API Name). For custom fields, use the name with “__c” at the end.
selection	With the selection option, the dashboard is shown with all its data, and the specified dimension values are highlighted	The selection option can be used alone or with the filter option. Selection takes dimension values only. To use this option, the dashboard must include a list, date, or toggle widget that groups by the specified dimension. If a selection specifies a value that doesn't exist, or the dashboard doesn't include a list, date, or toggle widget that groups by the specified dimension, then the selection input is ignored and the dashboard appears with all its data and no selection.
filter	With the filter option, the dashboard is shown with only filtered data	The filter option can be used alone or with the selection option. Filter takes dimension or measure values.
operator	Use with the filter option	Supported operators for dimensions: in, not in, matches Supported operators for measures: ==; !=; >=; >; <=; <

Use this syntax for filtering on dimensions.

```
{'datasets' : {'dataset1': [ {'fields': ['field1'], 'selection': ['$value1', '$value2']},
{'fields': ['field2'], 'filter': { 'operator': 'operator1', 'values': ['$value3', '$value4']}}]}}
```

Use this syntax for filtering on measures.

```
{'datasets' : {'dataset1': [ {'fields': ['field1'], 'selection': ['$value1', '$value2']},
{'fields': ['field2'], 'filter': { 'operator': 'operator1', 'values': [[value3]]}}]}}
```

For information about working with Community Builder, start with [Customize Communities with Community Builder](#).

Use Visualforce to Embed Analytics Dashboards in Communities

Share Analytics with external users via Analytics dashboards embedded in their community.

1. To add Analytics to your community, follow the high-level steps in [Share Analytics with Communities](#).
2. Select the Visualforce page where you'll embed Analytics, or create a new page. See [Defining Visualforce Pages](#).
3. Optionally, you can add your page to a Visualforce tab. For more information, refer to [Create Visualforce Tabs](#).
4. When you're ready to embed a dashboard, see [Add an Analytics Dashboard to a Visualforce Page](#).

EDITIONS

Available in: Salesforce Classic and Lightning Experience.

Available for an extra cost in: **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in: **Developer Edition**.

USER PERMISSIONS

To create, customize, or activate a community:

- Create and Set Up Communities
AND is a member of the community they're trying to update

To modify Analytics settings:


- *Analytics Platform* permission set license with Manage Analytics permission

To view, explore, and share embedded Analytics dashboards:


- Analytics for Communities permission set license with View Analytics on Communities pages permission

Collaborate on Analytics Dashboards in Communities with Annotations

Foster an environment of open communication sparked by Analytics dashboards embedded in communities. With annotations, partners and customers can converse in Chatter feeds on individual dashboard widgets. Annotations are available whether dashboards are embedded via Visualforce or the Community Builder.

 **Note:** This feature is supported in communities, but not in portals, for users with a Customer Community Plus or Partner Community license.

If you don't already have Analytics for Communities, see [Share Analytics with Communities](#). To set up annotations, verify that Chatter is enabled for your community users. Also, enable feed tracking on Analytics Assets. (For more information, see [Enable Annotations on Dashboard Widgets](#).)

To create annotations, click  to open your embedded dashboard in Analytics. Then select **Annotate** from the dropdown menu on a widget.

EDITIONS

Available in: Salesforce Classic and Lightning Experience.

Available for an extra cost in: **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in: **Developer Edition**.

USER PERMISSIONS

To create, customize, or activate a community:

- Create and Set Up Communities

AND is a member of the community they're trying to update

To modify Analytics settings:

- *Analytics Platform* permission set license with Manage Analytics permission

To view, explore, and share embedded Analytics dashboards:

- Analytics for Communities permission set license with View Analytics on Communities pages permission

In the annotations panel, you can type messages and @mention people in your org who have access to the dashboard. You can also share screenshots of the current state of the dashboard. Analytics dashboard annotations are natively integrated with Chatter, and comments on dashboards also appear as Chatter posts. If users click the **Follow** button, they see all comments on the dashboard. From Chatter, they can click the dashboard image to navigate directly to the annotation on the dashboard in Analytics, where they can add to the conversation. For more information, see [Collaborate with Dashboard Annotations](#).

The visibility of posts depends on the type of user that makes the original post. For security, external community users can't see annotations originated by your org's internal users. But if an internal user replies on an annotation started by an external user, then all users can see all posts. For more information, see the `visibility` property in the [Chatter REST API Developer Guide](#).

Add Actions to Analytics Lenses and Dashboards

Let users take action on insights directly from Analytics. Add actions to charts and tables in lenses and dashboards.

You can add [object-specific actions](#) and [global actions](#) that you previously defined on Salesforce objects. You can let dashboard viewers invoke these actions directly from Analytics to create, update, and interact with Salesforce records. For example, you can add actions that let users create cases, update accounts, and post to Chatter.

IN THIS SECTION:

[Perform Actions on a Salesforce Record from Analytics](#)

As you gain insights into your business from Analytics, you sometimes have to perform actions on an underlying Salesforce record. No need to exit Analytics. You can invoke a Salesforce action on the record directly from Analytics. You can also open web pages, such as search the web for the company name listed in an Analytics lens or dashboard.

[Perform Bulk Actions on Multiple Salesforce Records from Analytics](#)

Sometimes, you need to perform the same action on a group of records. With Analytics bulk actions, you can perform an action on all records shown in a table in Analytics.

Perform Actions on a Salesforce Record from Analytics

As you gain insights into your business from Analytics, you sometimes have to perform actions on an underlying Salesforce record. No need to exit Analytics. You can invoke a Salesforce action on the record directly from Analytics. You can also open web pages, such as search the web for the company name listed in an Analytics lens or dashboard.

You can add an action menu to any dataset field, except a measure. These actions appear in Analytics chart legends and table cells.

USER PERMISSIONS

To edit a dataset:

- Edit Analytics Dataflows

To create actions:

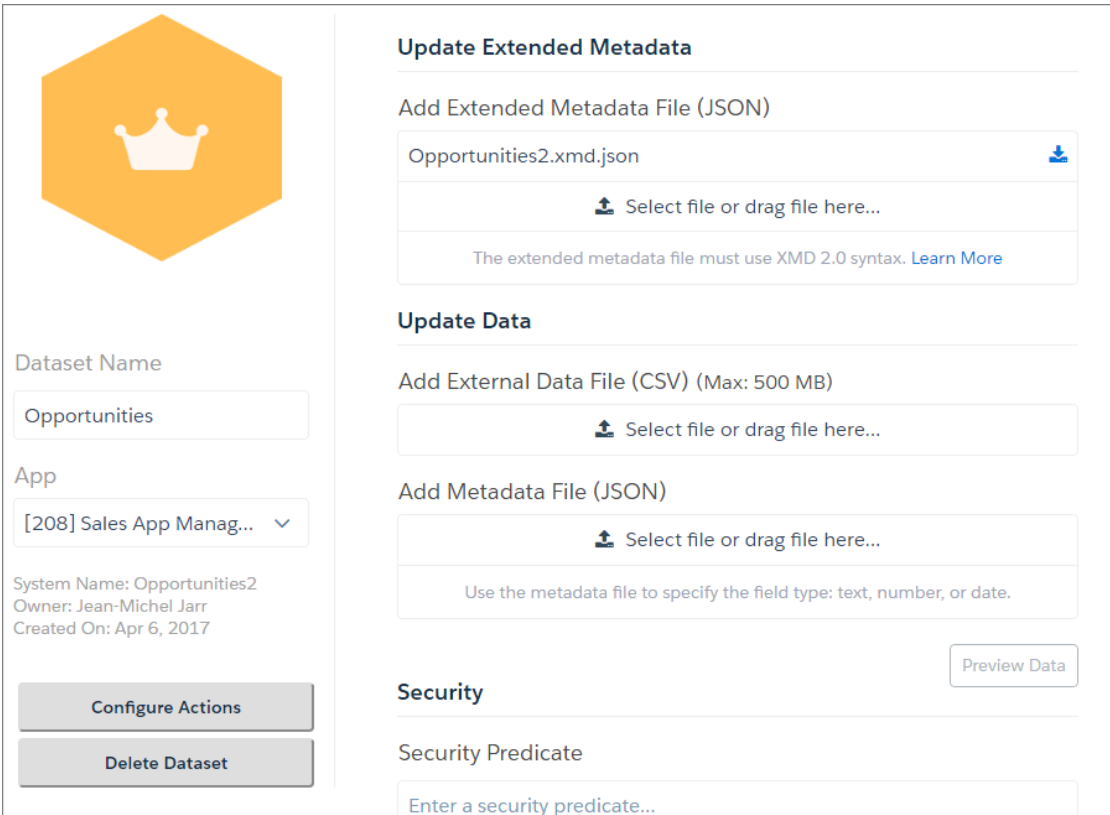
- Customize Application

The screenshot shows the 'My Opportunities' dashboard in Salesforce Analytics. A table displays various opportunity records. An action menu is open over the row for 'Opportunity for Adkins [1176]', showing options like 'Open Record', 'Post', 'File', and 'New Note'. A red arrow points to the 'Open Record' option.

#	NAME	ACCOUNT INDUSTRY	OPPORTUNITY TYPE	WON	ACCOUNT NAME
4	Opportunity for Adams [1716]	Utilities	New Business / Add-on	-	Stone Inc [569]
5	Opportunity for Adams [490]	Biotechnology	New Business / Add-on	-	Perkins Inc [81]
6	Opportunity for Adams [54]	Technology	Existing Business	-	Houston Inc [7]
7	Opportunity for Adkins [1176]	Technology	Existing Business	-	Riley Inc [963]
8	Opportunity for Aguilar [1420]	Technology	New Business / Add-on	-	Holloway Inc [E]
9	Opportunity for Aguilar [1890]	Technology	Existing Business	-	Andrews Inc [6]
10	Opportunity for Aguilar [576]	Technology	Existing Business	-	Graves Inc [67C]
11	Opportunity for Aguilar [911]	Communications	Existing Business	-	Butler Inc [633]

Analytics supports all object and global actions defined in Salesforce, except actions assigned to a page layout for the User object. Analytics doesn't support Lightning component actions.

1. Edit the dataset.



The screenshot shows a configuration interface for an analytics dataset. On the left, there is a sidebar with a crown icon, the dataset name 'Opportunities', the app '[208] Sales App Manag...', and system information. Two buttons, 'Configure Actions' and 'Delete Dataset', are visible. The main area is divided into sections: 'Update Extended Metadata' with a file upload field for 'Opportunities2.xmd.json'; 'Update Data' with fields for 'Add External Data File (CSV)' and 'Add Metadata File (JSON)'; and 'Security' with a 'Security Predicate' input field. A 'Preview Data' button is located in the top right of the main area.

Update Extended Metadata

Add Extended Metadata File (JSON)

Opportunities2.xmd.json [Download](#)

Select file or drag file here...

The extended metadata file must use XMD 2.0 syntax. [Learn More](#)

Update Data

Add External Data File (CSV) (Max: 500 MB)

Select file or drag file here...

Add Metadata File (JSON)

Select file or drag file here...

Use the metadata file to specify the field type: text, number, or date.

[Preview Data](#)

Security

Security Predicate

Enter a security predicate...

2. Click **Configure Actions**.
3. In the left pane, select the dataset field where you want the action menu to appear.

The screenshot shows a configuration window titled "Configure Actions in Wave". On the left, there is a search bar "Search fields..." and a list of fields including "Contact_First_Name", "Contact_Last_Name", "Day", "ID", "Industry", "Month", "Name" (highlighted in blue), "Phone_Number", "State", "Type", and "Year". On the right, the "Actions for: Name" section contains two dropdown menus: "Record ID Field" and "Display Fields". Below these is a section titled "CONFIGURE ACTIONS" with two checkboxes: "Open Salesforce record" and "Perform Salesforce actions", both of which are currently unchecked. At the bottom of the window are "Cancel" and "Save" buttons.

4. In the Record ID Field, select the dataset field that contains the record ID of the object that you want to perform the action on. For instance, if the dataset has Opportunity ID and Account ID fields, select Account ID to perform actions on the account records. Analytics uses the ID to identify the Salesforce object and record to perform the action on.
5. In Display Fields, choose which dataset fields to show users. An action can apply to multiple Salesforce records. Specifying the dataset fields narrows the choices and helps users pick the correct record to perform the action on. For example, if you enable actions on opportunity records, you can show the opportunity name, account name, and opportunity owner name to help users pick the right opportunity.
6. To let users open a Salesforce record or URL, select **Open Salesforce record**, choose the action in the Open field, and then enter a tooltip. Users see the tooltip when they hover over the action in an Analytics lens or dashboard.

CONFIGURE ACTIONS

Open Salesforce record ⓘ

Open


Salesforce Record ▾

Tooltip ⓘ

Choose one of the following actions.

Action	Description
Salesforce Record	Opens the Salesforce record. Analytics searches for the record in the same org in which it's running.
Salesforce Record (Multiple Orgs)	Opens the Salesforce record from another org. If the dataset contains records from multiple orgs, select this option. In the Org ID Field, select the dataset field that contains the org ID. To enable Analytics to connect to each org, select Manage Orgs and specify the URL for each org.
URL	<p>Opens a URL.</p> <p>Use the following syntax to pass a dataset field as a parameter in the URL:</p> <pre> {{row.<dataset_field_dev_name>}} </pre> <p>For example, http://www.google.com?q={{row.AccountName}}</p> <p>If you don't specify the URL, Analytics uses the org's URL. For example, you can specify the following parameter to open the Account record in Salesforce:</p> <pre> / {{row.AccountId}} </pre> <p>Analytics retrieves the Account ID from the AccountId field in the dataset record.</p>

- To enable users to perform actions on a Salesforce record, select **Perform Salesforce actions** and then choose the actions. The list of actions varies based on the object identified by the Record ID Field.



Option	Description
All actions	Adds all actions defined in the page layout for this object, including new ones created later.
Choose actions	Select from the list of currently available actions.  Note: The list contains a superset of all actions defined in all page layouts for the Salesforce object.


Perform Salesforce actions 

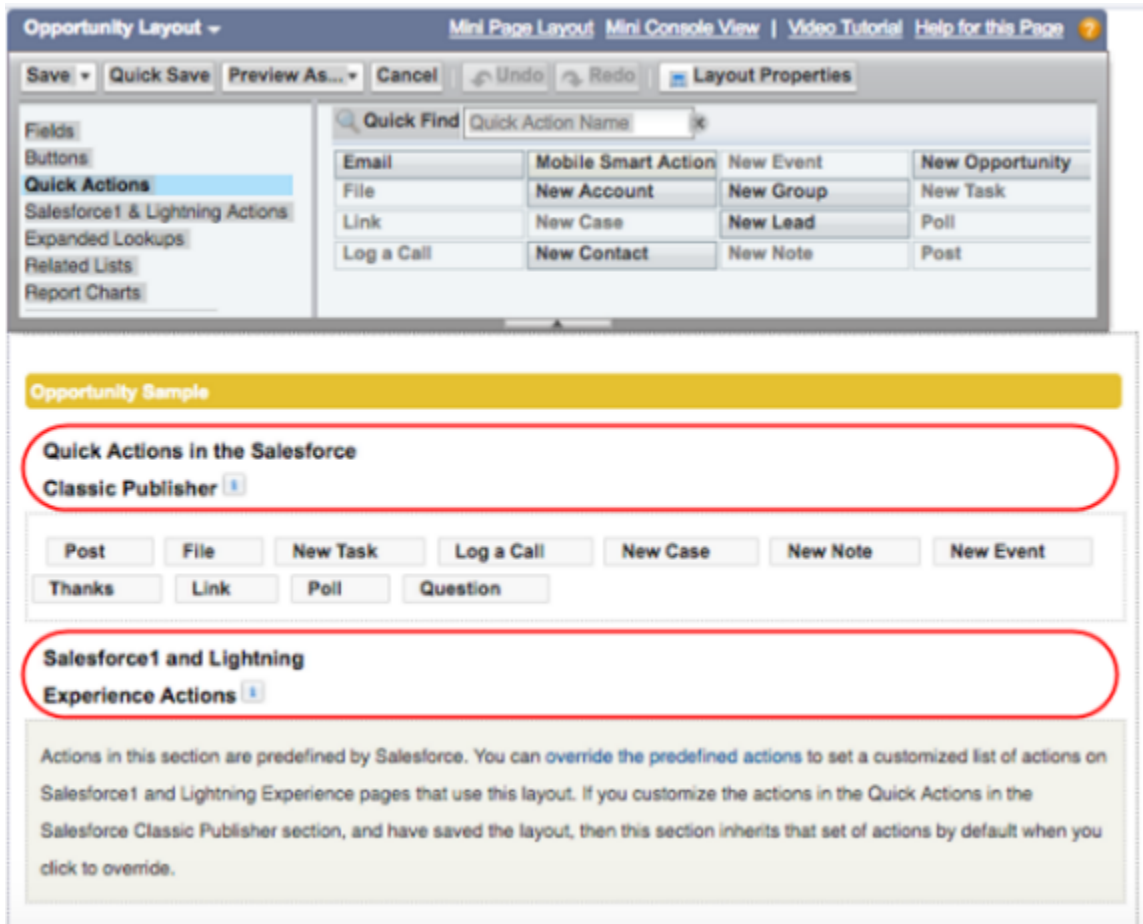
- All actions
- Choose actions

Each user can only see actions assigned to their page layout.

Salesforce Actions

<input type="checkbox"/>	LABEL	API NAME
<input type="checkbox"/>	 New Event	NewEvent
<input type="checkbox"/>	 New Task	NewTask

 **Note:** An Analytics user sees only the actions that you select and that are assigned to their page layout. If the predefined actions are overridden for the Salesforce app and Lightning Experience in a page layout, Analytics displays only the actions that are added to both the Quick Actions in Salesforce Classic Publisher and the Mobile & Lightning Actions sections of the layout.



8. Click **Save**.

IN THIS SECTION:

[Record Actions Example](#)

Each week, opportunity owners analyze their opportunities using an Analytics dashboard. Sometimes, they must update an opportunity. To help them perform the update without going back and forth between Analytics and Sales Cloud, you decide to set up Analytics actions. To let Analytics dashboard viewers update an opportunity record from Analytics, you add the Update Opportunity action to the Opportunity Name field in an Analytics dataset. The first step is to set up the action in Salesforce and then add the action to the Analytics dataset field.

Record Actions Example

Each week, opportunity owners analyze their opportunities using an Analytics dashboard. Sometimes, they must update an opportunity. To help them perform the update without going back and forth between Analytics and Sales Cloud, you decide to set up Analytics actions. To let Analytics dashboard viewers update an opportunity record from Analytics, you add the Update Opportunity action to the Opportunity Name field in an Analytics dataset. The first step is to set up the action in Salesforce and then add the action to the Analytics dataset field.

To implement this record-level action, perform the following tasks.

IN THIS SECTION:

1. [Create the Salesforce Action and Add It to an Object](#)

This example adds the predefined Update a Record action to the Opportunities object.

2. [Apply the Action to the Object's Page Layout](#)

Add the action to the page layout for the object. Users whose profiles are assigned to that layout can see the action in Salesforce. Page layouts control the layout and organization of content, including custom actions, on record detail pages. Each record detail page can have multiple page layouts to give different users a unique experience.

3. [Add the Action to the Analytics Dataset Field](#)

When you add the Update Opportunity action to the Opportunity Name field in the Opportunities dataset, you specify which dimension shows the action menu. You also specify the dataset field that contains the Salesforce record ID. The ID identifies both the Salesforce object and the record.

Create the Salesforce Action and Add It to an Object

This example adds the predefined Update a Record action to the Opportunities object.

1. In Setup, in the Quick Find box, enter the name of the object that you want to add actions to. For this example, enter *Opportunities*, then select **Buttons, Links, and Actions**.
2. Click **New Action** to see which types of actions are available.
3. From the Action Type dropdown list, select the action to add. In this case, select **Update a Record**.
4. Enter a label and description for the action.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

- Use Analytics

To create actions:

- Customize Application

Opportunity Actions
New Action

Enter Action Information Save Cancel

Object Name i

Action Type i

Standard Label Type i

Label

Name i

Description i

Success Message i

Icon

Save Cancel

5. Click **Save**.

The next page shows the default fields that you can update. For the example, add the **Probability (%)** and **Type** fields.

6. Drag **Probability (%)** and **Type** below the Stage field in the workspace. To select multiple fields, hold down **Ctrl** (for Windows) or **Cmd** (for macOS).

Action: Update Opportunity Help

Save Quick Save Preview As... Cancel Undo Redo

Quick Find *

Opportunity Fields

Blank Space	Contract	Description	Lead Source	Opportunity Source	Private	Tracking Number
Account Name	Created By	Expected Revenue	Main Competitor(s)	Order Number	Probability (%)	Type
Amount	Current Generator(s)	Forecast Category	Next Step	Price Book	Quantity	
Close Date	Delivery/Installa...	Last Modified By	Opportunity Name	Primary Campaign ...	Stage	

Opportunity Name *
Sample Opportunity Name

Account Name
Sample Account

Close Date *
3/18/2016

Stage *
Sample Stage

Amount
\$123.45

Next Step
Sample Next Step

7. Click **Save**.

You added the Update Opportunity action to the Opportunities object. Next, you add it to a page layout to determine which users can see the action.

Apply the Action to the Object's Page Layout

Add the action to the page layout for the object. Users whose profiles are assigned to that layout can see the action in Salesforce. Page layouts control the layout and organization of content, including custom actions, on record detail pages. Each record detail page can have multiple page layouts to give different users a unique experience.

In this example, you add the Update Opportunity action to the opportunity page layout that's assigned to the Standard User profile. You can use these same techniques to add actions to any Salesforce page layout and user profile.

1. Go to Setup in Salesforce, and enter the name of the object in the Quick Find box. For the example, enter *Opportunities*. Then select **Page Layouts** to see what's available.
2. If multiple page layouts are defined for the object, click **Page Layout Assignment** to see which page layout is assigned to each user profile.

Page Layout Assignment
Opportunity

The table below shows the page layout assignments for different profiles.

Profiles	Page Layout
Analytics Cloud Integration User	Opportunity Layout
Analytics Cloud Security User	Opportunity Layout
Contract Manager	Opportunity Layout
Custom: Marketing Profile	Opportunity (Marketing) Layout
Custom: Sales Profile	Opportunity (Sales) Layout
Custom: Support Profile	Opportunity (Support) Layout
Gold Partner User	Opportunity Layout
Marketing User	Opportunity Layout
Partner Community Login User	Opportunity Layout
Partner Community User	Opportunity Layout
Read Only	Opportunity Layout
Solution Manager	Opportunity Layout
Standard User	Opportunity Layout
System Administrator	Opportunity Layout

3. Edit the page layout assigned to the profile for the users for whom you want to access the action.
For this example, edit the Opportunity Layout, which is assigned to the Standard User profile. Users who are assigned the other opportunity page layouts can't see this custom action, unless you apply the action to those page layouts.
4. To open the layout, click the **Opportunity Layout** link next to a profile. It doesn't matter which profile.
5. In the palette, click **Quick Actions** to select the actions to add to the layout.
The available actions appear to the right.
6. Drag the **Update Opportunity** custom action to the existing actions in the Quick Actions in the Salesforce Classic Publisher section.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To view visualizations:

- Use Analytics

To create actions:

- Customize Application

The screenshot shows the 'Opportunity Layout' configuration page. The left sidebar has 'Quick Actions' selected. The main area contains several sections:

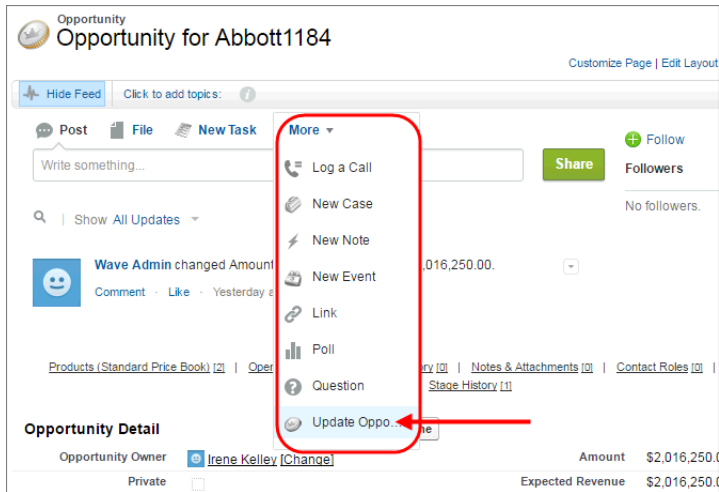
- Quick Find:** A search bar for 'Quick Action Name'.
- Table of Actions:** A grid of buttons including 'New Account', 'New Group', 'New Task', 'Update Opportunity', 'New Case', 'New Lead', 'Poll', 'Log a Call', 'New Contact', 'New Note', 'Post', 'Mobile Smart Actions', 'New Event', and 'New Opportunity'.
- Opportunity Sample:** A yellow header bar.
- Highlights Panel:** A text input field for customizing the highlights panel.
- Quick Actions in the Salesforce Classic Publisher:** A row of buttons including 'Post', 'File', 'New Task', 'Log a Call', 'New Case', 'New Note', 'New Event', 'Link', 'Poll', and 'Question'. A red arrow points from the 'Update Opportunity' button in the top table to the 'New Task' button here.
- Salesforce1 and Lightning Experience Actions:** A section with explanatory text about predefined actions.
- Opportunity Detail:** A section with 'Standard Buttons' (Edit, Delete, Clone, Sharing, Send an Email) and 'Custom Buttons'.

- If the predefined actions are overridden in the Salesforce app and Lightning Experience Actions section, you must also drag the action to that section.

If the predefined actions are overridden, Analytics shows only the actions that appear in both the Quick Actions in the Salesforce Classic Publisher and Mobile & Lightning Actions sections.

- Click **Save**.

This action is now available on the Opportunity details page for all users assigned the Opportunity Layout.



Note: If a page layout is based on a record type that certain users can't access, actions for that type aren't available to them.

Add the Action to the Analytics Dataset Field

When you add the Update Opportunity action to the Opportunity Name field in the Opportunities dataset, you specify which dimension shows the action menu. You also specify the dataset field that contains the Salesforce record ID. The ID identifies both the Salesforce object and the record.

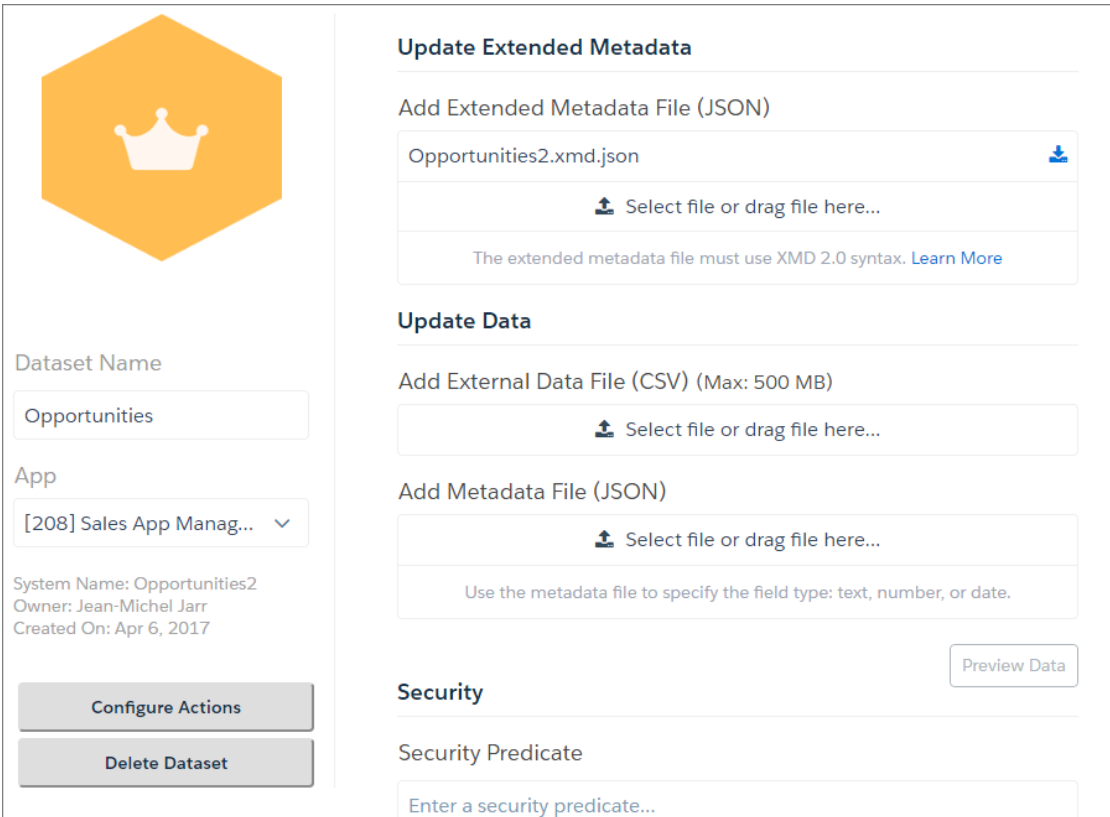
Salesforce Opportunity Object

Action	Opportunity Name	Account Name	Amount
Edit Del +	Opportunity for Abbott1184	Rodgers79 Inc	\$2,016,250.00
Edit Del +	Opportunity for Abbott836	Tucker284 Inc	\$121,490.00
Edit Del +	Opportunity for Adams708	Bryant456 Inc	\$1,269,390.00
Edit Del +	Opportunity for Adams87	Floyd832 Inc	\$1,093,390.00
Edit Del +	Opportunity for Adkins111	Moreno366 Inc	\$1,402,500.00
Edit Del +	Opportunity for Aquilar1908	Colon817 Inc	\$3,314,900.00
Edit Del +	Opportunity for Aquilar210	McCarthy602 Inc	\$202,174.00
Edit Del +	Opportunity for Aquilar566	Ross559 Inc	\$2,850,700.00

Wave Opportunities Dataset

#	Opportunity ID	Opportunity Name	Account Name	Amount
1	00658000002FLZ2AA4	Opportunity for Adams708	Bryant456 Inc	\$1,269,390
2	00658000002FLZ6AAG	Opportunity for Adams87	Floyd832 Inc	\$1,093,390
3	00658000002FLcKAAW	Opportunity for Alexander954	Clarke268 Inc	\$895,135
4	00658000002FLaKAAW	Opportunity for Allen1162	Roberts804 Inc	\$1,032,800
5	00658000002FLdqAAG	Opportunity for Allison1432	Strickland686 Inc	\$1,471,800
6	00658000002FLYTAA4	Opportunity for Allison281	Wright507 Inc	\$1,573,350
7	00658000002FLa5AAG	Opportunity for Alvarado1128	Duncan773 Inc	\$254,886

1. Edit the dataset.



The screenshot displays a configuration interface for an analytics dataset. On the left, there is a sidebar with a crown icon, the dataset name 'Opportunities', the app '[208] Sales App Manag...', and system details. The main area is divided into sections for updating metadata, data, and security.

Dataset Name
Opportunities

App
[208] Sales App Manag... ▾

System Name: Opportunities2
Owner: Jean-Michel Jarr
Created On: Apr 6, 2017

Update Extended Metadata

Add Extended Metadata File (JSON)

Opportunities2.xmd.json [↓](#)

⬆ Select file or drag file here...

The extended metadata file must use XMD 2.0 syntax. [Learn More](#)

Update Data

Add External Data File (CSV) (Max: 500 MB)

⬆ Select file or drag file here...

Add Metadata File (JSON)

⬆ Select file or drag file here...

Use the metadata file to specify the field type: text, number, or date.

[Preview Data](#)

Security

Security Predicate

Enter a security predicate...

2. Click **Configure Actions**.
3. In the left pane, select the dataset field where you want the action menu to appear.

Configure Actions in Wave

My amazing lenses
Account

Search fields...

Contact_First_Name
Contact_Last_Name
Day
ID
Industry
Month
Name
Phone_Number
State
Type
Year

Actions for: **Name**

Record ID Field ⓘ

Display Fields ⓘ

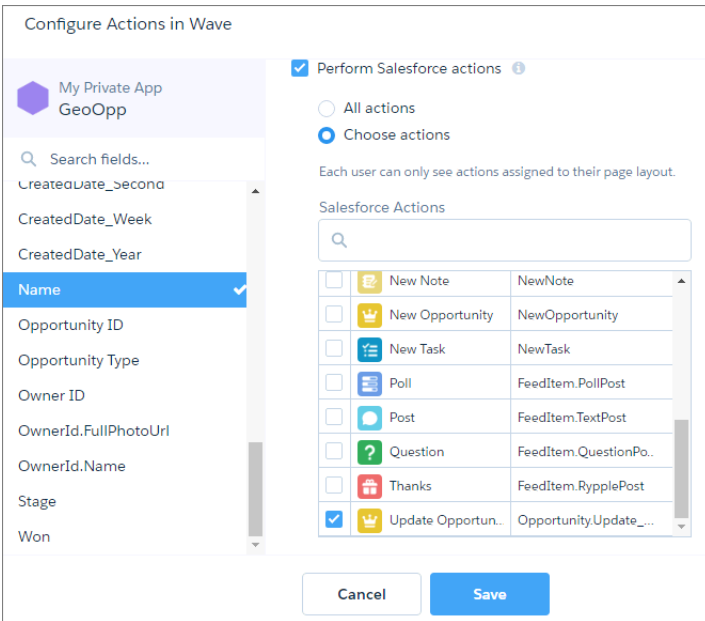
CONFIGURE ACTIONS

Open Salesforce record ⓘ

Perform Salesforce actions ⓘ

Cancel Save

4. In the Record ID Field, select **Opportunity Id**, which is the dataset field that contains the record ID of the Opportunity object.
5. In Display Fields, select the dataset fields to show if multiple records match the action. Users can review this information to determine which Salesforce record to perform the action on. To help users identify the correct opportunity record, show Opportunity ID, Opportunity Name, Opportunity Owner, and Account Name.
6. To enable users to perform actions on a Salesforce record, select **Perform Salesforce actions** and then select **Choose actions**.
7. Select **Update Opportunity**.



8. Click **Save**.


Perform Bulk Actions on Multiple Salesforce Records from Analytics

Sometimes, you need to perform the same action on a group of records. With Analytics bulk actions, you can perform an action on all records shown in a table in Analytics.


You define the bulk action in a Visualforce page. The Visualforce page can make calls to Apex methods. You can also configure the Visualforce page to display the results of the action or show an interactive form. For example, you can create a form that allows the dashboard viewer to change the account owner of each opportunity shown in the table widget.

Before we get into the details about how to create a bulk action, review the following high-level process.

1. Analytics passes the SAQL query used to populate the table widget to the Visualforce page.

 **Note:** The SAQL query that Analytics passes usually contains a limit. To return more results, modify the `limit` statement in the SAQL query.


2. You write custom Visualforce and, if needed, Apex code to extract the SAQL query.

 **Tip:** When issuing an Analytics API request for the SAQL query, if most of your logic is in Javascript on the client side, then you should use AJAX from Javascript. If most of your logic is in Apex, then use HTTP from your Apex class.

3. Your code executes the SAQL query against the Analytics Query API.

4. The Analytics API returns the results of the query—dataset rows—to the Visualforce page.

5. You write more custom code that performs actions on the returned dataset rows. For example, you can perform a bulk edit, bulk create, or integrate with third party.

 **Note:** Bulk actions only work on steps that query datasets. If the table widget is built on a step with type `static` or `soql`, the action doesn't work.

IN THIS SECTION:

[Bulk Actions Example](#)

You want to add the “Create Opportunities” option in a table widget’s action menu. This action must create an opportunity for each account shown in a table widget.

Bulk Actions Example

You want to add the “Create Opportunities” option in a table widget’s action menu. This action must create an opportunity for each account shown in a table widget.

#	ACCOUNT SOURCE	ACCOUNT.ANNUALREVENUE	BILLING COUNTRY	INDUSTRY
1	-	\$100,000,000	USA	
2	-	\$100,000,000	USA	
3	-	-	USA	
4	-	-	USA	Techn
5	-	-	-	Chem
6	Advertisement	\$135	Belgium	Electr

⋮ Annotate

🔧 Create Opportunities

🔗 Share

 **Note:** This widget-level action menu is different from the record-level action menu that you can access from a record.

To keep the user informed of what is happening, the action must also display a Visualforce page that shows the progress of the following tasks.

1. The Visualforce page retrieves a list of accounts from the SAQL query used to populate the table widget. If the table widget’s results were previously filtered because of selections in other dashboard widgets, only the filtered records are returned.

Querying Accounts...	
Account	Opportunity

2. The Visualforce page creates an opportunity for each retrieved account.

Creating Opportunities...	
Account	Opportunity
Open Source Inc.	Creating...
Missoula & Sons Inc.	Creating...
Open Source Inc.	Creating...
Missoula & Sons Inc.	Creating...

3. The Visualforce page shows the opportunity created for each account.

Opportunities Created	
Account	Opportunity
Open Source Inc.	From Open Source Inc.
Missoula & Sons Inc.	From Missoula & Sons Inc.
Open Source Inc.	From Open Source Inc.
Missoula & Sons Inc.	From Missoula & Sons Inc.

To implement this bulk action, perform the following tasks.

IN THIS SECTION:

1. [Define Action Behavior with Apex Controller Class and Methods](#)

Define an Apex controller class and methods that generate a list of accounts shown in the table widget, create an opportunity for each account, and return the progress of each task.

2. [Create a Visualforce Page That Executes the Action](#)

The Visualforce page calls the methods defined in the Apex controller class to invoke the action and provide a status on the tasks.

3. [Assign Bulk Action to Table Widget](#)

Configure the table widget properties to expose the bulk action defined in the Visualforce page.

Define Action Behavior with Apex Controller Class and Methods

Define an Apex controller class and methods that generate a list of accounts shown in the table widget, create an opportunity for each account, and return the progress of each task.

1. From setup, enter *Apex Classes* in the Quick Find box.
2. Select **Apex Classes**.
3. Click **New**.

Q apex

- ▼ Email
 - Apex Exception Email
- ▼ Custom Code
 - Apex Classes**
 - Apex Test Execution
 - Apex Test History
 - Apex Triggers
- ▼ Environments
 - ▼ Jobs
 - Apex Flex Queue
 - Apex Jobs

Apex Classes

Force.com Apex Code is an object oriented programming language that allows developers to develop o

Percent of Apex Used: 0.28%
 You are currently using 8,547 characters of Apex Code (excluding comments and @isTest annotated the amount in use includes both Apex Classes and Triggers defined in your organization.

Estimate your organization's code coverage [i](#)

Compile all classes [i](#)

View: All New [Create New View](#)

Action	Name ↑	Namespace Prefix	Api Version	Status
Edit Del Security	CreateOpportunitiesController		39.0	Active
Edit Del Security	CustomBulkActionController		39.0	Active
Edit Del Security	DiffModifier		33.0	Active
Edit Del Security	SalesWaveQuotas		39.0	Active
Edit Del Security	WaveQuery		39.0	Active

4. Add the following code.

```
public class CreateOpportunitiesController {
    public string query{get; set;}

    /* To determine the records to perform the bulk action on, extract the SAQL query */
    public PageReference init() {
        query = ApexPages.currentPage().getParameters().get('query');
        return null;
    }

    /* Takes the account records from the SAQL query, creates an opportunity for each account,
    and then returns a map between account ID and new opportunity name. Note: Account.Name
    and AccountId referenced below refer to the dataset field names. Update them to match
    your dataset fields. */
    @RemoteAction
    public static Map<String, String> create(List<Map<String, String>> accountRecords)
    {
        Map<String, String> result = new Map<String, String>();

        List<Opportunity> opps = new List<Opportunity>();
        for (Map<String, String> accountRecord : accountRecords) {

            String name = accountRecord.get('Account.Name') + ' - Sprint Review - 12/2';

            String accountId = accountRecord.get('AccountId');
            result.put(accountId, name);
            Opportunity opp = new Opportunity(
/* You can set different fields from the Opportunity object than those listed below,
```

```

like Amount. */
        Name = name,
        Type = 'New Customer',
        AccountId = Id.valueOf(accountId),
        CloseDate=Date.valueOf('2016-12-31'),
        StageName='Prospecting');
    opps.add(opp);
}
insert opps;
return result;
}
}

```

5. Click **Save**.

Create a Visualforce Page That Executes the Action

The Visualforce page calls the methods defined in the Apex controller class to invoke the action and provide a status on the tasks.

1. From setup, enter *visualforce* in the Quick Find box.
2. Select **Visualforce Pages**.
3. Click **New**.
4. Enter the Visualforce page label and description.

5. Replace the existing markup with this code.

```

<apex:page controller="CreateOpportunitiesController" action="{!init}" showheader="false"
  sidebar="false" standardStylesheets="false" title="Create Opportunities" >
  <apex:stylesheet
value="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.6/css/bootstrap.min.css"/>

  /* Use jQuery to process API calls */
  <apex:includeScript value="https://code.jquery.com/jquery-3.1.0.min.js"/>
  <style>
    th {
      width: 50%;
    }
  </style>

```

```

    }
    h4 {
        font-size: 24px;
    }
    table {
        font-size: 20px;
        width: 100%;
    }
</style>
<div class="container-fluid">

/* Add HTML table to the Visualforce page that shows the accounts, the opportunity
creation status, and then finally the new opportunity name */
    <h4 id="message">Querying Accounts...</h4>
    <table name="results" id="results" data-role="table" class="table-bordered
table-striped table-responsive">
        <thead><tr><th>Account</th><th>Opportunity</th></tr></thead>
        <tbody></tbody>
    </table>
</div>

<script>
    $(function() {
        $.ajaxSetup({
            headers: {"Authorization": 'Bearer {!$Api.Session_ID}' }
        });

        setTimeout(executeQuery, 1000);
    });

/* Executes the SAQL query and displays the resulting accounts. Note: Account.Name and
AccountId referenced below refer to the dataset field names. Update them to match your
dataset fields. */
    function executeQuery() {
        var query = {};
        query.statements = "{!JSENCODE(query)}";
        var queryObj = {query: query.statements};
        $.ajax({
            type: 'POST',
            url: '/services/data/v39.0/wave/query',
            data: JSON.stringify(queryObj),
            contentType: 'application/json',
            success: function(data) {
                $('#message').html('Creating Opportunities...');
                var record = null;
                var row = null;
                $('#results tbody').empty();

                for (var i = 0; i < data.results.records.length; i++) {
                    record = data.results.records[i];
                    row = $('<tr>');
                    row.append($('<td>').html(record['Account.Name']));
                    row.append($('<td class="' + record.AccountId +
'">').html('Creating...'));

```

```

                $('#results tbody').append(row);
            }

            setTimeout(function() {createOpportunities(data.results.records);},
1000);
        },
    });
}

/* Calls the Apex controller method that creates opportunities for each account and
returns the opportunity name for each account to the HTML table. */
function createOpportunities(accountRecords) {
    CreateOpportunitiesController.create(accountRecords, function(result, event)
{
        console.log(result);
        if (event.status) {
            for (var i = 0; i < accountRecords.length; i++) {
                $('#td.' +
accountRecords[i].AccountId).html(result[accountRecords[i].AccountId]);
            }
            $('#message').html(accountRecords.length + ' Opportunities Created');
        }
        else {
            $('#message').html('Error: ' + event.message);
        }
    });
}
</script>
</apex:page>

```

6. Click **Save**.

Assign Bulk Action to Table Widget

Configure the table widget properties to expose the bulk action defined in the Visualforce page.

1. Open the Analytics dashboard that contains the table widget.
2. Edit the dashboard.
3. Select the table widget.
4. In the widget properties, select **Show custom action**.
5. Enter the following widget properties.

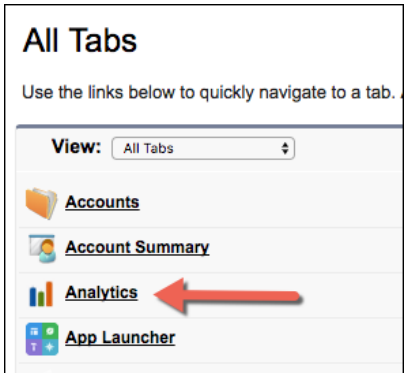
Property	Description
Custom Action Label	Label for the action in the action menu.
Visualforce Page Name	API name of the Visualforce page.
Visualforce Namespace Prefix	Optional. Namespace prefix specified for the Visualforce page.

#	ACCOUNT SOURCE	ACCOUNT.ANNUALREVENUE	BILLING C
1	-	\$100,000,000	USA
2	-	\$100,000,000	USA
3	-	-	USA
4	-	-	USA
5	-	-	-
6	Advertisement	\$135	Belgiu
7			

6. Save the dashboard.

Integrate Analytics into Salesforce with an Analytics Tab

Access your Analytics home and run Analytics apps from a tab within Salesforce Classic or Lightning Experience. The Analytics tab is available in new Analytics-enabled orgs.



In existing orgs, set up the Analytics tab as you would any new tab.

The screenshot shows the Salesforce Analytics interface. At the top, there's a navigation bar with tabs for Home, Analytics, Chatter, Profile, Groups, Files, Leads, Accounts, Contacts, Opportunities, Reports, Dashboards, Products, and Forecasts. The 'Analytics' tab is selected. Below the navigation bar, there's a search bar and a 'Sales' dropdown menu. The main content area is titled 'ANALYTICS Recent' with '140 items'. It features a sidebar with categories like 'Created by Me', 'Shared with Me', 'Pinned Apps', and 'Notifications'. The main area displays a table of 'Apps' with columns for Title, Description, Created By, and Created On. The table lists several apps, including 'My Private App', 'Service App', 'new', 'sales app 1', and 'sales test'. Below the 'Apps' section, there is a 'Dashboards' section with a table listing 'Service Analytics Overview'.

The Analytics tab can include these features:

- Annotations, notifications, and full-screen presentation
- Sharing and downloading options
- Links to other Analytics assets
- Record actions menu
- Link to Analytics Studio (available for Analytics users but not Community users)

Customize Analytics Dashboards using JSON

Configure advanced features in Analytics dashboards using JSON.

The easiest way to build dashboards in Analytics is to use the designer. However, if needed, you can further customize dashboards by editing their JSON files. The JSON defines the components of the dashboard and how they interact.

Modify a dashboard's JSON file to perform advanced customization tasks that can't be accomplished in the designer's user interface, like:

- Manually set up bindings to override the default faceting behavior and specify the relationships between the steps that aren't bound by default.
- Set query limits.
- Specify columns for a values table.
- Specify a SAQL query.
- Populate a filter selector with a specified list of static values instead of from a query.
- Set up layouts for mobile devices for a dashboard.

The last three tasks only pertain to dashboards created with the classic designer. With the Wave dashboard designer, you can use the user interface to accomplish these tasks—no JSON editing required.

For complete information about Dashboard JSON, see the [Analytics Dashboard JSON Reference](#).

Format Measures and Display Elements with Analytics Extended Metadata (XMD)

Set up your data and customize dashboard elements with Analytics Extended Metadata.

Extended metadata (XMD) enables you to customize the formatting of dataset fields and their values in Analytics dashboards and lenses. If you modify the XMD for a dataset, every UI visualization that uses the dataset shows the modified format.

You can customize the following with XMD:

- Format measures. Example: Show the decimal and grouping separators for currency.
- Add prefixes and suffixes to measures. Example: Show the percent symbol (%) after each percentage.
- Multiply measures by a factor. Example: Multiply by 100 to convert a decimal to a percent.
- Change display labels for dimensions and measures.
- Customize colors in charts based on field values.
- Define the first day of the week for the calendar year.
- Add action menus to dimensions that let dashboard viewers invoke actions from lenses and dashboards.

For complete information about Dashboard JSON, see the [Analytics Extended Metadata \(XMD\) Reference](#).

Manage and Share Analytics in Apps

Create Analytics apps to run presentations, organize your data projects, and control asset sharing.

Analytics apps can contain datasets, lenses, and dashboards. Create them to organize and run your analytics presentations, and share them with other people in your organization.

Examples of Analytics apps are the prebuilt Salesforce apps such as the Sales Analytics app and Service Analytics app. Like the apps you create yourself, these are collections of Analytics assets—in both cases, the apps include dashboards and datasets. The difference is that Salesforce has created the assets to provide a ready-made path through Salesforce data to help users get started fast with Analytics. Your own apps contain assets that you create yourself.

IN THIS SECTION:

[App-Level Sharing](#)

Analytics apps are like folders, allowing users to organize their own data projects—both private and shared—and control sharing of datasets, lenses, and dashboards.

[Create an App](#)

Create an app to organize and contain any combination of lenses, dashboards, and datasets.

[Set Up Navigation Through Your App](#)

Target your app for customers with custom navigation that shows them the right dashboards and lenses.

[Share an App](#)

To enable others to see a lens, dashboard, or dataset, one way to share is by sharing the app it's in.

[Delete an App](#)

If you have Manager access to an app, you can delete it. Deleting an app permanently removes all of its lenses, dashboards, and datasets from Analytics.

Analytics Migration, Packaging, and Distribution

Migrate Analytics assets using change sets, bundle them together in managed packages, distribute and track packages through AppExchange and the License Management App, and use the metadata API to manage customizations for your org.


App-Level Sharing

Analytics apps are like folders, allowing users to organize their own data projects—both private and shared—and control sharing of datasets, lenses, and dashboards.

All Analytics users start off with Viewer access to the default Shared App that's available out of the box; administrators can change this default setting to restrict or extend access. Each user also has access to a default app out of the box, called My Private App, intended for personal projects in progress. The contents of each user's My Private App aren't visible to administrators, but dashboards and lenses in My Private App can be shared.

All other apps created by individual users are private, by default; the app owner and administrators have Manager access and can extend access to other users, groups, or roles.

Here's a summary of what users can do with Viewer, Editor, and Manager access.

Action	Viewer	Editor	Manager
View dashboards, lenses, and datasets in the app	X	X	X
 Note: If the underlying dataset is in a different app than a lens or dashboard, the user must have access to both apps to view the lens or dashboard.			
See who has access to the app	X	X	X
Save contents of the app to another app that the user has Editor or Manager access to	X	X	X
Save changes to existing dashboards, lenses, and datasets in the app (saving dashboards requires the appropriate permission set license and permission)		X	X
Change the app's sharing settings			X
Rename the app			X
Delete the app			X

Create an App

Create an app to organize and contain any combination of lenses, dashboards, and datasets.

1. On the home page, click **Create**.
2. Click **App**.
3. Type the name of your app.
4. Click **Create**.
Your app is created and displayed in a new tab. You can now put lenses, dashboards, and datasets in it.
5. Add a description of the app's purpose and contents so that your colleagues understand how to use the data.
 - a. Click in the description box under the app's name.
 - b. Type a description.
 - c. Click the check mark to save.
6. Optionally, change the app's default icon to make it easier to distinguish from other apps.
 - a. Hover over the default icon.
 - b. Click **Change Icon**.
 - c. Click an icon from the gallery.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS


To create an app:

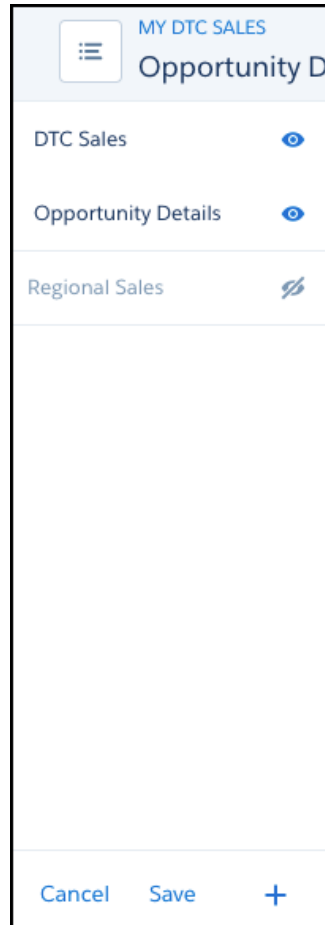
- Create Analytics Apps

Set Up Navigation Through Your App

Target your app for customers with custom navigation that shows them the right dashboards and lenses.

Follow these steps to set up an app's navigation.

1. Click  to open the navigation panel. By default, the panel shows the first 20 assets alphabetically by name, including both dashboards and lenses.
2. If you're the manager of an app, you see the **Organize** button. Click it to set up the app.



3. Change the presentation order by sliding the Analytics assets up or down, and click asset names to hide or show them.
4. To add more dashboards or lenses from the app, click the plus sign.
5. To retain the navigation for your app, click **Save**.
Share the app with colleagues or customers. When they run the app, it starts with the first asset in your navigation list.

Share an App

To enable others to see a lens, dashboard, or dataset, one way to share is by sharing the app it's in.

1. On the app page, click the **Share** button.
2. On the Give Access tab:
 - a. Choose whether you're sharing the app with a user, group, or role.
 - b. Start typing the name and select from the suggested matches.
 - c. Choose the level of sharing access: Viewer, Editor, or Manager.
 - d. Click **Add**.
 - e. Click **Save**, then click **Done**.

EDITIONS

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Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS


To share an app:

- Use Analytics and Manager access to the app

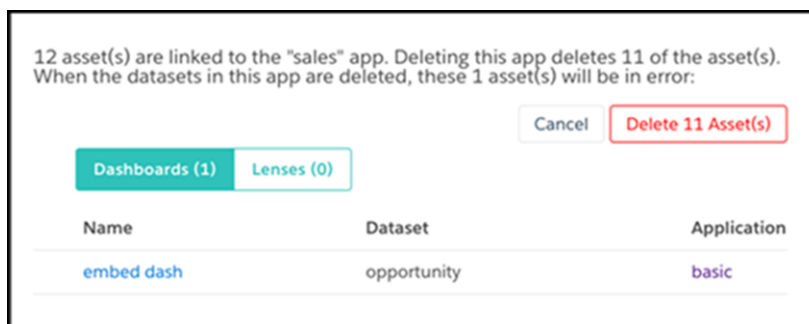
Delete an App

If you have Manager access to an app, you can delete it. Deleting an app permanently removes all of its lenses, dashboards, and datasets from Analytics.

1. Open the app, and then click **Delete**.

 **Warning:** You can't recover a deleted app.

If applicable, Analytics lists the lenses and dashboards outside of your app that will be affected. When the datasets belonging to your app are deleted, any lens or dashboard that references those datasets becomes unusable.



EDITIONS


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USER PERMISSIONS

To delete an app:

- Use Analytics and Manager access to the app

 **Important:** Only lenses and dashboards to which you have access appear in the list. If you don't have access to them, lenses and dashboards aren't listed even though they have references to datasets in your app.

2. Click **Delete Asset(s)**.

Analytics Migration, Packaging, and Distribution

Migrate Analytics assets using change sets, bundle them together in managed packages, distribute and track packages through AppExchange and the License Management App, and use the metadata API to manage customizations for your org.

IN THIS SECTION:

[Migrate Analytics Assets with Change Sets](#)

Use change sets to move customized Analytics assets between orgs that have a deployment connection. For example, create an Analytics app containing dashboards, lenses, datasets, dataflows in your Sandbox org, then migrate the app assets to your production org once testing is complete.

[Package Analytics Assets in Managed Packages](#)

You can create managed packages of Analytics assets, including Analytics apps, dashboards, lenses, datasets, and dataflows. Use packages to distribute those assets to other users or organizations, including those outside your company.

[Distribute Analytics Assets Through AppExchange](#)

Once your managed package is certified through our security review, you can make it available to your customers by uploading it to AppExchange. You can specify your package release type, control major and minor version numbers, and specify licensing options through the Licensing Management Application.

[Use the Metadata API for Analytics Assets and User XMD](#)

Analytics provides full support for the Metadata API, which can be used to retrieve, deploy, create, update, or delete customizations for your organization.

Migrate Analytics Assets with Change Sets

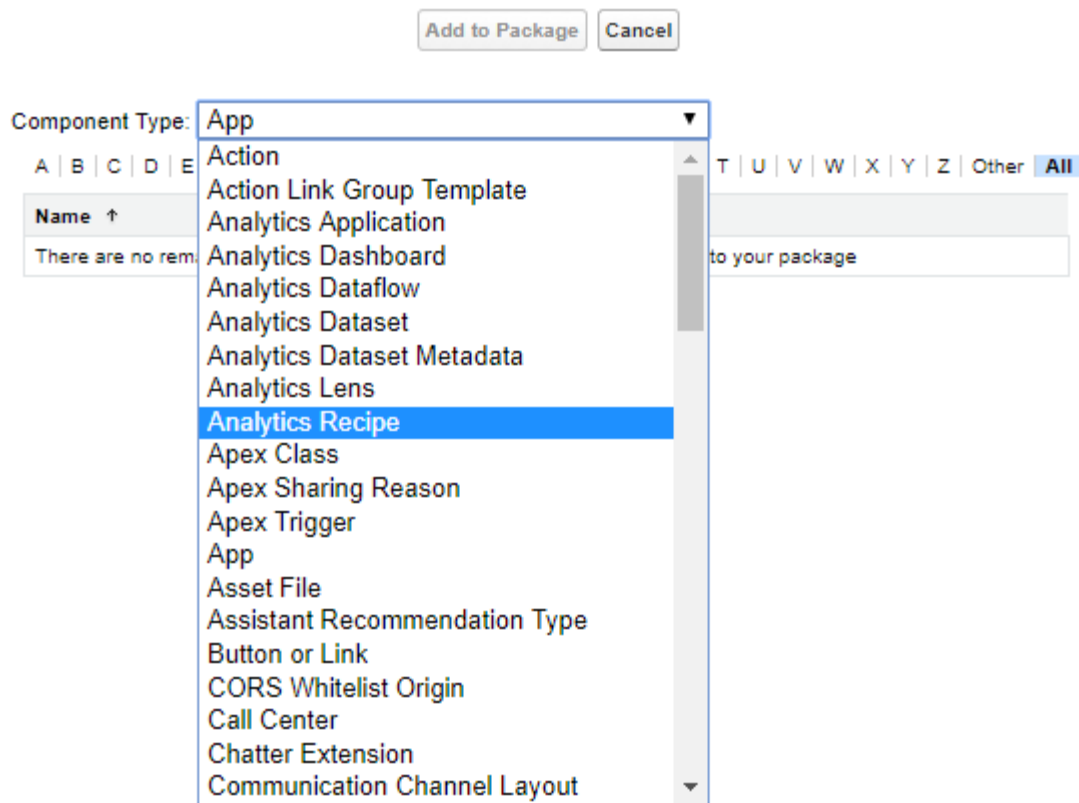
Use change sets to move customized Analytics assets between orgs that have a deployment connection. For example, create an Analytics app containing dashboards, lenses, datasets, dataflows in your Sandbox org, then migrate the app assets to your production org once testing is complete.



Tip: Remember, this topic describes how to migrate Analytics assets—such as lenses, customized dashboards, dataset containers, and so on. It does not discuss migrating Salesforce or Analytics data from org to org. Where this topic refers to an Analytics dataset, what actually gets migrated is the container; the dataset metadata.

To migrate Analytics assets:

1. Create and test your Analytics assets in your source org, such as Sandbox.
2. From Setup in your source org, select **Outbound Change Sets** and create a new one.
3. Click **Add** in the Change Set Components section, then use the **Component Type** drop-down list to select and add your Analytics assets to the change set. Each asset type is prefixed with “Analytics.” Note that you must add dependent dataflows manually. That is, if you add a dataset to a change set, the associated dataflows are not automatically picked up.



Important: Analytics components include Analytics applications, dashboards, dataflows, datasets, lenses, recipes, and master user XMD. As you package Analytics components, keep these tips and best practices in mind.

- Analytics unmanaged packages, as opposed to managed packages, are considered a developer-only feature and are not supported for general-purpose distribution. While Analytics unmanaged packages work as expected within the constraints of Salesforce unmanaged packages, they have not been subject to the same level of testing as managed packages. Unmanaged packages come without many of the safeguards of managed packages, and are intended for developers familiar with their limitations. Also refer to the relevant topic in the [ISV Guide](#).
- Before a recipe is available for packaging, you must create a dataset with the recipe.
- Analytics Admin permissions are required to create a package but not for deployment, which requires only Salesforce admin permissions.
- There is no spidering between datasets and dataflows, meaning there is no dependency following. When packaging both, they must be added manually. If they are not, an error appears during deployment. The same is true for change sets—when packaging both datasets and dataflows, add them manually.
- The Winter '18 release contains a beta version of Apex steps, which lets developers include custom Apex functionality in a dashboard to access Salesforce platform features that aren't inherently supported in Analytics. If you include dashboards in a package, Apex steps are not included—migrate Apex classes separately.
- Before the Spring '17 release, images didn't render when deploying a dashboard that used an image widget that referenced image files not available on the target org. There were two workarounds: Manually upload the images, or add a folder containing the images to the package. As of the Spring '17 release, images are packaged with the dashboard, and references between dashboards are maintained. You can't delete a dashboard that is referenced in a link. Either re-create the image, or link the widgets in the dashboard in the source org. Then repackage or fix the link issues in the target org.

- Take care when packaging dataflows. Invalid schema overrides and unsupported or illegal parameters are removed. For example, `Type = dim` is no longer supported. Use `Type = text` instead. Comments in JSON are removed. Nodes can appear in a different order.

4. Click **View/Add Dependencies** to ensure all dependent assets and appropriate [permission sets and profile settings](#) are added.
5. Click **Upload** and select your target org, such as Production. Make sure that the target org allows inbound connections. The inbound and outbound orgs must have a deployment connection.
6. From **Setup** in your target org, select **Inbound Change Sets** and find the one you uploaded from your source org.
7. Validate and deploy the change set, making sure to assign the right users to any permission sets and profiles you included. Your Analytics assets will be available in the target org.

For details on using change sets to migrate configuration changes between orgs, view the [Release Management: Deploying Changes Using Change Sets \(Salesforce Classic\)](#) video.

SEE ALSO:

- [Change Sets](#)
- [Change Sets Best Practices](#)
- [Upload Outbound Change Sets](#)
- [Deploy Inbound Change Sets](#)

Package Analytics Assets in Managed Packages


You can create managed packages of Analytics assets, including Analytics apps, dashboards, lenses, datasets, and dataflows. Use packages to distribute those assets to other users or organizations, including those outside your company.

A package is a container for something as small as an individual component or as large as a set of related apps. Packages can be distributed to other Salesforce users and organizations, including those outside your company. While packages come in two forms—unmanaged and managed—Analytics supports only managed packages, which must be created from a Developer Edition organization.

Why only managed packages? There are some key advantages, especially around licensing and managing licenses. Using the AppExchange and the License Management Application (LMA), partners, ISVs, and developers can sell and manage user-based licenses for the app. Managed packages are also upgradeable, meaning you don't have to start over; you can incrementally upgrade.

To package Analytics assets:

1. From Setup in your Developer Edition org, select **Packages** and click **New** to [create a managed package](#).
2. Click **Add** in the Components tab, then use the **Component Type** drop-down list to select and add your Analytics assets to the package. Each component type is prefixed with "Analytics". Note that you must add dependent dataflows manually. That is, if you add a dataset to a package, the associated dataflows are not automatically picked up.

 **Important:** Analytics components include Analytics applications, dashboards, dataflows, datasets, lenses, recipes, and master user XMD. As you package Analytics components, keep these tips and best practices in mind.

- Analytics unmanaged packages, as opposed to managed packages, are considered a developer-only feature and are not supported for general-purpose distribution. While Analytics unmanaged packages work as expected within the constraints of Salesforce unmanaged packages, they have not been subject to the same level of testing as managed packages. Unmanaged packages come without many of the safeguards of managed packages, and are intended for developers familiar with their limitations. Also refer to the relevant topic in the [ISV Guide](#).
- Before a recipe is available for packaging, you must create a dataset with the recipe.

- Analytics Admin permissions are required to create a package but not for deployment, which requires only Salesforce admin permissions.
- There is no spidering between datasets and dataflows, meaning there is no dependency following. When packaging both, they must be added manually. If they are not, an error appears during deployment. The same is true for change sets—when packaging both datasets and dataflows, add them manually.
- The Winter '18 release contains a beta version of Apex steps, which lets developers include custom Apex functionality in a dashboard to access Salesforce platform features that aren't inherently supported in Analytics. If you include dashboards in a package, Apex steps are not included—migrate Apex classes separately.
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- Take care when packaging dataflows. Invalid schema overrides and unsupported or illegal parameters are removed. For example, `Type = dim` is no longer supported. Use `Type = text` instead. Comments in JSON are removed. Nodes can appear in a different order.

3. Click **View Dependencies** to ensure all dependent assets and appropriate [permission sets and profile settings](#) are added.
4. Once packaged, [prepare your apps for distribution](#).

SEE ALSO:

[Package and Distribute Your Apps](#)

[Introduction to the License Management App](#)

Distribute Analytics Assets Through AppExchange

Once your managed package is certified through our security review, you can make it available to your customers by uploading it to AppExchange. You can specify your package release type, control major and minor version numbers, and specify licensing options through the Licensing Management Application.

To distribute an Analytics managed package:

1. Submit your package for a security review.

Before a package can be listed on AppExchange, it must meet established standards. Since packages containing Analytics assets can potentially contain standard Salesforce objects too, they are subject to the same [security requirements](#) as all other AppExchange listings.

2. When your package is ready, click **Upload**, then fill in the required information.
3. Add version specifics, including the name (usually a description and date) and the version number.
4. Choose the release type—*Managed - Beta* or *Managed - Released*—and an appropriate version number.
The *Managed - Beta* type is for testing, usually with a subset of customers, and allows changes that the *Managed - Released* type does not.
5. Add a description for your AppExchange listing.
6. Optionally, add URLs for release notes and instructions, a password (if you wish to keep the package private), and any other objects required.
7. Click **Upload**.

 **Note:** Deployment requires Salesforce admin permissions.

Use the AppExchange and the [License Management Application](#) (LMA) to manage user-based licenses. You can request the application through your partner community site.

SEE ALSO:

[Package and Distribute Your Apps](#)

[Security Review Overview](#)

[Introduction to the License Management App](#)

Use the Metadata API for Analytics Assets and User XMD

Analytics provides full support for the Metadata API, which can be used to retrieve, deploy, create, update, or delete customizations for your organization.

Every time your Salesforce organization is customized, its metadata is modified. Editing page layouts, creating a custom field, or adding an Analytics dataflow are all metadata updates. Metadata is the information that describes the configuration of your organization and of your Analytics assets. It's data about your data. For example, the metadata type `WaveLens` includes properties that describe the lens—what dataset it uses, the label of the dashboard, what visualization widget type it uses (pivottable, stackvbar, heatmap, and so on).

You can create your own custom metadata types, which enable you to create your own setup objects whose records are metadata rather than data. Rather than building apps from data records in custom objects or custom settings, you can create custom metadata types and add metadata records, with all the manageability that comes with metadata: package, deploy, and upgrade.

While the [Metadata API](#) is the foundation on which change sets and packaging is built, developers can use the Metadata API to manipulate their Analytics assets. For example, your application could retrieve metadata about your dashboards and back it up to (and restore from) some repository, effectively providing version control.

You can package and deploy user XMD too. User XMD is a JSON document that allows an application to override certain metadata for a dataset. You can govern settings to control how the data is presented—for example, colors, formats, and labels. To deploy the overridden dataset metadata, you must package the user XMD attributes. Metadata API support allows migration tools to migrate datasets with user XMD between orgs—for example, you can migrate user XMD overrides from sandbox to production. Partners can deploy their application-specific user XMD with their AppExchange package. They retain control of the user XMD and can update it with future package versions. Refer to the [WaveXmd](#) metadata type in the Metadata API Developer Guide.

The following Analytics metadata types are supported in the Metadata API:

- `WaveApplication`
- `WaveDashboard`
- `WaveDataflow`
- `WaveDataset`
- `WaveLens`
- `WaveXmd`
- `WaveTemplateBundle`

SEE ALSO:

[Understanding Metadata API](#)

Develop on the Analytics Platform

Find resources for developing with Analytics.

IN THIS SECTION:

[The Analytics REST API](#)

Access Analytics datasets and lenses programmatically using the Analytics REST API.

[Salesforce Analytics Query Language \(SAQL\)](#)

Use SAQL to access data in Analytics datasets. Analytics uses SAQL behind the scenes in lenses and dashboards to gather data for visualizations.

[Analytics Migration, Packaging, and Distribution](#)

Migrate Analytics assets using change sets, bundle them together in managed packages, distribute and track packages through AppExchange and the License Management App, and use the metadata API to manage customizations for your org.

[Analytics Templates Developer Guide](#)

Use Analytics Templates to "templatize" a master app, enabling others to build apps from your template.

[The Analytics SDK](#)

Use the Analytics SDKs to communicate with Analytics from Apex, Visualforce, Lightning apps, and more.

The Analytics REST API

Access Analytics datasets and lenses programmatically using the Analytics REST API.

Using the Analytics REST API, you can:

- Send queries directly to the Analytics Platform.
- Access datasets that have been imported into the Analytics Platform.
- Create and retrieve Analytics lenses.
- Access XMD information.
- Retrieve a list of dataset versions.
- Create and retrieve Analytics applications.
- Create, update, and retrieve Analytics dashboards.
- Retrieve a list of dependencies for an application.
- Determine what features are available to the user.
- Work with and schedule Trend in Analytics report snapshots.
- Manipulate replicated datasets.
- Get, add, update, and delete 'eclair' geo map charts.
- Work with data connectors.
- Retrieve or update recipes.
- Discover whether objects and particular dataset versions have support for sharing inheritance.

For complete information about the API, see the [Analytics REST API Developer Guide](#).

SEE ALSO:

[Enable the Analytics REST API](#)

Salesforce Analytics Query Language (SAQL)

Use SAQL to access data in Analytics datasets. Analytics uses SAQL behind the scenes in lenses and dashboards to gather data for visualizations.

Developers can write SAQL to directly access Analytics data via:

- [Analytics REST API](#)
Build your own app to access and analyze Analytics data or integrate data with existing apps.
- [Dashboard JSON](#)
Create advanced dashboards. A dashboard is a curated set of charts, metrics, and tables.

For complete information about SAQL, see the [Analytics SAQL Reference](#).

SEE ALSO:

[View the Query Behind Your Lens](#)

Analytics Migration, Packaging, and Distribution

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Analytics Templates Developer Guide

Use Analytics Templates to "templatize" a master app, enabling others to build apps from your template.

For complete information about Analytics Templates, see the [Analytics Templates Developer Guide](#).

The Analytics SDK

Use the Analytics SDKs to communicate with Analytics from Apex, Visualforce, Lightning apps, and more.

Analytics Web SDK

Would you like your application to communicate with your Analytics dashboards, whether your application is built with the Lightning SDK, Visualforce, or mobile? How about from an application outside of Salesforce? Wouldn't it be great if your application could apply filters or know about dashboard selections and filters made by a user?

Your application could take actions specific for your business if values fall outside of defined ranges. Or you could have an application that is a viewpoint for dashboards made available by different parts of your business application ecosystem. Imagine that: a single information source to present to your executive staff!

The Analytics Web SDK events we're making available are the foundation for a new way of thinking about Analytics applications. Coupled with the [LockerService](#), you can even code your application outside of Salesforce—you can interact with Analytics from any JavaScript application.

Analytics Apex SDK

Is your company one of the gazillion making use of custom code in Apex, the server-side programming language for Force.com? Would you like it to be easier to query data in Analytics directly from your Apex code? Say hello to the Analytics Apex SDK and send well-formed SAQL queries to Analytics.

This first phase of the Analytics Apex SDK lets developers build SAQL queries and execute them in the security context of the logged-in user, ensuring that security settings are honored. API versioning is supported to avoid breaking applications as the SDK evolves. The SDK also offers `Wave.InvalidParameterException` to help catch bad values supplied to the class methods.

For complete information about the SDK, see the [Analytics SDK Developer Guide](#).

Deploy Prebuilt Analytics Apps

Prebuilt Analytics apps guide you along a ready-made path through your Salesforce data. You get best-practice dashboards and KPIs in a single place your team can use to drive business success.

Prebuilt Analytics apps from Salesforce help speed your organization's time-to-value with Analytics. Instead of having to build visualizations yourself, with Analytics apps you answer questions in a handy configuration wizard that's part of each app. Analytics takes care of the rest, creating dashboards designed and built by Salesforce based on our years of experience helping companies manage their customer interactions.

Prebuilt apps are designed for desktop and mobile devices. They come with dashboards that you can embed in Salesforce pages to give users direct access to business intelligence right from the cloud where they do their everyday work. And you can drill deeper into key aspects of your business by customizing Analytics apps to meet your specific needs.

To get started, see step-by-step instructions for each app by following these links.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

IN THIS SECTION:

[The Sales Analytics App](#)

The Sales Analytics app brings the power of Analytics to Sales Cloud on any device that supports Analytics. With intuitive visualizations based on your Salesforce data, Sales Analytics lets you move from insight to action quickly and helps you turn data into smarter sales.

[The Service Analytics App](#)

The Service Analytics app gets you started fast with Analytics and provides a clear path through your Service Cloud data on any device. Whether you're a service manager or agent, you get everything you need in one place to uncover key data insights to help you grow your business.

[The Field Service Analytics App](#)

The Field Service Analytics app brings the power of Analytics to Field Service Lightning on any device that supports Analytics.

[Event Monitoring Analytics App](#)

The Event Monitoring Analytics App integrates with event monitoring and setup audit trail data to give you insights into your user and org behavior.

[The B2B Marketing Analytics App](#)

B2B Marketing Analytics provides advanced analytics for the data-driven marketer, letting you explore both your marketing and sales data in one place. With powerful dashboards that consolidate Pardot and Sales Cloud data, you can quickly explore data, understand the impact of marketing on revenue, and take instant action to drive marketing results.

The Sales Analytics App

The Sales Analytics app brings the power of Analytics to Sales Cloud on any device that supports Analytics. With intuitive visualizations based on your Salesforce data, Sales Analytics lets you move from insight to action quickly and helps you turn data into smarter sales.



Tip: Follow the steps in the order shown to get started with Sales Analytics. If you haven't used Analytics before, learn more about it from the [Analytics Documentation](#).

IN THIS SECTION:

1. [About the Sales Analytics App](#)
Learn the benefits of Sales Analytics before you create and use the app to explore your Sales Cloud data.
2. [Sales Analytics Prebuilt Dashboards, Lenses, and Datasets](#)
The Sales Analytics app includes prebuilt dashboards, lenses, and datasets to accelerate your data exploration.
3. [Set Up Permissions for the Sales Analytics App](#)
Set up your organization to use the Sales Analytics app by enabling Analytics and creating and assigning permission sets.
4. [Create and Share the Sales Analytics App](#)
Follow these steps to create Sales Analytics and start uncovering the value of your Salesforce data.
5. [Customize Sales Analytics with the Configuration Wizard](#)
The Sales Analytics configuration wizard lets you create the app to reflect how you prefer to view Salesforce data.
6. [Delete the Sales Analytics App](#)
Delete apps to start app creation all over or to get rid of apps you no longer use.
7. [Upgrade the Sales Analytics App](#)
Take advantage of the latest Sales Analytics features by upgrading your app when we release a new version.
8. [Reconfigure the Sales Analytics App](#)
To restore deleted or altered dashboards or change wizard settings, reconfigure an existing app.
9. [Collaborative Forecasting and Quotas Data in Sales Analytics](#)
Sales Analytics gives you a choice for how to include your team's quotas depending on whether you use the Sales Cloud Collaborative Forecasts feature to store quotas data.
10. [Schedule the Sales Analytics Daily Dataflow](#)
Schedule a daily dataflow at a time outside standard business hours before you start exploring with Sales Analytics.
11. [Integrate Sales Analytics With Salesforce](#)
Make Sales Analytics more usable by performing a variety of optional integrations and customizations.

12. [Understand Sales Analytics App Limitations](#)

Sales Analytics requires that Sales Cloud include specific data and supports a limited set of Salesforce objects.

13. [Get to Know Sales Analytics Data Terminology](#)

To make the best use of Sales Analytics, it's helpful to understand the metrics and terms used in the app.

About the Sales Analytics App

Learn the benefits of Sales Analytics before you create and use the app to explore your Sales Cloud data.

EDITIONS

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USER PERMISSIONS

To use Analytics templated apps:

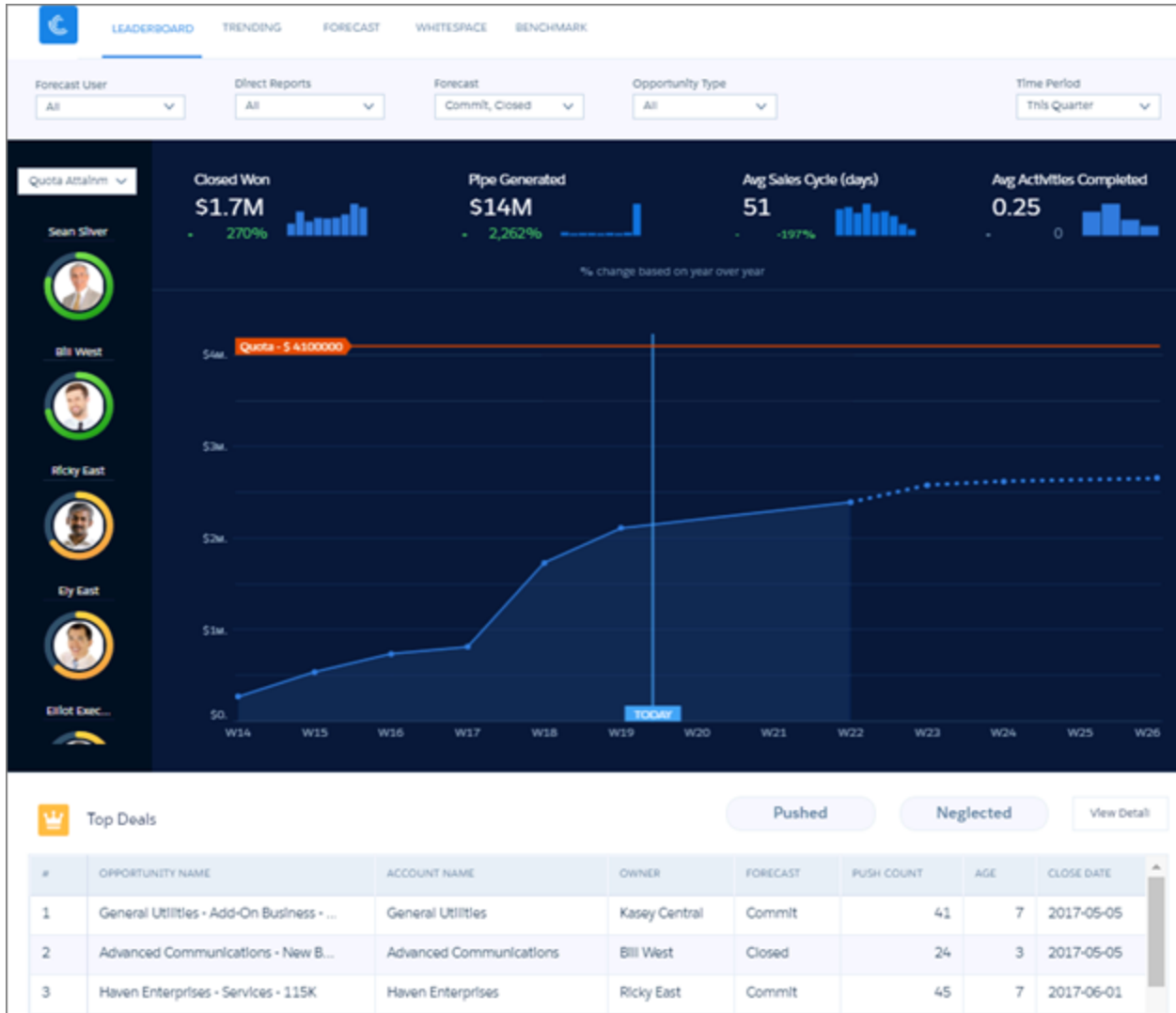
- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Salesforce created the Sales Analytics app to make it easy to analyze Sales Cloud data. Whether you're a sales executive or manager, a rep, or on the operations side, Sales Analytics gives you a new level of insight into your Salesforce data. Start with the Sales Analytics Home dashboard to see the latest wins, win rate, average deal amount. Dig in to all the other dashboards from there, which take advantage of Sales Cloud Collaborative Forecasts to show quotas and help you pinpoint forecasting.

- Execs get their own overview highlighting pipeline and sales and service business performance as well as top deals. They can easily jump to dashboards with all the details.
- Managers can start with a leaderboard showing team key performance indicators (KPIs) and dive right in to specifics about quota, changes in the pipeline, team trending, and average sales cycle time. They can also focus on the performance of members of their team and take action to accelerate business closings.
- Reps can view their own quota attainment, bookings, and pipe activities for a given period. They can also quickly find opportunities for new business to help hit their quotas.
- Operations staff can sort through performance by geography, source, and customer to spot trends to help speed new deals.


App creation is easy. Sales Analytics runs a compatibility check against your org to be sure it includes all the data to create the app's datasets and dashboards. If your org doesn't have the required data, error messages tell you what you need to add before creating the app.

Once the compatibility check determines that your org is ready, you have two options:

- Quickly create the app using standard, default settings as determined by Sales Analytics during the compatibility check. Default settings include collaborative forecasting data to show quotas in app dashboards if your org uses the Sales Cloud Collaborative Forecasting feature.
- Use the built-in configuration wizard to choose your own, custom settings to reflect the way you and others on your team want to view data.

Once you've created the app, use its prebuilt dashboards to explore Sales Cloud data from any device that supports Analytics.

You get actionable insights fast from your sales data using the intuitive Analytics interface. And you can drill deeper into key aspects of your business by customizing Sales Analytics around your business needs.

 **Note:** Your organization can use the Sales Analytics app with or without the Salesforce Analytics platform by purchasing a Sales Analytics license. Each Salesforce Analytics license includes a Sales Analytics App license.

Sales Analytics Prebuilt Dashboards, Lenses, and Datasets

The Sales Analytics app includes prebuilt dashboards, lenses, and datasets to accelerate your data exploration.

The prebuilt dashboards in the Sales Analytics app contain key performance indicators (KPIs) that help you get value from your Salesforce data—fast. The dashboards let you manage pipeline, visualize quotas data, and fine-tune forecasts. They also help you understand key business performance drivers, visualize trends, and assign actions. You get fast answers to questions you have about business results.

The app also includes lenses—more narrowly focused visualizations that augment dashboards with greater detail about your sales KPIs. Additionally, when you create Sales Analytics, the app automatically creates datasets based on your existing Salesforce data in the Sales and Service clouds. The dashboards and lenses use data from those datasets to visualize your KPIs to give you the insights you need to run your business.

The following tables guide you through Sales Analytics dashboards, lenses, and datasets.

You can also create your own lenses and dashboards using the data in Sales Analytics datasets. To learn more about exploring data in Analytics, see [Explore and Visualize Your Data](#).

 **Note:** The dashboards and datasets included in Sales Analytics differ depending on how you answer configuration wizard questions when you create the app.

Sales Analytics Dashboards

USER PERMISSIONS

To use Analytics apps:

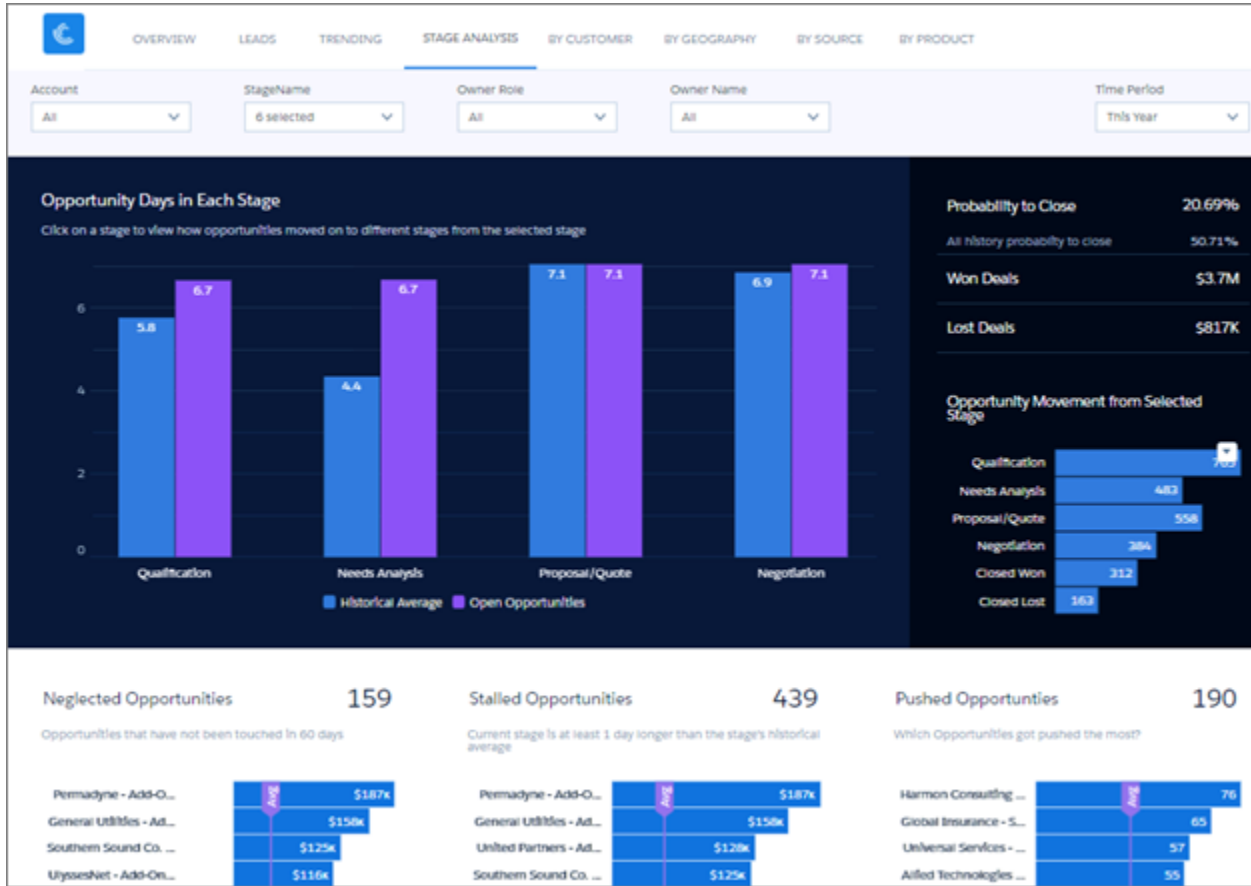
- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps


To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



After creating your app, view all its dashboards in a single screen by opening the app and clicking the **Dashboards** tab.

Table 3: Sales Analytics Dashboards

Dashboard Name	Contents	Target User Role	Tips and Special Requirements
Sales Analytics Home	Start exploring Sales Analytics with an overview of top-level year-to-date key performance indicators (KPIs).	Sales executive and manager	<ul style="list-style-type: none"> Customize your own goal for each metric by editing the dashboard. With the dashboard open in Analytics Studio, click the  icon to open the designer, then click the Goal widget. In the properties panel on the right, expand Breakpoints, and change Max to the goal you'd like to use. Complete dashboard details.

Dashboard Name	Contents	Target User Role	Tips and Special Requirements
Leaderboard	Gives sales leaders an overview of team and individual rep performance, including quota attainment, pipe coverage, bookings, pipe generation, closed won business, average sales cycle time, and sales activities.	Sales leader	<ul style="list-style-type: none"> If you use Sales Cloud Collaborative Forecasts, by default the Sales Analytics app displays quotas data stored using that feature. If you store quotas data outside Salesforce, import quotas data to the app. If your app includes quotas data, the dashboard defaults to showing leaders according to Quota Attainment. To see leaders according to another metric, change the filter just above your leaders to another criteria, such as Closed Won or Pipe Coverage. Complete dashboard details.
Executive Overview – Pipeline Performance on page 552	Sales executives get instant pipeline status. You can view the current amount in the pipe, comparison to the previous period, projected closing, and top deals by lead source, product, account, and region. Also get top-level views of sales and service performance.	Sales executive	<ul style="list-style-type: none"> Click Best Cast or Commit in the donut chart to view performance of deals in either category. Complete dashboard details.
Executive Overview – Sales Performance	Sales executives get instant insight into closed business and quickly recognize trends. See bookings for the period, changes from previous period, as well as win rate, lead conversion rate, and top deals. Also see top-level views of pipeline and service business.	Sales executive	Complete dashboard details
Company Overview	Highlights forecast hierarchy, quota attainment, pipeline changes, pipeline by segment, and top deals.	Sales manager	<ul style="list-style-type: none"> If you use Sales Cloud Collaborative Forecasts, by default the Sales Analytics app displays quotas data stored using that feature. If you store quotas data

Dashboard Name	Contents	Target User Role	Tips and Special Requirements
			<p>outside Salesforce, import quotas data to the app.</p> <ul style="list-style-type: none"> • Defaults to showing top deals for the entire team. Click the bar for each rep to see their top deals. • Complete dashboard details.
Sales Rep Overview	Sales reps start here for a summary of KPIs. Review quota attainment, bookings, and pipeline for a particular time period. Also see key opportunities for accelerating deal closing and number of activities completed in a week.	Sales representative	<ul style="list-style-type: none"> • If you use Sales Cloud Collaborative Forecasts, by default the Sales Analytics app displays quotas data stored using that feature. If you store quotas data outside Salesforce, import quotas data to the app. • Supports Opportunity Splits.
Company Trending	Get a company-wide perspective of the pipeline with a broad set of filters that let you zero in on any aspect of the pipe. Highlights pipeline for the entire company, including pipeline changes, new pipe, closed won/lost, moved in/out, and amount reduced/expanded.	Sales leader	<ul style="list-style-type: none"> • Change the View As filter to look at the pipe as it rolls up to key execs. Then drill down into the pipe from a wide variety of perspectives by changing other filters. • Complete dashboard details
Team Trending	Managers can see pipeline changes for just their team, including new pipe, closed won/lost, moved in/out, and amount reduced/expanded.	Sales manager	<ul style="list-style-type: none"> • View trends for longer or shorter periods by changing the Time Period filter. View pipe for individual team members by selecting them in the Direct Reports filter. • Complete dashboard details.
Trending (individual)	Reps can view their own pipe.	Sales representative	Complete dashboard details.
Forecast on page 565	View quota attainment and forecast for each member of the team, and fine-tune the forecast by reviewing opportunities by stage in a selected period.	Sales manager	<ul style="list-style-type: none"> • Select from the Forecast User filter to view forecast for each team member. • Complete dashboard details.
Team Whitespace	Use this dashboard to uncover resell and upsell opportunities	Sales manager	<ul style="list-style-type: none"> • View specific opportunities by clicking a bubble in the

Dashboard Name	Contents	Target User Role	Tips and Special Requirements
	by viewing whitespace: accounts that you can revisit to create new business.		<p>Discover New Opportunities by Account widget. The larger the bubble, the bigger the account.</p> <ul style="list-style-type: none"> • Complete dashboard details on page 574.
Whitespace (individual)	Reps can view whitespace for their own accounts.	Sales representative	Complete dashboard details
Team Benchmark	Shows a ranking of sales rep results across your team's KPIs, such as closed won deals, best case, and average deal size. Also shows each rep's performance against team average.	Sales leader (operations)	<ul style="list-style-type: none"> • Defaults to view of the entire team. View results for individual reps by selecting them from the Forecast User filter. • Complete dashboard details
Team Activities	See what your team's been doing to keep on top of opportunities. Look at their total, completed, and overdue tasks and review each member's calls, events, emails, and tasks.	Sales leader (operations)	Complete dashboard details..
Sales Stage Analysis	Shows how deals move through stages of the sales process and if deals are moving smoothly. Also reveals bottlenecks and exposes at-risk opportunities.	Sales leader (operations)	<ul style="list-style-type: none"> • Click a stage to see how opportunities move to different stages from the stage. • Complete dashboard details.
Lead Analysis	Boost operational efficiency by taking a close look at your team's lead conversions. Quickly identify leads that convert the most quickly and visualize the team's conversion rate. And get a view into top leads by source and region.	Sales leader (operations)	<ul style="list-style-type: none"> • Defaults to showing leads for the entire team. Select names from the Owner Name filter to see leads according to team members. • Complete dashboard details.
Sales Performance	Sales leaders: Drill into your closed business by geography, account, product, source, or other criteria to get a 360-degree view of the team's operational efficiency.	Sales leader (operations)	<ul style="list-style-type: none"> • Defaults to showing all geographies. Click a location on the map to see performance for just that location. • Complete dashboard details.

Sales Analytics Lenses



After creating your app, view all its Lenses in a single screen by opening the app and clicking the lenses tab.

Table 4: Sales Analytics Lenses

Lens Name	Contents	Edit Through User Interface?
Explore Opportunities	Details about opportunities, starting with pushed opportunities. Narrow the time period to look at pushed opportunities for a year, quarter, month, and so on. Select a new grouping, such as by team or by opportunity owner. Filter by a different stage, status, product, or any other way you break down opportunities to get a more refined view of opportunities in your pipe.	Yes.
Historical Pipeline By Forecast	Augments Team Trending dashboard with detail about the pipeline for the past six months broken out by forecast status.	No. Requires SAQL editing. For advanced users only.
Historical Pipeline By Stage	Augments Team Trending dashboard with detail about the pipeline for the past six months broken out by sales stage.	No. Requires SAQL editing. For advanced users only.
Sales Stage Details	Augments Sales Stage Analysis dashboard, shows where specific deals stand in the sales process. Select a bubble in the chart and click drill-down button at top right to	Yes.

Lens Name	Contents	Edit Through User Interface?
	learn specifics about a deal (for example, forecast category, stage, owner, age).	

Sales Analytics Datasets

After creating your app, view all its datasets in a single screen by opening the app and clicking the **Datasets** tab.

Table 5: Sales Analytics Datasets

Dataset Name	Contents	Special Requirements
Accounts	Data about accounts. Includes accounts without opportunities.	None.
Opportunities	Data about accounts, opportunities, and users.	None.
Oppty Products	Data about products with opportunities and accounts.	None.
Pipeline Trending	Opportunity historical Data. Tracks opportunity amount, close date, and stage changes over the life of an opportunity.	None.
Quota	Quotas data.	Upload a CSV file on page 594 with quotas data to update this dataset if you store quotas data externally to Salesforce and don't use the Sales Cloud Collaborative Forecasts feature.
User Allocation	Applies role hierarchy information to quotas data during manager roll-up.	None.
Users	Provides details about all users in an org.	None.
Roles	Basic data about user roles.	None.
Cases	Data about cases related to accounts.	Only included if you choose to import cases data to Sales Analytics through the configuration wizard.
Activities	Data about events and tasks.	None.
ForecastingItem	Data about forecasts and forecast adjustments.	Only included if you use the Sales Cloud Collaborative Forecasts feature.

Dataset Name	Contents	Special Requirements
Leads	Salesforce leads data, including converted leads connected to accounts and opportunities.	Only included if you choose to import leads data to Sales Analytics through the configuration wizard.
Campaigns	Salesforce campaign data, including opportunities connected to campaigns.	Only included if you choose to import campaigns data to Sales Analytics through the configuration wizard.
Campaign Members	Data about campaign members with campaigns. See who's connected to which campaigns.	Only included if you choose to import campaigns data to Sales Analytics through the configuration wizard.
Opportunity Splits	Split opportunity data.	Only included if you choose to import opportunity splits to Sales Analytics through the configuration wizard.

IN THIS SECTION:

[Sales Analytics Home Dashboard](#)

Start exploring Sales Analytics with an overview of top-level year-to-date key performance indicators (KPIs).

[Sales Analytics Company Overview Dashboard](#)

Sales leaders and operations staff high in the corporate hierarchy: Get an overview of the sales business and operations.

[Sales Analytics Executive Overview – Pipeline Performance Dashboard](#)

Sales executives get instant pipeline status. You can view the current amount in the pipe, comparison to the previous period, projected closing, and top deals by lead source, product, account, and region. Also get top-level views of sales and service performance.

[Sales Analytics Executive Overview – Sales Performance Dashboard](#)

Sales executives get instant insight into closed business and quickly recognize trends. See bookings for the period, changes from previous period, as well as win rate, lead conversion rate, and top deals. Also see top-level views of pipeline and service business.

[Sales Analytics Leaderboard Dashboard](#)

Gives sales leaders an overview of team and individual rep performance, including quota attainment, pipe coverage, bookings, pipe generation, closed won business, average sales cycle time, and sales activities.

[Sales Analytics Trending Dashboards](#)

View company, team, and pipeline changes for a given period, including beginning and end values of the pipe as well as what's moved in and out.

[Sales Analytics Forecast Dashboard](#)

View quota attainment and forecast for each member of the team, and fine-tune the forecast by reviewing opportunities by stage in a selected period.

[Sales Analytics Sales Stage Analysis Dashboard](#)

Shows how deals move through stages of the sales process and if deals are moving smoothly. Also reveals bottlenecks and exposes at-risk opportunities.

[Sales Analytics Lead Analysis Dashboard](#)

Boost operational efficiency by taking a close look at your team's lead conversions. Quickly identify leads that convert the most quickly and visualize the team's conversion rate. And get a view into top leads by source and region.

[Sales Analytics Team Whitespace Dashboard](#)

Use this dashboard to uncover resell and upsell opportunities by viewing whitespace: accounts that you can revisit to create new business.

[Sales Analytics Team Benchmark Dashboard](#)

Shows a ranking of sales rep results across your team's KPIs, such as closed won deals, best case, and average deal size. Also shows each rep's performance against team average.

[Sales Analytics Team Activities Dashboard](#)

See what your team's been doing to keep on top of opportunities. Look at their total, completed, and overdue tasks and review each member's calls, events, emails, and tasks.

[Sales Analytics Sales Performance Dashboard](#)

Sales leaders: Drill into your closed business by geography, account, product, source, or other criteria to get a 360-degree view of the team's operational efficiency.

Sales Analytics Home Dashboard

Start exploring Sales Analytics with an overview of top-level year-to-date key performance indicators (KPIs).

USER PERMISSIONS

To use Analytics apps:

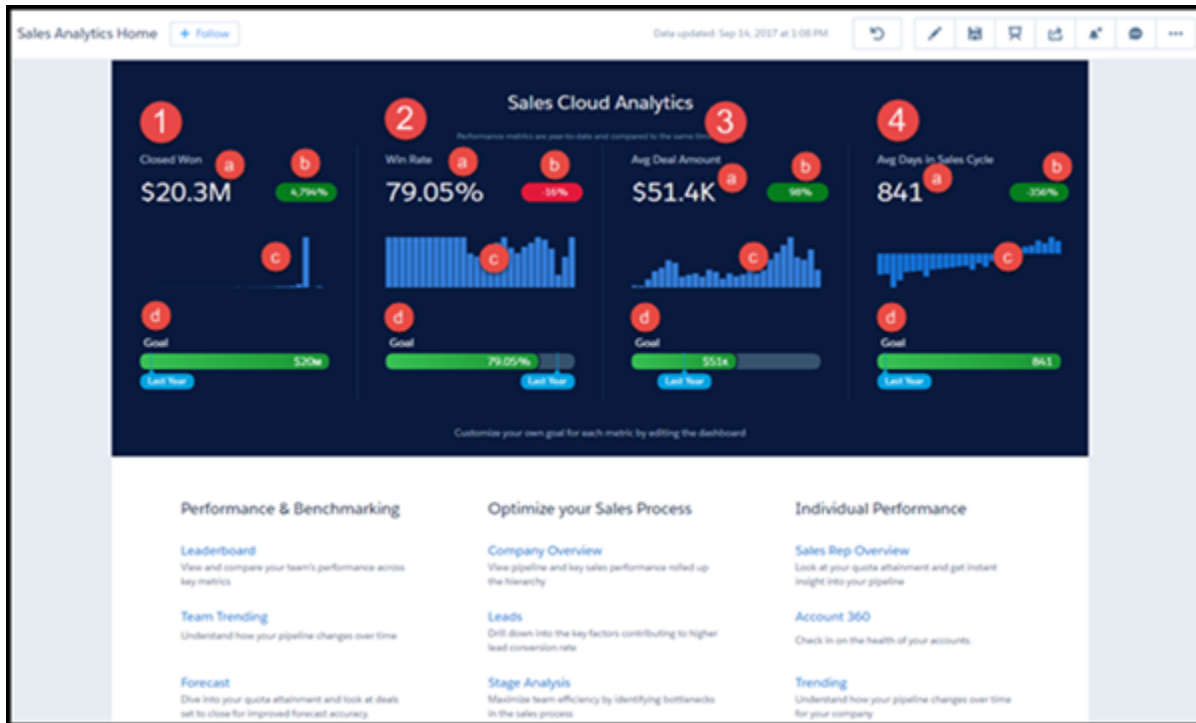
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Default Behavior and Recommended Options

Get an overview of your sales business for your current fiscal year, including comparisons to the previous year and the team's progress against goals. Includes closed won, win rate, average deal amount, and average days in the sales cycle. Also, follow links to see all the app's other dashboards and KPIs. All KPIs are based on row visibility settings defined in the Opportunities dataset.

Customize the goal for each metric by editing the dashboard:

1. With the dashboard open in Analytics Studio, click the edit icon  to open the designer.
2. Click the Goal widget.
3. In the properties panel on the right, expand **Breakpoints**. Then change **Max** to the goal you'd like to use.
4. Save the dashboard.

Wizard and Other Setup Options

Closed Won (1) and Avg Deal Amount (3) KPIs use amounts from the field selected for opportunity amount, wizard Page 5, Question 1. All other KPIs based on standard fields that can't be changed.

Supports Opportunity Splits if the feature is enabled in your org. See [Opportunity Splits](#).

Datasets Used

- Opportunities.

KPI Calculations

- **Closed Won (1)**
 - Total (a). Total closed won year-to-date (YTD) based on Opportunity.IsWon = true.
 - Comparison (b). $(\text{Total closed won YTD} - \text{Total closed won same time last year}) / \text{Total amount closed won YTD}$.
 - Over time (c). Total closed won by month for past 3 years.
 - Goal (d). Total closed won this year vs. last year.
- **Win Rate (2)**
 - Total (a). $\text{Total won YTD} / \text{Total closed won or lost YTD}$.
 - Comparison (b). $(\text{Win rate YTD} - \text{Win rate last YTD}) / \text{Win rate last YTD}$.
 - Over time (c). Win rate by month for past 3 years.
 - Goal (d). $\text{Total won YTD} / \text{Total closed won or lost YTD}$ vs. same for last year.
- **Avg Deal Amount (3)**
 - Total (a). Average amount for won deals YTD.
 - Comparison (b). $(\text{Average amount for won deals YTD} - \text{Average amount for won deals last YTD}) / \text{Average amount for won deals last YTD}$.
 - Over time (c). Average amount for won deals by month for past 3 years.
 - Goal (d). Average deal size YTD vs. same for last year.
- **Avg Days in Sales Cycle (4)**
 - Total (a). Average won opportunity $(\text{Opportunity CloseDate} - \text{CreatedDate})$ for YTD.
 - Comparison (b). $(\text{Average cycle YTD} - \text{Average cycle last YTD}) / \text{Average cycle last YTD}$.
 - Over time (c). Average days to complete (win) sales cycle each month for past 3 years.
 - Goal (d). Average cycle YTD vs same for last year.

Sales Analytics Company Overview Dashboard

Sales leaders and operations staff high in the corporate hierarchy: Get an overview of the sales business and operations.

USER PERMISSIONS

To use Analytics apps:

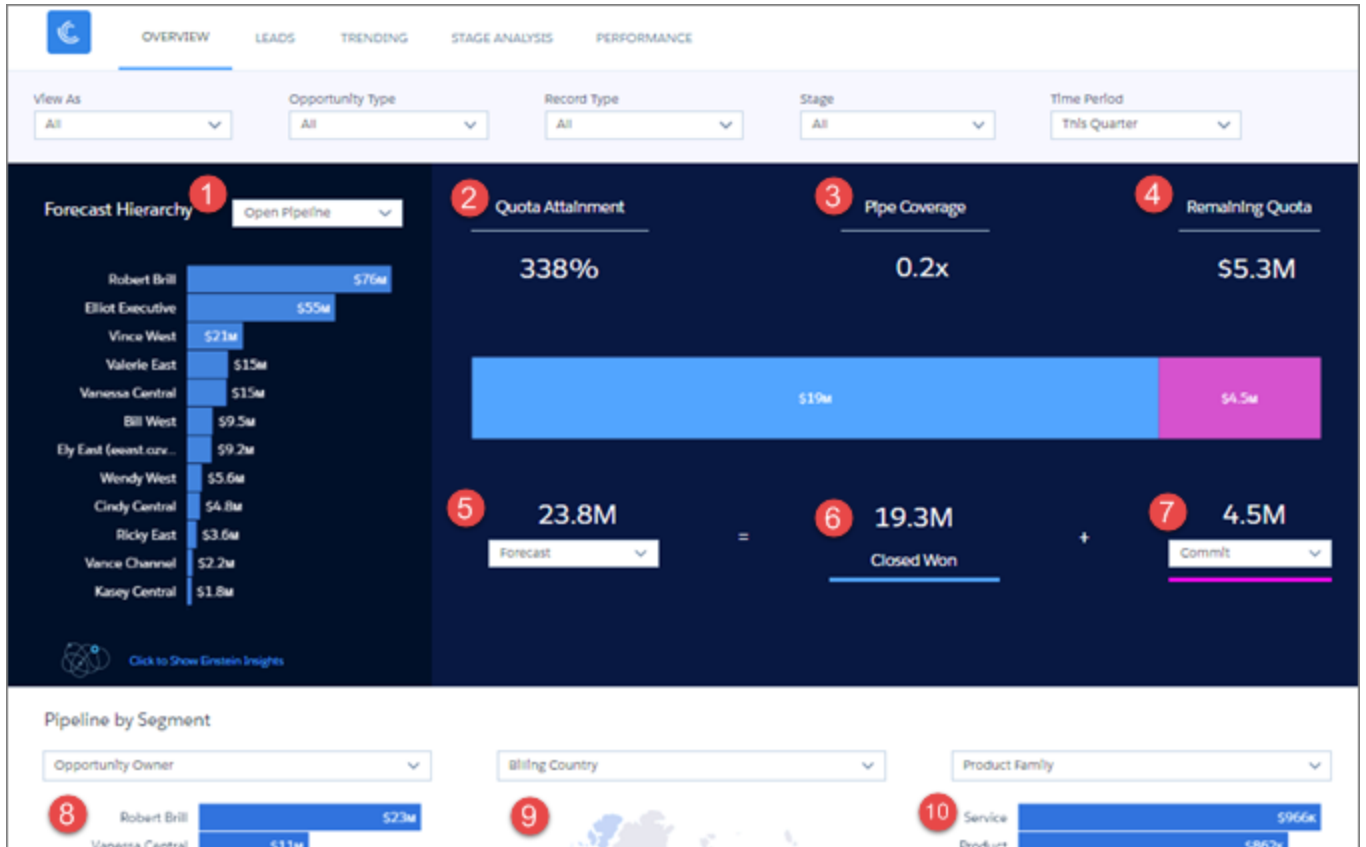
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To use Sales Analytics:

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To create and manage Analytics apps:

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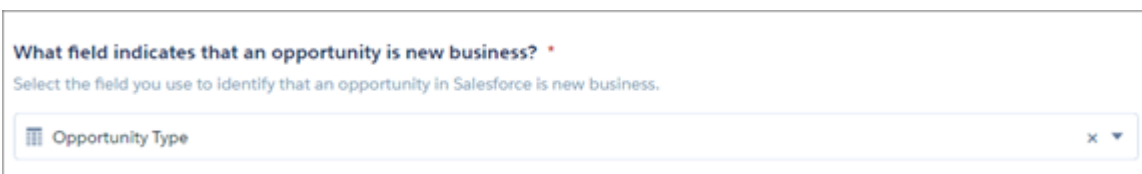


Default Behavior and Recommended Options

Shows quota progress and pipeline rolled up to the role one level below the manager selected in the **View As** filter. Defaults to showing results for the manager currently running the app. Select a different manager from the **View As** filter to view rollup of pipeline and quota for all team members subsidiary to that manager in the role hierarchy. You can remove any KPIs your organization doesn't care about by removing them from the dashboard layout. To learn how to build and edit Analytics dashboards, see [Build Analytics Dashboards](#).

Wizard and Other Setup Options

- **View As filter.** If Salesforce is set up to use the Sales Cloud Collaborative Forecasts feature, the filter shows forecast user names. If your org doesn't use Collaborative Forecasts, filter shows role developer names. In either case, quota and pipe roll up to the selected user. If your org doesn't use Salesforce role hierarchy, this filter does not appear.
- **Opportunity Type filter.** Values shown are determined by selection made in wizard page 5, question 3. By default, the filter uses the standard Opportunity Type field.



- **Time Period filter.** All time periods based on Salesforce fiscal year setting.

- Geography chart at bottom of dashboard uses values from fields selected in wizard page 4, questions 4 and 5.

What is the first field you want to use to segment your geographies? *
Choose the primary way Sales Analytics filters geographic data.

Billing Country x ▼

What is the second field you want to use to segment your geographies? *
Choose the second way Sales Analytics filters geographic data.

Billing State/Province x ▼

- Product chart at bottom of dashboard uses values from fields selected in wizard page 6, questions 2 and 3, if you added Products object to your app. If you set up app without Products, the chart shows fields selected from wizard page 4, questions 1 and 2 about how you segment customers.

Supports Opportunity Splits if the feature is enabled in your org. See [Opportunity Splits](#).

Datasets Used

- Opportunity
- Oppty Products (optional)
- User Manager
- Roles (optional)
- User Allocations
- ForecastingItems (optional)

KPI Calculations

Forecast Hierarchy Filter Options (1)

- Open Pipe. For selected role, total roll-up opportunity amount for any open opportunity with a close date in selected time period.
- Closed Won. For selected role, total roll-up opportunity amount for any closed won opportunity with a close date in selected time period.
- Avg Deal Size (Closed Won). For selected role, total roll-up average opportunity amount for all closed won opportunities with close dates in selected time period.
- Avg Deal Size (Open). For selected role, total roll-up average opportunity amount for all open opportunities with close dates in selected time period.
- Opportunity Count (Closed Won). For selected role, total roll-up opportunity count for all closed won opportunities with close dates in selected time period.
- Opportunity Count (Open). For selected role, total roll-up opportunity count for all open opportunities with close dates in selected time period.

Top of Main Chart

- Quota Attainment (2). Closed won/quota. Quota is the sum of the sales reps quotas that roll up to the role or user selected in the View As filter
- Pipe Coverage (3). Open pipe/remaining quota. Open Pipe amount based on value selected in Stage and Forecast filters.

- Remaining Quota (4). Quota - closed won

Bottom of Main Chart

- Total Forecast (5). Closed won + opportunity amount for categories selected in **View As** and **Opportunity Type** filters
- Closed Won (6). Total amount of opportunities won in the selected time period.
- Commit (7). Based on Forecast Category. Open pipeline based on close date from the period selected in the **Time Period** filter and categories selected in the **Forecast Hierarchy** filter.

Last two amounts shown in horizontal bar in middle of main chart.

Pipeline by Segment Charts

- Owners (8). Total opportunity amount grouped by opportunity or account owner. Based on values selected in filters at top of the dashboard.
- Geographies (9). Total opportunity amount grouped by geography based on close date from the selected time period.
- Products (10). Product total price grouped by product family or product name, depending on how you answered wizard page 6, questions 2 and 3 about products.

Sales Analytics Executive Overview – Pipeline Performance Dashboard

Sales executives get instant pipeline status. You can view the current amount in the pipe, comparison to the previous period, projected closing, and top deals by lead source, product, account, and region. Also get top-level views of sales and service performance.

USER PERMISSIONS

To use Analytics apps:

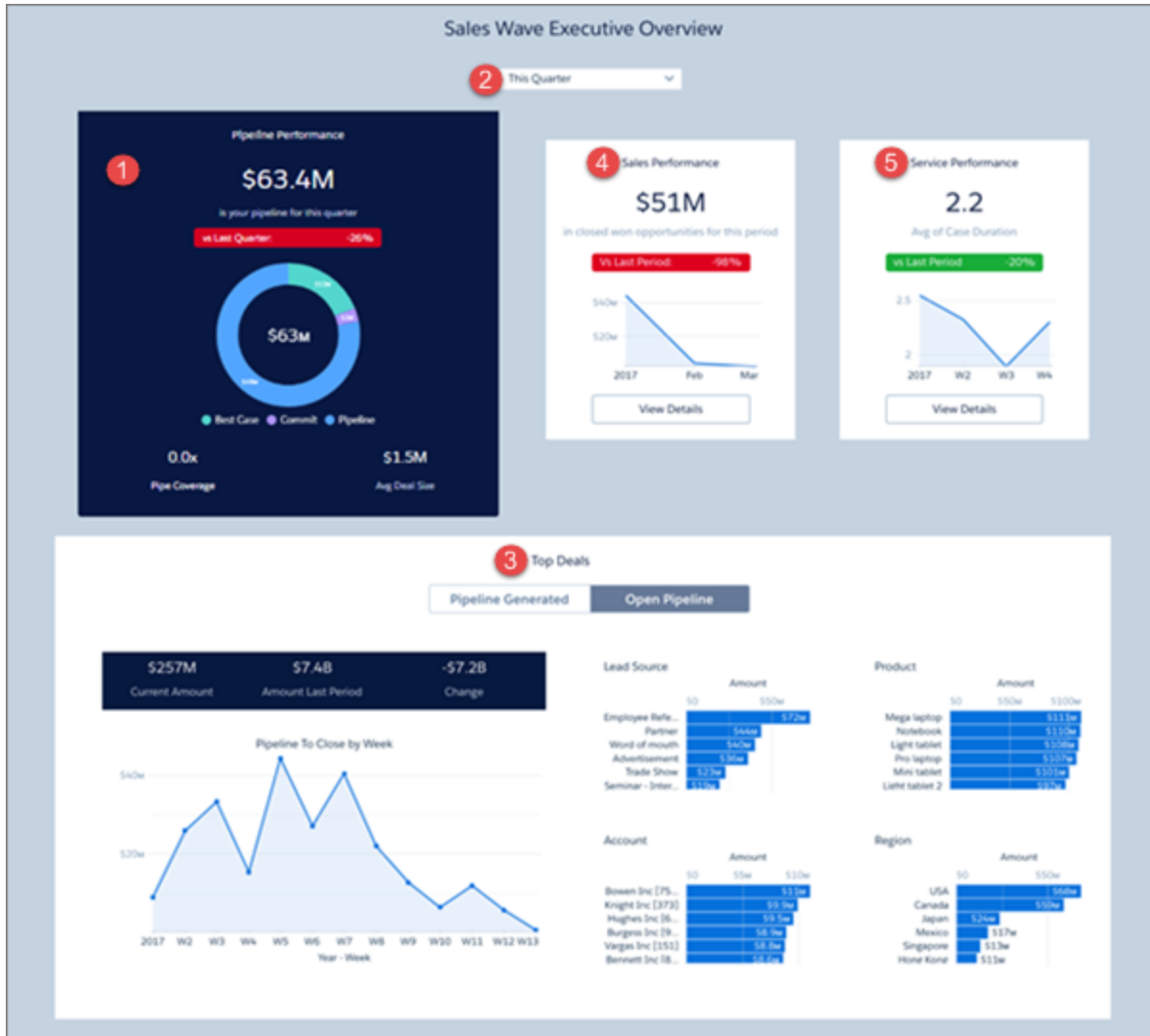
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Default Behavior and Recommended Options

Pipeline Performance Amount chart (1) shows results for the current quarter. View results from a different period by changing the selection in the filter at top (2). Also shows pipeline coverage for the period, assuming you track quotas for your team. And shows average deal size for open opportunities set to close that period.

Top deals widget (3) defaults to deals set to close during selected period (**Open Pipeline**). Switch toggle to **Pipeline Generated** to see deals generated during the period.

To view sales and service performance overviews, click **View Details** buttons in Sales Performance (4) and Service Performance (5) charts.

Wizard and Other Setup Options

- Products. Only included if you add Products to your app on the wizard page that lets you add objects.
- Services data. Only included if you add Cases to your app on the wizard page that lets you add objects.

Datasets Used

- Opportunities
- Opportunity Products (if you add Products to the app)
- User Allocation
- Pipeline Trending
- Cases (if you add Cases to the app)

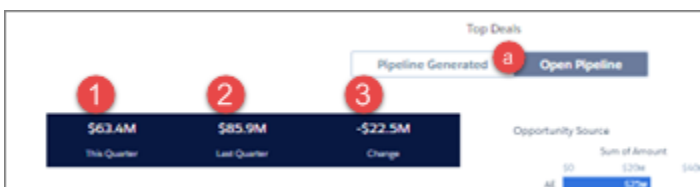
KPI Calculations

Pipeline Performance



1. Pipeline Performance. Total amount open opportunities for selected period.
2. Comparison to prior period (quarter, year, month, etc. depending on selected period). $(\text{Total amount open opportunities to date in selected period} - \text{Total amount open opportunities in prior period}) / \text{Total amount open opportunities in prior period}$. Prior period uses historical open pipeline amount.
3. Pipe coverage. $\text{Total open quota} / \text{Remaining quota for selected period}$. Remaining quota equals $\text{Sum of total sales rep quota} - \text{Closed won}$.
4. Avg Deal Size. Average Amount for open opportunities in selected period.

Top Deals



1. This period (quarter, year, month, etc., depending on selected period). Either total open set to close this quarter or total created this quarter (open or closed) depending on whether you select Open Pipe or Pipe Generated (a).
2. Last period (quarter, year, month, etc., depending on selected period). Either historical amount open at the same time last period or total pipeline generated last period.
3. Change. This Period - Last Period.

Product Name widget appears only if you add Products to your app.

Sales Performance



1. Sales performance. Total closed won in selected period.
2. Comparison to prior period (quarter, year, month, etc. depending on selected period). $(\text{Total closed won in current period} - \text{total closed won prior period}) / \text{Total closed won prior period}$.
3. Total closed over time. Total closed won by week.

Service Performance



1. Service performance. Average days to close cases during selected period.
2. Comparison to prior period (quarter, year, month, etc. depending on selected period). $(\text{Average time to close in selected period} - \text{Average time to close in prior time period}) / \text{Average time to close in prior time period}$.
3. Timeline. Average time to close cases by week.

Sales Analytics Executive Overview – Sales Performance Dashboard

Sales executives get instant insight into closed business and quickly recognize trends. See bookings for the period, changes from previous period, as well as win rate, lead conversion rate, and top deals. Also see top-level views of pipeline and service business.

USER PERMISSIONS

To use Analytics apps:

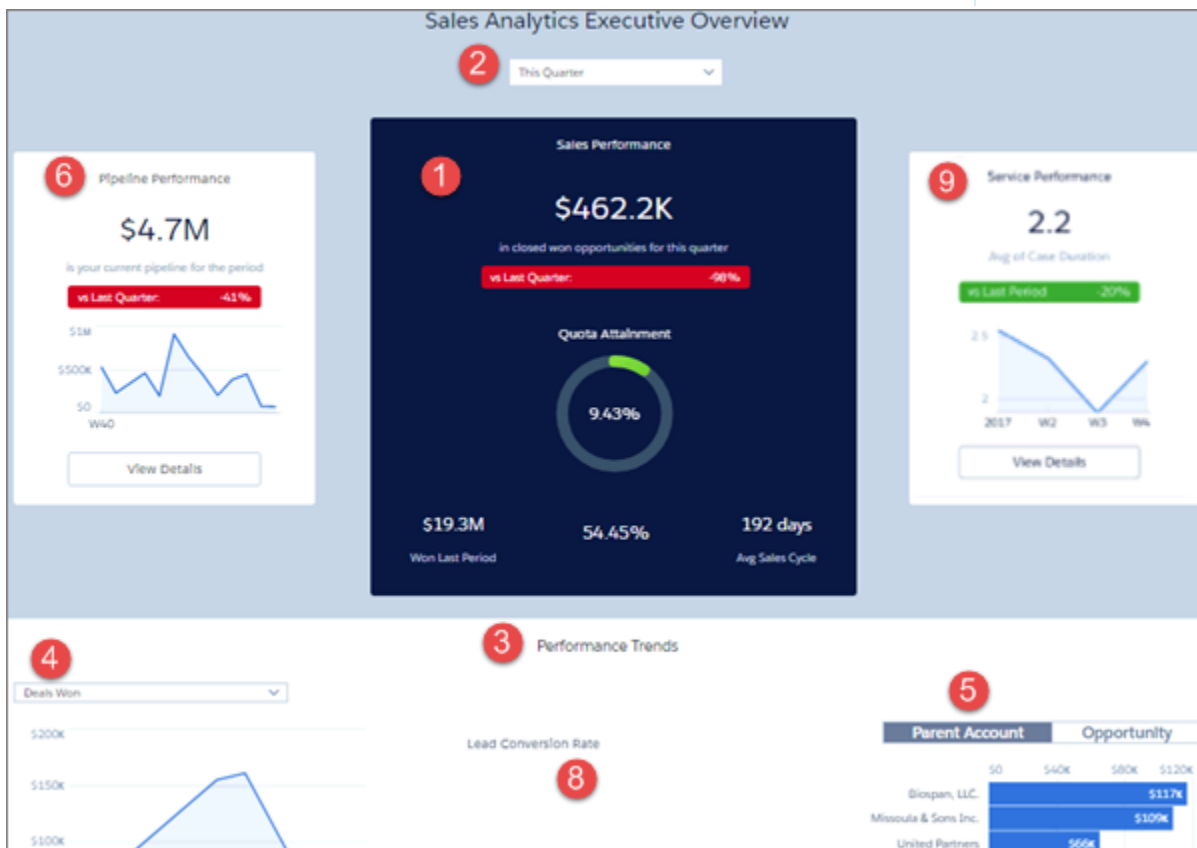
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Default Behavior and Recommended Options

Sales Performance chart (1) shows results for the current quarter. View results from a different period by changing the selection in the filter at top (2)

Performance Trends chart (3) defaults to closed won opportunities. View other closed opportunities (such as lost) by changing the filter (4) selection.

Top deals widget (5) defaults to accounts. Toggle between **Parent Account** and **Opportunity**.

To view pipeline and service performance overviews, click **View Details** buttons in Pipeline Performance (6) and Service Performance (7) charts.

Wizard and Other Setup Options

- Lead Conversion Rate (8). Only included if you add Leads to the app with the wizard page that lets you add objects.
- Service Performance (7). Only included if you add Cases to your app on the wizard page that lets you add objects.

Datasets Used

- Opportunities
- User Allocation
- Leads (if you add Leads to the app)
- Cases (if you add Cases to the app)

KPI Calculations

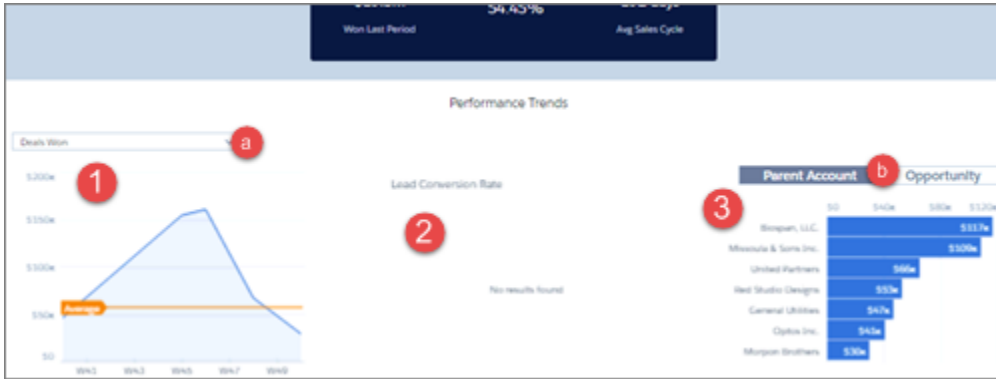
Pipeline Performance



1. Sales Performance. Total closed won in selected period.
2. Comparison to prior period (quarter, year, month, etc., depending on selected period) (Total closed won to date in current period - Total closed won prior period) / Total closed won prior period.
3. Quota Attainment. Total quota / Total closed. Based on sum of all sales rep quotas.
4. Won Last Period. Total won in prior selected period (quarter, year, month, etc., depending on selected period).

5. Win rate. Total closed won amount / Total closed amount win rate. Total closed won amount / Total closed amount.
6. Avg Sales Cycle. Average time to close for all closed won opportunities.

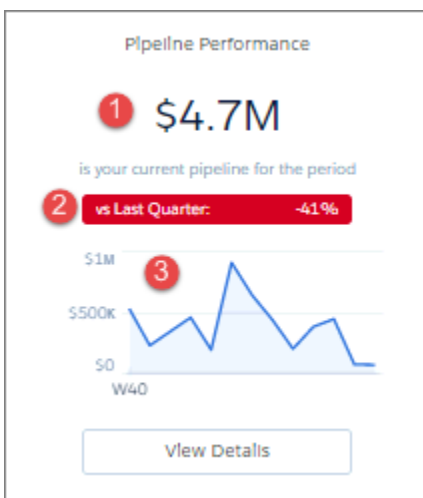
Performance Trends



1. Deals over time. Either closed won or closed lost depending on filter (a) selection, week by week for selected period. Average line shows average closed won or lost.
2. Lead Conversion Rate. Leads converted to closed won opportunities / Total leads created in selected period, by week. Only shows if customer adds leads when creating app with wizard. (Not shown in images.)
3. Top accounts or opportunities. Depending on toggle (b) selection, shows top deals according to opportunity name or account name (or parent account name if your org uses account hierarchy, as shown in image). Shows either top closed won or closed lost depending on filter (a) selection.

Product Name widget appears only if you add Products to your app.

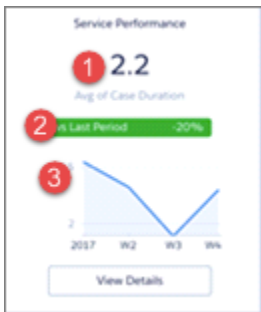
Pipeline Performance



1. Pipeline Performance. Total open opportunity amount for selected period.
2. Comparison to prior period (quarter, year, month, etc., depending on selected period). (Total open opportunity amount to date this period - Total open opportunity amount in prior period) / Total open opportunity amount in prior period. Prior period uses historical open pipeline amount.

- Open deals over time. Open deals by week of close date.

Service Performance



- Service performance. Average days to close cases during selected period.
- Comparison to prior period (quarter, year, month, etc. depending on selected period). (Average time to close in selected period - Average time to close in prior time period) / Average time to close in prior time period.
- Timeline. Average time to close cases by week.

Sales Analytics Leaderboard Dashboard

Gives sales leaders an overview of team and individual rep performance, including quota attainment, pipe coverage, bookings, pipe generation, closed won business, average sales cycle time, and sales activities.

USER PERMISSIONS

To use Analytics apps:

- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Default Behavior and Recommended Options


The Leaderboard gives a quick overview of team performance for a given time period. View results for the entire team or for any of your subordinates. The team is made up of sales reps that roll up to the user selected in the Forecast User/Manager Role/Opportunity Owners filter (1), depending on the configuration of the app. (See below under Wizard and Other Setup Options.)

Select a key performance indicator (KPI) at the top of the left column (2) to view a stacked ranking of your team according to that KPI. Examples of KPIs you can choose include the following:

- Quota progress.
- Pipe coverage.
- Open pipe.
- Pipe generated.
- Remaining quota.
- Closed won.
- Completed activities.
- Average sales cycle.

Change the Forecast User/Manager Role/Opportunity Owners filter (1) and view KPIs from that user's perspective.

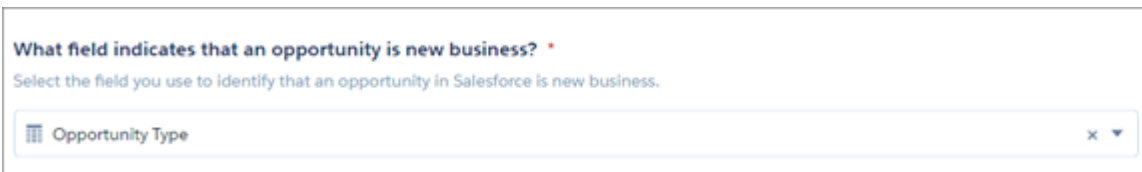
Forecast User/Manager Role/Opportunity Owners filter (1) filter is set to **All** when you first open the dashboard because the names of categories may be unique to your org. Change the initial value to one that works better for you:

1. With the dashboard open in Analytics Studio, click the edit icon  to open the designer.
2. Click the icon with three dots to the right of group of icons, and select **Pick Initial Selections**.
3. Choose one or more categories from the filter list, such as Closed, Commit, or Best Case.
4. Click the disk icon at the top, then click **Save**.

The leaderboard column on the left (2) displays opportunity owners only. It does not roll up metrics up the role hierarchy; the Company Overview dashboard provides that view.

Wizard and Other Setup Options

- **Quotas.** Dashboard automatically includes quota information from Sales Cloud Collaborative Forecasts Quotas if your org uses this feature. If it does not, you can manually upload quotas data into the app from an external tool as a CSV file. See [Collaborative Forecasting and Quotas Data in Sales Analytics](#) on page 594.
- **Opportunity Type filter.** Values shown are determined by selection made in wizard page 5, question 3. By default, the filter uses the standard Opportunity Type field.

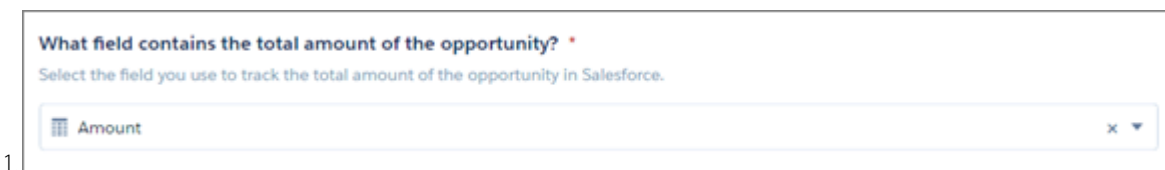


What field indicates that an opportunity is new business? *

Select the field you use to identify that an opportunity in Salesforce is new business.

Opportunity Type

- **Forecast User/Manager Role/Opportunity Owner filter (*Forecast User* in image).** Title and contents of this filter depend on your org:
 - *Forecast User.* If your org uses the Sales Cloud Collaborative Forecasts feature, the filter lists forecasting managers as defined by the forecast hierarchy.
 - *Manager Role.* If your org defines a role structure/hierarchy but doesn't use Collaborative Forecasts, the filter lists manager roles as defined by the hierarchy.
 - *Opportunity Owners.* If your org does not define role hierarchy, the filter lists opportunity owners.
- Closed won and quota amounts calculated based on the amount field selected in the wizard, Page 5, Question



What field contains the total amount of the opportunity? *

Select the field you use to track the total amount of the opportunity in Salesforce.

Amount

1.

Supports Opportunity Splits if the feature is enabled in your org. See [Opportunity Splits](#).

Datasets Used

- Opportunity
- User Allocation

- Activities
- User
- Opportunity Splits (if you select Opportunity Splits on the wizard page that lets you add objects)

KPI Calculations

Yearly comparisons are calculated as follows:

- $(\text{Metric year-to-date} - \text{Metric same period last year}) / \text{Metric same period last year}$

All data is filtered by Opportunity Close Date within the selected time period except Pipe Generated. Pipe Generated KPI is filtered by Opportunity Created Date within the selected time period.

- **Top of Chart**

- Closed Won (4a). Total amount closed won based during selected time period. May include future closed opportunities.
- Closed Won comparison (4b). $(\text{Total amount closed won during selected time period to date} - \text{Total amount closed won during same period last year}) / \text{Total amount closed won during same period last year}$. Only done to date, and does not include future closed opportunities.
- Closed Won over time (4c). Total amount closed won by quarter for past eight quarters
- Pipe Generated (5a). Total amount of opportunities created in selected time period. May include opportunities set to close outside of the selected time period.
- Pipe Generated comparison (5b). $(\text{Total amount created in selected time period to date} - \text{Total amount created in same time period last year}) / \text{Total amount created in same time period last year}$.
- Pipe Generated over time (5c). Win rate by month for past three years.
- Avg Days in Sales Cycle (6a). Average of opportunity close date - created date for won opportunities year to date.
- Avg Days in Sales Cycle comparison (6b). $(\text{Average cycle year to date} - \text{Average cycle last year to date}) / \text{Average cycle last year to date}$.
- Avg Days in Sales Cycle over time (6c). Average days to complete (win) sales cycle in the selected period
- Avg Activities Completed (7a). Average number of activities completed per team member in selected time period. Team made up of opportunity owners included in role selected in Forecast User and Opportunity Owner filters.
- Avg Activities comparison (7b). $(\text{Activities completed in the time period selected to date} - \text{Activities completed in the same period last year}) / \text{Activities completed in the same period last year}$.
- Avg Activities over time (7c). Activities completed per quarter.

- **Upper-Left Filter Options (2)**

- Closed Won. Total amount closed won as of lose date in selected period per opportunity owner.
- Open Pipe. Total amount open as of close date in selected period per opportunity owner.
- Quota Attainment. $\text{Closed won} / \text{Quota amount}$ per opportunity owner as of close date and quota date in selected period.
- Remaining Quota. $\text{Quota amount} - \text{Closed won}$ as of close date and quota date in selected period.
- Pipe Generated. Total amount of opportunities created since created date in selected period per opportunity owner.
- Avg Sales Cycle. Average sales cycle since created date in selected time period per opportunity owner.
- Activities Completed. Number of activities completed in the selected time period per opportunity owner.
- Pipe Coverage. $\text{Open pipeline} / \text{Remaining quota}$ per opportunity owner in selected period. Values selected in Forecast Category filter impact open pipeline calculation.

- **Top Deals (open opportunities) table (8)**

- **Pushed.** Number of times an opportunity close date has been pushed to a future date. Only shows opportunities in the table for which the closed date has been pushed into the future at least once.
- **Neglected.** Opportunities that have not been touched for 60 days. Time period can be changed by editing app dataflow.

Sales Analytics Trending Dashboards

View company, team, and pipeline changes for a given period, including beginning and end values of the pipe as well as what's moved in and out.

USER PERMISSIONS

To use Analytics apps:

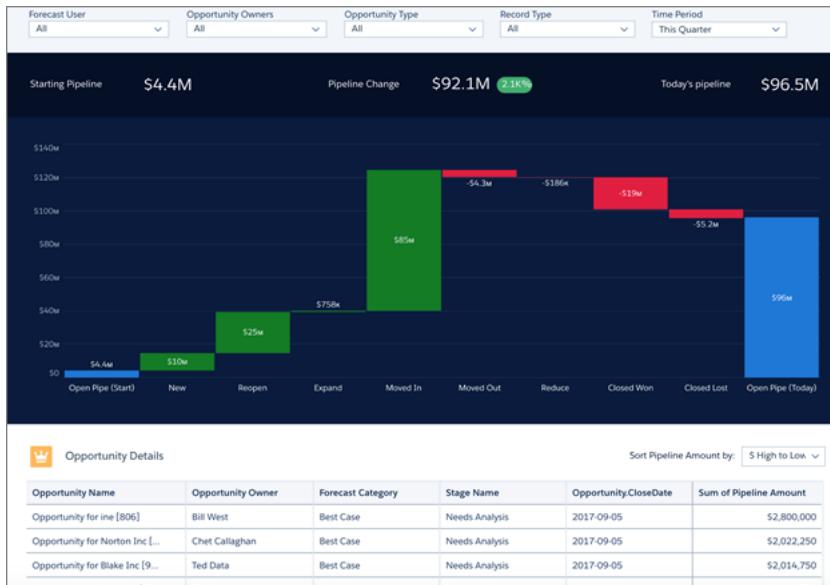
- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Note: The following pertains to Team Trending (shown), Company Trending, and Trending (individual) dashboards, except as noted.

Default Behavior and Recommended Options

Dashboards show the pipeline for all opportunity owners rolling up to the manager using the app. Depending on which dashboard you view, choose another user to change opportunity owner(s) reflected in the chart.

- Team Trending (shown): Change opportunity owner using the **Forecast User/Manager Role/Opportunity Owner** filter (*Forecast User* in image). Filter name changes depending on how your org is set up. See Wizard and Other Setup Options.
- Company Trending: Change opportunity owner using the **View As** filter.
- Trending (individual): Change opportunity owner using the **Opportunity Owner** filter.

The dashboard supports only fields within the opportunity history table. Even if you select a custom amount field in the wizard, the dashboard contains only the standard opportunity amount field. Filters at the top use only current opportunity values; they don't reflect historical values. For example, if the owner of the opportunity has changed, historical data does not reflect the change.

The dashboard does not support opportunity splits.

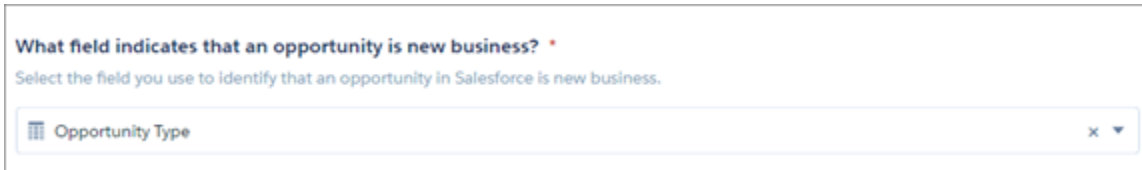
Wizard and Other Setup Options

Forecast User/Manager Role/Opportunity Owner filter (*Forecast User* in image). Title and contents of this filter depend on your org:

- *Forecast User*. If your org uses the Sales Cloud Collaborative Forecasts feature, the filter lists forecasting managers as defined by the forecast hierarchy.
- *Manager Role*. If your org defines a role structure/hierarchy but doesn't use Collaborative Forecasts, the filter lists manager roles as defined by the hierarchy.
- *Opportunity Owners*. If your org does not define role hierarchy, the filter lists opportunity owners.

 **Note:** Pertains only to Team Trending dashboard.

Opportunity Type filter. Values shown are determined by selection made in wizard page 5, question 3. By default, the filter uses the standard Opportunity Type field.



Time Period filter. All time periods based on Salesforce fiscal year setting.

Datasets Used

Pipeline Trending, including data from Opportunity History.

KPI Calculations

Time Period Filter Options

Filters both the historical opportunity close date and determines the window for start and end dates.

- Last 1 Day (Month Close). Shows how pipeline has changed within the last day for opportunities set to close this month.
- Last 1 Day (Quarter Close). Show how pipeline has changed within the last day for opportunities set to close this quarter.
- Last 7 Days (Month Close). Shows how pipeline has changed within the last 7 days for opportunities set to close this month.
- Last 7 Days (Quarter Close). Show how pipeline has changed within the last 7 days for opportunities set to close this quarter.
- Last 14 Days (Month Close). Show how pipeline has changed within the last 14 days for opportunities set to close this month.
- Last 14 Days (Quarter Close). Shows how pipeline has changed within the last 14 days for opportunities set to close this quarter.
- This Month. Shows how pipeline has changed from the start of the month to now for opportunities set to close this month.
- This Quarter. Shows how pipeline has changed from the start of the quarter to now for opportunities set to close this quarter.

Main (Waterfall) Chart

- *Values along top*
 - Starting Pipeline. Total amount closed won during selected time period, which may include future closed opportunities.
 - Pipeline Change. (Total amount closed won during selected time period to date - Total amount closed won same period last year) / Total amount closed won total amount same period last year. Does not include future closed opportunities.
 - Today's pipeline. Total pipeline at the end of the period.
- *Values in vertical bars*
 - Open Pipe (Start). Total pipeline at the start of the time period.
 - New. Opportunities created after the start period.

- Expand. Existing opportunities in which total amount was increased since start of the period.
- Moved In. Opportunities with close dates moved into the selected time period. (Where close date was changed after start of the period.)
- Moved Out. Opportunities with a close date that no longer falls within the selected time period. (Where close date was changed after start of the period.)
- Reduce. Opportunities in which total amount is less than at the beginning of the period.
- Closed Won. Opportunities closed won after the beginning of the period.
- Closed Lost. Opportunities lost after the beginning of the period.
- Open Pipe (Today). Total pipeline at the end of the period.

Sales Analytics Forecast Dashboard

View quota attainment and forecast for each member of the team, and fine-tune the forecast by reviewing opportunities by stage in a selected period.

USER PERMISSIONS

To use Analytics apps:

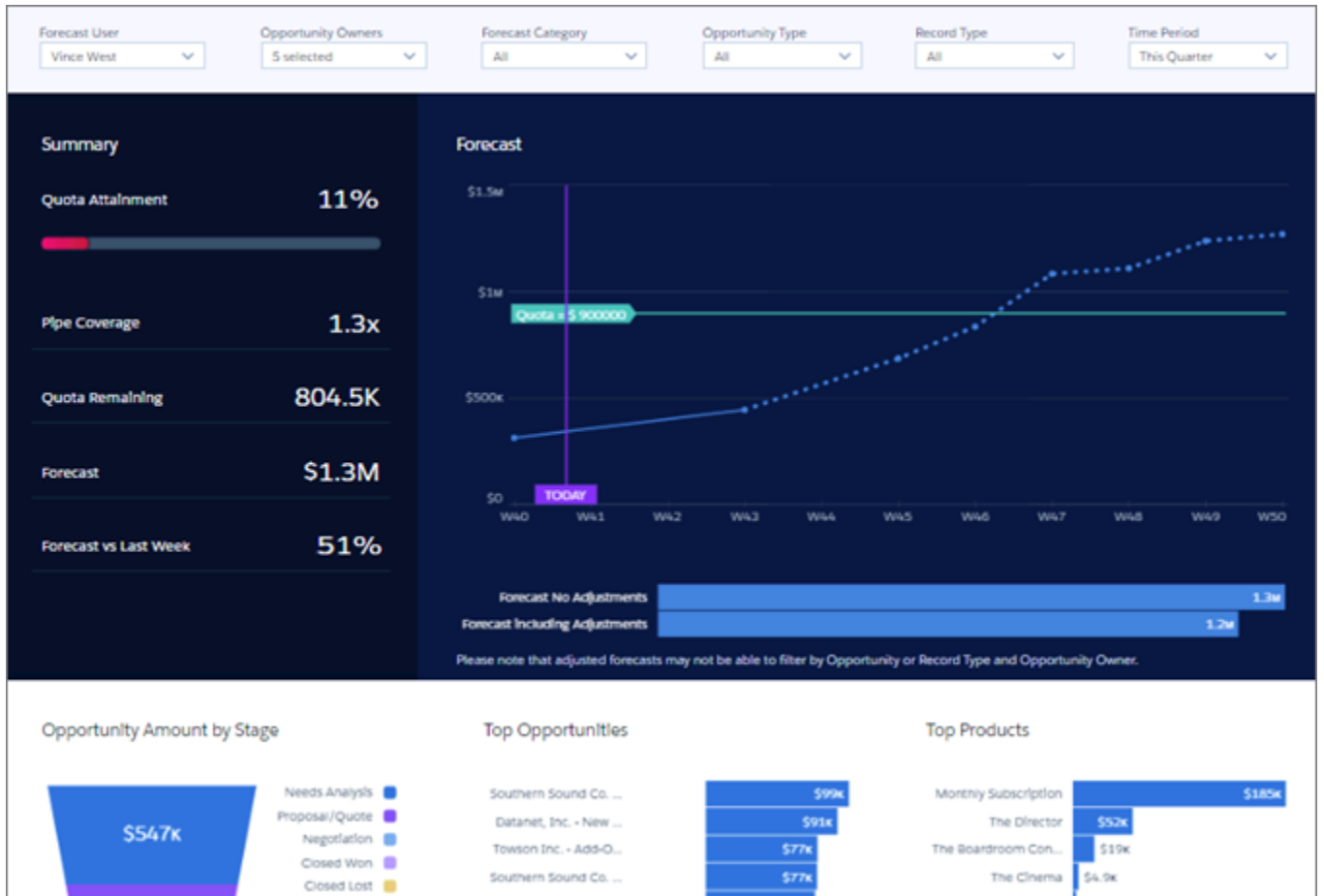
- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Default Behavior and Recommended Options

If your org uses the Sales Cloud Collaborative Forecasts feature, the dashboard shows opportunity forecast and forecasts with manager adjustments. Historical opportunity data draws from the standard Opportunity Amount field.

Select from the Forecast User filter to view forecast for each team member.

Change the Time Period filter to Next Month or Next Quarter to identify possible opportunities to move into the current period. When you choose other categories from the Forecast Category filter, the Pipe Coverage metric changes accordingly.

Wizard and Other Setup Options

Forecast User/Manager Role filter (Forecast User in image). If Salesforce is set up to use the Sales Cloud Collaborative Forecasts feature, the filter shows forecast user names. If your org doesn't use Collaborative Forecasts, filter shows role developer names. In either case, pipe rolls up to the selected user. If your org doesn't use Salesforce role hierarchy, this filter does not appear.

Opportunity Type filter. Values shown are determined by selection made in wizard page 5, question 3. By default, the filter uses the standard Opportunity Type field.

What field indicates that an opportunity is new business? *
Select the field you use to identify that an opportunity in Salesforce is new business.

Opportunity Type

Quotas. Dashboard automatically includes quota information from Sales Cloud Collaborative Forecasts Quotas if your org uses this feature. If it does not, you can manually upload quotas data into the app from an external tool as a CSV file. See [Collaborative Forecasting and Quotas Data in Sales Analytics](#).

Products. Dashboard includes products if you include products (opportunity line items) when you create the app. Top products are sorted by the product amount selected in the wizard, page 6, question

Sales Analytics - Personalize

These questions focus on how Sales Analytics displays data about the Products object. Only answer if you answered Yes to Question 4 on the previous page. Step 6 of 10

What field contains the total amount of a product on the opportunity? *
Select the field you use to track the total amount of the product on the opportunity in Salesforce.

Total Price

1. Supports Opportunity Splits if the feature is enabled in your org. See [Opportunity Splits](#).

Datasets Used

- Opportunities (or Opportunity Splits)
- Users
- User Allocation
- Forecasting Item (if org uses Collaborative Forecasts)
- Oppty Products (if you set up app with products)
- Pipeline Trending (for Forecast last week comparison)

KPI Calculations

Filters at Top

- Manager Role / Forecast User. Role developer names or forecast managers, depending on how app is set up.
- Opportunity Owner. Any user who has ever owned an opportunity, including inactive users or users who do not own any deals in the selected period.
- Forecast Category. Values from standard opportunity forecast category field.
- Opportunity Type. Values from standard opportunity type field, or another field selected during app setup.
- Record Type. Opportunity record type names defined in your org.
- Time Period. Based on Salesforce fiscal year settings.

Summary (Top Left Panel)

- Quota Attainment. Closed won / Quota amount per opportunity owner based on close date and quota date in selected period. May include future closed opportunities.
- Pipe Coverage. Open pipeline/ Remaining quota per opportunity owner based on selected period. Comparisons are to date. Does not include future closed opportunities.
- Quota Remaining. Quota amount - Closed won based on close date and quota date in selected period.

- Forecast. Closed won + Amount of categories selected in Forecast Category filter. May include opportunities set to close outside of selected period.
- Forecast vs Last Week. Current opportunity forecast amount for categories selected in Forecast Category filter compared with historical opportunity amount for the same categories.

Forecast (Top Right Panel)

- Forecast. Cumulative forecast for categories selected Forecast Category filter. Based on opportunity close date within selected period.
- Forecast No Adjustments/Forecast including adjustments. Total opportunity amount of forecast for categories selected Forecast Category filter compared with adjusted forecast for user selected in Forecast User filter.

Charts at Bottom

- Opportunity Amount by Stage. Opportunities grouped by stage based on close dates within selected period and other values selected in filters.
- Top Opportunities. Total amount open for selected opportunity owner based on close date in selected period.
- Top Products. Top products based on total product amount for all opportunities in forecast.

Sales Analytics Sales Stage Analysis Dashboard

Shows how deals move through stages of the sales process and if deals are moving smoothly. Also reveals bottlenecks and exposes at-risk opportunities.

USER PERMISSIONS

To use Analytics apps:

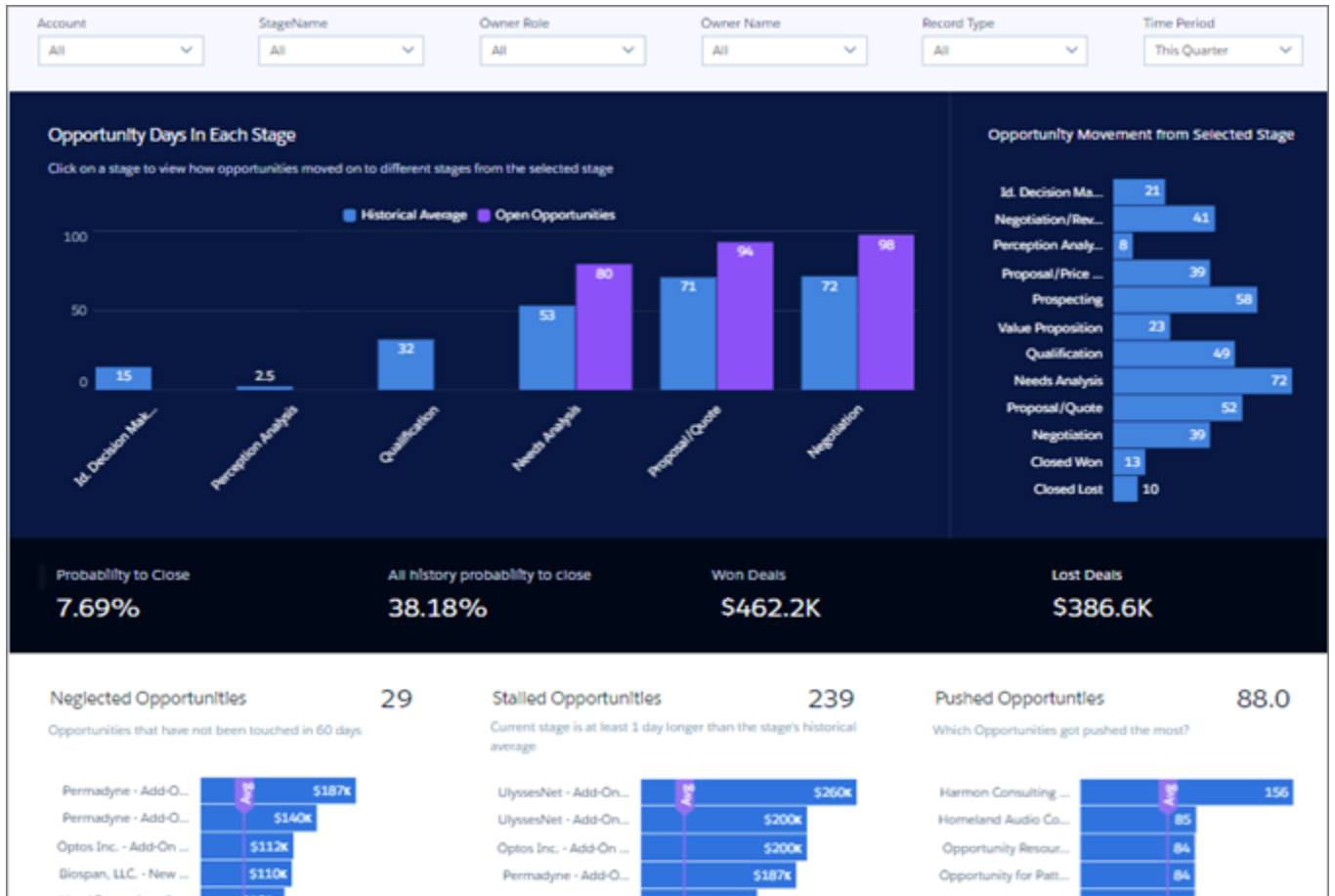
- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Default Behavior and Recommended Options

Compares how long current opportunities currently take in each stage of your process with the same data for historical deals. Click a stage in the main chart and the chart to the right shows deal movement from that stage to others. The main chart shows historic and current average number of days deals spend in that stage.

By comparing current with historical data, the dashboard determines which deals are at risk and displays them in neglected, stalled, and pushed opportunities charts below.

Data comes from the Opportunity History table, which supports only the standard amount and stage name fields.

The Stage Name filter uses stage names in the standard StageName field in the Opportunities object.

Wizard and Other Setup Options

The Sales Analytics dataflow determines neglected opportunities. Change the threshold from the default 60 days to your team's preferred length of time using the Dataflow Editor. See [Configure the Dataflow with the Dataflow Editor](#) on page 93

Datasets Used

- Opportunities
- Pipeline Trending

KPI Calculations

Filters at Top

- Account. Account names related to opportunities in the dashboard.
- Owner Name. Names of opportunity owners. May include inactive users or users who do not own any deals in the selected period.
- Owner Role. Role name of opportunity owners.
- Stage Name. Names in the standard StageName field in the Opportunities object.
- Record Type. Opportunity record type names defined in your org.
- Time Period. Based on Salesforce fiscal year settings.

Main Chart, Top

- Historical Average. Number of days each opportunity stay in each stage. Average days in stage for all opportunities in the OpportunityHistory object, independent of selected period.
- Open Opportunities. Number of days current open opportunities stay in each stage. Average days in stage to date for all open opportunities with close dates within the selected period. Does not include future closed opportunities.

Opportunity Movement From Selected Stage Chart. Shows number of opportunities moved from stage selected in main chart to other stages within selected period.

Main Chart, Bottom

- Probability to Close. Total won/Total closed based on the selected stage, for opportunities closed within the selected period. If no stage is selected, shows win rate.
- All history probability to close. Total won/Total closed based on the selected stage for all time. If no stage is selected, shows win rate.
- Won Deals. Total amount won in selected period.
- Lost Deals. Total amount won in selected period.

Charts Below Main Chart

- Neglected Opportunities. Top open opportunities by amount that have not been touched in 60 days that are set to close in the selected period.
- Stalled Opportunities. Top open opportunities by amount that have stayed in current stage at least one day longer than historical average for all opportunities. Based on close date in the selected period.
- Pushed Opportunities. Top open opportunities by push count based on close date in the selected period.

Sales Analytics Lead Analysis Dashboard

Boost operational efficiency by taking a close look at your team’s lead conversions. Quickly identify leads that convert the most quickly and visualize the team’s conversion rate. And get a view into top leads by source and region.

USER PERMISSIONS

To use Analytics apps:

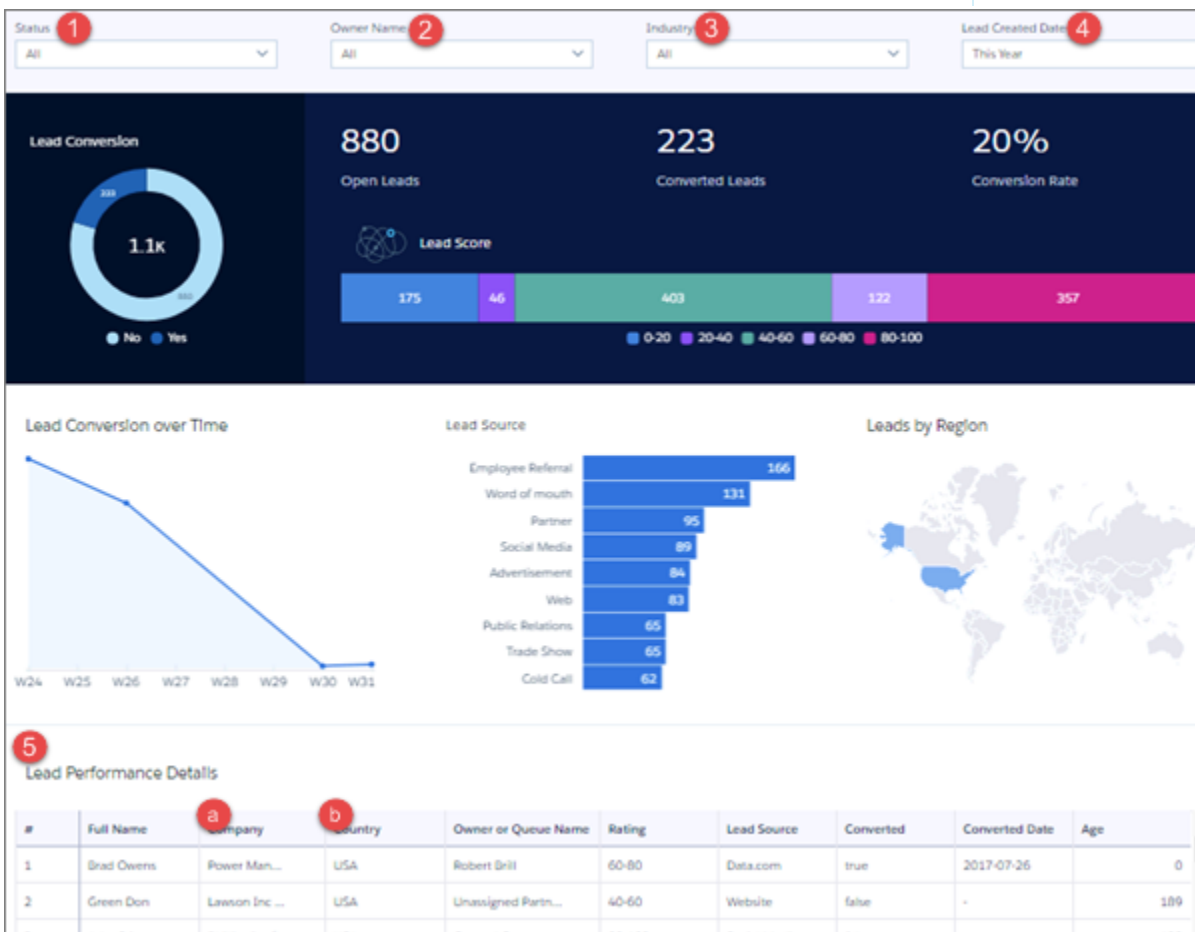
- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Default Behavior and Recommended Options

Default view shows leads for the entire team. To see leads according to each team member, select a member's name from the **Owner Name** filter (2).

In the Lead Performance Details chart (5), open the action menus from Full Name (a) or Company (b) fields and post to Chatter, create a task or event, or perform another action. Converted leads in Salesforce can't be edited, so you can't perform actions from a converted lead.

Wizard and Other Setup Options



Wizard selections made when you create the app determine the labels and values in the KPIs numbered in the image just above. Select basic create or accept default values in custom create to use labels and values from standard Salesforce fields. To customize KPIs, select other fields from the wizard.

- 1. Lead Score** in image, defaults to showing count of leads grouped by their rating. Customize with wizard page 8, question 1.
 - 2. Lead Source** in image. Defaults to showing count of leads grouped by their source. Customize with wizard page 8, question 2.
 - 3. Leads by Region** in image. Defaults to showing count of leads grouped by region. Customize with wizard page 8, question 3.
- Industry filter (4 in main image at top). Change filter by choosing a field other than Industry in wizard page 8, question 4.

Datasets Used

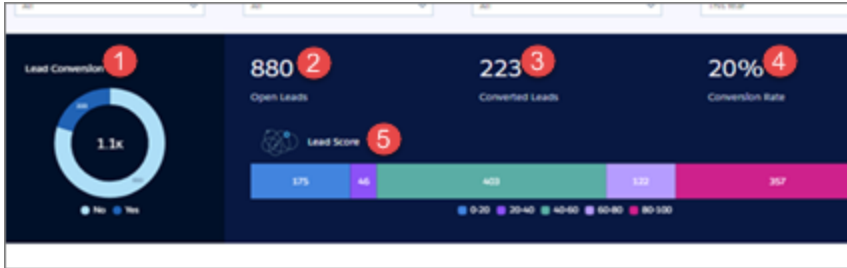
- Leads
- Users

KPI Calculations

Filters Across Top

1. Status. Values from your org's standard Lead Status field.
2. Owner Name. Owner or queue name for owner of lead.
3. Industry. Values from your org's Industry field. Can change filter with configuration wizard. See Wizard and Other Setup Options.
4. Lead Created Date. Based on Salesforce fiscal year settings.

Top Chart



1. Lead Conversion. Counts of closed and open leads. (Leads grouped by IsConverted.)
2. Open Leads. Total number of open leads created during period selected in Lead Created Date filter.
3. Converted Leads. Number of converted leads created during period selected in Lead Created Date filter. Determined by the isConverted flag on Leads. Counts only leads converted to contacts, accounts, or opportunities.
4. Conversion Rate. Leads converted / Leads created during period selected in Lead Created Date filter.
5. Lead Score. Counts of leads grouped by Rating. Can change grouping with configuration wizard. See Wizard and Other Setup Options.

Middle Chart



1. Lead Conversion over Time. Weekly count of converted leads.
2. Lead Source. Count of leads grouped by source. Can change grouping with configuration wizard. See Wizard and Other Setup Options.
3. Leads by Region. Counts of leads grouped by region. Can change grouping with configuration wizard. See Wizard and Other Setup Options.

Sales Analytics Team Whitespace Dashboard

Use this dashboard to uncover resell and upsell opportunities by viewing whitespace: accounts that you can revisit to create new business.

USER PERMISSIONS

To use Analytics apps:

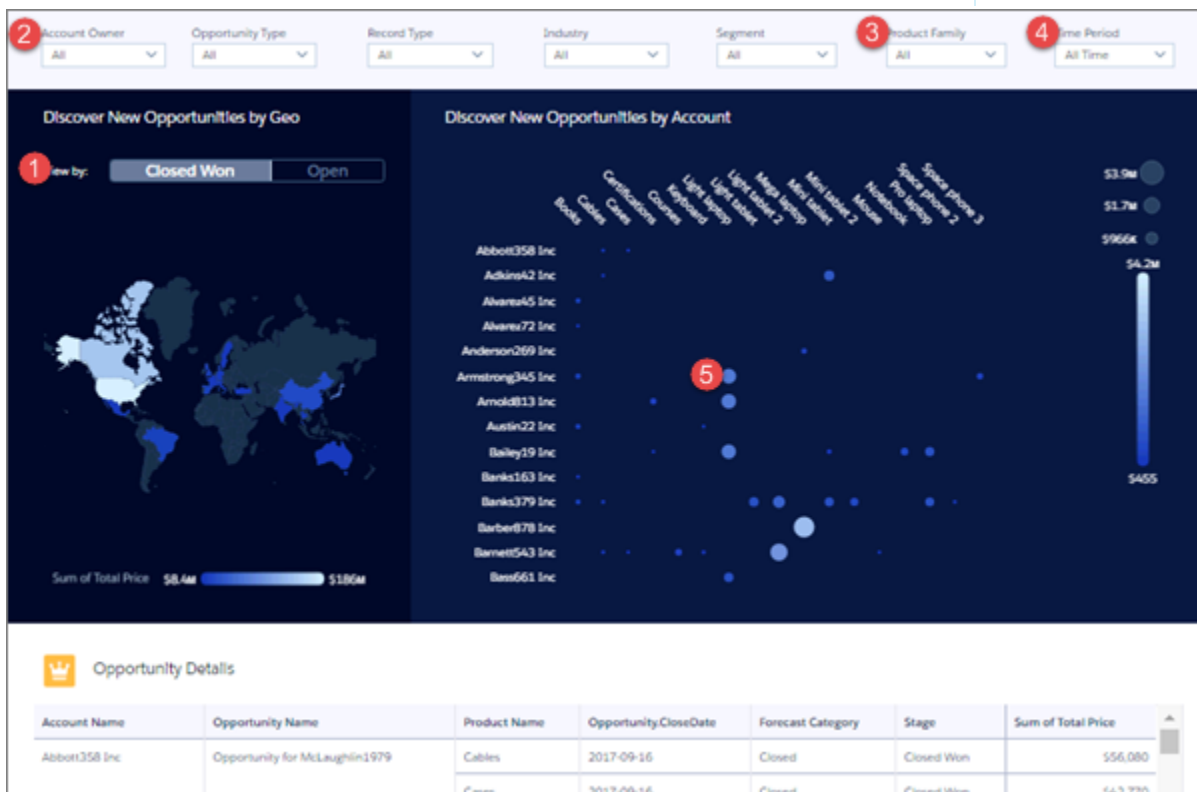
- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Note: The following pertains to Team Whitespace (shown) and Whitespace (individual) dashboards, except as noted.

Default Behavior and Recommended Options

Start by viewing products your team or individual reps have sold by account and what's in the pipeline. You can also see accounts not associated with products and products that have not been sold to any account. Use filters to group similar accounts to spot product whitespace.

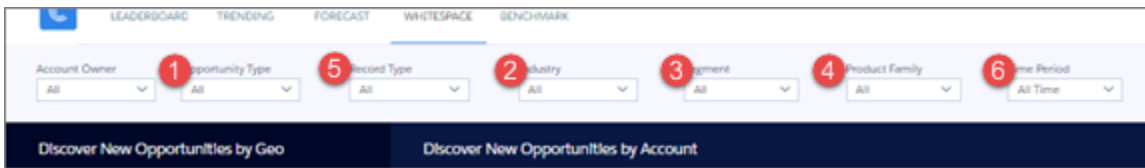
Team version shows accounts where you and subordinate members of your team are named owners or other accounts that you can see based on security settings in your org.

Opens to all closed won and open deals for a given time period for the entire team or an individual rep. Click **Closed Won** (shown in image) or **Open** in the **View by** toggle (1) to see just those deals. Select a sales rep's name from the **Account Owner** filter (2) to view deals for that rep. Change the **Product Family** (3) or **Time Period** (4) filters to narrow time period and specific products.

Position cursor over a bubble (5) to see the size of a deal and which products are involved. Bubble sizes increase according to the amount of the deal. Click the bubble to open the details, then take action from the opportunity to recommend steps to pursue a new opportunity.

Wizard and Other Setup Options

Sales Analytics includes this dashboard only if you select Products on the wizard page that lets you add objects to your app.



Wizard selections made when you create the app determine the labels and values in the filters numbered in the image. Select basic create or accept default values in custom create to use labels and values from standard Salesforce fields. Select other fields from the following wizard questions to customize filters:

1. **Opportunity Type** in image. Wizard page 5, question 3. Product Family in image. Wizard page 6, question 2.
2. **Industry** in image. Wizard page 4, question 2.
3. **Segment** in image. Wizard page 4, question 1.
4. **Product Family** in image. Wizard page 6, question 2. Only available if you add products to the app on the wizard page that lets you add objects.

Record Type filter (5). Only appears if your org uses record types.

Time Period filter (6). All time periods based on Salesforce fiscal year setting.

Datasets Used

- Accounts
- Products
- Oppty Products

Combination of these three datasets lets you view accounts with or without products and products with or without opportunities with accounts.

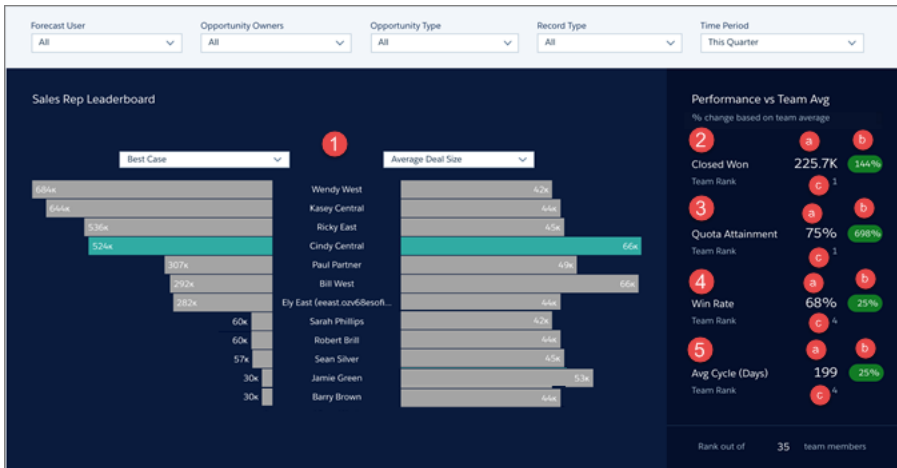
KPI Calculations

Main Chart

Shows product total price by account for the selected period for either closed won, open, or both depending on selected filters. Row visibility settings from Opportunities dataset determine which accounts appear in the chart.

Sales Analytics Team Benchmark Dashboard

Shows a ranking of sales rep results across your team’s KPIs, such as closed won deals, best case, and average deal size. Also shows each rep’s performance against team average.



USER PERMISSIONS

To use Analytics apps:

- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Default Behavior and Recommended Options

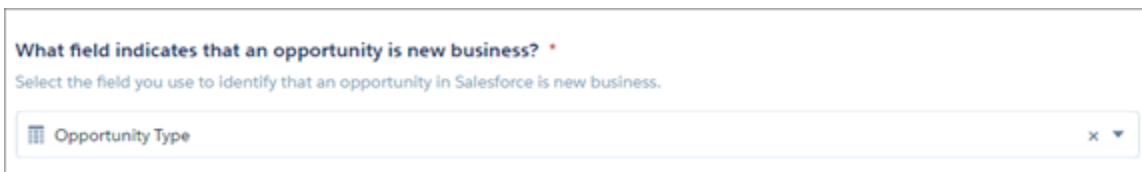
Select two KPIs in the main (bar) chart (1) to compare one measure of performance against another. Both selectors contain the same KPIs so you can compare whatever is on the left with whatever is on the right. The rank order of your team sorts according to the measure selected on the left.

Select a specific rep to view their scorecards in the right column, which also shows the rep’s team rank. Team is defined by all the reps that show up in the bar chart, depending on what you select in the Forecast User/Manager Role filter (**Forecast User** in image).

Wizard and Other Setup Options

Forecast User/Manager Role filter (*Forecast User* in image). If Salesforce is set up to use the Sales Cloud [Collaborative Forecasts](#) feature, the filter shows forecast user names. If your org doesn’t use Collaborative Forecasts, filter shows role developer names. In either case, pipe rolls up to the selected user. If your org doesn’t use Salesforce role hierarchy, this filter does not appear.

Opportunity Type filter. Values shown are determined by selection made in wizard page 5, question 3. By default, the filter uses the standard Opportunity Type field.



Time Period filter. All time periods based on Salesforce fiscal year setting.

Supports Opportunity Splits if the feature is enabled in your org. See [Opportunity Splits](#).

Datasets Used

- Opportunities (or Opportunity Splits)

- User Manager
- User Allocation
- Activities

KPI Calculations

All KPIs appear in the right-hand column.

- Closed Won (2a). Total amount closed won based on selected time period, which may include future opportunities.
- Closed Won Comparison (2b). $(\text{Total amount closed won for selected time period to date [for owner selected in main chart (1)]} - \text{Average total amount closed won for team during same period}) / \text{Average total amount closed won for all team members during the same period}$. Comparative value appears only if you select a sales rep in main chart (1), otherwise you see 0.
- Closed Won Team Rank (2c). Rank of rep selected in the main chart (1) based on closed won business in the selected time period. Rank based on opportunity owners who roll up to the manager selected in **Forecast User** filter as well as the owners selected in **Opportunity Owner** filter. Rank appears only if you select a sales rep in main chart (1), otherwise you see a 1.
- Quota Attainment (3a). Closed Won / Quota Amount based on selected time period, which may include future opportunities.
- Quota Attainment Comparison (3b). $(\text{Quota attainment for rep selected in main chart (1)} - \text{Quota attainment for team}) / \text{Quota attainment for team}$. Comparative value appears only if you select a sales rep in main chart (1), otherwise you see 0.
- Quota Attainment Team Rank (3c). Rank of rep selected in main chart (1) based on quota attainment in the selected time period. Rank based on opportunity owners who roll up to manager selected in **Forecast User** filter as well as the owners selected in **Opportunity Owner** filter. Rank appears only if you select a sales rep in main chart (1), otherwise you see a 1.
- Win Rate (4a). Total amount won / Total amount closed (Won or Lost) based on selected time period, which may include future opportunities.
- Win Rate Comparison (4b). $(\text{Win rate for the owner selected in main chart (1)} - \text{Win rate for team}) / \text{Win rate for team}$. Comparative value appears only if you select a sales rep in main chart (1), otherwise you see 0.
- Win Rate Team Rank (4c). Rank of rep selected in main chart (1) based on their win rate in the selected time period. Rank based on opportunity owners who roll up to the manager selected in **Forecast User** filter as well as the owners selected in **Opportunity Owner** filter. Rank appears only if you select a sales rep in main chart (1), otherwise you see a 1.
- Avg Sales Cycle (5a). Number of days from CreatedDate in the selected time period, which may include future opportunities.
- Avg Sales Cycle Comparison (5b). $(\text{Sales cycle for rep selected in main chart (1)} - \text{Average sales cycle for team}) / \text{Average sales cycle for team}$. Comparative value appears only if you select a sales rep in main chart (1), otherwise you see 0.
- Avg Sales Cycle Team Rank (5c). Rank of rep selected in main chart (1) based on sales cycle in the selected time period. Rep with shortest sales cycle receives top ranking. Rank appears only if you select a sales rep in main chart (1), otherwise you see a 1.

Sales Analytics Team Activities Dashboard

See what your team’s been doing to keep on top of opportunities. Look at their total, completed, and overdue tasks and review each member’s calls, events, emails, and tasks.

USER PERMISSIONS

To use Analytics apps:

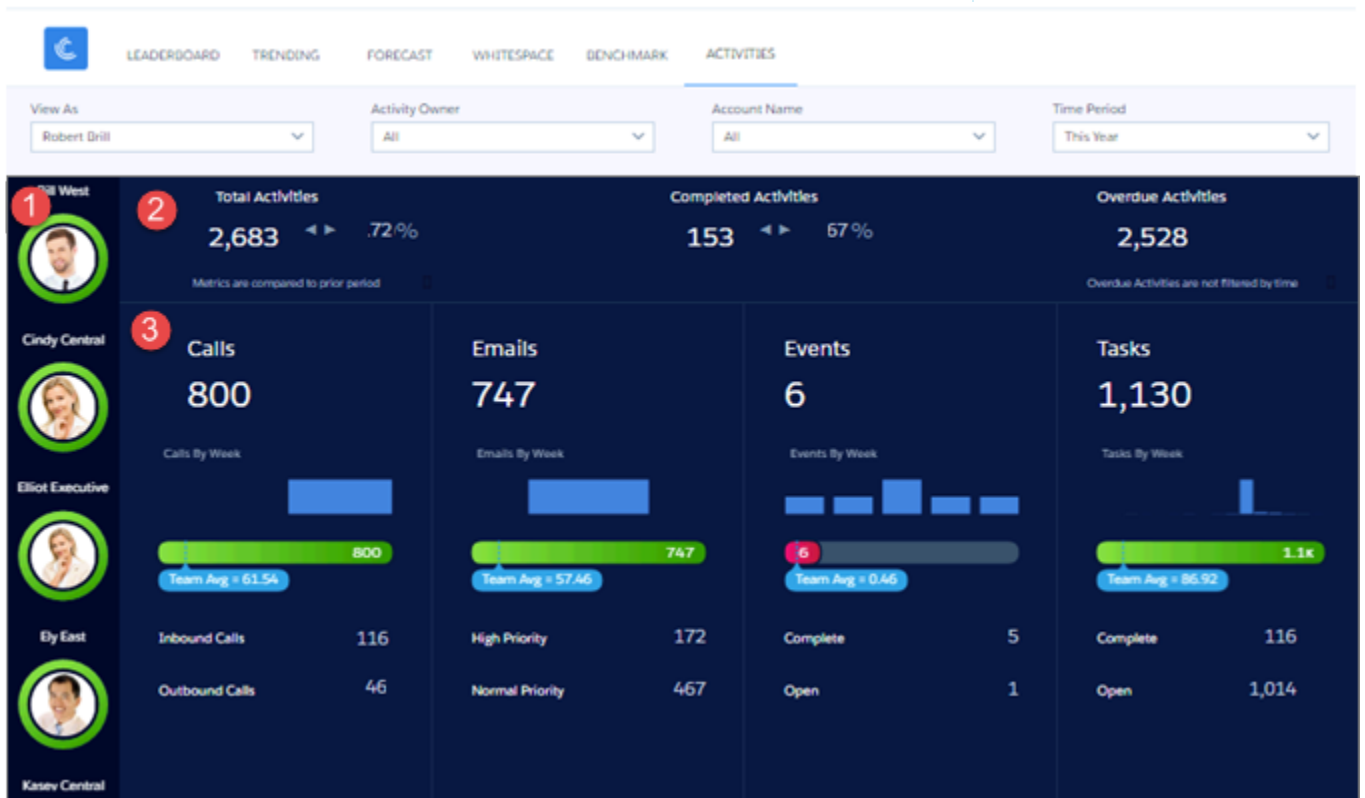
- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Default Behavior and Recommended Options

Measure team and individual activity based on Salesforce tasks and events data. Start by looking at total, completed, and overdue tasks for your entire team. Select team members in the panel on the left (1) to see their individual activities and review their calls, events, emails, and tasks. Also see how their level of activity compares to the team average.

Note: The dashboard does not yet support Einstein Activity Capture.

Wizard and Other Setup Options

View As filter. If Salesforce is set up to use the Sales Cloud Collaborative Forecasts feature, the filter shows forecast user names. If your org doesn't use Collaborative Forecasts, filter shows role developer names. In either case, pipe rolls up to the selected user. If your org doesn't use Salesforce role hierarchy, this filter does not appear.

Datasets Used

Activities.

KPI Calculations

Top Section (2)

- Total Activities. Total number of activities with due date in the selected period.
- Total Activities comparison. $(\text{Total activities this period} - \text{Total activities in previous period}) / \text{Total activities in previous period}$. Previous period based on selected period. For example, if you select This Quarter, previous period is the quarter before. If you select This Year, previous period is the year before.
- Completed Activities. Total number of activities marked as complete based on due date in the selected period. Events are marked as complete if the event date is in the past.
- Completed Activities comparison. $\text{Completed Activities this period} - \text{Completed Activities Last period} / \text{Completed Activities Last Period}$. Last period determined by selected period. If This Year is selected, last period is Last Year. If This Month is selected, prior period is Last Month.
- Overdue Activities. Total count of any activity which is overdue. These are tasks that not marked as complete and their due dates are in the past. Selected period has no impact on this KPI.

Middle and Lower Sections (3)

- Calls. Number of tasks of type *call* with due date in selected period.
- Calls by Week. Number of calls per week with due date in selected period.
- Calls vs. Team Avg. Number of calls for selected user compared with average number for team. Team is made up of activity owners who roll up to user selected in **View As** filter or user selected in **Activity Owner** filter.
- Inbound Calls. Number of inbound calls based on standard Tasks object Call Type field.
- Outbound Calls. Number of inbound calls based on standard Tasks object Call Type field.
- Emails. Number of tasks of type *email* with due date in selected period.
- Emails by Week. Number of emails per week with due date in selected period.
- Emails vs. Team Avg. Number of emails for selected user compared with average number for team. Team is made up of activity owners who roll up to user selected in **View As** filter or user selected in **Activity Owner** filter.
- High Priority emails. Number of high-priority emails based on standard Tasks object Priority field.
- Normal Priority emails. Number of normal emails based on standard Tasks object Priority field.
- Events. Number of events with due date in selected period.
- Events by Week. Number of events per week with due date in selected period.
- Events vs Team Avg. Number of events for selected user compared with average number for team. Team is made up of activity owners who roll up to user selected in **View As** filter or user selected in **Activity Owner** filter.
- Complete events. Number of events marked closed.
- Open events. Number of future events within the selected period.
- Tasks. Number of open tasks due in the selected period, including overdue tasks.

- Tasks by Week. Number of tasks per week with due date in selected period.
- Tasks vs. Team Avg. Number of tasks for selected user compared with average number for team. Team is made up of activity owners who roll up to user selected in **View As** filter or user selected in **Activity Owner** filter.
- Complete tasks. Number of tasks marked closed.
- Open tasks. Number of future events in the selected period.

Sales Analytics Sales Performance Dashboard

Sales leaders: Drill into your closed business by geography, account, product, source, or other criteria to get a 360-degree view of the team's operational efficiency.

USER PERMISSIONS

To use Analytics apps:

- Use Analytics Templated Apps

To use Sales Analytics:

- Access Sales Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Default Behavior and Recommended Options

Replaces Performance by Account, Geography, Source, and Product dashboards. You can now view all performance KPIs through a single dashboard filtered by the type of data you'd like to view.

In the main chart at top, change the **View By** filter to group data by dimensions available in your org. The title and type of the chart change to reflect the data being shown. The image shows deals grouped by **Billing Country** in a map. Data grouped by product or account type is displayed with the titles *Performance by Product* or *Performance by Account Type* in a bar chart. The chart also shows closed won deals by default. Select Period Over Period in the **Display** filter to get a comparative view of closings over time. The period being compared depends on the selection in the **Time Period** filter. If you select This Quarter, for example, the chart compares the time to date in this quarter with the same period in the previous quarter.

Wizard and Other Setup Options



Wizard selections made when you create the app determine the labels and values in the filters numbered in the image. Select basic create or accept default values in custom create to use labels and values from standard Salesforce fields. Select other fields from the following wizard questions to customize filters:

1. **Account Type** in image. Wizard page 4, question 1. Opportunity Type in image. Wizard page 5, question 3.
2. **Industry** in image. Wizard page 4, question 2.
3. **Billing Country** in image. Wizard page 4, question 4.
4. **Billing State** in image. Wizard page 4, question 5.
5. **Account Source** in image. Wizard page 4, question 3.
6. **Lead Source** in image. Wizard page 5, question 2.
7. **Product Family** in image. Wizard page 6, question 2. Only available if you add products to the app on the wizard page that lets you add objects.
8. **Product Name** in image. Wizard page 6, question 3. Only available if you add products to the app on the wizard page that lets you add objects.

Other filters can't be customized. Selections they contain are determined by the app and/or values in your org.

Datasets Used

Uses Opportunity Products if you add products to the app. Otherwise uses Opportunities.

KPI Calculations

Header at Top and Main Chart



- Closed Won (1) for period selected in Time Period filter (year, month, etc.) (2). Closed won total based on close date within the selected period. May include future closed opportunities.
- Closed won over time (3). Closed won total by week for the last year.
- Period over period growth depending on selection in Time Period filter (year, month, etc.) (4). Last period based on selected period, or example if you choose This Quarter, last period = last quarter.
 - Percentage (4a). $(\text{Closed won this period to date} - \text{Closed won last period}) / \text{Closed won last period}$.
 - Amount (4b). $\text{Closed won this period to date} - \text{Closed won last period to date}$.
- Closed Won for same period last year (5). Closed won total based on close date within the year ago selected period (year, month, etc.).
- Performance By (6) dimension selected in View By filter (7).
 - When Display filter (8) is set to Closed Won. Opportunity total or product total.
 - When Display filter (8) is set to Period Over Period. Period over period change of opportunity total or product total.

Charts at Bottom

- Performance by Quarter. Quarter / Same quarter previous years.
- Top Ten Opportunity Owner. Top opportunity owners by amount.
- Win/Loss Analysis. Total amount closed grouped by IsWon.

Set Up Permissions for the Sales Analytics App

Set up your organization to use the Sales Analytics app by enabling Analytics and creating and assigning permission sets.

Each Sales Analytics App license is a single-user license that provides access to Sales Analytics. It includes a single Sales Analytics app single-user license. The table shows data storage limits for the app. If you require more data, you can purchase Analytics Cloud - Additional Data Rows, which entitles you to an additional 100 million rows.

Table 6: Sales Analytics Data Storage Limits

License	Limit
Sales Analytics Apps	25 million rows when used without Analytics Platform license. Use of Sales Analytics app license does not increase data limit for platform license.
Analytics Cloud - Additional Data Rows	100 million rows.

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Important: Sales Analytics App license data storage limits are contractual, not technical. Licensee agrees to strictly monitor its total number of data rows.

Your org can use the Sales Analytics app with or without the Salesforce Analytics platform.

Each Sales Analytics app user needs a Sales Analytics Apps permission set license. The Sales Analytics Apps permission set license enables the following permissions.

Table 7: Sales Analytics User Permissions

Permission	Function
"Access Sales Cloud Analytics Templates and Apps"	Provides specific access to the Sales Analytics App as well as the data and prebuilt dashboards included with it.
"Download Analytics Data"	Download screenshots and data in tabular format through the Analytics user interface.
"Edit Analytics Dataflows"	Enables admins to upload and download JSON for existing data flows.
"Manage Analytics Templated Apps"	Gives admins the ability to create Analytics apps for users in their orgs, in this case the Sales Analytics app.
"Use Analytics Templated Apps"	Enables access to all Analytics templated apps.

You assign the Sales Analytics Apps permission set license when you create and assign permission sets to users in your organization.

Sales Analytics App Setup Process

To set up your organization to use Sales Analytics, follow these steps:

1. Enable Analytics for your organization.
2. Define the main Sales Analytics user types in your organization.
3. Create permission sets to group related user permissions according to the needs of each user type.

When you create permission sets, you also select the Sales Analytics Apps permission set license.

4. Assign a permission set to an individual user, which also *auto-assigns* the Sales Analytics Apps permission set license to that user. For efficiency, you can assign a permission set to groups of users. You can assign multiple permission sets to a user.

After you've completed these steps, create and share Sales Analytics with the users in your organization. Users can only explore Sales Analytics dashboards and datasets after you've shared the app with them.



Tip:

For best results, follow the steps for setting up the Sales Analytics app in the order shown here.

IN THIS SECTION:

1. [Identify Sales Analytics App User Types](#)
Identify Sales Analytics app user types and the tasks they perform to assure that the setup process meets your team's analytics needs.
2. [Enable Analytics and Create Sales Analytics Permission Sets](#)
After Salesforce provisions you with the Sales Analytics App license, enable Analytics and create permission sets for Sales Analytics users.
3. [Assign Sales Analytics Permission Sets to Users](#)
Assign permission sets to one or more Sales Analytics users—either one at a time, or in bulk—to give them access to the app.

Identify Sales Analytics App User Types

Identify Sales Analytics app user types and the tasks they perform to assure that the setup process meets your team's analytics needs.

The Sales Analytics App license includes the permissions required by users in your organization to administer Sales Analytics and to import, work with, and explore data. Set up the Sales Analytics in the most useful way by thinking through the different ways people can access Sales Analytics features and categorizing users into types. Here are a few examples.

In most cases, Sales Analytics addresses the needs of two basic types of people on your team:

- Users, who view Sales Analytics dashboards and datasets.
- Administrators or managers, who access all Sales Analytics functionality to create apps, dashboards, and datasets, import data, and otherwise customize the Sales Analytics experience.

Accordingly, when you set up Sales Analytics, creating two basic permission sets probably meets the needs of most users in your organization:

- A "view" permission set that contains the permissions needed by most basic-level users when they access Sales Analytics.
- A "manage" permission set that's reserved for a select few administrators and managers and contains permissions to use all Sales Analytics features.

In the detailed Sales Analytics app setup instructions that follow, we show you how to create and assign these two permission sets.

Enable Analytics and Create Sales Analytics Permission Sets

After Salesforce provisions you with the Sales Analytics App license, enable Analytics and create permission sets for Sales Analytics users.

Enable the Analytics Platform

To use Sales Analytics, first enable Analytics for your organization.

1. In the Salesforce Setup menu, under administer, click **Analytics Cloud | Getting Started**

USER PERMISSIONS

To create permission sets:

- [Manage Profiles and Permission Sets](#)

2. Click **Enable Analytics**

Create Permission Sets

The next step in the setup process is to create permission sets made up of Sales Analytics user permissions. We show you how to create two permission sets:

- *Manage Sales Analytics* permission set, for users who create and administer Sales Analytics.
 - *View Sales Analytics* permission set, for users who explore app dashboards and datasets.
1. Create a Manage Sales Analytics permission set, which gives users access to all app features.
 - a. In the Setup menu, under administer, click **Manage Users | Permission Sets** and then click **New**.
 - b. Enter `Manage Sales Analytics` in the Label field, which automatically creates the API name, as well. You can change the API name, but it can't include spaces, end with an underscore, or have two consecutive underscores. You can also enter a description, but it's optional.
 - c. For License, select the license to associate with this permission set. In this case, select Sales Analytics Apps in the Permission Set License section.

Enter permission set information

Label: Manage Sales Wave

API Name: Manage_Sales_Wave

Description: Permission set for Sales Wave admin

Session Activation Required:

Select the type of users who will use this permission set

Who will use this permission set?

-Choose "--None--" if you plan to assign this permission set to multiple users with different user and permission set licenses.
 -Choose a specific user license if you want users with only one license type to use this permission set.
 -Choose a specific permission set license if you want this permission set license auto-assigned with the permission set.

Not sure what a permission set license is? [Learn more here.](#)

License: XOrg Proxy User, Permission Set Licenses, Analytics Cloud - Wave Analytics Platform, Analytics Cloud Explorer, Field Service Dispatcher, Field Service Mobile, Field Service Scheduling, Field Service Standard, Identity Connect, **Sales Analytics Apps**, Sales Console User, Service Analytics Apps

When you select a specific permission set license, any user assigned to the permission set is *auto-assigned* the permission set license. If you select --None--, you must *manually* assign the permission set license to users before you can add them to the new permission set.


- d. Click **Save**. The Permission Set Overview page shows the new permission set. Now add user permissions to the set.
- e. Click **System Permissions** to open the list of user permissions enabled by the Sales Analytics license. Then click **Edit**.

- f. Select the following user permissions: “Use Analytics Templated Apps,” “Access Sales Cloud Analytics Templates and Apps,” “Manage Analytics Templated Apps,” and “Edit Analytics Dataflows.” Make sure to select all four. Click **Save**. You’ve successfully created a permission set that enables users to create and administer Sales Analytics and access all app features. You can now assign it to users, which is covered in [Assign Sales Analytics Permission Sets](#).
2. To create a View Sales Analytics permission set, which enables users to view app dashboards and datasets, repeat the steps to create a Manage Sales Analytics permission set, with these exceptions:
 - a. Name the permission set `View Sales Analytics`.
 - b. Select only the “Use Analytics Templated Apps” and “Access Sales Cloud Analytics Templates and Apps” user permissions and click **Save**. You’ve successfully created a permission set that enables users to view the Sales Analytics dashboards and datasets. You can now assign it to users, which is covered in [Assign Sales Analytics Permission Sets](#) on page 587.

You can build other permission sets out of the individual permissions enabled by the Sales Analytics license, depending on the needs of users in your organization.

Assign Sales Analytics Permission Sets to Users

Assign permission sets to one or more Sales Analytics users—either one at a time, or in bulk—to give them access to the app.

1. In the Setup menu, under administer, click **Manage Users | Permission Sets**.
2.  **Warning:** Assign the Manage Sales Analytics permission set sparingly because it lets users administer Sales Analytics, which lets them create, edit, and delete the app. Assign it only to users who administer or manage the app.

Click the permission set you want to assign to users. If you’ve followed the instructions in [Enable Analytics and Create Sales Analytics Permission Sets](#) on page 585, select either the Manage Sales Analytics or View Sales Analytics permission sets.

3. Click **Manage Assignments** and click **Add Assignments**.
4. Select the users who need to manage or use Sales Analytics, and click **Done**.

When you assign the permission set to users, Salesforce *auto-assigns* the Sales Analytics Apps *permission set license* to those users.

After you’ve completed these steps, create and share Sales Analytics with the users in your organization. Users can only explore Sales Analytics dashboards and datasets after you’ve shared the app with them.


Create and Share the Sales Analytics App

Follow these steps to create Sales Analytics and start uncovering the value of your Salesforce data.

For rapid app creation, choose Basic creation, which uses default settings to create Sales Analytics. To set up Sales Analytics according to your team’s specific Sales Cloud analytics requirements, choose Custom creation.

If you use the Sales Cloud [Collaborative Forecasts](#) feature to store quota data, the data is automatically available to Sales Analytics. If you track quotas outside of Salesforce, you need to upload a quotas .CSV to include quotas in Sales Analytics dashboards. See [Collaborative Forecasting and Quotas Data in Sales Analytics](#).

1. Log in to Salesforce and open Analytics Studio. In Salesforce Classic, select **Analytics Studio** from the Force.com menu (top right of

the Salesforce window). In Lightning Experience, click the app launcher , then click the **Analytics Studio** tile.

USER PERMISSIONS

To assign a permission set to users:

- Assign Permission Sets

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

2. Click **Create**, select **App**, select **Sales Analytics**, and then click **Continue** to open the configuration wizard. *If you've created an app before:* Choose between creating a brand new app or creating an app based on settings from a previously-created app. Click **Continue**. Sales Analytics runs a compatibility check against your org to be sure it includes the data to successfully create the app's datasets and dashboards. If it doesn't, follow the instructions in the error message to add the required data and start the app creation process again.
3. Once the org compatibility check succeeds, click **Looks good, next**.
4. Choose between using preselected standard settings or custom settings to set up your app. Select **Basic** to set up your app quickly based on standard settings determined by the org compatibility check. The standard settings include collaborative forecasting if you use the Sales Cloud [Collaborative Forecasts](#) feature. Select **Custom** to open the configuration wizard, which you use to make your own, custom settings to reflect the way you and others on your team want to view data. For details about using the configuration wizard, see [Customize Sales Analytics with the Configuration Wizard](#).
5. If you choose **Basic**: You're almost done. Click **Looks good, next**, and skip to Step 9.
6. If you choose **Custom**: Click **Looks good, next**. The wizard asks you to choose Salesforce objects to add to Sales Analytics. It then takes you through a set of questions about how you prefer to view data. Go to [Personalize Sales Analytics with the Configuration Wizard](#) for complete instructions on how to use the wizard.
7. Give your app a name that's easily recognizable to others in your company and click **Create**. That starts a dataflow that creates the app and its assets (which include a [dataflow](#) definition file, datasets, and dashboards).
8. Before it creates your app, Sales Analytics checks to see that the Analytics Cloud Integration User has access to all fields in Salesforce you'd like your app to use. The check happens in the background, and if it succeeds, the app creates successfully. If it fails, you see an error that says the Integration User does not have access to specific fields. If you receive that error, here's what to do:
 - a. In Salesforce Setup, go to Manage Users, then Profiles.
 - b. Open the profile for the Analytics Cloud Integration User.
 - c. Scroll down to Field Level Security and click **View** next to the objects indicated in the error message.
 - d. Check **Read Access** for the fields indicated in the error message.
 - e. Refresh your browser cache, and click **Create** again.
9. The app creation process can take a few minutes. You can check the status of the dataflow: Open the Analytics Home page, click the gear menu at the upper right of the page, and select Data Manager. From pulldown menu, select Dataflow View and look for your app.
10. Now that you've created the app, share it with users in your organization. You can only share it with users who have the Use Analytics Templated Apps and Access Sales Cloud Analytics Templates and Apps permissions enabled. (For more about Sales Analytics app permissions, see [Set Up Salesforce Permissions for the Sales App](#)). To share the app, roll your cursor over the icon for the app and click **Share**. Next, type in the names of team members, click **Add**, and click **Save**.

SEE ALSO:


[Customize Sales Analytics with the Configuration Wizard](#)

[Upgrade the Sales Analytics App](#)

Customize Sales Analytics with the Configuration Wizard

The Sales Analytics configuration wizard lets you create the app to reflect how you prefer to view Salesforce data.

Choose the Custom creation option for Sales Analytics to open the configuration wizard. The app scans data in your org and builds a series of questions and default and recommended answers based on the results of the scan. You may not see all the questions described here and some contain different default answers. Your answers determine how users view your sales data in Sales Analytics's dashboards. Answer these questions according to the way your organization uses Sales Cloud data so the dashboards are as meaningful and useful as possible.


 **Note:** Choose the Basic creation option to install a basic version of the app using the default settings. These settings include using collaborative forecasting data if you use the Sales Cloud [Collaborative Forecasts](#) feature. The Basic creation option does not use the wizard.

The wizard includes instructions to help you choose appropriate answers, and many questions are self-explanatory. Here are tips for how to use the wizard, including details about how to answer more complex questions for each page in the wizard.

General Guidelines

Follow these guidelines to assure a great result when you use the wizard.

- **Most questions provide answers in pick lists showing fields from Salesforce objects.** The lists include standard Salesforce fields and any custom fields you've set up on an object. Answer these questions by selecting from the fields shown. Most questions of this type let you choose only one field, and some let you choose multiple fields.
- **You can choose a field from an object only once.** After you select a field, it's no longer available as an answer to other questions.
- **Other questions are yes/no, provide a set of options, or require you to enter text.**
- **Questions marked with an asterisk (*) require answers.**
- **Using the default answers results in a useful set of dashboards.** If you're not sure what to select, use the answer that's preselected. Some questions do not have preselected answers. In those cases, Sales Analytics reminds you to make a selection. If you're not happy with the result, you can delete the app and create it again.
- **You control only parts of the app with wizard settings, such as the filters used in dashboards.** We built the app to provide immediate analytics value without much work on your part.
- **Only some answers make sense given the question's context.** The answer pick-lists contain many fields, but only some make sense for your app. For example, it's unlikely that you'd filter Accounts data by Photo URL, even though the Accounts object includes a Photo URL field.

 **Important:** Fields that aren't available to the Analytics Integration User aren't visible in the wizard. See [Create and Share the Sales Analytics App](#), Step 9, to give the Integration User access to all the fields you want your app to use.

Add Objects to Your App

By default, Sales Analytics includes data from the following standard Salesforce objects:

- Accounts
- Users
- Roles
- Opportunities
- Projects (Opportunities line item)
- Tasks

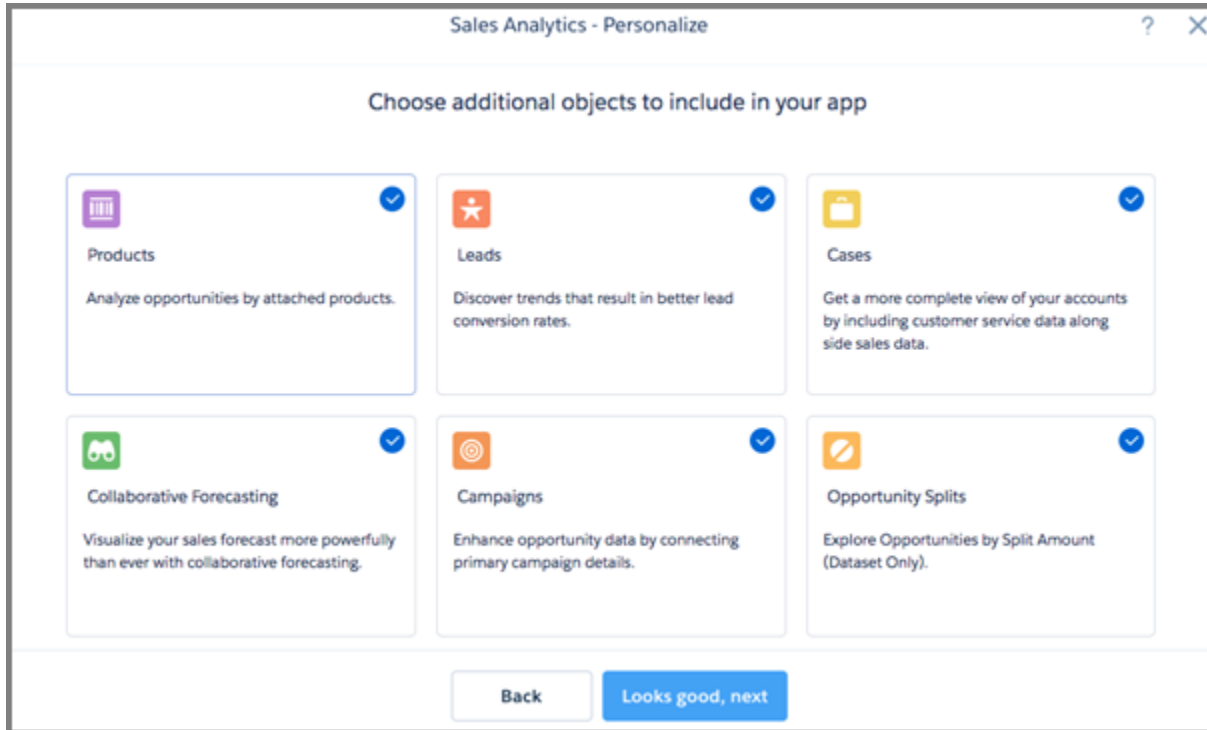
USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

- Events

The first wizard screen lets you add other objects to the app. The app shows objects in your org it finds during the compatibility check Sales Analytics that runs when you start app creation. If the compatibility check doesn't find any other objects to add to your app, the configuration wizard doesn't display this screen.



The wizard preselects the objects it finds. Deselect the objects you don't want by clicking the object. Click **Looks good, next** once you're done.

- ❗ **Important:** If your org does not use Collaborative Forecasting and you'd like Sales Analytics to show quotas data in dashboards, you need to upload a `quotas.csv` file to the app. See [Collaborative Forecasting and Quotas Data in Sales Analytics](#). You also need to upload a `quotas.csv` if you don't store quotas data in Collaborative Forecasting.

Questions About How Analytics Displays Data from the Accounts Object

Questions on this page let you determine how Sales Analytics filters customer data, sources for new business, and geographic data. All questions are required.

- Question 3: Asks about the field from Accounts you use to track if an account is new business. This is the first way Sales Analytics filters new business data. The second way comes from a field in the Opportunities object, which you choose on the next page.

Questions About How Analytics Displays Data from the Opportunities Object

Questions on this page let you determine how Sales Analytics filters data about opportunities. It also asks about how your organization uses the Opportunities object. All are required.

- Question 2: Lets you choose the second way Sales Analytics filters new business data. You determine the first in Question 3 on the previous page.

Questions About How Analytics Displays Products Object Data

This page displays only if you added the Products object to the app on the first wizard page. If you didn't add the Products object, you won't see this page and instead go directly to the next one. The questions here let you determine how Sales Analytics filters data about products.

- Question 1: Lets you choose the field you use to track total amount of products on opportunities. Sales Analytics checks to see if your org supports Historical Trending and shows the results here. If it does, the answers to this question include fields that support Historical Trending. To enable Historical Trending, go to Salesforce Setup, type *Historical Trending* in the Quick Find box. Select the Opportunity object and check the field(s) you want to enable. See [Set Up Historical Trend Reporting](#).

Questions That Help Analytics Enhance Your Analytics Experience

This page asks you to about miscellaneous—but important—aspects of how you want Sales Analytics to use and display data. All are required.

- Question 1: Lets you control Sales Analytics user access to data. Here are the available options:
 - Option 1 enforces [Salesforce role hierarchy](#), which means that users can only see data in Opportunities and Accounts owned by them and their subordinates.
 - Option 2 enables team benchmarking. It lets users see data in Opportunities and Accounts owned by them and their subordinates. It also lets users see data from Opportunities and Accounts owned by others at the same level in the role hierarchy.
 - Option 3 lets all users see all Sales Cloud data regardless of role.
- Question 4 lets you customize the set of record types from the Opportunities object that appear in Sales Analytics dashboards. By default, Sales Analytics includes all record types in dashboards. If you want only certain types to appear, select them here.

Determine How to Display Data in Your Leads Dashboard

This page displays only if you added the Leads object to the app on the first wizard page. If you didn't add the Leads object, you won't see this page and instead go directly to the next one. The questions here let you determine how the Sales Analytics Leads dashboard displays data.

Add Fields to the Campaigns and Campaign/Member Datasets

This page displays only if you added the Campaigns object to the app on the first wizard page. If you didn't add the Campaigns object, you won't see this page and instead go directly to the next one. The questions give you the option of adding data from Campaigns fields to datasets. Once the data is imported, you can view it in dashboards after first modifying them through the user interface or by changing the dashboard JSON. The questions ask you separately about fields including measures, which are numerical values, and fields including dimensions, which are values expressed in words.

SEE ALSO:

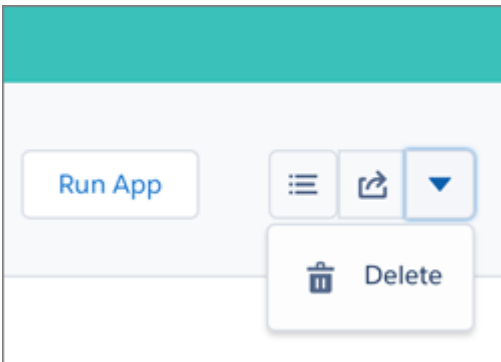
[Create and Share the Sales Analytics App](#)

Delete the Sales Analytics App

Delete apps to start app creation all over or to get rid of apps you no longer use.

Important: If you delete your app, Analytics doesn't retain the wizard answers you selected for that version of the app. You have to start the creation process over. If you wish to reuse settings from the app, keep it until you've recreated the app and then delete it.

1. Navigate to Analytics Studio and open the app. Make sure you're viewing the app's landing page and that you can see the app name at upper left, with a list of dashboards in the center panel.
2. Click the triangle in the upper left corner and select **Delete**.



3. In the next screen, Sales Analytics asks you to confirm that you want to delete your app. If you are, click the **Delete XX Asset(s)** button.
4. Analytics deletes your app.

Upgrade the Sales Analytics App

Take advantage of the latest Sales Analytics features by upgrading your app when we release a new version.

The banner at the top of your app home page tells you that we've released a new version. It also provides a link to more information about the release. There's also a link inviting you to start the upgrade process in the left-hand column of the home page, just below the app name.

Here's how to upgrade your app.

1. Click either the "What's new" link in the banner or the "New version available" link in the left-hand column of your app's home page.
2. You can read information about the new version on top of the page that opens. At the bottom of the page, find the buttons: **Upgrade current app** and **Create new app**.
3. See descriptions of what the buttons do by hovering over them. If you click **Upgrade current app**, you overwrite your current app and all its assets, replacing it with an app based on the new version. This also deletes any customizations, including any new fields or object you've added to the dataflow or changes you've made to security settings and dashboard labels and colors. If you click **Create new app**, you create a second copy of your current app based on the new version. Decide which option suits your circumstances, and click the appropriate button.

USER PERMISSIONS


To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

4.  **Warning:** If you've customized your app, click **Create new app** instead of **Upgrade current app** to make an app copy based on the new version. This preserves the current version and any customizations, which you can then manually copy into the new version of the app.



If you click **Upgrade current app**, you see a screen warning you that the upgrade option overwrites the current app and gets rid of any customizations you've made to it. If you're OK with that, check the box and click **Continue**. If you're not, click **Back** to return to the previous screen. Clicking **Continue** takes you to the configuration wizard. Skip ahead to step 6.

5. If you click **Create new app**, you're taken to the configuration wizard. You don't see a warning, since you're not overwriting your current app, which is preserved with any customizations you've made to it.
6. The configuration wizard is preloaded with the settings you chose last time you used the wizard. You can either keep those settings or change them. Go through each page of the wizard.
7. Once you complete the wizard, Analytics shows a screen that indicates which assets are impacted by the upgrade. Review the screen to see how many datasets, dashboards, and lenses will be changed, deleted, or added by the upgrade. It also shows how changed assets will be modified—whether the change is to data or appearance. On the same screen, you have the option to download a file with code for changes made to the app. If you've customized the app, download and save the file so you can copy and paste customization code into the upgraded version.
8. *Upgrade option only:* If you're upgrading your app, click **Upgrade current app**. Remember, this overwrites any customizations you've made. You can also click **Back** to go back into the configuration wizard and change your selections or click the **X** in the upper-right corner to cancel.
9. *Create option only:* If you're creating a new app, name your app something different from the current version and click **Create new app**. This option saves your current app and all its customizations. You can also click **Back** to go back into the configuration wizard and change your selections or click the **X** in the upper-right corner to cancel.

If the link below the app name says "Reset app," you're using the latest version and don't need to upgrade.

Reconfigure the Sales Analytics App

To restore deleted or altered dashboards or change wizard settings, reconfigure an existing app.

-  **Important:** Reconfiguring your app gets rid of dashboard customizations, including fields or objects added to the dataflow. It also deletes actions you enable, or changes to security settings and dashboard colors and labels. If you've made any customizations, save copies of your dataflow definition file or dashboards. Then copy them into your reconfigured app.
1. Navigate to Analytics Studio and open the app. Make sure you're viewing the app's landing page and that you can see the app name at upper left, with a list of dashboards below.
 2. Click the **Reconfigure app** link below the app name. If you see **Upgrade** instead of **Reconfigure**, you need to upgrade to the new version of the app before you can use the reconfigure feature. [See Upgrade the Sales Analytics App](#) on page 592.
 3. Review the next screen carefully. It warns you that reconfiguring overwrites app customizations. If you're comfortable overwriting customizations, check the box and click **Continue**. If not, click **Back** or the **X** in the upper right corner.
 4. Complete the app creation process described in [Create and Share the Sales Analytics App](#) on page 587.
 5. At the end of the process, you're asked to confirm that you want to reconfigure your app. This gives you one more chance to make sure you're comfortable overwriting customizations. If you are, click **OK**. Analytics creates a new version of your app.
-  **Important:** If you delete your app, Analytics doesn't retain the answers you selected when you created that version of the app, and you have to start the creation process all over again. If you wish to reuse settings from the app, keep it until you've completed recreating the app and then delete it.

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Collaborative Forecasting and Quotas Data in Sales Analytics

Sales Analytics gives you a choice for how to include your team's quotas depending on whether you use the Sales Cloud Collaborative Forecasts feature to store quotas data.


You have the following options for including quotas data in Sales Analytics.


Table 8: Sales Analytics Quotas Data Options

Option	Sales Cloud Settings	Configuration Wizard Settings	Additional Setup Requirements
1	<ul style="list-style-type: none"> Sales Cloud Collaborative Forecasts enabled Collaborative Forecasts includes forecast quota data. 	Select Collaborative Forecasting in first wizard screen that lets you add objects.	None. Sales Analytics automatically adds quota data from the Forecasts object.
2	<ul style="list-style-type: none"> Sales Cloud Collaborative Forecasts enabled Collaborative Forecasts <i>does not</i> include forecast quota data. 	Select Collaborative Forecasting in first wizard screen that lets you add objects.	Create .CSV file with quotas data, upload to Analytics, rerun dataflow. See instructions below.
3	Sales Cloud Collaborative Forecasts <i>not</i> enabled	No setting available. Wizard does not give you the option of adding Collaborative Forecasts data.	Create .CSV file with quotas data, upload to Analytics, rerun dataflow. See instructions below.

Wizard settings are optional, depending on whether you want to include Sales Cloud Collaborative Forecasts data in your app.

With Option 1, Sales Analytics automatically adds quotas data to your app and its dashboards. With Options 2 and 3, add quotas data to your app by following these instructions. [▶ Create the Sales App, Part 2: Upload the Quota CSV File and Schedule a Dataflow \(Lightning Experience\)](#), which covers the steps described here.

 **Note:** When you work with .CSV files you want to import to Sales Analytics, create and open them using only a UTF-8-compliant text editor. Opening them in Microsoft Excel or other spreadsheet software reformats .CSV files and makes them unusable in Sales Analytics

 **Important:** When you create the .CSV file, be sure it contains the following fields, in this order, with exactly these names. Field names are case-sensitive:

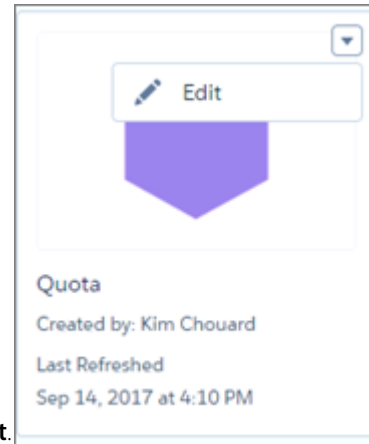
1. StartDate (in yyyy-mm-dd format)
2. QuotaAmount
3. OwnerName
4. Username

USER PERMISSIONS

To create and manage Analytics apps:

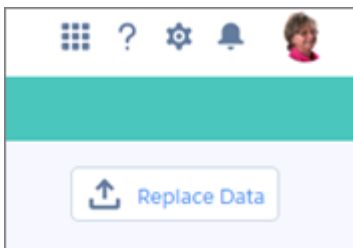
- Manage Analytics Templated Apps
- Edit Analytics Dataflows

1. Create a .CSV file to include the fields just described, that is StartDate (in yyyy-mm-dd format, QuotaAmount, OwnerName, Username). For an example, see [Sales Analytics Example .CSV File](#).
2. Save the file to a location that you can easily remember.
3. In Salesforce, go to the Analytics home page and find the Quota (Target) dataset.
- 4.

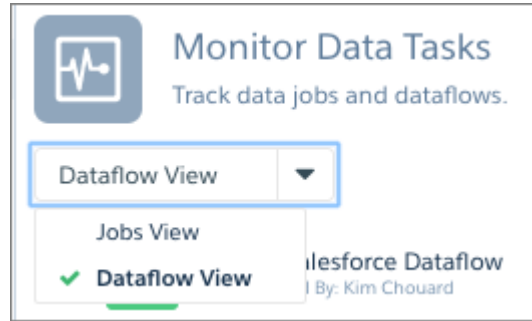


Click the arrow at the upper right corner of the dataset panel and select **Edit**.

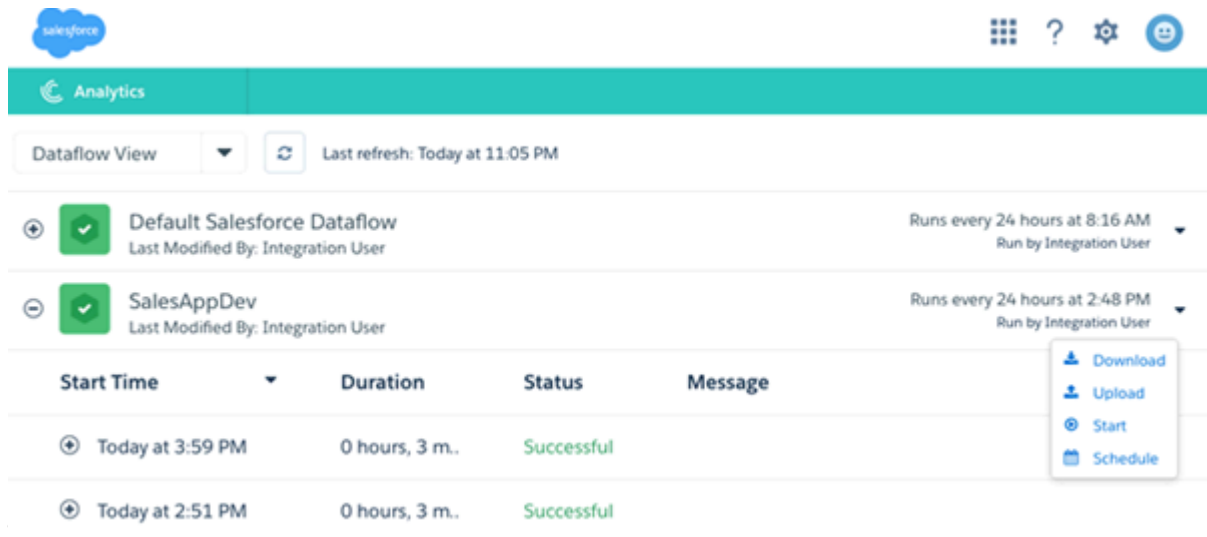
5. Salesforce displays the dataset editing screen for the Quota dataset. Look for **Replace Data** in the upper right corner and click it.



6. In the dialog box that opens, navigate to the .CSV file you created in Step 1, and double-click it.
7. Click **Next** to open the Replace Dataset Data page.
8. If your fiscal period is different than calendar period, that is if it starts on a date other than January 1, update the Quota Metadata file. If your fiscal period starts on January 1, skip to the next step.
 - a. Copy the JSON from [Sales Analytics App Quota Dataset JSON File](#) and paste it into a text editor of your choice.
 - b. Change the value of "fiscalMonthOffset" from 4 to a number that represents the month your fiscal period starts. In Sales Analytics metadata, the numeral "0" stands for January, "1" stands for February, and so on up to "11," which stands for December. Save the file to your desktop.
 - c. In Analytics Studio, go to the Replace Dataset Data page and locate the Data Schema File area of the page. Click the arrow next to Quota .JSON file, select Replace File, find the file you just saved and upload it to Analytics.
9. On the Replace Dataset Data page, click **Next**, then on the next page, click **Next** again. You'll be asked to confirm that you want to replace the file. Click **Replace** to upload the file.
10. After uploading your quota data, rerun the dataflow to update the dashboards.
 - a. Click the Gear menu at the upper right of the Sales Analytics screen and select Data Manager.
 - b. Select Dataflow view from the menu at the top left of the Data Manager screen.



- c. Find your app; you may have to scroll down the page. Open the menu on the far right of the screen next to the app icon and name, and click



it. The dataflow assures that Sales Analytics has your company’s latest sales data. You can learn more about dataflows from [Schedule the Sales App Daily Dataflow](#).

IN THIS SECTION:

[Sales Analytics Example .CSV File](#)

Here’s an example of the .CSV file you create to update the Sales Analytics Quota (Target) dataset.

[Sales Analytics App Quota Dataset JSON File](#)

Use this file to update the Sales Analytics Quota dataset with your fiscal year start date if it’s *not* January 1.

Sales Analytics Example .CSV File

Here’s an example of the .CSV file you create to update the Sales Analytics Quota (Target) dataset.

Note: This file is for example purposes only. Create a unique .CSV file with quota data for members of your team including the following fields:

- QuotaAmount
- StartDate
- OwnerName

- Username

Save the .CSV file in UTF-8 format. Field names are case-sensitive and must appear in your file exactly as shown here.

 **Important:** Do not open the .CSV file with Microsoft Excel or another spreadsheet application, which can corrupt the file format.

See [Collaborative Forecasting and Quotas Data in Sales Analytics](#) on page 594.

 **Example:**

```
QuotaAmount,StartDate,OwnerName,Username
1700000,2017-04-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-05-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-06-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-07-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-08-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-09-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-10-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-11-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-12-01,Laura Garza,trailhead002@isaweso.me
1700000,2018-01-01,Laura Garza,trailhead002@isaweso.me
1700000,2018-02-01,Laura Garza,trailhead002@isaweso.me
1700000,2018-03-01,Laura Garza,trailhead002@isaweso.me
1700000,2018-04-01,Laura Garza,trailhead002@isaweso.me
1700000,2017-04-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-05-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-06-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-07-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-08-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-09-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-10-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-11-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-12-01,Irene Kelley,trailhead011@isaweso.me
1700000,2018-01-01,Irene Kelley,trailhead011@isaweso.me
1700000,2018-02-01,Irene Kelley,trailhead011@isaweso.me
1700000,2018-03-01,Irene Kelley,trailhead011@isaweso.me
1700000,2018-04-01,Irene Kelley,trailhead011@isaweso.me
1700000,2017-04-01,Julie Chavez,trailhead012@isaweso.me
1700000,2017-05-01,Julie Chavez,trailhead012@isaweso.me
1700000,2017-06-01,Julie Chavez,trailhead012@isaweso.me
```

Sales Analytics App Quota Dataset JSON File

Use this file to update the Sales Analytics Quota dataset with your fiscal year start date if it's *not* January 1.

Copy the contents of this file into an editor of your choice and change the `"fiscalMonthOffset"` value (shown in **bold**) to the month your fiscal period begins. In metadata, the numeral "0" stands for January, "1" stands for February, and so on up to "11," which stands for December. In the code below, the number is set to "4", which stands for May. Use the number that represents the month your fiscal period begins. Then save the file and upload it to Sales Analytics following the instructions in [Collaborative Forecasting and Quotas Data in Sales Analytics](#).

```
{
  "objects": [
    {
```

```


    "connector": "CSV",
    "fullyQualifiedName": "Quota_csv",
    "label": "Quota.csv",
    "name": "Quota_csv",
    "fields": [
      {
        "fullyQualifiedName": "QuotaAmount",
        "name": "QuotaAmount",
        "type": "Numeric",
        "label": "QuotaAmount",
        "precision": 18,
        "defaultValue": "0",
        "scale": 0
      },
      {
        "fullyQualifiedName": "StartDate",
        "name": "StartDate",
        "type": "Date",
        "label": "StartDate",
        "format": "yyyy-MM-dd",
"fiscalMonthOffset": 4,
        "isYearEndFiscalYear": true
      }
    ],
    "fullyQualifiedName": "OwnerName",
    "name": "OwnerName",
    "type": "Text",
    "label": "OwnerName"
  },
  {
    "fullyQualifiedName": "Username",
    "name": "Username",
    "type": "Text",
    "label": "Username"
  }
]
}

```

Schedule the Sales Analytics Daily Dataflow

Schedule a daily dataflow at a time outside standard business hours before you start exploring with Sales Analytics.

When you create Sales Analytics, the creation process includes a dataflow that imports the latest Sales Cloud data to Analytics. You can schedule the dataflow to be rerun every day to assure that your app uses up-to-date Salesforce data. Schedule the dataflow to take place sometime outside normal business hours so the dataflow doesn't interrupt your use of the app.

 **Note:** The Sales Analytics dataflow runs only once when you create the app. Schedule it to run daily so the app uses the latest sales data.

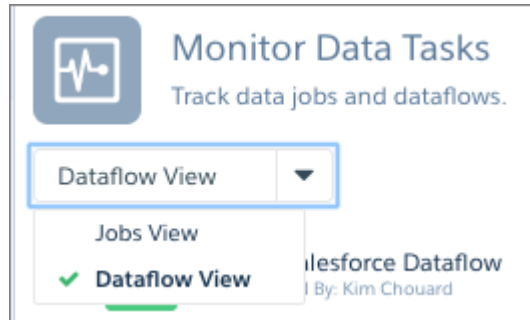
USER PERMISSIONS

To create and manage Analytics apps:

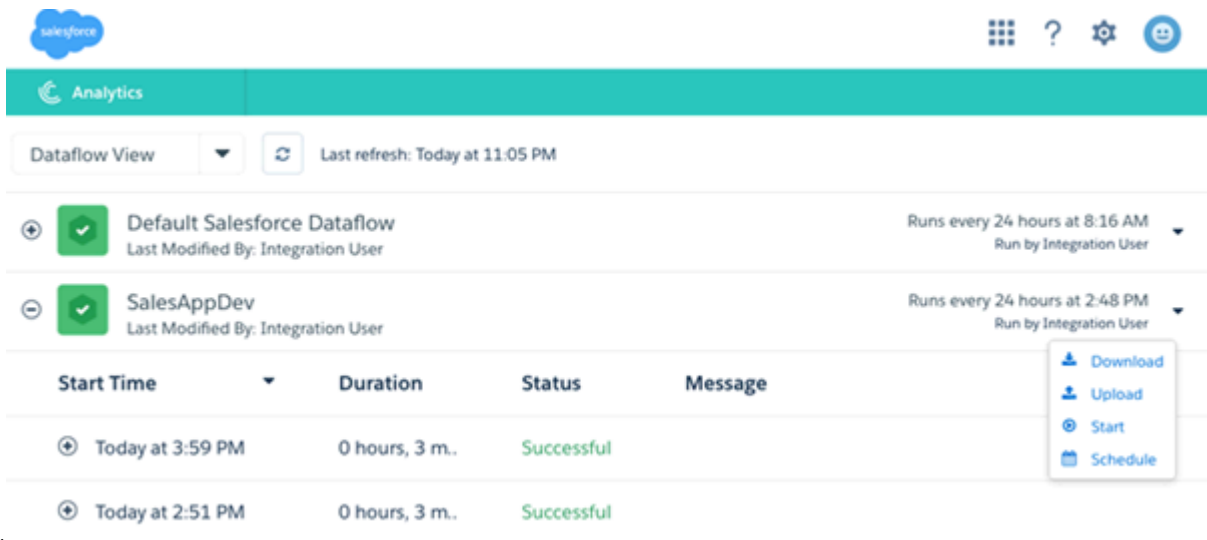
- Manage Analytics Templated Apps
- Edit Analytics Dataflows

You can also watch the video [Create the Sales App, Part 2: Upload the Quota CSV File and Schedule a Dataflow \(Lightning Experience\)](#), which covers the steps described here.

1. Go to **Analytics** if you're not already there. Open the Data Manager by clicking the gear icon at the upper right of the screen.
2. Select Dataflow view from the menu at the top left of the Data Manager screen.



3. Find the app you created; you may have to scroll down the page. Open the menu on the far right of the screen next to the app icon and name. Select **Schedule**, and set a time for the dataflow. Select a time outside normal work hours so the dataflow doesn't interrupt business activities. Click



Integrate Sales Analytics With Salesforce

USER PERMISSIONS

To use Analytics templated apps:	Use Analytics Templated Apps
To use Sales Analytics:	Access Sales Cloud Analytics Templates and Apps
To create and manage Analytics apps:	Manage Analytics Templated Apps
	Edit Analytics Dataflows

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

To edit a dataset's extended metadata (XMD) file:

Edit Analytics Dataflows

Make Sales Analytics more usable by performing a variety of optional integrations and customizations.

Overriding role names in datasets, embedding the "Sales Analytics - Account Overview" dashboard in your Salesforce Accounts page, and expose Sales Analytics as a tab in Salesforce Classic can make it easier for your team to use the app.

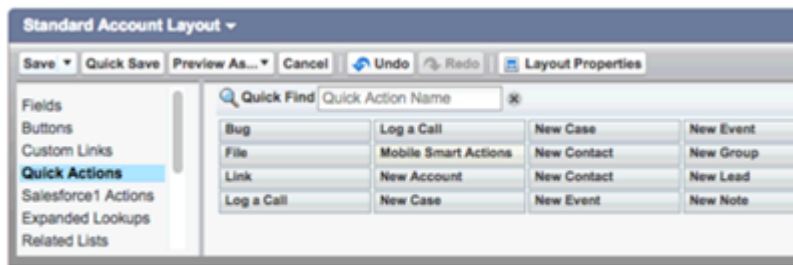
Add Actions to Sales Analytics Dashboards

Sales Analytics dashboards use actions that are enabled on the Account and Opportunity page layouts. To add actions, you edit the page layout for those objects.

In Salesforce, go to the Accounts or Opportunities tab, open the page for an account or opportunity, and click the **Edit Layout link** at the top right of the page.

In the Quick Actions in the Publisher section, click the **override the global publisher layout link**. If you or someone else in your org has already done this, you won't see the link. Note that this section may be called something slightly different in the org you use, for example "Quick Actions in the Salesforce Classic Publisher."

In the Account Layout or Opportunity Layout panel (depending on which object you're adding actions to) at the top of the page, click **Quick Actions** on the left. Drag the action(s) that begin with the word "New" (for example, New Task, New Note) to the Quick Actions in the Publisher section.



Click **Save** to save your changes. The actions you added to the layout are now available from charts and tables in Sales Analytics dashboards.

Override Role Name in Datasets

Sales Analytics uses Salesforce Role Hierarchy to help you to understand your company's sales performance. When you first create the app, Sales Analytics dashboards show the number associated with role name in the hierarchy. That's not the most useful way to view the role. To see the name of the person responsible for that role, you can update the role value by editing the corresponding dataset's Extended Metadata (XMD) file.

Let's say your role hierarchy is the following:

```
CEO (Manager: Paul)
    Sales_WW (Manager: Yves)
        Sales_WEST
        Sales_EAST
```


To have the manager's name appear in Sales Analytics dashboards, update the Opportunity dataset XMD file with the following:

```

{"labels": {
  "keys": {
    "RoleName": {
      "CEO": "Paul",
      "Sales_WW": "Yves"
    },
  }
}}

```

For more information, see [Analytics Extended Metadata \(XMD\) Reference](#).

Embed the Account Overview Dashboard in Account Page Layout

We've optimized the Sales Analytics Account Summary and Opportunity Summary dashboards to be embedded in the Salesforce Account page layout. You can do that by following the instructions in [Embed Your Dashboard in a Salesforce Page](#).

To be able to filter the dashboard based on the account that you're viewing, use this string as filter:

```

{
  "opportunity1": {
    "AccountId": ["$Id"]
  }
}

```

`opportunity1` corresponds to the system name of the Opportunity dataset. Its name can be different in your organization.

Make Sales Analytics Available in a Salesforce Classic Tab

You can access Sales Analytics by going to Analytics in the Force.com menu and selecting the app from the Analytics home page. To make it easier for your team to reach the app, you can expose it as a tab in Salesforce Classic. To do so, create a new tab that points to a Visualforce page that includes the "Sales Analytics - Overview" dashboard. Complete instructions are available in [Add an Analytics Dashboard to a Visualforce Page](#).

Understand Sales Analytics App Limitations

Sales Analytics requires that Sales Cloud include specific data and supports a limited set of Salesforce objects.

Sales Analytics Limitations

These limitations apply to Sales Analytics.

App Creation Does Not Support Internet Explorer 11

The Sales Analytics *creation process* does not support Internet Explorer 11. Use another browser when you create the app. Your team can *view the app* using any standard browser after the app is created, including Internet Explorer 11.

Sales AnalyticsData Requirements

Sales Cloud data must meet the following requirements for Sales Analytics dashboards to function correctly:

- Use standard sales objects.
- Have at least one event and one task connected with an opportunity.
- Enable history tracking for Amount, Stage, and CloseDate fields on the Opportunities object.

- Cases must be connected to Accounts if you choose to import Cases data to Sales Analytics using the configuration wizard.
- There are two requirements if you choose to import Leads data to Sales Analytics using the configuration wizard.
 1. At least one lead must be converted to an opportunity.
 2. The lead must be connected to an account.
- There are two requirements if you choose to import Campaigns data to Sales Analytics using the configuration wizard.
 1. At least one opportunity must be connected to a campaign.
 2. At least one campaign member must be connected to a campaign.
- There are two requirements if you choose to import opportunity record types to Sales Analytics using the configuration wizard.
 1. At least one opportunity record type must be defined.
 2. The opportunity record type must be connected to at least one opportunity.

Sales Analytics Support for Salesforce Objects and Fields

Sales Analytics supports all Salesforce standard and custom objects and data. To add custom objects or additional fields not included when you first create the app, you need to update the Sales Wave dataflow. For details see [Create Datasets with the Dataflow](#).

When you first create the app it includes only a predefined set of objects and fields. Sales Analytics creates a dataflow that exposes selected fields from the following standard Salesforce objects:

- Accounts
- Users
- Roles
- Opportunities
- Projects (Opportunities line item)
- Tasks
- Events

The fields provided are determined by the answers you provide when you create the app using the built-in configuration wizard.

Sales Analytics supports standard and custom fields on standard Salesforce objects. The fields provided are determined by the answers you provide when you create the app using the built-in configuration wizard.

Sales Analytics limits custom objects support to no more than 10 custom objects for each org that implements Sales Analytics. This limitation is contractual, not technical.

To add custom objects or extra fields not included when you first create the app, you must update the Sales Analytics dataflow. For details, see [Create Datasets with the Dataflow](#).

Sales Analytics Support for Non-Salesforce Data

Sales Analytics does not support external data sources [except a CSV file](#) that contains quota data at the user level. Importing other external data requires an extra license. See your Salesforce representative for details.

To include data about quotas in Sales Analytics, you must upload a CSV file with the details. For more information, see [Collaborative Forecasting and Quotas Data in Sales Analytics](#).

Get to Know Sales Analytics Data Terminology

To make the best use of Sales Analytics, it's helpful to understand the metrics and terms used in the app.

Table 9: Sales Analytics Dashboards

Metric/Term	Formula	Description/Notes
Closed Won		Amount of opportunities that have been closed and won.
Closed Lost		Amount of opportunities that have been closed and lost.
Closed Total	Closed Won + Closed Lost	Total amount of opportunities that have been closed.
Quota		Amount that was planned/committed/targeted for a certain time period.
Quota Attainment	Closed Won / Quota	How much of quota has been achieved.
Expected to Close	Many	Can use Forecast Category or Stage Name to calculate.
Forecast	Closed Won + Expected to Close	Amount that is expected/outlooked to end at for a time period.
Forecast to Quota	Forecast / Quota	Ratio of forecast to quota.
Need to Close	Quota - Closed Won	Amount needed to hit quota.
Need to Find	Quota - Forecast	Amount needed to hit quota, after accounting for opportunities expected to close in the future.
Open Pipe		Total amount of open opportunities in the pipeline, where Forecast Category does not equal Closed or Omitted.
Open Pipe Coverage	Open Pipe / Need to Close	How much in pipe to cover what is needed to close.
Bookings		Amount of Closed Won opportunities for new business.
Diff	This Year - Last Year	Difference between two items.
Y / Y %	(This Year / Last Year) - 1	Year-over-year growth rate.
Avg Selling Price	Total Amount (\$) / Total Count (#)	Average selling price for Opportunities, Products, and so on.
Avg Win Rate by \$	Closed Won / Closed Total	Success rate on closed opportunities, based on amount (\$).
Avg Win Rate by #	Closed Won / Closed Total	Success rate on closed opportunities, based on count (#).
Avg Sale Cycle	Closed Date - Created Date	How long it took to close the deal.

Metric/Term	Formula	Description/Notes
Avg Discount %	$\text{abs} ((\text{Selling Price} / \text{List Price}) - 1)$	How much was reduced from what was listed.

The Service Analytics App

The Service Analytics app gets you started fast with Analytics and provides a clear path through your Service Cloud data on any device. Whether you're a service manager or agent, you get everything you need in one place to uncover key data insights to help you grow your business.



Tip: Follow the steps in the order shown to get started with Sales Analytics. If you haven't used Analytics before, learn more about it from the [Analytics Documentation](#).

IN THIS SECTION:

1. [About the Service Analytics App](#)

Salesforce created the Service Analytics app to make it easy for service managers and agents to use data to drive the success of your service business. Learn the app's benefits before you create and use the app to explore your Service Cloud data.

2. [Service Analytics Prebuilt Dashboards and Datasets](#)

The Service Analytics app includes prebuilt dashboards and datasets to accelerate data exploration for both service managers and agents.

3. [Set Up Permissions for the Service Analytics App](#)

Set up your organization to use the Service Analytics app by enabling Analytics and creating and assigning permission sets.

4. [Create the Service Analytics App](#)

Follow these steps to create the Service Analytics and start uncovering the value of your Salesforce data—fast.

5. [Customize Service Analytics with the Configuration Wizard](#)

Create Service Analytics with the configuration wizard so the app reflects how your company prefers to view Service Cloud data.

6. [Share the Service Analytics App](#)

Members of your team can only use the Sales Analytics app if you share it with them.

7. [Reconfigure the Service Analytics App](#)

To restore deleted or altered dashboards or change wizard settings, reconfigure an existing version of Service Analytics.

8. [Delete the Service Analytics App](#)

Delete apps to start app creation all over or to get rid of apps you no longer use.

9. [Upgrade the Service Analytics App](#)

Take advantage of the latest Service Analytics features by upgrading your app every time we release a new version.

10. [Schedule the Service Analytics Daily Dataflow](#)

Schedule a daily dataflow at a time outside standard business hours before you start exploring with Service Analytics.

11. [Embed Service Analytics Sidebar Dashboards in a Salesforce Page](#)

Add Service Analytics dashboards to Salesforce pages so your service team can get a complete view of their cases and take appropriate action.

12. [Understand Service Analytics App Limitations](#)

Service Analytics requires that Service Cloud include specific data, initially supports a limited set of Salesforce objects, and has other miscellaneous limitations.

About the Service Analytics App

Salesforce created the Service Analytics app to make it easy for service managers and agents to use data to drive the success of your service business. Learn the app's benefits before you create and use the app to explore your Service Cloud data.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To use Analytics templated apps:

- Use Analytics Templated Apps

To use Service Analytics:

- Access Service Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Service Analytics gives you best-practice key performance indicators (KPIs) about your Salesforce service data in a single place. We've based the app's dashboards on learnings from many years of helping businesses manage customer relationships. The goal is to provide the right amount of information at the right time to help both managers and agents make the right decision.

Service managers get a complete view of service customer data that includes trending as well as historical and peer benchmarks. Agents can quickly view a snapshot of each case and customer to help them make quick decisions about their next customer interactions.

We've done a lot of the hard work: Our team has built complex queries, formulas, and ratios that draw from your service and sales data and assembled them into easy-to-read visualizations. You just create the app: using a built-in configurator, answer a few questions about the data and fields you'd like to see, and Analytics takes care of the rest. Once you've created the app, use its prebuilt datasets and dashboards to explore Service Cloud data from any device that supports Analytics.

You get actionable insights fast from your data using the intuitive Analytics interface. And you can drill deeper into key aspects of your business by customizing Service Analytics around your needs.



Note: Your organization can use Service Analytics without Salesforce Analytics platform by purchasing a Service Analytics license. A Service Analytics license is included with the Analytics platform license.

Service Analytics Prebuilt Dashboards and Datasets

The Service Analytics app includes prebuilt dashboards and datasets to accelerate data exploration for both service managers and agents.

Note: The dashboards and datasets included in your instance of Service Analytics can differ. The ones you see depend on how you answer configuration wizard questions when you create the app.

Service Analytics Dashboards

The prebuilt dashboards in the Service Analytics app contain best practices that help you get value from your Salesforce data—fast. The dashboards let you manage pipeline and forecast and understand key business performance drivers, visualize trends, assign actions. They also help you get fast answers to questions you have about business results.

USER PERMISSIONS

To use Analytics apps:

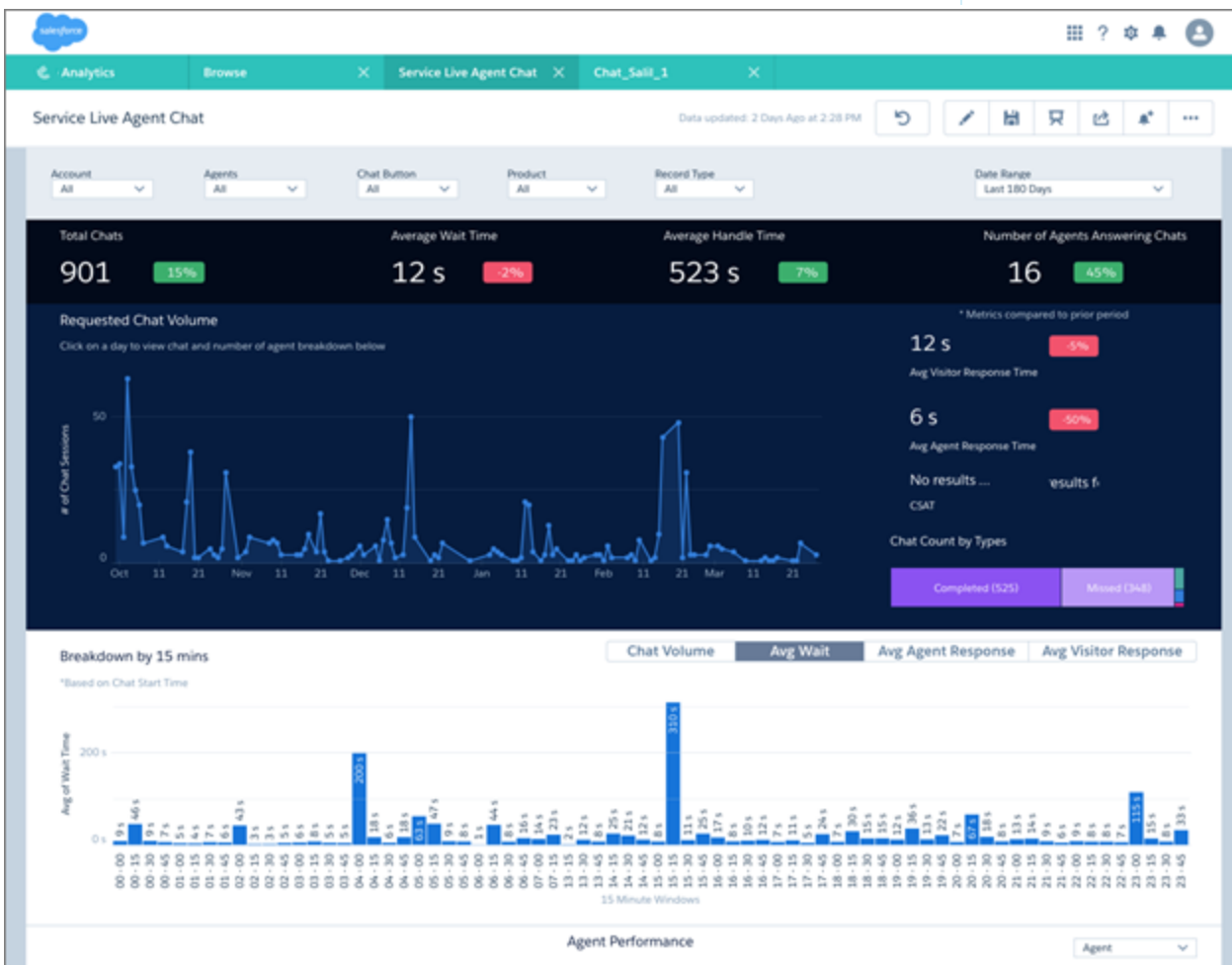
- Use Analytics Templated Apps

To use Service Analytics:

- Access Service Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Dashboards available from the app provide a complete view of service customer data that includes all your key service performance indicators in one place. Managers can quickly view average case closing times, customer satisfaction, trending, and historical and peer

benchmarks. They can also get insight into the teams' use of knowledge to resolve cases and other data so they can quickly take appropriate action.

Another set of dashboards -- called sidebars -- are specifically for service agents. Embed sidebars in a Salesforce page, such as the service console, to make them more accessible to agents during their day-to-day work. For a given case, an agent can view customer history, number of cases, and CSAT. Agents can also see previous customer actions and their result so they can find out what worked. The goal is to provide agents the right amount of information at the right time to help them take the right action.

The following table guides you through Service Analytics dashboards. You can also explore further on your own at any point. To learn more about exploring data in Analytics, see [Explore and Visualize Your Data](#) on page 276.

Table 10: Service Analytics Dashboards

Dashboard Name	Contents	Target User
Service Analytics Overview (Service Manager Overview)	Start here. Summarizes key performance indicators (KPIs) from your Service Cloud, including open cases in the backlog, agent average time to close, and first contact resolution rate. Helps you gauge health of the business and surface issues requiring further investigation. Also, provides springboard to all other dashboards.	Service manager
Account Profile	Provides a full breakdown of a selected customer's service history and current backlog and includes customer satisfaction (CSAT) data and trends. If you track Opportunity data, you can also see pending and closed deals.	Service manager
Agent Activity	Helps determine how well agents use their time. Shows how much work agents do and how their work aligns with case-closing numbers and duration as well as CSAT.	Service manager
Agent Performance	Shows agent and team performance against key activity and customer satisfaction metrics. Performance trends and benchmarks on agent performance help you provide direction and drive agent success.	Service manager
Channel Review	Shows CSAT and activities—duration and volume—on cases by channel to help you monitor success of each channel.	Service manager
Backlog	Gives complete view of your backlog to show how efficiently your team resolves cases and how quickly your backlog is growing. Helps you prioritize and acquire/assign resources accordingly.	Service manager

Dashboard Name	Contents	Target User
Customer Satisfaction	Highlights CSAT measures so you can identify specific areas to improve the service experience. Indicates most/least satisfied customers and associates agents, products, and channels with CSAT.	Service manager
Knowledge Impact	Provides a view into how knowledge articles attached to cases impact CSAT and resolution time. See which agents used the most articles to determine who needs training/coaching in the use of knowledge to help resolve service issues	Service manager
Knowledge Use	Helps you understand how agents use knowledge articles to help you drive article creation. See which articles are attached the most and the least and which have the most views or votes (high ratings) over time.	Service manager
Live Agent Chat	Shows how your team uses chat to help solve support cases. Includes number of chats, days of the week with most activity, missed or abandoned chats, chat length, and average handle time.	Service manager
Omni	Gives managers insight into agent utilization based on Omni-Channel work record tracking. Includes incoming agent work volume, average speed to answer, average handle time, average active time, and other agent utilization metrics.	Service manager
Open Cases	Shows current open case workload to help you prioritize, investigate problematic cases, and view escalations and SLA compliance. Let's you prioritize cases by accounts and pending deals so you can take appropriate action.	Service manager
Telephony	Helps you understand the impact of telephone contact with customers during service case resolution. Filter call volume and duration by inbound or outbound call, the result of the call, and other factors. Also relates call volume to agent performance.	Service manager
Sidebar – By Customer	Provides a snapshot of customers, including the service products they're using, case reason, and priority. Also shows which	Service agent

Dashboard Name	Contents	Target User
	agents have helped customers and provides a CSAT overview.	
Sidebar – By Similarity	Shows a snapshot of historical data to help guide further customer interactions. Shows if there are other cases similar to the ones they're resolving. Helps agents identify potential product issues or candidates for creating knowledge and find agents who have worked similar cases.	Service agent
Sidebar – By Case History	Gives an overview of case history or lifecycle so agents can be more informed during customer conversations. Includes a snapshot of case interactions and duration of case against the average.	Service agent
My Performance Summary	Gives agents visibility to their own productivity so they're always aware of their results towards targets as tracked in Salesforce. Includes ranking within the support center, trends, and benchmarking so they're always prepared for meetings with managers and reviews. Typically results in higher agent satisfaction and performance and lower turnover rates.	Service agent

Service Analytics Datasets

The table lists all the possible standard datasets that become part of Service Analytics when you create the app.

Table 11: Service Analytics Datasets

Dataset Name	Contents
Service Activity	Replaces Service Event and Service Task datasets used in Classic version of app. Data about events and tasks associated with cases, including last modified date and case duration. (Your Service Cloud data must include at least one event and one task for Service Analytics dashboards to function correctly.)
Service Case	Data about cases, including duration, last modified date, and customer satisfaction measure.
Service Case History	Data about case history, including owner, type, and creation date.
Service Chat Transcript	One of two Service Analytics datasets with data about your team's use of LiveAgent for chat. Includes data from Live Agent transcripts , such as response times, numbers of messages per chat, and chat duration.

Dataset Name	Contents
Service Chat Transcript Event	One of two Service Analytics datasets with data about your team's use of LiveAgent for chat. Includes data about Live Agent events , such as if chats are accepted, queued, declined, or transferred.
Service Knowledge	Data about use of knowledge articles in cases, such as number of views, ratings, last referenced dates, and case associations.
Service Knowledge Attached	Data about attachment of knowledge articles to cases including whether articles are shared by email, article version number, and case type.
Service Omni Agent Work	One of two Service Analytics datasets with data from Omni-Channel Agent Work object. Includes data that helps you track information about the assignments your agents work on, including the queue, channel, status, and speed to answer. (Your org must use Omni-Channel to create and route work items for Service Analytics to create this dataset. You must also answer Yes to the configuration wizard question about Omni-Channel.)
Service Omni User Presence	One of two Service Analytics datasets with data from Omni-Channel User Presence object. User presence records contain fields that help you track information about agent availability. (Your org must use Omni-Channel to create and route work items for Service Analytics to create this dataset. You must also answer Yes to the configuration wizard question about Omni-Channel.)
Service Opportunities	Data about opportunities so you can filter cases by opportunity for prioritization and appropriate action.
Service Event <i>(Only in Classic version of app.)</i>	Data about events associated with cases, including last modified date and case duration. (Your Service Cloud data must include at least one event for Service Analytics dashboards to function correctly.)
Service Task <i>(Only in Classic version of app.)</i>	Data about tasks associated with cases, including last modified date and case duration. (Your Service Cloud data must include at least one task for Service Analytics dashboards to function correctly.)

Set Up Permissions for the Service Analytics App

Set up your organization to use the Service Analytics app by enabling Analytics and creating and assigning permission sets.

Each Service Analytics App license is a single-user license that provides access to Service Analytics. It includes a single Service Analytics app single-user license. The table shows data storage limits for the app. If you require more data, you can purchase Analytics Cloud - Additional Data Rows, which entitles you to an additional 100 million rows.

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Table 12: Service Analytics Data Storage Limits

License	Limit
Analytics Cloud - Service Analytics App	25 million rows when used without Analytics Platform license. Use of Service Analytics app license does not increase data limit for platform license.
Analytics Cloud - Additional Data Rows	100 million rows.

 **Important:** Service Analytics App license data storage limits are contractual, not technical. Licensee agrees to strictly monitor its total number of data rows.

Your org can use the Service Analytics app with or without the Salesforce Analytics platform.

Each Service Analytics user needs a Service Analytics Apps permission set license. The Service Analytics Apps permission set license enables the following permissions.

Table 13: Service Analytics User Permissions

Permission	Function
"Use Analytics Templated Apps"	Enables access to all Analytics templated apps.
"Access Service Cloud Analytics Templates and Apps"	Provides specific access to the Service Analytics app as well as the data and prebuilt dashboards included with it.
"Manage Analytics Templated Apps"	Gives admins the ability to create Analytics apps for users in their orgs, in this case the Service Analytics app.
"Edit Analytics Dataflows"	Enables admins to upload and download JSON for existing data flows.


You assign the Service Analytics Apps permission set license when you create and assign permission sets to users in your organization.

Service Analytics App Setup Process

To set up your organization to use Service Analytics, follow these steps:

1. Enable Analytics for your organization.
2. Define the main Service Analytics user types in your organization.
3. Create permission sets to group related user permissions according to the needs of each user type.
When you create permission sets, you also select the Service Analytics Apps permission set license.
4. Assign a permission set to an individual user, which also *auto-assigns* the Service Analytics Apps permission set license to that user.
For efficiency, you can assign a permission set to groups of users. You can assign multiple permission sets to a user.

After you've completed these steps, create and share Service Analytics with the users in your organization. Users can only explore Service Analytics dashboards and datasets after you've shared the app with them.

 **Tip:** For best results, follow the steps for setting up the Service Analytics app in the order shown here.

IN THIS SECTION:

1. [Identify Service Analytics App User Types](#)

Identify Service Analytics user types and the tasks they perform to assure that the setup process meets your team's analytics needs.

2. [Enable Analytics and Create Service Analytics Permission Sets](#)

After Salesforce provisions you with the Service Analytics App license, enable Analytics and create permission sets for Service Analytics users.

3. [Assign Service Analytics Permission Sets to Users](#)

Assign permission sets to one or more Service Analytics users—either one at a time, or in bulk—to give them access to the app.

Identify Service Analytics App User Types

Identify Service Analytics user types and the tasks they perform to assure that the setup process meets your team's analytics needs.

The Service Analytics App license includes the permissions required by users in your organization to administer Service Analytics and to import, work with, and explore data. Set up the Service Analytics in the most useful way by thinking through the ways people access features and categorizing users into types. Here are a few examples.

In most cases, Service Analytics addresses the needs of two basic types of people on your team:

- Users, who view Service Analytics dashboards and datasets.
- Administrators or managers, who access all Service Analytics functionality to create apps, dashboards, and datasets, import data, and otherwise customize the Service Analytics experience.

Accordingly, when you set up Service Analytics, creating two basic permission sets probably meets the needs of most users in your organization:

- A “view” permission set that contains the permissions needed by most basic-level users when they access Service Analytics.
- A “manage” permission set that's reserved for a select few administrators and managers and contains permissions to use all Service Analytics features.

In the detailed Service Analytics app setup instructions that follow, we show you how to create and assign these two permission sets.

Enable Analytics and Create Service Analytics Permission Sets

After Salesforce provisions you with the Service Analytics App license, enable Analytics and create permission sets for Service Analytics users.

Enable the Analytics Platform

To use Service Analytics, first enable Analytics for your organization.

1. In the Salesforce Setup menu, under administer, click **Analytics > Getting Started**.
2. Click **Enable Analytics**.

Create Permission Sets

The next step in the setup process is to create permission sets made up of Service Analytics user permissions. We show you how to create two permission sets:

- *Manage Service Analytics* permission set, for users who create and administer Service Analytics.
- *View Service Analytics* permission set, for users who explore app dashboards and datasets.

1. Create a Manage Service Analytics permission set, which gives users access to all app features.
 - a. In the Setup menu, under administer, click **Manage Users | Permission Sets** and then click **New**.

USER PERMISSIONS

To create permission sets:

- **Manage Profiles and Permission Sets**

- b. Enter `Manage Service Analytics` in the Label field, which automatically creates the API name, as well. You can change the API name, but it can't include spaces, end with an underscore, or have two consecutive underscores. You can also enter a description, but it's optional.
- c. For License, select the license to associate with this permission set. In this case, select `Service Analytics Apps` in the Permission Set License section.

Enter permission set information

Label

API Name

Description

Session Activation Required ⓘ

Select the type of users who will use this permission set

Who will use this permission set?

-Choose "--None--" if you plan to assign this permission set to multiple users with different user and permission set licenses.
 -Choose a specific user license if you want users with only one license type to use this permission set.
 -Choose a specific permission set license if you want this permission set license auto-assigned with the permission set.

Not sure what a permission set license is? [Learn more here.](#)

Licenses

- XOrg Proxy User
- Permission Set Licenses
- Analytics Cloud - Wave Analytics Platform
- Analytics Cloud Explorer
- Field Service Dispatcher
- Field Service Mobile
- Field Service Scheduling
- Field Service Standard
- Identity Connect
- Orders Platform
- Sales Analytics Apps
- Sales Console User
- Service Analytics Apps**


When you select a specific permission set license, any user assigned to the permission set is *auto-assigned* the permission set license. If you select --None--, you must *manually* assign the permission set license to users before you can add them to the new permission set.

- d. Click **Save**. The Permission Set Overview page shows the new permission set. Now add user permissions to the set.
 - e. Click **System Permissions** to open the list of user permissions enabled by the Service Analytics license. Then click **Edit**.
 - f. Select the following user permissions: "Use Analytics Templated Apps," "Access Service Cloud Analytics Templates and Apps," "Manage Analytics Templated Apps," and "Edit Analytics Dataflows." Make sure to select all four. Click **Save**. You've successfully created a permission set that enables users to create and administer Service Analytics and access all app features. You can now assign it to users, which is covered in [Assign Service Analytics Permission Sets to Users](#).
2. To create a View Service Analytics permission set, which enables users to view app dashboards and datasets, repeat the steps to create a Manage Service Analytics permission set, with these exceptions:
 - a. Name the permission set `View Service Analytics`.
 - b. Select only the "Use Analytics Templated Apps" and "Access Service Cloud Analytics Templates and Apps" user permissions and click **Save**. You've successfully created a permission set that enables users to view the Service Analytics dashboards and datasets. You can now assign it to users, which is covered in [Assign Service Analytics Permission Sets to Users](#).

You can build other permission sets out of the individual permissions enabled by the Service Analytics App license, depending on the needs of users in your organization.

Assign Service Analytics Permission Sets to Users

Assign permission sets to one or more Service Analytics users—either one at a time, or in bulk—to give them access to the app.

1. In the Setup menu, under administer, click **Manage Users | Permission Sets**.
2.  **Warning:** Assign the Manage Service Analytics permission set sparingly because it lets users administer Service Analytics, which lets them create, edit, and delete the app. Assign it only to users who administer or manage the app.

Click the permission set you want to assign to users. If you've followed the instructions in [Enable Analytics and Create Service Analytics Permission Sets](#) on page 613, select either the Manage Service Analytics or View Service Analytics permission sets.

3. Click **Manage Assignments** and click **Add Assignments**.
4. Select the users who need to manage or use Service Analytics, and click **Done**.

When you assign the permission set to users, Salesforce *auto-assigns* the Service Analytics Apps *permission set license* to those users.

After you've completed these steps, create and share Service Analytics with the users in your organization. Users can only explore Service Analytics dashboards and datasets after you've shared the app with them.

USER PERMISSIONS

To assign a permission set to users:


- Assign Permission Sets

Create the Service Analytics App

Follow these steps to create the Service Analytics and start uncovering the value of your Salesforce data—fast.


For rapid app creation, choose the basic creation option, which uses default settings to create Service Analytics. To set up the app according to your team's specific Service Cloud analytics requirements, choose custom creation.

1. Log in to Salesforce.

 **Important:** Service Analytics requires that your org has at least one closed case and one task. It also requires that your org has at least one contact ID associated with a case.

2. Set [Salesforce field-level security](#) to enable the Analytics Integration User to see all fields you'd like your app to use. Integration users run the dataflow, and if they don't have proper field-level security permissions, the dataflow can fail.
 - a. Go to Setup and enter the name of an object—for example, Accounts or Cases—in the Quick Find box and hit Enter.
 - b. Click the name of the object.
 - c. The next window shows all the fields for the object. Go to the one(s) where you need to edit field-level security.
 - d. Look for the Analytics Cloud Integration User, check the box(es) for the required fields under Visible, and click Save.
 - e. Repeat the Steps a through d for all objects with fields you want to use.
 - f. Refresh your browser cache.



- 3.

Select **Analytics Studio** from the **App Launcher** .



USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

4. *If you've created an app before:* Choose between creating a brand new app or creating an app based on settings from a previously-created app. Click **Continue**. Service Analytics scans your org's data and features. For details about the scan, see [Checking Data and Features with the Service Analytics Configuration Wizard](#).
 -  **Tip:** If you want to create your app with different settings, repeat the previous steps and select the previously-created app here. Complete app creation choosing different wizard settings and give your app a new name.
5. If the scan detects your org is missing required data, Service Analytics displays error messages telling you what to do. Follow the instructions and start app creation again. Position your cursor over tooltips  to see more detail. If there are no errors, click **Looks good, next**.
6. Choose between basic and custom creation options to set up your app. Select **Basic** to set up your app quickly based on standard settings determined by the org data check. Select **Custom** to open the configuration wizard. The wizard helps fine-tune app setup to reflect the way your team wants to view data. See [Customize Service Analytics with the Configuration Wizard](#).
7. If you choose **Basic**: Click **Looks good, next**. Answer the question about the field you use to categorize cases. Click **Looks good, next**, and skip to Step 10. See [Service Analytics Wizard Basic Create Option](#).
8. If you choose **Custom**: The wizard asks you to choose Salesforce objects to add to Service Analytics. It then takes you through a set of questions about how you prefer to view data. See [Service Analytics Wizard Custom Create Option](#) on page 619.
9. Give your app a name that's easily recognizable to others in your company and click **Create**. That starts a dataflow, which creates the app and its assets (a dataflow definition file, datasets, and dashboards). The app creation process can take a few minutes. During that process, Service Analytics runs a final scan to be sure the Analytics Integration User has access to all fields you select in the wizard. If the scan fails, you see an error message with the fields that can't be accessed. Return to Step 2 and give the Integration User access to those fields.
10. You can check the status of the dataflow while you wait. In Analytics Studio, click the gear menu at the upper right of the page, and select **Data Manager**. From the pulldown menu, select **Dataflow View** and look for your app.

Taking a few extra steps can make Service Analytics better serve the needs of your organization:


- [Embed the sidebar dashboards](#) on page 628 in a Salesforce page of your choice, such as the service console. This step provides a seamless analytics experience for service agents. Embedding sidebars in pages used regularly by agents gives them access to key metrics as part of their regular work to help them take the most effective customer action.
- Add datasets to the app based on Salesforce data using the [Analytics dataset builder](#) on page 175. Service Analytics includes a default set of datasets based on your Salesforce data. Creating additional datasets lets your service managers and view other Salesforce data through the app.
 -  **Note:** Service Analytics does not support data sources external to Salesforce or registering new datasets from the app-generated dataflow.
- Add objects, fields, and filters to Service Analytics. [Edit the app's dataflow](#) on page 98 to include standard and custom objects and fields from Salesforce. For complete instructions about adding data to Analytics, see [Analytics Data Integration Guide](#).
 -  **Note:** To create new datasets with just the Service Analytics app license, use the [Analytics dataset builder](#). Analytics associates new datasets created using the builder with the Analytics default dataflow. If you edit the dataflow for the Service Analytics app to register new datasets, you can't access the resulting datasets.

Customize Service Analytics with the Configuration Wizard

Create Service Analytics with the configuration wizard so the app reflects how your company prefers to view Service Cloud data.

When you start the app creation process, Service Analytics opens the configuration wizard. The wizard guides you through the following steps.

1. Checks your org to be sure it meets minimum data requirements and to detect features that can be added to your app. The results let you know if you have to add data or change Salesforce settings to create the app. It also lets you know about available features.
2. Asks you to choose between basic and custom create options. Basic is intended for first-time app users, while custom lets experienced administrators fine-tune app setup.
3. Choose the basic option, and Analytics creates the app quickly with default settings.
4. Choose custom and the wizard guides you through the steps to fine-tune your app.
 - a. Add features to your app
 - b. Answer a series of questions about how you use data in your org.

The following provide details about each using each part of the wizard. Read them in the order shown to get the best results when you create Service Analytics. Click the question mark  in the top-right corner of each page of the wizard to see help for that page.

IN THIS SECTION:

1. [Service Analytics Wizard Data and Feature Check](#)
At the start of app creation, Service Analytics scans your org. It checks to make sure you can create the app and looks for features and data to add to your app.
2. [Choose Service Analytics Wizard App Creation Options](#)
After Service Analytics checks your org's data and features, choose between basics and custom app creation options.
3. [Use the Service Analytics Wizard Basic Create Option](#)
Select the basic app creation option when you create Service Analytics for the first time or when you want to create the app quickly.
4. [Use the Service Analytics Wizard Custom Create Option](#)
Custom app creation gives more advanced users fine-grained control over Service Analytics features and data.
5. [How to Answer Service Analytics Custom Wizard Questions](#)
After you add features to Service Analytics, the custom version of the configuration wizard asks you a series of questions about your data. Follow these general guidelines, and the specifics that follow, to get the best result.
6. [Data Drilldown Questions, Service Analytics Custom Wizard Step 5 of 6](#)
Tell Service Analytics how you prefer to drill down into data about cases, including category, type, severity, owner, and reason, and if they're resolved at first contact.
7. [Questions About Added Features, Service Analytics Custom Wizard Step 6 of 6](#)
Provide more specifics about how Service Analytics uses data from the features you added to the app.
8. [Set Up Service Analytics CSAT Metrics: Example](#)
This scenario provides detail to help you answer questions about CSAT data in Step 6 of the Service Analytics configuration wizard.

USER PERMISSIONS


To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Service Analytics Wizard Data and Feature Check

At the start of app creation, Service Analytics scans your org. It checks to make sure you can create the app and looks for features and data to add to your app.

Service Analytics checks your org for data and features when you open the configuration wizard. If it finds any issues you need to correct before creating the app, you see messages that tell you

what to do. Position your cursor over the tooltip  for more information.

Here are details about each phase of the check.


Minimum Requirements


Your org must have at least one closed case and one closed task to enable app creation. If you see an error message, go to Service Cloud, close a case and a task, and try creating the app again.

Features to Add to Your App

The wizard checks to see if you track data about the following in your org:

- Customer satisfaction (CSAT)
- Knowledge
- Case history
- Opportunity
- Queues
- Events
- Business hours
- Case record types
- Opportunity record types
- Telephony
- Live Agent chat
- Omni-Channel

The tooltip  tells you which are available in your org. Basic app creation automatically adds those features. Custom app creation lets you choose the ones to add.

 **Note:** CSAT and knowledge data can only be added using custom app creation.

Field-Level Security

The wizard checks if the Analytics Integration User has access to all fields needed to create the app using the basic create option. If the Integration User can't access all fields, you see a warning and the tooltip lists the fields that lack access. Go to Salesforce Setup and provide access to those fields. See [Create the Service Analytics App](#) on page 615, Step 2, for details. Until all fields are available, you can't use the basic create option.

Fiscal Calendar Setting

The wizard looks for your org's fiscal year start date and uses it for Service Analytics. To choose a different fiscal start date, use the app's Custom create option.

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Choose Service Analytics Wizard App Creation Options

After Service Analytics checks your org's data and features, choose between basics and custom app creation options.

Select **Basic** if you're using Service Analytics for the first time. It sets up your app quickly based on standard settings determined by the org compatibility check. You get an immediately useful version of the app so you can see how it works. Experiment with it and share it with your team. Based on what you learn, change the standard settings by recreating the app using the custom create option.

Service Analytics disables basic app creation if the Analytics Integration User can't access all required fields. If the basic option is disabled, click **Back** to return to the org check and follow the instructions in the field-level security tooltip and error message.

Select **Custom** and follow additional steps in the wizard to make your own, custom settings to reflect the way you and others on your team want to view data. The initial, default settings in the screens that follow are the ones used when you create an app using the basic create option. Custom create lets you vary these settings to meet your team's specific needs. You can choose to add or delete features detected by the org check. You can also make specific choices about the data used in the app's dashboards.

Whether you use basic or custom create, Service Analytics runs a final scan of your org's field-level security settings. The scan detects if the Analytics Integration User has access to all data fields required to create the app. If the scan fails, you see a message telling you how to fix the issue. For more information about field-level security settings, see [See Create the Service Analytics App](#), Step 2.

Use the Service Analytics Wizard Basic Create Option

Select the basic app creation option when you create Service Analytics for the first time or when you want to create the app quickly.

The basic create option uses data, features, and default settings detected during the compatibility check that runs when you start app creation.

The wizard asks you a single, required question about the field you use to categorize cases. Choose the name of the field your business uses most to identify and organize cases, such as service product, type or level. Then click **Looks good, next**.

Name your app, and click **Create**.

Basic create can't use customer satisfaction and knowledge data. Service Analytics requires more information about how they're used in your org before creating an app. To add them, use the custom create option, and the wizard asks for the required details.

Basic create uses the following settings:

- To identify cases by geography, the Billing State/Province field from the Accounts object.
- Fifty (50) seconds as the maximum time agents can keep customers waiting during phone calls.

To vary these settings based on how you use Service Cloud, select the custom create option.

Consult [Create the Service Analytics App](#) on page 615 for details about creating your app.

Use the Service Analytics Wizard Custom Create Option

Custom app creation gives more advanced users fine-grained control over Service Analytics features and data.

Add Data and Features

The first window in the custom creation process lets you add data and features to your app. By default, Service Analytics includes data from the following standard Salesforce objects:

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

- Account
- Cases
- Contact
- User
- UserRole
- Task

The compatibility check that runs at the start of app creation looks for other available data and features. The wizard displays the results on the first custom create window, letting you know which features you use in your org. If you use a feature, this window tells you its availability to your app. If you don't use the feature, Service Analytics tells you it's not available.

Service Analytics preselects the features used for basic app creation. You have the option of adding others. Preselected options contain a check mark in the upper right corner. Add other available options to your app by clicking them. Click options with a check mark to deselect them. Here are the options Service Analytics lets you add, if available, and details about adding each.

- **Customer Satisfaction (CSAT) Score.** Select to add CSAT data to your app. If you select, Service Analytics adds questions to the wizard that ask how you track CSAT data. See [Questions About Objects and Features Added to Service Analytics \(Step 6 of 6\)](#).
- **Knowledge.** Select to add Salesforce knowledge data to your app. If you select, Service Analytics adds questions to the wizard that ask how you track knowledge data. See [Questions About Objects and Features Added to Service Analytics \(Step 6 of 6\)](#).
- **Business Hours.** Select to add a business hours case duration calculation to datasets. This uses data from the Business Hours field in the Cases object. Be sure that the Analytics Integration User has access to this field by editing field-level security for the Cases object, as described in [Create the Service Analytics App, Step 2](#).
- **Case History.** Select to include historical tracking for both case owner and for the field selected in wizard Page 5, Question 4. See [Questions About Objects and Features Added to Service Analytics \(Step 6 of 6\)](#).
- **Case Record Types.** Select to add record type for the Cases object. If you select, Service Analytics lets you filter cases by record type.
- **Queues.** Select to add queues data from the Group object, which your org uses to assign case ownership. If you select, Service Analytics lets you filter cases by user and queues.
- **Opportunities.** Select to add data from the Opportunities object, which is connected to cases via accounts in your org. If you select, Service Analytics adds sales data to dashboards to give you a complete view of accounts.
- **Opportunity Record Types.** Select to add record type from the Opportunities object. If you select, Service Analytics lets you filter opportunities by record type.
- **Events.** Select to add data from the Events objects, which your org uses to track case activity. If you select, Service Analytics includes events data and combines it with tasks data so you can drill into cases by activities (that is, tasks and events).
- **Telephony.** Select to add telephony data from standard call fields in the Tasks object. Standard fields include call duration, call object identifier, call result, and call type. If you select, Service Analytics creates the Telephony dashboard showing data from those fields.
- **Live Agent Chat.** Select to add Live Agent chat data. If you select, Service Analytics creates the Chat dashboard and dataset based on Live Agent data.
- **Omni-Channel.** Select to add data from Omni-Channel, which your org uses to create and route work items. If you select, Service Analytics creates the Omni-Channel dashboard and dataset.

How to Answer Service Analytics Custom Wizard Questions

After you add features to Service Analytics, the custom version of the configuration wizard asks you a series of questions about your data. Follow these general guidelines, and the specifics that follow, to get the best result.


- **Most questions provide answers in pick lists of fields from Salesforce objects.** The lists include standard Salesforce fields and custom fields you've set up on an object. Answer these questions by selecting from the fields shown. Most questions of this type let you choose only one field, and some let you choose multiple fields.
- **You can choose a field from an object only once.** After you select a field, it's no longer available as an answer to other questions.
- **Other questions are yes/no (Boolean), provide a set of options, or require you to enter text.**
- **Questions marked with an asterisk (*) require answers.**
- **Default answers result in a useful set of dashboards.** If you're not sure what to select, use the answer that's preselected. Some questions do not have preselected answers. In those cases, Service Analytics reminds you to make a selection.
- **You can only control parts of the app with wizard settings, such as filters and widgets.** We built the app to provide immediate analytics value without much work on your part.
- **Only some answers make sense given the question's context.** The questions often contain many fields, but only some make sense for your app. For example, it's unlikely that you'd filter Accounts data by Photo URL, even though the Accounts object includes a Photo URL field.

USER PERMISSIONS

To create and manage Analytics apps:


- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Metrics Questions, Service Analytics Custom Wizard Case Step 4 of 6


-  **Note:** This page is labeled *Step 4 of 6*, even though it's the first page of questions you see after you select custom create. This is the fourth of six steps for creating Service Analytics with the custom option.
- Question 1, optional: Asks you to indicate the primary field you use in Salesforce to track case duration, if any. If you don't track case duration, Service Analytics uses its own formula to calculate case duration based on the date a case was opened and closed. If the case is still open, it uses today's date as part of the calculation. Allows only a single selection. If you add business hours to the app, Service Analytics includes a business hours case duration calculation. See [Use the Service Analytics Wizard Custom Create Option](#).
- Question 2, optional: Asks if you use other (secondary) fields related to case duration. You can select multiple fields, for example, **Duration with customer** and **Duration with agent**.
- Question 3, optional: Asks you to select the field you use to track SLA compliance. Typically, you would track SLA compliance with a custom formula field on the Cases object or the standard Milestone Status field. (Milestone Status field values include compliant, open violation, and closed Violation). If you track SLA compliance using a Boolean custom formula field, you can't select that field from the wizard. In that case, do the following: Select any field and then manually edit the dataflow to include the Boolean field. (See [Configure the Dataflow Through the Definition File](#).) Then, find and replace the field name in Service Analytics dashboard JSON (see [Analytics Dashboard JSON Reference](#)).
- Question 4, optional: Asks you to select the field you use to record that a case is resolved on first contact. You would typically track first contact resolution using a Boolean custom formula field on the Cases object or the standard Closed when Created (IsClosedOnCreate) field.
- Question 5, optional: Asks if you'd like to include other Cases object metrics in your app. Choose a numeric field.

Data Drilldown Questions, Service Analytics Custom Wizard Step 5 of 6

Tell Service Analytics how you prefer to drill down into data about cases, including category, type, severity, owner, and reason, and if they're resolved at first contact.

 **Note:** This page is labeled *Step 5 of 6*, even though it's the second page of questions you see after you select custom create. This is the fifth of six steps for creating Service Analytics with the custom option.


- Question 1, required. Asks about the field you use to categorize cases. Choose the name of the field your business uses most to identify and organize cases, such as service product, type or level.

 **Note:** This is the only question you see if you use basic app creation.

- Question 2, optional. Asks about the field you use to record customers' type of support. Examples include gold, silver, or bronze; and premium and basic.
- Question 3, required. Asks which field you use to categorize case severity—usually the field you use to prioritize cases.
- Question 4, required. Asks which field you use to track case status of case. You filter and analyze cases in dashboards based on your selection.
- Question 5, required. Asks about the field you use to identify topics, reasons, and closure codes of cases. Your selection helps you understand which kinds of cases your team solves for most efficiently.
- Question 6, required. Asks you to choose the field you use to track types of cases so you can filter and analyze cases according to support type.
- Question 7, required. Asks you to select the field used to track channels customers use to open cases, such as phone, email, mobile, or web.
- Question 8, required. Asks you to select the object used to track cases according to geography. Options are **Accounts**, **Contacts**, and **Cases**. Defaults to **Accounts**, which is used in basic create.
- Question 9, required. Asks you to indicate the field in the object selected in Question 8 to track cases by geography. Defaults to **Billing State/Province**, which is used in basic create.
- Question 10, required. Asks you to indicate your fiscal year start month. Defaults to January; select another month if your fiscal year is different from calendar year. Service Analytics supports only standard fiscal periods.
- Question 11, optional: Select dimension fields from the Cases object you haven't selected in previous questions. Adding dimensions lets you drill into dimensions that are important to your organization. Dimensions are qualitative values, such as date, region, and product name.

Questions About Added Features, Service Analytics Custom Wizard Step 6 of 6

Provide more specifics about how Service Analytics uses data from the features you added to the app.

 **Note:** This page is labeled *Step 6 of 6*, even though it's the third page of questions you see after you select custom create. This is the last of six steps for creating Service Analytics with the custom option.

Most of the questions on this page appear only if you add CSAT and knowledge features to your app. See [Use the Service Analytics Wizard Custom Create Option](#). Follow the instructions carefully to assure success.

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
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- Question 1, required. You see this question only if you add CSAT to your app. Asks which object you use to track CSAT. Service Analytics defaults to **Cases**. If you use a different object to track CSAT, select it from the pick list and answer the additional questions that appear.
- Question 2, required. You see this question only if you add CSAT to your app. Asks you to select the field from the object selected in Question 1 you use to track CSAT.
 - Question 2a, required. You see this question only if you select an object other than Cases in Question 1. Service Analytics has to create a join between that object and Cases for you to see CSAT data in dashboards. (For an example, see [Set Up Service Analytics CSAT Metrics: Example](#).) Enter the API name the field where you store case identification information. Usually, that's the **Id** field, in which case you enter *Id*.

If it's a field other than **Id**, find the API name for the field. Go to **Setup**—>**Cases**—>**Fields**. In the top chart showing standard fields, field name column shows the API name. For example **IsSelfServiceClosed** is the API name for the **Closed by Self-Service User** field. The chart further down for custom fields includes an API Name column.
 - Question 2b, required. You see this question only if you select an object other than Cases in Question 1. Determine which field from the object selected in Question 1 to use for the other side of the join with the Cases object. Use the field that contains case identification. Enter the API name for the field here.
- Question 3, required. You see this question only if you added knowledge to your app. Asks about the article type you want to see data about in Service Analytics dashboards. Choose only a single article type. To see the names of article types in Service Cloud, go to Salesforce Setup and enter *knowledge* in the Quick Find box.
- Question 4, required. You always see this question in the wizard. Gives you the option of having Analytics check to see if data in your org supports the answers you select. We recommend that you select **Yes** and run the check, because app creation fails if your org doesn't contain the right data. Analytics displays an error message that tells you what to fix. Make any required changes in Salesforce, refresh your browser cache, and come back to the wizard and finish creating your app.

SEE ALSO:

[Set Up Service Analytics CSAT Metrics: Example](#)

Set Up Service Analytics CSAT Metrics: Example

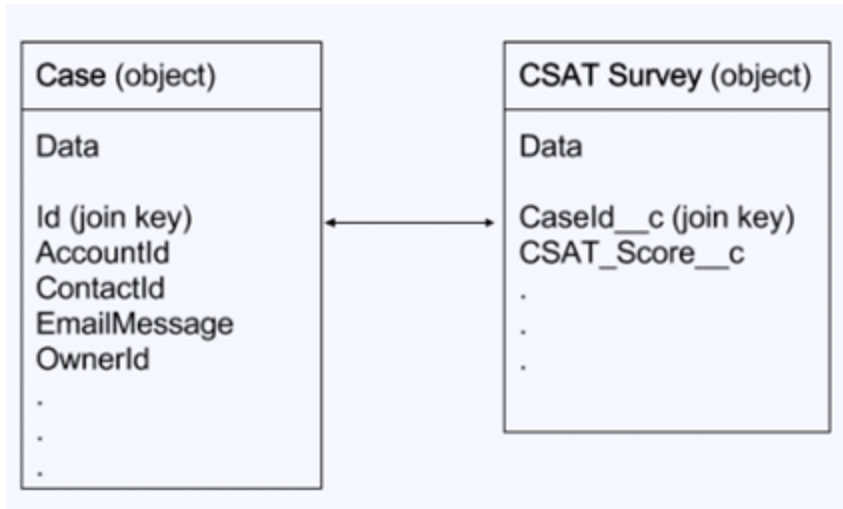
This scenario provides detail to help you answer questions about CSAT data in Step 6 of the Service Analytics configuration wizard.

If you track customer satisfaction (CSAT) data, such as the CSAT score for a service case, in an object other than Cases, take particular care in how you answer the questions on this page.

For example, if you store the CSAT score in a custom object, for example "CSAT Survey", select this object in question 1. In Question 2, specify the field that has the CSAT metric you would like to report, for example "CSAT Score." Service Analytics needs to relate the custom object specified in Question 1 to the Cases object so dashboards can include data about cases, accounts, and agents by CSAT. This relationship is created through a join.

To specify the relationship between the Cases object and your custom CSAT object, designate join keys from both objects and enter their API names in Questions 3 and 4. On the Cases object, this will typically be the "Id" field. On the example custom object "CSAT Survey," this is the custom field that stores the case ID, which in this scenario is the field with the API name `CaseId__c`.

The following diagram shows the join between the two objects.



Share the Service Analytics App

Members of your team can only use the Sales Analytics app if you share it with them.

You need to create an app before you can share it. See [Create the Service Analytics App](#) You can only share it with users who have the following permissions enabled:

- Access Service Cloud Analytics Templates and Apps
 - Use Analytics Templated Apps
 - Access Sales Cloud Analytics Templates and Apps
1. Roll your cursor over the icon for the app and click **Share**.
 2. Type in the names of team members.
 3. Click **Add**, and click **Save**.

Reconfigure the Service Analytics App

To restore deleted or altered dashboards or change wizard settings, reconfigure an existing version of Service Analytics.

Important: Important. Reconfiguring your app gets rid of dashboard customizations, including fields or objects added to the dataflow. It also deletes actions you enable, or changes to security settings and dashboard colors and labels. If you've made any customizations, save copies of your dataflow definition file or dashboards. Then copy them into your reconfigured app.

1. Open the app landing page. If you see **Upgrade** instead of **Reconfigure**, you need to upgrade to the new version of the app before you can use the reconfigure feature. See [Upgrade the Service Analytics App](#).
2. Click the **Reconfigure app** link.

USER PERMISSIONS

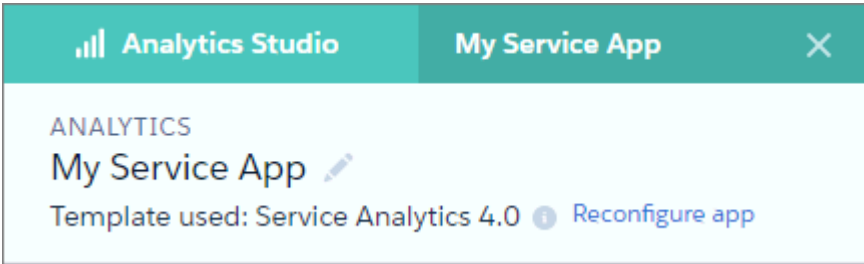
To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

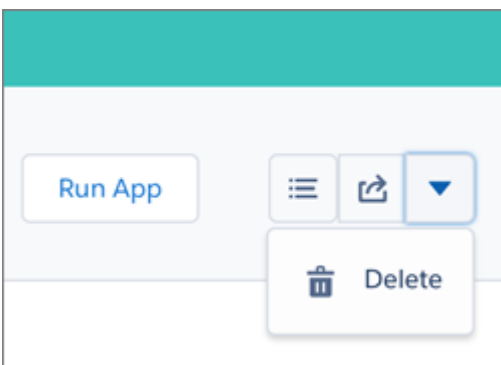


3. Review the next screen carefully. It warns you that reconfiguring overwrites customizations, including changes or additions you've made to your app. If you're comfortable overwriting customizations, check the box and click **Continue**. If not, click **Back** or the **X** in the upper right corner.
4. Complete the app creation process described in [Create the Service Analytics App](#).
5. At the end of the process, you're asked if it's OK to reconfigure your app. This gives you one more chance to make sure you want to overwrite customizations. If you are, click **OK**. Service Analytics creates a new version of your app.

Delete the Service Analytics App

Delete apps to start app creation all over or to get rid of apps you no longer use.

- Important:** If you delete your app, Analytics doesn't retain the wizard answers you selected for that version of the app. You have to start the creation process over. If you wish to reuse settings from the app, keep it until you've recreated the app and then delete it.
1. Navigate to Analytics Studio and open the app. Make sure you're viewing the app's landing page and that you can see the app name at upper left, with a list of dashboards in the center panel.
 2. Click the triangle in the upper left corner and select **Delete**.



3. In the next screen, Service Analytics asks you to confirm that you want to delete your app. If you are, click the **Delete XX Asset(s)** button.
4. Analytics deletes your app.

USER PERMISSIONS

To create and manage Analytics apps:


- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Upgrade the Service Analytics App

Take advantage of the latest Service Analytics features by upgrading your app every time we release a new version.

The banner at the top of your app home page tells you that we've released a new version. It also provides a link to more information about the release. There's also a link inviting you to start the upgrade process in the left-hand column of the home page, just below the app name.

Here's how to upgrade your app.

1. Click either the "What's new" link in the banner or the "New version available" link in the left-hand column of your app's home page.
2. You can read information about the new version on top of the page that opens. At the bottom of the page, find the buttons: **Upgrade current app** and **Create new app**.
3. See descriptions of what the buttons do by hovering over them. If you click **Upgrade current app**, you overwrite your current app and all its assets, replacing it with an app based on the new version. Upgrading also deletes any customizations, including any new fields or object that you've added to the dataflow or changes you've made to security settings and dashboard labels and colors. If you click **Create new app**, you create a second copy of your current app based on the new version. Decide which option suits your circumstances, and click the appropriate button.
4.  **Warning:** If you've customized your app, click **Create new app** instead of **Upgrade current app** to make an app copy based on the new version. Creating a new app preserves the current version and any customizations, which you can then manually copy into the new version of the app.

If you click **Upgrade current app**, you see a screen warning you that the upgrade option overwrites the current app and gets rid of any customizations you've made. If you're OK with overwriting customizations, check the box and click **Continue**. If you're not, click **Back** to return to the previous screen. Clicking **Continue** takes you to the configuration wizard. Skip ahead to step 6.

5. If you click **Create new app**, you're taken to the configuration wizard. You don't see a warning, since you're not overwriting your current app, which is preserved with any customizations you've made to it.
6. The configuration wizard is preloaded with the settings you chose last time you used the wizard. You can either keep those settings or change them. Go through each page of the wizard.
7. Once you complete the wizard, Analytics shows a screen that indicates which assets are impacted by the upgrade. Review the screen to see how many datasets, dashboards, and lenses will be changed, deleted, or added by the upgrade. It also shows how changed assets will be modified—whether the change is to data or appearance. On the same screen, you have the option to download a file with code for changes made to the app. If you've customized the app, download and save the file so you can copy and paste customization code into the upgraded version.
8. *Upgrade option only:* If you're upgrading your app, click **Upgrade current app**. Remember, this overwrites any customizations you've made. You can also click **Back** to go back into the configuration wizard and change your selections or click the **X** in the upper-right corner to cancel.
9. *Create option only:* If you're creating a new app, name your app something different from the current version and click **Create new app**. This option saves your current app and all its customizations. You can also click **Back** to go back into the configuration wizard and change your selections or click the **X** in the upper-right corner to cancel.

If the link below the app name says "Reset app," you're using the latest version and don't need to upgrade.

USER PERMISSIONS


To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows

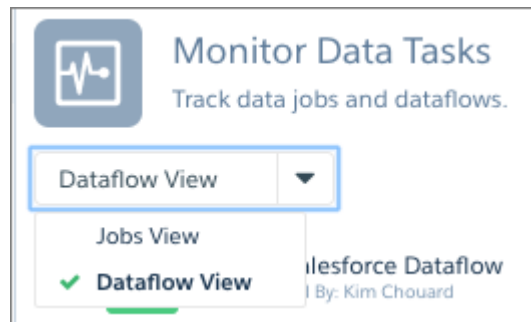
Schedule the Service Analytics Daily Dataflow

Schedule a daily dataflow at a time outside standard business hours before you start exploring with Service Analytics.

When you create Service Analytics, the creation process includes a dataflow that imports the latest Service Cloud data to Analytics. You can schedule the dataflow to be rerun every day to assure that your app uses up-to-date Salesforce data. Schedule the dataflow to take place sometime outside normal business hours so the dataflow doesn't interrupt your use of the app.

 **Note:** The Service Analytics dataflow runs only once when you create the app. Schedule it to run daily so the app uses the latest services data.

1. Go to **Analytics** in the Force.com menu (top right of the Salesforce window) if you're not already there. Open the Data Manager by clicking the gear icon at the upper right of the screen.
2. Select Dataflow view from the menu at the top left of the Data Manager screen.

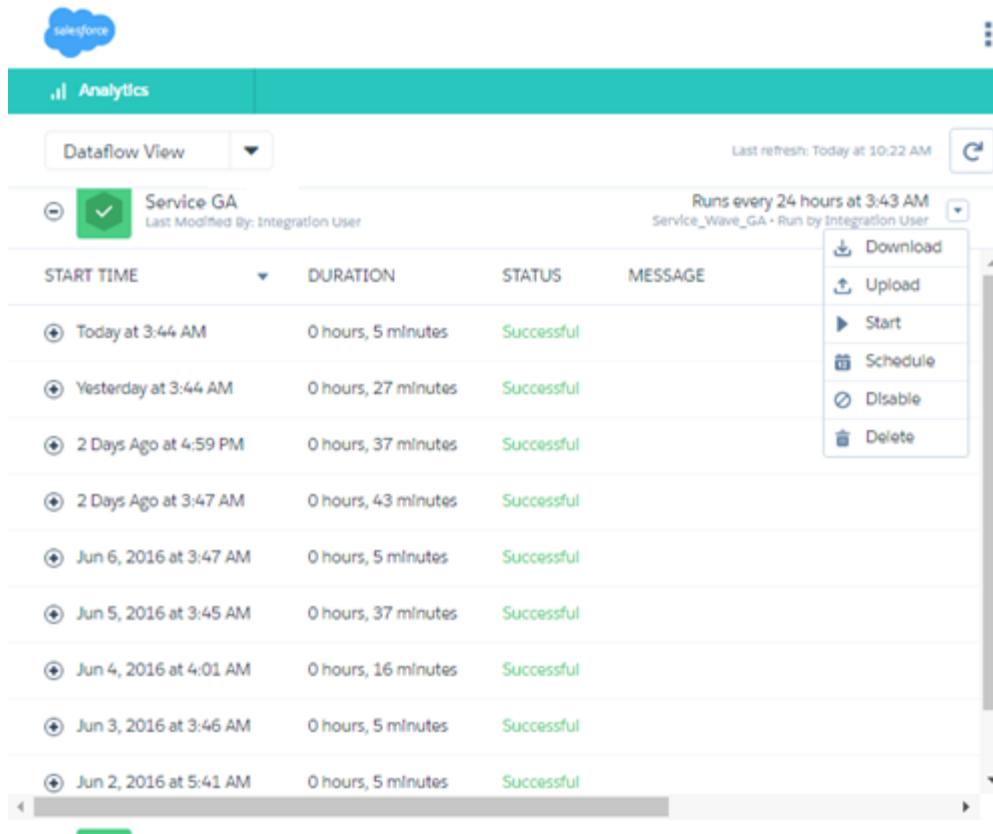


3. Find the app you created; you may have to scroll down the page. Open the menu on the far right of the screen next to the app icon and name. Select **Schedule**, and set a time for the dataflow. Select a time outside normal work hours so the dataflow doesn't interrupt business activities. Click **Save**.

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- Edit Analytics Dataflows



Embed Service Analytics Sidebar Dashboards in a Salesforce Page

USER PERMISSIONS

To use Analytics templated apps:	Use Analytics Templated Apps
To use Service Analytics:	Access Service Cloud Analytics Templates and Apps
To create and manage Analytics apps:	Manage Analytics Templated Apps
	Edit Analytics Dataflows
To edit a dataset's extended metadata (XMD) file:	Edit Analytics Dataflows
To create a Visualforce page (for Salesforce Classic pages)	Customize Application
To create and save Lightning pages in the Lightning App Builder	Customize Application
To view Lightning pages in the Lightning App Builder	View Setup and Configuration

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

Add Service Analytics dashboards to Salesforce pages so your service team can get a complete view of their cases and take appropriate action.

Service Analytics includes three specialized dashboards—called sidebars—to give service agents instant access to visualizations of data about their cases.

- The By Customer sidebar gives agents a snapshot of their customers, including products, case reasons and priority, and CSAT.
- The By Similarity sidebar shows data about previous cases so agents can guide customer interactions based on what they did in similar cases.
- The By Case History sidebar provides a quick view of the lifecycle of a case so agents can be informed during customer conversations.

Administrators can embed them in a Salesforce page so agents can access Service Analytics seamlessly while they carry out their normal case work. For example, if your Salesforce makes the Service Cloud available through a service console, that's an ideal place to embed the sidebar dashboards.

To embed a sidebar in Lightning Experience, use Wave Dashboard Components. Read the process in [Embed Analytics Dashboards in Lightning Pages](#), then see Steps 3, 4, and 5 below to create the filter.

To embed a sidebar in Salesforce Classic, follow the steps here.

1. Create a Visualforce page for each sidebar. Go to Setup and enter Visualforce Pages in the Quick Find box, then select Visualforce Pages, and click New. Enter a label with the name of the sidebar and, optionally, a description.
2. Replace the text that appears when you open the editor with the following: `<apex:page standardController="case">
<wave:dashboard dashboardId="Your_dashboard_id" height="1000px" showTitle="false"
filter="Filter_condition" /></apex:page>`
 - a. Replace `Your_dashboard_ID` with the dashboard ID for the sidebar. You can find the dashboard ID by opening the sidebar in Service Analytics; the ID is the last 15 characters of the URL for the sidebar.

Depending on which sidebar you're embedding, go to one of the following steps:

- **By Customer sidebar:** Go to Step 3.
 - **By Similarity sidebar:** Go to Step 4.
 - **By Case History sidebar:** Go to Step 5.
3. If you're creating a page for the By Customer sidebar, replace `filter="Filter_condition"` with one of the following, then skip to Step 6.
 - a. If you're embedding a sidebar dashboard from the Service Analytics (Classic) app built with the old dashboard designer in a Salesforce Classic page, use this syntax: `filter="{ 'ServiceCase1': { 'AccountId': ['!case.AccountId'] } }"`.
 - b. If you're using the latest version of Service Analytics based on the new dashboard designer, use this syntax to embed the dashboard in a Salesforce Classic page: `filter="{ 'datasets' : { 'ServiceCase1': [{ 'fields': ['AccountId'], 'filter': { 'operator': 'in', 'values': ['!case.AccountId'] }] } }"`.
 - c. If you're embedding a dashboard from the latest version of Service Analytics in a Lightning Experience page, use this syntax: `filter="{ 'datasets' : { 'ServiceCase1': [{ 'fields': ['AccountId'], 'filter': { 'operator': 'in', 'values': ['$AccountId'] }] } }"`.

In all cases, replace `'ServiceCase1'` with the name of the Service Case dataset. To find the name, open a dashboard, hit **Command+e** to view the JSON for the dashboard, and search for `ServiceCase`. The name of the dataset is appended with a numeral that's incremented each time you create the app, such as `'ServiceCase2'`. Enter the entire dataset name including the numeral.

4. If you're creating a page for the By Similarity sidebar, replace `filter="Filter_condition"` with one of the following, then skip to Step 6.
 - a. If you're using Service Analytics (Classic) with previous dashboards built with the old dashboard designer, use this syntax to embed the dashboard in a Salesforce Classic page: `filter="{ 'ServiceCase1': { 'Reason': ['{!case.Reason}'], 'Product__c': ['{!case.Product__c}'] } }"`.
 - b. If you use the latest version of Service Analytics based on the new dashboard designer, use this syntax to embed the dashboard in a Salesforce Classic page: `filter="{ 'datasets' : { 'ServiceCase1': [{ 'fields': ['Reason'], 'filter': { 'operator': 'in', 'values': '{!case.Reason}' }], { 'fields': ['Product__c'], 'filter': { 'operator': 'in', 'values': '{!case.Product__c}' } }] } }`.
 - c. If you're embedding a dashboard from the latest version of Service Analytics in a Lightning Experience page, use this syntax: `filter="{ 'datasets' : { 'ServiceCase1': [{ 'fields': ['Reason'], 'filter': { 'operator': 'in', 'values': ['$Reason'] } }, { 'fields': ['Product__c'], 'filter': { 'operator': 'in', 'values': ['$Product__c'] } }] } }`.

In all cases, do the following.

- Replace `'ServiceCase1'` with the name of the Service Case dataset. See Step 3 to learn how to find the name.
- Replace `'Product__c'` with the API name of the custom field you use to track products. This field is the answer you selected in the configuration wizard, Page 2, Question 4. Find the API name of this field by going to Setup and typing `Cases` in the Quick Find box. Then click `Fields` and review your custom field names to find the field you use for products. Look for the API name of the field, and use that in place of `'Product__c'` in both places in the query.



Note: If you use a custom field to track case reasons, replace `'Reason'` with the API name of your custom field. Find the API name using the same technique you use for finding the custom field you use to track products.

5. If you're creating a page for the By Case History sidebar, replace `filter="Filter_condition"` with one of the following, then skip to Step 6.
 - a. If you're using Service Analytics (Classic) with previous dashboards built with the old dashboard designer, use this syntax to embed the dashboard in a Salesforce Classic page: `filter="{ 'ServiceCase1': { 'Id': ['{!case.Id}'], 'OwnerId' : ['{!case.OwnerId}'], 'Product__c' : ['{!case.Product__c}'], 'Reason' : ['{!case.Reason}'] } }"`.
Also do the following:
 - Replace `'Product__c'` with the name of the custom field you use to track product family. See Step 4 to learn how to find the name of that field.
 - Replace `'Reason'` with the API name of the field you use to track the case reason. This field is the answer you selected in the configuration wizard, Page 2, Question 5. Find the API name of this field by going to Setup and typing `Cases` in the Quick Find box. Then click `Fields` and review your custom field names to find the field you use for case reason. Look for the API name of the field, and use that in place of `'Reason'` in the query.
 - b. If you're using the latest version of Service Analytics based on the new dashboard designer, use this syntax to embed the dashboard in a Salesforce Classic page: `filter="{ 'datasets' : { 'ServiceCase1': [{ 'fields': ['Id'], 'filter': { 'operator': 'in', 'values': '{!case.Id}' }] } } }`.
 - c. If you're embedding a dashboard from the latest version of Service Analytics in a Lightning Experience page, use this syntax: `filter="{ 'datasets' : { 'ServiceCase1': [{ 'fields': ['Id'], 'filter': { 'operator': 'in', 'values': ['$Id'] } }] } }`.

In all cases, replace `'ServiceCase1'` with the name of the Service Case dataset. See Step 3 to learn how to find the name.

6. Save the page, and open it in preview mode to be sure it shows the dashboard.

7. Add the page to the console or whatever page you prefer in Salesforce. Through Setup, find the specific page layout you want to include the sidebar. For example, some customers use a page layout for information from the Cases object. In that case, enter `Cases` in the QuickFind box in Setup, then open Page Layouts under Cases, and look for the page layout you want to edit.
8. Click Edit Layout and select the **Custom Console Components** tab near the top. Go the Right Sidebar section and select one of the pages you just created. First, select Visual Force page from **Type**, then select the page you just created from the **Component** drop-down. Enter a label.
9. Set the width to 450px and save the layout. The sidebar should appear embedded in the page you just edited.
10. Repeat this step with the other two sidebars, as needed.

Understand Service Analytics App Limitations

Service Analytics requires that Service Cloud include specific data, initially supports a limited set of Salesforce objects, and has other miscellaneous limitations.

Service Analytics Limitations

The following limitations apply to Service Analytics.

Service Analytics Data Requirements

Service Cloud data must include at least one each of the following for Service Analytics dashboards to function correctly: Events, tasks, closed cases, or published articles attached to a case or an opportunity. It also requires that your org have at least one contact ID associated with a case.

Custom formula fields on the Cases object must exist or be created for the SLA missed (text) and FCR (Boolean) fields.

Service Analytics Support for Salesforce Objects and Fields

Service Analytics supports all Salesforce standard and custom objects and data. When you first create the app by default it includes only a predefined set of objects and fields. The app creates a dataflow that exposes selected fields from the following Salesforce objects:

- Account
- Cases
- Contact
- User
- UserRole
- Task

Service Analytics also uses fields from the following options depending on the answers you select in the configuration wizard:

- Customer satisfaction (CSAT)
- Knowledge
- Business hours
- Case history
- Case record types
- Queues
- Opportunities
- Opportunity record types
- Events
- Telephony

- Live Agent
- Omni-Channel

Service Analytics supports standard and custom fields on standard Salesforce objects. The fields provided are determined by the answers you provide when you create the app using the built-in configuration wizard.

Service Analytics limits custom objects support to no more than 10 custom objects for each org that implements Service Analytics. This limitation is contractual, not technical.

To add custom objects or extra fields not included when you first create the app, you must update the Service Analytics dataflow. For details, see [Create Datasets with a Dataflow](#). For details, see [Create Datasets with the Dataflow](#).

More Service Analytics Limitations

Service Analytics does not support external data sources or registering new datasets from the app-generated dataflow.

Including CSAT score in dashboards/dataflow is optional. The app configuration wizard lets you associate CSAT from a custom case field or Custom Object associated to the Cases object.

You must manually add any security predicates or other dataset filters to the app dataflow.

The app does not support multi-hierarchy (team/manager) when you create it. You must manually add that functionality.

The Knowledge Usage dashboard currently reports on a single Article Type, which you select when you use the configuration wizard.

The Field Service Analytics App

The Field Service Analytics app brings the power of Analytics to Field Service Lightning on any device that supports Analytics.

With intuitive visualizations based on your field service data, Field Service Analytics provides just-in-time analytics for field service managers and dispatchers. You get clear data insights to improve every on-site experience. Field Service Analytics empowers managers with answers to help their technicians deliver personalized, actionable customer service.



Tip: Follow the steps in the order shown to get started with Field Service Analytics. If you haven't used Analytics before, learn more about it from the [Analytics Documentation](#).

IN THIS SECTION:

1. [About the Field Service Analytics App](#)

Learn the benefits of Field Service Analytics before you create and use the app to help manage field service operations.

2. [Field Service Analytics Prebuilt Dashboards](#)

The Fields Service Analytics app includes prebuilt dashboards to accelerate Field Service Lightning data exploration.

3. [Set Up and Create the Field Service Analytics App](#)

Set up Field Service Analytics app permissions, make sure your org is enabled to use Field Service Lightning, and assign field level security correctly so you can create and share the app.

About the Field Service Analytics App

Learn the benefits of Field Service Analytics before you create and use the app to help manage field service operations.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance,** and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To use Analytics templated apps:

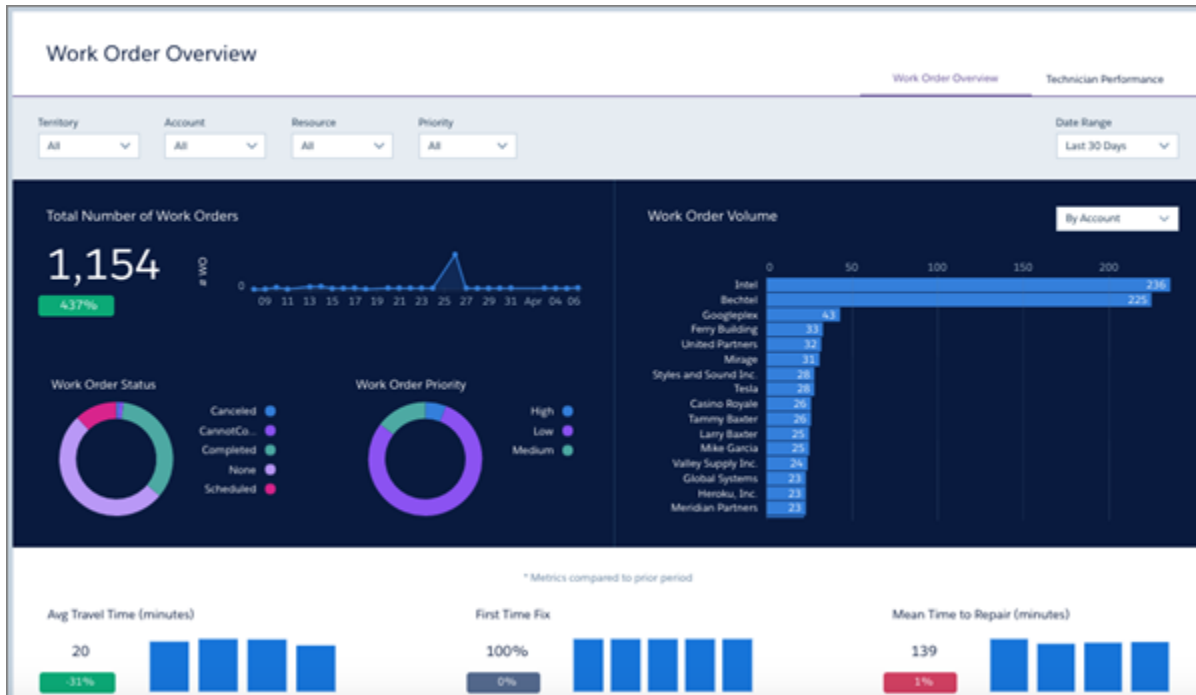
- Use Analytics Templated Apps

To use Field Service Analytics:

- Access Service Cloud Analytics Templates and Apps

To create and manage Analytics apps:

- Manage Analytics Templated Apps



Salesforce created the Field Service Analytics app to help service managers analyze customer service data their teams generate when they use Field Service Lightning. The app is bundled with the Service Analytics app.

Important: Your org must be enabled to use Field Service Lightning. Analytics datasets are based on Field Service Lightning's new object model.

We've designed Field Service Analytics to give you just-in-time analytics to optimize the outcome of your field service business. Service managers get a new level of insight into their field service data that they can use to maximize the efficiency of their technical service agents.

Using the app, service managers can access insights to improve every on-site service visit. You gain visibility into mobile workforce utilization, first-time-fix rate, and travel time. Problem detection lets you optimize field technician agent productivity. Performance analysis visualizations help your team prioritize and resolve work orders faster to improve customer satisfaction. Armed with actionable analytics, your agents can deliver personalized, effective customer service.

Analytics automatically creates the app for you based on your Field Service Lightning data. Select the Field Service Analytics template, click Create, and Analytics does the rest. You get actionable insights fast from your field service data using the intuitive Analytics interface. And you can drill deeper into key aspects of service engagements and technician performance by customizing Field Service Analytics around your business needs.

Note: Your organization can use Field Service Analytics with or without the Salesforce Analytics platform by purchasing a Service Analytics license. Each Salesforce Analytics license includes a Service Analytics license.

Field Service Analytics Prebuilt Dashboards

The Fields Service Analytics app includes prebuilt dashboards to accelerate Field Service Lightning data exploration.

USER PERMISSIONS

To use Analytics apps:

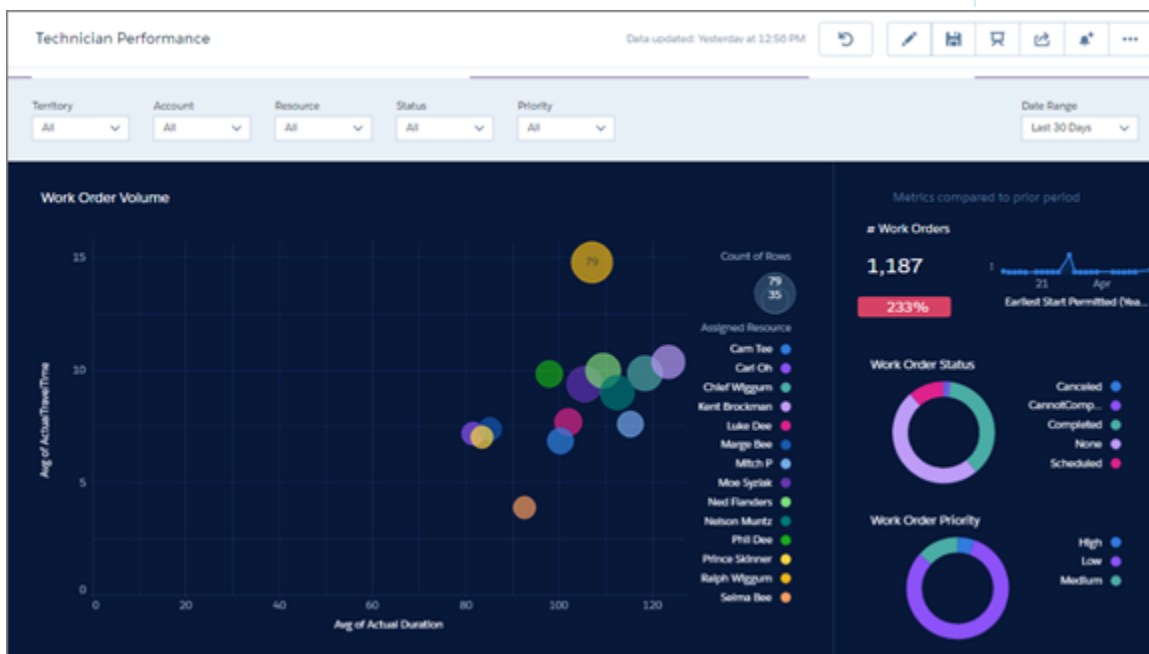
- Use Analytics Templated Apps

To use Field Service Analytics:

- “Access Service Cloud Analytics Templates and Apps”

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- “Edit Analytics Dataflows”



The prebuilt dashboards in the Fields Service Analytics app contain key performance indicators that help you get value from your Salesforce field service data—fast. The dashboards help you understand key elements of customer service work order status and field team performance. You can prioritize customer service engagements, make technician utilization decisions, and quickly drill down to isolate problems and take action. Quickly review first-time fix rates, utilization, SLA compliance, and travel-time analysis. Start from a territory overview of all accounts, products, and teams and zoom into the technician and work order level.

The following table guides you through Field Service Analytics dashboards. You can also explore further on your own at any point. To learn more about exploring data in Analytics, see [Explore and Visualize Your Data](#).

Table 14: Field Service Analytics Dashboards

Dashboard Name	Contents	Target User Role
Work Order Performance	Service managers start here for a summary of KPIs. Review work order volume, average work time, average travel times, and first-time fix rate. Also review technician agent data, including the number of work orders per technician, their planned and actual travel times, and utilization rates.	Service manager/dispatcher
Technician Performance	Focuses on each technician's work order volume. Review agent-by-agent work order prioritization, travel time, first-time fix rates, mean time to repair, due date and SLA violations.	Service manager
Service Resource	Shows time spent by an individual technician on each type of job so managers can assess technicians' efficiency. Also shows average number of jobs completed by the technician for a specific date range, the worker's first-time fix rate, and actual versus estimated travel times to job sites. Embeddable in technicians' pages so they can monitor their own efficiency KPIs.	Service manager and technician
Service Territory	Service managers can see the types of jobs completed in their territories—for example, HVAC, electrical, or plumbing—to ensure that their team members have the skills they need. They can also see the daily average number of jobs completed, technician utilization rate, and actual versus estimated technician travel times.	Service manager

Set Up and Create the Field Service Analytics App

Set up Field Service Analytics app permissions, make sure your org is enabled to use Field Service Lightning, and assign field level security correctly so you can create and share the app.

Set Up Field Service Analytics App Permissions

The Service Analytics license provides access to the Field Service Analytics app. To set up permissions for Field Service Analytics, follow the detailed instructions starting at [Set Up Permissions for the Service Analytics App](#).

USER PERMISSIONS

To create and manage Analytics apps:

- Manage Analytics Templated Apps
- "Edit Analytics Dataflows"

Make Sure That Field Service Lightning Is Enabled in Your Org

Important: Important: Your org must be enabled to use Field Service Lightning and its new standard object model to use Field Service Analytics.

1. Go to Salesforce Setup.
2. Enter **Field Service** in the Quick Find/Search box. If **Field Service Settings** appears in Setup, click it.
3. In the center window, under Field Service Settings, check to see if the box for **Enable Field Service Lightning** is checked.

If you're unsure that your org is set up to use Field Service Lightning, contact your Salesforce representative.

Assign Field Level Security

Before you create Field Service Analytics, set [Salesforce field-level security](#) to enable the Analytics Cloud Integration User to see all fields you'd like your app to include. Integration users run the dataflow, and if they don't have proper field-level security permissions, the dataflow can fail. For instructions, see [Create and Share the Service Analytics App](#), Step 2.

Create Field Service Analytics

Once you've completed the previous setup processes, create Field Service Analytics.

1. Go to Analytics.
2. Click Create in the upper right corner.
3. Select the Field Service Analytics template.
4. Name your app and click Create.


Analytics creates your app. This may take a few minutes while Analytics runs a new dataflow and creates the app's dashboards. Refresh your browser, and click the app you just created to see the dashboards.

Share Field Service Analytics

Now that you've created the app, share it with users in your organization. You can only share it with users who have the "Use Analytics Templated Apps" and "Access Service Cloud Analytics Templates and Apps" permissions enabled. To share the app, roll your cursor over the icon for the app and click **Share**. Next, type in the names of team members, click **Add**, and click **Save**.

Event Monitoring Analytics App

The Event Monitoring Analytics App integrates with event monitoring and setup audit trail data to give you insights into your user and org behavior.

 **Note:** As part of Event Monitoring, you also get the Event Monitoring Analytics App. Use this app to upload and access only the data provided to you as part of your subscription. Please prevent your users from using the app to upload or access any other data. Salesforce sometimes monitors such usage. The Event Monitoring Analytics App is available in English only. If you have an Analytics Platform license, you can access dashboards in the Event Monitoring Analytics app.

The Event Monitoring Analytics App is the first built-in way to explore your monitoring data in Salesforce. App creation is easy and with its prebuilt dashboards and datasets, you can start exploring right away. This app helps you drill into your org's data and swiftly identify suspicious behavior, slow page performance, and poor user adoption.

IN THIS SECTION:

1. [Set Up Salesforce Permissions for the Event Monitoring Analytics App](#)
Set up your org to use the Event Monitoring Analytics App by enabling Analytics, assigning permission set licenses, and then creating and assigning permission sets.
2. [Create and Share the Event Monitoring Analytics App](#)
After you've enabled the correct permissions, the setup for the Event Monitoring Analytics App is simple.
3. [Upgrade the Event Monitoring Analytics App](#)
Take advantage of the latest Event Monitoring Analytics features by upgrading your app every time we release a new version.
4. [Schedule the Event Monitoring Analytics Daily Dataflow](#)
Schedule a daily dataflow before you start exploring with Event Monitoring Analytics.
5. [Event Monitoring Analytics App Prebuilt Dashboards](#)
The Event Monitoring Analytics App comes with a set of prebuilt dashboards so that you can start exploring your data right away. Data from your org is automatically loaded into your Event Monitoring Analytics App datasets when it's generated.
6. [Get to Know Event Monitoring Analytics App Terminology](#)
To make the best use of the Event Monitoring Analytics App, it's helpful to understand the metrics and terms used in the app.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

USER PERMISSIONS

To use the Event Monitoring Analytics App:


- Use Analytics Templated Apps

To create and manage Event Monitoring Analytics Apps:

- Access Event Monitoring Analytics Templates and Apps
- Use Analytics Templated Apps
- Edit Analytics Dataflows

Set Up Salesforce Permissions for the Event Monitoring Analytics App

Set up your org to use the Event Monitoring Analytics App by enabling Analytics, assigning permission set licenses, and then creating and assigning permission sets.

 **Note:** As part of Event Monitoring, you also get the Event Monitoring Analytics App. Use this app to upload and access only the data provided to you as part of your subscription. Please prevent your users from using the app to upload or access any other data. Salesforce sometimes monitors such usage. The Event Monitoring Analytics App is available in English only. If you have an Analytics Platform license, you can access dashboards in the Event Monitoring app.

Each Event Monitoring Analytics Apps license provides access to Event Monitoring Analytics to up to 10 users. The table shows data storage limits for the app. If you require more data, you can purchase Analytics Cloud - Additional Data Rows, which entitles you to an additional 100 million rows.


USER PERMISSIONS

To create and manage Event Monitoring Analytics Apps:

- Access Event Monitoring Analytics Templates and Apps
- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Table 15: Event Monitoring Analytics App Data Storage Limits


License	Limit
Event Monitoring Analytics Apps	50 million rows when used without Analytics Platform license. Provides access to up to 10 users.
Analytics Cloud - Additional Data Rows	100 million rows.

 **Important:** Event Monitoring Analytics App license data storage limits are contractual, not technical. Licensee agrees to strictly monitor its total number of data rows.

Event log file data is available for the past 30 days. If you have a Developer Edition org, it's available for the last 24 hours.

Your org can use the Event Monitoring Analytics App with or without the Salesforce Analytics platform. The Event Monitoring Analytics app is available for free to any org with the paid Event Monitoring license. The Event Monitoring Analytics Apps license enables the following permissions.

Table 16: Event Monitoring Analytics App User Permissions

Permission	Function
Use Analytics Templated Apps	Enables access to all Analytics templated apps, including the Event Monitoring Analytics App.  Warning: This permission allows users to access event monitoring data without requiring the View Event Log Files and API Enabled user permissions. Use caution when assigning it.
Access Event Monitoring Analytics Templates and Apps	Gives admins the ability to create Event Monitoring Analytics apps.
Manage Analytics Templated Apps	Gives admins the ability to create templated Analytics apps for users in their orgs.
Edit Analytics Dataflows	Enables admins to upload and download JSON for existing data flows.

Event Monitoring App Setup Process

For best results, follow the steps for setting up the Event Monitoring Analytics app in the order shown.

IN THIS SECTION:

1. [Event Monitoring Analytics App Permission Set License and User Permissions](#)
The Event Monitoring Analytics Apps permission set license enables the user permissions required to explore data with and manage the Event Monitoring Analytics app.
2. [Identify Event Monitoring Analytics App User Types](#)
Identify Event Monitoring Analytics app user types and the tasks they perform to ensure that the setup process meets your team's event monitoring analytics needs.
3. [Enable Analytics and Event Monitoring Integration with Analytics](#)
After Salesforce provisions you with the Event Monitoring Analytics Apps license, enable Analytics and Event Monitoring.
4. [Select User Permissions and Assign Users to Event Monitoring Analytics App Permission Sets](#)
Give your users access to Event Monitoring Analytics features by assigning one or more permission sets based on the capabilities they need.

Event Monitoring Analytics App Permission Set License and User Permissions

The Event Monitoring Analytics Apps permission set license enables the user permissions required to explore data with and manage the Event Monitoring Analytics app.

Each Event Monitoring app user needs an Event Monitoring Analytics Apps permission set license. The Event Monitoring Analytics Apps permission set license enables the following permissions.

Table 17: Event Monitoring Analytics Apps Permissions

User Permission	What It Enables
Use Analytics Templated Apps	General access to all Analytics templated apps, including the Event Monitoring Analytics app.
Access Event Monitoring Analytics Templates and Apps	The ability to create Event Monitoring Analytics apps.
Manage Analytics Templated Apps	The ability to create templated Analytics apps for users in their orgs.
Edit Analytics Dataflows	Editing, starting, stopping, and rescheduling the dataflow. Creating, editing, and running dataset recipes. Monitoring dataflow and system jobs in the data monitor. Use discretion when assigning this user permission because it enables access to all Salesforce object data to which the Integration User has access. See Salesforce Data Access in Analytics .

Identify Event Monitoring Analytics App User Types

Identify Event Monitoring Analytics app user types and the tasks they perform to ensure that the setup process meets your team's event monitoring analytics needs.

The Event Monitoring Analytics Apps license includes the permissions required by users in your organization to administer Event Monitoring Analytics and explore event data. Set up Event Monitoring Analytics by considering the different ways people can access Event Monitoring Analytics features and categorizing users into types. Here are a few examples.

In most cases, Event Monitoring Analytics addresses the needs of two basic types of people on your team:

- Users, who view Event Monitoring Analytics dashboards and datasets.
- Administrators or managers, who access all Event Monitoring Analytics functionality to create apps, dashboards, and datasets, and otherwise customize the Event Monitoring app experience.

Accordingly, when you set up Event Monitoring Analytics, creating two basic permission sets probably meets the needs of most users in your organization:

- A “view” permission set that contains the permissions needed by most basic-level users when they access Event Monitoring Analytics.
- A “manage” permission set that’s reserved for a select few administrators and managers and contains permissions to use all Event Monitoring Analytics features.

In the detailed Event Monitoring Analytics app setup instructions that follow, we show you how to create and assign these two permission sets. Or, you can use the standard permission sets we provide.

Enable Analytics and Event Monitoring Integration with Analytics

After Salesforce provisions you with the Event Monitoring Analytics Apps license, enable Analytics and Event Monitoring.

Enable the Analytics Platform

1. In the Salesforce Setup menu, under Administer, select **Analytics Cloud | Getting Started**.
2. Click **Enable Analytics**.

Enable Event Monitoring

1. In Setup, enter *Event* in the Quick Find box, then select **Event Monitoring Setup**.
2. Select **Enable Event Log File Integration with Event Monitoring Analytics App**.

Select User Permissions and Assign Users to Event Monitoring Analytics App Permission Sets

Give your users access to Event Monitoring Analytics features by assigning one or more permission sets based on the capabilities they need.

After enabling Analytics and Event Monitoring Integration with Analytics, identify users who will access the Event Monitoring Analytics app and assign them to a permission set. You can create any permission set you need to meet the needs of your users. For convenience, two standard permission sets are provided.

USER PERMISSIONS


To create permission sets:

- **Manage Profiles and Permission Sets**

Standard Permission Sets	For
Event Monitoring Analytics Apps Admin	Users who create and customize Event Monitoring Analytics apps and data flows
Event Monitoring Analytics Apps User	Users who view Event Monitoring Analytics apps

Let’s begin selecting the user permissions in the Event Monitoring Analytics Apps Admin standard permission set.

1. From Setup, enter *Permission Sets* in the Quick Find box, then select **Permission Sets**.
2. Select the Event Monitoring Analytics Apps Admin permission set.

3. Select the feature permissions to enable for your permission set. Use **Find Settings** to search for them quickly. Select **Use Analytics Templated Apps**, **Access Event Monitoring Analytics Templates and Apps**, **Manage Analytics Templated Apps**, and **Edit Analytics Dataflows**. Make sure to select all four permissions.
 4. Click **Save**. You can now assign the permission set to users. See [Assign Permission Sets to a Single User](#).
 5. Repeat the steps for the Event Monitoring Analytics Apps User standard permission set. However, for this permission set, select only the **Use Analytics Templated Apps** user permission, because your end users need only view access. If they need more access, you can create your own permission set by cloning and customizing the standard permission set.
-  **Warning:** Assign the Event Monitoring Analytics Apps Admin permission set carefully, because it lets users create, edit, and delete the app. Assign it only to users who administer or manage the app.


SEE ALSO:

- [Assign Permission Sets to a Single User](#)
- [Create Permission Sets](#)

Create and Share the Event Monitoring Analytics App

After you've enabled the correct permissions, the setup for the Event Monitoring Analytics App is simple.

If you haven't enabled permissions and event log file integration, complete the steps in [Enable Analytics and Event Monitoring Integration with Analytics](#) on page 641.

 **Note:** Because event log files have a 24-hour generation period, you won't see your data in the app for the first day after you create it. The app includes some sample data so you can preview your dashboards in the meantime. Event log file data is available for the past 30 days. If you have a Developer Edition org, it's available for the last 24 hours.

1. Log in to Salesforce.
2. Select Analytics from the App Picker.
3. Click **App**, select **Event Monitoring Analytics App**, and then click **Continue**.
4. Give your app a name.
5. Click **Create**. The app creation process can take a while. You can check the progress by selecting **Data Manager** from the gear menu at the top of the page. If any part of your app creation fails, you'll need to recreate the app.
6. After your app is ready to go, you can share it with other users in your org. Remember that only users with the Manage Analytics Templated Apps and Access Event Monitoring Analytics Templates and Apps permissions can see the app. To share your app, hover your mouse over the app tile on the Analytics home screen and click **Share**. You can also share from the app itself.

USER PERMISSIONS

To use the Event Monitoring Analytics App:

- Use Analytics Templated Apps

To create and manage Event Monitoring Analytics App:


- Access Event Monitoring Analytics Templates and Apps
- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Upgrade the Event Monitoring Analytics App

Take advantage of the latest Event Monitoring Analytics features by upgrading your app every time we release a new version.

The banner at the top of your app home page tells you that we've released a new version. It also provides a link to more information about the release. There's also a link inviting you to start the upgrade process in the left column of the home page, just below the app name.

Here's how to upgrade your app.

1. Click either the **What's new** link in the banner or the **New version available** link in the left column of your app's home page.
2. You can read information about the new version on top of the page that opens. At the bottom of the page, find the buttons: **Upgrade current app** and **Create new app**.
3. See descriptions of what the buttons do by hovering over them. If you click **Upgrade current app**, you overwrite your current app and all its assets, replacing it with an app based on the new version. Upgrading also deletes any customizations, including any new fields or object that you've added to the dataflow or changes you've made to security settings and dashboard labels and colors. If you click **Create new app**, you create a second copy of your current app based on the new version. Decide which option suits your circumstances, and click the appropriate button.
4.  **Warning:** If you've customized your app, click **Create new app** instead of **Upgrade current app** to make an app copy based on the new version. Creating a new app preserves the current version and any customizations, which you can then manually copy into the new version of the app.

If you click **Upgrade current app**, you see a screen warning you that the upgrade option overwrites the current app and gets rid of any customizations you've made. If you're OK with overwriting customizations, check the box and click **Continue**. If you're not, click **Back** to return to the previous screen. Clicking **Continue** takes you to the configuration wizard. Skip ahead to step 6.

5. If you click **Create new app**, you're taken to the configuration wizard. You don't see a warning, since you're not overwriting your current app, which is preserved with any customizations you've made to it.
6. The configuration wizard is preloaded with the settings you chose last time you used the wizard. You can either keep those settings or change them. Go through each page of the wizard.
7. Once you complete the wizard, Analytics shows a screen that indicates which assets are impacted by the upgrade. Review the screen to see how many datasets, dashboards, and lenses will be changed, deleted, or added by the upgrade. It also shows how changed assets will be modified—whether the change is to data or appearance. On the same screen, you have the option to download a file with code for changes made to the app. If you've customized the app, download and save the file so you can copy and paste customization code into the upgraded version.
8. Upgrade option only: If you're upgrading your app, click **Upgrade current app**. Remember, this overwrites any customizations you've made. You can also click **Back** to go back into the configuration wizard and change your selections or click the **X** in the upper-right corner to cancel.
9. Create option only: If you're creating a new app, name your app something different from the current version and click **Create new app**. This option saves your current app and all its customizations. You can also click **Back** to go back into the configuration wizard and change your selections or click the **X** in the upper-right corner to cancel.

If the link below the app name says "Reset app," you're using the latest version and don't need to upgrade.

USER PERMISSIONS


To create and manage Event Monitoring Analytics Apps:

- Access Event Monitoring Analytics Templates and Apps
- Manage Analytics Templated Apps
- Edit Analytics Dataflows

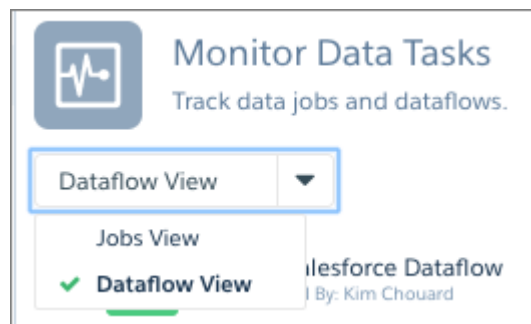
Schedule the Event Monitoring Analytics Daily Dataflow

Schedule a daily dataflow before you start exploring with Event Monitoring Analytics.

When you create Event Monitoring Analytics, the creation process includes a dataflow that imports the latest Event Monitoring data to Analytics. You can schedule the dataflow to be rerun every day to assure that your app uses up-to-date Salesforce data. Salesforce generates and uploads event log files in the early morning, usually at 6:00 AM. Schedule the dataflow for a couple of hours after so that the app has the latest data and that the dataflow doesn't interrupt your use of the app. We recommend running the dataflow between 8:00 and 9:00 AM.

 **Note:** The Event Monitoring Analytics dataflow runs only once when you create the app. Schedule it to run daily so the app uses the latest event data.

1. Go to Analytics in the Force.com menu (top right of the Salesforce window) if you're not already there. Open the Data Manager by clicking the gear icon at the upper right of the screen.
2. Select Dataflow view from the menu at the top left of the Data Manager screen.



3. Find the app you created; you may have to scroll down the page. Open the menu on the far right of the screen next to the app icon and name. Select **Schedule**, and set a time for the dataflow. Select a time outside normal work hours so the dataflow doesn't interrupt business activities. Click **Save**.

Event Monitoring Analytics App Prebuilt Dashboards

The Event Monitoring Analytics App comes with a set of prebuilt dashboards so that you can start exploring your data right away. Data from your org is automatically loaded into your Event Monitoring Analytics App datasets when it's generated.

Most of the dashboards represent a single event type on the EventLogFile object. The [EventLogFile object reference](#) contains detailed information about each event type. Two of the dashboards, My Trust and Setup Audit Trail, don't correspond to event types. Let's get a quick idea about what each dashboard does.

Analytics Adoption

Corresponds to the Wave Change, Wave Interaction, and Wave Performance event types. This dashboard shows Analytics usage and performance information.

Apex Executions

Corresponds to the Apex Execution event type. This dashboard lets you track trends in Apex code executions and performance.

API

Corresponds to the API Event event type. This dashboard gives you information about both your users' API usage and API performance in your org. You can see how often each object is being used, how fast each object is being processed, and what methods are being invoked on that object.

USER PERMISSIONS

To create and manage Event Monitoring Analytics Apps:

- Access Event Monitoring Analytics Templates and Apps
- Manage Analytics Templated Apps
- Edit Analytics Dataflows

Dashboards

Corresponds to the Dashboard event type. This dashboard helps you track dashboard adoption and performance.

Files

Corresponds to the Content Transfer event type. When users in your org perform content transfers (downloads, uploads, or previews), they show up on this dashboard. You can also track file adoption.

Lightning Adoption

Corresponds to the Lightning Interaction and Lightning Page View event types. Use this dashboard to see how users interact with Lightning Experience on the desktop and mobile devices.

Lightning Performance

Corresponds to the Lightning Error, Lightning Interaction, Lightning Page View, and Lightning Performance event types. Use this dashboard to optimize performance and user interactions with Lightning Experience and the Salesforce app.

Login-As

Corresponds to the Login As event type. This dashboard lets you see which admins are using the login-as feature and on which user accounts.

My Trust

The My Trust dashboard gives you an overall idea of what kind of events are taking place in your org over time. It also shows the average speed of these transactions.

Page Views (URIs)

Corresponds to the URI event type. This dashboard lets you see which pages users are accessing in the Salesforce desktop app.

Report Downloads

Corresponds to the Report Export event type. This dashboard lets you see which users are downloading your reports and where they're downloading them from.

Reports

Corresponds to the Report event type. This dashboard shows you trends in reporting as well as which users are running specific reports. You can also find out which reports are having performance issues.

RestAPI

Corresponds to the REST API event type. This dashboard shows you trends in REST API usage and which endpoints are seeing the most traffic. You can also view information about the IP ranges issuing the requests and which methods are being called.

Setup Audit Trail

Corresponds to the Setup Audit Trail page in Setup. Use this dashboard to see the changes your users are making in the Setup area.

User Logins

Corresponds to the Login event type. This dashboard shows login trends by user and information about where and how users are accessing your org.

Visualforce Requests

Corresponds to the Visualforce Request event type. Here you can see trends in Visualforce adoption and page performance.

Get to Know Event Monitoring Analytics App Terminology

To make the best use of the Event Monitoring Analytics App, it's helpful to understand the metrics and terms used in the app.

Term	Description
APT	Average page time. An aggregate metric across multiple transactions.

Term	Description
EPT	Experienced page time. The timing of a page transaction as seen by the user.
Event	A user-initiated interaction in Salesforce. For example, a login, the firing of an API call, or the download of a report. Events are related to the EventLogFile sObject.

The B2B Marketing Analytics App

B2B Marketing Analytics provides advanced analytics for the data-driven marketer, letting you explore both your marketing and sales data in one place. With powerful dashboards that consolidate Pardot and Sales Cloud data, you can quickly explore data, understand the impact of marketing on revenue, and take instant action to drive marketing results.

 **Note:** Help for the B2B Marketing Analytics app currently resides within the Salesforce Pardot Knowledge Base. Go to the [B2B Marketing Analytics overview page](#) to get started.

Find Insights with Einstein Discovery

Einstein Discovery exposes relevant facts and themes in your data without you building sophisticated software and statistical models. It generates unbiased answers, explanations, and recommendations.

Einstein Discovery walks you through what has happened and why, what has changed, what is likely to happen, and what you can do about it. Now anyone can tap into the power of data science and do statistical and predictive analytics.

IN THIS SECTION:

[Set Up Einstein Discovery](#)

Set up your org to use Einstein Discovery by creating and assigning permission sets and enabling Einstein Discovery.

[Get Started Using Einstein Discovery](#)

Einstein Discovery exposes relevant facts and themes in your data without you building sophisticated software and statistical models. It generates unbiased answers, explanations, and recommendations. Einstein Discovery walks you through what has happened and why, what has changed, what is likely to happen, and what you can do about it. Now anyone can tap into the power of data science and do statistical and predictive analytics.

[Display Einstein Discovery Recommendations in a Salesforce Object](#)

You can share actionable insights from Einstein Discovery with users in Salesforce.

[Learn Einstein Discovery with Trailhead](#)

Trailhead is the fun and free way to learn Salesforce. Now you can get acquainted with Einstein Discovery through Trailhead.

[Einstein Discovery Limits](#)

Einstein Discovery limits the number of rows and columns per dataset.

[Einstein Discovery Considerations](#)

Einstein Discovery differs from other Salesforce features in some ways.

Set Up Einstein Discovery

Set up your org to use Einstein Discovery by creating and assigning permission sets and enabling Einstein Discovery.

The information here describes how to set up your organization to use Einstein Discovery.

IN THIS SECTION:

1. [Learn About Einstein Discovery Permission Set Licenses and User Permissions](#)
Each Einstein Discovery - Analyst or Einstein Discovery - User license is a single-user license that provides access to Einstein Discovery.
2. [Create Permission Sets](#)
Create permission sets made up of Einstein Discovery user permissions.
3. [Assign Permission Sets to Users](#)
Assign the appropriate permission sets to users. Although you can assign a permission set to an individual user, for efficiency, you can also assign it to a group of users. You can assign multiple permission sets to a user.
4. [Enable Einstein Discovery](#)
Enable Einstein Discovery in your org.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

Learn About Einstein Discovery Permission Set Licenses and User Permissions

Each Einstein Discovery - Analyst or Einstein Discovery - User license is a single-user license that provides access to Einstein Discovery.

The Einstein Discovery - Analyst permission set license makes these user permissions available for provisioning.

User Permission	What It Enables
Connect Einstein Discovery Model	Connect Einstein Discovery model to a Salesforce object.
Create and Update Einstein Discovery Datasets	Import data into Einstein Discovery and easily create datasets from Salesforce data, CSV files, Oracle, Microsoft SQL Server, Postgres, MySQL, Hadoop, SAP, and Netezza.
Create and Update Einstein Discovery Stories	Create stories to discover relationships between a business relevant metric and the explanatory variables that are potential influencers of that metric.
Manage Einstein Discovery	Access all Einstein Discovery features and see all datasets and stories created by users.
Share Einstein Discovery Stories	Allow user to export Einstein Discovery stories to Word, PowerPoint, R, and Analytics.
Use Einstein Discovery	Use Einstein Discovery and view the datasets and stories that you have permission to view.
View Einstein Discovery Recommendations	View Einstein Discovery recommendations that are connected to a Salesforce object.

The Einstein Discovery - User permission set license makes these user permissions available for provisioning.

User Permission	What It Enables
View Einstein Discovery Recommendations	View Einstein Discovery recommendations that are connected to a Salesforce object.

Create Permission Sets

Create permission sets made up of Einstein Discovery user permissions.

Create Permission Sets

This example shows you how to create a *Manage Einstein Discovery* permission set, for users who create and administer Einstein Discovery.

 **Note:** To use Einstein Discovery, the View Setup and Configuration permission is required.

1. From Setup, enter *Permission Sets* in the Quick Find box, select **Permission Sets** and then click **New**.
2. For Label, enter *Manage Einstein Discovery*. The API name is filled in automatically.
3. For License, select **Einstein Discovery Analyst PSL**.
When you select a specific permission set license, any user assigned to the permission set is *auto-assigned* the permission set license. If you select --None--, you must *manually* assign the permission set license to users before you can add them to the new permission set.
4. Click **Save**. The Permission Set details page shows the new permission set.
5. Click **System Permissions** to open the list of user permissions enabled by the Einstein Discovery Analyst PSL license.
6. Click **Edit**.
7. Select **Manage Einstein Discovery**, and then click **Save**. You've successfully created a permission set that enables users to create and administer Einstein Discovery. You can now assign it to users.

You can build other permission sets out of the individual permissions enabled by the Einstein Discovery Analyst license, depending on the needs of users in your organization.

To create a different permission set for other kinds of users, repeat the steps to create a Manage Einstein Discovery permission set, with these exceptions:

1. Name the permission set something different.
2. Select the appropriate user permissions and click **Save**.

Assign Permission Sets to Users

Assign the appropriate permission sets to users. Although you can assign a permission set to an individual user, for efficiency, you can also assign it to a group of users. You can assign multiple permission sets to a user.

1. From Setup, enter *Permission Sets* in the Quick Find box, then select **Permission Sets**.
2. Click the permission set you want to assign to users.

 **Note:** Assign the Manage Einstein Discovery permission set only to users who administer or manage the app.

3. Click **Manage Assignments**, and click **Add Assignments**.

USER PERMISSIONS

To create permission sets:

- Manage Profiles and Permission Sets

USER PERMISSIONS

To assign a permission set to users:

- Assign Permission Sets

4. Select the users, and click **Assign**.
5. Click **Done**.

Repeat these steps for every user in your organization who requires access to Einstein Discovery.

Enable Einstein Discovery

Enable Einstein Discovery in your org.

1. From Setup, enter *Einstein Discovery* in the Quick Find box, then select **Getting Started**.
2. Use the toggle button to enable Einstein Discovery.

USER PERMISSIONS

To enable Einstein Discovery:

- Manage Einstein Discovery

Get Started Using Einstein Discovery

Einstein Discovery exposes relevant facts and themes in your data without you building sophisticated software and statistical models. It generates unbiased answers, explanations, and recommendations. Einstein Discovery walks you through what has happened and why, what has changed, what is likely to happen, and what you can do about it. Now anyone can tap into the power of data science and do statistical and predictive analytics.

The analysis centers around uncovering the relationships between a business relevant metric (outcome) and the metric's potential influences (explanatory variables). Einstein Discovery surfaces causes and correlations, points your investigations in the right direction, and suggests answers. It complements you and your team's knowledge of your business. When you combine your human intuition and domain knowledge with Einstein Discovery analytics, you gain amazing predictive insights that might never be found using manual analysis techniques.

IN THIS SECTION:

1. [Bring Your Data into Einstein Discovery](#)

You can import your data into Einstein Discovery to create datasets in several ways, including from Salesforce data, CSV files, Oracle, Microsoft SQL Server, Postgres, MySQL, Hadoop, SAP, and Netezza.

2. [Create a Story to Uncover Relationships](#)

Einstein Discovery quickly sifts through huge amounts of data to find the important correlations and make accurate predictions. Create a story to start uncovering the relationships between a business relevant metric and the explanatory variables that are potential influencers of that metric.

3. [Use the Story](#)

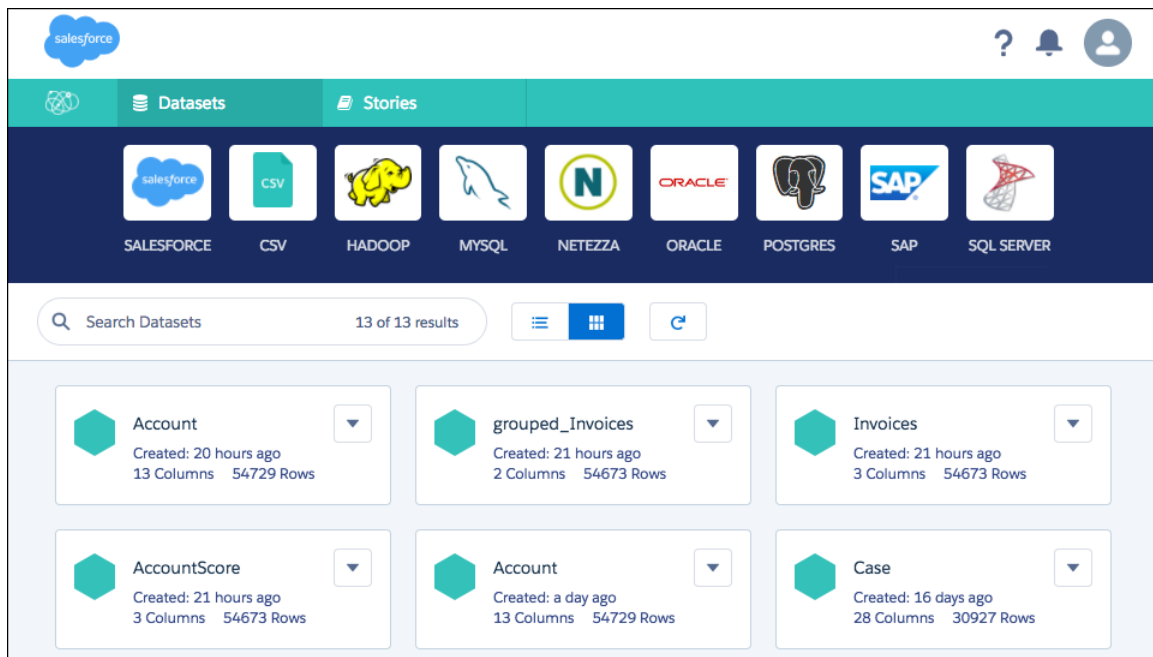
Einstein Discovery surfaces hidden, statistically sound patterns in your data to point your investigations in the right direction. It suggests unbiased answers so that you can focus on the metrics that matter. You learn why something happened and then what to do about it.

Bring Your Data into Einstein Discovery

You can import your data into Einstein Discovery to create datasets in several ways, including from Salesforce data, CSV files, Oracle, Microsoft SQL Server, Postgres, MySQL, Hadoop, SAP, and Netezza.

Get suggestions on how to improve the quality of your dataset, review the suggested changes, and make data improvements.

You can load one dataset at a time.



IN THIS SECTION:

[Open Einstein Discovery](#)

Use the App Launcher to open Einstein Discovery.

[Connect to Salesforce to Create a Dataset](#)

You can create Einstein Discovery datasets by importing your data from Salesforce.

[Upload a CSV File to Create a Dataset](#)

You can create Einstein Discovery datasets by uploading your data from a CSV file.

[Connect to Other Data Sources to Create a Dataset](#)

You can create a dataset from other data sources such as Oracle, Postgres, Microsoft SQL Server, MySQL, Hadoop, Netezza, and SAP HANA. Your data source must be accessible to the Einstein Discovery server.

[Use a Dataset Imported from an Einstein Analytics Dataflow \(Beta\)](#)

Create Einstein Discovery datasets using an Einstein Analytics dataflow. These dataflows can gather data from Salesforce objects, replicated objects, or existing Einstein Analytics datasets.

[Review Suggested Changes and Make Data Improvements](#)

Einstein Discovery includes several data transformation and manipulation features. If much data manipulation is required, do that step before you import your data.

[Edit, Share, or Delete a Dataset](#)

It's easy to edit, share, or delete a dataset in Einstein Discovery.

[Data Preparation for Predictive Analytics](#)

Data preparation is a critical success factor for achieving optimal results. The data preparation process involves choosing an outcome measure to evaluate and potential influencer variables. You then cleanse the data, create fields, and generate datasets to use for automated analysis. The quality of output relies on high-quality input. Einstein Discovery provides features for loading and lightly cleaning or modifying your data. You can also use third-party tools and utilities to further expedite data cleansing and wrangling tasks.

Open Einstein Discovery

Use the App Launcher to open Einstein Discovery.

In Lightning Experience, click the app launcher (), and then click the Einstein Discovery tile.

In Salesforce Classic, select **Einstein Discovery** from the app menu at the upper right.

 **Note:** Be sure to set your popup blocker to allow popups. Otherwise, your connected app doesn't launch.

If you don't see Einstein Discovery in the menu, ask your administrator to enable Einstein Discovery. For more information, see [Set Up Einstein Discovery](#).

Connect to Salesforce to Create a Dataset

You can create Einstein Discovery datasets by importing your data from Salesforce.

1. On the Datasets tab, click the **Salesforce** tile. Your Salesforce instance must be accessible to the Einstein Discovery server. If IP address restrictions are set for your Salesforce user profile, contact your administrator.
2. In the Connect to Salesforce window, provide the following information.
 - a. **Connection Name**—A name for your Salesforce connection.
 - b. **Salesforce Login URL**—The login URL of your Salesforce org.
 - c. **Username**—Your Salesforce username.
 - d. **Password (+ Security Token)**—A security token is an automatically generated key from Salesforce. For example, if your password is mypassword, and the security token is XXXXXXXXXXX, enter *mypasswordXXXXXXXXXX*. If you don't know your security token, you can request a new one via the Salesforce user interface. From your personal settings, enter *Reset* in the Quick Find box, then select **Reset My Security Token**. Click **Reset Security Token**. The new security token is sent to the email address in your Salesforce personal settings.
3. Click **Connect**.
4. On the Objects tab, select a Salesforce object in the Objects list.
5. Select the fields to import.
6. To copy the data to the Einstein Discovery server, click **Copy Data**. When it finishes, the new dataset appears in your list of datasets.

The next steps are described in "Review Suggested Changes and Make Data Improvements."

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To open Einstein Discovery:

- Use Einstein Discovery

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create or update a dataset:

- Create and Update Einstein Discovery Datasets

Upload a CSV File to Create a Dataset

You can create Einstein Discovery datasets by uploading your data from a CSV file.

1. On the Datasets tab, click the **CSV** tile.
2. Select the CSV file that you want to upload from your local drive. You can also upload a compressed CSV file. The recommended compression format is 7z, which is the open source file format used by 7-Zip. The normal ZIP compression format is discouraged for larger files. Your data is copied to the server and analysis is conducted on Einstein Discovery's copy of the data. It takes a few moments for the data to be transferred and processed. When finished, you see your dataset. The message, "Data Improvements Detected," means that ways to improve the quality of your dataset have been identified.

The next steps are described in "Review Suggested Changes and Make Data Improvements."

Connect to Other Data Sources to Create a Dataset

You can create a dataset from other data sources such as Oracle, Postgres, Microsoft SQL Server, MySQL, Hadoop, Netezza, and SAP HANA. Your data source must be accessible to the Einstein Discovery server.

1. On the Datasets tab, click the tile for your datasource.
2. In the connection information window, enter the connection name, host, database, port, username, and password. Only alphanumeric characters and the underscore (`_`), period (`.`), and dash (`-`) are allowed for the username, host, and database fields.
3. Click **Connect**.
4. Select the table to use.
5. Choose to either copy the data or link to the remote server. To copy the data to the Einstein Discovery server, click **Copy Data**. When you link to your database, the data remains on your server and analysis is conducted on the latest version of the data. To create a link, click **Direct Link**.

When finished, the new dataset appears in your list of datasets. The message, "Data Improvements Detected," means that ways to improve the quality of your dataset have been identified.

The next steps are described in "Review Suggested Changes and Make Data Improvements."

Use a Dataset Imported from an Einstein Analytics Dataflow (Beta)

Create Einstein Discovery datasets using an Einstein Analytics dataflow. These dataflows can gather data from Salesforce objects, replicated objects, or existing Einstein Analytics datasets.

Use an Einstein Analytics Dataflow to Export a Dataset to Einstein Discovery

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create or update a dataset:

- Create and Update Einstein Discovery Datasets

EDITIONS

Available in Salesforce Classic and Lightning Experience.



Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create or update a dataset:

- Create and Update Einstein Discovery Datasets

Let's look at how you can use the editor to configure the dataflow.

1. Open Analytics Studio. For more information, see [Open Analytics](#).
2. To open the data manager, click the gear icon () and then click **Data Manager**.
3. Click **Dataflows & Recipes**.
4. On the **Dataflows** tab, click the dataflow that produces the dataset that you want to export. The dataflow opens in the dataflow editor. For more information, see [Configure the Dataflow with the Dataflow Editor](#).
5. To add an export transformation, click the export transformation button ().
6. In the export window, enter the node attributes.
 - a. In the **Source Node** field, type the name of the node in the dataflow that identifies the dataset that you want to export.
 - b. In the **Target** field, select Einstein Discovery as the destination for the exported data.
 - c. In the **User** field, specify a user. This determines who will be the owner of the dataset in Einstein Discovery. Search for the user by name and then select the user ID in the search results. The User ID is placed into the **User** field.

export: export ✕

ATTRIBUTES OUTPUT FIELDS

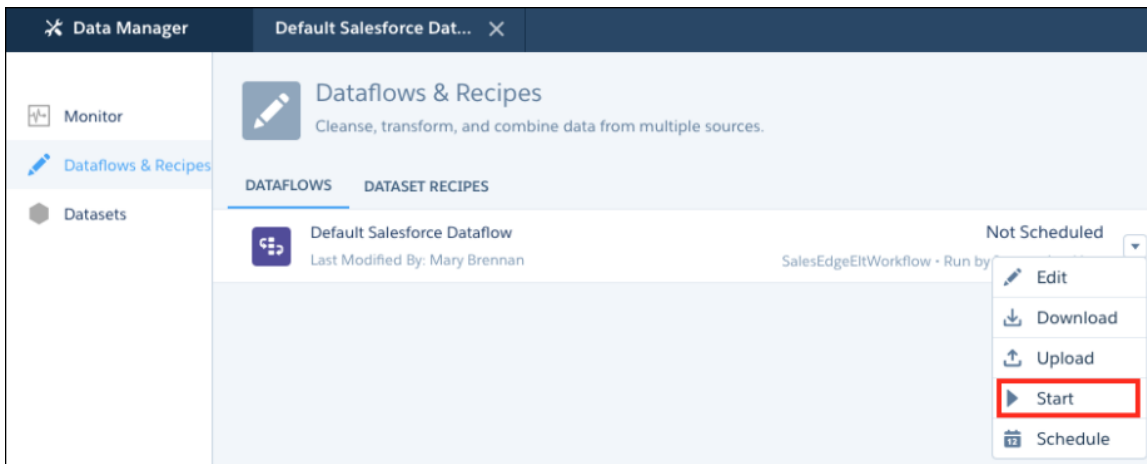
Source Node

Target

User

USER NAME	USER ID
✓ Admin User	005R000005R000005

7. Click **Save**. The new node appears on the canvas.
8. Click **Update Dataflow** to update the definition file with your changes. Updating a dataflow overwrites the existing dataflow. Analytics validates your dataflow to ensure that you provided all the required attribute values.
9. Click the **Data Manager** tab.
10. Click **Dataflows & Recipes**.
11. To start the dataflow, click the down arrow beside the dataflow and select **Start**.



12. Click the **Monitor** tab to view the progress of your dataflow. For more information, see [Manage and Monitor Dataset Recipes](#).

When the status of the dataflow is successful, the exported dataset will be visible in Einstein Discovery for the user you specified in the User field of the export transformation node of your dataflow. Each time the dataflow runs, a new copy of the dataset is put onto the Einstein Discovery datasets page.

Use a Dataset Imported from Einstein Analytics

Let's look at how you can use a dataset that was imported from Einstein Analytics.

1. Open Einstein Discovery.
2. Click the **Datasets** tab.
3. In your list of datasets, click the dataset that was imported from Einstein Analytics. Datasets that are imported from an Einstein

Analytics dataflow are shown with a bar chart logo in inside the icon.



Note: You will only see the exported dataset if you are logged in as the user that is specified in the User field of the export transformation node of the dataflow.

4. To give other users access to the dataset, share it with them.

Review Suggested Changes and Make Data Improvements

Einstein Discovery includes several data transformation and manipulation features. If much data manipulation is required, do that step before you import your data.

1. To see how Einstein Discovery can improve your data, click **Review Changes**. The number of columns and rows in the dataset are shown so you can verify that they're correct.
2. Review the dataset improvement suggestions. For example, you're notified if you have a value in a column that rarely occurs, because statistical tests can't be performed on small samples. If you select the action **Do Nothing**, these entries are bucketed into a category called "Other." Or you can choose to delete the row. If the value is spelled incorrectly and you want to fix it, select **Find And Replace**.
3. If a numeric column contains a non-numeric entry, you can replace the entry, delete it, change the column to a text column, delete the rows, or delete the entire column.
4. To view the first few rows of data in the original dataset, click **Original Dataset**.
5. To view the data after making dataset improvements, click **Improved Dataset**.
6. To save your changes, click **Apply**.
7. On the screen that appears, you can perform various data preparation tasks. When you make a change, the Create button turns into the Apply button. After you make a change, click **Apply**.
8. Set each field type to Text, Number, or Date. Einstein Discovery makes a best guess based on the values in each column of your dataset, but it's important to check that they make sense. Set categorical fields that you want to group by to Text. Your measures must be set to Numbers.
9. To rename a field, click the field name.
10. To delete a field, click the trash icon.
11. To view the minimum and maximum values in the imported data, click the gear icon beside a number or date field. You reduce a numeric or date field to a tighter minimum and maximum by clicking the value and editing it.
12. To rename categories or view the number of rows in a category, click the gear icon beside a text field. Deselecting the checkbox next to a category removes those rows from your dataset. To select every category, click **Add All Values**. To not include any category, click **Remove All Values**. You can also convert null values to zero or only include numbers. To rename a category, click the category name. You can also combine categories by giving them the same name.
13. To use a mathematical formula to create a column, click **Add Derived Column**. You can create columns based on the existing columns in your data or an absolute number that you specify. For example, you can calculate the ratio of two columns or take a column that contains the temperature in Celsius and create one that contains the temperature in Fahrenheit.
14. To add data from another dataset, click **Add Column from Lookup Table**. Specify the other dataset and the matching criteria (key). Select the field that you want to include from the second dataset. In the New Name field, you can enter a different label for the field. To add another field, click **Add Field**. When done, click **Submit**.
15. To create a grouped table, click **Create Grouped Table**. A grouped table combines (tabulates) multiple rows in the dataset into a single row. For example, a table lists individual purchases by a customer, but you want to know the total amount that the customer spent for the year. So you group the purchases by customer and purchase year before analyzing the data. The data is summarized and tabulated by the variable that you chose to group by. You can also specify how each numeric column in your dataset is tabulated based on the primary Group By variable. Pick a numeric field and select Average, Sum, Min, or Max (or for a Text field, select **First** to use the value of the first row). For example, if you select **Average**, it calculates the average of this variable for each distinct value of the Group By. If you select **Sum**, it calculates the sum of the variable for each distinct value. If you select **First**, it chooses the value for this column for the first row that matched the group by criterion. If you group individual purchases by each customer, and the original table is ordered by date of purchase, First on the Product Name column returns the first purchase made by the customer in that time period.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create or update a dataset:

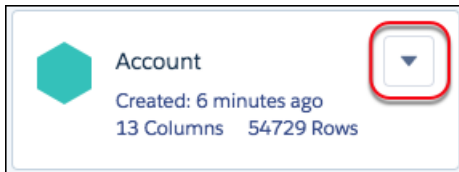
- Create and Update Einstein Discovery Datasets

16. When you have finished making your changes, click **Apply** and then click **Create**.

Edit, Share, or Delete a Dataset

It's easy to edit, share, or delete a dataset in Einstein Discovery.

1. On the Datasets tab, click the down arrow in the corner of the dataset tile.



2. Click **Edit Dataset**, **Share Dataset**, or **Delete Dataset**.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise**, **Performance**, and **Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create or update a dataset:

- Create and Update Einstein Discovery Datasets

The screenshot shows the Salesforce Einstein Discovery interface for a dataset named "Account". At the top, there are navigation tabs for "Datasets" and "Stories". Below the dataset name, there are action buttons: "Delete", "Undo Changes", "Share", "Export to Wave", and "Create +".

Key statistics for the dataset are displayed:

- Created On: 4/27/2017
- Columns: 13
- Rows: 54729

The main area shows a list of fields with their types and names:

Type	Field Name	Actions
Text	Division__c	[Delete] [Settings]
Text	Name	[Delete] [Settings]
Text	BillingState	[Delete] [Settings]
Date	Close_Date__c	[Delete] [Settings]
Number	Ext_Id__c	[Delete] [Settings]
Text	Industry	[Delete] [Settings]
Text	Ownership	[Delete] [Settings]
Text	Rating	[Delete] [Settings]
Date	Start_Date__c	[Delete] [Settings]
Text	Type	[Delete] [Settings]
Number	Close_Date__c_datesubtract...	[Delete] [Settings]
Number	InvoiceValue_Invoices	[Delete] [Settings]
Text	AccountScore_AccountScore	[Delete] [Settings]


On the right side, there is an "Additional Options" panel with the following buttons:

- Add Derived Column
- Add Column from Lookup Table
- Create Grouped Table

Data Preparation for Predictive Analytics

Data preparation is a critical success factor for achieving optimal results. The data preparation process involves choosing an outcome measure to evaluate and potential influencer variables. You then cleanse the data, create fields, and generate datasets to use for automated analysis. The quality of output relies on high-quality input. Einstein Discovery provides features for loading and lightly cleaning or modifying your data. You can also use third-party tools and utilities to further expedite data cleansing and wrangling tasks.

To get started with Einstein Discovery, select a few columns of data, including one outcome measure (for example, revenue, units, or days). Also select several predictor, independent variables (for example, product category, region, date of sale, customer type) to find what insights are immediately identified. Then you can continue to experiment with more columns of data or by organizing your dataset in a machine-learning-friendly format.

 **Note:** It's best to start with just a few columns and then add more data using the following techniques to optimize results.

Depending on your project, data preparation can be a one-time activity or a periodic one. Predictive analytics is an iterative process that can continue after your solution has been deployed. As new insights are revealed, it is common to experiment by adding or changing aspects of the input data. You can schedule analysis to continually add new data to your model incrementally. It is also common to periodically update your model variables and fields with new information or more focused business questions.

Einstein Discovery requires data to be input as a table, view, or comma-separated (.csv) flat file of rows and columns. If you have data stored in a dimensional data warehouse or transactional database format, use record identifiers or primary keys to join fields from multiple tables to create a single, unified, flattened view. Your view contains an outcome metric, along with input predictor variables collected at a level of analytical granularity that you can make actionable decisions on.

For many outcome metrics, data is captured at various business process steps in multiple data sources. A sales process can have data in a CRM, email marketing program, Excel spreadsheet, and accounting system. If that is the case, identify the fields in those systems that can relate or join the different data sources together.

If you want to capture changes in data over a time period, check if your data source is keeping only the current state values of a record. Most data warehouses are designed to save different values of a record over time and do not overwrite historical data values with current data values. Transactional application data sources, Salesforce for instance, contain only the current state value for a record. Getting a prior value requires storing a snapshot of the historical data or keeping the prior value data in custom fields on the current record.

After identifying outcome metric business process data sources and fields, select any fields (predictor variables) that directly affect the outcome. Ensure that the variable data is clean and consistent. The order and meaning of input predictor variables must remain the same from record to record. Inconsistent data formats, "dirty data," and outliers can undermine the quality of analytical findings.

Then you shape the data into analytical fields with derived variables that describe or influence the outcome metric. Shaping data involves subject-matter expertise to creatively select, create, and transform variables for maximum influence.

Select an Outcome Metric


The first thing you decide is which metric you want to better understand and at what granularity. A metric could be a revenue, discount or cost measure, duration, or any business process number. You can also use categories with two values as a numeric outcome, such as Win (100)/Loss (0). Two-value outcomes are less accurate than continuous value outcomes. Occasionally, a new metric is created, such as customer revenue by month. It's possible to create outcome variable metrics.

Einstein Discovery algorithms assume that each record is independent and are not related to other records. If relationships exist between records, create a variable within the row of data to capture that behavior. For instance, if the same Opportunity has multiple competitors, don't prepare multiple rows of data with the same Opportunity ID. Instead, create more fields on one Opportunity ID and indicate whether each of the top-10 competitors were present in the deal.

Select Predictor Variables

Think about which variables can relate, describe, or influence the numeric outcome. In our sales example, potential influencer variables include Discount, Days between Lead Received and Last Contacted, Lead Source, Region, Vertical, Competitor, and Promotion. When selecting predictor variables, you want to gather a maximum amount of information from a minimum number of variables. Einstein Discovery helps this process by eliminating variables that do not have good explanatory power from the story it generates.

Dates are usually rolled up to a duration when used as input in Einstein Discovery. If a business process has multiple key dates, create multiple variables in the Einstein Discovery prepared input view to store numeric durations (for example, Days between Lead to Last Contact and Days between Demo to Trial). Common date variable rollups include the earliest date and the most recent date. Time durations can also be represented in either absolute or relative form.

 **Note:** For proof-of-concept projects, keep your input data between 10 and 25 variables. It's faster to learn and improve your data preparation skills with a less complex model.

Einstein Discovery figures out which variables and combinations of variables best explain the behavior of your chosen metric without overfitting or underfitting your analysis.

Overfitting is a common beginner predictive modeling mistake that happens when too many variable fields are used in a predictive model. Overfitting captures the noise in your data with an overly complex, unreliable predictive model. Essentially what happens is that the model memorizes unnecessary details. When new data comes in, the model fails. To avoid overfitting, exclude variables that are too detailed.

Underfitting is often the result of an excessively simple model, and the statistical algorithm cannot capture the underlying patterns in the data. Thus there is a delicate balance between being too specific with too many variables and too vague with not enough selected variables.

Determine the Appropriate Level of Granularity

Determine the appropriate level of granularity for the business insights of interest. What level of insights are of interest to achieve the objective? For example, customer-level insights are of interest when looking at customer revenue. You can adjust the granularity of the data with grouping.

Choose a granularity that is actionable, understandable, and useful so that you can incorporate the results into your business process or application.

A common mistake is to overly aggregate data. Keep the desired outcome in mind, and use data collected in rows at that level of granularity. Data analyzed in Excel might be at a different level than you want for Einstein Discovery. For example, to understand the effects of day of the week, provide data at the day level. You cannot predict a day-level outcome from an aggregated, monthly level dataset.

Statistical analysis datasets can summarize a lifetime of values in just one single row with many columns that describe different points in time. Don't collect a lifetime of fields if a window of time, the "right horizon," more accurately predicts the outcome metric. Usually events closest to the outcome are stronger predictors than events that happened a long time ago.

To use Einstein Discovery for predictions, your variables must be at the point in time that the prediction is based on. For example, let's say that your objective is to decrease defaults on loans by not pre-approving loans that are likely to default. In this case, you capture variables, such as a credit score at the time of loan application and prior. If the person was late on two payments after loan origination, it would not be used in the pre-approval analysis because they have already been approved.

Cleanse and Prepare Data

Einstein Discovery conducts or recommends several of the steps required to clean and prepare your data. It also looks at combinations of variables to detect complex predictors. However, experts can further improve the quality of the analysis by carefully preparing the data. Assess the condition of your source data. As you collect the data into variables, profile the values. Look for extremes, outliers, missing values, incorrect values, skew, and high cardinality. Common data preparation issues are identified during the data-loading process. You can repair them in Einstein Discovery or in your data preparation process.

We recommend that you address data quality issues as early as possible. If you are seeing errors from source applications, a best practice is to resolve the issue at the source system instead of during data preparation. Here are a few approaches for handling common data issues for predictive data preparation.

Extreme Values and Outliers

Einstein Discovery algorithms are sensitive to outliers because those values affect averages (means) and standard deviations in statistical significance calculations. If you find unusual values or outliers, confirm whether these data points are relevant and real. Often unusual values are errors. If the extreme data points are accurate, predictable, and reoccurring, do not remove them unless those points are unimportant. You can reduce outlier influence by using transformations or converting the numeric variable to a categorical value with binning.

Missing Values

The most common repair for missing values is imputing a likely or expected value using a mean or computed value from a distribution. If you use a mean value, you could reduce your standard deviation. Thus, the distribution imputation approach is more reliable. Another approach is to remove records with missing values. Don't get too ambitious with filtering out missing values. Sometimes the pattern is in the missing data. Also, if you delete too many records, you undermine the real-world aspects in your analysis.

Incorrect Values

Predictive algorithms assume that the input information is correct. If only a few rows have incorrect values, decide whether to remove those rows from the analysis or replace the incorrect values with more correct or average values. If there are numerous inaccurate values, determine why the inaccuracies happened and whether it's possible to repair them. Sometimes it's better to remove a highly error-prone variable than include it in the analysis.

Skew

For continuous variables, review the distributions, central tendency, and spread of the variable. These variables are measured using various statistical visualization methods. Confirm that continuous variables are normally distributed. If not, try to reduce skewness for optimal prediction. For categorical variables, use a frequency table, along with a bar chart, to understand distributions of each category. If variable values are skewed, Einstein Discovery could produce biased models. When a skewed distribution must be corrected, the variable is typically transformed by a function, such as the Box-Cox transformation. After applying the fix, a normal distribution for the variable is achieved. The newly prepared, transformed variable performs much better for predictive modeling purposes.

High-Cardinality Fields

High-cardinality fields are categorical attributes that contain many distinct values. Examples include names, ZIP codes, or account numbers. Although these variables can be highly informative, high-cardinality attributes are rarely used in predictive modeling. The main reason is that including these attributes vastly increases the dimensionality of the dataset, making it difficult or even impossible for most algorithms to build accurate prediction models.

Ordinal Variables

Ordinal variables are problematic for predictive models. Ordinal data consists of numerical scores on an arbitrary scale that is designed to show ranking in a set of data points. For example, Low, Medium, and High are ordinal. Predictive algorithms assume that the variable is an interval or ratio variable and therefore be misled or confused by the scale. Ordinal variables are usually treated as categorical. If you have ordinal values, transform them into continuous or categorical values.

Duplicate, Redundant, or Highly Correlated Variables

Minimize duplicate, redundant, or other highly correlated variables that carry the same information. Einstein Discovery algorithms perform better without these kinds of collinear variables. Collinearity occurs when two or more predictor variables are highly correlated, meaning that one can be linearly predicted from the others with a substantial degree of accuracy. To avoid collinearity, do not include multiple variables that are highly correlated or data that is from the same reporting hierarchy. For example, customers who live in the city of Tampa also live in the state of Florida. To identify high correlation between two continuous variables, review scatter plots. The pattern of a scatter plot indicates the relationship between variables. The relationship can be linear or nonlinear. To find the strength of the relationship, compute correlation. Correlation varies between -1 and $+1$.

Create Fields

There is an art to extracting more information from existing data by creating fields and making the data you already have more useful. Fields that precisely describe the process being predicted can improve pattern detection and enable more actionable insights to be found. Creating fields from several combined variables and ratios usually provides more improvement and model accuracy than any single-variable transformation because of the information gain associated with these interactions.

Aggregations

Some commonly computed aggregated fields are the mean (average), most recent, minimum, maximum, sum, multiplying two variables together, and ratios made by dividing one variable by another.

Ratios

Ratios can be excellent fields. A ratio can communicate more complex concepts, such as a price-to-earnings ratio where neither price nor earnings alone can deliver this insight.

Transformations

Transformation refers to the replacement of a variable by a function. For instance, replacing a variable by its square or cube root or logarithm is a transformation. You transform variables when you want to change the scale of a variable or standardize the values of a variable for better understanding. Variable transformation can also be done using categories or bins to create variables, for example, binning continuous Lead Age into Lead Age Groups or Price into Price Categories, such as Discount, Retail, and OEM.

Generate Datasets

The most common strategy is to split data into training, testing, and validation datasets. These datasets are usually created through a random selection of records without replacement, meaning each record belongs to only one. All three datasets must contain at least 10,000 rows of data and reflect your real-world scenario.

How Much Data to Get

You must provide Einstein Discovery with at least 10,000 records that resemble real-world distributions of variables to build reliable predictive models. The actual number of records is not always easy to determine and depends on patterns found in your data. If you have more noise in your data, you need more data to overcome it. Noise in this context means unobserved relationships in the data that are not captured by the input predictor variables. In general, more rows of data are better for analysis accuracy. Columns with more possible values result in finer segmentation of the data, but can require more rows of data for a statistically sound analysis. For example, 10,000 rows with a binary outcome of gender (either male or female) results in potentially 5,000 observations per gender. But 10,000 rows with a variable indicating 50 states results in potentially 200 observations per state.

Cross-Validation

Einstein Discovery has an optional k-fold cross-validation feature that divides the data into k subsets with the holdout repeated k times. One of the k subsets is used as the test set, and the other k-1 subsets are put together to form a training set. K-fold cross-validation enables you to independently choose how much data to use in testing.

 **Note:** Einstein Discovery uses industry-standard, k-fold cross-validation for predictive model evaluation when it is selected during story development.

Time Series Consideration with Datasets

Data that changes over time must be reflected in your model and also in your input dataset. When time sequences (Lead Received > Quote Provided > Deal Closed) are important in predictions, proportionally collect data from those different time periods. The key principle is to provide data that reflects what actually happens in the real world at the right level of outcome metric granularity.

Thinking Proportionally

When collecting data, think about the balance of your variables in your raw data. For example, how many vertical industry records are there by time period? When extracting a subset of data, include approximately the same proportion of variables in your input dataset. If you provide more records of one variable, vertical in our example, you can unintentionally introduce bias into your analysis. If you have datasets with millions of rows, it is unlikely to encounter accidental bias.

Create a Story to Uncover Relationships

Einstein Discovery quickly sifts through huge amounts of data to find the important correlations and make accurate predictions. Create a story to start uncovering the relationships between a business relevant metric and the explanatory variables that are potential influencers of that metric.

1. On the Datasets tab, click the down arrow in the corner of the dataset tile.
2. Click **Create Story from Dataset**. If you have unresolved improvements for your dataset, the Create Story from Dataset option is not available. In that case, click **Review Changes** to prepare the dataset.
3. On the Story Setup page, you see “Maximize the variable <variable> in <dataset>.”

EDITIONS

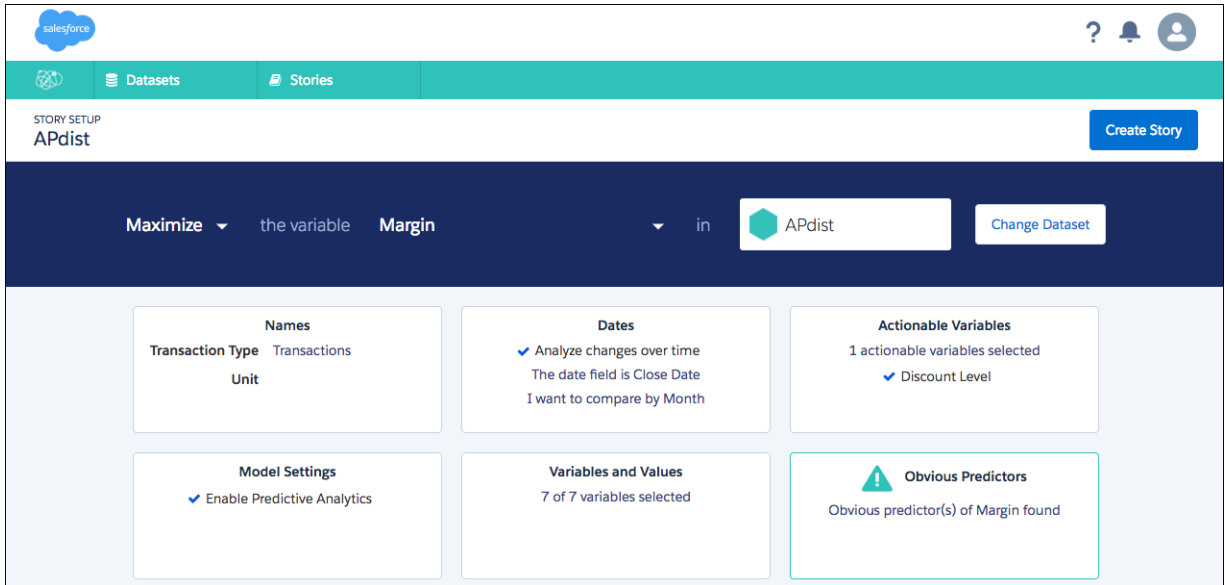
Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

To create a story:

- Create and Update Einstein Discovery Stories



4. Click the down arrow next to the variable, and scroll through the available measures. Select the one you want to understand. This variable is the outcome variable.
5. Click the down arrow next to Maximize, and select **Maximize** if you want the outcome variable to increase. Select **Minimize** if you want to decrease it. The other options on the story setup page are optional and described in more detail later.
6. To rename the story, click the title. The default story title is the name of the dataset that you are analyzing.
7. Click **Create Story**. Einstein Discovery analyzes hundreds, thousands, or millions of variable combinations to find hidden, statistically significant insights in your dataset. Each user can create one story at a time.

IN THIS SECTION:

[Optional Settings on the Story Setup Page](#)

You can modify the story by selecting different measure variables to analyze and configure the model.

Optional Settings on the Story Setup Page

You can modify the story by selecting different measure variables to analyze and configure the model.

- **Names**—To improve the readability of the narrative text that is generated for your story, change the default names of the units and transaction types.
- **Dates**—If your data contains a date column, the Dates tile is visible. Use this setting to analyze changes over time—daily, monthly, quarterly, or yearly—and identify trends within the data.
- **Actionable Variables**—Specify which variables you can manipulate (actionable variables). The variable you selected in your question is unavailable because it's already being used as the outcome variable. Einstein Discovery finds which value within the actionable variable leads to the greatest positive impact and prescribes which actions to take. Not all variables are actionable. For example, in a retail context, sometimes you can't change the region sold to because the region is assigned, so you can't change it to obtain better performance. If you know that you want to see prescriptions in the "How Can I Improve It" insights of your story, select actionable variables. This setting increases processing time, so instead of selecting actionable variables consider running the analysis later from within the story.
- **Model Settings**—These settings let you specify which types of analysis to run. You can select more than one option.
 - **Enable Predictive Analytics**—Runs the predictive model for the dataset. If you don't select this option, only the "What Happened" and "What Changed Over Time" insights are generated.

- **Use Logistic Regression**—Creates a piecewise linear model and leverages a logistic model that is appropriate for boolean outcomes. The results are shown in the “What Will Happen” part of the story in which terms are expressed in Log Odds rather than Linear Coefficients. The piecewise linear model includes ridge regression to avoid overfitting. It is not a bound model, so it produces values greater than 1 and less than 0 in a boolean scenario.
- **Perform K-Fold Validation**—K-fold validation randomly divides the data into k equal size subsets. The model is trained k times based on $(k-1)$ portions of the data and is then tested on the remaining one portion of data. By default, Einstein Discovery divides the data into four subsets. You can see the model validation results in the R code after the story is created.
- Variables and Values—These settings let you modify the fields used for this story. The changes don’t affect the saved dataset. To exclude a field from the story, click the trash icon. To modify a field’s settings, click the gear icon. The available settings are different for each data type.
 - **Date fields**—The date range and time period to analyze.
 - **Text fields**—The sort order for insights. You can rename the categories, and you can combine categories by giving them the same name. If **Combine unchecked values into the Other column** is selected, deselecting categories includes the rows they contain in the Other category. Otherwise, deselecting a category removes its rows from your analysis, but doesn’t remove them from the underlying dataset.
 - **Number fields**—Specify whether each category has the same transaction count or numeric width. Click the minimum and maximum values to reduce the field to a tighter minimum and maximum.

Use the Story

Einstein Discovery surfaces hidden, statistically sound patterns in your data to point your investigations in the right direction. It suggests unbiased answers so that you can focus on the metrics that matter. You learn why something happened and then what to do about it.

Based on historical behavior, you see what the future might hold and what the effective options are for dealing with a situation.

IN THIS SECTION:

[Play the Executive Summary of the Story](#)

The executive summary walks you through the key insights as a human analyst would.

[Story Insights](#)

The initial story is a series of charts that present the insights in the order of influence on the outcome variable that you specified on the Story Setup page.

[What Happened Insights](#)

The first insights presented are about what happened. These descriptive insights are the primary insights in your story.

[What Changed Over Time Insights](#)

What Changed Over Time insights are descriptive. Not only do they tell you what changed over time, but they also show you the trend in the data across different time periods.

[Why It Happened Insights](#)

Why It Happened insights are diagnostic. There might be several unrelated factors that contribute to a visual pattern you can see in an insight.

[What Could Happen Insights](#)

What Could Happen insights are predictive.

[How Can I Improve It Insights](#)

You can explore which values of variables maximize or minimize your desired outcome. Einstein Discovery recommends specific actions, quantifies the expected impact, and explains the reasoning behind the recommendations.

[Interact with Insights](#)

Interact with the insights to explore the story.

[Examine the Story Timeline](#)

Learn which factors drive changes over time.

[Explore and Add More Insights to Your Story](#)

Einstein Discovery presents the insights with the highest statistical importance and highlights the areas to focus on. You can further explore the data by changing the filters. As you explore, you can add insights to your story.

[Improve the Story](#)

Make your story even better with suggestions from Einstein Discovery.

[Refresh the Story](#)

You can refresh a story with updated data and rerun the analysis.

[Modify the Story Settings](#)

After the initial analysis, you can change the story settings and rerun the analysis. Stay on top of changes and iterate the analysis.

[View Story Details](#)

You can display a summary of the story details.

[Share or Export the Story](#)

Getting insights is only half the adventure; the other half is acting on them. To involve others, share the story or export it to Analytics. You can also export customizable reports as Microsoft Word documents or PowerPoint slides. All reports include speaker notes written in plain language, so you can stop spending hours building and curating your reports.

Play the Executive Summary of the Story

The executive summary walks you through the key insights as a human analyst would.

1. Click **Play Summary**.
The bottom of the page has buttons to mute the narration, restart from the beginning, pause the summary, skip to the next section, or jump to the end of the summary.
2. Turn **Discovery Mode** on or off by clicking the toggle switch in the bottom-right corner. Discovery Mode lets you pause the executive summary and investigate an insight in more depth. For example, you see an interesting insight about a region, and you want to compare it to a different region. Turn on Discovery Mode and add the other region. The insights are sorted in order of importance, so the first few tiles in each section are the most insightful.
3. To personalize the story before you read it, click **Personalize Story** in the bottom-left corner. To make adjustments, click the thumbs-up and thumbs-down buttons to contribute your domain knowledge and preferences to the model. When the animated briefing is done, the story is adjusted based on the personalization feedback.

EDITIONS

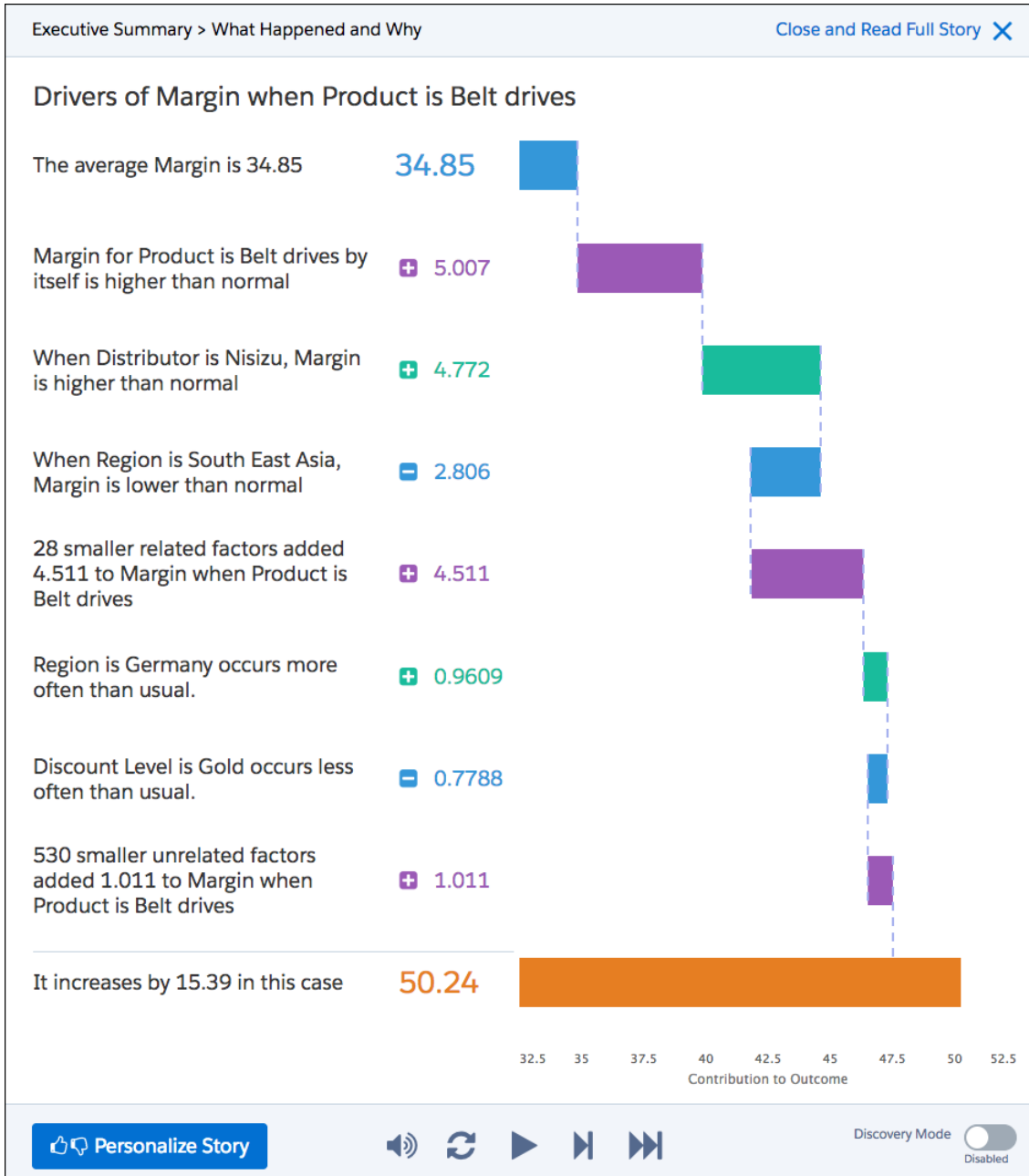
Available in Salesforce Classic and Lightning Experience.

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USER PERMISSIONS

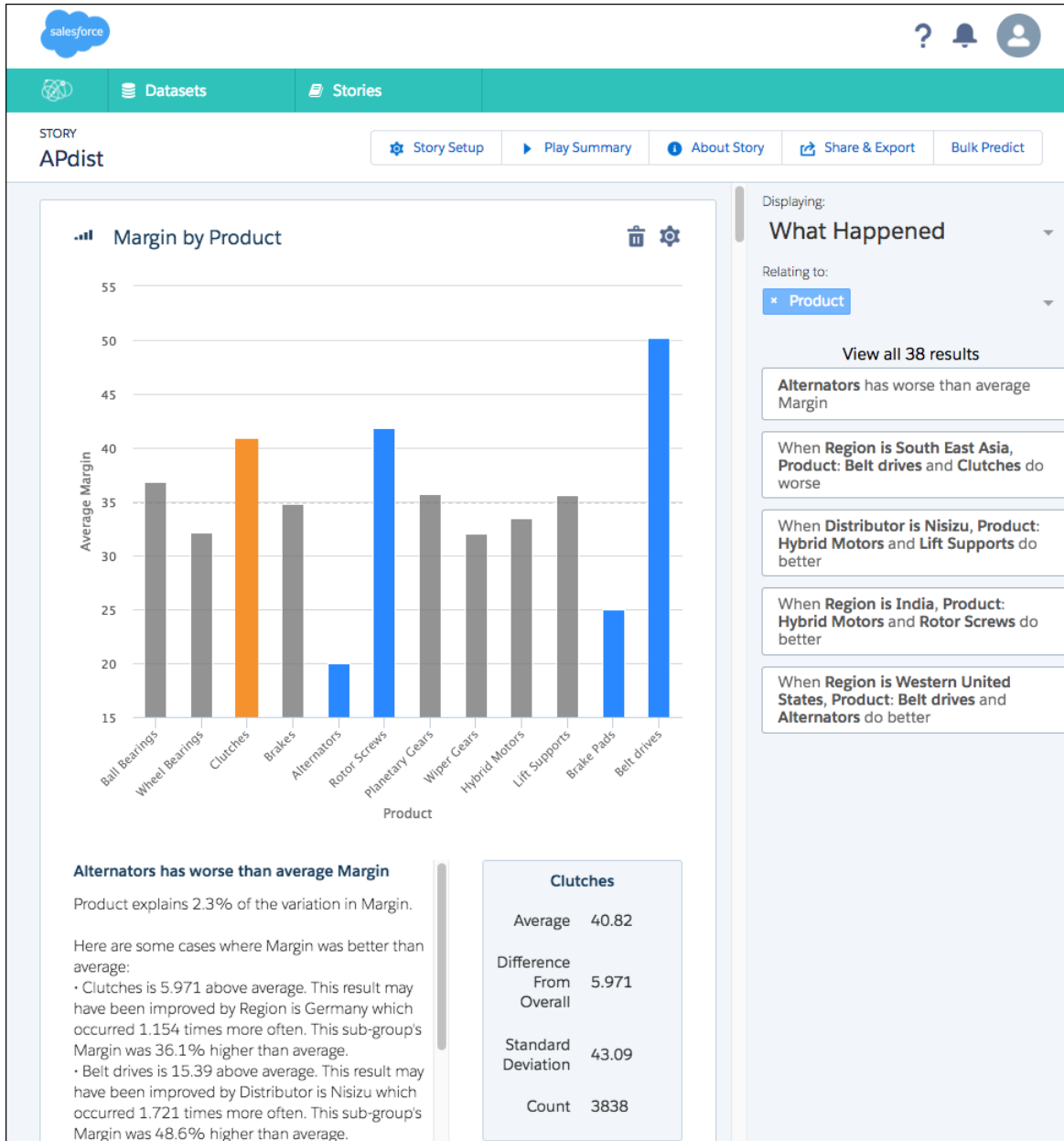
To use a story:

- Use Einstein Discovery



Story Insights

The initial story is a series of charts that present the insights in the order of influence on the outcome variable that you specified on the Story Setup page.

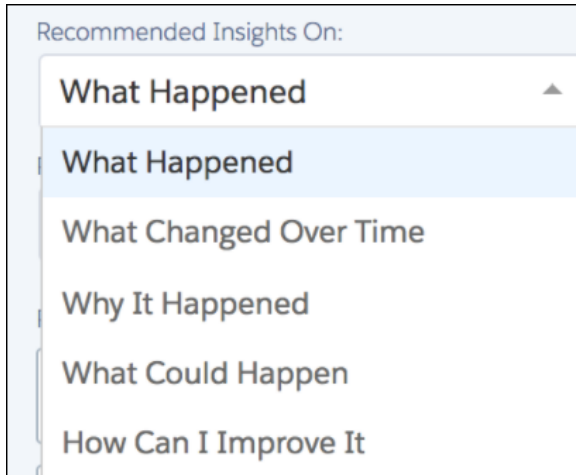


The insights are typically shown in the following order.

1. Single variable that best explains the variability in the outcome (best single predictor).
2. Variable that with the previous variable most improves the explanatory power (best two-variable predictor).
3. If appropriate, another variable that with the first variable improves the explanatory power.
4. Next single variable that best explains the variability on its own (second-best single predictor).

The story contains different types of insights.

In the margin on the right side, the Recommended Insights On menu is like a table of contents where you specify which types of insights in your story you want to view.




What Happened Insights

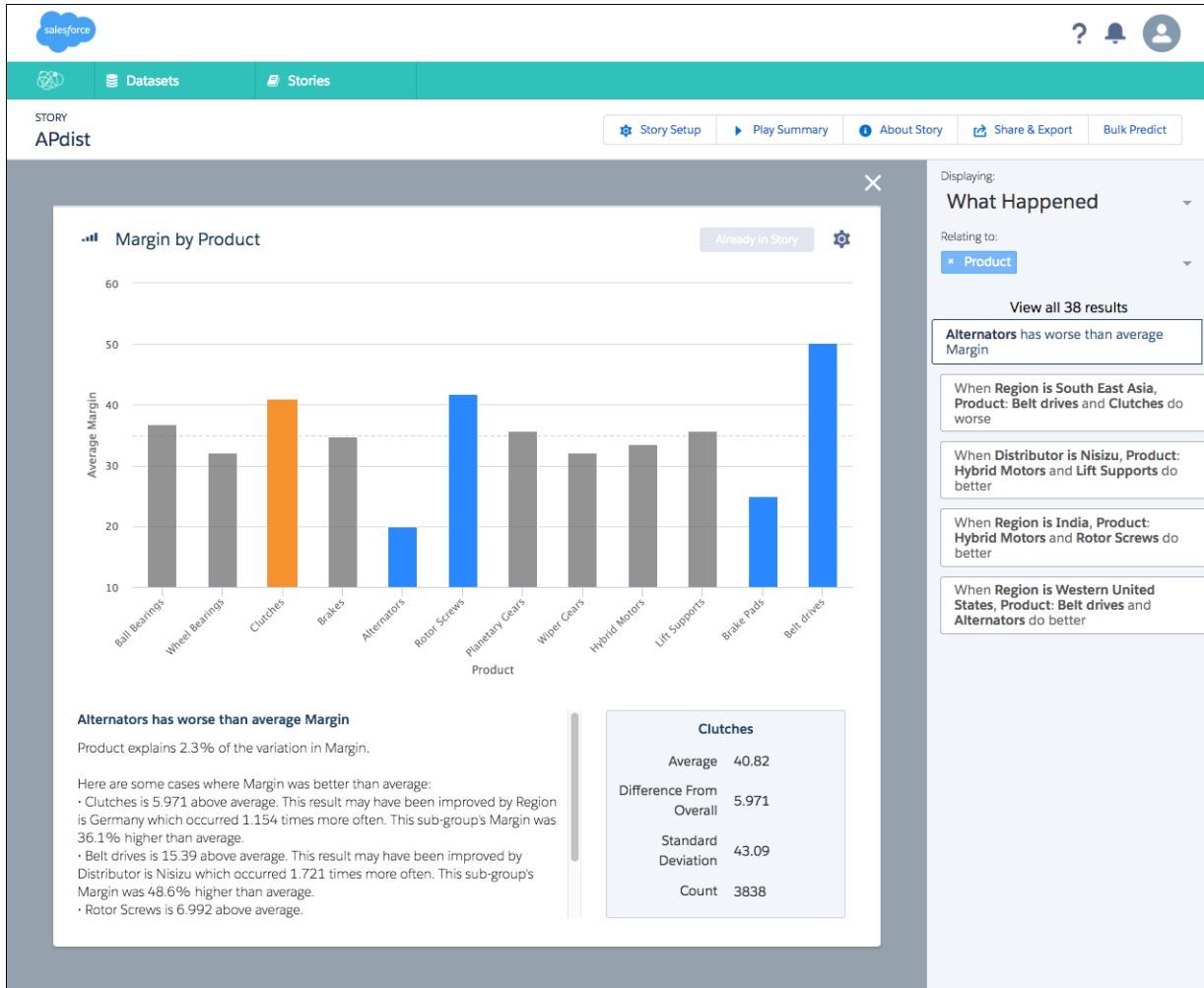
The first insights presented are about what happened. These descriptive insights are the primary insights in your story.

These insights are similar to what you see in BI, visualization, and reporting products, but in addition, Einstein Discovery does the following:

- Looks at all possible insights, and selects the ones with the highest statistical importance
- Conducts statistical soundness tests
- Highlights specific parts of each insight to focus on
- Provides explanations about how what the bars show could be deceptive
- Orders the insights by how interesting they are
- Displays the simplest bar chart that shows the relevant effect

1. In the **Recommended Insights On** menu on the right, click **What Happened**.
2. When the calculations are complete, you see the most relevant insights. The View All Results section contains additional recommended insights that are related to the insight you are currently looking at.
3. To view an insight and optionally add it to your story, click a result. The recommendations are sorted in order of importance.

 **Note:** The recommendations are a core part of the story. Explore the right panel, and add insights that you find interesting. By interacting with the story, you overlay your intuition and domain knowledge and make the story more insightful. Think of the automated analysis as a mapping system that figured out the lay of the land, which paths connect and where the traps are. But you still have many possible choices of paths to take. Your choices are a necessary part of creating your story.



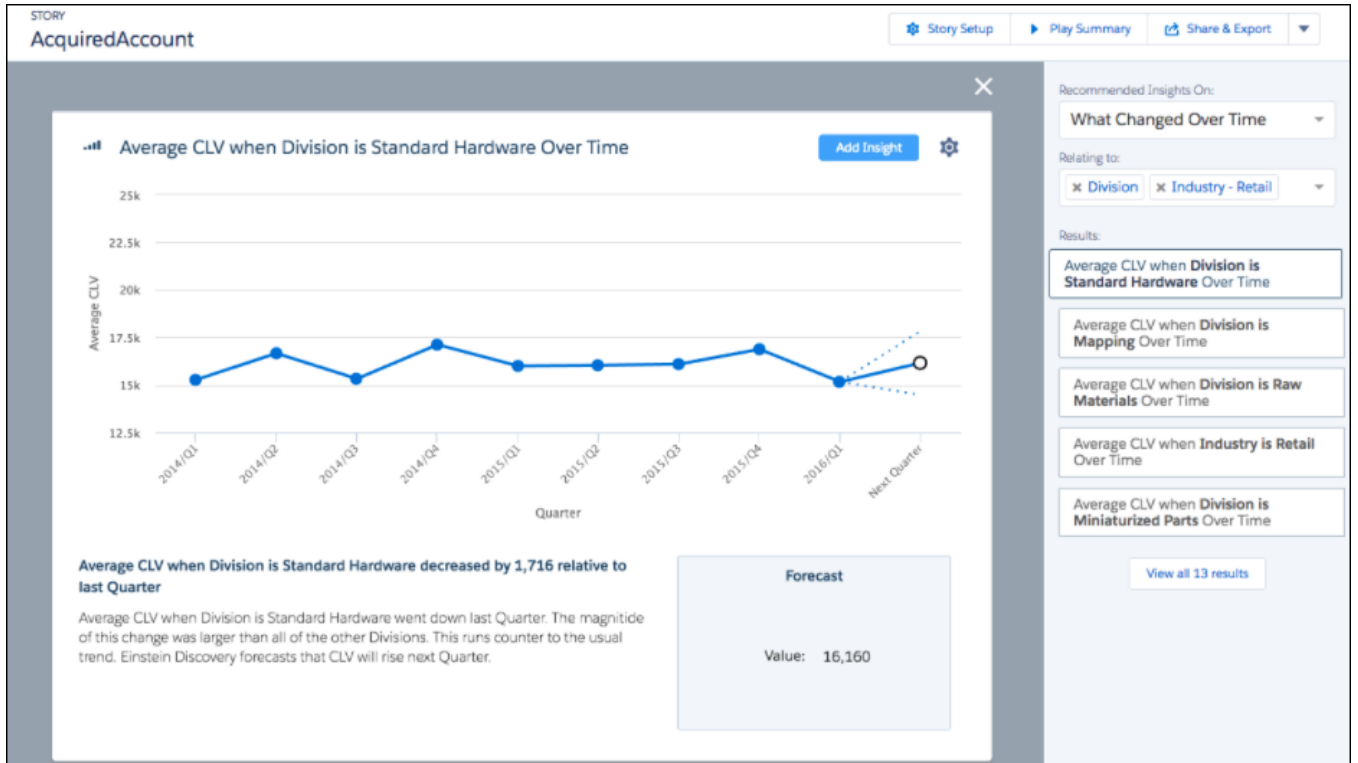
What Changed Over Time Insights

What Changed Over Time insights are descriptive. Not only do they tell you what changed over time, but they also show you the trend in the data across different time periods.

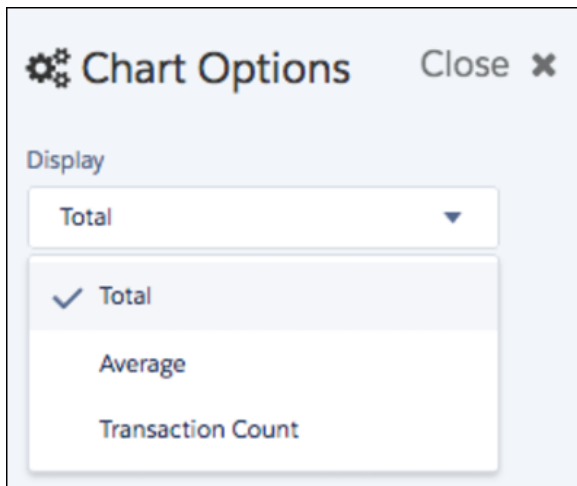
Several unrelated factors can contribute to an insight’s visual pattern. For each insight, Einstein Discovery also checks whether other factors are contributing to the pattern.

As with the other insights, the ones with the most variation surface first: The most interesting insights are usually near the top. These are ordered by the categories that experienced the greatest change between the previous period and the most recent period.

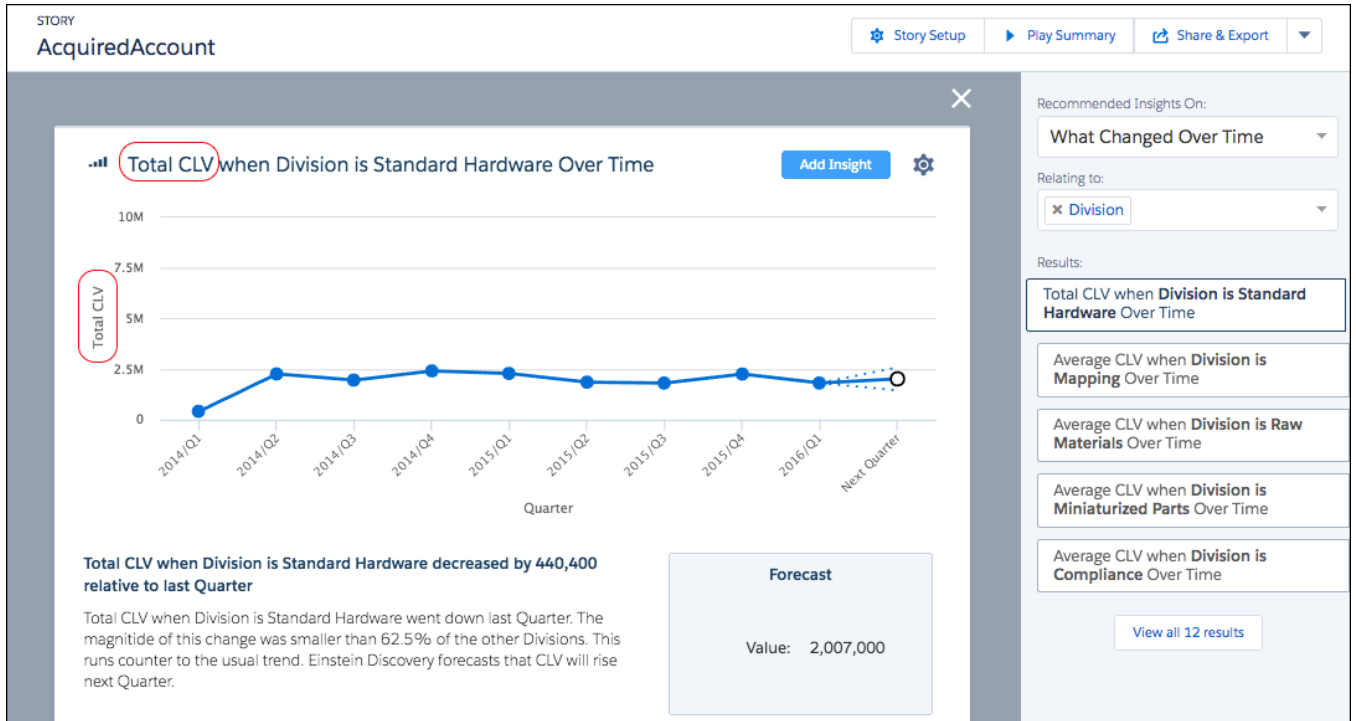
1. In the **Recommended Insights On** menu on the right, click **What Changed Over Time**.
2. To view an insight and optionally add it to your story, click a result. A time series graph that shows average of the outcome variable over time appears. On the right-hand side of the graph is a forecast for the next time period—in this example, next quarter.



Optionally, if the graph shows a revenue metric, you might want to see the total value instead of the average. Click the gear icon in the top-right corner of the insight. In the Chart Options panel, click **Total**.



The y-axis of the chart is changed from Average to Total. Close the Chart Options panel.



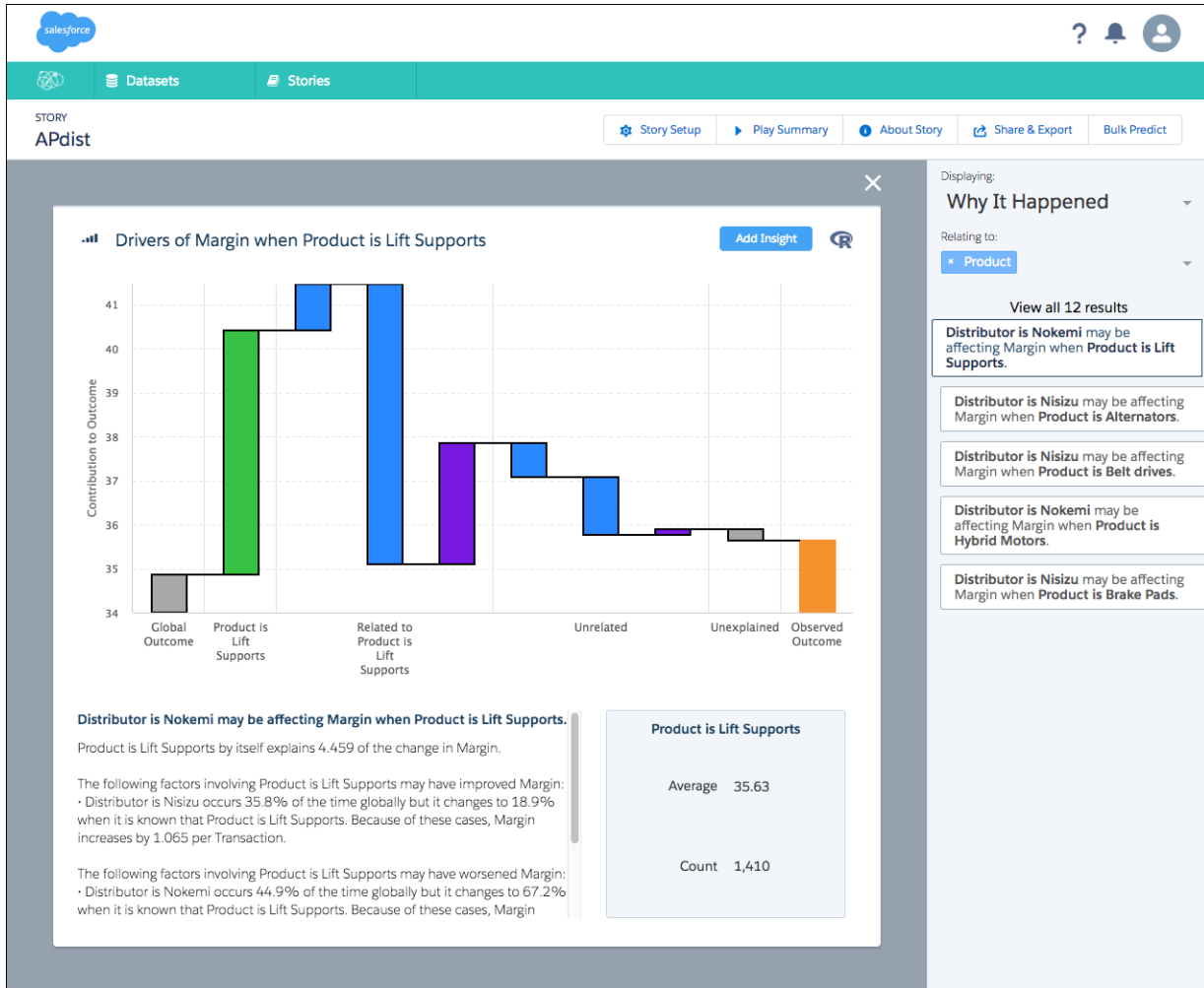
Why It Happened Insights

Why It Happened insights are diagnostic. There might be several unrelated factors that contribute to a visual pattern you can see in an insight.

For each descriptive insight, Einstein Discovery automatically checks what other factors might be contributing to the pattern. Diagnostic insights help ensure that the patterns you focus on are real and not accidents of the data.

1. In the **Recommended Insights On** menu on the right, click **Why It Happened**.
2. To view an insight and optionally add it to your story, click a result.

The global average value for the outcome variable is the gray bar. From there, you can explore the increase or decrease that significant variables contribute in the waterfall by hovering over each bar. For transparency, experts can export and review the precise model generated as part of the analysis in the form of open standards-compliant R code by clicking the R button. Even the model validation results are available at the bottom of the R code.

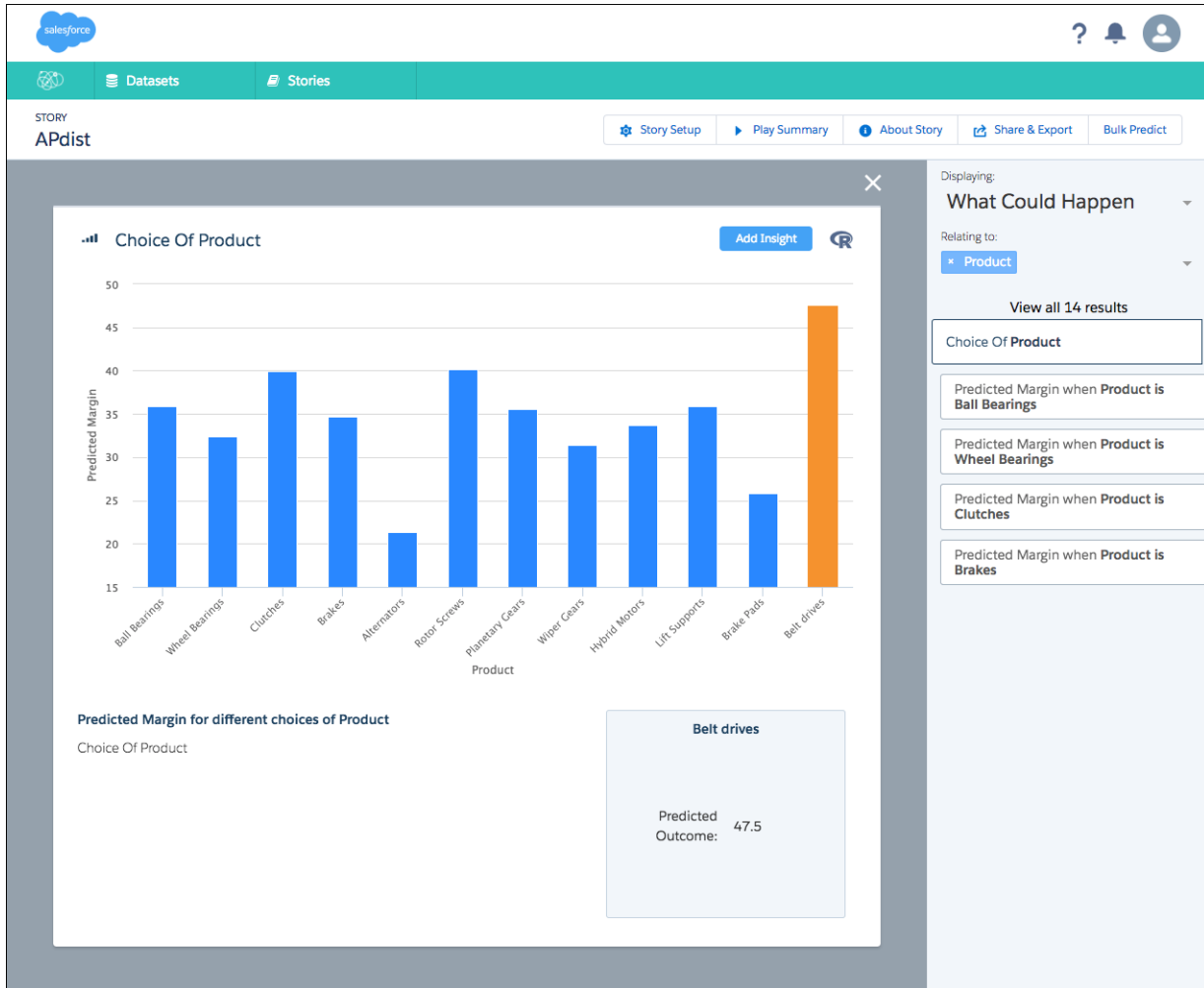


What Could Happen Insights

What Could Happen insights are predictive.

Einstein Discovery conducts predictive analysis to select the descriptive insights and to make prescriptive recommendations. Predictions are similar to the kind of regression or machine-learning analysis that data scientists conduct using advanced analytics tools.

1. In the **Recommended Insights On** menu on the right, click **What Could Happen**. When the calculations are complete, the relevant insights are displayed in the View All Results section. You can explore your dataset in several ways: by the predictor variable, the predicted count, or regression terms. Knowing the most influential predictor variables can, for example, help a sales or marketing manager choose where to invest budget and which areas are less important. To see the predicted outcome and the explanations, choose various values of the predictor variables.
2. To view an insight and optionally add it to your story, click a result.
3. For the "Choice Of" insight, click a bar to see how setting the variable to that value influences the outcome. It's like a what-if scenario.

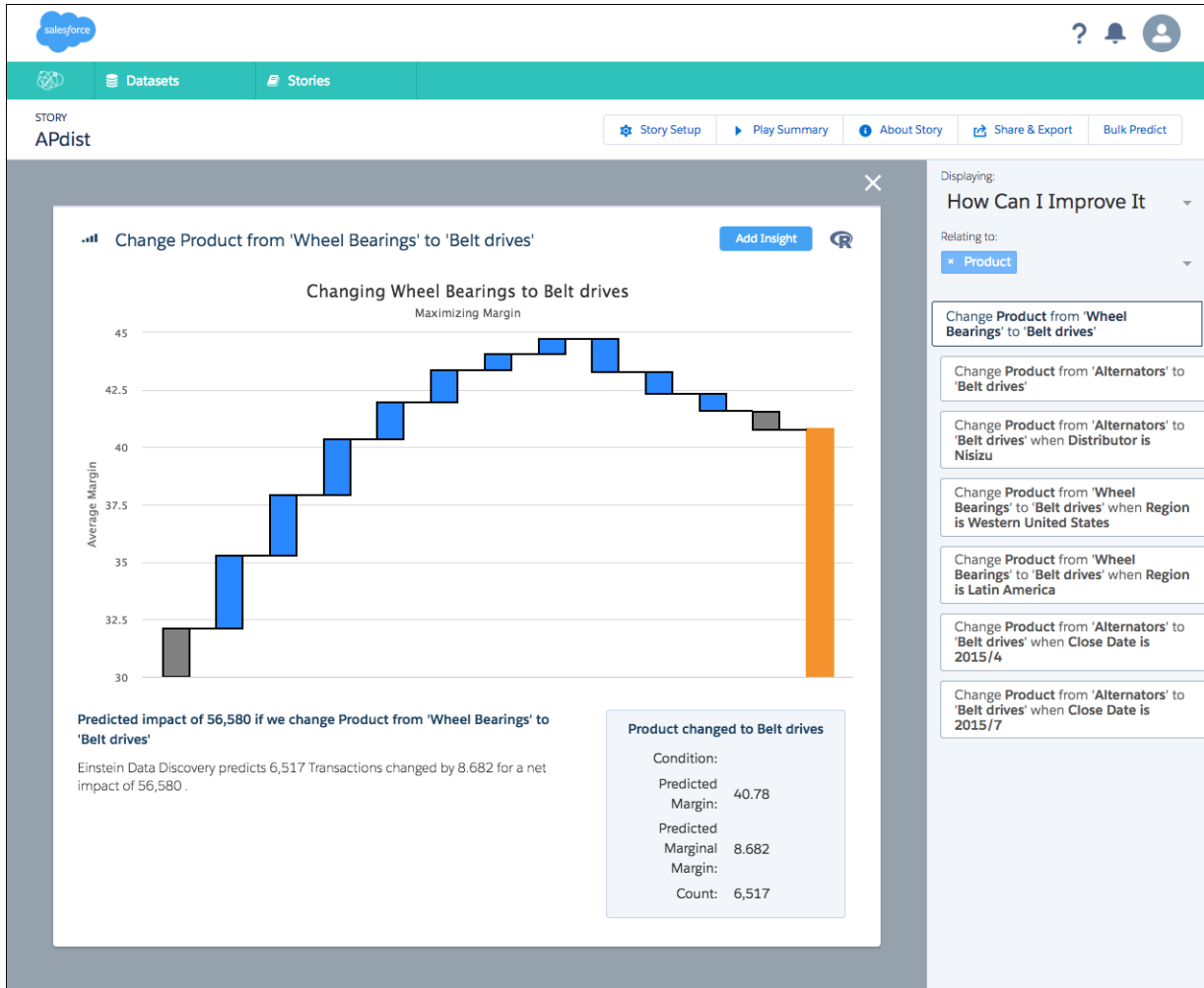


How Can I Improve It Insights

You can explore which values of variables maximize or minimize your desired outcome. Einstein Discovery recommends specific actions, quantifies the expected impact, and explains the reasoning behind the recommendations.

These insights are prescriptive. Prescriptive findings are actionable.

1. In the **Recommended Insights On** menu on the right, click **How Can I Improve It**. Recommended actions that can improve the outcome are presented on the right.
2. Click the card with the recommended action that you want to explore. Einstein Discovery then suggests actions that you can take. When you run a prescriptive analysis for a specific variable, you get a rank-ordered list of things you can do to affect the outcome variable.
3. To display a waterfall chart illustrating that insight, click a card.
4. If the insight is useful, click **Add Insight** to add it to your story.



Interact with Insights

Interact with the insights to explore the story.

1. Get more detail by hovering over a bar in the graph. For a single-variable graph, a gray bar indicates values that are statistically similar to the overall average. For a two-variable graph (drill-downs into subsets of the data), a gray bar indicates cases where the differences in the two groups are statistically unsound. You can't safely act on visibly apparent differences in the gray bars because if the data had been collected on a different day, or a few outliers had been removed, the bars could significantly change. The y-axis is automatically set to start from 0 or the minimum value.
2. Below the graphs is a text summary explaining the key points in each graph. The average outcome is indicated on the chart as a dashed line.
3. To remove the insight from your story, click the trash icon.
4. To change the chart options, such as the chart type or filter options, click the gear icon. To apply the changes, click **Close**.
5. If the insights are useful, click **Add Insight** to add it to your story. If the insight is already in your story, the button is unavailable and says **Already in Story**.

EDITIONS

Available in Salesforce Classic and Lightning Experience.

Available for an extra cost in **Enterprise, Performance, and Unlimited** Editions. Also available in **Developer Edition**.

USER PERMISSIONS

- To use a story:
- Use Einstein Discovery

Examine the Story Timeline

Learn which factors drive changes over time.

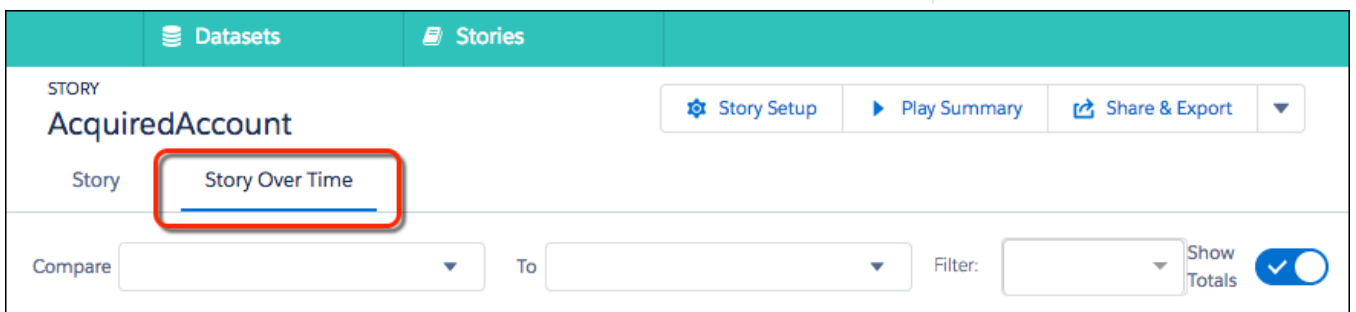
The story timeline shows you what happened and why. You can also compare a different time period with the equivalent period in previous years. For example, comparing the fourth quarter of this year with the fourth quarter of the previous year.

1. Open a story.
2. Click the **Story Over Time** tab.

EDITIONS

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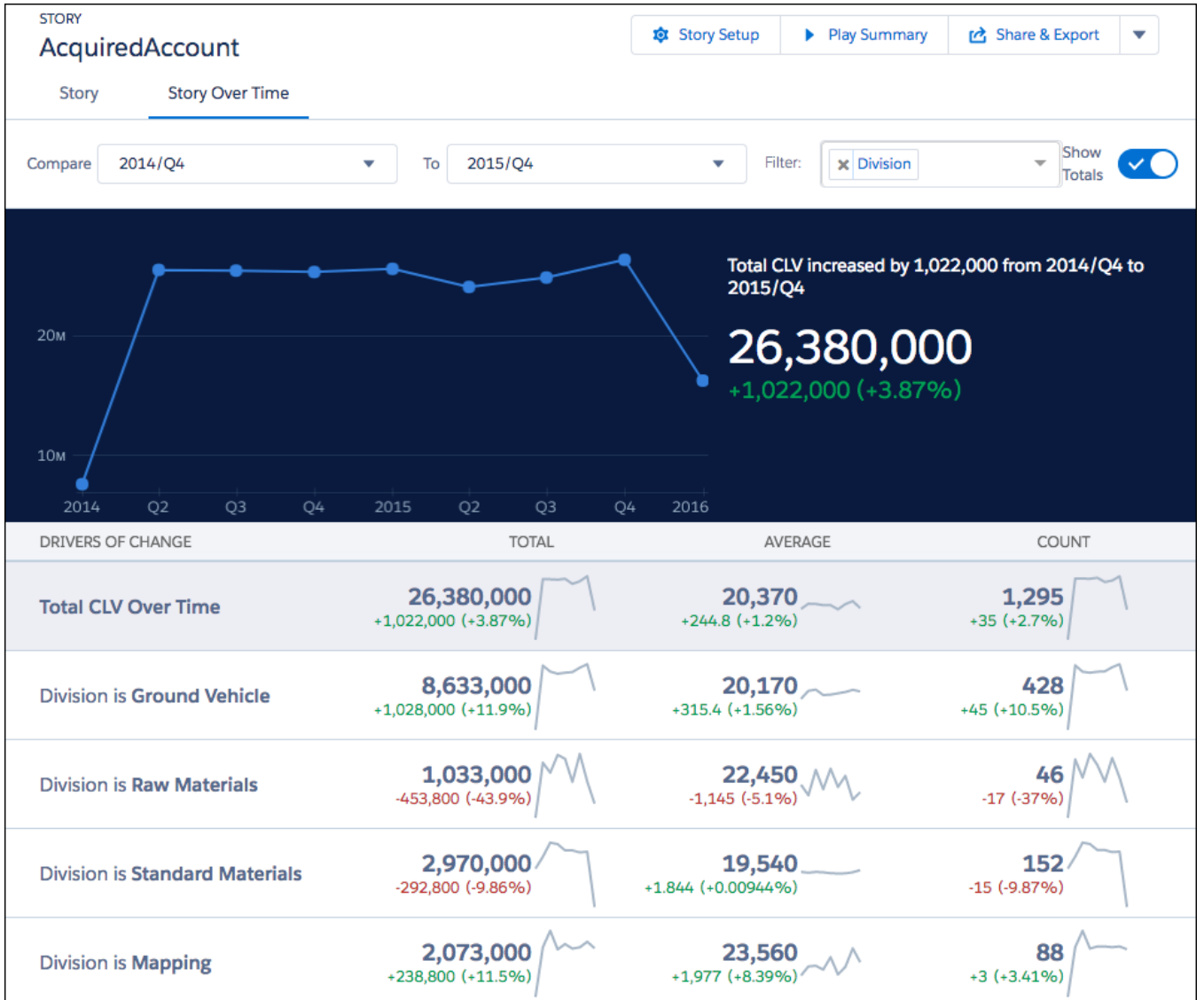
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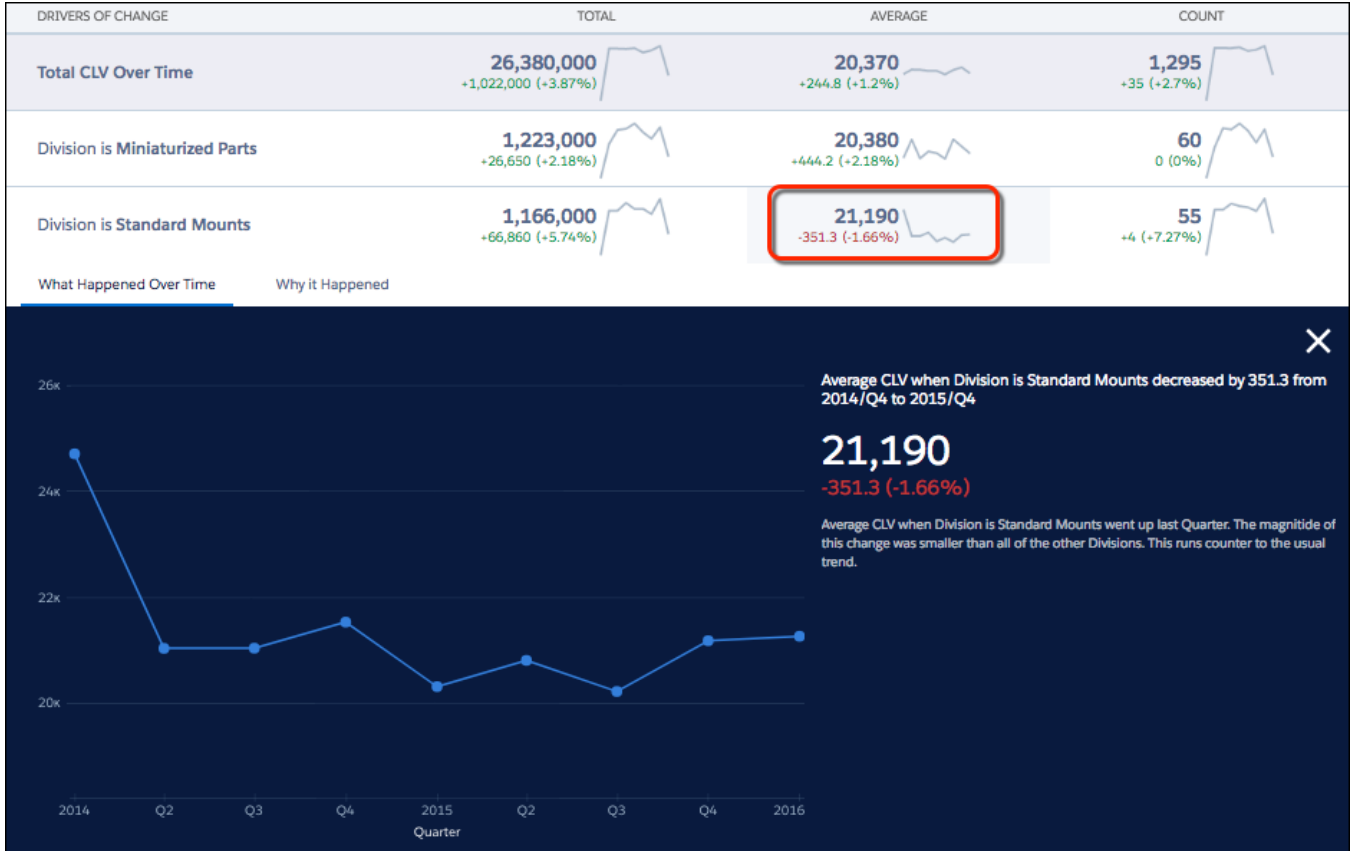
3. In the **Compare** dropdown list, select the start of the time period and in the **To** dropdown list, select the end of the time period.
4. Optionally, in the **Filter** dropdown list, select one or more variables to filter by.
5. Turn on or off the display of totals by using the **Show Totals** toggle switch.

The timeline analysis at the top is based on the date field and frequency that was selected when you set up your story. To see the totals for each time period, hover your mouse pointer over the graph.

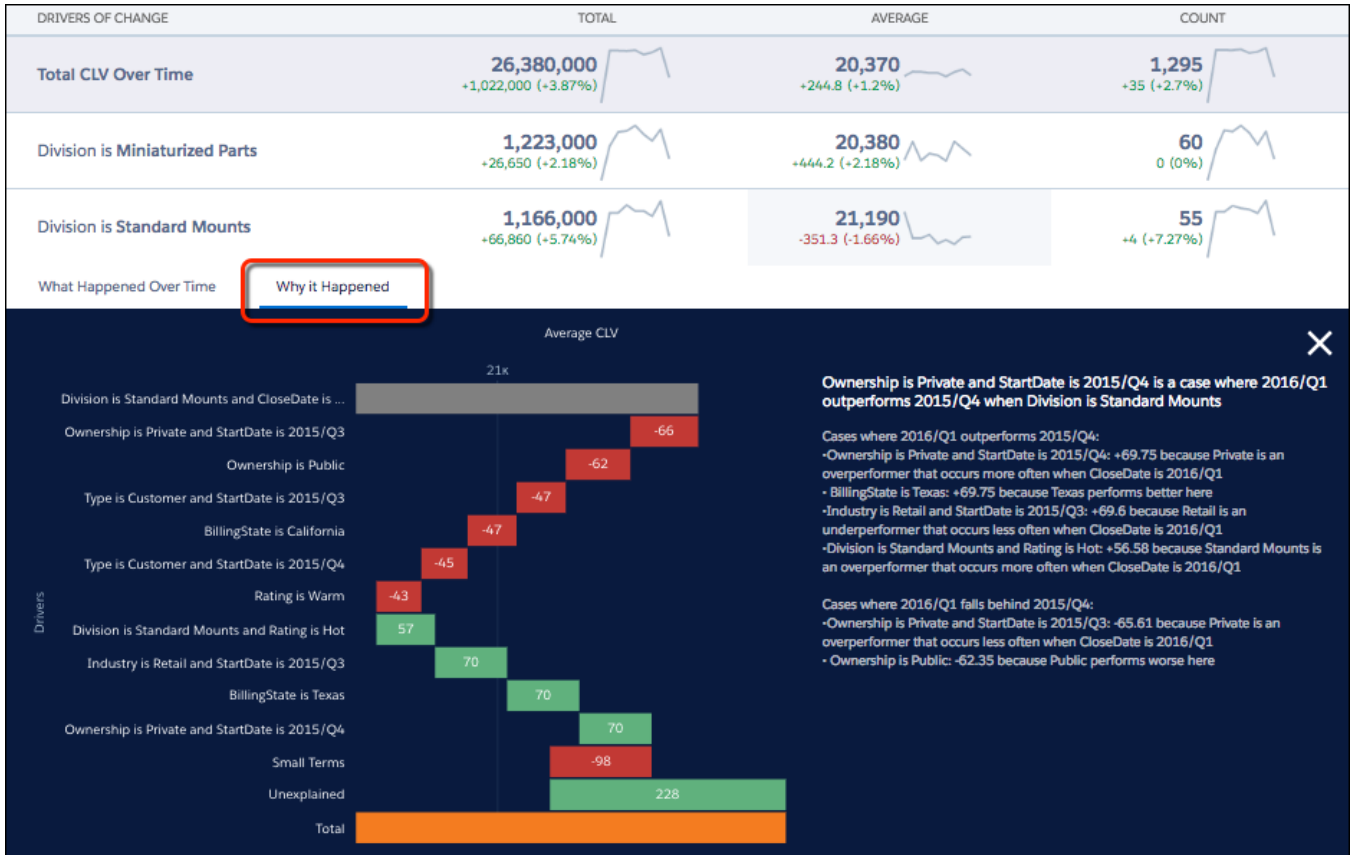
The drivers of change are listed under the timeline graph. To change the sort order, click a column header.



- To get more information about what happened over time for a particular driver of change, click its value in the Total, Average, or Count column.



If you selected a value in the Average column, you can click the **Why it Happened** tab to see diagnostic insights.



Explore and Add More Insights to Your Story

Einstein Discovery presents the insights with the highest statistical importance and highlights the areas to focus on. You can further explore the data by changing the filters. As you explore, you can add insights to your story.

1. To open the list of filters, click the down arrow in the Relating to section.
2. Select a filter.
3. When the calculations are complete, click a tile to open the insight.
4. If the insights are useful, click **Add Insight** to add it to your story.

EDITIONS

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USER PERMISSIONS

- To use a story:
- Use Einstein Discovery

Improve the Story

Make your story even better with suggestions from Einstein Discovery.

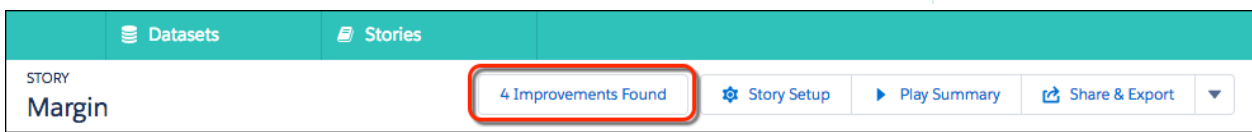
Einstein Discovery identifies ways to improve your story. The story improver detects extreme values, identical values, variables with little variation, and highly correlated variables, making it easy to build your model based on best practices.

1. Open the story.
2. Click the **Improvements Found** button.
The button is only visible if Einstein Discovery found opportunities to improve your story.

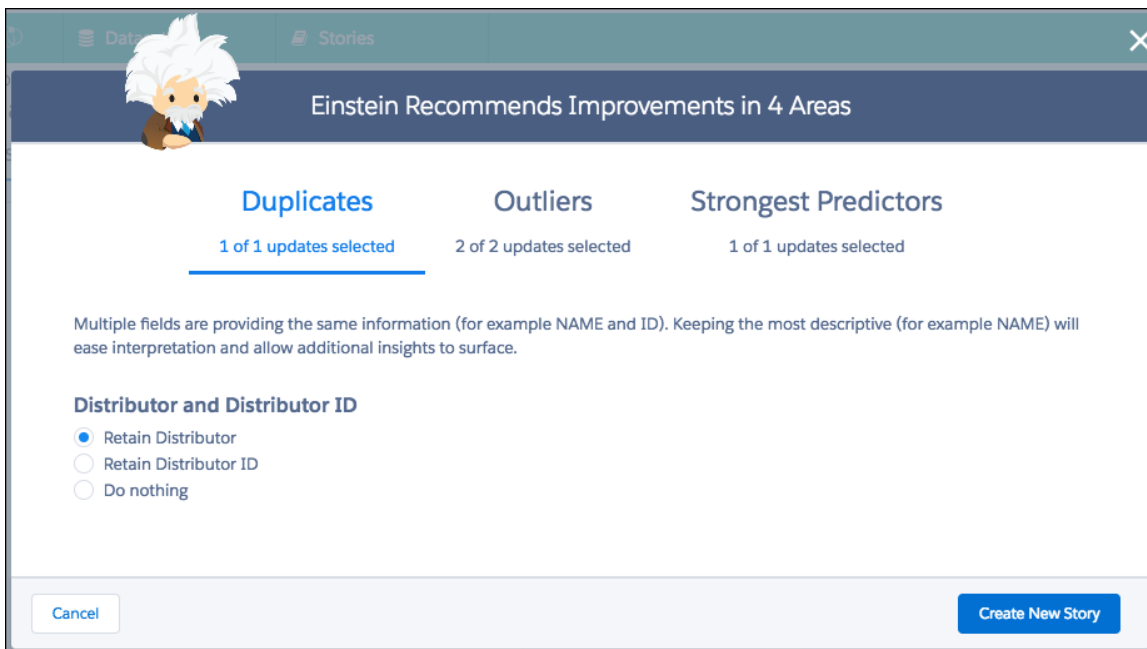
EDITIONS

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3. Review the recommendations.



4. Click **Create New Story**.

Refresh the Story

You can refresh a story with updated data and rerun the analysis.

This feature is currently available for stories that use Salesforce or CSV data.

1. Open the story.
2. Click **Refresh Story**.
The Create a New Story with Updated Data window opens.
3. In the New Story Name field, type a name for the story.
4. The Data Source section tells you what kind of data the story uses. If the story uses data from Salesforce, it will automatically refresh the data. If the story uses data from a CSV file, click the **Select CSV from your computer** button. Expand the Data Requirements section to view the column names that must be present in your CSV file.
5. Click **Create New Story**.

Note: The add derived column, add column from lookup table, and grouped table data transformations will not be automatically applied.

Modify the Story Settings

After the initial analysis, you can change the story settings and rerun the analysis. Stay on top of changes and iterate the analysis.

1. On the Story Setup page, click **Story Setup**.
2. Modify one or more of the story settings.
3. When finished, click **Create Story**. To cancel and go back, click **Back to Story**.

EDITIONS

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USER PERMISSIONS

To use a story:

- Use Einstein Discovery

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USER PERMISSIONS

To use a story:

- Use Einstein Discovery

View Story Details

You can display a summary of the story details.

1. Open a story.
2. Click **About Story**.
A summary of the details about the story is displayed.

Share or Export the Story

Getting insights is only half the adventure; the other half is acting on them. To involve others, share the story or export it to Analytics. You can also export customizable reports as Microsoft Word documents or PowerPoint slides. All reports include speaker notes written in plain language, so you can stop spending hours building and curating your reports.

1. Click **Share & Export**.
The Share and Export Story window lists the users with whom you can share the story. To locate a particular user, use the search box at the top right. You can share the story with people who have access to Einstein Discovery.
2. Click **Read Only** or **Read and Write** next to the users you want to share it with.
3. Click **Apply Changes**.
4. Click **Export**.
5. To export the story as PowerPoint slides, click **Microsoft PowerPoint**. To export the story as a Word document, click **Word Document**. To export the story to Analytics, click **Wave App**.
6. To close the Share and Export Story window, click the **X** at the top right.

Display Einstein Discovery Recommendations in a Salesforce Object

You can share actionable insights from Einstein Discovery with users in Salesforce.

There are a couple of different ways to set up your Salesforce org to display Einstein Discovery recommendations.

EDITIONS

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USER PERMISSIONS

To use a story:

- Use Einstein Discovery

EDITIONS

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USER PERMISSIONS

To use a story:


- Use Einstein Discovery

IN THIS SECTION:

1. [Natively Display Einstein Discovery Recommendations in a Salesforce Object \(Pilot\)](#)
Native support for importing Einstein Discovery recommendations into a Salesforce object is available as a pilot feature. Previously, it was necessary to install a managed package to enable the Writeback feature.
2. [Display Einstein Discovery Recommendations in a Salesforce Object](#)
You can share actionable insights from Einstein Discovery with end users in Salesforce by adding fields.

Natively Display Einstein Discovery Recommendations in a Salesforce Object (Pilot)

Native support for importing Einstein Discovery recommendations into a Salesforce object is available as a pilot feature. Previously, it was necessary to install a managed package to enable the Writeback feature.

 **Note:** Native support for importing Einstein Discovery recommendations into a Salesforce object is a pilot feature. To try it out, contact Salesforce.

IN THIS SECTION:

[Deploy an Einstein Discovery Model](#)

Create a story using Salesforce data and then deploy the model.

[Add Einstein Discovery Recommendations to a Salesforce Lightning Page](#)

After you deploy a recommendation, add it to an object's record page.

[Enhance an Existing Prediction and Recommendation Model](#)

To enhance a recommendation model, you can create extra models that are relevant to the same Salesforce object.

[Modify Settings for Deployed Recommendations](#)

You can view deployed recommendations, change the order, deactivate, or delete them.


[Limitations of Native Support for Importing Einstein Discovery Recommendations](#)


Native support for importing Einstein Discovery recommendations into a Salesforce object has a few limitations.

Deploy an Einstein Discovery Model

Create a story using Salesforce data and then deploy the model.

To create a model to deploy, create an Einstein Discovery story that uses data from a Salesforce object:

1. In your Salesforce org, click the App Launcher icon (), search for Einstein Discovery, and then click the Einstein Discovery tile.

 **Note:** You cannot use this feature if you log in to Einstein Discovery directly with a user name and password.

2. Create a dataset by importing data from a Salesforce object, as described in [Connect to Salesforce to Create a Dataset](#) on page 651. Note: The dataset can only contain data from fields in one Salesforce object. If you plan to deploy recommendations to Salesforce, your model's dataset cannot contain derived columns or secondary datasets. When the dataset is ready, it appears in the list of datasets.
3. Create a story with that dataset as described in [Create a Story to Uncover Relationships](#) on page 661.

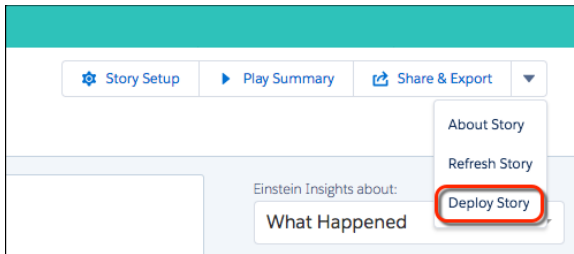
Now that you've created the story, deploy recommendations from the story to your Salesforce organization.

USER PERMISSIONS


To connect an Einstein Discovery model to a Salesforce object

- Connect Einstein Discovery Model

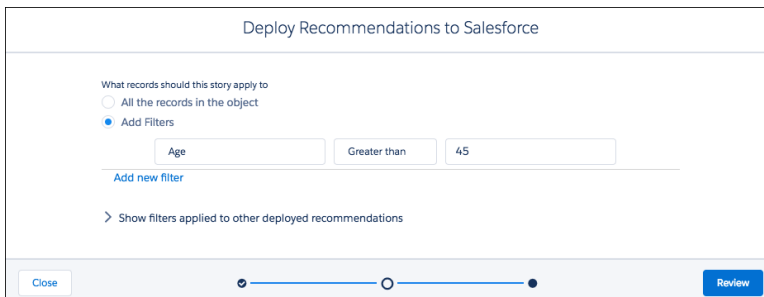
1. Open the story and in the drop-down menu on the top-right side, click **Deploy Story**.



You see the Deploy Recommendations to Salesforce wizard. If no other recommendations have previously been deployed, you see a screen that asks you to specify a name for the prediction.

 **Note:** If recommendations were previously deployed, you see a screen that asks you to select either **Deploy new Prediction & Recommendation model** or **Enhance an existing Prediction & Recommendation model**. These instructions show you how to deploy a new model so select **Deploy new Prediction & Recommendation model**. If you want to see how to enhance an existing model, refer to the next section.

2. Type a name for the prediction. For example, "Age Prediction" or "Maximize Age". This name is displayed to users later in the list of deployed recommendations on the Recommendations tab.
3. Click **Add Filters**. You see a screen that asks you which records the recommendation applies to.
4. Click **All the records in the object** to make the recommendation apply to all records or click **Add filters** to specify filters. Click **Add new filter** to add another filter condition.



This feature lets you segment your models. You control which records use the recommendation model. For example, if you select "Gender Equals Female" then the model will only be applied to Salesforce records where the gender is equal to female. For all records where the gender is not female, that model will not be applied and other models will be evaluated if they have been configured, or nothing will be done if there are no other models.

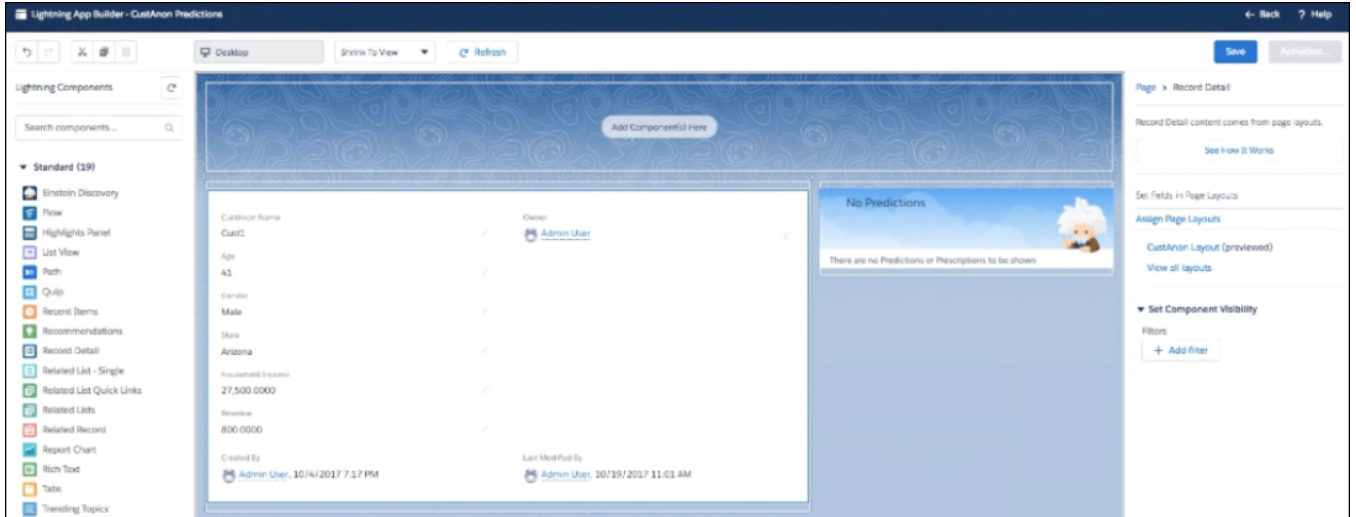
5. Click **Review**. You see a summary of the recommendation details.
6. Click **Deploy**.
7. Click **View Recommendation**. The recommendation details are displayed.

Add Einstein Discovery Recommendations to a Salesforce Lightning Page

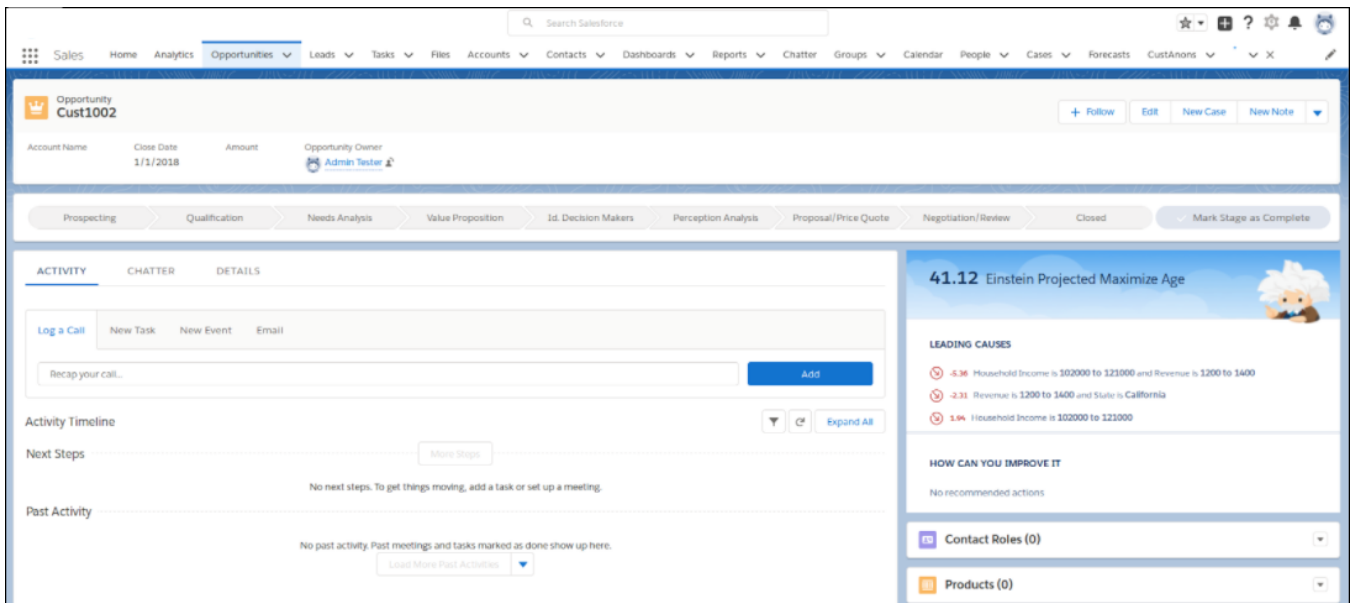
After you deploy a recommendation, add it to an object's record page.

1. Log in to your Salesforce org.
2. From Setup, click **Lightning App Builder**.
3. Click **New**.
4. Click **Record Page**.

5. Click **Next**.
6. Enter a label for the recommendation and in the Object field, select the Salesforce object that it applies to. Click **Next**.
7. Select a page template and then click **Finish**.
8. Drag the Einstein Discovery component onto the page template.



9. Add other components that you want to include in the page. For example, the Record Detail component.
10. Click **Save**.
11. Click **Activate**.
12. Click **Assign as Org Default**.
13. Click **Save**.
14. Open the record detail page for the object that the recommendation is about. Einstein Discovery recommendations are displayed on the page.

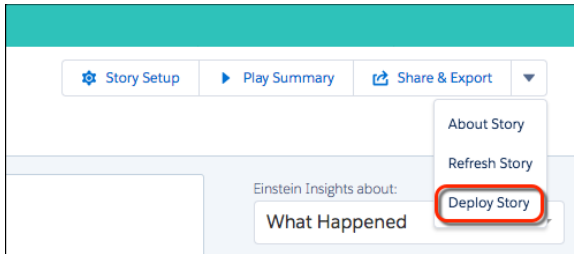


Enhance an Existing Prediction and Recommendation Model


To enhance a recommendation model, you can create extra models that are relevant to the same Salesforce object.

You can segment your population to have multiple models (one per segment) that does the same prediction. For example, if you want to predict time to close on an opportunity, you might have a model for time to close for small opportunities, and a model for time to close for large opportunities. The reason you might do that is if the behavior of your opportunities changes depending on their size. You could create a model on your large opportunities dataset and export that to Salesforce. Then you could create a model on your small opportunities dataset and append your small model to the same prediction and recommendation settings. In this context, the "model" is the segment.

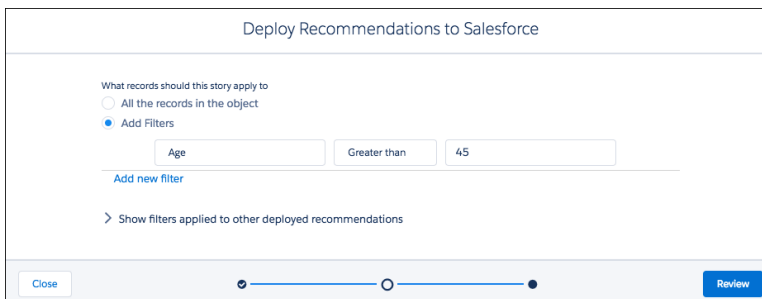
1. Open the story and in the drop-down menu on the top-right side, click **Deploy Story**.



You see the Deploy Recommendations to Salesforce wizard. If recommendations were previously deployed that apply to that Salesforce object, you see a screen that asks you to select either **Deploy new Prediction & Recommendation model** or **Enhance an existing Prediction & Recommendation model**. This option is only available when at least 1 recommendation has been deployed. If you select **Deploy new Prediction & Recommendation model**, it creates a different custom field for the same object or you can click **Enhance an existing Prediction & Recommendation model** to enhance the one you already have.

 **Note:** It is possible to deploy recommendations multiple times from the same story, but in general, this approach is not a best practice. Instead, create a new story that investigates a different angle.

2. Click **Enhance an existing Prediction & Recommendation model**.
3. Select a recommendation model from the list.
4. Click **Add Filters**.
5. Select to add the recommendation model to all records or to add filters. To see which filters have already been applied, click **Show filters applied to other deployed recommendations**. If you want to add a filter, click **Add new filter**.

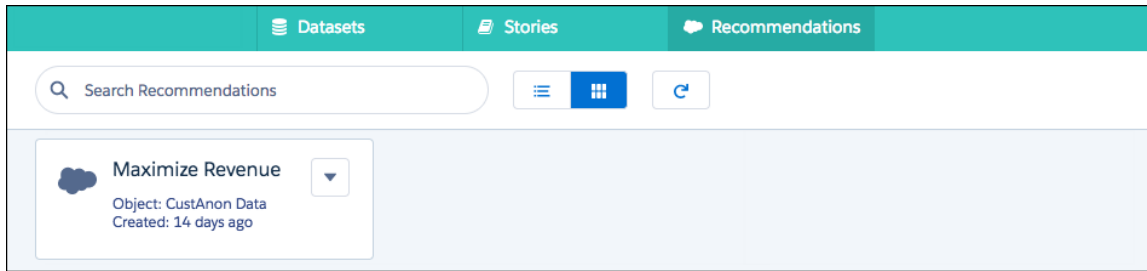


6. Click **Review**.
7. Click **Deploy**.
8. Click **View Recommendation**.

Modify Settings for Deployed Recommendations

You can view deployed recommendations, change the order, deactivate, or delete them.

To see the list of recommendations that you have deployed to Salesforce, click the **Recommendations** tab. The recommendations that have been deployed are displayed. Click a recommendation to open the Deployed Stories page.



To change to order of the prediction definitions, click the arrows in the REORDER column to move them up or down in the list. Click **Save**. On the Deployed Stories page, click the tile for a deployed recommendation. You see the all of the different models that apply to that deployed recommendation. For example, there is one model that will be used for when a Salesforce object's gender field is female and one model for when gender is male. For each record in the Salesforce object, when a record is modified and saved, Salesforce checks the filter conditions in the order that they appear. As soon as a match is found, the model is applied to the record and none of the other models are used. In other words, only the first filter that matches the model that will be applied.

To deactivate all of the deployed recommendations for a particular prediction definition, click **Deactivate** at the top-right corner of the page.

To deactivate a particular model, click the down arrow at the end of the table row and then click **Deactivate**. The status displayed in the table will change to "Inactive".

To delete all of the deployed recommendations for a particular prediction definition, click **Delete** at the top-right corner of the page.

To delete a particular model, click the down arrow at the end of the table row and then click **Delete**. The status displayed in the table will change to "Inactive".

Limitations of Native Support for Importing Einstein Discovery Recommendations

Native support for importing Einstein Discovery recommendations into a Salesforce object has a few limitations.

- This feature is only available to users who sign in to Einstein Discovery using single sign-on (SSO). It is not available to users who log in to Einstein Discovery directly with a username and password.
- The deployed model must be created from a dataset that contains data from fields in one Salesforce object. The dataset cannot contain derived columns or secondary datasets.
- This feature is only available only in Lightning Experience.

Display Einstein Discovery Recommendations in a Salesforce Object

You can share actionable insights from Einstein Discovery with end users in Salesforce by adding fields.

With the help of professional services, you add fields, like Outcome, Explanation, and Prescription, to a Salesforce object using Apex code and custom fields. The object must support triggers. Einstein Discovery recommendations are written to the custom fields.

IN THIS SECTION:

[Install the Managed Package](#)

Your Salesforce admin must install the Salesforce managed package to enable the Writeback feature.

[Create Custom Fields in Salesforce to Display Recommendations](#)

You create custom fields in Salesforce to display the outcome, explanation, and prescription information imported from Einstein Discovery.

[Add an Einstein Discovery Section to the Object's Page Layout](#)

Add the custom fields to the object's page layout.

[Enable Salesforce Writeback](#)

Before you can use the Writeback feature, you must enable it.

[Connect Einstein Discovery to Your Custom Fields](#)

To import the recommendations, you connect your custom fields with Einstein Discovery.

[Create an Apex Trigger](#)

The Apex trigger fetches the Einstein Discovery predictions when a record is inserted or updated. The Apex trigger is stored under the object with which it is associated.

[Troubleshoot the Integration](#)

To troubleshoot the integration, you can use the Developer Console. The Developer Console is an integrated development environment with a collection of tools for creating, debugging, and testing applications in your Salesforce org.

Install the Managed Package

Your Salesforce admin must install the Salesforce managed package to enable the Writeback feature.

Before installing the managed package, Einstein Discovery must be enabled in your Salesforce org.

For more information, see the Einstein Discovery setup documentation.

1. In your browser, navigate to

`https://login.salesforce.com/packaging/installPackage.apexp?p0=04t46000001dWxn.`

You see the Install Einstein Discovery Writeback Connector page.

2. If prompted, enter your login information.
3. On the Install Integration page, select **Install for Admins Only**.
4. Click **Install**.
5. In the Approve Third-Party Access warning message, select the `us1.sdd.salesforce.com` website and then select **Yes, grant access to these third-party websites** and then click **Continue**.
6. When you see the message, "Installation Complete," click **Done**.
In Setup, on the Installed Packages page, you see a package named Einstein Discovery - Writeback Connector.

USER PERMISSIONS

To read, create, update, or delete connected apps:

- Customize Application AND Modify All Data OR Manage Connected Apps

Create Custom Fields in Salesforce to Display Recommendations

You create custom fields in Salesforce to display the outcome, explanation, and prescription information imported from Einstein Discovery.

1. From Setup, select **Customize** and then click the Salesforce object that you want to add the fields to.
2. Click **Add a custom field**.
3. Add a field to store the Einstein Discovery outcome information.
 - a. In the Custom Fields & Relationships section, click **New**.
 - b. Select **Number**, and click **Next**.
 - c. Enter a field label. For example, `Discovery_Outcome`. The field name is filled in automatically. Click **Next**.

- d. On the Establish field-level security page, specify the field's access settings for each profile. Only a trigger should make changes to the custom field, so select the **Visible** checkbox and the **Read-Only** checkbox on the applicable profiles. Click **Next**.
 - e. Choose which page layouts display the field. Click **Save & New**.
4. Add a field to store the Einstein Discovery explanation information.
 - a. Select **Text Area (Rich)**, and click **Next**.
 - b. Enter a field label. For example, *Discovery_Explanation*. Click **Next**.
 - c. On the Establish field-level security page, specify the field's access settings for each profile. Only a trigger should make changes to the custom field, so select the **Visible** checkbox and the **Read-Only** checkbox on the applicable profiles. Click **Next**.
 - d. Choose which page layouts display the field. Click **Save & New**.
 5. Add a field to store the Einstein Discovery prescription information.
 - a. Select **Text Area (Rich)**, and click **Next**.
 - b. Enter a field label. For example, *Discovery_Prescription*. Click **Next**.
 - c. On the Establish field-level security page, specify the field's access settings for each profile. Only a trigger should make changes to the custom field, so select the **Visible** checkbox and the **Read-Only** checkbox on the applicable profiles. Click **Next**.
 - d. Choose which page layouts display the field. Click **Save & New**.

The three new custom fields are now in the Custom Fields & Relationships list. They are also visible on the object's detail page, depending on the page layout. Next, put the fields in their own section in the page layout.

Add an Einstein Discovery Section to the Object's Page Layout

Add the custom fields to the object's page layout.

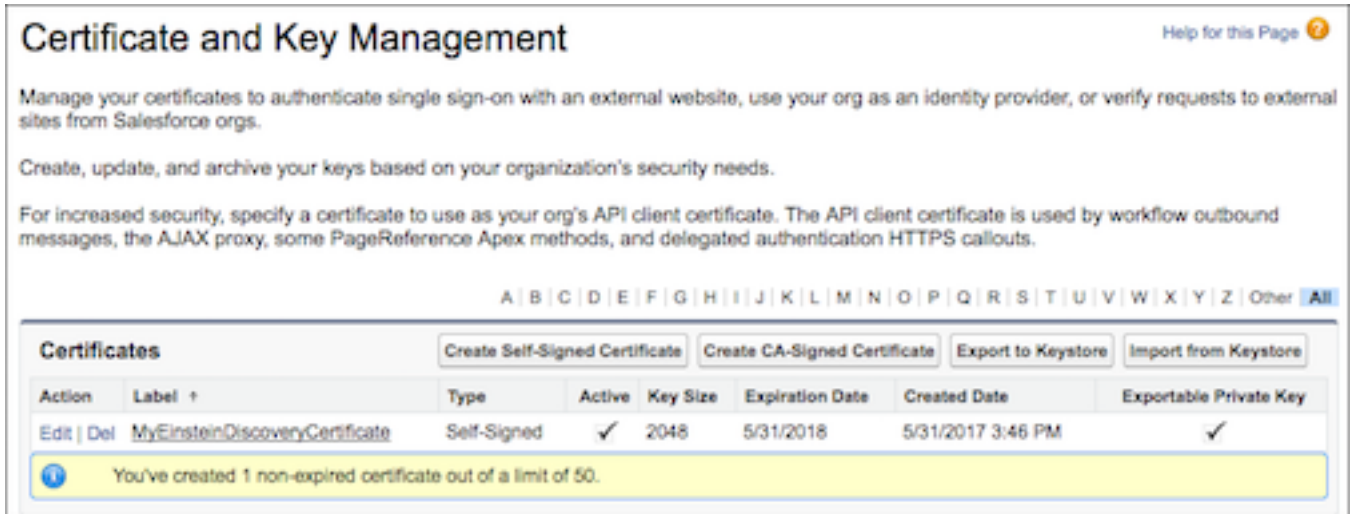
1. From Setup, select **Customize** and then click the object that you want to modify.
2. Click **Page Layouts**.
3. Click **Edit** next to the page layout to modify.
4. In the page layout editor, drag a section from the top palette to below the first section in the lower portion of the screen.
5. In the Section Properties window, enter *Einstein Discovery* for the section name, and click **OK**.
6. In the page layout on the lower portion of the screen, drag the custom fields to the Einstein Discovery section.
7. In the palette at the top, click **Save**.

The Einstein Discovery recommendation fields are now displayed in their own section.

Enable Salesforce Writeback

Before you can use the Writeback feature, you must enable it.

1. From Setup, select **Certificate and Key Management**.
2. In the Certificates section, create a new certificate or select the certificate to use and click **Download Certificate** to save it to your computer. For more information about how to configure certificates, see the Certificates and Keys article in the Salesforce documentation.



Certificate and Key Management Help for this Page

Manage your certificates to authenticate single sign-on with an external website, use your org as an identity provider, or verify requests to external sites from Salesforce orgs.

Create, update, and archive your keys based on your organization's security needs.

For increased security, specify a certificate to use as your org's API client certificate. The API client certificate is used by workflow outbound messages, the AJAX proxy, some PageReference Apex methods, and delegated authentication HTTPS callouts.

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 | Other | All

Certificates Create Self-Signed Certificate Create CA-Signed Certificate Export to Keystore Import from Keystore

Action	Label	Type	Active	Key Size	Expiration Date	Created Date	Exportable Private Key
Edit Del	MyEinsteinDiscoveryCertificate	Self-Signed	✓	2048	5/31/2018	5/31/2017 3:46 PM	✓

You've created 1 non-expired certificate out of a limit of 50.

- To launch Einstein Discovery, from the App Menu, select **Einstein Discovery**.
- To open the Admin page, click the gear icon.
- Click **Writeback**.
The Enable Salesforce Writeback page is displayed.
- Click **Upload Certificate**, navigate to the certificate file you downloaded to your computer and click **Open**.
You see the message, "Salesforce writeback has been enabled".
- Go back to your Salesforce org.

Connect Einstein Discovery to Your Custom Fields

To import the recommendations, you connect your custom fields with Einstein Discovery.

- From Setup, select **Custom Settings**.
- Next to Einstein Discovery - Write Back, click **Manage** and then click **New**.
- Fill out the information.
 - Name**—This integration name is used when the Apex trigger references the custom setting data. Note the name because you use it when you create the Apex trigger. You use this value to replace [NameOfCustomSetting] in the sample code.
 - SOQL for WriteBack**—If your Einstein Discovery story joins data from multiple Salesforce objects, copy the SOQL query from the info panel of the story. Otherwise, leave this field blank.
 - Analysis Id**—The ID number of the Einstein Discovery story from which you want to import the recommendations. To copy the Analysis ID, open the story in Einstein Discovery, and click the **About Story** button.
 - Salesforce Certificate Name**—The name of the certificate that you uploaded on the Einstein Discovery Admin Writeback page. For example, API Client Certificate.
 - Commentary Field Name**—The API name of the Discovery_Explanation__c custom field that you created.
 - Object**—The Salesforce object where you added the custom fields. For example, Case.
 - Outcome Field Name**—The Discovery_Outcome__c custom field that you created.
 - Einstein Discovery Password**—Only use this field if you are not using a Salesforce certificate for authentication. The password to access a standalone Einstein Discovery instance.
 - Prescription Field Name**—The Discovery_Prescription__c custom field that you created.

- j. Einstein Discovery Host—The URL to access Einstein Discovery.
- k. Einstein Discovery Username—Only use this field if you are not using a Salesforce certificate for authentication. The username to access a standalone Einstein Discovery instance.

4. Click **Save**.

Create an Apex Trigger

The Apex trigger fetches the Einstein Discovery predictions when a record is inserted or updated. The Apex trigger is stored under the object with which it is associated.

1. From Setup, select **Customize** and then click the object that you want to add the trigger to.
2. Click **Triggers** and then click **New**.
3. To define your trigger, enter Apex code similar to this sample code.
 - a. Replace `[object_name]` with the name of the object that you are adding the trigger to.
 - b. Replace `[NameOfCustomSetting]` with the integration name you created on the Einstein Discovery Integration information page.

USER PERMISSIONS

To define an Apex trigger:

- Author Apex

```
trigger Set[object_name]Prediction on [object_name] (after insert, after update) {
    if(system.isFuture()) return;

    // Name of the custom setting
    private static final String CONFIG_NAME = '[NameOfCustomSetting]';

    // get config
    analytics_edd__SDDPredictionConfig__c config =
        analytics_edd__SDDPredictionConfig__c.getInstance(CONFIG_NAME);

    List<Map<String, String>> fieldsList = new List<Map<String, String>>();

    for (sObject sObj: Trigger.new) {
        Map<String, Schema.SObjectField> objectFields =
            Schema.getGlobalDescribe().get(config.analytics_edd__object_api_name__c).getDescribe().fields.getMap();

        Map<String, String> fieldValues = new Map<String, String>();

        for (Schema.SObjectField field: objectFields.values()) {
            if (!field.getDescribe().getType().name().endsWithIgnoreCase('textarea')) {
                String fieldApiName = field.getDescribe().getName();
                fieldValues.put(fieldApiName, String.valueOf(sObj.get(fieldApiName)));
            }
        }

        // log field values
        System.debug(fieldValues);
        fieldsList.add(fieldValues);
    }

    // make setPrediction call
    analytics_edd.PredictionIntegration.setPrediction(CONFIG_NAME,
```

```
JSON.serialize(fieldsList);
}
```

4. Make sure that **Is Active** is selected.
5. Click **Save**.

When records of this type are created or updated, the trigger fires and gets the recommendations from Einstein Discovery.

Troubleshoot the Integration

To troubleshoot the integration, you can use the Developer Console. The Developer Console is an integrated development environment with a collection of tools for creating, debugging, and testing applications in your Salesforce org.

1. Open the Developer Console. If you are using Salesforce Classic, click your name and then click **Developer Console**. If you are using Lightning Experience, click the quick access menu (gear icon) and then click **Developer Console**.
2. To view the execution log, select **File > Open Log**. The execution log shows you the information that is sent and received from Einstein Discovery. The callout to Einstein Discovery is *FutureHandler*.

Learn Einstein Discovery with Trailhead

Trailhead is the fun and free way to learn Salesforce. Now you can get acquainted with Einstein Discovery through Trailhead.

- Gain Insight with Einstein Discovery: https://trailhead.salesforce.com/trails/wave_analytics_einstein_discovery

Einstein Discovery Limits

Einstein Discovery limits the number of rows and columns per dataset.

Dataset Storage Limits

Limit	Number
Maximum number of rows for all registered datasets combined	100 million
Maximum number of columns per dataset	200
Maximum number of input columns in a story	50

Developer Edition Limits

The following limits apply to the free trial Einstein Discovery Developer Edition. This edition restricts the dataset size but provides the capabilities of the full product.

Limit	Number
Maximum number of data rows	50,000
Maximum number of columns	12






Einstein Discovery Considerations


Einstein Discovery differs from other Salesforce features in some ways.

- Einstein Discovery isn't localized.
- Accessibility features aren't incorporated into Einstein Discovery.
- To display Einstein Discovery recommendations in a Salesforce object, your Salesforce administrator must install a managed package provided by Salesforce.
- When you create a sandbox, Salesforce does not copy the Einstein Discovery dataset or story from your production org to the sandbox org. A new instance of Einstein Discovery is created.
- Supported browsers: The most recent stable version of Google Chrome™ is supported.
- Stories that are exported to Microsoft PowerPoint or Microsoft Word can be viewed in versions 2013 or later.




Reports and Dashboards









Salesforce offers a powerful suite of reporting tools that work together to help you understand and act on your data.

Get Started with Reports and Dashboards	
Learn Reporting Concepts and Build Your First Report and Dashboard	<p> Trailhead</p> <ul style="list-style-type: none"> • Reports and Dashboards (Lightning Experience) • Reports and Dashboards (Salesforce Classic) • Quick Start: Reports and Dashboards (Salesforce Classic) <p> Help</p> <ul style="list-style-type: none"> • Reports Basics • Dashboards Basics • Getting Started with Salesforce Reports and Dashboards (PDF) <p> Video</p> <ul style="list-style-type: none"> •  Make Data-Driven Decisions with Reports and Dashboards (Lightning Experience)
Review Report and Dashboard Limitations	<p> Help</p> <ul style="list-style-type: none"> • Report Limits • Dashboard Limits

Report on Your Data	
Build Reports	<p> Help</p> <ul style="list-style-type: none"> • Build a Report • Using the Drag-and-Drop Report Builder (PDF)

<p>Report on Your Data</p>	<ul style="list-style-type: none"> • Using Bucket Fields (PDF) • Report Formula Summary Functions (PDF) • What Are Joined Reports? (PDF) <p>▶ Video</p> <ul style="list-style-type: none"> • Getting Started with Report Builder (Salesforce Classic) • Getting Started with Buckets (Salesforce Classic) • Building Matrix Reports (Salesforce Classic) • Introducing Joined Reports in Salesforce (Salesforce Classic)
<p>Filter Reports</p>	<p>📖 Help</p> <ul style="list-style-type: none"> • Filter Report Data • Using Cross Filters in Reports • Filter Reports Via URL Parameters in Lightning Experience <p>▶ Video</p> <ul style="list-style-type: none"> • Dynamically Filter Reports Using URL Parameters (Lightning Experience) • Using Cross Filters in Reports (Salesforce Classic)
<p>Share Reports and Report Data</p>	<p>📖 Help</p> <ul style="list-style-type: none"> • Report and Dashboard Folders <p>▶ Video</p> <ul style="list-style-type: none"> • Analytics Folder Sharing (Salesforce Classic)
<p>Subscribe to and Schedule Reports</p>	<p>📖 Help</p> <ul style="list-style-type: none"> • Schedule and Subscribe to Reports • FAQ: Scheduling Reports (PDF) <p>▶ Video</p> <ul style="list-style-type: none"> • Report Notifications (Salesforce Classic) • Tips for Scheduling Reports (Salesforce Classic)
<p>Work with Report Data in Other Tools</p>	<p>📖 Help</p> <ul style="list-style-type: none"> • Open a Report in Quip • Report on Salesforce Data with Excel • Export a Report

<p>Report on Your Data</p>	
<p>Troubleshoot Reports</p>	<p> Help</p> <ul style="list-style-type: none"> • Do your big reports take a long time to return data? (PDF) <p> Video</p> <ul style="list-style-type: none"> •  Making Your Reports Run Faster (Salesforce Classic)

<p>Share Insights with Dashboards</p>	
<p>Build Dashboards</p>	<p> Help</p> <ul style="list-style-type: none"> • Build a Dashboard • Edit and Customize Lightning Experience Dashboard Components • Work with Salesforce Classic Dashboards • Dynamic Dashboards: Choose Who People View a Dashboard As • Taking Advantage of Dynamic Dashboards (PDF) • Tips for Creating Dashboards (PDF) • Sample CRM Dashboards (PDF) <p> Video</p> <ul style="list-style-type: none"> •  An Overview of Dashboards (Salesforce Classic)
<p>Filter Dashboards</p>	<p> Help</p> <ul style="list-style-type: none"> • Filter a Dashboard • One Dashboard For Many Viewers (PDF)
<p>Share Dashboards</p>	<p> Help</p> <ul style="list-style-type: none"> • Report and Dashboard Folders
<p>Troubleshoot Dashboards</p>	<p> Help</p> <ul style="list-style-type: none"> • Why Doesn't My Dashboard Display the Data I Expect? <p> Video</p> <ul style="list-style-type: none"> •  Getting Dashboards to Display the Right Data (Salesforce Classic)

Reports

Reports give you access to your Salesforce data. You can examine your Salesforce data in almost infinite combinations, display it in easy-to-understand formats, and share the resulting insights with others. Before building, reading, and sharing reports, review these reporting basics.

As you prepare to report on your Salesforce data, keep these tips in mind:

- Well-designed reports run faster.
- Before building your report, consider writing down each of the questions your report must answer. This way, your report is sure to return all the data you need.
- Reports are shared via folders. Whomever has permission to the folder your report is saved in also has access to your report. Ensure that you save your report in an appropriate folder.

Before building your first report, familiarize yourself with these features and concepts.

Report Builder

The *report builder* is a visual, drag-and-drop tool which you use to create reports and edit existing ones. The report builder is where you choose a report type, report format, and the fields that make up your report.

To launch the report builder, click **New Report**.

Fields

One or more *fields* describe each report result. If you imagine that your report as a table of information, then each row is a result and each column is a field.

For example, a human resources manager creates a report about employees. Each result is an employee, and each field is a different piece of information about the employee: first name, last name, job title, start date, and so forth.

When you create or edit a report, you choose which fields you want to include in your report. To ensure your reports run quickly, it's a good idea to include only the fields that you need.

Filters

Limit the data that your report returns by using *filters*. Filters are useful for many reasons, such as focusing your report on specific data, or ensuring that your report runs quickly.

For example, say your report returns all the Cases in your company, but you only want to see Cases which are open and assigned to you. Filter the report on the `Owner` field and `Status` field.

Add filters in the Report Builder. In Lightning Experience, you can add, edit, or remove filters while reading a report, too.

Report Types

The *report type* governs which fields are available in your report. For example, File and Content reports have fields like `File ID`, `File Name`, and `Total Downloads`. Accounts reports have fields like `Account ID`, `Account Name`, and `Phone`.

The first thing you do when creating a report is choose a report type.

Report Format

The *report format* specifies how your report results are laid out. Possible formats are tabular, summary, matrix, or joined. Joined reports aren't available in Lightning Experience.

IN THIS SECTION:

1. [Build a Report](#)

When you have questions about your Salesforce data, like "How much revenue did we earn in the South East last quarter?", "Which lead source is generating the most closed opportunities?", or "What is the average age of all open cases?", build a report to get the answers.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

2. [Filter Report Data](#)
What if your report gives you more data than you need? Use filters to pare down your report until it only shows the data that you want.
3. [Schedule and Subscribe to Reports](#)
Schedule and Subscribe to Reports and receive notifications that keep you informed about metrics you care most about without having to manually run reports. In Salesforce Classic, you can specify criteria that trigger report notifications.
4. [Report on Historical Changes](#)
On top of the standard up-to-the-minute reporting on the current state of your business, you can analyze day-to-day and week-to-week changes in opportunities, cases, forecasts, and custom objects.
5. [Run and Read a Report](#)
Click on a report's name to run it. After running a report, there are a series of tools you can use to help you read the information.
6. [Export and Connect Reports to Other Tools](#)
Export or connect a report to another tool, such as Quip, to work with report data outside of Salesforce.
7. [Organize Reports](#)
Keep your reports at your fingertips by sorting them into folders and deleting unused reports. If you have a lot of reports, you can use the search field to find the one you need.
8. [Report Limits](#)
As you report on your data, be aware of these limits and restrictions.
9. [Troubleshoot Reports](#)
Use these tips to help solve problems that arise when you're working with reports.

Build a Report

When you have questions about your Salesforce data, like "How much revenue did we earn in the South East last quarter?", "Which lead source is generating the most closed opportunities?", or "What is the average age of all open cases?", build a report to get the answers.

IN THIS SECTION:

1. [Build a Report in Lightning Experience \(Beta\)](#)
Lightning report builder is a powerful and intuitive tool for analyzing your Salesforce data. Group, filter, and summarize records to answer business questions like "How much revenue did we generate from new business in California last quarter?" For a visual overview of your data, add a report chart. When finished, run your report to see full results.
2. [Build a Report in Salesforce Classic](#)
Report Builder is a drag-and-drop tool for accessing your data quickly and comprehensively. Use it to set up new reports and edit existing ones.
3. [Report Type Reference](#)
The report type you choose determines which records and fields appear in your report. For example, the Opportunities report type gives you access to Opportunity records and fields like Amount, Stage and Opportunity Owner.

EDITIONS

Available in: Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Enhanced Folder Sharing

Build a Report in Lightning Experience (Beta)

Lightning report builder is a powerful and intuitive tool for analyzing your Salesforce data. Group, filter, and summarize records to answer business questions like “How much revenue did we generate from new business in California last quarter?” For a visual overview of your data, add a report chart. When finished, run your report to see full results.

Available in: Lightning Experience

Available in: **Essentials, Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

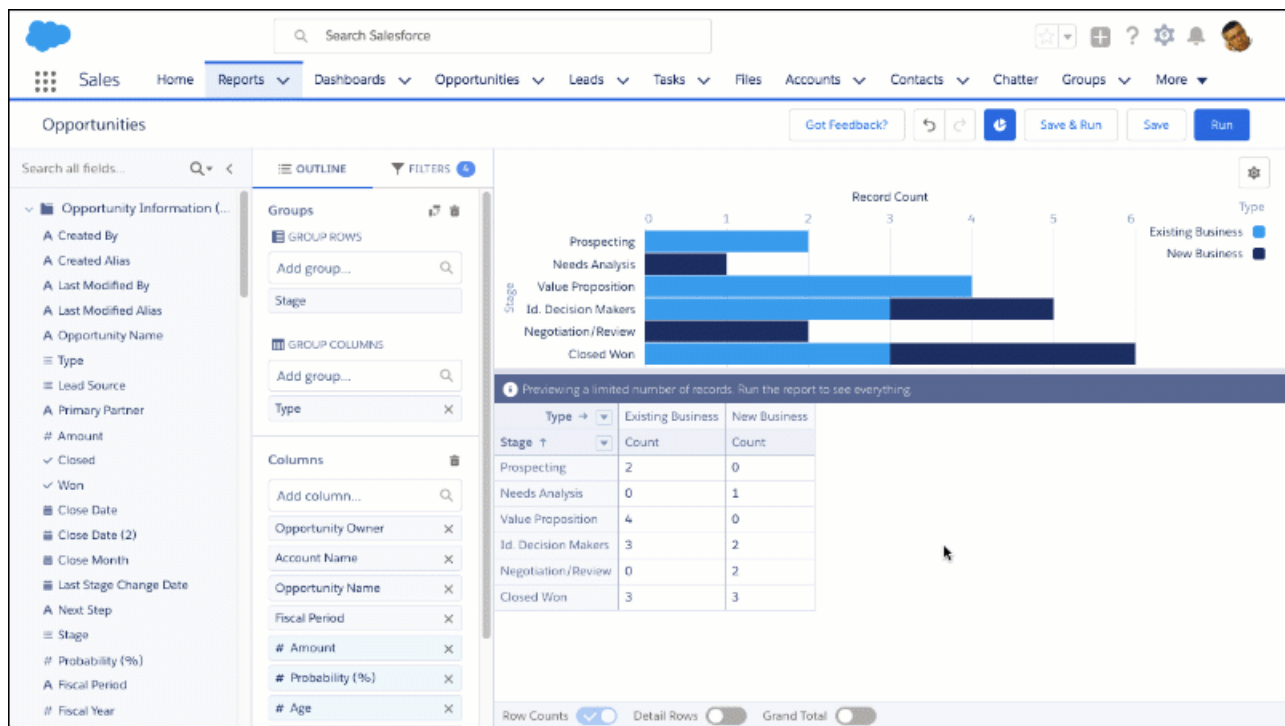
Available in: Enhanced Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- Create and Customize Reports
- AND
- Report Builder

Note: These instructions are for building reports in the Lightning report builder. To learn how to build a report using the Classic report builder, see [Build a Report in Salesforce Classic](#) in the Salesforce help.



1. From the reports tab, click **New Report**.

If you have access to both the Lightning report builder and the Classic report builder, then you can open the Classic report builder by clicking **New Report (Salesforce Classic)**. If you have access to the Classic report builder, but not the Lightning report builder, then clicking **New Report** opens the Classic report builder.

2. Choose a report type, then click **Continue**.




The report type you choose determines which records are returned and which fields are available in your report.

3. The report opens in edit mode, and shows a preview.


In edit mode, add and remove fields to your report as columns, group rows and columns, filter report data, and show or hide a chart. Customize your report until it shows exactly the data that you need.


4. To add a column to your report,
 - a. Choose a field from the **Add column...** picklist.
 - b. Alternatively, expand the **Fields** pane, then drag-and-drop a field onto the Columns list or directly onto the report preview.

To remove a column from your report,

- a. From the Columns list, find the column you want to remove. Then click .
- b. Alternatively, from the preview pane, find the column you want to remove. Click  > **Remove Column**.
- c. To remove all columns from your report, from the Columns list, click .



Removing a column from your report doesn't delete the field. If you remove a column, but want it back, add it again.

5. To summarize a column in your report,
 - a. From the preview pane, find the column you want to summarize. Click  > **Summarize**.
 - b. Choose how you want to summarize the column: **Sum, Average, Max, Min**.


6. To group records in your report,
 - a. Choose a column from the **Add group...** picklist under GROUP ROWS.
After grouping a row, you can group a column by choosing a column from the **Add group...** picklist under GROUP COLUMNS. Group up to 2 rows and 2 columns.
 - b. Alternatively, drag-and-drop a column from the Columns list or from the preview pane onto the GROUP ROWS or GROUP COLUMNS list.
 - c. Alternatively, from the preview pane, find the column you want to group. Click  > **Group Rows by This Column** (or **Group Columns by this Column**).

After adding a group, you can show or hide detail rows, subtotals, and a grand total by toggling switches at the bottom of the preview pane.


To ungroup records in your report,

- a. From the Groups list, find the group you'd like to ungroup and then click .
- b. Alternatively, drag-and-drop the group onto the preview pane.
- c. To ungroup all groups in your report, from the Groups list, click .

Unless you drag-and-drop the group onto the preview pane, removing a group also removes the column from your report. If you still want to show the column, add it back.

7. To filter records from your report, click  **FILTERS**.


Depending on which report type you chose, your report has between two and four standard filters which are applied by default. Most templates include a Show Me filter and a Date filter. The Show Me filter scopes report results around common groups, like "my opportunities" or "all opportunities". The Date filter scopes results around a date field, like "created date" or "closed date".

- a. To add a field filter, choose a field from the **Add filter...** picklist.
- b. To edit a filter, including standard filters, click the filter.
- c. To remove a filter, click the  icon on the filter.

For more information about filtering reports, see Filter Report Data in the Salesforce help.

8. To add a chart, first add at least 1 group, then click **Add Chart**.

A chart appears. To customize the chart, click . Change the chart type, color palette, and more.

To show or hide the chart, click .

To remove the chart, click  > **Remove Chart**.

9. Click **Save**. If you're creating a brand new report, give it a name. Optionally, give it a description. With access and sharing in mind, save the report in an appropriate folder.

10. To view complete report results, click **Run**.



Example: Now you know how to harness your Salesforce data to answer your business questions. So, "How much revenue did we generate from new business in California last quarter?", anyways?

To find out, first create a report based on the Opportunities report type. Then, add these filters:

- Close Date range is Previous FQ.
- Billing State is California.
- Type is New Business.

Summarize the Amount column.

Finally, run the report and take note of the total.

As you prepare to build reports with the Lightning report builder, take note of these few beta limitations.

Differences Between the Lightning and Classic Report Builders

Feature	Difference
Report Formats	<p>In the classic report builder, you must choose a report format before grouping data.</p> <p>In the Lightning report builder, the report format automatically updates as you group report data. Tabular, summary, and matrix reports are all available, but you don't select the format before grouping the data.</p>
Charts	The Lightning report builder features the same charts as the report-view-page in Lightning Experience.
Customizing Granularity when Grouping by Date Fields	<p>When grouping records by a date field, you can't customize date granularity.</p> <p>For example, on the Opportunity report type, grouping by the Date Closed field always groups records by day, and Month Closed always groups records by month.</p>

Features Not Available in the Lightning Report Builder Beta

These features aren't available in the beta version of the Lightning report builder, but we're working hard to implement them in a future release.

Reports built in the Lightning report builder are editable in the Classic builder, and vice versa. To use unavailable features, edit a report in the Classic report builder. For example, edit a report in the Classic builder to add bucket fields.


- Joined Reports
- Bucketing
- Custom Summary Formulas
- Cross Filters
- Row Limit Filters
- Role Hierarchy Filters
- Dashboard Settings Menu
- Report Properties Menu

Build a Report in Salesforce Classic

Report Builder is a drag-and-drop tool for accessing your data quickly and comprehensively. Use it to set up new reports and edit existing ones.

Watch a Demo: [▶ Getting Started with Report Builder \(Salesforce Classic\)](#)

To customize an existing report using report builder, click the name of a report and click **Customize**. To optimize screen real estate, report builder uses a compressed page header. To view your application tabs, simply close the builder or click the Salesforce logo.

 **Note:** These instructions are for building reports in the Classic report builder. To learn how to build a report using the Lightning report builder, see [Build a Report in Lightning Experience \(Beta\)](#) in the Salesforce Help.

IN THIS SECTION:

1. [Choose a Report Type](#)

The report type you choose determines which records and fields appear in your report. For example, the Opportunities report type gives you access to Opportunity records and fields like Amount, Stage, and Type.

2. [Choose a Report Format](#)

A report can use the tabular, summary, matrix, or joined format. Choose a format that's complex enough to capture the data you want to show, but simple enough to communicate it effectively.

3. [Group Your Report Data](#)

Group data in columns or rows in summary, matrix, and joined reports to display meaningful information. For example, group opportunities by Close Date to see closed opportunities or group cases by product to see the number of cases for each product. You can have groupings inside groupings.

4. [Keep Working While Your Report Preview Loads](#)

For most actions, you can continue working on your report while the preview loads. For example, when editing a report you can drag multiple fields into the report, then create a grouping while those columns load.

5. [Categorize Data Quickly with Buckets](#)

Bucketing lets you quickly categorize report records without creating a formula or a custom field. When you create a bucket field, you define multiple categories (buckets) used to group report values.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

6. [Customizing Reports](#)

Report builder is a visual editor for reports. The report builder screen lets you work with report fields and filters, and shows you a preview of your report with just some of the data.

7. [Report Fields](#)

The Fields pane displays fields from the selected report type, organized by folder. It also lists custom summary formulas, which you can create, edit, and delete.

8. [Summarize Your Report Data](#)

A summary field contains numeric values for which you want to know the sum, the average, or the highest or lowest. Summary fields show at all grouping levels. In summary and matrix reports, they also appear at the grand total level.

9. [Subtotal Report Results](#)

Subtotaling your reports gives you a tool to analyze trends in the data. You can group sets of information, sort the groupings, and compare subtotals for each set against the overall total. In summary and joined reports, you can also subtotal by multiple fields to give you cascading sets of information.

10. [Smart Totaling in Reports](#)

“Smart” totaling means that duplicate data is counted only once in any subtotal or total. Salesforce uses “smart” totaling when you run reports that include duplicate data in any of the columns chosen for summing or averaging.

11. [Work with Formulas in Reports](#)

Formulas let you create custom summaries based on calculated values using report data. These formulas can then be used as columns in your report.

12. [Save Your Report](#)

Click **Save** to update an existing report with recent changes, or **Save As** to clone the original report without changing it. In Lightning Experience, click **Clone** to clone the report.

13. [Show Report Data Graphically](#)

To help readers understand your data quickly and easily, show the data in chart form. Charts appear just above the report table. They can help users get a feel for the data before they delve into the details. Use line charts to track changes over time, or a bar or pie chart to compare values at a point in time. Charts can also appear in dashboard components.

14. [Show Report Data in Tables](#)

To help readers scan for data easily, try hiding details and ranges, limiting the number of results shown, and highlighting with color. You can also show your table in a dashboard component.

15. [Combine Different Types of Information in a Joined Report](#)

The joined report format lets you view different types of information in a single report. A joined report can contain data from multiple standard or custom report types.

SEE ALSO:

[Keep Working While Your Report Preview Loads](#)

[Create a Report](#)

[Create a Report](#)

[Report Fields](#)

[Choose a Report Type](#)

[Customizing Reports](#)

[Choose a Report Format](#)

[Creating a Custom Report](#)

[Combine Different Types of Information in a Joined Report](#)

Choose a Report Type


The report type you choose determines which records and fields appear in your report. For example, the Opportunities report type gives you access to Opportunity records and fields like Amount, Stage, and Type.

There are two types of report types: standard report types and custom report types.

Standard report types give you access to most Salesforce data. For example, the Opportunities report type gives you access to Opportunity records and fields in your report. If you're going to report on Opportunity Amounts or Probability or Type, then Opportunities is the report type is for you.

Custom report types give you access to custom objects in Salesforce, or custom views of standard objects (like Opportunities), which your administrator configures. For example, your administrator can create a custom report type which gives access to Opportunities, plus related fields from Products. With that custom report type, you can easily report on Opportunities for a given product.

1. From the Reports tab, click **New Report**.
2. Select the report type, and then click **Create**.

 **Note:** You can't change the report type after the report is created.

The report builder opens, granting access to records and fields based on your selected report type.

SEE ALSO:

[Set Up a Custom Report Type](#)

[Why doesn't my report return the data I expect?](#)

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To run reports:

- **Legacy Folder Sharing**
Run Reports
- **Enhanced Folder Sharing**
Run Reports

To schedule reports:

- **Legacy Folder Sharing**
Schedule Reports
- **Enhanced Folder Sharing**
Schedule Reports

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Choose a Report Format

A report can use the tabular, summary, matrix, or joined format. Choose a format that's complex enough to capture the data you want to show, but simple enough to communicate it effectively.

Choose one of the following report formats using the **Format** menu of the report builder. Tabular format is the default.

Format	Description
Tabular	Tabular reports are the simplest and fastest way to look at data. Similar to a spreadsheet, they consist simply of an ordered set of fields in columns, with each matching record listed in a row. Tabular reports are best for creating lists of records or a list with a single grand total. They can't be used to create groups of data or charts, and can't be used in dashboards unless rows are limited. Examples include contact mailing lists and activity reports.
Summary	Summary reports are similar to tabular reports, but also allow users to group rows of data, view subtotals, and create charts. They can be used as the source report for dashboard components. Use this type for a report to show subtotals based on the value of a particular field or when you want to create a hierarchical list, such as all opportunities for your team, subtotaled by <code>Stage</code> and <code>Owner</code> . Summary reports with no groupings show as tabular reports on the report run page.
Matrix	Matrix reports are similar to summary reports but allow you to group and summarize data by both rows and columns. They can be used as the source report for dashboard components. Use this type for comparing related totals, especially if you have large amounts of data to summarize and you need to compare values in several different fields, or you want to look at data by date <i>and</i> by product, person, or geography. Matrix reports without at least one row and one column grouping show as summary reports on the report run page. Building Matrix Reports (Salesforce Classic)
Joined	Joined reports let you create multiple report blocks that provide different views of your data. Each block acts like a "sub-report," with its own fields, columns, sorting, and filtering. A joined report can even contain data from different report types. Joined reports are available only in Enterprise, Performance, Unlimited, and Developer Editions. Introducing Joined Reports in Salesforce (Salesforce Classic)

Changing the Report Format

Changing the format affects filters and groupings, as follows:

When you change...	What Happens?
Tabular to Summary or Matrix	The <code>Rows to Display</code> filter is removed.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- Legacy Folder Sharing**
 Create and Customize Reports
 AND
 Report Builder
- Enhanced Folder Sharing**
 Create and Customize Reports
 AND
 Report Builder

When you change...	What Happens?
Summary, Matrix, or Joined to Tabular	All groupings, charts, and custom summary formulas are removed from the report. Grouping fields are not converted to columns in the tabular report. If the joined report contained multiple blocks, the columns from only the first block are included in the tabular report.
Summary to Matrix	The first summary grouping becomes the first row grouping. The second becomes the first column grouping. The third becomes the second row grouping. If you're using the report wizard, the third summary grouping is removed.
Matrix to Summary	The first row grouping becomes the first summary grouping. The second row grouping becomes the <i>third</i> summary grouping. The first column grouping becomes the <i>second</i> summary grouping. The second column grouping is removed. If you're using the report wizard, <i>both</i> the second row grouping and second column grouping are removed.
Tabular, Summary, or Matrix to Joined	The existing report becomes the first block in the joined report, and the report type becomes the principle report type for the joined report. Joined report blocks are formatted as summary reports, so if you switch from a summary to a joined report, your groupings stay the same. If you switch from a matrix to a joined report, groupings are converted the same way as when you switch from a matrix to a summary report. The following items aren't supported in joined reports, and aren't converted: <ul style="list-style-type: none"> • Bucket fields • Cross filters • The Rows to Display filter

SEE ALSO:

[Build a Report in Salesforce Classic](#)

Group Your Report Data

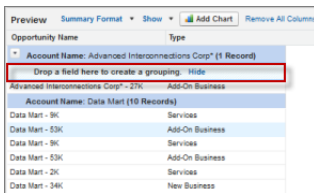
Group data in columns or rows in summary, matrix, and joined reports to display meaningful information. For example, group opportunities by Close Date to see closed opportunities or group cases by product to see the number of cases for each product. You can have groupings inside groupings.

Data for Grouping

The Fields pane displays fields from the selected report type, organized by folder. Before you group data in a summary report, drag and drop at least a few fields into the preview pane.

Add a Grouping

Add a group by dropping a field onto a drop zone.



Click **Show > Drop Zones** to make them visible. You can also click a column menu for a field in the report and choose **Group by this Field**.

Tip: If you group your report by a date field, you can click the group menu, select **Group Dates By**, and specify the grouping time frame: day, week, month, quarter, year, etc.

Grouping Data in Different Report Formats

Summary and joined reports can have up to three grouping levels. Matrix reports can have two row and two column groupings. For matrix reports, you can't use the same field for both row and column groupings. For joined reports, you can use the fields from the Common Fields category in the Fields pane to group across all report blocks.

Remove a Grouping

To remove a group, click the group menu and choose **Remove Group**. You can also grab the group and:

- Drag it to the column bar to remove the group, but keep the field as a column in the report.
- Drag it back to the Fields pane to remove the group and the field from the report.

Change Order of a Grouping

Drag groups to change their order, or click the group menu and choose **Move Group Up** or **Move Group Down** for column groupings, or **Move Group Left** or **Move Group Right** for row groupings.

SEE ALSO:

[Report Fields](#)

[Subtotal Report Results](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS


To create, edit, and delete reports:

- **Legacy Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder
- **Enhanced Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder

Keep Working While Your Report Preview Loads

For most actions, you can continue working on your report while the preview loads. For example, when editing a report you can drag multiple fields into the report, then create a grouping while those columns load.

The data you see in the Preview panel is real data, but it's only a subset of the data in the report, designed to show you what the report will look like when you run it. Don't worry if rows are missing or not sorted as expected in the Preview panel.

 **Note:** For each external object in the report, your org calls out to the external system each time the preview loads. If the URL of a report callout approaches or exceeds 2 KB, your org splits the request into multiple HTTP calls, with each URL being less than 2 KB.

You can continue working in the report preview while the following actions occur:

- Add, remove, or reorder fields
- Add or remove summary fields
- Add, remove, or reorder groupings
- Remove formulas

 **Note:**

- If you remove a summary field or formula used in a chart, the chart reloads, but the report preview loads asynchronously.
- Asynchronous loading isn't available for matrix and joined reports.

You can't work in the report preview while the following actions occur:

- Add or edit formulas
- Remove a report's only grouping
- Remove a column used to [limit the row count](#) for a tabular report
- Sort the report by group or column
- Update standard or custom filters
- Change report format
- Show or hide report details
- Add or remove a chart
- Add or remove conditional highlighting
- Change **Group Dates By**
- Change a converted currency field
- Save the report

SEE ALSO:

[Build a Report in Salesforce Classic Report Fields](#)

Categorize Data Quickly with Buckets

Bucketing lets you quickly categorize report records without creating a formula or a custom field. When you create a bucket field, you define multiple categories (buckets) used to group report values.

Watch a Demo: [▶ Getting Started with Buckets \(Salesforce Classic\)](#)

Bucketing lets you quickly categorize report records without creating a formula or a custom field. For example, create a bucket field named `Size` based on the `# Employees` field. Then, create buckets that group records into "Large," "Medium," or "Small" ranges that you define. Bucket fields can be used like any other field to sort, filter, and group your report.

IN THIS SECTION:

1. [Add a Bucket Field](#)
Create a bucket field to contain the buckets into which you want to organize your report data.
2. [Edit a Bucket Field](#)
Set up your bucket field by specifying the buckets that it contains and the values that go in the buckets.
3. [Edit a Numeric Bucket Field](#)
A numeric bucket helps you sort data that can be described in terms of numbers.
4. [Numeric Bucketing Example: Deal Size](#)
To gain insight into your deals, use bucketing to group by deal size instead of looking at individual deals. This lets you concentrate on the large deals that affect your quota the most.
5. [Edit a Picklist Bucket Field](#)
A picklist bucket field contains items that can be selected from a list.
6. [Picklist Bucketing Example: Industry Types](#)
Use a picklist bucket field to sort your accounts by their industry.
7. [Edit a Text Bucket Field](#)
A text bucket helps you sort out values that consist of words or phrases.
8. [Enter Values for Text Buckets](#)
A text bucket field needs a descriptive name and two or more buckets containing text strings.
9. [Text Bucketing Example: Strategic Accounts](#)
Use a text bucket to sort accounts into general categories that you can act on.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Add a Bucket Field

Create a bucket field to contain the buckets into which you want to organize your report data.

You can add up to five bucket fields per report, each with up to 20 buckets.

1. In the Fields pane of the report builder, double-click **Add Bucket Field** or drag it into the report preview. You can also click a column menu for a field in the report and select **Bucket this Field**.
2. Edit the bucket field according to the field type.
 - [Edit a Numeric Bucket Field](#)
 - [Edit a Picklist Bucket Field](#)
 - [Edit a Text Bucket Field](#)

Fields with other field types are not supported.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing


USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Edit a Bucket Field

Set up your bucket field by specifying the buckets that it contains and the values that go in the buckets.

1. In the report builder Fields pane under Bucket Fields, hover over a bucket field and click . Or in the Preview pane, click the bucket field column menu and select **Edit Bucket Field**.
2. Edit the bucket field according to the field type.
 - [Edit a Numeric Bucket Field](#)
 - [Edit a Picklist Bucket Field](#)
 - [Edit a Text Bucket Field](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Edit a Numeric Bucket Field

A numeric bucket helps you sort data that can be described in terms of numbers.

In the Edit Bucket Field overlay for a numeric field:

1. For `Source Column`, select the field you want to bucket.
2. Enter a bucket field name. This appears as the column name in the report.
Since a bucket field is intended to have multiple buckets (known as “ranges” in numeric bucket fields) within it, a good name for a bucket field describes the scope of the ranges. For example, a bucket field named “Size” could have ranges of “Small,” “Medium,” and “Large”.
3. Define your ranges by entering a number and a name. The range names appear as values in your new column.
Each range is greater than the lower number up to and including the higher number.
To remove all ranges and start over, click **Clear All**.
4. To move all empty values to the bucket containing the value zero, enable `Treat empty source column values in the report as zeros`.
If this is disabled, unbucketed values appear as a dash (-) in the column.
5. Click **OK**.

In a report, numeric bucket columns are sorted by range values.

SEE ALSO:

[Numeric Bucketing Example: Deal Size](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Numeric Bucketing Example: Deal Size

To gain insight into your deals, use bucketing to group by deal size instead of looking at individual deals. This lets you concentrate on the large deals that affect your quota the most.

1. Create or edit a standard opportunity report.
2. In the Fields pane of the report builder, double-click **Add Bucket Field** or drag it into the report.
3. For Source Column, select *Amount*.
4. For Bucket Field Name, enter *Deal Size*.
5. Under Define Ranges, enter *1000* in the first row. This represents the maximum for a small deal. Name this range *Small*.
6. Click **Add** and enter *25000* in the second row. This represents the maximum for a medium-size deal. Name this range *Medium*.
7. By default, the last range is any amount over the previous range. You don't need to enter a number for this range. Name this range *Large*.
8. Click **OK**.

With numeric bucket fields, each range is greater than the lower number, up to and including the higher number. Once you've set up this bucket field, amounts will be bucketed as follows:

Amounts	Bucket
1000 or less	Small
1001 to 25000	Medium
25001 or more	Large

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
 - Create and Customize Reports
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 - Report Builder
- **Enhanced Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder

Edit Bucket Field Help for this Page ? x

Use bucket fields to group, filter, or arrange report data. Create multiple buckets in this bucket field to group your report records.

Source Column:

Bucket Field Name:

Define Ranges Clear All

Range	Name
<= <input type="text" value="1,000"/>	<input type="text" value="Small"/>
> 1,000 to <input type="text" value="25,000"/>	<input type="text" value="Medium"/> Delete
> <input type="text" value="25,000"/>	<input type="text" value="Large"/>

Treat empty **Amount** values in the report as zeros.

SEE ALSO:

[Edit a Numeric Bucket Field](#)

Edit a Picklist Bucket Field

A picklist bucket field contains items that can be selected from a list.

Note: The following picklist types can't be bucketed.

- Record types
- Divisions
- Multi-value picklists
- The **Type** picklist in Activity reports

In the Edit Bucket Field overlay for a picklist field:

1. For **Source Column**, select the field you want to bucket.
2. Enter a bucket field name. This appears as the column name in the report.
Since a bucket field is intended to have multiple buckets within it, a good name for a bucket field describes the scope of the buckets. For example, a bucket field named "Priority" could have "High," "Medium," and "Low" buckets.

Important: Picklist bucket names must include one or more letters or symbols. If a picklist bucket field includes a bucket whose name contains only numbers, the bucket field cannot be saved.

3. To create a bucket, click **New Bucket** and enter a bucket name. Create multiple buckets to group your report records.
4. To find a particular value in the list of values, type the first few characters of its name in the Quick Find box. As you type, items that match your search terms appear in the menu.
5. Select values and drag them into a bucket. Alternatively, select values, click **Move To**, and select a bucket or enter a new bucket name.

While you're bucketing values, use these functions as needed:

- To show all the values in the report, click **All Values**.

- To show the values for a particular bucket, click the bucket name.
- To remove values from a bucket, select the values and drag them to another bucket, or drag them to **Unbucketed Values**.

 **Note:** You can bucket only active picklist values. Inactive picklist values aren't shown.

6. To move all unbucketed values into a bucket named "Other", enable `Show unbucketed values as "Other"`. If this is disabled, unbucketed values appear in the bucket column with the value name.

7. Click **OK**.

In a report, picklist bucket columns are sorted by the bucket position as shown in the Edit Bucket Field dialog box, followed by "Other" if `Show unbucketed values as "Other"` is enabled, or the unbucketed picklist item names if `Show unbucketed values as "Other"` is disabled.

SEE ALSO:

[Picklist Bucketing Example: Industry Types](#)

Picklist Bucketing Example: Industry Types

Use a picklist bucket field to sort your accounts by their industry.

1. Create or edit a standard accounts report, making sure at least a few records appear in the report.
2. In the Fields pane of the report builder, double-click **Add Bucket Field** or drag it into the report.
3. For Source Column, select `Industry`.
4. For Bucket Field Name, enter `Industry Types`.
5. Click **New Bucket** and name the bucket `IT`.
6. Click **New Bucket** and name the bucket `Bio Tech`.
7. Click **New Bucket** and name the bucket `Telecom`.
8. Select values and drag them into the appropriate buckets.
9. Enable `Show unbucketed values as "Other"`.
10. Click **OK**.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

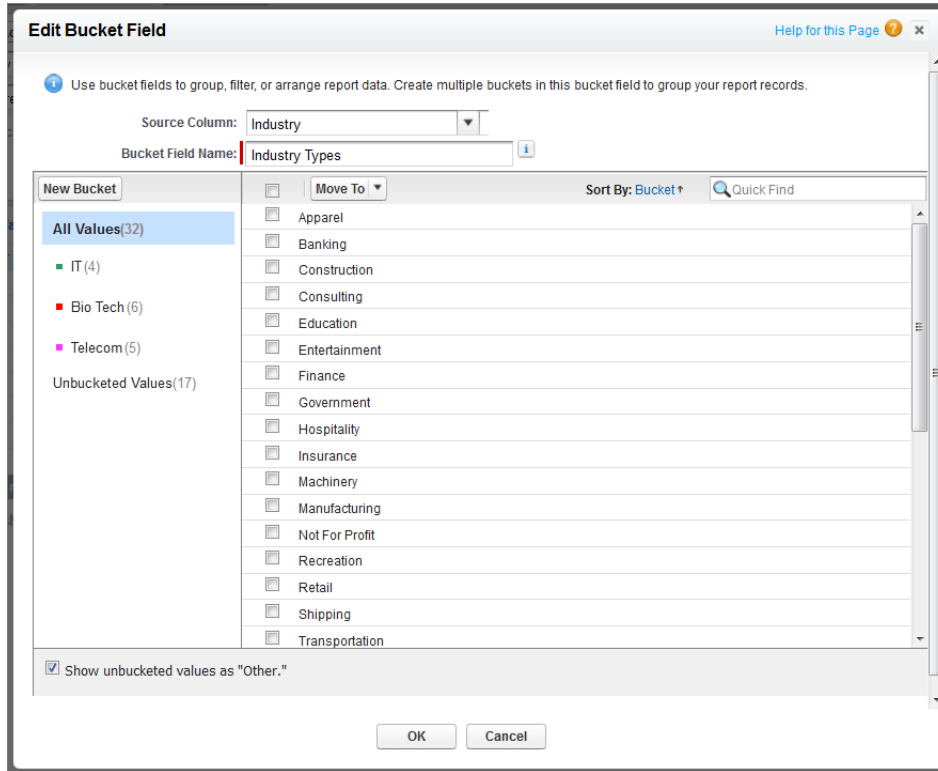
Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder
- Enhanced Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder




SEE ALSO:

[Edit a Picklist Bucket Field](#)

Edit a Text Bucket Field

A text bucket helps you sort out values that consist of words or phrases.

 **Note:** The following text types can't be bucketed.

- Text area
- Text area—long
- Text area—rich
- Text area—encrypted
- URL
- Date
- Date/Time

In the Edit Bucket Field overlay for a text field:

1. For `Source Column`, select the field you want to bucket.
2. Enter a bucket field name. This appears as the column name in the report.
Since a bucket field is intended to have multiple buckets within it, a good name for a bucket field describes the scope of the buckets. For example, a bucket field named "Region" could have "East," "West," and "Central" buckets.
3. To create a bucket, click **New Bucket** and enter a bucket name. Create multiple buckets to group your report records.
4. To find a particular value in the list of values, type all or part of its name in the **Search for values...** box and click **Search**, or leave the box empty and click **Search**.
The search returns up to 200 values.
5. Select values and drag them into a bucket. Alternatively, select values, click **Move To**, and select a bucket or enter a new bucket name.
While you're bucketing values, use these functions as needed:
 - Use **Enter Values** to enter the exact name of a value you want to bucket, or to bucket values that may appear in your report later.
 - To show the values for a particular bucket, click the bucket name.
 - To remove values from a bucket, select the values, select **Move To**, and select a bucket or enter a new bucket name.
6. To move all unbucketed values into a bucket named "Other," enable `Show unbucketed values as "Other"`. If this is disabled, unbucketed values appear in the bucket column with the value name.
7. Click **OK**.

In a report, text bucket columns are sorted in alphanumeric order.

SEE ALSO:

[Enter Values for Text Buckets](#)

[Text Bucketing Example: Strategic Accounts](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Enter Values for Text Buckets

A text bucket field needs a descriptive name and two or more buckets containing text strings.

If you know the exact value you want to bucket, you can use the Enter Values function to quickly bucket it without searching. This is useful if your report has a large number (such as millions) of values and searching for a value is slow. You can also use this method to enter and bucket values that may appear in your report later.

In the Edit Bucket Field overlay for a text field:

1. Click **Enter Values**.
2. Select the bucket where you want to move the values. If you select **New Bucket**, enter a name for the bucket.
3. Type one or more values in the box. Enter multiple values on separate lines.
4. Click **Move**.

SEE ALSO:

[Edit a Text Bucket Field](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
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AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Text Bucketing Example: Strategic Accounts

Use a text bucket to sort accounts into general categories that you can act on.

1. Create or edit a standard account report, making sure at least a few records appear in the report.
2. In the Fields pane of the report builder, double-click **Add Bucket Field** or drag it into the report.
3. For Source Column, select `Account Name`.
4. For Bucket Field Name, enter `Strategic`.
5. Click **New Bucket** and name the bucket `IBM`.
6. Click **New Bucket** and name the bucket `DeLL`.
7. Click **New Bucket** and name the bucket `HP`.
8. To show the available values, leave the **Search for values...** box empty and click **Search**.
9. Select values and drag them into the appropriate buckets.
10. Enable `Show unbucketed values as "Other"`.
11. Click **OK**.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

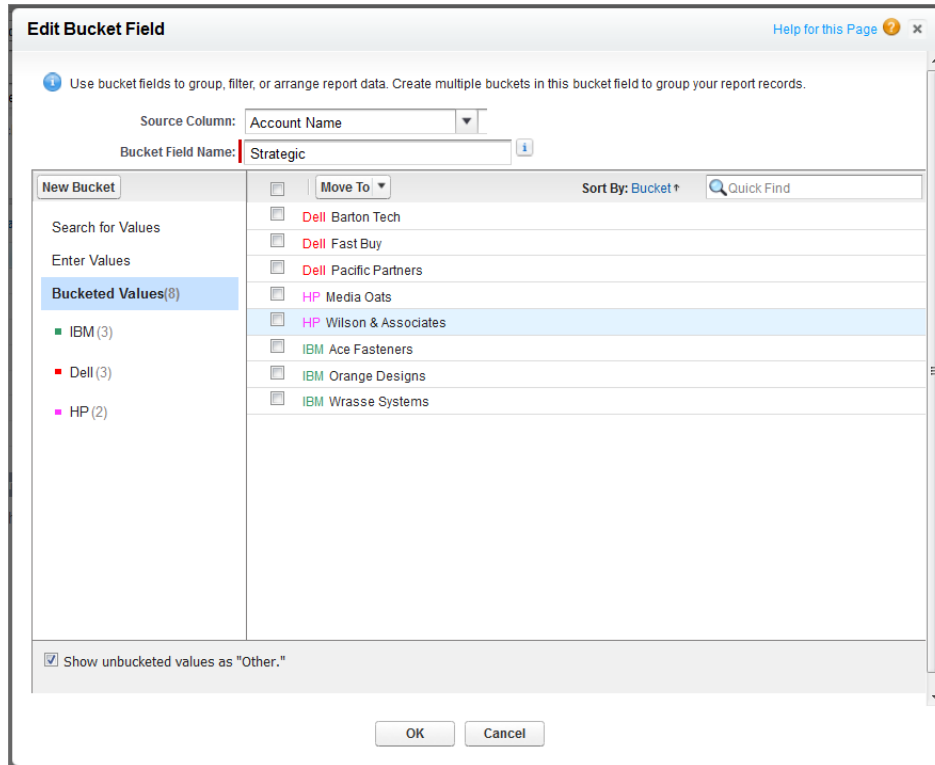
Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder
- Enhanced Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder



SEE ALSO:

[Edit a Text Bucket Field](#)

Customizing Reports

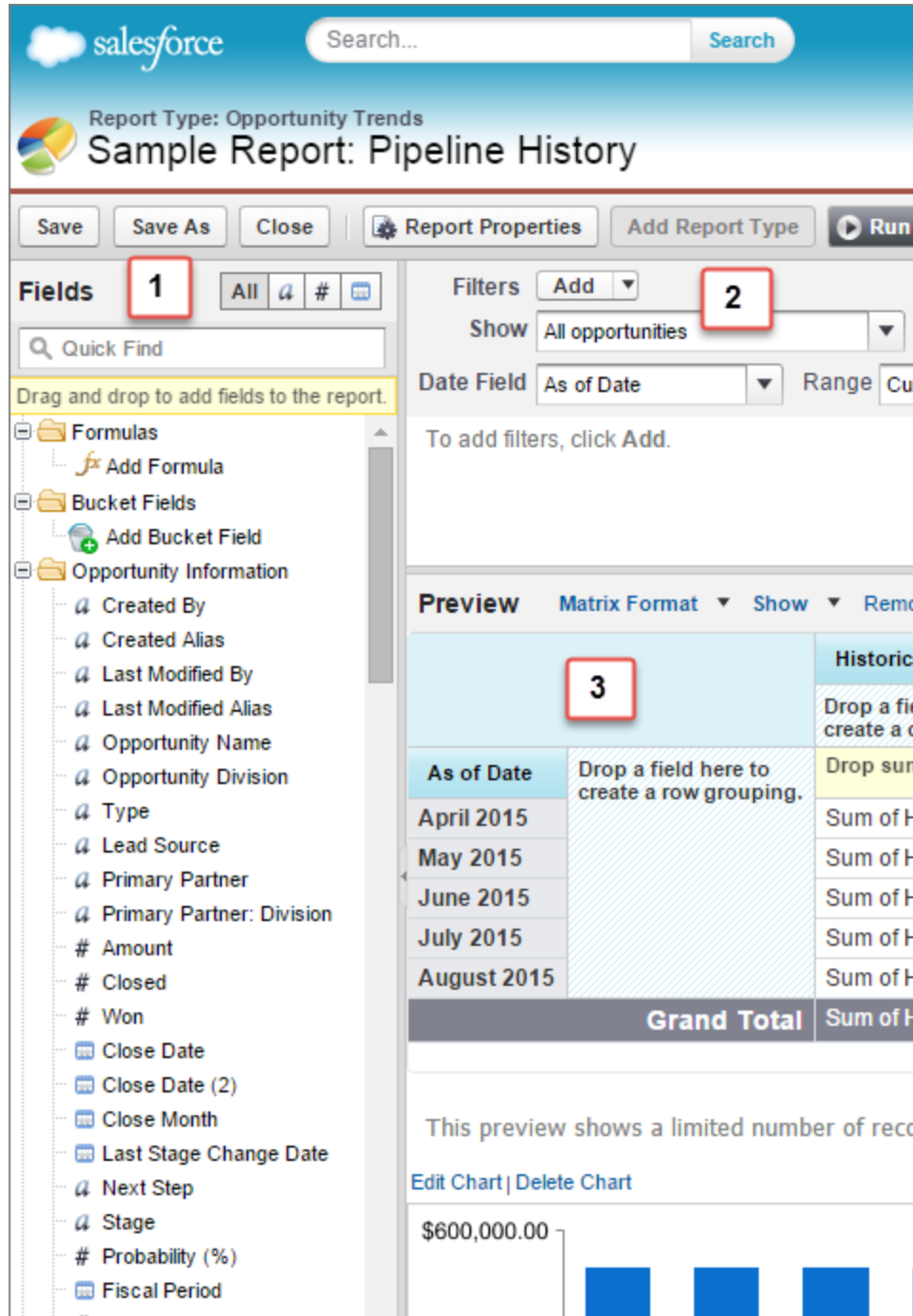
Report builder is a visual editor for reports. The report builder screen lets you work with report fields and filters, and shows you a preview of your report with just some of the data.

To optimize screen real estate, report builder uses a compressed page header. To view your application tabs, simply close the builder or click the Salesforce logo.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions



Fields Pane (1)

The Fields pane displays fields from the selected report type, organized by folder. Find the fields you want using the Quick Find search box and field type filters, then drag them into the Preview pane to add them to the report.

Create, view, edit, and delete custom summary formulas and bucket fields in the Fields pane as well.

In the joined report format, the Fields pane displays fields from all report types added to the report, organized by report type.

Filters Pane (2)

Set the view, time frame, and custom filters to [limit the data](#) shown in the report.

Preview Pane (3)

The dynamic preview makes it easy for you to customize your report. Add, reorder, and remove columns, summary fields, formulas, groupings, and blocks. Change the report format and display options, or add a chart.

The preview shows only a limited number of records. Run the report to see all your results.

Watch a Demo:  [Getting Started with Report Builder \(Salesforce Classic\)](#)

SEE ALSO:

[Create a Report](#)

[Build a Report in Salesforce Classic](#)

Report Fields





The Fields pane displays fields from the selected report type, organized by folder. It also lists custom summary formulas, which you can create, edit, and delete.

Adding Field Filters

With tabular, summary, and matrix reports, you can drag a field from the Fields pane to the Filters pane to add a report filter.

Finding Fields

Find a field by typing its name into the Quick Find search box. You can also filter the list by type:

- Click  to see all field types, as well as custom summary formulas.
- Click  to see just text fields.
- Click  to see just number fields (numeric, percentage, or currency).
- Click  to see just date fields.

Adding and Removing Fields

To add a field to a tabular, summary, or matrix report, double-click it or drag it into the Preview pane. To add a field to a joined report, drag it to the Preview pane. Press **CTRL** to select multiple fields. Drag an entire folder to add all its fields. If a tabular, summary, or matrix report already contains a field, you can't add it again. You can add the same field multiple times to a joined report as long as you add it to different blocks. In the preview pane, click **Show > Details** to see your report fields. While **Show > Details** is disabled, you can only add summary fields.

To remove a field, grab its column header and drag it back to the Fields pane. With tabular, summary, and matrix reports, you can click the column menu and choose **Remove Column**, or click **Remove All Columns**.

Working with More than One Field

You can select multiple fields to add, remove, or reorder. For example, you can add `Created By`, `Type` and `Opportunity Name` to your report at the same time.

To select multiple fields or columns, press **CTRL** (Windows) or **Command** (Mac).

Note:

- When you add multiple fields, they appear in the report in the order selected.
- For summary and tabular formats, disable **Show > Details** when adding multiple summarizable fields to a report. The Summarize dialog automatically appears, letting you select summaries for all the fields at once.
- Enable **Show > Details** when adding non-summary fields, such as text fields to a report.
- When working with a joined report, you can select multiple fields from the Common Fields category and one report type. You can't select multiple fields from different report types.

Ordering and Sorting Fields

Reorder report columns by grabbing a column header and dragging it to a new location. Press **CTRL** to select multiple columns. To sort your report by a column, click its column header. You can also click the column menu and choose **Sort Ascending** or **Sort Descending** from the drop-down list. Sort is disabled when **Show > Details** isn't selected.

Changing the Currency Displayed

If your organization has enabled multiple currencies, you can change the currency shown for all currency fields. Click **Show > Display Currencies Using**, then select an active currency to display.

SEE ALSO:

[Work with Formulas in Reports](#)

[Group Your Report Data](#)


[Summarize Your Report Data](#)

[Highlight Data Ranges](#)

Summarize Your Report Data


A summary field contains numeric values for which you want to know the sum, the average, or the highest or lowest. Summary fields show at all grouping levels. In summary and matrix reports, they also appear at the grand total level.

The Fields pane displays fields from the selected report type, organized by folder.

A summary is the **Sum**, **Average**, **Max**, or **Min** for a number field. (Use the  filter to find them faster.)

To add a summary field:

- Double-click a number field in the Fields pane.
- Drag a number field into the preview. Press **CTRL** to select multiple fields. For matrix reports, there are drop zones before, between, and after sets of summaries. For example, the sum, average, max, and min of **Annual Revenue** are a set, and you can't drop a new summary field between them.
- Choose **Summarize this Field** in the column menu for a field already in the report.

To change an existing summary field, or add other summaries on that same field, click  next to the summary field and choose **Summarize this Field**.

To remove a summary field:

- Click its menu and choose **Summarize this Field** and deselect all options.
- Click its menu and choose **Remove Summary**.
- Drag the summary set back to the Fields pane. Note that all summaries for that field are removed. Press **CTRL** to select multiple summary fields.

Reorder sets of summary fields in matrix reports by dragging them. The summaries for each field move together when dragged. For example, if your report contains the sum and average of **Annual Revenue**, and the max and min of **Probability**, you can drag the **Probability**

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

summaries before or after the Annual Revenue summaries, but not between. Summaries can't be placed after custom summary formulas or Record Count.

SEE ALSO:

[Report Fields](#)

[Subtotal Report Results](#)

Subtotal Report Results

Subtotaling your reports gives you a tool to analyze trends in the data. You can group sets of information, sort the groupings, and compare subtotals for each set against the overall total. In summary and joined reports, you can also subtotal by multiple fields to give you cascading sets of information.

For example, if you subtotal a summary report by Opportunity Owner, the report groups the accounts by Opportunity Owner, lists the number of opportunities owned by each user, and shows subtotals by Opportunity Owner for all the columns in the report. You could further subtotal each user's opportunities by product.

1. Click **Customize** or **Edit** from any report.
2. In the report builder, [add a summary field](#) to the report. Summaries show up at grouping levels as well as for individual rows.

SEE ALSO:

[Build a Custom Summary Formula](#)

[Build a Report in Salesforce Classic](#)


[Subtotal Report Results](#)

Smart Totaling in Reports

"Smart" totaling means that duplicate data is counted only once in any subtotal or total. Salesforce uses "smart" totaling when you run reports that include duplicate data in any of the columns chosen for summing or averaging.

For example, suppose an opportunity has two products, and you run the Opportunity Product Report with the total opportunity amount selected as a column to sum by. The amount appears twice in the details of the report, once for each product on the opportunity.

In this case, "smart" totaling correctly calculates any subtotals, grand totals, and averages, adding that opportunity amount only once.

 **Note:** For dashboard components, "smart" totaling isn't used. For example, in a dashboard table, the total displayed is simply the sum of the values listed in the table.

SEE ALSO:

[Subtotal Report Results](#)

[Subtotal Report Results](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS


To subtotal report results:


- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Work with Formulas in Reports

Formulas let you create custom summaries based on calculated values using report data. These formulas can then be used as columns in your report.

The Fields pane displays fields from the selected report type, organized by folder.

To add a new formula to a summary or matrix report, double-click **Add Formula**. Once you define it and click **OK**, it's automatically added to the preview as a column for summary reports, and a summary field for matrix reports. With joined reports, you can add either a cross-block or a standard custom summary formula. To edit a formula, hover over the name in the Fields pane and click .

To remove a formula from the preview, grab its header and drag it back to the Fields pane, or click its menu and choose **Remove Formula**. Press **CTRL** to select multiple formulas. Removing a formula from the preview doesn't delete it. To delete a formula, hover over the name and click , or click **Delete Formula** from the field menu.

Dashboard and report charts that display values from custom summary formulas display decimal places using your default currency setting instead of what you specified for the formula. For example, if the summary formula specifies zero decimal places, no decimal places appear in columns, but chart values show the number of decimal places specified for your default currency (usually two decimal places). This applies to currencies, numbers, and percentages.

IN THIS SECTION:

1. [Build a Custom Summary Formula](#)
Create custom summary formulas for summary and matrix reports to calculate additional totals based on the numeric fields available in the report.
2. [Use a Summary Function in a Custom Summary Formula](#)
Summary functions let you use grouping values in custom summary formulas for summary, matrix, and joined reports. There are two summary functions: `PARENTGROUPVAL` and `PREVGROUPVAL`.
3. [PARENTGROUPVAL and PREVGROUPVAL](#)
Use `PARENTGROUPVAL` to calculate values relative to a parent grouping. Use `PREVGROUPVAL` to calculate values relative to a peer grouping.
4. [Get the Most Out of Custom Summary Formulas](#)
Custom summary formulas are a powerful reporting technique, but they can be tricky. Here are some tips to keep in mind when working with them.

SEE ALSO:

- [Build a Custom Summary Formula](#)
- [Report Fields](#)

EDITIONS

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- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Build a Custom Summary Formula

Create custom summary formulas for summary and matrix reports to calculate additional totals based on the numeric fields available in the report.

A formula is an algorithm that derives its value from other fields, expressions, or values. Custom summary formulas can contain 3900 or fewer characters. Custom summary formulas are available for summary, matrix, and joined reports. They can't be shared across multiple reports.

1. In report builder, click **Add Formula** in the Fields pane.
2. Enter a name for your formula as it will appear on the report. The label must be unique. Optionally, enter a description.
3. From the `Format` drop-down list, select the appropriate data type for your formula based on the output of your calculation.
4. From the `Decimal Places` drop-down, select the number of decimal places to display for currency, number, or percent data types. This setting is ignored for currency fields in multicurrency organizations. Instead, the `Decimal Places` for your currency setting apply. If you select **None** for `Decimal Places`, the effective values are:
 - For currency, displays up to 18 digits, with the default decimal-place precision for the currency
 - For percentages, displays up to 18 digits, with no decimal places
 - For numbers, displays up to 18 digits, without changing the decimal-place precision
5. Set the `where will this formula be displayed?` option. The formula calculation will be displayed in the report at the level you select. To display the formula calculation at every level, including the Grand Total, select `All summary levels`.
6. Build your formula:
 - a. Select one of the fields listed in the **Summary Fields** drop-down list. This field's value is used in your formula.
 - b. Select the kind of summary type to use in your formula. This option is not available for `Record Count`

Summary Type	Description
Sum	The summary value of data in a field or grouping of fields.
Largest Value	The largest value of data in a field or grouping of fields.
Smallest Value	The smallest value of data in a field or grouping of fields.
Average	The average of data in a field or grouping of fields.

- c. Click **Operators** to add operators to your formula.

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Available in: Enhanced Folder Sharing and Legacy Folder Sharing

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Create and Customize Reports
AND
Report Builder

- d. Select the function category (All, Logical, Math, or Summary), choose the function you want to use in your formula, and click **Insert**.
 - e. Repeat these steps as necessary.
7. Click **Check Syntax** to see if your formula contains errors. Errors are highlighted by the cursor.
 8. Click **OK**. Your formula isn't saved until you save the report.

SEE ALSO:

- [Build a Report in Salesforce Classic](#)
- [Work with Formulas in Reports](#)
- [Get the Most Out of Custom Summary Formulas](#)
- [Build a Custom Summary Formula for a Joined Report](#)

Use a Summary Function in a Custom Summary Formula

Summary functions let you use grouping values in custom summary formulas for summary, matrix, and joined reports. There are two summary functions: `PARENTGROUPVAL` and `PREVGROUPVAL`.

1. Double-click **Add Formula** in the Fields pane.
2. In the Custom Summary Formula dialog, under Functions, select *Summary*.
3. Select `PARENTGROUPVAL` or `PREVGROUPVAL`.
4. Select the grouping level and click **Insert**.
5. Define the formula, including where to display the formula.
6. Click **OK**.

SEE ALSO:

- [Work with Formulas in Reports](#)
- [PARENTGROUPVAL and PREVGROUPVAL](#)

PARENTGROUPVAL and PREVGROUPVAL

Use `PARENTGROUPVAL` to calculate values relative to a parent grouping. Use `PREVGROUPVAL` to calculate values relative to a peer grouping.

PARENTGROUPVAL

Use this function to calculate values relative to a parent grouping.

Description:	This function returns the value of a specified parent grouping. A “parent” grouping is any level above the one containing the formula. You can only use this function in custom summary formulas for reports.
Use:	<p>Summary and Joined: <code>PARENTGROUPVAL(summary_field, grouping_level)</code></p> <p>Matrix: <code>PARENTGROUPVAL(summary_field, parent_row_grouping, parent_column_grouping)</code></p>

EDITIONS

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Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

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Where `summary_field` is the summarized field value, `grouping_level` is the parent level for summary reports, and `parent_row_level` and `parent_column_level` are the parent levels for matrix reports.

Example:

```
TOTAL_PRICE:SUM/PARENTGROUPVAL(TOTAL_PRICE:SUM, GRAND_SUMMARY)
```

This formula calculates, for each product, its relative size compared to the grand total. In this example, the report is a summary of opportunities and their products, grouped by `Product Name`.

PREVGROUPVAL

Use this function to calculate values relative to a peer grouping. If there's no previous grouping, the function returns a null value.

Description:

This function returns the value of a specified previous grouping. A "previous" grouping is one that comes before the current grouping in the report. Choose the grouping level and increment. The increment is the number of columns or rows before the current summary. The default is 1; the maximum is 12. You can only use this function in custom summary formulas for reports.

Use:

```
PREVGROUPVAL(summary_field, grouping_level [, increment])
```

Where `summary_field` is the name of the grouped row or column, `grouping_level` is the summary level, and `increment` is the number of rows or columns previous.

Example:

```
AMOUNT:SUM - PREVGROUPVAL(AMOUNT:SUM, CLOSE_DATE)
```

This formula calculates, for each month, the difference in amount from the previous month shown in the report. In this example, the report is an opportunity matrix with columns grouped by `Close Date` and rows by `Stage`.

Example: Three Week Moving Average

To calculate a three-week moving average of opportunity amounts:

```
(OppProductTrends__c.Amount__c:SUM+ PREVGROUPVAL(OppProductTrends__c.Amount__c:SUM, OppProductTrends__c.as_of_date__c) + PREVGROUPVAL(OppProductTrends__c.Amount__c:SUM, OppProductTrends__c.as_of_date__c,2)) /3
```

SEE ALSO:

[Build a Custom Summary Formula](#)

[Work with Formulas in Reports](#)

[Build a Custom Summary Formula for a Joined Report](#)

Get the Most Out of Custom Summary Formulas

Custom summary formulas are a powerful reporting technique, but they can be tricky. Here are some tips to keep in mind when working with them.

Functions for use with custom summary formulas in reports are available under the function category. Select a function, then click **Help on this function** for information.

- A summary formula can't reference another summary formula.
- Regardless of the summary formula data type, your summary formula can contain fields of different data types, including: number, currency, percent, and checkbox (true/false) fields. For example, a summary formula in an Opportunities with Partners report can reference opportunity `Amount` or `Stage Duration`, as well as account `Annual Revenue`.
- Dashboard and report charts that display values from custom summary formulas display decimal places using your default currency setting instead of what you specified for the formula. For example, if the summary formula specifies zero decimal places, no decimal places appear in columns, but chart values show the number of decimal places specified for your default currency (usually two decimal places). This applies to currencies, numbers, and percentages.
- When a field is deleted or is unavailable (for example, because of field-level security), all custom summary formulas that contain the field are removed from the report.
- The summary types `Sum`, `Largest Value`, `Smallest Value`, and `Average` are not available for use with the `Record Count` field.
- The `Smallest Value` summary type includes blank (null) or zero values in the summary formula calculation if these values are present in your report data.
- The `Largest Value` summary type includes the largest blank (non-null) value present in your report data.
- Percents are represented as decimals in summary formulas. 20% is represented as 0.20.
- Operators can be used to give fields in summary formulas a negative value. For example: `{ !EMPLOYEES : SUM } + - { !SALES : SUM }`.
- For custom summary formulas on matrix reports, Salesforce calculates results for all formulas where the `where will this formula be displayed?` option is not set to `All summary levels`. The formula determines the value returned. If null is returned, the cell will be empty.
- Summary fields on tabular, summary, and matrix reports can display up to 21-digits. Summary fields of 21 digits will display precisely, but more than 21 digits may not be precise. If `"#Too Big!"` appears in report cells, check your formula for calculations that could result in more than 18 digits. Avoid multiplying large numbers, raising a large number to a power, or dividing by a very small number.
- Formulas treat blank (null) report cells as zero values.
- `"#ERROR!"` displays on report cells whenever an error occurs while calculating a formula's value. `"#ERROR!"` also displays when formulas divide by zero. To resolve the error, check your formula and provide an alternative value.
- Cross-block custom summary formulas are available for joined reports.

SEE ALSO:

[Build a Custom Summary Formula](#)

[Custom Summary Formulas with Joined Reports](#)

[Build a Custom Summary Formula for a Joined Report](#)

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions


Available in: Enhanced Folder Sharing and Legacy Folder Sharing


Save Your Report

Click **Save** to update an existing report with recent changes, or **Save As** to clone the original report without changing it. In Lightning Experience, click **Clone** to clone the report.

1. Verify the name, description, and folder, then choose where to go next:

- Click **Save** to save the report and go to the Reports home page
- Click **Save & Return to Report** to save it and go back to the report run page.

 **Note:** To save your report at a specific role hierarchy drill-down level on sales, forecast, opportunity, and activity reports, select *Save Hierarchy Level*.

 **Tip:** If you add a colon to your report name, it displays in two separate lines when you view the report. Use this to categorize reports by name, or better display long names. For example, if you enter *First Line: Second Line* for Report Name, you'll see this on the run page:



Show Report Data Graphically

To help readers understand your data quickly and easily, show the data in chart form. Charts appear just above the report table. They can help users get a feel for the data before they delve into the details. Use line charts to track changes over time, or a bar or pie chart to compare values at a point in time. Charts can also appear in dashboard components.

IN THIS SECTION:

1. [Add a Chart to a Report](#)

Add a chart to give users a visual way to understand the data in your report.

2. [Chart Properties](#)

You can add a chart to any standard or custom summary or matrix report. The chart properties specify the data that appears in the chart, its labels and colors, and any conditional highlighting you apply.

3. [Present Data Effectively with Charts](#)

When you add a chart to a report, things like negative values, very large or small numbers, custom summary formulas, and field-level security can affect the charts' appearance. Switching the report format and changing groupings and blocks also affects charts.

4. [Show Different Data Sets in One Chart](#)

A *combination chart* plots multiple sets of data on a single chart. Each set of data is based on a different field, so values are easy to compare. You can also combine certain chart types to present data in different ways in a single chart.

5. [Combination Chart Examples](#)

Use a combination chart to show multiple values against a single axis range, show two chart types together, or compare two continuous summary values.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Schedule Reports
- **Enhanced Folder Sharing**
Schedule Reports

6. [Chart Formatting Options](#)

SEE ALSO:

[Present Data Effectively with Charts](#)

[Add a Chart to a Report](#)

[Chart Properties](#)

[Combination Chart Examples](#)



[Show Different Data Sets in One Chart](#)

Add a Chart to a Report

Add a chart to give users a visual way to understand the data in your report.

 **Note:** Your report must have at least one grouping before you can add a chart.

In Lightning Experience, add or edit a chart from the Report Run Page.

1. To show or hide the chart, click .
2. To edit the chart, click .

From the chart editor, change chart type, give the chart a title, change axes, show or hide a reference line, and show or hide chart values.

In Salesforce Classic, add or edit a chart from the Report Builder.

1. Click **Add Chart** in report builder. For existing charts, click **Edit Chart**.
2. Select a chart type.
3. Enter the appropriate settings on the Chart Data tab for the chart type you selected.
4. Enter the appropriate settings on the Formatting tab.
5. Click **OK**.

SEE ALSO:

[Chart Types](#)

[Present Data Effectively with Charts](#)

[Build a Report in Salesforce Classic](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing


USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder
- **Enhanced Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder

Chart Properties

You can add a chart to any standard or custom summary or matrix report. The chart properties specify the data that appears in the chart, its labels and colors, and any conditional highlighting you apply.

 **Note:** This topic only applies if you're not using report builder. *Report builder* is a visual editor for reports.

To customize chart properties, click **Add Chart** or **Edit Chart** in any matrix or summary report, and use the fields on the Chart Data and Formatting tabs.

See [Present Data Effectively with Charts](#) on page 731 for limits, considerations, and tips.

Chart Data Settings

Control the data that appears in your chart with these options.


Field	Description
Chart Type	Select the type of chart to use when representing the data in your report. The chart type that you choose determines which chart properties are available to set.
X-Axis and Y-Axis	Choose what values to display on the axes of your chart. Depending on the chart type, axis values can be record count, summary fields, or groupings defined in the report.  Note: If the Y-axis corresponds to a custom summary formula that has the <code>Where Will this Formula Be Displayed?</code> option set to a grouping level other than <code>All summary levels</code> , then the X-axis and Groupings selection must correspond to that custom summary formula's grouping level.
Combination Chart	Select this option to plot additional values on this chart. The chart type you chose must allow combination charts.
Groupings	Choose how to group information on your chart. You can only pick from groupings defined in the report. For bar and column charts, click an icon to select the grouping display: side-by-side, stacked, or stacked to 100%. For either single or grouped line charts, you can select <code>Cumulative</code> .
Values	Choose what to display as values for your pie, donut, or funnel chart.
Wedges	Choose what to display as wedges for your pie or donut chart.
Segments	Choose what to display as segments for your funnel chart.

Chart Presentation

Control the appearance and behavior of your chart using these options.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Field	Description
Chart Title	Enter a name for the chart.
Title Color	Select the color for the text of your chart title.
Title Size	Select the font size for the text of your chart title. The maximum size is 18. Larger values are shown at 18 points.
Text Color	Select a color for all the text and labels in your chart.
Text Size	Select a font size for all the text and labels in your chart. The maximum size is 18. Larger values are shown at 18 points.
Background Fade	Choose a direction for a gradient color background. Also select a Start Color and End Color for the gradient. Use white for both if you do not want a background design.
Legend Position	Choose a place to display the legend in relation to your chart.
Combine Small Groups into "Others"	Combine all groups less than or equal to 3% of the total into a single "Others" wedge or segment. Deselect to show all values individually on the chart. This only applies to pie, donut, and funnel charts. This option is on by default for pie and donut charts, and off for funnel.
X- or Y-Axis Range	Choose a manual or automatic axis range for bar, line, or column charts. If you choose manual, enter numbers for the minimum and maximum axis values to be displayed. If there are data points outside the range that you set, the axis automatically extends to include those values when you generate the chart.
Show Axis Labels	Display labels for each axis of your chart. This only applies to bar and line charts.
Show Labels	Display labels for your pie, donut, or funnel chart.
Show Group %	Display the percentage value for each group in the chart.
Show X- or Y-Axis Values	Display the values of individual records or groups on the chart axis. This only applies to certain horizontal bar and vertical column charts.
Show Values	Display the values of individual records or groups on the chart. This only applies to certain chart types.
Show Wedge %	Display the percentage value for each wedge of pie and donut charts.
Show Total	Display the total value for the donut chart.
Show Segment %	Display the percentage value for each segment of funnel charts.
Show Details on Hover	Display values, labels, and percentages when hovering over charts. Hover details depend on chart type. Percentages apply to pie, donut, and funnel charts only. Hover is disabled when viewing charts that have more than 200 data points.
Chart Size	Select a size for the chart, from Tiny to Extra Large.
Chart Position	Place the chart above or below your report.

Conditional Highlighting

Highlight field values on summary or matrix reports based on ranges and colors you specify. To enable conditional highlighting, your report must contain at least one summary field or custom summary formula.

Field	Description
Summary	Choose a summary field whose number ranges you want represented by colors.
Low Color	Select a color to represent data that falls below the Low Breakpoint value.
Low Breakpoint	The number that acts as the threshold between the Low Color and the Mid Color. Values that are exactly the same as the Low Breakpoint value are shown as the Mid Color.
Mid Color	Select a color to represent data that falls between the Low Breakpoint and High Breakpoint values.
High Breakpoint	The number that acts as the threshold between the Mid Color and the High Color. Values that are exactly the same as the High Breakpoint value are shown as the High Color.
High Color	Select a color to represent data that falls above the High Breakpoint value.

SEE ALSO:

- [Chart Types](#)
- [Customizing Reports](#)

Present Data Effectively with Charts

When you add a chart to a report, things like negative values, very large or small numbers, custom summary formulas, and field-level security can affect the charts' appearance. Switching the report format and changing groupings and blocks also affects charts.

- You can't have more than 250 groups or 4,000 values in a chart. If you see an error message saying that your chart has too many groups or values to plot, adjust the report filters to reduce the number. In [combination charts](#), all groups and values count against the total.
- If you lose access to a field used in a chart, another field may be used in its place. If no other fields are available, record count is used.
- Decimal-place precision on charts is not customizable. Numeric and currency values round to two decimal places. Percentage values round to one decimal place.
- If numeric values are too large or too small, they are shown in scientific notation. For example, the number 5,750,000,000 is displayed as 5.75E9; -0.0000000061 is displayed as -6.1E-9.
- Negative values are displayed on all line charts and non-stacked bar and column charts. Negative values on pie, donut, funnel, and stacked charts are not displayed. Groupings containing negative values are displayed in the legend, and negative values are reflected in the calculation of all summary values, including the total for donut charts.
- When creating charts, don't group by a field on a child object then sum by a field on the parent object. It's not good practice. If you do this with a donut chart, the total shown may not match the sum of the wedges.
- Dashboard and report charts that display values from custom summary formulas display decimal places using your default currency setting instead of what you specified for the formula. For example, if the summary formula specifies zero decimal places, no decimal places appear in columns, but chart values show the number of decimal places specified for your default currency (usually two decimal places). This applies to currencies, numbers, and percentages.
- With joined reports, summary field names contain both the field name and the block name. For example, if you've summarized the Amount field in Block 1, it appears as `Block 1 - Sum of Amount` in the Chart Editor. A cross-block or standard custom summary formula contains the block name when the formula is included in multiple blocks.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

- When a report already has a chart, changing the report format or removing blocks, groupings, or summary fields has impacts described in this table.

When you make this change ...	The effect is ...
Switch format from summary, matrix, or joined to tabular	All charts are removed from the report.
Switch format from summary to matrix	The first summary grouping becomes the first row grouping. The second becomes the first column grouping. The third becomes the second row grouping. The chart is unchanged.
Switch format from matrix to summary	The first row grouping becomes the first summary grouping. The second row grouping becomes the <i>third</i> summary grouping. The first column grouping becomes the <i>second</i> summary grouping. The second column grouping is removed. If the chart used the second column grouping, that grouping is replaced by the first available summary field that's not already used in the chart.
Switch format from summary or matrix to joined	The existing report becomes the first block and the chart remains in the report. If the matrix report used the second column grouping, that grouping is replaced by the first available summary field that's not already used in the chart. If the summary or matrix report included a grouping from a bucket field, the grouping is replaced with the next available grouping not already used in the chart.
Switch format from joined to summary or matrix	The first block becomes the report, and groupings and the chart are preserved. If the chart in the joined version contained summary fields from the first block, they remain in the chart in the summary report. Summaries from other blocks are removed from the chart.
Remove a block containing a summary field from a joined report	The summary field is replaced with the next available summary field. If no additional summary fields are available, the original field is replaced with the record count from the first remaining block. Removing all blocks from a report removes the chart completely.
Remove a grouping used in the chart	The grouping is replaced with the next available grouping. If all groupings are removed, the chart is removed as well. Note that groupings can be removed automatically when you add a report type to a joined report or if a field becomes unavailable, for example as a result of field-level security.
Remove a summary field used in the chart (including custom and cross-block summaries)	The summary field is replaced with the next available summary field. If no additional summary fields are available, the field is replaced with the record count for either the report or the first block. Note that summary fields can be removed automatically, for example as a result of field-level security or when the report format changes.

SEE ALSO:

[Add a Chart to a Report](#)

[Chart Formatting Options](#)

[Show Different Data Sets in One Chart](#)

Show Different Data Sets in One Chart


A *combination chart* plots multiple sets of data on a single chart. Each set of data is based on a different field, so values are easy to compare. You can also combine certain chart types to present data in different ways in a single chart.

With combination charts, you can:

- Add a line to an existing line, vertical column, grouped vertical column, or stacked vertical column chart.
- Add a cumulative line to an existing line cumulative chart.
- Add up to three more columns to a vertical column chart.
- Add up to three more bars to a horizontal bar chart.

For example, as a sales manager, you wish to see “Pipeline amount” as a line and “Number of open deals” as vertical bars on the same chart.

1. Edit the chart for any summary or matrix report, or edit a dashboard component that displays a summary or matrix report.
2. Choose a chart type that allows combination charts:
 - Bar chart
 - Column chart
 - Grouped column chart
 - Stacked column chart
 - Line chart
 - Cumulative line chart
3. Select the **Plot additional values** checkbox. The chart preview updates as you configure your combination chart.
4. To plot on the chart, select a `Value`.
5. Choose a `Display` option. Available options differ based on your chart type and whether you’re editing a chart or a dashboard component.
 - For columns or bars, click **Add Bar** or **Add Column** links to add up to three sets.
 - When adding a line to a vertical column chart, select **Use second axis** to show a separate axis for the added line on the right side of the column chart. A separate axis can be useful when the two values have different ranges or units.

 **Note:** Selecting **Use second axis** makes more values available in the `Value` drop-down list. Without this option, you can only pick from values of the same type as the primary Y-axis—for example, number, currency, or percentage. This option is only available for certain combination charts.

6. Once you've set up your report, click **Run Report** or **Save**.

 **Note:**

- If you lose access to a field used in a chart, another field may be used in its place. If no other fields are available, record count is used.
- Both X-Axis and Y-Axis must not be set to `Auto`. If set to `Auto`, you can’t plot the chart.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

- Filtered drill-down doesn't work for combination charts in dashboards.

SEE ALSO:

[Chart Types](#)

[Add a Chart to a Report](#)

[Combination Chart Examples](#)

Combination Chart Examples

Use a combination chart to show multiple values against a single axis range, show two chart types together, or compare two continuous summary values.

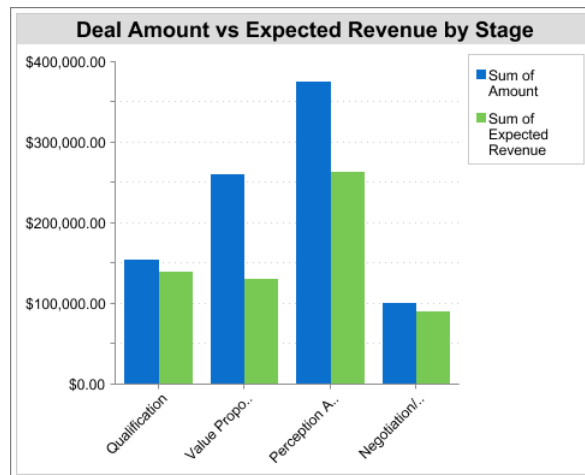
A *combination chart* plots multiple sets of data on a single chart.

Column-on-Column

Add columns to a column chart to show multiple values against a single axis range.

To create the chart in this example, choose the Vertical Column chart type, set the opportunity sum of amount as the *Y-Axis*, stage as the *X-Axis*, and use the **Plot additional values** option to add the sum of expected revenue as a column.

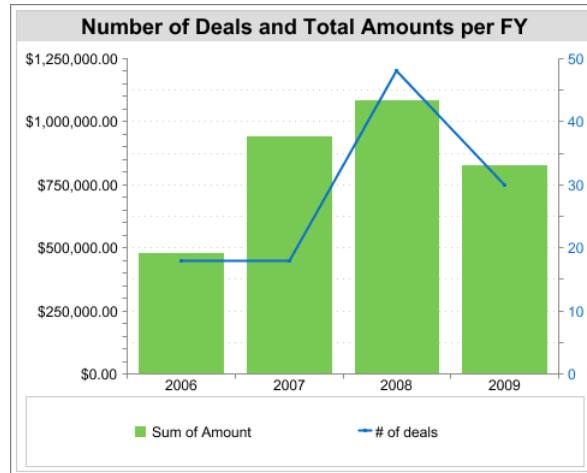
You can quickly compare the actual values against the expected values for each stage.

**Line-on-Column**

Add a line to a column chart to show two chart types together. Using a second axis allows you to add different types of values to the chart.

To create the chart in this example, choose the Vertical Column chart type, set the opportunity sum of amount as the *Y-Axis*, fiscal year as the *X-Axis*, and use the **Plot additional values** option to add the number of deals as a line. Summary values of different types won't be available in the *Values* drop-down list unless you select **Use second axis**.

You can see both the total amount and number of deals for each year on a single chart.

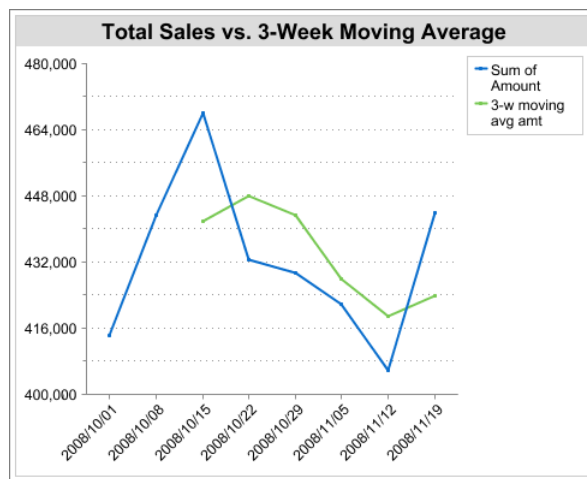


Line-on-Line

Add a line to a line chart to compare two continuous summary values.

To create the chart in this example, set up a custom summary formula to calculate a three-week moving average of opportunity amounts, then choose the Line chart type, set the opportunity sum of amount as the Y-Axis, date as the X-Axis, and use the **Plot additional values** option to add the calculated three-week moving average as a line.

You can compare sales against the moving average over time.



The custom summary formula used in this example is shown here:

```
(OppProductTrends__c.Amount__c:SUM+ PREVGROUPEVAL (OppProductTrends__c.Amount__c:SUM, OppProductTrends__c.as_of_date__c) + PREVGROUPEVAL (OppProductTrends__c.Amount__c:SUM, OppProductTrends__c.as_of_date__c, 2)) / 3
```

SEE ALSO:

[Show Different Data Sets in One Chart](#)

Chart Formatting Options

Control the appearance and behavior of your chart using these options.

Field	Description
Chart Title	Enter a name for the chart.
Title Color	Select the color for the text of your chart title.
Title Size	Select the font size for the text of your chart title. The maximum size is 18. Larger values are shown at 18 points.
Text Color	Select a color for all the text and labels in your chart.
Text Size	Select a font size for all the text and labels in your chart. The maximum size is 18. Larger values are shown at 18 points.
Background Fade	Choose a direction for a gradient color background. Also select a Start Color and End Color for the gradient. Use white for both if you do not want a background design.
Legend Position	Choose a place to display the legend in relation to your chart.
Combine Small Groups into "Others"	Combine all groups less than or equal to 3% of the total into a single "Others" wedge or segment. Deselect to show all values individually on the chart. This only applies to pie, donut, and funnel charts. This option is on by default for pie and donut charts, and off for funnel.
X- or Y-Axis Range	Choose a manual or automatic axis range for bar, line, or column charts. If you choose manual, enter numbers for the minimum and maximum axis values to be displayed. If there are data points outside the range that you set, the axis automatically extends to include those values when you generate the chart.
Show Axis Labels	Display labels for each axis of your chart. This only applies to bar and line charts.
Show Labels	Display labels for your pie, donut, or funnel chart.
Show Group %	Display the percentage value for each group in the chart.
Show X- or Y-Axis Values	Display the values of individual records or groups on the chart axis. This only applies to certain horizontal bar and vertical column charts.
Show Values	Display the values of individual records or groups on the chart. This only applies to certain chart types.
Show Wedge %	Display the percentage value for each wedge of pie and donut charts.
Show Total	Display the total value for the donut chart.
Show Segment %	Display the percentage value for each segment of funnel charts.
Show Details on Hover	Display values, labels, and percentages when hovering over charts. Hover details depend on chart type. Percentages apply to pie, donut, and funnel charts only. Hover is disabled when viewing charts that have more than 200 data points.
Chart Size	Select a size for the chart, from Tiny to Extra Large.
Chart Position	Place the chart above or below your report.

SEE ALSO:

[Add a Chart to a Report](#)

Show Report Data in Tables

To help readers scan for data easily, try hiding details and ranges, limiting the number of results shown, and highlighting with color. You can also show your table in a dashboard component.

IN THIS SECTION:

1. [Show and Hide Report Details](#)

You can show or hide report details from either the run reports page or the report builder. When you hide details, individual records don't display in the report. Groupings, summary formulas, and record counts remain visible.

2. [Highlight Data Ranges](#)

Highlight field values on summary or matrix reports based on ranges and colors you specify. To enable conditional highlighting, your report must contain at least one summary field or custom summary formula.

3. [Use a Tabular Report in a Dashboard](#)

You can use a tabular report as the source report for a dashboard table or chart component, if you limit the number of rows it returns.

4. [Limit Report Results](#)

Set limits to the scope of your report to avoid processing too many records. The built-in choices for limiting your results vary according to the object you are reporting on.

SEE ALSO:

[Highlight Data Ranges](#)

[Limit Report Results](#)

[Show and Hide Report Details](#)

[Use a Tabular Report in a Dashboard](#)

Show and Hide Report Details

You can show or hide report details from either the run reports page or the report builder. When you hide details, individual records don't display in the report. Groupings, summary formulas, and record counts remain visible.

- From the run reports page, click **Hide Details** to hide individual records. Click **Show Details** to show all records.
- From the report builder, click **Show > Details**. A check mark beside the **Details** menu item means that details are displayed. Click **Details** to toggle between showing or hiding records.

SEE ALSO:

[Show and Hide the Record Count for a Block](#)

[Build a Report in Salesforce Classic](#)

[Combine Different Types of Information in a Joined Report](#)

EDITIONS

Available in: Salesforce Classic

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To run reports:


- **Legacy Folder Sharing**
Run Reports
- **Enhanced Folder Sharing**
Run Reports

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Highlight Data Ranges

Highlight field values on summary or matrix reports based on ranges and colors you specify. To enable conditional highlighting, your report must contain at least one summary field or custom summary formula.

 **Note:** You can configure conditional highlighting in Lightning Experience using the Salesforce Classic report builder, but not using the Lightning Experience report builder. Though configurable, conditional highlighting doesn't display on reports in Lightning Experience.

To set conditional highlighting, click **Show > Conditional Highlighting** in report builder, then set the breakpoint values and their range colors as follows:

Field	Description
Summary	Choose a summary field whose number ranges you want represented by colors.
Low Color	Select a color to represent data that falls below the Low Breakpoint value.
Low Breakpoint	The number that acts as the threshold between the Low Color and the Mid Color. Values that are exactly the same as the Low Breakpoint value are shown as the Mid Color.
Mid Color	Select a color to represent data that falls between the Low Breakpoint and High Breakpoint values.
High Breakpoint	The number that acts as the threshold between the Mid Color and the High Color. Values that are exactly the same as the High Breakpoint value are shown as the High Color.
High Color	Select a color to represent data that falls above the High Breakpoint value.

SEE ALSO:

[Build a Report in Salesforce Classic](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS


To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Use a Tabular Report in a Dashboard

You can use a tabular report as the source report for a dashboard table or chart component, if you limit the number of rows it returns.

1. Click **Add > Row Limit**.
2. Set the `Row Limit` to `10`, `25`, or `Custom`. If you choose custom enter a number between one and 99.
3. Set the `Sort By` and sort order options. If you chose **Limit Rows by this Field** for a column, these options are already set.
4. Click **OK**.
5. Click **Dashboard Settings** in the toolbar.
6. Choose a `Name` and `Value` to use in dashboard tables and charts. Tables show both name and value. Charts are grouped by name.
7. Click **OK**. You can now use this tabular report as the source report for a dashboard component.

 **Tip:** When you create a dashboard component to display your tabular report, you can use the dashboard component editor to override the settings you chose in **Dashboard Settings**.

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Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:


- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Limit Report Results

Set limits to the scope of your report to avoid processing too many records. The built-in choices for limiting your results vary according to the object you are reporting on.

- To see a collapsed view of a report showing only the headings, subtotals, and total in report builder, deselect **Show > Details**.
On the report run page, click **Hide Details** or **Show Details** at the top of the report.
- To filter by a field, click **Add > Field Filter**. With tabular, summary, and matrix reports, you can drag a field from the Fields pane to the Filters pane to add a report filter.
- Cross filters work like ordinary filters, but they have some special characteristics of their own. To add one, click **Add > Cross Filter**.
- In Professional, Enterprise, Unlimited, Performance, and Developer edition organizations, the **Hierarchy** links let you browse report results based on the role or territory hierarchies.
- If your organization uses divisions to segment data and you have the “Affected by Divisions” permission, use the Division drop-down list to include records in just one division or all divisions. Select *Current* to show records in your current working division. Reports that are already scoped (such as My Cases or My team’s accounts) include records in all divisions, and you can’t further limit them to a specific division. If you do not have the “Affected by Divisions” permission, your reports include records in all divisions.
- You can set the maximum number of records to display in a tabular report by clicking **Add > Row Limit** in report builder. Set the number of rows, then choose a field to sort by, and the sort order. [Limiting rows on a tabular report](#) allows you to use it as a source report for dashboard table and chart components.

The `Row Limit` option on tabular reports shows only fields from the primary object on reports created from custom report types where object A may or may not have object B. For example, in an accounts with or without contacts report, only fields from accounts are shown. Fields from objects after a may-or-may-not association on custom report types aren’t shown. For example, in an accounts with contacts with or without cases report, only fields from accounts and contacts are available to use. If you change the report format, **Row Limit** settings are lost.

-  **Note:** Only the first 255 characters in a custom text field count for filtering purposes. For example, if you add a field filter to find opportunities where the custom text field *Customer notes* includes the word “phone,” but “phone” appears after the 255th character in the field, the filter will not find that record. In standard text fields, all characters count, regardless of the length of the field.

SEE ALSO:

[Example: Report on Related Objects with Cross Filters](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder


Combine Different Types of Information in a Joined Report

The joined report format lets you view different types of information in a single report. A joined report can contain data from multiple standard or custom report types.

Watch a Demo: [▶ Introducing Joined Reports in Salesforce \(Salesforce Classic\)](#)

To get started with joined reports, create a new or edit an existing report in report builder, click the **Format** drop-down, and choose `Joined`.

Most of the things you can do with summary or matrix reports you can also do with joined reports. For example, you can find, add, and remove fields; summarize fields; and run and save reports.

 **Tip:** You can show a joined report that includes a chart on a dashboard. Edit the joined report dashboard component and select **Use chart as defined in the source report**.

IN THIS SECTION:

1. [Add a Report Type to a Joined Report](#)
Adding a report type lets you expand the set of data available for analysis in a joined report.
2. [Change the Principal Report Type](#)
The principal report type controls how common fields are named. A joined report must have a principal report type. You can change the principal report type at any time
3. [Build a Custom Summary Formula for a Joined Report](#)
You can add standard or cross-block custom summary formulas for joined reports to calculate additional totals based on the numeric fields available in the report.
4. [Work with Blocks](#)
Blocks let you create different views of the information contained in a joined report.
5. [How Joined Reports Work](#)
A joined report can contain data from multiple standard or custom report types. You can add report types to a joined report if they have relationships with the same object or objects. For example, if you have a joined report that contains the Opportunities report type, you can add the Cases report type as well because both have a relationship with the Accounts object.

SEE ALSO:

- [Build a Report in Salesforce Classic](#)
- [How Joined Reports Work](#)

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Add a Report Type to a Joined Report

Adding a report type lets you expand the set of data available for analysis in a joined report.

1. Select **Joined** from the report format menu.
2. Click **Add Report Type**.
The Choose an Additional Report Type overlay appears and displays the report types that you can add to the existing report.
3. Select the report type.
The overlay displays a message that identifies the objects that are common to the selected report type and the types already included in the report.
4. Click **OK**.

The additional report type is added. Notice that:

- A new block appears in the report.
- The Fields pane updates with a new area that contains fields unique to the report type. Fields common to all report types are in the Common Fields area.

SEE ALSO:

[Build a Custom Summary Formula for a Joined Report](#)

[How Joined Reports Work](#)

[Combine Different Types of Information in a Joined Report](#)

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
- **Enhanced Folder Sharing**
Create and Customize Reports

Change the Principal Report Type

The principal report type controls how common fields are named. A joined report must have a principal report type. You can change the principal report type at any time.

By default, the first report type you add to the report is the principal.

The principal report type doesn't affect what data is available for reporting.

Change the principal report type by removing its blocks. To remove a block, drag it to the Fields pane. If there are multiple blocks based on the principal report type, you must remove them all.

When you remove the principal report type, the way the new report type is selected depends on how many report types the report contains.

- If the report contains only two report types, the other report type automatically becomes the principal.
- If the report contains more than two report types, a dialog displays that prompts you to pick one of them as the new principal report type.

SEE ALSO:

[Add a Block to a Joined Report](#)

[Add a Report Type to a Joined Report](#)

[What Can't I Do with Joined Reports?](#)

[Combine Different Types of Information in a Joined Report](#)

EDITIONS

Available in: **Salesforce Classic**

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Build a Custom Summary Formula for a Joined Report

You can add standard or cross-block custom summary formulas for joined reports to calculate additional totals based on the numeric fields available in the report.

1. Use one of these options to access the Add Summary Formula overlay from the Fields pane.

Option	Description
To create a standard custom summary formula	Go to the report type category, and double-click Add Formula
To create a cross-block custom summary formula	Go to the Common category and double-click Add Cross Block Formula

2. Enter a name for the formula as you want it to appear in the report, and optionally a description. The name must be unique.
3. From the **Format** drop-down list, select the appropriate data type for your formula based on the output of your calculation.
4. From the **Decimal Places** drop-down, select the number of decimal places to display for currency, number, or percent data types. This setting is ignored for currency fields in multicurrency organizations. Instead, the **Decimal Places** for your currency setting apply.
5. Set the **Where will this formula be displayed?** option.
The calculated value displays in the report block at either the Grand Total or the global grouping level, depending on which you select. To display the formula calculation at every level, including the Grand Total, select **All summary levels**. Optionally you can select to show the calculation at a global grouping level. You can have three global groupings in a joined report. The groupings apply across all blocks.
6. Build your formula:
 - a. Select one of the fields listed in the **Summary Fields** drop-down list. This field's value is used in your formula.
When creating a cross-block formula, the fields are grouped by block. You can also use Quick Find to search for a field. When creating a single-report type formula, the list displays numeric fields available for the report type.
 - b. Select the kind of summary type to use in your formula. This option is not available for **Record Count**.

Summary Type	Description
Sum	The summary value of data in a field or grouping of fields.
Largest Value	The largest value of data in a field or grouping of fields.
Smallest Value	The smallest value of data in a field or grouping of fields.
Average	The average of data in a field or grouping of fields.

- c. Click **Operators** to add operators to your formula.

EDITIONS

Available in: **Salesforce Classic**

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: **Enhanced Folder Sharing** and **Legacy Folder Sharing**

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

- d. Select the function category (All, Logical, Math, or Summary), choose the function you want to use in your formula, and click **Insert**.
 - e. Repeat these steps as necessary.
7. Click **Check Syntax** to see if your formula contains errors. Errors are highlighted by the cursor.
 8. Click **OK**. Your formula isn't saved until you save the report.

SEE ALSO:

- [Work with Formulas in Reports](#)
- [Custom Summary Formulas with Joined Reports](#)
- [Get the Most Out of Custom Summary Formulas](#)
- [Joined Report Examples](#)

Work with Blocks

Blocks let you create different views of the information contained in a joined report.

IN THIS SECTION:

1. [Add a Block to a Joined Report](#)
Adding blocks to joined reports lets you create multiple views of the data included in a single report.
2. [Reorder Blocks](#)
You can reorder blocks in a joined reports. Reordering blocks affects the report's appearance but doesn't affect the data in the blocks.
3. [Rename a Block](#)
You can rename blocks to provide more user-friendly descriptions of the information they contain.
4. [Show and Hide the Record Count for a Block](#)
You can choose to show or hide the number of records, or *record count*, for each block in a joined report. By default, record count is displayed for each block in the report builder and on the run reports page.
5. [Delete a Block](#)

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

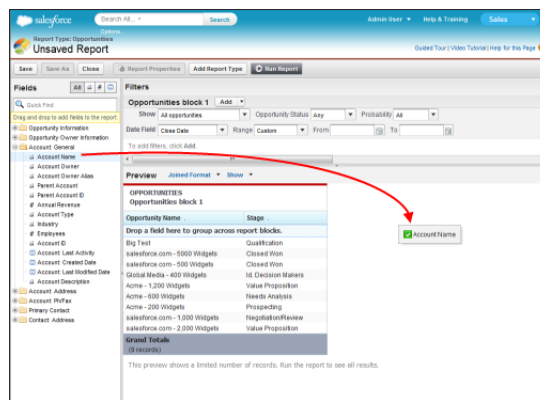
To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Add a Block to a Joined Report

Adding blocks to joined reports lets you create multiple views of the data included in a single report.

1. Click and hold a field from the Fields pane, then drag it to the empty area of the Preview pane.



2. Drop the field to create the block.

EDITIONS

Available in: Salesforce Classic

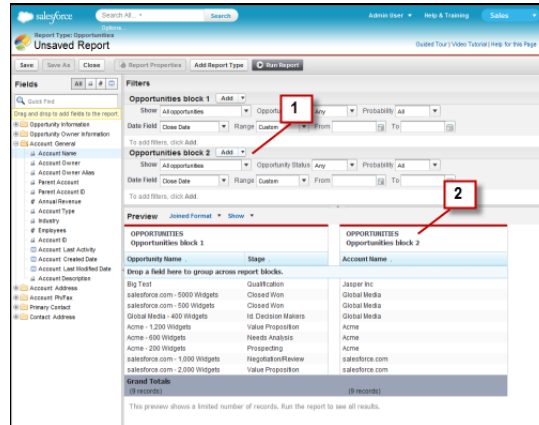
Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder



When you've added the block, notice that standard and field filters for the additional block are added to the Filters pane (1). Also, the new block appears in the Preview pane (2).

To delete a block, click  in the block header, then click **Remove Block**. Or just drag the block to the Fields pane.

Keep the following in mind when working with blocks.

- Adding a new report type to a joined report also adds a new block.
- You must choose a field from a report type category when creating a block. You can't use a field from the Common category. For example, if your report contains both the Opportunities and the Cases report types, choosing a field from the Opportunities category creates a new Opportunities block, while choosing a field from the Cases category creates a new Cases block.

SEE ALSO:

[Add a Report Type to a Joined Report](#)

[Delete a Block](#)

[Build a Custom Summary Formula for a Joined Report](#)

[Work with Blocks](#)

[Combine Different Types of Information in a Joined Report](#)

Reorder Blocks

You can reorder blocks in a joined reports. Reordering blocks affects the report's appearance but doesn't affect the data in the blocks.

When you reorder blocks, block numbers don't change. For example, if you have a report containing three blocks, and you move block 1 to a new position to the right of block 3, the blocks now display as block 2, block 3, and block 1. You should rename the blocks to avoid confusion.

When reordering a block, you move it to either the left or right of an existing block. You can't drag it to an empty area in the Preview pane.

To reorder a block:

- In the Preview pane, drag the block to either the left or right side of an existing block. A blue bar beside the block indicates an acceptable drop location.

SEE ALSO:

[Rename a Block](#)

[Work with Blocks](#)

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

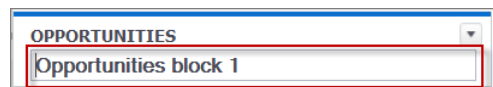
- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Rename a Block

You can rename blocks to provide more user-friendly descriptions of the information they contain.

When you add a block to a joined report, it's named automatically based on the report type and the number of blocks in the report. For example, if your report contains two blocks and you add a new block that's based on the Opportunities report type, it's named Opportunities block 3.

1. Click the block's name.
The name now appears in an editable text box.



2. Enter the new name.
3. Press Enter or click outside the block to apply the name.

SEE ALSO:

[Work with Blocks](#)

[Combine Different Types of Information in a Joined Report](#)

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS



To create, edit, and delete reports:


- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Show and Hide the Record Count for a Block

You can choose to show or hide the number of records, or *record count*, for each block in a joined report. By default, record count is displayed for each block in the report builder and on the run reports page.

You can hide or show record count two ways.

- Click the arrow in the block header () to display the block menu. The check mark beside the **Record Count** menu item shows that record count is enabled for the block. Click **Record Count** to toggle between showing and hiding the count.
- When you've hidden report details, position the cursor over the Record Count column to display an arrow (). Click the arrow, and select **Remove Column**. To display record count again, click the arrow in the block header and select **Record Count**.

 **Note:** If you haven't summarized any rows in your report blocks and have also hidden both details for the report and row counts for all blocks, your blocks will be hidden on the run reports page. To display the blocks, choose **Show Details** from the run reports page or the report builder.

SEE ALSO:

[Show and Hide Report Details](#)

[Use a Summary Function in a Custom Summary Formula](#)

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing


USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Delete a Block

There are two ways to delete a block from a joined report.

- Click the arrow in the block header () to display the block menu, then click **Remove Block**.
- Click and hold in the block header, and drag the block to the Fields pane.

SEE ALSO:

[Work with Blocks](#)


[Combine Different Types of Information in a Joined Report](#)

How Joined Reports Work

A joined report can contain data from multiple standard or custom report types. You can add report types to a joined report if they have relationships with the same object or objects. For example, if you have a joined report that contains the Opportunities report type, you can add the Cases report type as well because both have a relationship with the Accounts object.

A joined report consists of up to five report *blocks*, which you add to the report to create multiple views of your data. For each block, you can add regular and summary fields, create standard and cross-block custom summary formulas, apply filters, and sort columns. You apply groupings across all blocks in the report, and can add up to three groupings to the blocks, the same as for the summary format. You can also add a chart to a joined report.

Each joined report has a *principal* report type. By default, the principal type is the first one added to the report, and is identified in the Fields pane with a small dot beside its name. For example, if you create the joined report by selecting the Opportunities report type, and then add the Cases type, the Opportunities type is the principal report type.

The principal report type controls how common fields are named. Some common fields have different names or appear in different sections in different report types. In those fields, click  to see the name of the field in other report types.

When a joined report contains multiple report types, some fields are identified as *common* fields. A field is a common field if it's shared by all report types or if all report types share a lookup relationship to the field. These fields appear in the Common Fields area in the Fields pane, and can be used to group report blocks.

IN THIS SECTION:

1. [Joined Report Examples](#)

Creating a sales rep performance scorecard, reviewing support cases by status, and predicting your opportunity pipeline are some examples of what you can do with joined reports.

2. [Custom Summary Formulas with Joined Reports](#)

Two types of custom summary formulas are available with joined reports: standard and cross-block.

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To delete reports in My Personal Custom Reports folder:

- **Legacy Folder Sharing**
Create and Customize Reports

Enhanced Folder Sharing

Create and Customize Reports

To delete reports in public folders:

- **Legacy Folder Sharing**
Manage Public Reports

Enhanced Folder Sharing

Manage Reports in Public Folders

3. [What Can't I Do with Joined Reports?](#)

Most of the things you can do with summary or matrix reports you can also do with joined reports, such as find, add, and remove fields; summarize fields; and run and save reports. However, there are some things you can't do.

SEE ALSO:

[Add a Report Type to a Joined Report](#)

[Build a Custom Summary Formula for a Joined Report](#)

[Work with Blocks](#)

Joined Report Examples

Creating a sales rep performance scorecard, reviewing support cases by status, and predicting your opportunity pipeline are some examples of what you can do with joined reports.

Creating a Sales Rep Performance Scorecard

A sales rep scorecard lets your sales management team understand the performance and actions of your organization's sales reps. To create it, you need to have three separate custom report types, each of which creates a relationship between User (as the primary object) and one of the following three objects: Opportunity Owner, Opportunity Creator, and Activity Owner. Note that, in this example, we've named the custom report types `User and Opportunity Owner Custom Report`, `User and Opportunity Creator Custom Report`, and `User and Activity Owner Custom Report`.

Start by creating a new custom report based on the User and Opportunity Owner custom report type, and then add the User and Opportunity Creator and User and Activity owner custom report types as two additional blocks. Then, group by Sales Rep (opportunity owner) and set the filters as described in the procedure.

To create the report:

1. Create a new report, selecting `User and Opportunity Owner Custom Report` as the report type.
2. Select `Joined` from the **Format** drop-down.
3. Click **Add Report Type**.
4. Select `User and Opportunity Creator Custom Report`.
5. Click **Add Report Type** again, and choose `User and Activity Owner Custom Report`.
6. Group the blocks by `Full Name`.
7. Add additional fields and filters to the report as needed. For example, you might want to change the date filters to focus on rep performance during a particular time frame. Or, to make sure that only sales people are included as opportunity owners, create a filter on the `Role : Name` filter limit your results to users with "Sales" in their roles.
8. Optionally, provide names for the blocks.
9. Click **Save** or **Run Report**.

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Report Help for this Page ?

Sales Rep Scorecard

[Go to Report List](#)

[Add Tags](#)

[Run Report](#)
[Show Details](#)
[Report Properties](#)
[Save](#)
[Save As](#)
[Customize](#)
[Delete](#)
Report generation complete.

	USER AND OPPORTUNITY OWNER CUSTOM REPORT TYPE Opportunities - Owned by Rep	USER AND OPPORTUNITY CREATOR CUSTOM REPORT TYPE Opportunities - Created by Rep	USER AND ACTIVITY OWNER CUSTOM REPORT TYPE Activities - Owned by Rep
	Record Count .	Record Count .	Record Count .
Full Name: Ely East	25	0	23
Full Name: Joe Seller	8	0	18
Full Name: John Seller	15	0	37
Full Name: Mary Seller	20	13	27
Full Name: Ricky East	25	0	26
Full Name: Wendy West	21	0	37
Grand Totals	114	13	168

Reviewing Support Cases by Status

You can also create a report comparing the number of support cases that are new, closed, or in-progress by priority. The report contains a single standard report type: Cases. First, create the report, add three blocks to the report, filter each block by the appropriate status, and then use the `Priority` field for grouping.

To create the report:

1. Create a new report, selecting `Cases` as the report type.
2. Select `Joined` from the **Format** drop-down.
3. Remove unwanted fields by dragging them to the Fields pane.
4. Create three blocks, each containing the `Case Number` and `Status` and, optionally, `Case Owner` fields.
5. For each block, filter on all cases. Then, filter each of the blocks by `Status` as follows:
 - Block 1: `Status equals Closed`
 - Block 2: `Status equals New`
 - Block 3: `Status not equal to Closed, New, Closed in Portal, Closed - First Call`
6. Group the blocks by `Priority`.
7. Optionally, rename the blocks.
8. Click **Save** or **Run Report**.

Report
Support Calls by Priority

« Go to Report List

Run Report Hide Details Report Properties Save Save As Customize Delete Report generation complete.

CASES Closed Cases			CASES New Cases			CASES Cases In-Progress		
Case Number	Status	Case Owner	Case Number	Status	Case Owner	Case Number	Status	Case Owner
Priority: Critical (2 records)			(2 records)			(8 records)		
00001196	Closed	Jake Borland	00001244	New	Linda Steinberg	00001217	New	Tier 2 Queue
00001258	Closed	Jake Borland	00001217	New	Tier 2 Queue	00001251	Escalated	Jake Borland
						00001244	New	Linda Steinberg
						00001175	Researching	Luke Williams
						00001203	Researching	Luke Williams
						00001182	Escalated	Luke Williams
						00001393	Waiting on customer	Luke Williams
						00001168	Researching	Luke Williams
Priority: High (2 records)			(5 records)			(10 records)		
00001195	Closed	Matt Buchanan	00001167	New	Amy Argenta	00001216	New	Tier 3 Queue
00001250	Closed	Tier 1 Queue	00001188	New	Linda Steinberg	00001296	Escalated	Tier 3 Queue
			00001181	New	Luke Williams	00001257	Escalated	Tier 3 Queue
			00001202	New	Matt Buchanan	00001167	New	Amy Argenta
			00001216	New	Tier 3 Queue	00001202	New	Matt Buchanan
						00001188	New	Linda Steinberg
						00001243	On Hold	Linda Steinberg
						00001400	Waiting on customer	Luke Williams
						00001321	Contacting PM	Luke Williams
						00001181	New	Luke Williams
Priority: Medium (19 records)			(11 records)			(25 records)		
00001361	Closed	Luke Williams	00001248	New	Linda Steinberg	00001218	New	Tier 2 Queue
00001371	Closed	Luke Williams	00001185	New	Linda Steinberg	00001214	New	Tier 3 Queue
00001362	Closed	Luke Williams	00001169	New	Luke Williams	00001165	New	Tier 1 Queue

Predicting Opportunity Pipeline

Using cross-block custom summary formulas, you can create a report that predicts future opportunity revenue based on your sales reps' past performance. Create a report based on the Opportunities standard report type, add three blocks to the report, filter each block by the appropriate status, and then create a formula that uses fields from different blocks.

To create the report:

1. Create a new joined report, selecting `Opportunities` as the report type.
2. Remove unwanted fields by dragging them to the Fields pane.
3. Create three blocks, each containing the `Opportunity Name`, `Account Name` and `Amount` fields.
4. For each block, show `All Opportunities`. Then, filter each block.

Block	Filters
Block 1	<p><i>Opportunity Status equals Closed</i></p> <p><i>Date Field equals Close Date</i></p> <p><i>Range equals Current and Previous FY</i></p> <p><i>Stage equals Closed Lost</i></p>
Block 2	<p><i>Opportunity Status equals Closed Won</i></p> <p><i>Date Field equals Close Date</i></p> <p><i>Range equals Current and Previous FY</i></p>

Block	Filters
Block 3	<p><i>Date Field equals Close Date</i></p> <p><i>Range equals Next Month</i></p> <p><i>Opportunity Status equals Open</i></p>

- Group the blocks by `Opportunity Owner`.
- Rename the blocks. For example, "Closed — Won", "Close — Lost", and "Closing Next Month".
- Create a cross-block custom summary formula that predicts upcoming revenue based on past sales rep performance:

```
[Closing Next Month]AMOUNT:SUM* ([Closed - Won]RowCount/ ([Closed - Lost]RowCount+[Closed - Won]RowCount))
```

- Add the formula to one or more of the blocks.
- Optionally, add a cross-block custom summary formula that calculates the win ratio of each sales rep:

```
[Closed - Won]RowCount/ ([Closed - Lost]RowCount+[Closed - Won]RowCount)
```

- Click **Save** or **Run Report**.

	OPPORTUNITIES Closed - Lost		OPPORTUNITIES Closed - Won		Oppty Won Ratio	OPPORTUNITIES Closing Next Month		Predicted Revenue
	Record Count	Amount	Record Count	Amount		Record Count	Amount	
Opportunity Owner: Anjana Shah	1	USD 75,000.00	1	USD 225,000.00	0.50	2	USD 4,325,250.00	USD 2,162,625.00
Opportunity Owner: Anna Bressan			2	USD 10,833.33	1.00	3	USD 37,000.00	USD 37,000.00
Opportunity Owner: David Hudson	2	USD 2,329,500.00	4	USD 290,000.00	0.67	5	USD 6,357,375.00	USD 4,238,250.00
Opportunity Owner: Karen Adams	1	USD 4,268,227.62	0	0.00		1	USD 511,000.00	USD 0.00
Opportunity Owner: Matt Wilson	7	USD 689,935.17	4	USD 1,955,000.00	0.36	5	USD 4,169,325.00	USD 1,516,118.18
Opportunity Owner: Phil Smith	1	USD 850,000.00	6	USD 241,500.00	0.86	3	USD 531,243.67	USD 455,351.72
Grand Totals	12	USD 8,212,662.78	17	USD 2,722,333.33		19	USD 15,931,193.67	USD 9,338,975.60

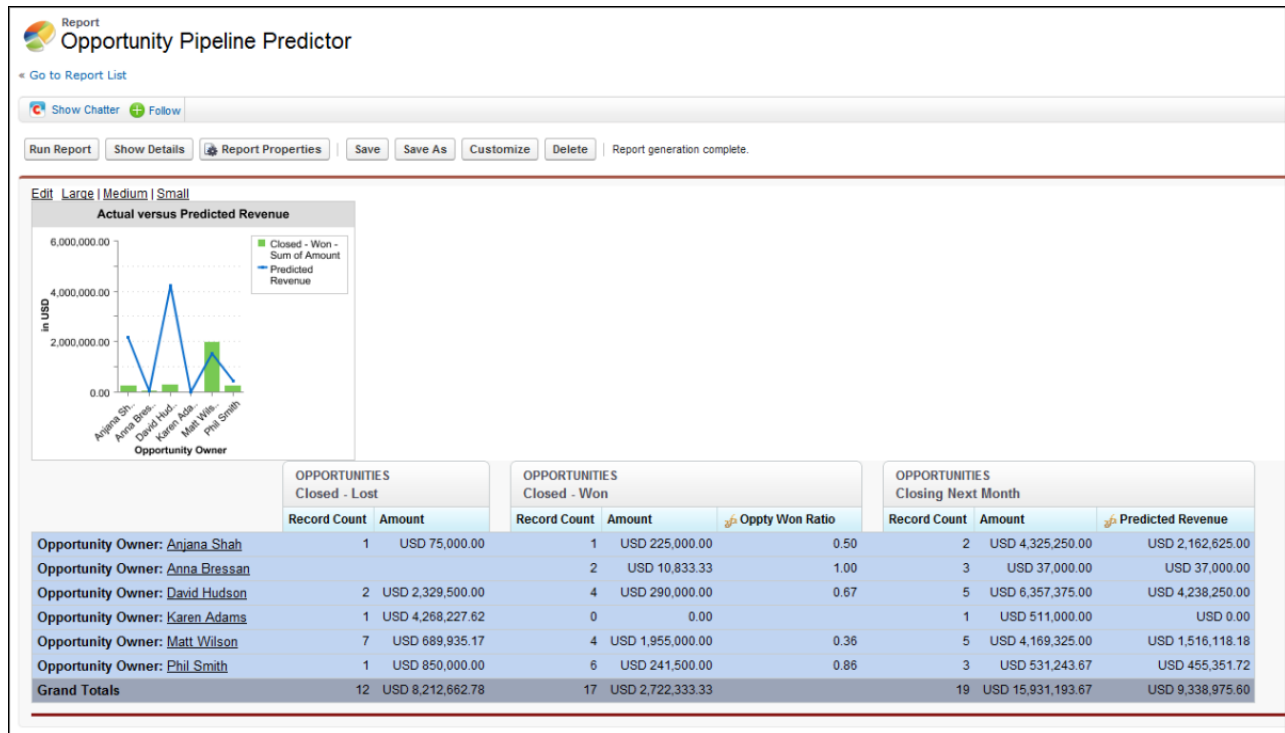
Adding a Chart to the Opportunity Pipeline Predictor Report

You can include a chart with a joined report to provide a visual representation of the data. For example, you can add a chart to the Opportunity Pipeline Predictor report that shows actual versus predicted revenue.

To add the chart:

- Create the [Predicting Opportunity Pipeline](#) report.
- Click **Add Chart**.
- For the Y-axis, select `Closed — Won — Sum of Amount`.
- Select **Plot additional values**.
- Select `Line` for the Display option, and `Predicted Revenue` as the Value.

6. Click the Formatting tab, and enter *Actual versus Predicted Revenue* as the chart title.
7. Click **OK**.
8. Click **Save** or **Run Report**.



SEE ALSO:

- [Add a Chart to a Report](#)
- [Custom Summary Formulas with Joined Reports](#)
- [How Joined Reports Work](#)
- [Work with Blocks](#)
- [Combine Different Types of Information in a Joined Report](#)

Custom Summary Formulas with Joined Reports

Two types of custom summary formulas are available with joined reports: standard and cross-block.

Standard Custom Summary Formulas

Standard custom summary formulas apply to one report type, and can be added to blocks that are based on that report type only. For example, a summary formula created for the Cases report type can only be applied to Cases blocks. Custom summary formulas in joined reports support the same data formats, formula options, functions, and calculation display locations as they do with summary and matrix reports.

Keep the following in mind when working with custom summary formulas in joined reports.

- The formulas aren't automatically added to the report when you create them. To add a formula, drag it to a block with the same report type.

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

- When you add custom summary formulas to a block, they appear to the right of the standard fields in the order in which you added them to the block. If you also add cross-block custom summary formulas, they appear to the right of the standard ones.
- The results of custom summary formulas are affected by the filter options applied to the blocks they're included in. As a result, the same formula can yield different results in different blocks.
- You can add up to 10 custom summary formulas to each block in a joined report. A joined report can have a total of 50 custom summary formulas.
- Each custom summary formula must have a unique name. However, standard and cross-block custom summary formulas can have the same name.
- Custom summary formula names can't include brackets ("[" or "]").

Cross-Block Custom Summary Formulas

Cross-block custom summary formulas let you calculate values across multiple blocks in a joined report. For example, you can use a cross-block formula to calculate the ratio of open to closed opportunities for an account or the ratio of closed pipeline deals to sales targets.

Building a cross-block formula is similar to creating a standard one. The same data formats, formula options, functions, and calculation display locations are available. The formula syntax is also similar, except that block information is also included. For example, when calculating the ratio of opportunities to cases for each account, the formula also includes the block title: `[Opportunities block 1]RowCount / [Cases block 2]RowCount`. Note that if you omit block title, you see an error message when you check formula syntax or save the formula.

Keep the following in mind when working with cross-block custom summary formulas.

- You can add a cross-block formula to any block in the report.
- Cross-block formulas aren't automatically added to the report when you create them. To add a formula, drag it to a block.
- When you add cross-block formulas to a block, they appear to the right of standard ones in the order in which you add them to the block.
- The results of cross-block formulas are affected by the filter options applied to the blocks in the report. As a result, a cross-block formula can yield different results when you change filter options.
- Each joined report can have up to 10 cross-block custom summary formulas.
- Deleting a block that's used in a cross-block formula also deletes the formula from both the Fields pane and any remaining blocks containing it.
- Each cross block formula must have a unique name. However, standard and cross-block custom summary formulas can have the same name.
- Cross-block formula names can't include brackets ("[" or "]").

SEE ALSO:

[Build a Custom Summary Formula](#)

[Get the Most Out of Custom Summary Formulas](#)

[Joined Report Examples](#)

[Build a Custom Summary Formula for a Joined Report](#)

What Can't I Do with Joined Reports?

Most of the things you can do with summary or matrix reports you can also do with joined reports, such as find, add, and remove fields; summarize fields; and run and save reports. However, there are some things you can't do.

Here are some things you can't do with joined reports.

- Add bucketed fields.
- Add cross filters.
- Drag and drop filters from the Fields pane on to the Filter pane.
- Apply conditional highlighting.
- Change the hierarchy for opportunity or activity reports.
- Create reporting snapshots based on joined reports.



Note:

- For users to be able to create and edit joined reports, report builder must be enabled for your entire organization. When report builder isn't enabled, users can run joined reports, but can't create them.
- Joined reports require that the new user interface theme is enabled. Users without the new theme are unable to create, edit, or run joined reports.
- Internet Explorer 6 is not supported for joined reports.
- You can't filter data on a joined report in dashboard view or add a filter to a dashboard that only has joined reports.

Standard Report Types That Can't Be Used in Joined Reports

- Accounts and Contacts
 - Account History
 - Account Owners*
 - Contact History
- Activities
 - My Delegated Approval Requests*
- Administrative
 - All Pending Approval Requests*
 - API Usage Last 7 Days*
- Campaign
 - Campaign Call Down*
 - Campaign Member
 - Campaign Member Analysis*
 - Campaigns with Influenced Opportunities
- Contract
 - Contract History
 - Order History

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

- Customer Support
 - Case History
 - Self Service Usage
 - Solution History
- File and Content
 - Content Authors
 - Content Publication Time Frame
 - File and Content Downloads
 - File and Content Engagement
 - File and Content Links
 - Library Administrators
 - Library Content
 - Most Content Downloads
 - Most Content Subscriptions
 - Stale Content
- Forecasts
 - Customizable Forecasting: Forecast History
 - Customizable Forecasting: Forecast Summary
 - Customizable Forecasting: Opportunity Forecasts
 - Forecast History
 - Forecasts
 - Quota versus Actual*
- Lead
 - Lead All
 - Lead History
 - Lead Status*
- Opportunity
 - Opportunities with Contact Roles and Products
 - Opportunities with Opportunity Teams and Products
 - Opportunity Field History
- Price Books, Products and Assets
 - Assets without Products*

**Note:**

- You might not have access to all the report types listed here. Certain factors can affect the report types you see, such as which features your organization has enabled and how your administrator has set up report folder visibility. Check with your administrator if you think you should see a report type that you don't.

- If your organization has renamed standard objects, the names of the standard report types will contain your organization's names instead of the original ones. For example, if your organization has renamed the "Opportunity" object as "Deal," the standard report type "Opportunity Field History" will be renamed "Deal Field History."
- In this list, report types marked with an asterisk (*) aren't available when you create a new report. Instead, you access them by customizing standard reports, which are in folders on the Reports tab.

SEE ALSO:

[Choose a Report Type](#)

[Change the Principal Report Type](#)

[Combine Different Types of Information in a Joined Report](#)

[Standard Report Types](#)

Report Type Reference

The report type you choose determines which records and fields appear in your report. For example, the Opportunities report type gives you access to Opportunity records and fields like Amount, Stage and Opportunity Owner.

There are two kinds of report types: *standard report types* and *custom report types*.

Standard report types give you access to most Salesforce data. For example, the Opportunities report type gives you access to Opportunity records and fields. If you're going to report on Opportunity Amounts or Probability, then Opportunities is the report type for you.

Custom report types give you access to custom objects in Salesforce, or custom views of standard objects (like Opportunities), which your administrator configures. For example, your administrator can create a custom report type which gives access to Opportunities, plus related fields from Products. That way, you can report on Opportunities for a given product.

IN THIS SECTION:

[Standard Report Types](#)

Salesforce provides a rich collection of standard report types that you can tailor to your unique requirements. You rarely need to create a brand-new report.

[Pre-Designed Custom Report Types](#)

Some Salesforce features come with custom report types that are designed for you in advance, so you don't have to create a new report.

Standard Report Types

Salesforce provides a rich collection of standard report types that you can tailor to your unique requirements. You rarely need to create a brand-new report.



Tip: You may not see some of these folders if your administrator has customized the visibility of the Report tab folders.

If you can't find a report to customize for your own needs, you can also create a new custom report to access exactly the right information.

IN THIS SECTION:

1. [Account and Contact Reports](#)

Use account and contact reports to learn about active, neglected, or new accounts, as well as accounts by account owner or partner. The two standard contact reports let you create a mailing list of contacts or track opportunities by contact role.

2. [Activity Reports](#)

Activity reports are useful for gathering information about open activities, completed activities, multi-person events, or pending approval requests for which you are a delegated approver.

3. [Administrative Reports](#)

Administrative reports help you analyze your Salesforce users, documents, and pending approval requests. You can report on the active Salesforce users and see who has been logging in.

4. [Campaign Reports](#)

Use campaign reports to analyze your marketing efforts. You can report on the ROI of your campaigns, track who you targeted with your campaigns and who has responded, or analyze which opportunities resulted from your campaigns.

5. [File and Content Reports](#)

Run File and Content reports to analyze how users are engaging with files and Salesforce CRM Content.

6. [Forecast Reports](#)

Forecast reports give you information about your customizable forecast data.

7. [Lead Reports](#)

Use lead reports to show information about the source and status of leads, how long it takes to respond to leads, neglected leads, and the history of lead fields.

8. [Opportunity Reports](#)

Opportunity reports provide information about your opportunities, including owners, accounts, stages, amounts, and more. The default settings show you the most commonly used information from each object, but you can customize a report to view other information, such as primary campaign source, forecast category, and synced quote.

9. [Product and Asset Reports](#)

Use product and asset reports to view information about the products your users currently have installed. Find out what assets your customers have, list the cases filed for a particular asset, or identify assets that aren't associated with a product.

10. [Self-Service Reports](#)

Self-Service reports help you analyze the effectiveness of your Self-Service portal. Find out how many cases are being viewed, how many customers are logging in, or what customers think of the solutions you're offering.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **All Editions** except **Database.com** (The edition determines which reports you see.)

USER PERMISSIONS

To run reports:

- Run Reports

To schedule reports:

- Schedule Reports

To create, edit, and delete reports:

- Create and Customize Reports

AND

Report Builder

11. Reporting on Support Activity

Use support reports to track the number of cases created, case comments, case emails, case owners, case contact roles, cases with solutions, the length of time since the case last changed status or owner, and the history of cases.

SEE ALSO:

[Find a Report](#)

[Creating a Custom Report](#)

Account and Contact Reports

Use account and contact reports to learn about active, neglected, or new accounts, as well as accounts by account owner or partner. The two standard contact reports let you create a mailing list of contacts or track opportunities by contact role.

Standard Report: Field History

If your organization tracks field history on accounts or contacts, you can report on that information using the account history or contact history report.

Standard Report: Person Accounts

If your organization uses person accounts, fields specific to person accounts are available and prefixed with `Person Account :` in account reports. In addition, you can include the `Is Person Account` field in both account and contact reports. Your administrator may have given a different label to `Person Account`.

Mass Mail Merge

You can also create a report of your contact information, export that data to Microsoft® Excel®, and then do a mass mail merge using Microsoft® Word®.

View Filter for Account Reports

The standard `view` filter for account reports allows you to limit your account data according to the following options. These options vary depending on your organization's edition and setup.

- My accounts: Shows accounts that you own.
- My account team accounts: Shows accounts where you are on the account team.
- My account team and my accounts: Shows accounts you own and those where you are on the account team.
- My team's accounts: Shows your accounts and accounts owned by all of your subordinates in the role hierarchy.
- My territories: For organizations that use territory management, this option shows accounts that belong to the territories to which you are assigned.
- My territory team's accounts: For organizations that use territory management, this option shows accounts that belong to your territories and your territories' descendants.
- My team's account team and their own accounts: For users who report to you in the role hierarchy, shows accounts they own or for which they are on the account team.
- All visible accounts: Shows all accounts that you can view, as determined by your sharing model.
- Territories: For organizations that use previous versions of territory management (not Enterprise Territory Management), the additional `Territories` filter can be set to All, Multiple Territories, or Missing Territory. In custom report types, when using the `Territories` filter that includes territories, Multiple Territories or Missing Territories are not shown in the report results.
- Customer Portal: If your organization uses a Salesforce Customer Portal, add the `Customer Portal Account` field to your account reports to view which accounts have contacts enabled to use the portal.

SEE ALSO:


[Limit Report Results](#)

Activity Reports

Activity reports are useful for gathering information about open activities, completed activities, multi-person events, or pending approval requests for which you are a delegated approver.

Standard activity reports allow you to select the date range and status of the activities you want included. The standard activity reports list your tasks and appointments for a selected date range or events with all invitees.

You can also create custom reports for activities by clicking the Reports tab, **New Report**, and choosing **Activities** as the type of data on which to report.

 **Note:** Click **Show Hierarchy** to see your org's role hierarchy above the report results. You can use the role hierarchy to share report data with people at different levels in the hierarchy. For example, if you see **CEO > VP of Global Sales > Sales Operations Director**, you're viewing data for the Sales Operations Director role. Click any role name to see and share the data that's visible to people in that role.

Special Features of Activity Reports

Consider the following when running activity reports:

Standard Reports

- Choose the HTML Email Status report if you have the HTML email tracking enabled. This reports on anything in the HTML Email Status related list of your leads and contacts.
- Choose the Events with Invitees report to include only multi-person events in your report. The standard filters for events with invitees are:
 - Assigned to...—Shows only multi-person events that you own.
 - Assigned to the team of...—Shows multi-person events that anyone in your team owns.
 - Invitee is...—Shows only multi-person events that list you as an invitee.
 - Invitee is in the team of...—Shows the multi-person events that show anyone on your team as an invitee.
- The My Delegated Approval Requests report lists all the approval requests for which you are the approval proxy. Note that the All Pending Approval Requests report is listed in the Activity Reports folder.
- In Professional, Enterprise, Unlimited, Performance, and Developer Edition organizations, to show the activities for users who report to you, use the **Hierarchy** links in the Tasks and Appointments report. Note that you can view only your own activities and activities owned by users below you in the role hierarchy.
- If your organization uses Shared Activities, reports (including custom report types and Tasks and Events reports) display different results depending on your permissions. Say you're reporting on events, and your report results include an event that is related to two or more contacts and also has invitees. If you're an administrator, your report results show an event for the primary contact plus a separate event for each invitee. If you're not an administrator, your report results show just one event, for the primary contact.

Report Types

- Using report builder, you can create activity reports that show activities related to another type of record. For example, a custom Activities with Leads report shows activities associated with leads.
- Activities with Leads reports do not display data for the Address Line 1, Address Line 2, and Address Line 3 fields.

Tips for Activity Reports

- Set a search criteria of "Event Invitation equals 0" to filter out events that are meeting invites sent to users for a multi-person event.


- Archived activities aren't included in reports. Events and closed tasks older than a year are archived. However, open tasks aren't archived. You can still see archived activities for a record by selecting **View All** in the **Activity History** section of a record's detail page.
- Activities for private contacts are displayed only in reports for the contact owner.
- The standard filters for activity reports allow you to limit your report results using the following options. Some of these options will not be visible depending on your edition.
 - My Activities—Shows activities that you own.
 - My Delegated Activities—Shows activities that you created but are owned by someone else in the same role as you, and below your role, in the role hierarchy.
 - My Team's Activities—Shows activities owned by users who report to you in the role hierarchy.
 - All Activities—Shows all activities that you can view, as determined by your sharing model.
- If you receive an error message that your activity report has too many results, customize the report to include a filter on a picklist, text, or date field. Alternatively, rerun the report using a different activity data type such as "Activities with Accounts" or "Activities with Opportunities."

SEE ALSO:

[Limit Report Results](#)

Administrative Reports

Administrative reports help you analyze your Salesforce users, documents, and pending approval requests. You can report on the active Salesforce users and see who has been logging in.

-  **Note:** You can see the Administrative Reports folder on the Reports tab only if you have the "View Setup and Configuration" permission. You don't need this permission to view the Administrative Reports report type—all users can view it and manage any document reports associated with that type. To view other types of reports associated with that type, such as user and approval request reports, you must have the permission.

Special Features of Administrative Reports

Consider the following when running administrative reports:

Standard Reports

- The All Active Users report lists the active users in your organization and when they last logged in.
- The Users Logged in This Week report lists all of the users who have logged in to Salesforce in the past seven days. If Communities is enabled, you can add a **Community** column so that you can see which communities users have logged in to as well.
- The Documents report lists the documents within each document folder.
- The All Pending Approval Requests report lists the approval requests awaiting approval for each approval process. Note that the My Delegated Approval Requests report is listed in the Activity Reports folder.
- If your organization uses territories, the User Territory Report in the Territory Reports folder summarizes the territories to which users have been assigned.

Report Types


- Create a custom report that lists your organization's reports and the last time each report was used. Choose Administrative Reports and select Reports as the report type.
- If your organization uses Communities, you can report on login history for external members of your communities.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Contact Manager, Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

1. Create a custom report.
 2. Choose Administrative Reports.
 3. Select Users as the report type.
 4. Add `Community` to your report columns.
 5. Add a filter that includes profiles of community users.
- If your organization uses a Salesforce Customer Portal, you can report on Customer Portal users:
 1. Create a custom report.
 2. Choose Administrative Reports.
 3. Select Users as the report type.
 4. Add `License Type`, `Profile`, and `Role` to your report columns. You can't report on roles for high-volume portal users because they don't have roles.

 **Note:** Permission sets aren't supported.

You can also add the `Customer Portal Account` field to your account reports to view which accounts have contacts enabled to use the portal.

- You can create custom report types from which users can report on your organization's reports and dashboards. When defining a custom report type, select Reports or Dashboards from the `Primary Object` drop-down list on the New Custom Report Type page.

Tips for Administrative Reports

- Users with the “Manage Internal Users” permission can create a custom user report that lists the details of users' login attempts. The relevant fields—such as `Login Date/Time`, `Source IP Address`, and `Login Status`—are grouped in the Login History section of the Select Columns step. Note that the `Client Type` field shows whether the user logged in via a Web browser or an alternate interface such as Connect for Lotus Notes or a partner portal. You can also see which users have never logged in by setting report criteria: choose the `Login Date/Time` field and the “equals” operator and leave the third value blank.

SEE ALSO:

[Limit Report Results](#)

Campaign Reports


Use campaign reports to analyze your marketing efforts. You can report on the ROI of your campaigns, track who you targeted with your campaigns and who has responded, or analyze which opportunities resulted from your campaigns.

Special Features of Campaign Reports

Consider the following when running Campaign Reports:

Standard Reports

- On the Campaign Detail custom report and the Campaign ROI Analysis report, you can include campaign-hierarchy statistics that provide aggregate values for a parent campaign and all the campaigns below it in the campaign hierarchy. If your campaigns include a custom picklist that indicates hierarchy level (for example, “tactic,” “program,” and “initiative”), you can run a report that summarizes data at any hierarchy level across all campaigns.
- Use the Campaign Leads or Campaign Contacts reports to list the leads or contacts associated with your campaigns.

- Use the Campaign Member Report for a list of campaign members by campaign.
 - Use the Campaign Member Analysis report to summarize information about who has responded to campaigns.
 - Use the Campaign Revenue Report to analyze which opportunities have resulted from your campaigns. In Enterprise, Unlimited, Performance, and Developer Editions, you can also analyze products, quantity schedules, and revenue schedules in this report.
 - The Campaign ROI Analysis Report calculates the return on investment (ROI) and average costs for your campaigns. The ROI is calculated as the net gain ($\text{Total Value Won Opps} - \text{Actual Cost}$) divided by the Actual Cost . The ROI result is expressed as a percentage.
 - Use the Campaigns with Influenced Opportunities report to view opportunities that have been influenced by multiple campaigns.
-  **Note:** The Campaigns with Influenced Opportunities report respects sharing rules on accounts, contacts, and campaigns. Objects with sharing rules set to private will not display in the report.

Report Types

- Use the Campaigns with Campaign Members custom report type to create a report that contains information about the leads and contacts on multiple campaigns. Use the Campaign Call Down report to see contacts and leads for a specific campaign. These reports are only available to users that have the “Read” permission on both contacts and leads.
- Use the Campaigns with Leads and Converted Lead Information report to view lead lifetime information sorted by a campaign or campaigns.
- Use the Campaigns with Influenced Opportunities report to view opportunities that have been influenced by multiple campaigns.

Tips for Campaign Reports

- Some reports allow you to limit the data to one campaign by using the lookup icon to select a campaign. If the user running a report no longer has access to view the selected campaign, the report does not show any results. This report behavior is similar to what happens when a campaign is deleted.
- `Member Status` is the status of a lead or contact in reference to the campaign. The campaign owner can create up to 50 member status values. Sample Member Status values include, “Planned,” “Sent,” or “Attended.” Additionally, you can now add the `Member First Associated`, `Member Responded`, and `Member First Responded` fields to campaign reports. These fields allow you to see the date the member was added to the campaign, whether the member responded to the campaign, and the date the member initially responded to the campaign.
- The `Last Activity` of a campaign is the most recent due date of an activity on the record. The following past or future activities set this date:
 - Any event
 - Closed tasks

SEE ALSO:

[Limit Report Results](#)

File and Content Reports

Run File and Content reports to analyze how users are engaging with files and Salesforce CRM Content.

Standard File and Content Reports

Run these prebuilt reports about files and content.

Content Authors

View how many files, content packs, Google Docs, and Web links each author has published in Salesforce CRM Content.

Content Publication Time Frame

Determine how many files, content packs, Google Docs, and Web links were published in a library during a given time frame.

File and Content Downloads

See which users downloaded what files, and when they downloaded the files.

File and Content Engagement

See the number of times a file has been downloaded, shared, liked, and commented on.

File and Content Links

See which files users are sharing using content deliveries or **Share via link**. See when each link was created, when it expires, when it was last accessed, whether it is password protected, and the total number of times the link has been accessed. Each of the links in this report can be accessed by users outside of your organization.

Library Administrators

View the number of files, content packs, Google Docs, and Web links in each library as well as the total amount of file storage used by each library.

Library Content

View the number of files, content packs, Google Docs, and Web links in each library as well as the total amount of file storage used by each library.

Most Content Downloads

Determine which files and content packs are downloaded most frequently and which Web links and Google Docs are opened most frequently.

Most Content Subscriptions

Determine which files, content packs, Google Docs, and Web links have the most subscribers.

Stale Content

Determine which files have not been downloaded or revised recently.


File and Content Report Types

Build standard reports about files and content.

Content Report

Generate a report about Salesforce CRM Content.

Field	Description
Archived	Flag that indicates whether a file has been archived. Archiving a file removes it from its library but does not permanently delete the file from Salesforce CRM Content. Archived files can be restored as needed.
Content Created By	Contributor who published the file, content pack, Google Doc, or Web link.
Content ID	Identifier that enables you to group by file rather than version. The Content Title is not guaranteed to be unique because multiple versions of the same file can have different titles.
Content Published Date	Date a file, content pack, Google Doc, or Web link was first published.
Content Title	Title of a file, content pack, Google Doc, or Web link.
Record Type	Title of the record type associated with the file, content pack, Google Doc, or Web link.
Featured Content	Flag that indicates whether a piece of content is featured.

Field	Description
Individual Content Size (MB)	Size of an individual file, exclusive of other versions of the same file.
Last Subscribed Date	Date on which the content was subscribed to most recently.
Num Downloads	Number of times a file has been downloaded or the total number of downloads in a library. The number of times a Google Doc or Web link has been opened is also included in this count.
	 Tip: To see which users have downloaded a certain file, go to the file's content details page and click the Downloads tab.
Num Negative Ratings	Number of thumbs-down votes.
Num Positive Ratings	Number of thumbs-up votes.
Num Subscriptions	Number of users who are subscribed to a file, content pack, Google Doc, or Web link, or the total number of subscriptions in a library.
Num Versions	Number of times a new version of a file has been published.
Overall Rating	The number of positive votes minus the number of negative votes. For example, if a file has two positive votes and no negative votes, its <code>Overall Rating</code> is 2.
Tag	Salesforce CRM Content tag assigned to a file, content pack, Google Doc, or Web link.
Total Content Size (MB)	Size of a file, inclusive of all the file's versions.
Version Revised Date	Date and time a new version of the file was published.
Version Revised By	Contributor who published the file version.
Library Name	Name of the library.
Library Created Date	Date and time the library was created.

Library and User Report

Generate a list of users who are assigned to libraries.

Field	Description
Administrator	Flag that indicates whether or not the user is a library administrator.
Group	Flag that indicates whether or not the library member is a single user or a public group.
Library Created	Date and time the library was created.
Library Name	Name of the library.
Member Name	First and last name of the library member.

File and Content Report

Generate a report about files uploaded to your organization.

Field	Description
Archived	Flag that indicates whether or not a file has been archived. Archiving a file removes it from its library but does not permanently delete the file from Salesforce CRM Content. Archived files can be restored as needed.
Title	Title of a file, content pack, Google doc, or Web link.
Created By	User who uploaded the file, content pack, Google Doc, or Web link.
Download Date	Date of the first file download.
Downloaded By	User who downloaded the file.
Download User Type	Profile type of the user who download the file.
File Type	MIME type of the uploaded file.
ID	Identifier that enables you to group by file rather than version. The <code>Title</code> is not guaranteed to be unique because multiple versions of the same file can have different titles.
Last Revised By	Last user to edit or upload a new version of the file.
Last Revised Date	Date of last file revision.
Likes	Number of times file posts have been liked. This number doesn't count likes applied to comments on the file post.
Links	Number of external file links that have been generated. External links are generated when a user shares a file using Share via link or when a user shares content from a library using a content delivery.
Post Comments	Number of comments made on file posts in feeds.
Posts	Number of times the file has been posted to a feed. This number doesn't count the number of times the file has been attached to comments on posts.
Published Date	Date a file, content pack, Google Doc, or Web link was first published or uploaded.
Shares	Number of times the file has been posted to a user's feed, shared using Share with people , and shared using Share with groups .
Size (MB)	Size of the most recent file version in megabytes.
Total Downloads	Number of times the file has been downloaded.
Total Size (MB)	Combined Size of all uploaded file versions.
Versions	Number of uploaded file versions.

Tips for Using File and Content Reports

- Salesforce CRM Content users who have the `Manage Content` option checked in their library permission can sort report data by the library they have access to ("My Libraries") or by all the libraries in an organization ("All Libraries"). Users without the `Manage Content` option can only sort data by the libraries they have access to.
- Sort custom reports by `Library Name` to view data for individual files as well as library summaries, such as total storage used and total number of downloads.



- Sort according to the `Content ID` to view data for a particular document.
- If you have Customer Portal or partner portal users with the “Create Libraries” user permission, run the Library Administrators report to determine which new libraries have been created by portal users.

SEE ALSO:

[Limit Report Results](#)

Forecast Reports

Forecast reports give you information about your customizable forecast data.

-  **Note:** This information applies to Customizable Forecasting and not [Collaborative Forecasts](#).
-  **Note:** If you don't see the Forecast Reports folder, your organization may not have customizable forecasting enabled. Customizable Forecasting includes five standard report types. You can't create custom report types with Customizable Forecasting.

Special Features of Customizable Forecast Reports

Consider the following when running customizable forecast reports:

Standard Reports

Create a forecast history report if you want the report to include information about forecasts you already submitted. Select *All Forecasts* to show the state of the forecasts after each update. Choose *Latest Forecasts* to display only the current state of the forecasts.

Report Types


- When creating a custom forecast report, choose the **Customizable Forecast: Opportunity Forecasts** report type if you want to include information about the opportunities that contribute to your forecast.
- You can include custom user fields in custom opportunity forecast reports as columns and as column values. Custom user fields are available as either opportunity owner or account owner custom information. The custom field label will be used for both opportunity owner or account owner information, which can cause confusion if they are both on the same report and have similar field labels.
- If you have the “View All Forecasts” permission, forecast summary and forecast history reports include all users' data for the chosen forecast hierarchy, including users in branches of the forecast hierarchy that have no forecast manager.


Tips on Customizable Forecasting Reports

- You must specify a reporting interval by fiscal year or by date.
- Forecast reports include private opportunities.
- Opportunity amounts are included in forecast reports if the opportunity is set to close within the forecast period.
- Forecast reports include only opportunities that are set to close within the forecast period, except those assigned to the Omitted forecast category.
- Create a forecast summary report if you want to view information about the amounts in your forecast without details of the opportunities that contribute to that amount.
- If your organization uses territories, you can create custom forecast reports that summarize information by territory name.
- You can view an opportunity forecast report based on the forecast hierarchy by drilling down in your forecast hierarchy.
 1. Select the desired role or territory from the **Hierarchy** links.
 2. Choose the appropriate forecast users or teams from the **Show Opportunities Owned By** or **Show Forecasts Owned By** scopes at the top of the report.

3. Click **Run Report** again to refresh the report data for your chosen parameters.

For example, to see your opportunity information, including your overrides on opportunity amounts or quantities and overrides from users below you in the forecast hierarchy, set the **Hierarchy** link to your forecast role. To see the opportunity information of someone beneath you in the forecasting hierarchy, drill down into that role.

 **Warning:** The My Team view shows forecasts across multiple hierarchy levels. Consequently, values may be included in a subordinate's forecast total and a forecast manager's forecast total. This may lead to larger than expected values in the column total because subordinate amounts are included multiple times in the total.

 **Note:** Click **Show Hierarchy** to see your org's role hierarchy above the report results. You can use the role hierarchy to share report data with people at different levels in the hierarchy. For example, if you see **CEO > VP of Global Sales > Sales Operations Director**, you're viewing data for the Sales Operations Director role. Click any role name to see and share the data that's visible to people in that role.

SEE ALSO:

[Limit Report Results](#)

Lead Reports


Use lead reports to show information about the source and status of leads, how long it takes to respond to leads, neglected leads, and the history of lead fields.

Special Features of Lead Reports

Consider the following when running lead reports:

Standard Reports

Choose the Lead History report type to track the history of standard and custom fields on leads where field histories are set to tracked. Use this report to see tracked fields' old and new values.

 **Tip:** If you have the "Create and Customize Reports" permission, you can use the **View** drop-down on a Lead History Report to view lead history data by My Leads, My Team's Leads, User Owned Leads, Queue Owned Leads, and All Leads.

Tips for Lead Reports

- Limit your report view to "My team's leads" to see leads owned by users who report to you in the role hierarchy.
- Lead reports can show all leads, both converted and unconverted. To limit your report to just unconverted leads, enter filter criteria of "Converted equals 0."
- The **Last Activity** of a lead is the most recent due date of an activity on the record. The following past or future activities set this date:
 - Any event
 - Closed tasks
- You can create a report of your lead information, export that data to Excel, and then do a mass mail merge using Microsoft® Word.

Lead Report Limitations

- You can't use filter conditions to search the results of the **Old Value** and **New Value** fields.

- You can't use filter logic if you are filtering by *Field/Event*.

SEE ALSO:

[Limit Report Results](#)

Opportunity Reports

Opportunity reports provide information about your opportunities, including owners, accounts, stages, amounts, and more. The default settings show you the most commonly used information from each object, but you can customize a report to view other information, such as primary campaign source, forecast category, and synced quote.

IN THIS SECTION:

1. [Tips for Working with Opportunity Reports](#)

Opportunity reports can include all opportunity fields plus some extra columns for additional detail.

2. [Standard Opportunity Reports](#)

Standard opportunity reports help you report on your opportunity pipeline and history, opportunity sources, opportunity types, and more.

3. [Opportunity Report Types](#)

Report types provide a report template that you can customize to capture the unique data you're after without creating a report from scratch. Many of the opportunities custom report types include information from associated objects, such as products, partners, and quotes.

SEE ALSO:

[Limit Report Results](#)

Tips for Working with Opportunity Reports

Opportunity reports can include all opportunity fields plus some extra columns for additional detail.

- You can use the following columns to provide additional detail:
 - **Age**—For an open opportunity, the number of days since the opportunity was created. For a closed opportunity, the number of days between the creation date and the closed date.
 - **Stage Duration**—The number of days the opportunity was in the stage listed in the **Stage** column. You can run the Opportunity Stage Duration report to see how much time an opportunity spent at different stages.
 - **Last Activity**—The most recent due date of an activity on the opportunity record, including any opportunity event or closed task.
- If your organization uses Forecasts or Customizable Forecasts, you'll see forecast report options paired with opportunity report options in the standard reports folders and the custom reports wizard. Opportunities owned by users who do not have a role in your organization's hierarchy are omitted from opportunity, forecast, and sales reports. This restriction does not apply to Personal, Essentials, or Group Edition organizations, which do not have a role hierarchy. For reports that include the **Partner** column (except for the Partner Opportunities report), only the primary partner of the opportunity is displayed.
- Not all Opportunity Product fields are available in report filters. For example, the **Product Family** field is not available in Opportunity Product report filters because it is related to that object through the Pricebook Entry object. To make the **Product Family** field available in Opportunity Product report filters—for cross-sell or upsell reporting—create a custom formula field to store its contents and use that formula field in your filter. From the object management settings for opportunities, go to the fields

area, then create a custom field of type Formula, making sure to use `Text` for your formula return type and `TEXT(PricebookEntry.Product2.Family)` for your formula.

- In Professional, Enterprise, Unlimited, Performance, and Developer edition organizations, the **Hierarchy** links let you browse report results based on the role or territory hierarchies.
- If your organization uses previous versions of territory management (not Enterprise Territory Management), the Hierarchy filter on opportunity reports lets you view data according to either the role or territory hierarchies. In addition, the Territories filter lets you display either opportunities from all territories or opportunities that lack an associated territory.
- You can include the `Primary Campaign Source` field on all standard opportunity reports. This field is controlled by field-level security.
- Use the View filter to limit your opportunity report results. View options vary depending on your organization's Edition and setup.
 - My opportunities—Shows only your opportunities.
 - My team-selling opportunities—Shows opportunities for which you are on the opportunity team.
 - My team-selling and my opportunities—Shows your opportunities and opportunities for which you are on the opportunity team.
 - My team's opportunities—Shows your opportunities and opportunities owned by all of your subordinates in the role hierarchy. If your organization uses previous versions of territory management (not Enterprise Territory Management), the effect of this option depends on the value of the Hierarchy filter above. If you select `Role`, you see your opportunities and opportunities owned by all of your subordinates in the role hierarchy. If you select `Territory`, you see opportunities that you own and any opportunities owned by your territories' descendants.
 - My team's team-selling and their opportunities—For users who report to you in the role hierarchy, shows opportunities they own or for which they are on the opportunity team.
 - My territories—For organizations that use territory management, this option shows opportunities that belong to the territories to which you are assigned.
 - All opportunities—Shows all opportunities you can view.

SEE ALSO:

[Opportunity Reports](#)

[Opportunity Report Types](#)

[Standard Opportunity Reports](#)

Standard Opportunity Reports

Standard opportunity reports help you report on your opportunity pipeline and history, opportunity sources, opportunity types, and more.

1. In the `Folders` pane on the Reports tab, select **Opportunity Reports**.
2. Click the report you want.

Report Name	Description
Closed Opportunities	Won opportunities
Opportunities by Type	Types of available opportunities.
Opportunity Field History	Field history on opportunities. Available only if your organization tracks this information.

Report Name	Description
Opportunity History	Status changes on opportunities. Available only if your organization tracks this information.
Opportunity Pipeline Trend	A historical snapshot of your opportunities; opportunity amounts are grouped by historical stage for specified months. This report is available in Professional, Enterprise, Unlimited, Performance, and Developer Edition organizations only.
Opportunity Pipeline	Opportunities by stage.
Opportunity Pipeline with Splits	Opportunities summarized by split information such as assigned user and percentage.
Opportunity Product	Opportunities by month and product.
Opportunity Product Report with Splits	<p>Split assignments and percentages for each product. You can also summarize information by these fields:</p> <ul style="list-style-type: none"> • <code>Split Total Price</code>—Split percentage multiplied by Total Price. • <code>Split Expected Product Amount</code>—Split Total Price multiplied by Probability.
Opportunity Schedule Report with Splits	<p>Opportunities by month, including split percentages for the opportunity team. To access this report, product scheduling must be enabled for your organization.</p> <p>You can also summarize information by these fields:</p> <ul style="list-style-type: none"> • <code>Split Total Price</code>—Split percentage multiplied by Total Price. • <code>Split Schedule Amount</code>—Split percentage multiplied by Schedule Amount. • <code>Split Expected Product Amount</code>—Split Total Price multiplied by Probability. • <code>Split Expected Schedule Amount</code>—Split Schedule Amount multiplied by Probability.
Opportunity Sources	Sources of your opportunities.
Opportunity Stage Duration	Duration of an opportunity at each stage.
Opportunity Teams	Information about opportunities and opportunity teams to which you belong.
Partner Opportunities	All partners associated with an opportunity or the primary partners only. To limit your results to primary partners, customize the report and enter <code>Primary equals True</code> on the criteria page of the report wizard.
Stuck Opportunities	Open opportunities grouped by stage and then sorted by age.

3. Run the report.

SEE ALSO:

[Opportunity Reports](#)

[Opportunity Report Types](#)

[Tips for Working with Opportunity Reports](#)

Opportunity Report Types

Report types provide a report template that you can customize to capture the unique data you're after without creating a report from scratch. Many of the opportunities custom report types include information from associated objects, such as products, partners, and quotes.

IN THIS SECTION:

[Opportunities Reports](#)

View standard information about your opportunities, including owners, accounts, stages, amounts, and more. The default settings show you the most commonly used information from each object, but you can customize the report to view other information, such as primary campaign source, forecast category, and synced quote.

[Opportunities with Contact Roles Report](#)

View information about the contacts associated with your opportunities, including name, title, and role.

[Opportunities with Contact Roles and Products Report](#)

View information about the contacts and opportunities associated with a selected product. You must select a product to filter results by when you run the report.

[Opportunities with Competitors Report](#)

View information about your company's competitors for opportunities, including their strengths and weaknesses.

[Opportunities with Historical Trending Report](#)

The Opportunities with Historical Trending report is a custom report type designed to help you analyze historical trends in your sales pipeline.

[Opportunity Field History Report](#)

View information about the change history of key opportunity fields, including old and new values and the dates edits were made.

[Opportunity History Report](#)

View information about the history of your opportunities, including stages and close date.

[Opportunities with Opportunity Teams Report](#)

View information about the members of your opportunity teams and their roles, organized by opportunity.

[Opportunities with Opportunity Teams and Products Report](#)

View information about your opportunity team members and their products, organized by opportunity. You must specify either a product or an opportunity team member to filter results by when you run the report.

[Opportunities with Partners Report](#)

View information about the partners you team with on your opportunities, including opportunity name, amount, and partner role.

[Opportunities with Products Report](#)

View information about the products associated with your opportunities, including product name and opportunity stage.

[Opportunity Trends Report](#)

View information about trends shared by the opportunities in your pipeline.

[Opportunities with Quotes and Quote PDFs Report](#)

View details about the quote PDFs created for each quote associated to an opportunity. The default settings show you the most commonly used information from each object, but you can customize the report to view other information, such as who created or last modified each listed quote PDF.

[Opportunities with Quotes and Quote Line Items Report](#)

View details about the quotes associated with opportunities, and the line items for each quote. The default settings provide the most commonly used information from each object, but you can customize the report to see any opportunity, quote, or quote line item field.

SEE ALSO:

[Choose a Report Type](#)

[Opportunity Reports](#)

[Tips for Working with Opportunity Reports](#)

Opportunities Reports

View standard information about your opportunities, including owners, accounts, stages, amounts, and more. The default settings show you the most commonly used information from each object, but you can customize the report to view other information, such as primary campaign source, forecast category, and synced quote.



Note: Click **Show Hierarchy** to see your org's role hierarchy above the report results. You can use the role hierarchy to share report data with people at different levels in the hierarchy. For example, if you see **CEO > VP of Global Sales > Sales Operations Director**, you're viewing data for the Sales Operations Director role. Click any role name to see and share the data that's visible to people in that role.

The default settings for this report are:

Format

Tabular

Selected Columns

Object Information Type	Columns
Opportunity Information	<ul style="list-style-type: none"> • Opportunity Name • Amount • Close Date • Stage • Age • Type • Probability (%) • Lead Source • Fiscal Period • Next Step • Created Date
Opportunity Owner Information	<ul style="list-style-type: none"> • Opportunity Owner • Owner Role

Object Information Type	Columns
Account Information	<ul style="list-style-type: none"> Account Name

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunities with Contact Roles Report

View information about the contacts associated with your opportunities, including name, title, and role.

The default settings for this report are:

Format

Tabular

Selected Columns

Object Information Type	Columns
Opportunity Information	<ul style="list-style-type: none"> Opportunity Name
Opportunity Owner Information	<ul style="list-style-type: none"> Opportunity Owner
Account: General Information	<ul style="list-style-type: none"> Account Name
Contact Role: General Information	<ul style="list-style-type: none"> Title First Name Last Name
Contact Role: Phone/Fax/Email	<ul style="list-style-type: none"> Phone Email
Contact Role: Address	<ul style="list-style-type: none"> Mailing Street Mailing City Mailing State/Province Mailing ZIP/Postal Code Mailing Country

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunities with Contact Roles and Products Report

View information about the contacts and opportunities associated with a selected product. You must select a product to filter results by when you run the report.

The default settings for this report are:

Format

Tabular

Selected Columns

Object Information Type	Columns
Opportunity: Information	<ul style="list-style-type: none"> • Opportunity Name
Product Information	<ul style="list-style-type: none"> • Product Name
Opportunity Owner Information	<ul style="list-style-type: none"> • Opportunity Owner
Account: General Information	<ul style="list-style-type: none"> • Account Name
Contact Role: General	<ul style="list-style-type: none"> • Title • First Name • Last Name
Contact Role: Phone/Fax/Email	<ul style="list-style-type: none"> • Phone • Email
Contact Role: Address	<ul style="list-style-type: none"> • Mailing Street • Mailing City • Mailing State/Province • Mailing ZIP/Postal Code • Mailing Country

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunities with Competitors Report

View information about your company's competitors for opportunities, including their strengths and weaknesses.

The default settings for this report are:

Format

Summary

Selected Columns

Object Information Type	Columns
Opportunity Information	<ul style="list-style-type: none"> • Opportunity Name • Close Date

Object Information Type	Columns
	<ul style="list-style-type: none"> Amount
Competitor Information	<ul style="list-style-type: none"> Competitor Name Strengths Weaknesses
Account: General Information	<ul style="list-style-type: none"> Account Name

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunities with Historical Trending Report

The Opportunities with Historical Trending report is a custom report type designed to help you analyze historical trends in your sales pipeline.

We've selected some of the most useful Opportunity fields for you in the default report:

Amount

Estimated total sale amount. For organizations using multiple currencies, the amount is shown in your personal currency by default. Change the `Opportunity Currency` picklist to track the amount in another currency.

Close Date

Date when you plan to close the opportunity. You can enter a date, or choose a date from the calendar that displays when you put your cursor in the field.

Stage

Current stage of opportunity based on selections you make from a predefined list, for example, Prospect or Proposal.

Probability

Percentage of estimated confidence in closing the opportunity.

Forecast Category

Forecast category name that is displayed in reports, opportunity detail and edit pages, opportunity searches, and opportunity list views. The setting for an opportunity is tied to its `Stage`.



Note: If you edit this report type, it is no longer automatically updated. If you remove this report type, it will not be regenerated.

Opportunity Field History Report

View information about the change history of key opportunity fields, including old and new values and the dates edits were made.



Note: You must enable and set up field history tracking and select fields in order to use the Field History Tracking report.

The default settings for this report are:

Format

Tabular

Selected Columns

Object Information Type	Columns
History Data	<ul style="list-style-type: none"> Edit Date New Value Edited By Field/Event Old Value
Opportunity Fields	<ul style="list-style-type: none"> Opportunity Name
Opportunity Owner Information	<ul style="list-style-type: none"> Opportunity Owner

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunity History Report

View information about the history of your opportunities, including stages and close date.

The default settings for this report are:

Format

Summary

Selected Columns

Object Information Type	Columns
Opportunity Information	<ul style="list-style-type: none"> Opportunity Name
Opportunity Owner Information	<ul style="list-style-type: none"> Owner
Opportunity History Information	<ul style="list-style-type: none"> From Stage Amount Last Modified To Stage Probability (%) Last Modified By Close Date

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunities with Opportunity Teams Report

View information about the members of your opportunity teams and their roles, organized by opportunity.

To be able to use this report, enable team selling.

The default settings for this report are:

Format

Tabular

Selected Columns

Object Information Type	Columns
Opportunity information	<ul style="list-style-type: none"> Opportunity Name
Team member information	<ul style="list-style-type: none"> Team Member Name Team Role

If your admin has created custom opportunity team fields, you can include them in this report.

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunities with Opportunity Teams and Products Report

View information about your opportunity team members and their products, organized by opportunity. You must specify either a product or an opportunity team member to filter results by when you run the report.

The default settings for this report are:

Format

Tabular

Selected Columns

Object Information Type	Columns
Opportunity Information	<ul style="list-style-type: none"> Opportunity Name
Product Information	<ul style="list-style-type: none"> Product Name
Team Member Information	<ul style="list-style-type: none"> Team Member Name Team Role

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunities with Partners Report

View information about the partners you team with on your opportunities, including opportunity name, amount, and partner role.

The default settings for this report are:

Format

Summary

Selected Columns

Object Information Type	Columns
Opportunity Information	<ul style="list-style-type: none"> • Opportunity Name • Close Date • Amount
Opportunity Owner Information	<ul style="list-style-type: none"> • Opportunity Owner
Partner Information	<ul style="list-style-type: none"> • Partner Owner • Partner Role • Partner
Account Information	<ul style="list-style-type: none"> • Account Owner • Account Name

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunities with Products Report

View information about the products associated with your opportunities, including product name and opportunity stage.

The default settings for this report are:

Format

Matrix

Summary Fields

Total Price (sum)

Selected Columns

Object Information Type	Columns
Opportunity Information	<ul style="list-style-type: none"> • Opportunity Name • Amount • Close Date • Stage • Age • Type

Object Information Type	Columns
	<ul style="list-style-type: none"> • Probability • Created Date
Product Information	<ul style="list-style-type: none"> • Product Name • Product Code • Quantity • Active Product • Sales Price • Product Date • Product Description • Total Price • Product: Month • List Price
Opportunity Owner Information	<ul style="list-style-type: none"> • Opportunity Owner • Owner Role
Account: General Information	<ul style="list-style-type: none"> • Account Name

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunity Trends Report

View information about trends shared by the opportunities in your pipeline.

The default settings for this report are:

Format

Matrix

Groupings

The default report shows rows grouped by `Historical Stage` and columns grouped by `As of Date`.

Summary Fields

`Historical Amount (sum)`

Selected Columns

Object Information Type	Columns
Opportunity Information	<ul style="list-style-type: none"> • Opportunity Name
Opportunity Trend Information	<ul style="list-style-type: none"> • Historical Amount • As of Date

Object Information Type	Columns
	<ul style="list-style-type: none"> Historical Stage
Opportunity Owner Information	<ul style="list-style-type: none"> Opportunity Owner Alias

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunities with Quotes and Quote PDFs Report

View details about the quote PDFs created for each quote associated to an opportunity. The default settings show you the most commonly used information from each object, but you can customize the report to view other information, such as who created or last modified each listed quote PDF.

The default settings for this report are:

Format

Summary

Grouping

The default report shows quotes and quote PDFs grouped by `Opportunity Name`.

Selected Columns

Object Information Type	Columns
Opportunity Information	<ul style="list-style-type: none"> Opportunity Name
Quote Information	<ul style="list-style-type: none"> Quote Name Syncing
Quote PDF Information	<ul style="list-style-type: none"> Quote PDF: Created Date Quote PDF: Name Quote PDF: Discount Quote PDF: Grand Total

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Opportunities with Quotes and Quote Line Items Report

View details about the quotes associated with opportunities, and the line items for each quote. The default settings provide the most commonly used information from each object, but you can customize the report to see any opportunity, quote, or quote line item field.

If your organization uses multicurrency or advanced currency management, you have additional options for customizing this report.

When you select report columns, you can select the “converted” version of an amount or total column to show its value converted to a different currency. Select the currency you want to convert to under Advanced Settings when you select your report criteria.

The default settings for this report are:

Format

Summary

Summary Fields

Amount (sum)

Quote Discount (sum)

Groupings

The default report shows you results grouped first by `Opportunity Name` and then by `Quote Name`. Each quote line item is listed beneath its associated quote.

Selected Columns

Object Information Type	Columns
Opportunity Information	<ul style="list-style-type: none"> • Opportunity Name • Amount
Quote Information	<ul style="list-style-type: none"> • Quote Name • Discount • Syncing • Status
Quote Line Item Information	<ul style="list-style-type: none"> • Quote Line Item: Discount • Product: Product Name • Line Item Number • Sales Price • List Price • Quote Line Item: Subtotal • Quote Line Item: Total Price

SEE ALSO:

[Limit Report Results](#)

[Opportunity Reports](#)

Product and Asset Reports

Use product and asset reports to view information about the products your users currently have installed. Find out what assets your customers have, list the cases filed for a particular asset, or identify assets that aren't associated with a product.

Special Features of Product and Asset Reports

Consider the following when running product and asset reports:

Standard Reports

Use the Assets without Products report, available from the “Products and Asset Reports” folder to list the assets that are not associated with a product. Depending on how you use assets, these assets can represent your competitor’s products.

Report Types

- To create a custom report showing what assets your customers have, click **New Report** from the Reports tab and choose the Accounts with Assets or Contacts with Assets report type from the Accounts & Contacts report type category.
- To view a list of the cases filed for a particular asset, click **New Report** from the Reports tab and choose the Assets with Cases report type from the Price Books, Products and Assets option.

SEE ALSO:

[Limit Report Results](#)

Self-Service Reports

Self-Service reports help you analyze the effectiveness of your Self-Service portal. Find out how many cases are being viewed, how many customers are logging in, or what customers think of the solutions you’re offering.

 **Note:** Starting with Spring '12, the Self-Service portal isn’t available for new orgs. Existing orgs continue to have access to the Self-Service portal.

Standard Reports

- The Self-Service Usage Report gives you information on how many cases are viewed and logged, the number of comments that have been added, and the number of searches Self-Service users have performed.
- The Self-Service User Report provides information about the customers who are logging into your Self-Service portal, including the associated account and last login date. You can also include Self-Service fields in any custom contact report.
- The Helpful Solutions report displays statistics from Self-Service portals that display solutions. On each Self-Service solution page, customers can indicate whether the solution is helpful. You can use the results of this survey when choosing the top five solutions for your Self-Service Home page and to verify that customers are able to find the solutions they need.

EDITIONS

Available in: Salesforce Classic

Available in: **Professional, Enterprise, Performance, Unlimited, and Developer Editions**

SEE ALSO:

[Limit Report Results](#)

Reporting on Support Activity

Use support reports to track the number of cases created, case comments, case emails, case owners, case contact roles, cases with solutions, the length of time since the case last changed status or owner, and the history of cases.

You can also report on the solutions for your organization, including solution history, the languages in which solutions have been written, and whether translated solutions are out of date. If you have enabled the Self-Service portal, you can run reports to track usage of your Self-Service portal.

IN THIS SECTION:

1. [Fields Available for Case Reports](#)

You can report on a number of key case fields in addition to the ones that are included in the standard and custom report types.

2. [Fields Available for Solution Reports](#)

You can report on a number of key solution fields in addition to the standard and custom fields.

SEE ALSO:

[Limit Report Results](#)

Fields Available for Case Reports

You can report on a number of key case fields in addition to the ones that are included in the standard and custom report types.

Cases	
Field	Description
# Cases Submitted	The number of cases submitted by Self-Service users via the Self-Service portal. (Self-Service Usage Report)
# Cases Viewed	The number of cases viewed by Self-Service users via the Self-Service portal. (Self-Service Usage Report)
# Comments Added	The number of comments added to all cases by Self-Service users via the Self-Service portal. (Self-Service Usage Report)
Entitlement Process Start Time	The time the case entered an entitlement process. This field displays if an entitlement process applies to the case.
Entitlement Process End Time	The time the case exited an entitlement process. This field displays if an entitlement process applies to the case.
Super User	A contact enabled to view case information, add comments, and upload attachments for all cases anyone in the company submitted via the Self-Service portal. (Self-Service User Report)
Self-Service Commented>	A checkbox showing a comment was added to a case via the Self-Service portal.
New Self-Service Comment	A checkbox showing someone added a comment to a case via the Self-Service that the case owner didn't review yet.
Is Incoming	A checkbox showing a case was received by email via the Email-to-Case or On-Demand Email-to-Case feature. (Cases with Emails Report)
Age	The age of an open case is the elapsed time from creation to the present. The age of a closed case is the elapsed time from creation to the closing time of the case. Age can be expressed in days, hours, or minutes. Note that the age of a case does <i>not</i> take into account any holidays that are associated with the case's business hours. Holidays suspend business hours during specified dates and times.

Cases

Field	Description
Closed	A checkbox showing a case has a closed status.
Escalated	A checkbox showing a case was escalated by an escalation rule.
Public Case Commented	A checkbox showing a case has comments that may be displayed via the Self-Service portal.
Has Attachment	A checkbox showing a case with emails has attachments. (Cases with Emails Report)
Old Value	The value in a tracked case or solution field before it was changed. (Case History Report and Solution History Report)
New Value	The value in a tracked case or solution field after it was changed. (Case History Report and Solution History Report)
Business Hours	The number of business hours that have elapsed since a case was last updated. Note that holidays are <i>not</i> taken into account for this field. Holidays suspend business hours during specified dates and times. (Case History Report)
Business Hours Since Similar Change	The number of hours that elapsed since the same field on a case was last updated. Note that holidays are <i>not</i> taken into account for this field. Holidays suspend business hours during specified dates and times. (Case History Report)
History ID	The unique identifier for each change tracked on a specified case or solution field. (Case History Report and Solution History Report)
Contact Account Name	The account associated with the contact on the case. View together with the Account Name field to see if the account on the case is different from the account on the contact.
Parent Case ID	The ID of a parent case, which can be used to access a parent case via the API.

Fields Available for Solution Reports

You can report on a number of key solution fields in addition to the standard and custom fields.

Field	Description
# Solution Searches	The number of solution searches performed by Self-Service users via the Self-Service portal. (Self-Service Usage Report)
Self-Service Access Count	The number of times a solution was viewed in the Self-Service portal.

Field	Description
Self-Service Answer Count	The number of times the survey question "Does this Solution help you answer your question?" is answered, either positively or negatively, on a solution in the Self-Service portal.
Self-Service Positive Count	The number of times the survey question "Does this Solution help you answer your question?" is answered positively on a solution in the Self-Service portal.
Author	The name of the user who originally created the solution.
Num Related Cases	The number of cases associated with the solution.
Reviewed	Checkbox that indicates whether the solution has a reviewed status.
Old Value	The value in a tracked case or solution field before it was changed. (Case History Report and Solution History Report)
New Value	The value in a tracked case or solution field after it was changed. (Case History Report and Solution History Report)
History ID	The unique identifier for each change tracked on a specified case or solution field. (Case History Report and Solution History Report)
Language	The language in which the master solution is written.
Translation Language	The language in which the translated solution is written. (Translated Solutions report)
Solution ID	The unique identifier for each solution. (Translated Solutions report)
Out of Date	Checkbox that indicates that the translated solution may need translating to match its master solution. (Translated Solutions report)
Master Solution Title	The title of the master solution. Displays up to 250 characters.
Translated Solution Title	The title of the translated solution. Displays up to 250 characters.
Master Solution Details	The solution details of the master solution. Displays up to 1000 characters.
Translated Solution Details	The solution details of the translated solution. Displays up to 1000 characters.

Pre-Designed Custom Report Types

Some Salesforce features come with custom report types that are designed for you in advance, so you don't have to create a new report.

 **Note:** Pre-designed custom report types are not the same as standard report types.

IN THIS SECTION:

1. [Territory Reports](#)

Use territory reports to analyze your sales territories. Identify which users have been assigned to which territories, which users have been assigned more than one territory, or which users have no territories.

2. [Reports for Answers](#)

Create custom report types so users can analyze questions, replies, and votes.

3. [Salesforce CRM Call Center Reports](#)

Call Center reports help you analyze the Salesforce CRM Call Center phone calls that were handled by you and your team.

4. [Create a Custom Report Type for Approval History](#)

Before you can run reports on executed and in-progress approval processes and their steps, you need to create a custom report type for approval process instances.

5. [Create a Custom Report Type in Collaborative Forecasts](#)

To make a forecasting report available to users, administrators must create a custom report type. A *report type* defines the set of records and fields available to a report based on the relationships between a primary object and its related objects. Reports display only records that meet the criteria defined in the report type.

6. [Custom Report Types in Collaborative Forecasts](#)

A *report type* defines the set of records and fields available to a report based on the relationships between a primary object and its related objects. Reports display only records that meet the criteria defined in the report type. When you create a custom report type, choose the primary and related objects carefully, because they determine the forecast types you can report on.

7. [Idea Reports](#)

Create custom report types so users can create reports about ideas, idea comments, and votes.

8. [Report on Salesforce Knowledge Articles](#)

Use Salesforce Knowledge custom reports to track how articles are created, maintained, and delivered.

9. [Live Agent Session Reports](#)

Use Live Agent Session reports to consolidate data about agents' activities while they chat with customers—for example, how long agents are online or how many chat requests are assigned to them.

10. [Report on Partners](#)

Some opportunities involve partner relationships. Use this report to identify and analyze those relationships.

11. [Report on Relationship Groups](#)

You can report on relationship groups and relationship group members if your administrator has enabled custom report types for those custom objects.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

to run reports:

- **Legacy Folder Sharing**
Run Reports
- **Enhanced Folder Sharing**
Run Reports

12. [Enable the Account Owner Report](#)

The Account Owner report lists all accounts and who owns them.

13. [Report on File Search Activity](#)

Use a report to determine the top 300 search term queries for file searches and to identify which content is missing or needs to be renamed based on users' search terms and the click-rank.

14. [Report on Chatter Top 100 Feed Item Views with Interaction Count Report](#)

Get a report on the top 100 feed item views in your organization or community with the primary object Interaction Count Report. Knowing the posts that people are looking at most is a great way to get insight into current Chatter trends. Actions counted as views include liking, commenting, and viewing a feed item detail. View counts are not unique. For example, a user can add three comments to a post, and that is counted as three views. Once you set up the report, it's run weekly.

15. [Related Articles and Questions Reports](#)

Create custom report types so users can report on click-through rates on related articles and questions. Salesforce Einstein suggests related articles and questions in communities. Use the click-through rates reports to create content around the most accessed articles and questions, empowering your customers to find the information they need.

16. [Report on External Documents Attached to Cases](#)

Create a report to see how many and which specific external documents are being attached to cases. Use this information to see which external sources have the most impact on closing cases. This report is helpful when you have set up Salesforce Federated Search, which gives users access to external search results when using the Knowledge One Widget. Users can attach external documents to cases only if Chatter is enabled.

Territory Reports

Use territory reports to analyze your sales territories. Identify which users have been assigned to which territories, which users have been assigned more than one territory, or which users have no territories.

Special Features of Territory Reports

Consider the following when running territory reports:

Standard Reports

- The territory report lists all territories in your organization. Select **No Users** in the `Users` drop-down list and click **Run Report** to see the territories in your organization that do not have any assigned users.
- The User Territory report, User Multiple Territory report, and User Missing Territory report summarize the users who have been assigned to any territories, more than one territory, or no territories, respectively.
- The Account Territory report, Account Multiple Territory report, and Account Missing Territory report summarize the accounts that have been assigned to any territories, more than one territory, or no territories, respectively.
- The Opportunity Territory report summarizes the opportunities that are in territories. To see opportunities owned by users who are not currently active in the opportunity's territory, customize the Opportunity Territory report with the following advanced filter: `Active in Territory` equals "False." The Opportunity Missing Territory report summarizes the opportunities that are associated with accounts that do not have a territory.
- Reports run from custom report types that include territories may display results differently than standard reports that include territories. This is because reports run from custom report types only display results *with* territories, such as accounts with territories, whereas standard reports that include territories may display results *without* territories. For example, if you select the Account Territory Report, results display accounts without territories. In custom report types, when using the `Territories` filter that includes territories, Multiple Territories or Missing Territories are not shown in the report results.

EDITIONS

Available in: Salesforce Classic

Territory management is available in: **Performance** and **Developer** Editions and in **Enterprise** and **Unlimited** Editions with the Sales Cloud.

Tips for Territory Reports


- Standard and custom territory fields are available in territory reports. They are also available in account reports, activity reports that include accounts, opportunity reports, and user reports.

SEE ALSO:

[Limit Report Results](#)

Reports for Answers

Create custom report types so users can analyze questions, replies, and votes.

-  **Note:** Answers will no longer be supported in all Salesforce orgs as of the Spring '18 release. For more information, see [End of Support for Chatter Answers in Spring '18](#). Starting with Summer '13, Answers isn't available in new orgs. Instead, you can use Chatter Questions, a Q&A feature that's seamlessly integrated into Chatter. With Chatter Questions, users can ask questions and find answers without ever needing to leave Chatter. Existing orgs will continue to have access to Answers if it was enabled before the Summer '13 release.

As an administrator, you can create custom report types so users can create reports about questions, replies, and votes. Custom report types are the only way to make reports about your answers community available for your users—Salesforce does not provide sample answers reports or a standard report folder for answers.

To create a folder of answers reports for your users:

1. Set up a custom report type for answers.
 - The primary object for your report is Questions.
 - There isn't a specific report category for answers, so you probably want to store your report in the Other Reports or Administrative Reports category.
 - When setting up object relationships, Questions can have a relationship with Replies, and Replies can have a relationship with Votes.
2. Create a new public folder for answers reports. This step requires the "Manage Public Reports" permission.
3. Using your custom report type, create one or more new custom reports for answers. Assign the reports to the new answers reports folder you created.

After completing these steps, a folder of answers reports is available to your users on the Reports home page.

EDITIONS

Available in: Salesforce Classic

Answers is available in: **Enterprise, Performance, Unlimited, and Developer** Editions.

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To delete custom report types:

- Modify All Data

Salesforce CRM Call Center Reports

Call Center reports help you analyze the Salesforce CRM Call Center phone calls that were handled by you and your team.

Special Features of Call Center Reports

Consider the following when running call center reports:

Standard Reports

- The My Team's Calls This Week gives you information about the calls that were handled by the call center users on your team during the past week, including associated records and the result of each call.
- The My Calls Today report gives you information about the calls that you initiated or received during the past day, including associated records and the result of each call.
- The My Calls This Week report gives you information about the calls that you initiated or received during the past week, including associated records and the result of each call.

Create a Custom Report Type for Approval History

Before you can run reports on executed and in-progress approval processes and their steps, you need to create a custom report type for approval process instances.

1. From Setup, enter *Report Types* in the Quick Find box, then select **Report Types**.
2. Click **New Custom Report Type**.
3. Fill out the fields.

For this field...	Do this...
Primary Object	Select Process Instance. A process instance represents one instance of an approval process. A new process instance is created each time a record is submitted for approval.
Report Type Label	Enter a label. Users see this label when they create reports. Example: <i>Approval Process Instances</i>
Report Type Name	Enter a unique name for the report type.
Description	Enter a description. Users see this label when they create reports.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To run reports:

- Run Reports
- AND
- Read on the records included in report

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To delete custom report types:

- Modify All Data

For this field...	Do this...
Store in Category	Select Administrative Reports. If you like, you may select a different category. This determines in which folder your users find the custom report type when they create approval history reports.
Deployment Status	When you're ready to let all users access the report type, select Deployed.

4. Click **Next**.
5. Click the box under the primary object.
6. Select Process Instance Node.

A process instance node represents an instance of an approval step. A new process instance node is created each time a record enters a step in an approval process. No process instance node is created when the record doesn't meet the step criteria or if the approval process instance is otherwise completed without entering the step.

7. For the A to B relationship, select one of these options.

Option	Description
Each "A" record must have at least one related "B" record.	The report includes only process instances that enter at least one approval step to create a process instance node. The report excludes process instances for records that were submitted for approval but that didn't meet any step criteria.
"A" records may or may not have related "B" records.	The report includes all process instances.

8. Click **Save**.

After the report type is deployed, notify the relevant users with the names of the category folder and the custom report type, so that they can start creating and running approval history reports.

SEE ALSO:


[Approval History Reports](#)

[Create a Custom Report Type](#)

[Build a Report in Salesforce Classic](#)

Create a Custom Report Type in Collaborative Forecasts


To make a forecasting report available to users, administrators must create a custom report type. A *report type* defines the set of records and fields available to a report based on the relationships between a primary object and its related objects. Reports display only records that meet the criteria defined in the report type.

 **Note:** This information applies to Collaborative Forecasts and not Customizable Forecasts. To create a forecasting custom report type, enable Collaborative Forecasts.

1. Start creating a custom report type from Setup by entering *Report Types* in the *Quick Find* box, then selecting **Report Types** and **New Custom Report Type**.
2. For Primary Object, select a Forecasting object, such as Forecasting Items or Forecasting Quotas.
3. For Store in Category, select **Forecasts**.
4. Let your reps know the locations and names of the report types.

Custom Report Types in Collaborative Forecasts

A *report type* defines the set of records and fields available to a report based on the relationships between a primary object and its related objects. Reports display only records that meet the criteria defined in the report type. When you create a custom report type, choose the primary and related objects carefully, because they determine the forecast types you can report on.

 **Note:** This information applies to Collaborative Forecasts and not Customizable Forecasts. To create a forecasting custom report type, enable Collaborative Forecasts.

This table lists the forecasting custom report types that you can create.

Primary Object	Use to create a report for...
Forecasting Items	<p>Viewing information about forecasting amounts, including adjustment amount information. As a best practice, if you use a forecast type based on revenue, use these default fields in the report type.</p> <ul style="list-style-type: none"> • Owner Only Amount—The sum of a person’s revenue opportunities, without adjustments. For example, if you own two opportunities, each worth \$10,000, the Owner Only Amount is \$20,000. • Amount Without Adjustments—The sum of a person’s owned revenue opportunities and the person’s subordinates’ opportunities, without

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Professional** (no custom field forecasts), **Enterprise, Performance, Unlimited,** and **Developer** Editions

Opportunity Splits available in: **Performance** and **Developer** Editions and in **Enterprise** and **Unlimited** Editions with the Sales Cloud

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To delete custom report types:

- Modify All Data

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Professional** (no custom field forecasts), **Enterprise, Performance, Unlimited,** and **Developer** Editions

Opportunity Splits available in: **Performance** and **Developer** Editions and in **Enterprise** and **Unlimited** Editions with the Sales Cloud

Primary Object**Use to create a report for...**

adjustments. Subordinates include everyone reporting up to a person in the forecast hierarchy. This amount is visible only on reports. For example, if the sum of the amount of all opportunities owned by you is \$20,000, and the sum of the amount of your subordinates' opportunities is \$55,000, the Amount Without Adjustments is \$75,000.

- **Amount Without Manager Adjustments**—The forecast number as seen by the forecast owner. This is the sum of the owner's revenue opportunities and the owner's subordinates' opportunities, including adjustments made by the forecast owner on the owner's or subordinates' forecasts. It doesn't include adjustments made by forecast managers above the owner in the forecast hierarchy. For example, Anne has an Amount Without Adjustments of \$75,000, made up of \$20,000 of her own opportunities and \$55,000 of opportunities owned by Ben, her subordinate. She adjusts Ben's amount to \$65,000 for a total of \$85,000. If you adjust Anne's number from \$85,000 to \$100,000, you see \$85,000 in Amount Without Manager Adjustments, because Anne sees this amount (and Anne can't see your adjustments because you're her manager). To see the amount that includes your adjustment to \$100,000, look at Forecast Amount.
- **Forecast Amount**—The revenue forecast from the forecast manager's perspective and the sum of the owner's and subordinates' opportunities, including all forecast adjustments. For example, you're a forecast manager and have another forecast manager reporting to you who has an Amount Without Manager Adjustment totaling \$85,000. If you adjust the forecast to \$100,000, the Forecast Amount is \$100,000.

If you use a forecast type based on quantity, use these default fields in the report type.

- Owner Only Quantity, Quantity Without Adjustments, Quantity Without Manager Adjustments, and Forecast Quantity

Regardless of whether you forecast based on revenue or quantity, add these fields.


- **Has Adjustment**—A checkbox that indicates whether a manager adjustment has been made on a forecast owner's amount.
- **Has Owner Adjustment**—A checkbox that indicates whether a forecast user has adjusted the user's own forecast amount.


If you use cumulative forecast rollups, add this field to your report.

- **ForecastingItemCategory**—This field indicates which rollup each forecast amount is for: Open Pipeline, Best Case Forecast, Commit Forecast, Closed Only, Pipeline, Best Case, Commit, or Closed. If you changed the forecast category names, those changes appear in the ForecastingItemCategory values.

Forecasting Items with Opportunities as a related object

Viewing opportunity revenue or opportunity quantity forecasts. View opportunity information for specific forecasting line items. For example, you can create a summary report for each of your subordinates that includes the opportunity names and last activity dates for their forecasting items, with adjustment information and final forecast amounts.

-  **Note:** For opportunities with no opportunity products specified, this report type includes two forecasting items: one for the Opportunity-Revenue forecast type and one for the Product Family forecast type. These product family forecasting items roll up into the Products Not Specified row of the Product Family forecast.

Primary Object	Use to create a report for...
Forecasting Items with Opportunity Splits as a related object	Viewing opportunity splits or custom field forecasts. View opportunity split or custom field information for specific forecasting line items. For example, you can create a summary report for each of your subordinates that includes the opportunity split amounts and percentages for their forecasting items, with adjustment information and final forecast amounts.
Forecasting Items with Opportunity Product as a related object	Viewing product family revenue or product family quantity forecasts. View product family information for specific forecasting line items. For example, you can create a summary report for each of your subordinates that includes the product families and total price for their forecasting items, with adjustment information and final forecast amounts.  Note: This report type shows forecasting items only for the Product Family-Revenue and Product Family-Quantity forecast types. It includes opportunities with and without opportunity products specified.
Forecasting Quotas	Viewing data about individual or team quotas. As a best practice, include all the default fields in the report type. For example, you can include lookup fields, such as the full name of the owner. When running the report, you can filter by your name to see quotas that you created and their related accounts and owners.
Forecasting Quotas with Forecasting Items as a related object	Viewing quota attainment. For example, you can use Forecasting Quotas and Forecasting Items to create the custom report type. Then, when you create the report, include a team's quotas and forecasted revenue for closed forecasts and create a formula field to display the attained quota percentage.

 **Note:** If you delete a forecast type, reports that use that forecast type don't run.

Idea Reports

Create custom report types so users can create reports about ideas, idea comments, and votes.

As an administrator, you can create custom report types so users can analyze what happens to ideas. Custom report types are the only way to make idea reports available for your users—Salesforce does not provide sample idea reports or a standard report folder for ideas.

To create a folder of idea reports for your users:

1. Create a custom report type for ideas.

If you create a custom report type that uses Ideas as the primary object and Votes as the secondary object, child (merged) ideas will not appear in the report unless you select "A" records may or may not have related "B" records. Child ideas have no votes because their votes are transferred to the master idea. This means child ideas do not appear in a report if the Votes object is required.

2. Create a new public folder for idea reports. This step requires the "Manage Public Reports" permission.

3. Using your custom report type, create one or more new custom reports for ideas. Assign the reports to the new idea reports folder you created.

After completing these steps, a folder of idea reports will be available to your users on the Reports home page.

EDITIONS

Available in: Salesforce Classic

Available in: **Professional, Enterprise, Performance, Unlimited, and Developer** Editions

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types


To delete custom report types:

- Modify All Data

Report on Salesforce Knowledge Articles

Use Salesforce Knowledge custom reports to track how articles are created, maintained, and delivered.

As an administrator, you can create custom report types so agents can create reports on Salesforce Knowledge articles. Custom report types are the only way to make reports about articles available for your readers. Salesforce does not provide sample article reports or a standard report folder for articles.

 **Tip:** The *Knowledge Base Dashboards and Reports* AppExchange package provides over two dozen reports that help you monitor the knowledge base and analyze usage metrics.

IN THIS SECTION:

1. [Create a Folder for Article Reports](#)
Create a public folder where you can store article reports for your users.
2. [Article Reports](#)
Create a custom report type to report on Salesforce Knowledge article data.
3. [Create an Article Report](#)
Run your custom report on your Salesforce Knowledge articles and save them to your article reports folder.
4. [Fields Available on Salesforce Knowledge Reports](#)
The fields you can use in a knowledge report depend on the type of information you are reporting on.

EDITIONS

Available in: Salesforce Classic, Lightning Experience

Salesforce Knowledge is available in **Performance** and **Developer** Editions and in **Unlimited** Edition with the Service Cloud.

Salesforce Knowledge is available for an additional cost in: **Professional**, **Enterprise**, and **Unlimited** Editions.

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To create a public reports folder:

- Manage Public Reports

Create a Folder for Article Reports

Create a public folder where you can store article reports for your users.

1. In the Report Folder section of the Reports tab, click **Create New Folder**.
2. Enter *Article Reports* in the `Folder Label` field.
3. Optionally, modify the `Group Unique Name`.
4. Choose a `Public Folder Access` option.
Select read/write if you want users to be able to add and remove reports.
5. Choose a folder visibility option.
6. Click **Save**.

Reports you store in this folder are available on the Reports tab.

EDITIONS

Available in: Salesforce Classic, Lightning Experience

Salesforce Knowledge is available in **Performance** and **Developer** Editions and in **Unlimited** Edition with the Service Cloud.

Salesforce Knowledge is available for an additional cost in: **Professional**, **Enterprise**, and **Unlimited** Editions.

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To create a public reports folder:

- Manage Public Reports

Article Reports

Create a custom report type to report on Salesforce Knowledge article data.

To create a custom report:

1. From Setup, enter *Report Types* in the Quick Find box, then select **Report Types** and click **New Custom Report Type**.

See [Create a Custom Report Type](#)

2. In the Primary Object drop-down menu, select the article-related object you want to report on:

Primary Object	Description
Article types (Classic Knowledge only)	Compare information such as creation dates, published channels, and number of associated cases for your custom article type, such as an FAQ. To access any history and custom fields for the custom article type, add the article type's version as a secondary object.
Knowledge Articles	Compare information about individual articles, such as their creation dates, published channels, and number of associated cases. If you choose this custom report type, you can also include article view and vote statistics. In reports using the Knowledge Articles primary object, each article has five records (rows): one for each channel (All Channels, Internal App, Customer, Partner, and Public Knowledge Base).
Knowledge Article Searches	Analyze the number of searches per day, month, or year for each channel and role.
Knowledge Article Version	Compare information about individual translations, such as their creation dates, published channels, and number of associated cases. If you choose this custom report type, you can also include article view and vote statistics.
Article Version History	Compare information about individual article versions, such as their creation dates, published channels, and number of associated cases.
Knowledge Article Views	Analyze the number of views per day, month, or year for each channel and role.
Knowledge Article Votes	Analyze the number of votes per day, month, or year for each channel and role.
Knowledge Keyword Search	See which keywords users are looking for in your knowledge base.
Knowledge Search Activity	<ul style="list-style-type: none"> • Analyze the number of searches per day, month, or year for each channel and language. • For each search, see the: <ul style="list-style-type: none"> – Date – ID and title of the article that was clicked

EDITIONS

Available in: Salesforce Classic, Lightning Experience

Salesforce Knowledge is available in **Performance** and **Developer** Editions and in **Unlimited** Edition with the Service Cloud.

Salesforce Knowledge is available for an additional cost in: **Professional**, **Enterprise**, and **Unlimited** Editions.

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To create a public reports folder:

- Manage Public Reports

- See which keywords users are looking for in your knowledge base.
- For each keyword, see the average number of:
 - Results
 - Articles that appear in the search results
- For each article, see the average number of:
 - Clicks
 - Unique users who clicked it

3. Complete the required fields and click **Save**.

In the Store in Category drop-down menu, we recommend choosing **Customer Support Reports** or **Other Reports**. This is the category where users find the custom report type on the Reports tab.

4. Make your choices on the Define Report Records Set page.

Primary Object	Available Secondary Objects
Article types (Classic Knowledge only)	Article type Versions
Knowledge Articles	Article View Statistics, Article Vote Statistics, Case Article
Knowledge Article Searches	None
Knowledge Article Version	Article View Statistics, Article Vote Statistics
Article Version History	None
Knowledge Article Views	None
Knowledge Article Votes	None
Knowledge Keyword Search	None
Knowledge Search Activity	None

5. Click **Save**.

6. As needed, remove and rearrange fields from your report layout.

To learn which fields are available on each primary object, see [Fields Available on Salesforce Knowledge Reports](#) on page 804.

 **Note:** An article's score is calculated slightly differently in the API than it is in a custom report. We recommend standardizing on one or the other and not attempting to use both.

Create an Article Report

Run your custom report on your Salesforce Knowledge articles and save them to your article reports folder.

Using your [custom report types](#), create article reports and save them to your [article reports folder](#).

1. On the Reports tab, click **New Report**.
2. Choose the category where your custom report types are stored; for example, **Customer Support Reports** or **Other Reports**.
The Cases with Articles report is available by default in the Customer Support Reports folder.
3. Find your report type and click **Create**.
4. When viewing your report, click **Save As** and save it in the new Article Reports folder to make the report available to other users.

Note:

- In reports using the Knowledge Article custom report type, there are at least five rows per article (one for each channel, including “All Channels”).
- Daily values are reported independently for the last 90 days and monthly values for the last 18 months. After those time periods, use the monthly aggregate and yearly aggregate values, respectively.
- In reports using the Knowledge Article Votes, Knowledge Article Views, or Knowledge Article Searches custom report types, each row represents a day, channel, and role combination. For example, if a user with the Kingmaker role views articles in the internal app and the next day the same reader views more articles in the internal app, the Article Views report has two rows: one for each unique date.
- In reports using Knowledge Article Version (KAV), except Knowledge Article Version History, you can filter by data category. You can add up to four filters and set their logic to AT, ABOVE, BELOW, or ABOVE OR BELOW. The logic between filters is OR. You can use the same category group multiple times, however, you must use the same operator each time.
- To report on Approval Processes for Knowledge Articles, use **Process Instance** and **Process Instance Node** when creating a custom report type. Then filter the report on object type, which is the article type.

EDITIONS

Available in: Salesforce Classic, Lightning Experience

Salesforce Knowledge is available in **Performance** and **Developer** Editions and in **Unlimited** Edition with the Service Cloud.

Salesforce Knowledge is available for an additional cost in: **Professional**, **Enterprise**, and **Unlimited** Editions.

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To create a public reports folder:

- Manage Public Reports

Fields Available on Salesforce Knowledge Reports

The fields you can use in a knowledge report depend on the type of information you are reporting on.

The following tables list the available fields by primary object for Salesforce Knowledge reports.

Fields Available on Article types (Classic Knowledge only) Reports

The Article Type primary object allows you to add a secondary object of the article type version.

Table 18: Article Type Report Primary Object Fields

Field	Description
Archived By	User who archived the article.
Archived Date	Date the article was archived.
Article Number	Unique number automatically assigned to the article.
Article Type ID	The ID associated with the article type.
Case Association Count	Number of cases attached to the article.
Created By	User who created the article.
Created Date	Date the current article version was created. If the article has been published more than once, this is the latest draft date. To create reports that use the original article creation date, first create a Custom Report Type that joins the Knowledge Article (__ka) and Knowledge Article Version (__kav) objects for a given article type to allow for use of the created date on the record in the Knowledge Article object, rather than the one for the Knowledge Article Version record.
Custom fields	Any custom fields created on the article types. Add the article type's version as a secondary object to access any custom fields for the article type.
First Published Date	Date the article was originally published.
Knowledge Article Version	The article's version number.
Last Modified By	User who changed the article most recently.
Last Modified Date	Date the article was last changed. The last modified date of a draft article is the time the draft was saved. The last modified date of a published article is time the article was most recently published.
Last Published Date	Date the article was last published.
Master Language	The original language of the article.

EDITIONS

Available in: Salesforce Classic, Lightning Experience

Salesforce Knowledge is available in **Performance** and **Developer** Editions and in **Unlimited** Edition with the Service Cloud.

Salesforce Knowledge is available for an additional cost in: **Professional**, **Enterprise**, and **Unlimited** Editions.

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To create a public reports folder:

- Manage Public Reports


 **Note:** Currently you can't use Knowledge Article Version and Last Modified Date in the same report.

Table 19: Article Type Report Secondary Object Fields

Field	Description
Archived By	User who archived the article.
Article Type	The article type associated with the article.
Created By	User who created the article.
Created Date	Date the current article version was created. If the article has been published more than once, this is the latest draft date. To create reports that use the original article creation date, first create a Custom Report Type that joins the Knowledge Article (__ka) and Knowledge Article Version (__kav) objects for a given article type to allow for use of the created date on the record in the Knowledge Article object, rather than the one for the Knowledge Article Version record.
Custom fields	Any custom fields created on the article types. Add the article type's version as a secondary object to access any custom fields for the article type.
Is Latest Version	Indicates if the article is the most recent version.
Is Master Language	Indicates that the article is not a translation, but the original article.
Knowledge Article Version ID	Unique ID automatically assigned to the article translation.
Language	The article's language.
Last Modified By	User who changed the article most recently.
Last Modified Date	Date the article was last changed. The last modified date of a draft article is the time the draft was saved. The last modified date of a published article is time the article was most recently published.
Out of Date	Indicates that the master article has been updated since this translation was published.
Publication Status	Indicates whether the article or translation is in progress (draft), published, or archived.
Summary	Description of the article provided by the author.
Title	The article's title.
Translation Completed Date	Date the translation was completed.
Translation Exported Date	Date the article was exported for translation.
Translation Imported Date	Date the translation was imported.
URL Name	Text used as hyperlink for the article.
Validation Status	Indicates if the article is valid or not.
Version Number	The version number of the article.

Field	Description
Visible in Customer	Indicates that the article is published in the Customer Portal.
Visible in Internal App	Indicates that the article is published in the internal app (Articles tab).
Visible in Partner	Indicates that the article is published in the partner portal.
Visible in Public Knowledge Base	Indicates that the article is published in the public knowledge base.

Fields Available on Knowledge Articles Reports

Field	Description
Article Number	Unique number automatically assigned to the article.
Article Type	The article type associated with the article.
Case Association Count	Number of cases attached to the article.
Created By	User who created the article.
Created Date	Date the current article version was created. If the article has been published more than once, this is the latest draft date. To create reports that use the original article creation date, first create a Custom Report Type that joins the Knowledge Article (__ka) and Knowledge Article Version (__kav) objects for a given article type to allow for use of the created date on the record in the Knowledge Article object, rather than the one for the Knowledge Article Version record.
First Published Date	Date the article was originally published.
Is Latest Version	Indicates if the article is the most recent version.
Knowledge Article Version ID	Unique ID automatically assigned to the article translation.
Last Modified By	User who changed the article most recently.
Last Modified Date	Date the article was last changed. The last modified date of a draft article is the time the draft was saved. The last modified date of a published article is time the article was most recently published.
Last Published Date	Date the article was last published.
Summary	Description of the article provided by the author.
Title	The article's title.
URL Name	Text used as hyperlink for the article.
Validation Status	Indicates if the article is valid or not.
Version Number	The version number of the article.
Visible in Customer	Indicates that the article is published in the Customer Portal.
Visible in Internal App	Indicates that the article is published in the internal app (Articles tab).

Field	Description
Visible in Partner	Indicates that the article is published in the partner portal.
Visible in Public Knowledge Base	Indicates that the article is published in the public knowledge base.

Fields Available on Knowledge Article Searches Reports

Field	Description
Channel	The channel that's applicable to the article. Possible values are All Channels, Internal App, Customer, Partner, and Public Knowledge Base.
Count	The number of article searches applicable to the duration shown (day, month, or year).
Cumulative Count	The total number of article searches for the history of the record.
Date	Last date on which an article search took place for the record. All rows represent a date, channel, and role combination.
Duration	The time period the search count is applied to. Possible values are Daily, Monthly, and Yearly. For example, a record where the Count is 70 and the Duration is Monthly indicates that 70 searches took place over the past month. Totals are aggregated daily for the current month, monthly from the past full month through the past full year, and yearly beyond that.
Related Role	Name of the role that applies to the record. Each row in the report represents searches per channel per role.

Fields Available on Knowledge Article Version Reports

Field	Description
Archived By	User who archived the article.
Archived Date	Date the article was archived.
Article Number	Unique number automatically assigned to the article.
Article Type	The article type associated with the article.
Case Association Count	Number of cases attached to the article.
Created By	User who created the article.
Created Date	Date the current article version was created. If the article has been published more than once, this is the latest draft date. To create reports that use the original article creation date, first create a Custom Report Type that joins the Knowledge Article (__ka) and Knowledge Article Version (__kav) objects for a given article type to allow for use of the created date on the record in the Knowledge Article object, rather than the one for the Knowledge Article Version record.
First Published Date	Date the article was originally published.
Is Latest Version	Indicates if the article is the most recent version.

Field	Description
Is Master Language	Indicates that the article is not a translation, but the original article.
Knowledge Article Version ID	Unique ID automatically assigned to the article translation.
Language	The article's language.
Last Modified By	User who changed the article most recently.
Last Modified Date	Date the article was last changed. The last modified date of a draft article is the time the draft was saved. The last modified date of a published article is time the article was most recently published.
Date the article was last published.	Date the article was last published.
Master Language	The original language of the article.
Out of Date	Indicates that the master article has been updated since this translation was published.
Publication Status	Indicates whether the article or translation is in progress (draft), published, or archived.
Summary	Description of the article provided by the author.
Title	The article's title.
Translation Completed Date	Date the translation was completed.
Translation Exported Date	Date the article was exported for translation.
Translation Imported Date	Date the translation was imported.
URL Name	Text used as hyperlink for the article.
Validation Status	Indicates if the article is valid or not.
Version Number	The version number of the article.
Visible in Customer	Indicates that the article is published in the Customer Portal.
Visible in Internal App	Indicates that the article is published in the internal app (Articles tab).
Visible in Partner	Indicates that the article is published in the partner portal.
Visible in Public Knowledge Base	Indicates that the article is published in the public knowledge base.

Fields Available on Knowledge Article Views Reports

You can add up to 6 of the 8 fields below.

Field	Description
Channel	The channel that's applicable to the article. Possible values are All Channels, Internal App, Customer, Partner, and Public Knowledge Base.
Count	The number of article views applicable to the duration shown (day, month, year).
Cumulative Count	The total number of article views for the history of the record.
Date	Last date on which an article view took place for the record. All rows represent a date, channel, and role combination.
Duration	The time period the search count is applied to. Possible values are Daily, Monthly, and Yearly. For example, a record where the Count is 70 and the Duration is Monthly indicates that 70 searches took place over the past month. Totals are aggregated daily for the current month, monthly from the past full month through the past full year, and yearly beyond that.
Related Role	Name of the role that applies to the record.
Score	Article's average view rating. Scoresake into account a half-life calculation. Every 15 days, if an article has not been viewed its average rating moves up or down. This calculation ensures that over time, older or outdated articles don't maintain artificially high or low ratings compared to newer, more frequently viewed articles.
Total Views	Number of times a published article has been viewed.

Fields Available on Knowledge Article Votes Reports


Field	Description
Channel	The channel that's applicable to the article. Possible values are All Channels, Internal App, Customer, Partner, and Public Knowledge Base.
Count	The number of article votes applicable to the duration shown (day, month, year).
Cumulative Count	The total number of article votes for the history of the record.
Date	Last date on which an article vote took place for the record. All rows represent a date, channel, and role combination.
Duration	The time period the search count is applied to. Possible values are Daily, Monthly, and Yearly. For example, a record where the Count is 70 and the Duration is Monthly indicates that 70 searches took place over the past month. Totals are aggregated daily for the current month, monthly from the past full month through the past full year, and yearly beyond that.
Related Role	Name of the role that applies to the record.

Fields Available on Knowledge Keyword Search Reports

Field	Description
Channel	The channel that's applicable to the article. Possible values are All Channels, Internal App, Customer, Partner, and Public Knowledge Base.

Field	Description
Count	The number of keyword searches applicable to the duration shown (day, month, year).
Date	Last date on which a keyword search took place for the record. All rows represent a date, channel, and role combination.
Duration	The time period the search count is applied to. Possible values are <code>Daily</code> , <code>Monthly</code> , and <code>Yearly</code> . For example, a record where the Count is 70 and the Duration is <code>Monthly</code> indicates that 70 searches took place over the past month. Totals are aggregated daily for the current month, monthly from the past full month through the past full year, and yearly beyond that.
Found	Indicates whether the keyword shown was found during a search of the knowledge base.
Keyword	Search term used to search published articles in the knowledge base.

Fields Available on Knowledge Search Activity Reports

Field	Description
Average Click Rank	The order in which the article appeared in search results when results are sorted by relevance and when readers clicked it from the list of results.
Channel	The channel that's applicable to the article. Possible values are <code>All Channels</code> , <code>Internal App</code> , <code>Customer</code> , <code>Partner</code> , and <code>Public Knowledge Base</code> .
Clicked Article Title	The title of the clicked article taken when the search results are sorted by relevance by the reader.
Duration	The time period the search count is applied to. Possible values are <code>Daily</code> , <code>Monthly</code> , and <code>Yearly</code> . For example, a record where the Count is 70 and the Duration is <code>Monthly</code> indicates that 70 searches took place over the past month. Totals are aggregated daily for the current month, monthly from the past full month through the past full year, and yearly beyond that.
	 Note: Activity totals are collected nightly and aren't in real time.
Language	The language filter that's applied to the reader's search.
Number of Results	The number of search results that were returned for the search term. If Duration is also included, this value is aggregated based on the time period specified.
Number of Searches	The number of searches for the duration that's shown (day, month, or year).
Number of Users	The number of individual users who clicked the article.
Search Date	The date of the search.
Search Term	The first 100 characters of the search term that was used to search published articles in the knowledge base.

Live Agent Session Reports

Use Live Agent Session reports to consolidate data about agents' activities while they chat with customers—for example, how long agents are online or how many chat requests are assigned to them.

A *report type* defines the set of records and fields available to a report based on the relationships between a primary object and its related objects. Reports display only records that meet the criteria defined in the report type. You can create a custom report type for Live Agent sessions to aggregate data about your agents' activity while they support customers. These reports include data for all of the chats that occurred during a specific Live Agent session.

Customize Live Agent session reports to include columns of information about any of the following categories, as well as any custom fields related to Live Agent sessions:

Column Name	Description
Agent: Full Name	Name of the agent associated with the session.
Assistance Flags Lowered (Agent)	Number of times an agent lowered an assistance flag during a Live Agent Session.
Assistance Flags Lowered (Supervisor)	Number of times a supervisor lowered an assistance flag during an agent's Live Agent Session.
Assistance Flags Raised	Number of times an agent raised an assistance flag during a Live Agent Session.
Chat Requests Assigned	Number of chat requests assigned to an agent.
Chat Requests Declined (Manually)	Number of chat requests declined manually by an agent.
Chat Requests Declined (Push Timeout)	Number of chat requests that timed out while assigned to an agent.
Chat Requests Engaged	Number of chats in which an agent was engaged during the session.
Created By: Full Name	Full name of the creator of the session record.
Created Date	Date the session record was created.
Last Modified By: Full Name	Full name of the person who last modified the session record.
Last Modified Date	Date the session record was last modified.
Live Agent Session ID	ID of the Live Agent session record.
Live Agent Session Name	Automatically generated ID of the Live Agent session.
Login Time	Time and date the agent logged in to the session.
Logout Time	Time and date the agent logged out of the session.
Time Idle	Total amount of time in seconds an agent was not engaged in chats during a session. The following formula indicates how an

EDITIONS

Live Agent is available in: Salesforce Classic, Lightning Experience

Live Agent is available in: **Performance** Editions and in **Developer** Edition orgs that were created after June 14, 2012

Live Agent is available in: **Unlimited** Edition with the Service Cloud

Live Agent is available for an additional cost in: **Enterprise** and **Unlimited** Editions

agent's idle time is calculated: (Time Spent Online + Time Spent Away) - Time Spent in Chats = Time Idle.

Time Spent at Capacity	Total amount of time in seconds in which an agent's queue was full.
Time Spent Away	Total amount of time in seconds an agent spent in "Away" status.
Time Spent in Chats	Total amount of time in seconds an agent spent engaged in chats.
Time Spent Online	Total amount of time in seconds an agent spent online.

Report on Partners

Some opportunities involve partner relationships. Use this report to identify and analyze those relationships.

To report on all partnerships or primary partnerships within opportunities:

1. From the Reports tab, choose the Partner Opportunities report.
2. Choose **Customize** to change the report and view only primary partner relationships. Add a field filter where *Primary equals 1*.

In any other opportunity report, when you customize the report to display the Partner column, only the primary partner displays.

You can also run the Partner Accounts report to analyze the partnerships of your accounts.

EDITIONS

Available in: Salesforce Classic

Available in: **Professional, Enterprise, Performance, Unlimited, and Developer** Editions

USER PERMISSIONS

To report on partners:

- Read on accounts or opportunities
- AND
- Run Reports

Report on Relationship Groups

You can report on relationship groups and relationship group members if your administrator has enabled custom report types for those custom objects.

Custom report types are the only way to make relationship group reports available for your users—Salesforce does not provide sample relationship group reports or a standard report folder for relationship groups.

Administrators can create a public folder of relationship group reports as follows:

1. Create a custom report type for relationship group objects.



Tip: To create a report type about the members of relationship groups, select **Relationship Groups** as the primary report type object and add **Relationship Group Members** as an object relationship. Alternatively, to create a report type about the accounts that are primary on a relationship group, select **Relationship Accounts** as the primary report type object and add **Relationship Groups (Primary Account)** as an object relationship.

EDITIONS

Available in: Salesforce Classic

Available in: Salesforce for Wealth Management

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To delete custom report types:

- Modify All Data

2. Create a new public folder for relationship group reports. This step requires the “Manage Public Reports” permission.
3. Using your custom report type, create one or more new custom reports for relationship groups. Assign the reports to the new relationship groups reports folder you created.

After completing these steps, a folder of relationship group reports will be available to users on the Reports home page.

Enable the Account Owner Report

The Account Owner report lists all accounts and who owns them.

Organizations that have their organization-wide sharing access level set to Private for accounts may want to restrict users from running the Account Owner report.

To show or hide this report:

1. From Setup, enter *Account Owner Report* in the **Quick Find** box, then select **Account Owner Report**. This option is available only in organizations that have a private account sharing model.
2. Select the checkbox to allow all users to run this report. If you leave the box unchecked, only administrators and users with the “View All Data” permission can run this report.
3. Click **Save**.

Report on File Search Activity

Use a report to determine the top 300 search term queries for file searches and to identify which content is missing or needs to be renamed based on users’ search terms and the click-rank.

User Permissions Needed	
To create or update custom report types:	“Manage Custom Report Types”
To create a public reports folder:	“Manage Public Reports”
To run the File Search Activity report:	“Run Reports” AND “View All Data” OR “Content Administrator”. Users with “Manage Library” for the library don’t need the “View All Data” or “Content Administrator” permissions to run the report.

Custom report types are the only way to make reports about file search activity available for your users—Salesforce does not provide sample file search activity reports or a standard report folder.

 **Note:** Activity totals are collected nightly and aren’t in real time.

Primary Object for File Search Activity Report

When you create a custom report type, select **File Search Activity** for the **Primary Object**.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited, and Developer** Editions.

USER PERMISSIONS

To show or hide account owner report:

- Customize Application

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Salesforce Files available in: **All** editions, **except** Customer Portals

Available File Search Activity Report Fields

The following table lists the available fields for File Search Activity reports.

Field	Description
Average Click Rank	The order in which the file appeared in search results when users clicked it from the list of results.
Average Number of Results	The number of search results that were returned for the search term. If Duration is also included, this value is aggregated based on the time period specified.
Duration	The time period the search count is applied to. Possible values are Daily, Monthly, and Yearly. For example, a record where the Count is 70 and the Duration is Monthly indicates that 70 searches took place over the past month. Totals are aggregated daily for the current month, monthly from the past full month through the past full year, and yearly beyond that.
Language	The language filter that's applied to the user's search.
Number of Searches	The number of searches for the duration that's shown (day, month, or year).
Number of Users	The number of individual users who clicked the file.
Search Date	The date of the search.
Search Terms	The first 100 characters of the search term that was used to search published files.

SEE ALSO:

[Access to Report Folders](#)

[Creating and Editing Folders](#)

[Create a Custom Report Type](#)

[Create a Report](#)

Report on Chatter Top 100 Feed Item Views with Interaction Count Report

Get a report on the top 100 feed item views in your organization or community with the primary object Interaction Count Report. Knowing the posts that people are looking at most is a great way to get insight into current Chatter trends. Actions counted as views include liking, commenting, and viewing a feed item detail. View counts are not unique. For example, a user can add three comments to a post, and that is counted as three views. Once you set up the report, it's run weekly.

EDITIONS

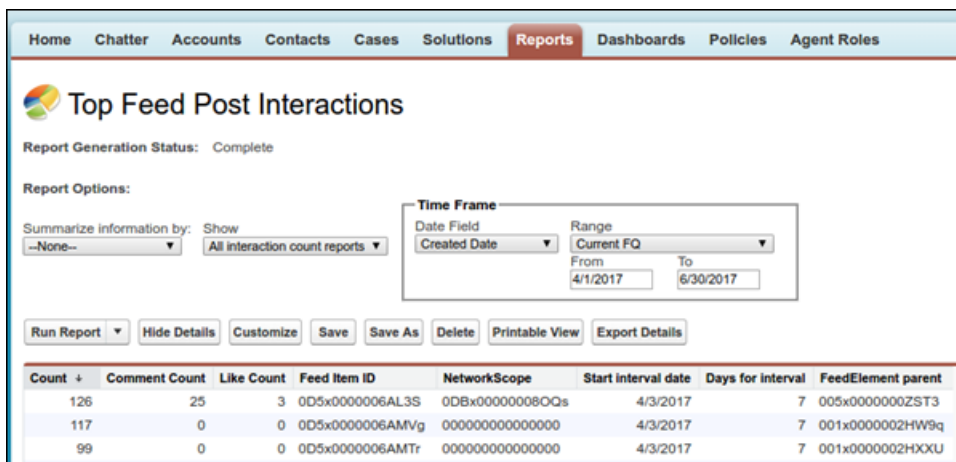
Available in: both Lightning Experience and Lightning communities

Chatter is available in: **Essentials, Group, Professional, Enterprise, Performance, Unlimited, Developer, and Contact Manager** Editions

Communities are available in: **Enterprise, Performance, Unlimited, and Developer** Editions

User Permissions Needed	
To create or update custom report types:	"Manage Custom Report Types"
To create a public reports folder:	"Manage Public Reports"

Custom report types are the only way to make reports about the 100 top feed item views. Salesforce doesn't provide sample top view activity reports or a standard report folder.



Primary Object for Interaction Count Report

When you create a custom report type, select **Interaction Count Reports** for the **Primary Object**.

Available Interaction Count Report Fields

The following table lists the available fields for Interaction Count reports.

Field	Description
Comment Count	The number of comments on a post
Count	The number of views on a post
Days for interval	How often the report is run—currently 7, for every seven days (this is a fixed value)

Field	Description
FeedElement parent	The ID of the group, profile, record, or other entity that is the parent to the feed where the content is posted
Feed Item ID	The ID of the post
Like Count	The number of likes on the post
NetworkScope	The scope of the network where this feed item is available. This field always has a value. For the default network, it's 0000000000000000. If it's posted in a community, it has the ID of the community (also known as the NetworkId). If the value contains an "l," the post is parented by a record, like an account, an opportunity, or some other record type.
Start interval Date	The date that marks the start of the seven-day run interval

Related Articles and Questions Reports

Create custom report types so users can report on click-through rates on related articles and questions. Salesforce Einstein suggests related articles and questions in communities. Use the click-through rates reports to create content around the most accessed articles and questions, empowering your customers to find the information they need.

As an admin, you can create custom report types so users can analyze which related articles and questions are most clicked in a community.

To create a folder of reports for your users:

1. Create a custom report type using Related Content Metrics as the primary object.
2. Create a public folder for related content metric reports. This step requires the Manage Public Reports permission.
3. Using your custom report type, create one or more new custom reports. For example, you can make specific reports on related questions click-through rates and related articles click-through rates. Assign the reports to the new reports folder you created.

After completing these steps, a folder of related content metrics reports is available to your users on the Reports home page.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To delete custom report types:

- Modify All Data

Report on External Documents Attached to Cases

Create a report to see how many and which specific external documents are being attached to cases. Use this information to see which external sources have the most impact on closing cases. This report is helpful when you have set up Salesforce Federated Search, which gives users access to external search results when using the Knowledge One Widget. Users can attach external documents to cases only if Chatter is enabled.

1. From Setup, enter *Report Types* in the Quick Find box, then select **Report Types**.
2. Click **New Custom Report Type**.
3. Select **Cases** as the Primary Object for your custom report type.
4. Enter the **Report Type Label**. For example, *Cases with External Documents*. The Report Type Name automatically fills.
5. Enter a description for your custom report type. For example, *Reports on the external documents attached to cases*.
6. To indicate where to store the custom report type, select the **Other Reports** category.
7. Select the deployment option of your choice. Click **Next**.
8. On the next page, **Define Report Records Set**, relate another object and create an A to B Relationship. Select **External Documents** as the child object for your custom report type. Leave **Each "A" record must have at least one related "B" record** selected. Click **Save**.
9. Leaving Setup, click the **Reports** tab.
10. Click **New Report**. From the Other Reports folder, select **Cases with External Documents**, or the name of the report you created.
11. Click **Create**.
12. If they're not already included, from the Cases object in the left pane, drag and drop the **Case ID** and **Case Number** fields onto the report. From the External Object: Object Name object, drag and drop the **Display URL** and **Title** fields. Drag and drop other fields that you want to include in the report.
13. Click **Run Report**. Save the report.

EDITIONS

Available in: Salesforce Classic

Available in: Salesforce Knowledge is available in **Performance** and **Developer** Editions and in **Unlimited** Edition with the Service Cloud. Salesforce Knowledge is available for an additional cost in: **Professional**, **Enterprise**, and **Unlimited** Editions.

USER PERMISSIONS

To create or update custom report types

- "Manage Custom Report Types"

To delete custom report types

- "Modify All Data"

To run reports

- "Run Reports"

To create, edit, and delete reports

- "Create and Customize Reports"

Filter Report Data

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions


Available in: Enhanced Folder Sharing and Legacy Folder Sharing

What if your report gives you more data than you need? Use filters to pare down your report until it only shows the data that you want.


In Salesforce Classic, filter your report from the report builder.

In Lightning Experience, there are two ways to filter reports: either from the Report Builder or while viewing a report. To add or edit report filters, use the Report Builder. To edit existing, unlocked report filters while you're reading a report, run the report and then edit filters directly from the filters pane (). You can edit existing filters from the filters pane, but you can't add new ones.

Each report supports up to 20 field filters.


 **Note:** In Lightning Experience, these filters are available in the Report Builder, but are not shown in the filter panel when viewing a report. Even though the filters are not shown, they still filter the report.

- Row limit filters
- Cross filters
- Historical field filters
- Standard filters (except for scope and date filters)

1. From the Lightning Experience report builder, click  **FILTERS**. Then, choose a field from the **Add Filter...** picklist.

From the Salesforce Classic report builder, open the **Add** dropdown menu and select a filter type:

- **Field Filter** to filter on fields. For example, use a field filter to filter by `Account Name equals Acme`.
- **Filter Logic** to customize how existing filters apply to your report. Each filter is assigned a number. If you'd like your report to return records that meet the criteria of Filter 1 and either Filter 2 or Filter 3, use this filter logic: `Filter 1 AND (Filter 2 OR Filter 3)`. Filter logic requires at least one field filter.

To add filter logic in the Lightning Experience report builder, click  **> Add Filter Logic**.

- **Cross Filter** to filter on one object's relationship to another object. Cross filter on `Accounts with Opportunities` so that your report only returns Accounts that have Opportunities. Add a subfilter to a cross filter to further filter by the second object. For example, the Opportunity subfilter `Amount greater than 50000` causes your report to return Accounts that have Opportunities worth more than \$50,000.00.

Cross filters aren't available in the Lightning Experience report builder.

- **Row Limit** to limit the number of report results in tabular reports. To see which five Accounts have the largest annual revenue, set a row limit of `Top 5 Accounts by Annual Revenue`.

Row limit filters aren't available in the Lightning Experience report builder.

Standard filters, such as date filters, are applied by default to most objects. Look for them underneath the Add dropdown menu and customize them as necessary. Different objects have different standard filters.

2. Enter filter criteria.

For help entering filter criteria, see Filter Operators Reference and Add Filter Logic.

USER PERMISSIONS

To add or edit a filter:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

To lock or unlock filters so that users can't edit them while viewing a report in Lightning Experience:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

To edit a filter while viewing a report in Lightning Experience:

- Run Reports

3. Optionally, to prevent people from editing a field filter while reading your report in Lightning Experience, check **Locked**.
4. Click **Save**.
5. To read your filtered report, click **Run Report**. In new reports, the Run Report button doesn't appear until you save your report.



Note: In the Lightning Experience Report Builder, save your report before running it or risk losing some changes. Specifically, be sure to save after adding:

- Row limit filters
- Cross filters
- Formula fields
- Bucket fields



Example: Say that you want your team to call new leads at companies with more than 100 employees located in California, Arizona, or Nevada. You have a leads report with fields like `Lead Status`, `Number of Employees`, and `State`. Your report gives a complete overview of your entire company's leads. But you only want to see *new* leads that *have more than 100 employees* and are *located in California*. Apply these filters to your report:

1. Lead Status equals New
2. Number of Employees greater than 100
3. State includes California, Arizona, Nevada

Now your leads report returns only the leads you need.

IN THIS SECTION:

[Add Filter Logic](#)

Filter logic governs how and when filters apply to your report.

[Filter Report Data by Role Hierarchy](#)

Want to see records based on org structure or job function? Get records owned by everyone in a job role (like sales manager) and their subordinate roles (like sales person) by filtering your report on a role.

[Filter Reports Via URL Parameters in Lightning Experience](#)

No need to futz with filters! Pass URL parameters to set filter values in Lightning Experience reports. When linking to reports or when bookmarking a report, add filter value parameters to the URL to customize how the report filters when opened. For example, bookmark your opportunities report and add a filter value parameter to specify whether you see New Business or Existing Business.

[Filters Type Reference](#)

Several different types of filters help you scope your report data: standard filters, field filters, cross filters, and row limit filters. Each filter type filters your report in different ways. This list of filter types helps you choose the right filter types for your report.

[Filter Operators Reference](#)

The operator in a filter is like the verb in a sentence. Operators specify how filter criteria relate to one another. Refer to this list of filter operators when setting filters on list views, reports, dashboards, and some custom fields.

[Relative Date Filter Reference](#)

Relative date filters let you filter on date fields using easy-to-understand, human-speech-inspired syntax.

[Notes about Filtering on Types of Fields and Values](#)

Keep these tips in mind when filtering on text fields, date fields, numeric values, picklist values, and blank or null values.

[Tips for Filtering on Multiple Currencies](#)

Tips for filtering on currency fields when your organization uses multiple currencies.

Add Filter Logic

Filter logic governs how and when filters apply to your report.


After adding a filter to your report, the filter is numbered. Your first filter becomes Filter 1 and your second filter becomes Filter 2. You apply filter logic based on these numbered filters.

For example, let's say you have a report of Accounts with fields like `State`, `Annual Revenue`, and `Industry`. Your report has these filters:

1. State includes California, Arizona, Nevada
2. Industry equals Banking
3. Annual Revenue greater than 1000000

These three filters cause your report to return Accounts located in California, Arizona, or Nevada in the Banking industry with annual revenue greater than \$1,000,000. But what if you only want Accounts located in California, Arizona, or Nevada AND in the Banking industry, OR with annual revenue greater than \$1,000,000.00? Add filter logic to your report.

To add filter logic,

1. From the Lightning Experience report builder, click **FILTERS** >  > **Add Filter Logic**.
From the Salesforce Classic report builder, click **Add** > **Filter Logic**.

2. Enter each filter line number, separated by a filter logic operator.

For example, **(1 AND 2) OR 3** finds records that match both Filter 1 and Filter 2, or Filter 3.

Here's a complete table of filter logic operators:

Operator	Definition
AND	Finds records that match both values. 1 AND 2
OR	Finds records that match either value. 1 OR 2
NOT	Finds records that exclude values. For example, Filter 1 is Industry equals "Biotechnology" . You set filter logic as Not 1 . Your report returns records which aren't equal to Biotechnology.

3. Click **Save**.

Now your report shows Banking industry Accounts in California, Arizona, and Nevada with any amount of revenue, and any Account with annual revenue above \$1,000,000.00.

 **Note:**

- Filter logic isn't available for all filters. For example, you can't use them for roll-up summary fields.

EDITIONS

Available in: Salesforce Classic

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To create, edit, and delete reports:

- Create and Customize Reports
- AND
- Report Builder

To create custom list views:

- Read on the type of record included in the list

To create, edit, or delete public list views:

- Manage Public List Views

- On reports where object A may or may not have object B, you can't use the OR condition to filter across multiple objects. For example, if you enter filter criteria *Account Name starts with M OR Contact First Name starts with M*, an error message displays informing you that your filter criteria is incorrect.
- Except filter logic on lookup fields, you can't use filter logic if your field filters use any of the following fields:
 - Topics
 - Description
 - any Address Line 1, Address Line 2, Address Line 3 fields
 - Forecast Category
 - Campaign: Member Type
 - User: Profile Name
 - Login Status
 - custom long-text area fields


SEE ALSO:

[Notes about Filtering on Types of Fields and Values](#)

Filter Report Data by Role Hierarchy

Want to see records based on org structure or job function? Get records owned by everyone in a job role (like sales manager) and their subordinate roles (like sales person) by filtering your report on a role.


For example, to see opportunities owned by sales team members in California, filter your opportunity report by the role *Sales Manager - California*. Optionally, drill down on opportunities owned by a specific sales manager in California, narrow your results by a specific person in the role.

 **Note:** Role hierarchy filters are only available for reports based on these standard report types:

- Activity
- Task
- Event
- Campaigns with Opportunities
- Forecasts
- Opportunity, except for:
 - Opportunities with Competitors
 - Opportunities with Contact Roles
 - Opportunities with Contact Roles and Products
 - Opportunity History
 - Opportunities with Partners
 - Opportunities with Teams
 - Opportunities with Teams and Products

Role hierarchy filters aren't available on reports based on custom report types.

Filter by Role Hierarchy in Lightning Experience

1. If necessary, from the report run page, click  to open the Filters panel.
2. From the Filters panel, click **Role Hierarchy**.
3. From the Role Hierarchy modal, filter by a role. To find specific roles, consider using the search box.
4. Optionally, further filter the report by narrowing results by a person in your selected role. Narrowing by a person shows records that belong to that person, and to people in roles that report to that person.

Filter by Role Hierarchy in Salesforce Classic

1. From the report run page, click **Show Hierarchy**.
2. Drill down to a role.
3. If you'd like the report to open already filtered by a role, then drill down to the role and then click **Customize** to open the report builder. Then, click **Report Properties** and check **Save Hierarchy Level**. From Report Properties, click **Save**, then, from the report builder, click **Save** again.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To add or edit a filter

- Create and Customize Reports
- AND
- Report Builder

To lock or unlock filters so that users can't edit them while viewing a report in Lightning Experience

- Create and Customize Reports
- AND
- Report Builder

To edit a filter while viewing a report in Lightning Experience

- Run Reports

Filter Reports Via URL Parameters in Lightning Experience

No need to futz with filters! Pass URL parameters to set filter values in Lightning Experience reports. When linking to reports or when bookmarking a report, add filter value parameters to the URL to customize how the report filters when opened. For example, bookmark your opportunities report and add a filter value parameter to specify whether you see New Business or Existing Business.

Watch a Demo: [🎥 Dynamically Filter Reports Using URL Parameters \(Lightning Experience\)](#)

1. Append the parameter `&fv0=Filter Value` to the end of a report's URL.

Let's take a closer look at what the parameter means.

- `&` — Denotes a new parameter in the URL. If no other parameters are present in the URL, then substitute `?` in place of `&`.
- `fv0` — The `fv` stands for "filter value," and is the name of the parameter. The `0` is the numerical order in which the filter appears in the report. (The first filter is 0, the second filter is 1, the third is 2, and so forth.) Standard filters don't count in this order, and can't be filtered using URL parameters, although they appear as the first three filters on any report. To set the value of the fifth filter in the report, specify `fv4`. In our example, we're filtering the first field filter in the report.

The order in which filters appear in Lightning Experience on the report run page isn't necessarily the order that filters appear in the report. Locked filters are listed beneath unlocked filters on the run page, but aren't necessarily ordered after all the unlocked filters. To see the order of filters in your report, refer to their order in the report builder. Alternatively, make a GET call to `/services/data/v39.0/analytics/reports/<report ID>/describe` and note their order in the JSON response.

- `Filter Value` — The criteria that the filter operates on.

The filter value must be URI encoded, which means certain characters (such as spaces) must be written in a format that URLs can understand. A space (`'`) becomes `%20` when URI encoded.

2. Navigate to the report's URL with the parameter appended.

When the report opens, it opens with filters applied as specified with parameters in the URL.

EDITIONS


Available in: Lightning Experience

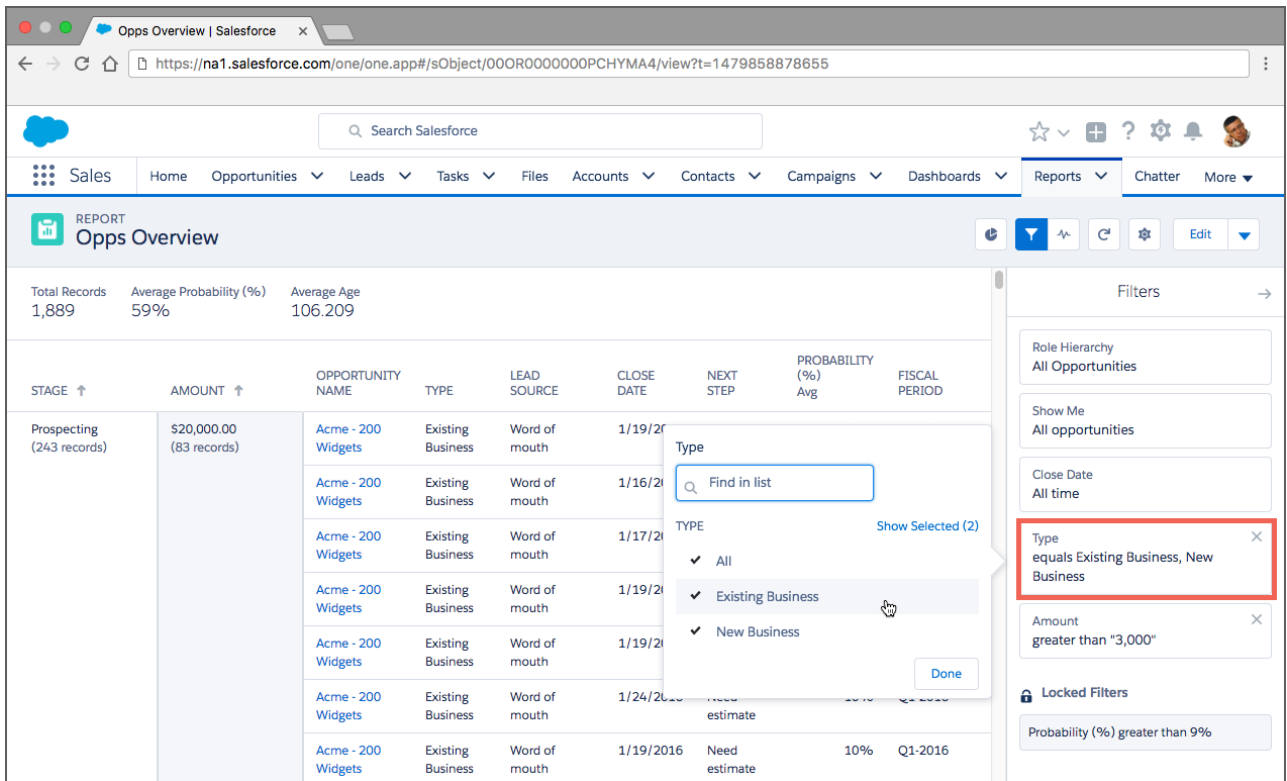
Available in: **Essentials, Group, Professional, Enterprise, Performance, Unlimited, and Developer Editions**

USER PERMISSIONS

To filter a report in Lightning Experience:

- Run Reports

 **Example:** Periodically throughout your day you check your opportunities report, and after opening it, you always edit a filter to show *New Business* or *Existing Business*. (The **Type** filter includes both *New Business* and *Existing Business* by default.)



The screenshot shows the Salesforce 'Opps Overview' report. The table has columns for STAGE, AMOUNT, OPPORTUNITY NAME, TYPE, LEAD SOURCE, CLOSE DATE, NEXT STEP, PROBABILITY (% Avg), and FISCAL PERIOD. A dropdown menu for the 'Type' filter is open, showing options: All, Existing Business, and New Business. The 'Existing Business' option is selected. On the right, the 'Filters' panel shows a filter for 'Type equals Existing Business, New Business' which is highlighted with a red box. Other filters include 'Role Hierarchy All Opportunities', 'Show Me All opportunities', 'Close Date All time', 'Amount greater than "3,000"', and 'Probability (%) greater than 9%'.

Instead of loading the report, editing the filter, and reloading the report, create a bookmark with a filter value parameter for *New Business* in the URL. Take note of the unfiltered opportunities report URL.

```
https://na1.salesforce.com/one/one.app#/sObject/00OR000000PCHYMA4/view?t=1479844235107
```

Edit the URL to set the **Type** filter value to *New Business* by appending the parameter `&fv0=New%20Business`. Remember, the parameter value must be URI encoded, which means certain characters (such as spaces) must be written in a format that URLs can understand. In our example, the space (' ') between "New" and "Business" becomes %20 when URI encoded. The full, bookmarked URL reads:

```
https://na1.salesforce.com/one/one.app#/sObject/00OR000000PCHYMA4/view?t=1479844235107&fv0=New%20Business
```

When you navigate to your opportunity report through the URL with a filter value parameter, the report opens filtered and ready to read.

The screenshot shows the Salesforce 'Opps Overview' report. The URL in the browser is `https://na1.salesforce.com/one/one.app/#sObject/00OR000000PCHYMA4/view?t=1479857188845&fv0=New%20Business`. The report summary shows 830 total records, 69% average probability, and an average age of 102.375. The table lists various opportunity records. On the right, the 'Filters' sidebar is open, showing a filter for 'Type equals New Business' which is highlighted with a red box. A red arrow points from the URL parameter to this filter.

STAGE	AMOUNT	OPPORTUNITY NAME	TYPE	LEAD SOURCE	CLOSE DATE	NEXT STEP	PROBABILITY (%) Avg	FISCAL PERIOD
Needs Analysis (195 records)	\$20,000.00 (64 records)	Acme - 600 Widgets	New Business	Trade Show	1/24/2016	Need estimate	20%	Q1-2016
		Acme - 600 Widgets	New Business	Trade Show	1/17/2016	Need estimate	20%	Q1-2016
		Acme - 600 Widgets	New Business	Trade Show	1/19/2016	Need estimate	20%	Q1-2016
		Acme - 600 Widgets	New Business	Trade Show	1/22/2016	Need estimate	20%	Q1-2016
		Acme - 600 Widgets	New Business	Trade Show	1/18/2016	Need estimate	20%	Q1-2016
		Acme - 600 Widgets	New Business	Trade Show	1/24/2016	Need estimate	20%	Q1-2016
		Acme - 600 Widgets	New Business	Trade Show	1/14/2016	Need estimate	20%	Q1-2016

Take note of these limitations to setting filter values via the URL.

- Only field filters support edits from URL parameters. Standard filters (role hierarchy filters, scope filters, date filters), cross filters, and row limit filters aren't supported. Standard, cross, and row limit filters don't count when listing filters — `fv0` is the first field filter.
- Chart filters aren't supported.
- Filter operators (like `equals` and `greater than`) can't be modified via URL parameters.
- You can't change the field being filtered via URL parameters.
- You can't add new filters to reports using filter value URL parameters. You can only modify existing filters.
- You can't delete filters from reports using filter value URL parameters. Setting a blank value filters by no text or numerals, but doesn't remove the filter.

Filters Type Reference

Several different types of filters help you scope your report data: standard filters, field filters, cross filters, and row limit filters. Each filter type filters your report in different ways. This list of filter types helps you choose the right filter types for your report.

Filter Type

Description

Standard Filter

Standard filters are applied by default to most objects. Different objects have different standard filters, but most objects include the standard filters `Show` and `Date Field`. `Show` filters the object around common groupings (like "My accounts" or "All accounts"). `Date Field` filters by a field (such as `Created Date` or `Last Activity`) and a date range (such as "All Time" or "Last Month").

Filter Type	Description
Field Filter	Field filters are available for reports, list views, workflow rules, and other areas of the application. For each filter, set the field, operator, and value. With tabular, summary, and matrix reports, you can drag a field from the Fields pane to the Filters pane to add a report filter.
Filter Logic	Add Boolean conditions to control how field filters are evaluated. You must add at least 1 field filter before applying filter logic.
Cross Filter	Filter a report by the child object using WITH or WITHOUT conditions. Add subfilters to further filter by fields on the child object. For example, if you have a cross filter of <i>Accounts with Opportunities</i> , click Add Opportunity Filter and create the <i>Opportunity Name equals ACME</i> subfilter to only include those opportunities.
Row Limit	For tabular reports, select the maximum number of rows to display, then choose a field to sort by and the sort order. You can use a tabular report as the source report for a dashboard table or chart component, if you limit the number of rows it returns.

To add a report with a row limit filter, specify a "name" and "value" in Dashboard Settings in the Report Builder.

IN THIS SECTION:

[Example: Report on Related Objects with Cross Filters](#)

Use a cross filter to fine-tune your results by including or excluding records from related objects, without having to write formulas or code. You can apply cross filters by themselves, or in combination with field filters.

[Example: Using Row Limits in Report Filters](#)

Here is where you can see a sample of a report filter using a field filter, filter logic, and a row limit.

Example: Report on Related Objects with Cross Filters

Use a cross filter to fine-tune your results by including or excluding records from related objects, without having to write formulas or code. You can apply cross filters by themselves, or in combination with field filters.

Watch a Demo: [Using Cross Filters in Reports \(Salesforce Classic\)](#)

With tabular, summary, and matrix reports, you can drag a field from the Fields pane to the Filters pane to add a report filter.

Add *subfilters* to further filter by fields on the child object. For example, if you have a cross filter of *Accounts with Opportunities*, click **Add Opportunity Filter** and create the *Opportunity Name equals ACME* subfilter to see just those opportunities. You can create up to five subfilters for each cross filter.

- Each report can have up to three cross filters.
- Each cross filter can have up to five subfilters.
- Filter logic applies only to field filters, not cross filters.

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited, and Developer** Editions

USER PERMISSIONS

To create, edit, and delete reports:

- Create and Customize Reports
- AND
- Report Builder

IN THIS SECTION:

1. [Create a Cross Filter](#)
Use cross filters to include or exclude records in your report results based on related objects and their fields.
2. [Example: Using WITH in Cross Filters](#)
Use cross filters to filter a report by an object's child objects using WITH conditions. For example, filter a report to show just accounts with cases.
3. [Example: Using WITHOUT in Cross Filters](#)
Use cross filters to filter a report by an object's child objects using WITHOUT conditions. For example, filter a report to show just contacts without activities.
4. [Example: Using Multiple Cross Filters](#)
Use cross filters to filter a report by an object's child objects using both WITH and WITHOUT conditions. For example, filter a report to show accounts that have cases but don't have activities.
5. [Tips for Working with Cross Filters](#)
Cross filters work like ordinary filters, but they have some special characteristics of their own.

Create a Cross Filter

Use cross filters to include or exclude records in your report results based on related objects and their fields.

Watch a Demo: [▶ Using Cross Filters in Reports \(Salesforce Classic\)](#)

1. In the Filters pane of report builder, click **Add > Cross Filter**.
2. Select a parent object from the drop-down list. Your choice determines which related objects you see in the child object list.

 **Tip:** In report types based on Campaigns, the parent object can be the secondary object in the report type. For example, in a "Campaigns with Leads" report, the parent object can be `Campaigns` or `Leads`.

3. Choose *with* or *without*.
4. Select a child object from the drop-down or search by its name. The drop-down list contains all eligible child objects of your selected parent object.
5. Optionally add subfilters:
 - a. Click **Add Your Related Child Object Filter**.
 - b. Select a field. The fields are determined by the child object in the cross filter. For example, if your cross filter is `Accounts with Cases`, you can use case fields for your subfilter.
 - c. Choose a filter operator.
 - d. Enter a value.
6. Click **OK**.

SEE ALSO:

[Example: Using Multiple Cross Filters](#)

[Example: Using WITH in Cross Filters](#)

[Example: Using WITHOUT in Cross Filters](#)

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited, and Developer** Editions

USER PERMISSIONS

To create, edit, and delete reports:

- Create and Customize Reports
- AND
- Report Builder

Example: Using WITH in Cross Filters

Use cross filters to filter a report by an object's child objects using WITH conditions. For example, filter a report to show just accounts with cases.

Let's say a recent campaign in California won you a lot of new customers. You want to ensure that their customer cases get resolved quickly. You can create a report to see which of those accounts currently have cases.

1. Create a new report. For the report type, click **Accounts & Contacts**, select **Accounts**, and click **Create**.
2. In the report builder's Filters pane, set the appropriate standard filters.
3. Create a field filter where *Billing State/Province equals CA* and click **OK**.
4. Click **Add > Cross Filter** and specify *Accounts with Cases*.

When you click **Run Report**, the results will include only California accounts with an associated case.

SEE ALSO:

[Create a Cross Filter](#)

Example: Using WITHOUT in Cross Filters

Use cross filters to filter a report by an object's child objects using WITHOUT conditions. For example, filter a report to show just contacts without activities.

Let's say that you've just imported a list of California accounts and you want to find which ones are missing contacts before you assign owners:

1. Create a new report. For the report type, click **Accounts & Contacts**, select **Accounts**, and click **Create**.
2. In the report builder's Filters pane, set the appropriate standard filters.
3. Create a field filter where *Billing State/Province equals CA* and click **OK**.
4. Click **Add > Cross Filter** and specify *Accounts without Contacts*.

When you click **Run Report**, the results will include only California accounts without an associated contact.

SEE ALSO:

[Create a Cross Filter](#)

EDITIONS

Available in: **Salesforce Classic**

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To create, edit, and delete reports:

- Create and Customize Reports
- AND
- Report Builder

EDITIONS

Available in: **Salesforce Classic**

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To create, edit, and delete reports:

- Create and Customize Reports
- AND
- Report Builder

Example: Using Multiple Cross Filters

Use cross filters to filter a report by an object's child objects using both WITH and WITHOUT conditions. For example, filter a report to show accounts that have cases but don't have activities.

Say you're a salesperson who wants to see which customer accounts have unresolved problem escalations because you want to ensure your support team takes care of them.

1. Create a new report. For the report type, click **Accounts & Contacts**, select **Accounts**, and click **Create**.
2. In the report builder's Filters pane, set the appropriate standard filters.
3. To limit your report to customer accounts, click **Add > Field Filter** and specify *Type equals Customer*.
4. To see which accounts have no activities, click **Add > Cross Filter** and specify *Accounts without Activities*.
5. To see only accounts without completed activities, add a subfilter to your cross filter:
 - a. Click **Add Activities Filter** and specify *Status equals Completed*.
 - b. Click **OK**.
6. To include your accounts that currently have cases, add another cross filter but this time specify *Accounts with Cases*.
7. To exclude cases that were not escalated, add a subfilter to this cross filter:
 - a. Click **Add Cases Filter** and specify *Type equals Problem*.
 - b. Click **Add Cases Filter** again, but this time specify *Status equals Escalated*.
 - c. Click **OK**.

When you run the report, it will include only customer accounts without completed activities with escalated cases.

SEE ALSO:

[Create a Cross Filter](#)

EDITIONS

Available in: **Salesforce Classic**

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To create, edit, and delete reports:

- **Create and Customize Reports**
AND
Report Builder

Tips for Working with Cross Filters

Cross filters work like ordinary filters, but they have some special characteristics of their own.

- Adding cross filters can potentially slow down your report. To avoid having the report or preview time out, limit the data returned by setting filters. For example, select *My opportunities* for Show and *Current FQ* for Range instead of viewing all opportunities for all time.
- Since the objects available in cross filters depend on the parent object of the report type you choose, consider the related child objects before selecting a report type. For example, choose the Accounts report type to filter on *Accounts with Partners* because Partner is a child object of Account.
- Cross filters work in conjunction with your report type selection. Cross filters have an AND relationship with the report type you select. Therefore, choosing a report type of Accounts with Partners and adding a cross filter for *Accounts without Partners* will yield no results.

SEE ALSO:

[Example: Using Multiple Cross Filters](#)

[Create a Cross Filter](#)

[Example: Using WITH in Cross Filters](#)

[Example: Using WITHOUT in Cross Filters](#)

EDITIONS

Available in: **Salesforce Classic**

Available in: **Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To create, edit, and delete reports:

- [Create and Customize Reports](#)
- AND
- [Report Builder](#)

Example: Using Row Limits in Report Filters

Here is where you can see a sample of a report filter using a field filter, filter logic, and a row limit.

Say you are a sales executive who wants to see which California accounts currently have the most potential to generate revenue:

1. Click **New Report** from the Reports tab.
2. Open the **Accounts & Contacts** report type, choose **Accounts**, and click **Create**.
3. To find California accounts that either have over \$10 million in revenue or are public companies, click **Add > Field Filter** and create these filters:
 - a. *Billing State/Province equals CA*
 - b. *Annual Revenue greater than 10000000*
 - c. *Ownership equals Public*
4. To ensure that your results include all California accounts with \$10 million in revenue OR that are public, click **Add > Filter Logic** and enter *1 AND (2 OR 3)*.
5. To limit the number of results for a tabular report to 10, click **Add > Row Limit** and enter 10. Choose your sort field and sort order. Click **OK**.

When you click **Run Report**, your results will contain ten rows and include public companies in California with revenues of more than \$10 million.

SEE ALSO:

- [Filters Type Reference](#)
- [Limit Report Results](#)

Filter Operators Reference

The operator in a filter is like the verb in a sentence. Operators specify how filter criteria relate to one another. Refer to this list of filter operators when setting filters on list views, reports, dashboards, and some custom fields.

Operator	Uses
equals	Use for an exact match. For example, "Created equals today."
less than	Use for results that are less than the value you enter. For example, "Quota less than 20000" returns records where the quota field ranges from 0 to 19,999.99.
greater than	Use when you want results that exceed the value you enter; for example, "Quota greater than 20000" returns records where the quota amount begins at 20,000.01.
less or equal	Use for results that match or are less than the value you enter.
greater or equal	Use for results that match or exceed the value you enter.

EDITIONS

Available in: Salesforce Classic and Lightning Experience



Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder
- Enhanced Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder


Operator	Uses
not equal to	<p>Shows results that don't have the value you enter. This operator is useful for eliminating empty fields. For example, "Email not equal to <blank>."</p> <p> Note: If evaluating more than one value, none of the specified values can exist on the record. For example, if you specify <code>not equal to A & C</code>, only records where the value is neither A nor C are returned.</p>
contains	<p>Use for fields that include your search string, but sometimes also include other information. For example, "Account contains California" would find California Travel, California Pro Shop, and Surf California. Keep in mind that if you enter a short search string, it can match a longer word. For example, "Account contains pro" would find California Pro Shop and Promotions Corporation. This operator is not case-sensitive.</p>
does not contain	<p>Eliminates records that don't contain the value you enter. For example, "Mailing Address Line 2 does not contain P. O. Box."</p> <p> Note: When specifying filter criteria on roll-up summary fields, <code>does not contain</code> uses "or" logic on comma-separated values. On list views, reports, and dashboards, <code>does not contain</code> uses "and" logic.</p> <p>This operator is not case-sensitive.</p>
starts with	<p>Use when you know what your value starts with, but not the exact text. This operator is a narrower search term than "contains." For example, if you enter "Account starts with California," you find California Travel and California Pro Shop, but not Surf California.</p>
includes	<p>Available when you choose a multi-select picklist as the selected field. Use this operator to find records that include one or more of the values you enter.</p> <p>For example, if you enter "Interests includes hockey, football, baseball," you find records that have only hockey selected, and records that have two or three of the values entered. Results do not include partial matches of values.</p>
excludes	<p>Available when you choose a multi-select picklist as the selected field. Use this operator to find records that do not contain any values that match the ones entered.</p> <p>For example, if you enter "Interests exclude wine, golf," your report lists records that contain any other values from that picklist, including values that are blank. Results do not include partial matches of values.</p> <p>Enter values on separate lines.</p>
between	<p>Available for dashboard filters only. Use to filter on ranges of values. For each range, the filter returns results that are greater than or equal to the minimum value and less than the maximum value.</p> <p>For example, if you enter "Number of Employees from 100 through 500," your results include accounts with 100 employees up to those with 499 employees. Accounts with 500 employees aren't included in the results.</p>
within	<p>Available when you create list views based on a Geolocation custom field. Shows results that are within the specified radius from a fixed latitude and longitude. For example, if you enter "Warehouse location within 50 miles 37.775° -122.418°," your list view includes all warehouses within a 50-mile radius of San Francisco, California.</p>

Relative Date Filter Reference

Relative date filters let you filter on date fields using easy-to-understand, human-speech-inspired syntax.


For example, instead of filtering on `Close Date greater than Jan 1, 2017`, filter using a relative date: `Close Date equals this year`.

For Enterprise, Unlimited, Performance, Professional, and Developer Editions, the week is defined by the Locale drop-down list on your personal information page. For Contact Manager, Group, and Personal Editions, the week is defined by the Locale setting in the company profile. For example, when the locale is US English, a week runs Sunday to Saturday, whereas with UK English, a week spans Monday to Sunday.

 **Note:** Capitalization doesn't matter in relative date filter operators. `THIS YEAR` works, as do `This Year` and `this year`.

Relative Date Value	Range
YESTERDAY	Starts at 12:00:00 AM on the day before the current day and continues for 24 hours.
TODAY	Starts at 12:00:00 AM on the current day and continues for 24 hours.
TOMORROW	Starts at 12:00:00 AM on the day after the current day and continues for 24 hours.
LAST WEEK	Starts at 12:00:00 AM on the first day of the week before the current week and continues for seven days.
THIS WEEK	Starts at 12:00:00 AM on the first day of the current week and continues for seven days.
NEXT WEEK	Starts at 12:00:00 AM on the first day of the week after the current week and continues for seven days.
LAST <i>n</i> WEEKS	Starts at 12:00:00 AM on the first day of the week that started <i>n</i> weeks before the current week, and continues up to 11:59 PM on the last day of the week before the current week.
NEXT <i>n</i> WEEKS	Starts at 12:00:00 AM on the first day of the week after the current week and continues for <i>n</i> times seven days.
<i>n</i> WEEKS AGO	Starts at 12:00:00 AM on the first day of the week that started <i>n</i> weeks before the start of the current week and continues for seven days.
LAST MONTH	Starts at 12:00:00 AM on the first day of the month before the current month and continues for all the days of that month.
THIS MONTH	Starts at 12:00:00 AM on the first day of the current month and continues for all the days of that month.
NEXT <i>n</i> MONTHS	Starts at 12:00:00 AM on the first day of the month after the current month and continues until the end of the <i>n</i> th month.
LAST <i>n</i> MONTHS	Starts at 12:00:00 AM on the first day of the month that started <i>n</i> months before the current month and continues up to 11:59 PM on the last day of the month before the current month.
<i>n</i> MONTHS AGO	Starts at 12:00:00 AM on the first day of the month that started <i>n</i> months before the start of the current month and continues for all the days of that month.

Relative Date Value	Range
NEXT MONTH	Starts at 12:00:00 AM on the first day of the month after the current month and continues for all the days of that month.
LAST 90 DAYS	Starts at 12:00:00 AM 90 days before the current day and continues up to the current second. (The range includes today.)
NEXT 90 DAYS	Starts at 12:00:00 AM on the day after the current day and continues for 90 days. (The range does not include today.)
LAST n DAYS	Starts at 12:00:00 AM n days before the current day and continues up to the current second. (The range includes today. Using this date value includes records from $n + 1$ days ago up to the current day.)
NEXT n DAYS	Starts at 12:00:00 AM on the next day and continues for the next n days. (The range does not include today.)
n DAYS AGO	Starts at 12:00:00 AM on the day n days before the current day and continues for 24 hours. (The range does not include today.)
LAST QUARTER	Starts at 12:00:00 AM on the first day of the calendar quarter before the current calendar quarter and continues to the end of that quarter.
THIS QUARTER	Starts at 12:00:00 AM on the first day of the current calendar quarter and continues to the end of the quarter.
NEXT QUARTER	Starts at 12:00:00 AM on the first day of the calendar quarter after the current calendar quarter and continues to the end of that quarter.
LAST n QUARTERS	Starts at 12:00:00 AM on the first day of the calendar quarter n quarters ago and continues to the end of the calendar quarter before the current quarter. (The range does not include the current quarter.)
NEXT n QUARTERS	Starts at 12:00:00 AM on the first day of the calendar quarter after the current quarter and continues to the end of the calendar quarter n quarters in the future. (The range does not include the current quarter.)
n QUARTERS AGO	Starts at 12:00:00 AM on the first day of the calendar quarter n quarters before the current calendar quarter and continues to the end of that quarter.
LAST YEAR	Starts at 12:00:00 AM on January 1 of the year before the current year and continues through the end of December 31 of that year.
THIS YEAR	Starts at 12:00:00 AM on January 1 of the current year and continues through the end of December 31 of the current year.
NEXT YEAR	Starts at 12:00:00 AM on January 1 of the year after the current year and continues through the end of December 31 of that year.
n YEARS AGO	Starts at 12:00:00 AM on January 1 of the calendar year n years before the current calendar year and continues through the end of December 31 of that year.
LAST n YEARS	Starts at 12:00:00 am on January 1, $n+1$ years ago. The range ends on December 31 of the year before the current year.

Relative Date Value	Range
NEXT <i>n</i> YEARS	Starts at 12:00:00 AM on January 1 of the year after the current year and continues through the end of December 31 of the <i>n</i> th year.
LAST FISCAL QUARTER	Starts at 12:00:00 AM on the first day of the fiscal quarter before the current fiscal quarter and continues through the last day of that fiscal quarter. The fiscal quarter is defined on the Fiscal Year page in Setup.  Note: None of the FISCAL literal date values are supported when creating mobile custom views.
THIS FISCAL QUARTER	Starts at 12:00:00 AM on the first day of the current fiscal quarter and continues through the end of the last day of the current fiscal quarter. The fiscal quarter is defined on the Fiscal Year page in Setup.
NEXT FISCAL QUARTER	Starts at 12:00:00 AM on the first day of the fiscal quarter after the current fiscal quarter and continues through the last day of that fiscal quarter. (The range does not include the current quarter.) The fiscal quarter is defined on the Fiscal Year page in Setup.
LAST <i>n</i> FISCAL QUARTERS	Starts at 12:00:00 AM on the first day of the fiscal quarter <i>n</i> fiscal quarters ago and continues through the end of the last day of the previous fiscal quarter. (The range does not include the current fiscal quarter.) The fiscal quarter is defined on the Fiscal Year page in Setup.
NEXT <i>n</i> FISCAL QUARTERS	Starts at 12:00:00 AM on the first day of the fiscal quarter after the current fiscal quarter and continues through the end of the last day of the <i>n</i> th fiscal quarter. (The range does not include the current fiscal quarter.) The fiscal quarter is defined on the Fiscal Year page in Setup.
<i>n</i> FISCAL QUARTERS AGO	Starts at 12:00:00 AM on the first day of the fiscal quarter <i>n</i> fiscal quarters before the current fiscal quarter and continues through the end of the last day of that fiscal quarter.
LAST FISCAL YEAR	Starts at 12:00:00 AM on the first day of the fiscal year before the current fiscal year and continues through the end of the last day of that fiscal year. The fiscal quarter is defined on the Fiscal Year page in Setup.
THIS FISCAL YEAR	Starts at 12:00:00 AM on the first day of the current fiscal year and continues through the end of the last day of the fiscal year. The fiscal quarter is defined on the Fiscal Year page in Setup.
NEXT FISCAL YEAR	Starts at 12:00:00 AM on the first day of the fiscal year after the current fiscal year and continues through the end of the last day of that fiscal year. The fiscal quarter is defined on the Fiscal Year page in Setup.
LAST <i>n</i> FISCAL YEARS	Starts at 12:00:00 AM on the first day of the fiscal year <i>n</i> fiscal years ago and continues through the end of the last day of the fiscal year before the current fiscal year. (The range does not include the current fiscal year.) The fiscal quarter is defined on the Fiscal Year page in Setup.
NEXT <i>n</i> FISCAL YEARS	Starts at 12:00:00 AM on the first day of the fiscal year after the current fiscal year and continues through the end of the last day of the <i>n</i> th fiscal year. (The range

Relative Date Value**Range***n* FISCAL YEARS AGO

does not include the current fiscal year.) The fiscal quarter is defined on the Fiscal Year page in Setup.

Starts at 12:00:00 AM on the first day of the fiscal year *n* fiscal years ago and continues through the end of the last day of that fiscal year.

Notes about Filtering on Types of Fields and Values

Keep these tips in mind when filtering on text fields, date fields, numeric values, picklist values, and blank or null values.

Filtering on Text Fields

- Separate search terms by commas to filter by more than one value. For example, to search for accounts in California, New York, or Washington, use *State contains CA,NY,WA*.
- Filtering isn't case sensitive. For example, searching *State contains ID* returns all matches for "ID", but also returns any instances of "Florida" and "Idaho" because they contain "id" in their names.
- When you filter on standard long text area fields, such as Description or Solution Details, only the first 1000 characters of the field are searched for matches in reports. Reports can't be filtered on custom long text area fields. Only the first 255 characters are shown for custom long text area fields in list views.


Filtering on Date Fields

- If entering a date, use the format allowed by your `Locale` setting. You can also use special date values like TODAY, NEXT WEEK, NEXT YEAR, LAST <number> DAYS, and so on.

Filtering on Numeric Values

- Place quotation marks around numbers or other data that includes commas. For example *Amount equals "10,000"* returns records that have an amount of \$10,000 but *Amount equals 10,000* returns \$10,000 as well as \$10 and \$0.
- To search for phone numbers, include the exact phone number formatting or example, *Phone starts with (561)*.

Filtering on Picklist Values

- When filtering on multi-select picklist fields, use a semicolon between values to specify an exact match.
For example, selecting the "equals" operator and a semicolon between two values includes records with both values specified, excluding all other values.
- If your organization uses record types, the lookup dialog lists picklist values for all record types. Use the "equals" or "not equal to" operators for these filters.
 -  **Note:** If you change the label for a picklist value that's used as a filter criterion, the picklist value is automatically removed from the filter criteria. For example, if your report contains a filter where *Lead Source equals Email or Web* and you change the picklist value Web to Referral, your report filter changes to *Lead Source equals Email*. If the changed picklist value was the only value specified for a particular filter, it continues to show up in your filters, but an error appears.

Filtering on Blank or Null Values

- When you use the “less than,” “greater than,” “less or equal,” or “greater or equal” operators on fields that have numeric values, records with blank or “null” values are returned as if their value is zero (0). For example, if you create a workflow rule or a lead assignment rule for accounts with the criteria *Annual Revenue less than 100000*, account records match if their Annual Revenue is blank.

However, records with blank field values are not considered matches in report filters, custom list views, and account assignment rules (which assign accounts to territories).

- To limit results to records that are blank or contain “null” values for a particular field, choose the field and the “equals” or “not equal to” operators, leaving the third field blank. For example, *Amount equals* returns records with blank amount fields. You can search for blank values or other specified values at the same time. For example, *Amount equals 1,,2* returns records where the Amount is blank or contains the value “1” or “2”.

SEE ALSO:

[Relative Date Filter Reference](#)

Tips for Filtering on Multiple Currencies

Tips for filtering on currency fields when your organization uses multiple currencies.

If your organization uses multiple currencies, follow these tips to create more effective filters:

- Use the **Currency** field to find items with a particular currency. For example, *Opportunity Currency equals AUD* finds opportunities with amounts in Australian dollars.
- Prefix currency amounts with a currency code, such as *Annual Revenue greater than USD 50000000*.

Without the currency code, all amounts are assumed to be in the user's currency. For example, if the user's currency is U.S. dollars, *Annual Revenue greater than 50000000* means 50 million U.S. dollars.

If the user's currency is invalid, the corporate currency is used.

From Setup, enter *Manage Currencies* in the **Quick Find** box, then select **Manage Currencies** to obtain the currency codes.

- All amounts are converted to the corporate currency for comparison. For example, *Annual Revenue greater than USD 50000000* finds accounts with revenue greater than 50 million U.S. dollars. This would include an account with revenue of 114 million Australian dollars, which is the equivalent of 60 million U.S. dollars, assuming a conversion rate of 1.9.
- Amounts in reports are shown in their original currencies, and report totals are displayed in your personal currency. You can change the currency used for report totals by clicking **Show > Currencies**. For any amount, you can also choose to display the “converted” column (for example, “Annual Revenue (converted)”), which will show amounts in the currency you select from the Display Currencies Using drop-down list.

SEE ALSO:

[Notes about Filtering on Types of Fields and Values](#)


EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Schedule and Subscribe to Reports

Schedule and Subscribe to Reports and receive notifications that keep you informed about metrics you care most about without having to manually run reports. In Salesforce Classic, you can specify criteria that trigger report notifications.

 **Note:** Users with Salesforce Platform User Licenses can't schedule or subscribe to reports.

IN THIS SECTION:


1. [Subscribe to Get Refreshed Report Results in Lightning Experience](#)
Subscribe yourself and other people to up to 5 reports to receive refreshed report results by email on a schedule that you set: daily, weekly, or monthly.
2. [Subscribe to Get Report Notifications in Salesforce Classic](#)
In Salesforce Classic, subscribe to a report to receive report notifications periodically when the metrics you care about most meet certain conditions. Set the conditions that trigger notification, and specify if you want to be notified via Salesforce app notifications, Chatter, or email.
3. [Schedule Reports in Salesforce Classic](#)
You can set up a report to run itself daily, weekly, or monthly and send the results automatically to the people who need to see them, so that you don't have to remember to log in and do it yourself.

Subscribe to Get Refreshed Report Results in Lightning Experience


Subscribe yourself and other people to up to 5 reports to receive refreshed report results by email on a schedule that you set: daily, weekly, or monthly.

 **Note:** Users with Salesforce Platform User Licenses can't subscribe to reports.

For example, every Monday morning you arrive at your desk and run your case overview report to determine case priority. Instead of manually running the report, subscribe to it and have it emailed to you every Monday morning at 8:00am.

1. From the Reports tab, or from the report run page, click  > **Subscribe**.
If you've already subscribed to a report, but want to change the schedule, then click **Subscribe** on the report again.
2. From the Edit Subscription modal, set the subscription schedule.
To review the cases your team closes each day, receive a case report daily at 5:00 PM.
3. Under **Send To**, subscribe people to the report.
 - **Me** — Only you receive the report.
 - **Select People** — People you specify receive the report. You are included by default, but you can remove yourself once you add at least one other person.

When the subscription emails the refreshed report to each recipient, it sends to the email address set in **Settings > Email > My Email Settings**. If no email is set in My Email Settings, then the refreshed report is sent to the recipient's email address set on their Salesforce User record.

 **Important:** Recipients see emailed report data as the person running the report. Consider that they may see more or less data than they normally see in Salesforce.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Essentials, Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

EDITIONS

Available in: Lightning Experience

Available in: **Essentials, Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

USER PERMISSIONS

To subscribe to reports:

- Subscribe to Reports

To subscribe other people to reports:

- Subscribe to Reports: Add Recipients

To specify who runs the report in a report subscription:

- Subscribe to Reports: Set Running User

4. Under **Run Report As**, specify who runs the report.
 - **Me** — You run the report, and recipients see report data in the emailed report as you.
 - **Another Person** — Specify someone who has permission to run reports and who has access to the report.
5. Click **Save**.

Your report subscription starts, and recipients begin receiving report results by email according to the schedule you set.

To unsubscribe, open the Edit Subscription window by clicking **Subscribe** again. Then, click **Unsubscribe**.

Subscribe to Get Report Notifications in Salesforce Classic

In Salesforce Classic, subscribe to a report to receive report notifications periodically when the metrics you care about most meet certain conditions. Set the conditions that trigger notification, and specify if you want to be notified via Salesforce app notifications, Chatter, or email.

 **Note:** Users with Salesforce Platform User Licenses can't subscribe to reports.

For example, you could subscribe to an open-issue report and get notified every morning if there are over 20 open issues. You can subscribe to notifications for up to five reports.

Watch a demo:  [Report Notifications \(Salesforce Classic\)](#)

 **Note:** Report Notifications doesn't appear as an available option for unsaved reports. Save the report before subscribing to it.

Personal Report Notifications aren't related to the Schedule Future Runs feature, which enables you to email reports at specified times without specifying conditions. To schedule emailed reports, select **Schedule Future Runs** from the Run Report drop-down menu.

1. On the Report Run page, click **Subscribe**.
2. On the Report Subscription page, choose whether to be notified each time conditions are met or only the first time.
3. Specify each condition in three parts: aggregate, operator, value.

For example, trigger notifications whenever the sum of amount is less than \$1 million.

- Aggregate is the metric that's the basis of your condition. It can be Record Count, Average Amount, Smallest Amount, Largest Amount, or Sum of Amount.
- Operator is the basis of comparison, such as Equal, Not Equal, Greater Than, and so on.
- Value is the number that you want the aggregate compared to.

Your conditions are evaluated when the report is run, and notifications are sent if all conditions are met (up to five conditions per report).

4. Schedule how often (every weekday, daily, or weekly) and when to evaluate for your conditions. For example, run the report every weekday at 7 a.m.
5. Select one or more notification types.
 - Send a Salesforce in-app notification
 - Post to Chatter
 - Send an email notification
 - Execute a custom Apex action, such as creating tasks or escalating cases

EDITIONS

Available in: Salesforce Classic

Available in: **Essentials, Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

USER PERMISSIONS

To subscribe to reports in Salesforce Classic:


- Run Reports

To enable or disable Salesforce Classic report notification subscriptions:

- Customize Application

For more information about developing a custom Apex class, see the [Apex Developer Guide](#).

6. Make sure that the subscription is active if you're ready to start receiving notifications.
7. Click **Save** to schedule the notifications.

 **Example:** A report is scheduled to be run every weekday at 7 a.m. If the sum of the amount is less than 1,000,000, a Salesforce app notification is sent and a Chatter post is made.


The screenshot displays the 'Report Subscription' configuration interface. At the top, there are navigation tabs: Home, Chatter, Profile, Groups, Files, Leads, Accounts, Contacts, Opportunities, Reports (highlighted), Dashboards, Products, and Forecasts. Below the navigation is the report title 'Oppty by Amount' and a 'Help for this Page' link. The main section is titled 'Report Subscription' and includes 'Save', 'Save & Run flow', and 'Cancel' buttons. A descriptive text states: 'When you subscribe to a report, you can define the set of conditions to meet before sending a notification, and choose how and when to be notified. Make sure to save any changes to your report before subscribing.' The configuration is divided into several sections: 'Type' with 'Notify me' options (radio buttons) for 'Every time conditions are met' (selected) and 'Only the first time conditions are met'; 'Conditions' with a table for 'Aggregate', 'Operator', and 'Value' (Sum of Amount, Less Than, 1000000); 'Schedule' with 'Frequency' options (radio buttons) for 'Every Weekday' (selected), 'Daily', and 'Weekly', and a 'Time' dropdown set to '7:00 AM'; 'Actions' with checkboxes for 'Send Salesforce1 Notification' (checked), 'Post to Chatter Feed' (checked), 'Send Email Notification' (unchecked), and 'Execute a Custom Action' (set to 'None'); a 'Preview' box showing a sample alert message; and an 'Active' checkbox which is checked. At the bottom, there are 'Save', 'Save & Run flow', and 'Cancel' buttons.

SEE ALSO:

- [Schedule Reports in Salesforce Classic](#)
- [Salesforce App Notifications](#)

Schedule Reports in Salesforce Classic

You can set up a report to run itself daily, weekly, or monthly and send the results automatically to the people who need to see them, so that you don't have to remember to log in and do it yourself.

 **Note:** Users with Salesforce Platform User Licenses can't schedule reports.

 [Tips for Scheduling Reports \(Salesforce Classic\)](#)

IN THIS SECTION:

1. [Schedule a Report for Refresh](#)
Schedule a report to run daily, weekly, or monthly. An HTML version of the report can be sent by email to users in your organization.
2. [View a Report's Schedule](#)
View a report's schedule on the Schedule Report page or from the Reports tab. View all report schedules for the organization under Setup.
3. [Manage a Report's Schedule](#)
Create, change, view or delete a scheduled report from the Schedule Report page.
4. [Change a Report's Schedule](#)
You can make changes to an already scheduled report on the Schedule Report page.
5. [Delete a Report's Schedule](#)
Select a scheduled report and unschedule it to delete its scheduled run.
6. [Tips on Scheduling Reports](#)
Some tips to keep in mind about timings, limits, and email notifications when scheduling a report.

SEE ALSO:

[Schedule a Report for Refresh](#)
[Change a Report's Schedule](#)
[Delete a Report's Schedule](#)
[Manage a Report's Schedule](#)
[Tips on Scheduling Reports](#)
[View a Report's Schedule](#)
[Subscribe to Get Report Notifications in Salesforce Classic](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Schedule Reports
- **Enhanced Folder Sharing**
Schedule Reports

Schedule a Report for Refresh


Schedule a report to run daily, weekly, or monthly. An HTML version of the report can be sent by email to users in your organization.

Watch a Demo: [▶ Tips for Scheduling Reports \(Salesforce Classic\)](#)

1. On the Reports tab, click a report name.
2. Click **Schedule Future Runs** from the **Run Report** drop-down menu.
If you're creating a new report, you are asked to save the report in a folder before scheduling. If the report folder is shared with a group, you can schedule the report only for the entire group. To schedule the report for an individual group member, share the report folder with that member.

3. On the Schedule Report page, specify a running user who has access to the folder where the report is stored.


The access level of the running user determines what other users, including portal users, see when they receive the scheduled report run results. This means that not all users can see every field, and the running user can see fields that others may not be able to see. When it's sent, the report indicates which fields the running user can see that can't be viewed by others. You need the "View All Data" permission to specify a running user other than yourself.

 **Note:** If the running user becomes inactive, the report doesn't run. Salesforce sends an email notification to either activate the user, delete the report schedule, or change the running user to an active one. Salesforce sends the notification to users with the "Manage Users," "Modify All Data," and "Manage Billing" permissions. If no user has all these user permissions, Salesforce sends the notification to users with the "Manage Users" and "Modify All Data" user permissions.

4. Select an email setting.

Select	To
To me	Send the report to your email address specified on your user profile.
To me and/or others	Email the report to additional users.

You can send reports only to email addresses included on Salesforce user records. When portal users receive emailed reports, they see the same data as the running user set in the report schedule. If you have information you'd rather not share, schedule the report to run with a portal user as the running user.

 **Note:** Portal users receive report and dashboard refresh email notifications when the `Allow Reports and Dashboards to Be Sent to Portal Users` option is enabled.

5. Set the frequency, duration, and time for running the report:
 - In the `Frequency` field, select `Daily`, `Weekly`, or `Monthly` and then refine the frequency criteria.
 - Using the `Start` and `End` fields, specify the dates during which you want to schedule the report. To enter the current date, click the link showing the date.
 - Next to `Preferred Start Time`, click **Find available options** to choose a start time.

Your preferred start time might not be available if other users have already selected that time to schedule a report.

6. Click **Save Report Schedule**. You can choose:

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USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Schedule Reports
- **Enhanced Folder Sharing**
Schedule Reports

Choose**To****Save report modifications with this schedule**

Save both the report schedule and changes you made to the report.

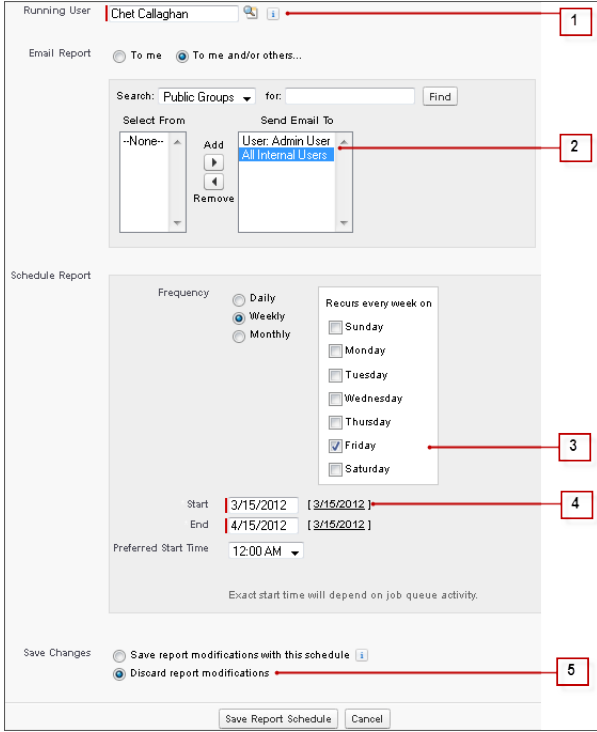
Discard report modifications

Save the schedule only. Changes you made to the report are discarded.

Report recipients can click the report name in emailed reports to log in to Salesforce and view the report directly.

 **Example: Example**

A report is scheduled to run every Friday at midnight, and its results are emailed to a selected group and user.



The screenshot shows the 'Schedule Report' configuration window. At the top, the 'Running User' is set to 'Chet Callaghan' (1). Below this, the 'Email Report' section has 'To me and/or others...' selected. The 'Send Email To' list includes 'User: Admin User' and 'All Internal Users' (2). The 'Schedule Report' section shows 'Frequency' set to 'Weekly' and 'Recurs every week on' with 'Friday' selected (3). The 'Start' date is '3/15/2012' (4). At the bottom, 'Save Changes' is set to 'Discard report modifications' (5). Buttons for 'Save Report Schedule' and 'Cancel' are at the bottom.

1. All users, including portal users, viewing the scheduled report see the report data that Sales Director Chet's access level allows.
2. Report run results are set to be emailed to a public user group called All Internal Users and the admin user. You can only send emails to users and groups with access to the report folders. The `Search` drop-down displays all available categories based on your search criteria in the `Running User` field.
3. The report is scheduled to run every Friday.
4. The report run is scheduled to start on the current date.
5. The schedule is saved without saving prior changes made to the report.



SEE ALSO:

[Manage a Report's Schedule](#)

View a Report's Schedule

View a report's schedule on the Schedule Report page or from the Reports tab. View all report schedules for the organization under Setup.

[Tips for Scheduling Reports \(Salesforce Classic\)](#)

- To see the schedule for a report on the Reports tab, hover over  in the schedule  column. This shows the frequency and the date of the next run. Users without the "Schedule Reports" permission can't see the icon and information.
- To see a report's run schedule on the Schedule Report page:
 1. Click a scheduled report name on the Reports tab.
 2. Click **Schedule Future Runs** from the **Run Report** drop-down menu..
- To see all scheduled reports for your organization, from Setup, enter *Scheduled Jobs* in the **Quick Find** box, then select **Scheduled Jobs**. Only users with the "View Setup and Configuration" permission can view this information.

SEE ALSO:

[Manage a Report's Schedule](#)

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USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Schedule Reports
- **Enhanced Folder Sharing**
Schedule Reports

Manage a Report's Schedule

Create, change, view or delete a scheduled report from the Schedule Report page.

▶ [Tips for Scheduling Reports \(Salesforce Classic\)](#)

On the Schedule Report page you can:

- [Schedule a new or existing report to run](#) in the future and have its results emailed to others.
- [Change the schedule](#) on a previously scheduled report.
- [View scheduled jobs](#) for all reports in your organization or view the schedule for just a selected report.
- [Delete a scheduled run](#) for a selected report.

Additional scheduled reports may be available for purchase.

SEE ALSO:

[Schedule a Report for Refresh](#)

Change a Report's Schedule

You can make changes to an already scheduled report on the Schedule Report page.

▶ [Tips for Scheduling Reports \(Salesforce Classic\)](#)

1. On the Reports tab, click the name of the scheduled report.
2. Click **Schedule Future Runs** from the **Run Report** drop-down menu.
3. Make the required changes on the Schedule Report page.
4. Click **Save Report Schedule**.

SEE ALSO:

[Manage a Report's Schedule](#)

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USER PERMISSIONS

To create, edit, and delete reports:

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Schedule Reports
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Schedule Reports

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Schedule Reports

Delete a Report's Schedule

Select a scheduled report and unschedule it to delete its scheduled run.

🔗 [Tips for Scheduling Reports \(Salesforce Classic\)](#)

1. On the Reports tab, click the name of the scheduled report.
2. Click **Schedule Future Runs** from the **Run Report** drop-down menu.
3. Click **Unschedule Report**.
The run schedule for the report is canceled and *not* sent to the Recycle Bin.



SEE ALSO:

[Manage a Report's Schedule](#)

Tips on Scheduling Reports

Some tips to keep in mind about timings, limits, and email notifications when scheduling a report.

Scheduling Report Runs

- On the Reports tab, hover over  in the schedule column () to [view](#) a report's schedule. Note that users without the "Schedule Reports" permission can't see this icon and information.
- You can't create schedules for [joined reports](#).
- Your organization is limited to no more than 200 scheduled reports. Daily limits differ by edition. Additional scheduled reports may be available for purchase.
- Scheduled reports run in the time zone of the user who set up the schedule. For example, if the `Time Zone` field on your user record is set to Pacific Standard Time, and you schedule a report to run every day at 2:00 PM, then the report runs every day between 2:00 PM and 2:29 PM Pacific Standard Time.
- If you view and save a schedule in a time zone different from the one in which it was previously scheduled, the time slot could potentially change.
- If you schedule a report to run on a specific day of every month, the report runs only on months that have that specific day. For example, if you schedule a report to run on the 31st day of every month, then the report runs only on months that have 31 days. To schedule a report on the last day of every month, choose last from the `On day of every month` drop-down list.
- The report runs within 30 minutes of the time you select for `Preferred Start Time`. For example, if you select 2:00 PM as your preferred start time, the report runs any time between 2:00 PM and 2:29 PM, depending on how many other reports are scheduled at that time.

EDITIONS

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USER PERMISSIONS

To schedule reports:

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Schedule Reports
- **Enhanced Folder Sharing**
Schedule Reports

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Available in: Enhanced Folder Sharing and Legacy Folder Sharing

- Scheduling reports is not tracked in the audit trail history.

Emailing Scheduled Reports

- You can't email scheduled reports to Chatter Free users.



Note: Previously, Chatter Free users could receive scheduled reports by email, even though they can't access the report in Salesforce. Scheduled reports that were set up to email Chatter Free users continue to email to Chatter Free users.

- Emailed reports don't include report charts. To email a chart of the report, create a dashboard and schedule a dashboard refresh.
- Reports display only the first 2,000 records (same as in a browser).
- Outlook 2007 limitation: Report emails containing tables more than 22 inches wide or with more than 63 columns might not display properly.
- The maximum size for emailed reports is 10 MB. Try the following techniques to reduce the amount of data in your report:
 - Filter for your own records, rather than all records.
 - Limit the scope of the data to a specific date range.
 - Exclude unnecessary columns from your report.
 - Hide the report details.

SEE ALSO:

[Schedule a Dashboard Refresh](#)

[Manage a Report's Schedule](#)

Report on Historical Changes

On top of the standard up-to-the-minute reporting on the current state of your business, you can analyze day-to-day and week-to-week changes in opportunities, cases, forecasts, and custom objects.



Note: Historical trend reporting with charts is supported in Lightning Experience, but tabular views of historical trend reports aren't available.

IN THIS SECTION:

1. [Track Changes Over Time with Historical Trend Reporting](#)

Historical trend reporting uses a special custom report type designed to highlight changes between five snapshot dates, such as five business days or five business weeks. You can visually represent the data changes in charts and on dashboards.

2. [Report on Historical Data with Reporting Snapshots](#)

A reporting snapshot lets you report on historical data. Authorized users can save tabular or summary report results to fields on a custom object, then map those fields to corresponding fields on a target object. They can then schedule when to run the report to load the custom object's fields with the report's data. Reporting snapshots enable you to work with report data similarly to how you work with other records in Salesforce.

Track Changes Over Time with Historical Trend Reporting

Historical trend reporting uses a special custom report type designed to highlight changes between five snapshot dates, such as five business days or five business weeks. You can visually represent the data changes in charts and on dashboards.

For organizations created in Winter '14 and thereafter, historical trend reporting is activated by default. If your organization is older than that, you must activate historical trend reporting in the Setup menu.

Salesforce retains historical data for the previous three months, plus the current month. (The amount of historical data you can work with in practice depends on your organization's data design and use patterns.) You can select up to five date snapshots in that span to compare, using up to four historical filters.

Longer durations than days or weeks are not recommended. They may result in reports timing out and not returning. For small organizations with fewer records, month-to-month trend reporting may work, but this is not what historical trend reporting is designed for.

Tip: You can also create and customize historical trend reporting reports via the Metadata API and the Reports and Dashboards REST API.

IN THIS SECTION:

[Track Changes in Your Sales Pipeline](#)

A historical report can help you monitor your company's sales pipeline to make sure it contains enough activity to meet current and future sales goals. You may want to focus on deals whose value grew or shrank in the last three months, or deals that moved into or out of a given target period.

[See How Forecast Amounts Have Changed](#)

Let's build a historical report, in matrix format, of the amounts your team members have assigned to each forecast category. Changes in those amounts can reveal how accurately your team is forecasting.

[Track History for Cases](#)

Monitor activity across cases and identify your case status changes in the last three months of a case's life cycle.

[Limitations on Historical Trend Reporting](#)

Historical trending in Salesforce is subject to certain limits on the time during which data is tracked, the number of rows of data, and the fields and objects you can track. These limits are designed to restrict the data set so that reports return data quickly.

Track Changes in Your Sales Pipeline

A historical report can help you monitor your company's sales pipeline to make sure it contains enough activity to meet current and future sales goals. You may want to focus on deals whose value grew or shrank in the last three months, or deals that moved into or out of a given target period.

You'll probably want to compare historical and current values of key attributes of opportunities, such as dates, amounts, and status, to see how your pipeline has changed over time. For example, this summary report points out opportunity amounts and close dates that have changed since yesterday.

The screenshot shows a Salesforce report interface. At the top, there are filters for 'Show' (All opportunities), 'Date Field' (Close Date), 'Range' (Current FQ), and date selection (From: 2/1/2013, To: 4/30/2013). The 'History' section is set to 'Yesterday'. A filter is applied: 'Amount (Historical): Any Historical Date greater than "\$5,000"'. The report preview shows a table with columns for Opportunity Name, Amount (Historical), Amount, Close Date (Historical), and Close Date. The table data is as follows:

Opportunity Name	Amount (Historical)		Close Date (Historical)	
	Yesterday	Today	Yesterday	Today
Acme	\$26,000	\$16,000	2/15/2013	2/28/2013
Advanced Interconnections Corp* - 32K	\$18,000	\$20,000	2/28/2013	2/28/2013
Advanced Interconnections Corp* - 8K	\$12,000	\$8,000	2/15/2013	2/28/2013
Allied Technologies - 40K	\$30,000	\$39,000	2/15/2013	2/15/2013
Data Solutions	\$10,000	\$3,000	2/28/2013	2/28/2013
DFC Inc. - 50K	\$55,000	\$45,700	2/15/2013	2/28/2013
Eastern Shipping	\$21,500	\$21,500	2/28/2013	2/28/2013

1. Snapshot up to five dates to track day-to-day or week-to-week trends.

2. Current and historical values are shown side by side for easy comparison.
3. Changed dates and amounts are highlighted in red or green.

IN THIS SECTION:

1. [Watch Your Pipeline Change Over Time](#)

Let's say you want to know how the total value of your pipeline today compares with its value yesterday. Create a simple report to compare the two dates.

2. [Identify Historical Deals Over a Given Value](#)

Suppose you want to focus only on deals in your pipeline worth more than \$5,000, but you're not concerned about today's fluctuations. You'll need a historical trending report that filters out any deal whose value was below \$5,000 yesterday.

3. [Find Deals that Have Been Pushed Out](#)

To focus on deals that are taking more time to close than expected, create a historical trending report that finds deals in your pipeline that have had their close dates moved to a later date.

4. [Identify Shrinking Deals](#)

Historical trending analysis can help you prioritize by quickly identifying deals that may be at risk. For example, target the deals in your pipeline that have decreased in value since yesterday. You'll need a historical trending report that gives you the deals whose value yesterday was greater than their value today.

Watch Your Pipeline Change Over Time


Let's say you want to know how the total value of your pipeline today compares with its value yesterday. Create a simple report to compare the two dates.

1. Create an opportunity history report.
 - a. On the Reports tab, click **New Report**.
 - b. Under **Select Report Type > Opportunities**, select *Opportunities with Historical Trending*.

In order to see *Opportunities with Historical Trending*, turn on Historical Trend Reporting for Opportunities in the Salesforce Setup. To learn how to turn on Historical Trend Reporting for Opportunities, see *Set Up Historical Trend Reporting* in the Salesforce help.

- c. Click **Create**.
2. For Show, select *All Opportunities*.

Note that the default value in the **Historical Date** field is *Yesterday*, and the **Amount (Historical)** field shows yesterday's date.

 **Tip:** "Yesterday" is a *rolling* date value, meaning that it points to a date that is relative to today's date. If you run this same report tomorrow, **Amount (Historical)** will show today's date.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

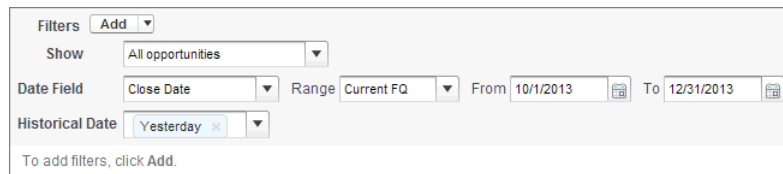
Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing


USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder
- Enhanced Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder



3. Click the down arrow in the headers of the **Amount (Historical)** and the **Amount—Today** columns. Click *Summarize This Field*, then select *Sum*.
The total amount appears at the bottom of each column.
4. Click the down arrow in the header of the **Amount** column and select *Show Changes*.
5. Click **Run Report**.
6. In the **Change** column, observe the difference between the total value of the **Amount (Historical)** column and that of the **Amount—Today** column.

 **Tip:** You can see changes at a glance by looking for values that are colored green or red.

You've created a simple historical trending report that can help you analyze your pipeline's behavior.

SEE ALSO:

[Opportunities with Historical Trending Report](#)

Identify Historical Deals Over a Given Value

Suppose you want to focus only on deals in your pipeline worth more than \$5,000, but you're not concerned about today's fluctuations. You'll need a historical trending report that filters out any deal whose value was below \$5,000 yesterday.

1. Create an opportunity history report.
 - a. On the Reports tab, click **New Report**.
 - b. Under **Select Report Type > Opportunities**, select *Opportunities with Historical Trending*.
 In order to see *Opportunities with Historical Trending*, turn on Historical Trend Reporting for Opportunities in the Salesforce Setup. To learn how to turn on Historical Trend Reporting for Opportunities, see *Set Up Historical Trend Reporting* in the Salesforce help.
 - c. Click **Create**.
2. For *Show*, select *All Opportunities*.
3. Filter for historical values over \$5,000.
 - a. Click **Add** and select *Historical Field Filter*.
 - b. Set Amount (Historical) to Yesterday.
 - c. Select *greater than* for the operator.
 - d. Enter *5,000* in the last field.
 - e. Click **OK**.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

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 Create and Customize Reports
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- Enhanced Folder Sharing**
 Create and Customize Reports
 AND
 Report Builder

Filters Add

Show All opportunities

Date Field Close Date Range Current FQ From 2/1/2013 To 4/30/2013

History Yesterday

Amount (Historical): Any Historical Date greater than "\$5,000"

Preview Tabular Format Show Remove All Columns

Opportunity Name	Amount (Historical)		Close Date (Historical)	
	Yesterday	Today	Yesterday	Today
Acme	\$26,000	\$16,000	2/15/2013	2/28/2013
Advanced Interconnections Corp* - 32K	\$18,000	\$20,000	2/28/2013	2/28/2013
Advanced Interconnections Corp* - 8K	\$12,000	\$8,000	2/15/2013	2/28/2013
Allied Technologies - 40K	\$30,000	\$39,000	2/15/2013	2/15/2013
Data Solutions	\$10,000	\$3,000	2/28/2013	2/28/2013
DFC Inc. - 50K	\$55,000	\$45,700	2/15/2013	2/28/2013
Eastern Shipping	\$21,500	\$21,500	2/28/2013	2/28/2013

4. Click **Run Report**.

5. In the finished report, observe that all the deals in the `Amount - Historical` column are worth more than \$5,000.

Tip: Values in the Amount, Close Date and Stage fields are shown in green or red to indicate the direction of change. You can reverse the colors by clicking the down arrow in the column header.

You've created a simple report that pulls out all the deals that have were worth more than a given amount as of a given historical snapshot date.


SEE ALSO:

[Opportunities with Historical Trending Report](#)

Find Deals that Have Been Pushed Out

To focus on deals that are taking more time to close than expected, create a historical trending report that finds deals in your pipeline that have had their close dates moved to a later date.

1. Create an opportunity history report.
 - a. On the Reports tab, click **New Report**.
 - b. Under **Select Report Type > Opportunities**, select *Opportunities with Historical Trending*.
In order to see *Opportunities with Historical Trending*, turn on Historical Trend Reporting for Opportunities in the Salesforce Setup. To learn how to turn on Historical Trend Reporting for Opportunities, see *Set Up Historical Trend Reporting* in the Salesforce help.
 - c. Click **Create**.
2. For *Show*, select *All Opportunities*.
3. Filter for close dates that are later now than they were in the past.
 - a. Click **Add** and select *Historical Field Filter*.
 - b. Set `Close Date (Historical)` to Feb. 1, 2013.
 - c. Click **OK**.
4. Click the down arrow in the header of the `Close Date` column and select *Show Changes*.
5. Click **Run Report**.
6. For each deal in the report, compare the date in the `Close Date - Historical` column with the date in the `Close Date - Today` column.

 **Tip:** You can see changes at a glance by looking for values that are colored green or red.

SEE ALSO:

[Opportunities with Historical Trending Report](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder
- Enhanced Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder

Identify Shrinking Deals

Historical trending analysis can help you prioritize by quickly identifying deals that may be at risk. For example, target the deals in your pipeline that have decreased in value since yesterday. You'll need a historical trending report that gives you the deals whose value yesterday was greater than their value today.

1. Create an opportunity history report.
 - a. On the Reports tab, click **New Report**.
 - b. Under **Select Report Type > Opportunities**, select *Opportunities with Historical Trending*.
 In order to see *Opportunities with Historical Trending*, turn on Historical Trend Reporting for Opportunities in the Salesforce Setup. To learn how to turn on Historical Trend Reporting for Opportunities, see *Set Up Historical Trend Reporting* in the Salesforce help.
 - c. Click **Create**.
2. For *Show*, select *All Opportunities*.
3. Filter out any deal that wasn't worth more yesterday than today.
 - a. Click **Add** and select *Historical Field Filter*.
 - b. Set *Amount (Historical)* to *greater than*.
 - c. Set the last field to *Field*.
 Here we're choosing to compare the historical amount with whatever amount is in the *Amount — Today* column, and not with a specific amount.
 - d. Click **OK**.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

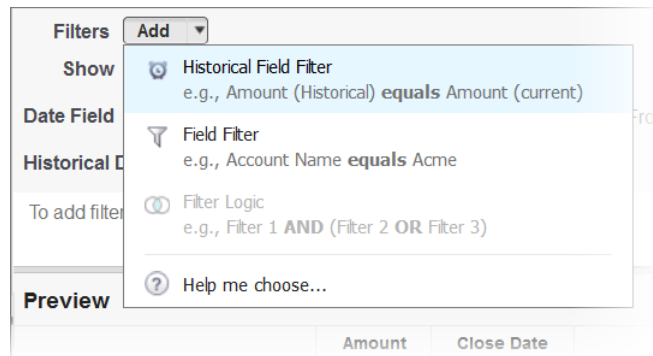
Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder
- Enhanced Folder Sharing**
 - Create and Customize Reports
 - AND
 - Report Builder



4. Click **Run Report**.

You've created a simple report that flags deals that have shrunk since yesterday. Note that all the results in the *Amount — Today* column are shown in red, to indicate decreases in value.

 **Tip:** To change the color-coding for amount changes, click the down arrow above the Change column and click **Reverse Colors**.

SEE ALSO:

[Opportunities with Historical Trending Report](#)

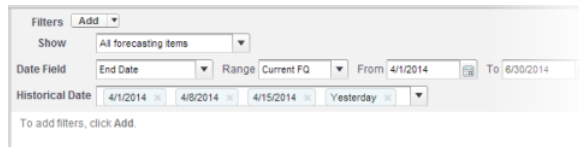
See How Forecast Amounts Have Changed

Let's build a historical report, in matrix format, of the amounts your team members have assigned to each forecast category. Changes in those amounts can reveal how accurately your team is forecasting.

For this example, we'll assume you're about a month into the current fiscal quarter.

1. Create a forecast history report.
 - a. On the Reports tab, click **New Report**.
 - b. Under **Select Report Type > Forecasts**, select *Forecasting Items with Historical Trending*. Before you can select this report type, your organization must have enabled Historical Trending for Forecasting Items. If you do not see the report type listed, talk to your administrator.
 - c. Click **Create**.
2. In the Filters area, choose **Show > All forecasting items**, then set up your filters.
 - a. For **Date Field**, choose End Date. For **Range**, choose Current FQ. The **From** and **To** date fields automatically get the beginning and end dates for the current quarter.
 - b. For **Historical Date**, choose 3 Months Ago, 2 Months Ago, then 1 Month Ago from the dropdown menu. Each date you select is added to the field.

Filter for the historical data you want.

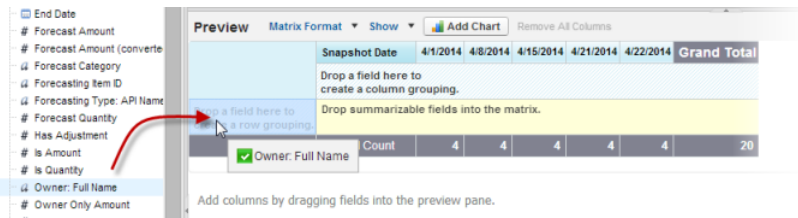


 **Tip:** To move *Yesterday* to the right side of the field, delete it, and then add it again from the dropdown menu.

If you're using multiple forecast types, add a filter for Forecasting Type: API Name to prevent duplicate values from appearing on the report.

3. Choose the data you want to monitor for historical changes. In this case, we're interested in the category in which the changes were made and how the forecast amount changed.
 - a. In the **Preview** pane, change **Tabular Format** to **Matrix Format**.
 - b. Drag the **Owner: Full Name** field from the Field area to the Preview pane to create a row grouping.
 - c. Drag the **Forecast Category** field over to the right of **Owner: Full Name** to create another row grouping.
 - d. Drag the **Forecast Amount (Historical)** field to the matrix area of the Preview pane, below the yellow bar. In the **Summarize** dialog, select **Sum**.

Select the fields that contain the data you want to track.



Columns appear for each of the historical dates you chose in the filters area that contain records.

4. Click **Run Report** to see what data you've gathered so far. Then click **Customize** to keep adjusting your filters and fields if necessary.
5. Once you've defined the data you want to track, create a chart to show it graphically.
 - a. In the Preview area, click **Add Chart** and select the line chart icon.
 - b. On the Chart Data tab, choose `Sum of Forecast Amount (historical)` for the **Y-Axis** and `Snapshot Date` for the **X-Axis**.
 - c. For **Group By**, choose `Forecast Category`, and select **Cumulative**.
 - d. Click **OK**, then click **Run Report** again.
6. Click **Save As**. Choose a name and folder for the report and click **Save**.

Track History for Cases


Monitor activity across cases and identify your case status changes in the last three months of a case's life cycle.

1. One way to optimize contact center operations is to observe the `Status` field over time, watching for cases that move backward to a previous status. This can help reveal ways to resolve cases more effectively.
2. For another example, try analyzing historical values of the `Priority` field to identify cases that may have been incorrectly classified when they were opened. Watching for frequent changes in priority may also lead to ways to improve the handling of complex cases.

Limitations on Historical Trend Reporting

Historical trending in Salesforce is subject to certain limits on the time during which data is tracked, the number of rows of data, and the fields and objects you can track. These limits are designed to restrict the data set so that reports return data quickly.

- Salesforce retains historical data for the previous three months, plus the current month.
- Up to 5 million rows of historical trending data can be stored for each object. Historical data capture stops when the limit is exceeded. The admin is alerted by email when any object reaches 70 percent of the limit, and again if the limit is exceeded.
- Each historical trend report can contain up to 100 fields. In Opportunities reports, this includes the standard preselected fields, which can't be disabled.
- Formula fields are not supported.
- Row limit filters are not supported.
- The summary report format is not supported.
- You can specify up to five historical snapshot dates in each historical trend report.
- You can use up to four historical filters on each historical trend report.
- These field types are supported: Number, Currency, Date, Picklist, Lookup.
- Dated exchange rates are not supported. When you run the historical trend report, it only uses the latest dated exchange rate.
- Internet Explorer 6 is not supported.

- You can't subscribe to historical trend reports.
 - The Report Wizard is not supported. Historical trend reports can only be created with the Report Builder.
 - Historical trend reporting with charts is supported in Lightning Experience, but tabular views of historical trend reports aren't available.
-  **Important:** If a picklist field is already being used in a historical trending data filter, think hard before changing any of its values. You could make that field less useful for historical reporting in the future.

Report on Historical Data with Reporting Snapshots

A reporting snapshot lets you report on historical data. Authorized users can save tabular or summary report results to fields on a custom object, then map those fields to corresponding fields on a target object. They can then schedule when to run the report to load the custom object's fields with the report's data. Reporting snapshots enable you to work with report data similarly to how you work with other records in Salesforce.

After you set up a reporting snapshot, users can:

- Create and run custom reports from the target object.
- Create dashboards from the source report.
- Define list views on the target object, if it's included on a custom object tab.

For example, a customer support manager could set up a reporting snapshot that reports on the open cases assigned to his or her team everyday at 5:00 PM, and store that data in a custom object to build a history on open cases from which he or she could spot trends via reports. Then the customer support manager could report on point-in-time or trend data stored in the custom object and use the report as a source for a dashboard component. For the total number of reporting snapshots you can create, see *Salesforce Limits*.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited, and Developer Editions**

IN THIS SECTION:

1. [Prepare Reporting Snapshots](#)

To set up a reporting snapshot, you need a source report and a target object with fields to contain the data in the source report.

2. [Define a Reporting Snapshot](#)

After you create a source report, target object, and target object fields, you can define your reporting snapshot. You define a reporting snapshot by naming it and choosing the source report that will load report results into the target object you specify when the reporting snapshot runs.

3. [Map Reporting Snapshot Fields](#)

After you create a source report, target object, target object fields, and define your reporting snapshot, you can map the fields on your source report to the fields on your target object. You map source report fields to target object fields so that when the report runs, it automatically loads specific target object fields with data from specific source report fields.

4. [Schedule and Run a Reporting Snapshot](#)

After you create a source report, target object, target object fields, define your reporting snapshot, and map its fields, you can schedule when it runs. You can schedule a reporting snapshot to run daily, weekly, or monthly so that data from the source report is loaded into the target object when you need it.

5. [Manage Reporting Snapshots](#)

After you set up a reporting snapshot, you can view details about it and edit and delete it. From Setup, enter *Reporting Snapshots* in the Quick Find box, then select **Reporting Snapshots** to display the Reporting Snapshots page, which shows the list of reporting snapshots defined for your organization.

6. Troubleshoot Reporting Snapshots

The Run History section of a reporting snapshot detail page displays if a reporting snapshot ran successfully or not. When a reporting snapshot fails during a scheduled run, the failure is noted in the `Result` column. To view the details of a run, click the date and time of the run in the `Run Start Time` column.

SEE ALSO:

[Build a Salesforce Classic Dashboard](#)

[Create a Custom Report in Accessibility Mode](#)

Prepare Reporting Snapshots

To set up a reporting snapshot, you need a source report and a target object with fields to contain the data in the source report.

To set up a reporting snapshot:

1. Create a new custom report that includes the fields you want to load as records into a target object.
2. Create a new custom object in which to store the records loaded from the source report.
3. Create fields on the target object that will receive the source report's results when the reporting snapshot runs.

Tips on Source Reports for Reporting Snapshots

- If you save a tabular source report with its details hidden, the report will not be available to include in a reporting snapshot. Furthermore, if you hide the details of a tabular source report included in a reporting snapshot, the reporting snapshot will fail when it runs. To verify that the details of the tabular source report are not hidden, view the report, click **Show Details**, and save the report. The **Show Details** button only displays if the report's details are hidden.
- When creating the source report for your reporting snapshot, note the names of the fields you added to the report, as those field names may be useful to you when you create fields on the target object in which to store the report results.
- You can choose any custom tabular or summary report as the source report, except legacy forecast reports, Quota vs Actual reports, and Leads by Source reports. The `Source Report` drop-down list does not display standard reports..
- You can include up to 100 fields in your source report.
- You can delete the schedule of when a reporting snapshot runs. You can't stop or pause a reporting snapshot when it is running, nor can you delete its source report. To delete the source report, you must first remove the report from the reporting snapshot by changing the report in the `Source Report` drop-down list..
- If you select Load No Data in the Fields from Source Report column, no data will load into the corresponding field in the Fields in Target Object column when the reporting snapshot runs. .
- The (No fields with compatible data type) field displays in the Fields from Source Report column when a field on the target object does not match the data type of a field on the source report..

Tips on Target Objects for Reporting Snapshots

Consider the following when setting up target objects for reporting snapshots:

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited, and Developer** Editions

USER PERMISSIONS

To create, save, and schedule a reporting snapshot:

- Manage Reporting Snapshots

To run a reporting snapshot as a running user and add the results to a custom object, the running user must have:

- Run Reports
- AND
- Create on the target object

- In Professional, Enterprise, Unlimited, Performance, and Developer Editions, use field-level security to make the target object's fields visible to the appropriate users.
- You can't delete a custom object if it's a target object in a reporting snapshot.
- The fields on the target object determine field mapping availability. For example, your source report may include ten fields, but if your target object includes one field, then you can only map one field in your reporting snapshot.
- You can add up to 100 fields to the target object.
- Target objects cannot contain validation rules or be included in a workflow.
- Reporting snapshots cannot contain target objects that trigger Apex code to run when new records are created..
- When a reporting snapshot runs, it can add up to 2,000 new records to the target object. If the source report generates more than 2,000 records, an error message is displayed for the additional records in the Row Failures related list. You can access the Row Failures related list via the Run History section of a reporting snapshot detail page.

Tips on Reporting Snapshots

- Be aware of the type of license your `Running User` has. For example, if the `Running User` of a reporting snapshot has a Salesforce license, users who have Force.com Platform or Salesforce Platform One licenses will not be able to view it. Alternatively, if the `Running User` has a Force.com Platform or Salesforce Platform One license, users who have Salesforce licenses will be able to see the reporting snapshot. If you have users with Force.com Platform or Salesforce Platform One licenses, we recommend creating a separate reporting snapshot for them with a `Running User` that has a Force.com Platform or Salesforce Platform One user license.
- You can only map fields with compatible data types. For example, you can map a currency field to a number field.
- If you change the source report or target object on a reporting snapshot with existing field mappings, the field mappings are deleted when you save the reporting snapshot. You can also view `Summary Fields in Source Report` and `Fields in Target Object` to see the number of summary or target fields, respectively..
- You must map at least one field from the source report to one field on the target object or data will not load from the source report to the target object when the reporting snapshot runs.
- When a reporting snapshot is defined, deleted, or its source report or target object is changed, it is tracked in your organization's setup audit trail history.
- The Run History section on a reporting snapshot detail page displays details on when the reporting snapshot ran. Details include:
 - The date and time at which the reporting snapshot ran
 - The name of the source report, target object, and running user
 - The time it took for the reporting snapshot to run
 - The total number of detail or summary rows in the source report, depending on the report type
 - The number of records created in the target object
 - Whether or not the reporting snapshot ran successfully

SEE ALSO:

[Report on Historical Data with Reporting Snapshots](#)

[Create a Custom Report in Accessibility Mode](#)

Define a Reporting Snapshot

After you create a source report, target object, and target object fields, you can define your reporting snapshot. You define a reporting snapshot by naming it and choosing the source report that will load report results into the target object you specify when the reporting snapshot runs.

1. From Setup, enter "Reporting Snapshots" in the `Quick Find` box, then select **Reporting Snapshots**.
2. Click **New Reporting Snapshot**.
3. Enter a name, unique name, and description for your reporting snapshot.
4. Choose a user in the `Running User` field by clicking the lookup icon.

The user in the `Running User` field determines the source report's level of access to data. This bypasses all security settings, giving all users who can view the results of the source report in the target object access to data they might not be able to see otherwise.

Only users with the "Modify All Data" permission can choose running users other than themselves.

5. Select a report from the `Source Report` drop-down list.

The report you choose determines the report results that will load as records into the target object when the reporting snapshot runs.

You can choose any custom tabular or summary report as the source report, except legacy forecast reports, Quota vs Actual reports, and Leads by Source reports. The `Source Report` drop-down list does not display standard reports.

6. Select a custom object from the `Target Object` drop-down list.

The custom object you choose will receive the source report's results as records when the reporting snapshot runs.

If a record used for an reporting snapshot has no record type associated with it, the record type of the running user is associated with the reporting snapshot by default.

7. Click **Save** to save the definition of your reporting snapshot, or click **Save & Edit Field Mappings** to save your reporting snapshot and map its fields.
8. [Map the fields](#) on the source report to the fields on the target object.

SEE ALSO:

[Standard Report Types](#)

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited, and Developer** Editions

USER PERMISSIONS

To create, save, and schedule a reporting snapshot:

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To run a reporting snapshot as a running user and add the results to a custom object, the running user must have:

- Run Reports

AND

Create on the target object

Map Reporting Snapshot Fields

After you create a source report, target object, target object fields, and define your reporting snapshot, you can map the fields on your source report to the fields on your target object. You map source report fields to target object fields so that when the report runs, it automatically loads specific target object fields with data from specific source report fields.

1. From Setup, enter *Reporting Snapshots* in the *Quick Find* box, then select **Reporting Snapshots**.
2. Select the name of the reporting snapshot whose fields you want to map.
3. Click **Edit** on the Field Mappings section.
4. For summary reports, select the *Grouping Level* at which summary data is extracted from the source report. Data loaded into the target object is taken from summary fields at the grouping level you specify. The *Grand Summary* summarizes on the total for all grouping levels.
5. In the Fields from Source Report column, click a *Load No Data* drop-down list and select a field from the source report to map to a custom object field in the Fields in Target Object column. Only summary fields can be mapped for reporting snapshots based on summary reports. Note that the fields for summary reports may vary depending on the grouping level selected.
6. Click **Quick Save** to save field mappings and continue mapping fields, or click **Save** to save field mappings and return to the reporting snapshot's detail page.
7. Next, [schedule](#) the reporting snapshot to run.

Considerations for Mapping Reporting Snapshot Fields

- You must map at least one field from the source report to one field on the target object or data will not load from the source report to the target object when the reporting snapshot runs.
- You can only map fields with compatible data types. For example, you can map a currency field to a number field.
- A custom summary formula can be mapped only if the grouping level in the reporting snapshot and the grouping level in the custom summary formula match.
- If you select *Load No Data* in the Fields from Source Report column, no data will load into the corresponding field in the Fields in Target Object column when the reporting snapshot runs..
- The *(No fields with compatible data type)* field displays in the Fields from Source Report column when a field on the target object does not match the data type of a field on the source report.
- The fields on the target object determine field mapping availability. For example, your source report may include ten fields, but if your target object includes one field, then you can only map one field in your reporting snapshot.
- You cannot map fields from the source report to the following fields on the target object: *Created By*, *Last Modified By*, *Created Date*, and *Last Modified Date*.
- When you map fields from the source report to the target object, some data may lose its context when loaded to the target object. For example, if you map a date and time field from the source report to a text field on the target object, the date and time load to the target object without the time zone.
- When executing a reporting snapshot, if the running user does not have "read" or "write" access to a mapped field in the target object, that field is dropped from the mapping, but does not cause the execution to fail. If a required field in the target object is not mapped, the execution fails. To ensure that fields are always mapped, make them required or set default values for them.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

USER PERMISSIONS

To create, save, and schedule a reporting snapshot:

- Manage Reporting Snapshots

To run a reporting snapshot as a running user and add the results to a custom object, the running user must have:

- Run Reports

AND

Create on the target object

- To map a field in the source report to a lookup field on the target object, you must map to the ID of the object associated with the lookup. For example, to map to an opportunity lookup field, you must map to the `Opportunity ID`. To get the `Opportunity ID` in the source report, you may need to use a custom report type to include ID and other related fields.

SEE ALSO:

- [Report on Historical Data with Reporting Snapshots](#)
- [Build a Custom Summary Formula](#)

Schedule and Run a Reporting Snapshot


After you create a source report, target object, target object fields, define your reporting snapshot, and map its fields, you can schedule when it runs. You can schedule a reporting snapshot to run daily, weekly, or monthly so that data from the source report is loaded into the target object when you need it.

The number of reporting snapshots you can schedule to run is determined by your Edition. After a reporting snapshot has run, you can send an email notification to yourself and other users that includes details about the reporting snapshot run, such as the date and time it ran, whether it ran successfully, and how many records were loaded into the target object from the source report. Also, the notification includes a link to the reporting snapshot detail page in Salesforce.

- From Setup, enter “Reporting Snapshots” in the `Quick Find` box, then select **Reporting Snapshots**.

- Select the name of the reporting snapshot that you want to schedule to run.

Reporting snapshots will not run as scheduled if the user in the `Running User` field does not have access to the folder in which the source report is stored.

 **Note:** If the running user becomes inactive, the report doesn't run. Salesforce sends an email notification to either activate the user, delete the report schedule, or change the running user to an active one. Salesforce sends the notification to users with the “Manage Users,” “Modify All Data,” and “Manage Billing” permissions. If no user has all these user permissions, Salesforce sends the notification to users with the “Manage Users” and “Modify All Data” user permissions.

- Click **Edit** on the Schedule Reporting Snapshot section.

The Schedule Reporting Snapshot section on a reporting snapshot detail page displays details on when the reporting snapshot is scheduled to run.

- Select a notification setting to send an email when the reporting snapshot finishes running:

- Click **Me** to send an email to the email address specified on your Salesforce user record.
- Click **Others . . .** to send an email to additional users. You can only send reporting snapshot notifications to email addresses included on Salesforce user records. Furthermore, you can only select Users and Public Groups in the `Search` drop-down list.

- Schedule the reporting snapshot to run:

- In the `Frequency` field, select the frequency at which the reporting snapshot runs. When you click the `Daily`, `Weekly`, or `Monthly` fields, more options display that allow you to refine frequency criteria.

If you schedule a reporting snapshot to run on a specific day of every month, the reporting snapshot will only run on months that have that specific day. For example, if you schedule a reporting snapshot to run on the 31st day of every month, then the

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited, and Developer** Editions

USER PERMISSIONS

To create, save, and schedule a reporting snapshot:

- Manage Reporting Snapshots

To run a reporting snapshot as a running user and add the results to a custom object, the running user must have:

- Run Reports
- AND
- Create on the target object

reporting snapshot will only run on months that have 31 days. If you want a reporting snapshot to run on the last day of every month, choose last from the `On day of every month` drop-down list.

- In the `Start` and `End` fields, specify the dates during which you wish to schedule the reporting snapshot to run.
- In the `Preferred Start Time` drop-down list, click the **Find available options...** link to choose a preferred start time for the reporting snapshot to run.
 - Your preferred start time may not be available if other users have already selected that time to run a reporting snapshot or your organization has reached its reporting snapshot limit.
 - Reporting snapshots run in the time zone of the user who schedules the run. For example, if the `Time Zone` field on your user record is set to Pacific Standard Time, and you schedule a reporting snapshot to run every day at 2:00 PM, then the reporting snapshot will run every day at 2:00 PM Pacific Standard Time.
 - If you view and save a schedule in a time zone different from the one in which it was previously scheduled, the time slot could potentially change.
 - The reporting snapshot runs within an hour of the time you select in the `Preferred Start Time` drop-down list. For example, if you select 2:00 PM as your preferred start time, the reporting snapshot may run any time in between 2:00 PM or 2:59 PM, depending on how many other reporting snapshots are scheduled to refresh at that time.

6. Click **Save** to schedule the reporting snapshot to run.

When the reporting snapshot runs, it adds new records to the target object.

Optionally, once you have scheduled a reporting snapshot to run, you can perform the following actions after you click **Edit** on the Schedule Reporting Snapshot section of a reporting snapshot detail page:

- Click **Edit** to update the notification and frequency settings of the reporting snapshot.
- Click **Delete** to permanently delete the existing schedule of when the reporting snapshot runs.

A reporting snapshot will fail during a scheduled run if:

- The source report includes more than 100 fields
- The source report was changed from summary to tabular
- The selected grouping level for a summary source report is no longer valid
- The running user does not have access to the source report
- The running user does not have the “Run Reports” permission
- The target object has more than 100 custom fields
- The target object contains validation rules
- The target object is included in a workflow
- The target object is a detail object in a master-detail relationship
- The target object runs an Apex trigger when new records are created on it
- The running user does not have the “Create” permission on the target object. Note that if the target object's status is `In Development`, the running user must have the “Customize Applications” permission.

Manage Reporting Snapshots

After you set up a reporting snapshot, you can view details about it and edit and delete it. From Setup, enter *Reporting Snapshots* in the *Quick Find* box, then select **Reporting Snapshots** to display the Reporting Snapshots page, which shows the list of reporting snapshots defined for your organization.

From the Reporting Snapshots page, you can:

- Select a list view from the *View* drop-down list to go directly to that list page, or click **Create New View** to define your own custom view.
- Define a new reporting snapshot by clicking **New Reporting Snapshot**.
- Update the reporting snapshot name, description, running user, source report, and target object by clicking **Edit** next to its name. Only users with the “Modify All Data” permission can choose running users other than themselves. If you have the “Customize Application” permission, enter a unique name to be used by the API and managed packages.

If you change the source report or target object on a reporting snapshot with existing field mappings, the field mappings are deleted when you save the reporting snapshot. You can also view *Summary Fields in Source Report* and *Fields in Target Object* to see the number of summary or target fields, respectively.

- Delete a reporting snapshot by clicking **Del** next to its name. After the reporting snapshot is deleted, it cannot be restored from the Recycle Bin.

! **Important:** When you delete a reporting snapshot, the source report and target object aren’t deleted; however, when the source report runs, it won’t load the target object with data.

You can delete the schedule of when a reporting snapshot runs. You can’t stop or pause a reporting snapshot when it is running, nor can you delete its source report. To delete the source report, you must first remove the report from the reporting snapshot by changing the report in the *Source Report* drop-down list.

- Display detailed information about a reporting snapshot and customize it further by clicking its name. Then you can:
 - Click links in the Identification section that redirect you to the reporting snapshot running user, source report, and target object. In addition, you can view the preferred date and time at which the reporting snapshot will approximately run next in the *Next Run* field, and view the date and time at which it last ran in the *Last Run* field.
 - Click **Edit** in the Field Mappings section to further customize the fields mapped from the source report to the target object.

The Reporting Snapshot Field Mappings section displays which source report fields are mapped to the target object’s fields. You can view the number of fields in the source report available for mapping to the target object in the *Columns in Source Report* field. Also, you can view the number of fields available for mapping in the target object in the *Fields in Target Object* field.
 - Click **Edit** in the Schedule Reporting Snapshot section to schedule when to run the reporting snapshot.

The Schedule Reporting Snapshot section displays details about when the reporting snapshot is currently scheduled to run.
 - The Run History section displays details about when the reporting snapshot ran. Details include:
 - The date and time at which the reporting snapshot ran
 - The name of the source report, target object, and running user
 - The time it took for the reporting snapshot to run

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited, and Developer** Editions

USER PERMISSIONS

To create, save, and schedule a reporting snapshot:

- Manage Reporting Snapshots

To run a reporting snapshot as a running user and add the results to a custom object, the running user must have:

- Run Reports
- AND
- Create on the target object

- The total number of detail or summary rows in the source report, depending on the report type
- The number of records created in the target object
- Whether or not the reporting snapshot ran successfully

Up to 200 records are stored in the Run History section. After 200 records are stored, the oldest record is automatically deleted and cannot be retrieved from the Recycle Bin.

SEE ALSO:

[Report on Historical Data with Reporting Snapshots](#)

Troubleshoot Reporting Snapshots

The Run History section of a reporting snapshot detail page displays if a reporting snapshot ran successfully or not. When a reporting snapshot fails during a scheduled run, the failure is noted in the `Result` column. To view the details of a run, click the date and time of the run in the `Run Start Time` column.

Tip:

- If the `Total Row Number` is blank, the run failed before the report was completed (for example, the report was invalid or the running user is inactive).
- When a reporting snapshot runs, it can add up to 2000 new records to the target object. Any records over 2000 are recorded in the Row Failures related list. If the `Total Row Number` is blank and the run history indicates “Some rows failed,” the report likely contained more than 2000 summaries.
- The details of a failed run are available on the Row Failures related list for 14 days before they are automatically deleted. You cannot retrieve details about row failures from the Recycle Bin.
- If you have a unique field in the target object, and records in the report have more than one of the same value in the column mapped to that unique field, duplicate records are not added. The run history indicates when records are not added to the reporting snapshot.
- If field mappings failed, the snapshot still runs, but the run history shows that there was a partial error.

A reporting snapshot could fail during a scheduled run for a number of reasons. This table lists the errors a failed run may display and how the errors can help you troubleshoot the reporting snapshot so that it will run successfully.

Running user does not have permission to run reports.

The user in the `Running User` field does not have the “Run Reports” or “Create and Customize Reports” permission. Choose a user with the appropriate permissions or enable the appropriate permissions for the running user.

Cannot run reporting snapshot because source report has been deleted.

The report in the `Source Report` field was deleted and no longer available to run. Choose another source report for your reporting snapshot or restore the deleted report from the Recycle Bin.

Running user does not have permission to access source report.

The user in the `Running User` field does not have access to the folder in which the source report is stored. Choose a user with access to the source report or provide the existing running user with access to the folder in which the source report is stored.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To create, save, and schedule a reporting snapshot:

- Manage Reporting Snapshots

To run a reporting snapshot as a running user and add the results to a custom object, the running user must have:

- Run Reports

AND

Create on the target object

Source report definition is obsolete.

The report in the `Source Report` field references a custom or external object that is no longer available for reports or the relationships between the objects in the report have changed.

Source report definition is invalid.

The report in the `Source Report` field cannot run because it contains invalid formulas or filter criteria. Update the report so that it can run without errors.

Running user does not have permission to access report type.

The user in the `Running User` field does not have permission to access a report type associated with the report in the `Source Report` field. Choose a running user that has the correct permissions or provide the existing running user with the appropriate permissions.

Source report must be tabular.

The report in the `Source Report` field is no longer in tabular format. Choose a new source report or update the existing source report's format to tabular.

Source report last saved with details hidden on report results.

The report in the `Source Report` field was saved with its details hidden. To display the details of the source report, view the report, click the **Show Details** button, and save the report.

Target object has been deleted or is inaccessible to running user.

The custom object in the `Target Object` field has been deleted or the user in the `Running User` field does not have permission to access the target object. Restore the deleted custom object, choose a new target object, or provide the existing running user with "Create" permissions to the custom object in the `Target Object` field. Note that if the custom object's status is `In Development`, the running user must have the "Customize Application" permission to access the target object.

Running user does not have permission to edit target object.

The user in the `Running User` field does not have "Create" permissions on the custom object in the `Target Object` field. Choose a running user that has such permissions or provide the existing running user with "Create" permissions to the custom object in the `Target Object` field.

Target object must not be a detail object in a master-detail relationship.

The custom object in the `Target Object` field is a detail object in a master-detail relationship, meaning that a master object controls certain behaviors on the target object's records. Choose a target object that is not included in a master-detail relationship.

Target object must not be included in a workflow.

The custom object in the `Target Object` field is included in a workflow. Choose a target object that is not included in a workflow.

Target object must not include an insert trigger.

An Apex trigger runs when new records are created for the custom object in the `Target Object` field. Remove the Apex trigger or choose a target object for which an Apex trigger does not run when new records are created.

Target object must not include validation rules.

The custom object in the `Target Object` field contains validation rules. Choose a target object that does not contain validation rules or delete validation rules from the existing target object.

Running user is inactive.

The user in the `Running User` field is no longer active. Choose an active user.

One or more required fields on the target object are not mapped.

One or more required fields on the target object are not mapped. Map all required fields on the target object to fields on the source report.

Source report contains too many fields, has a formula field with too many functions, or contains too many criteria.

The report in the `Source Report` field contains too many fields, criteria, or functions within a formula field. Remove any unnecessary fields, criteria and functions within formula fields from the source report.

Source report cannot have more than 100 selected columns.

The report in the `Source Report` field contains more than 100 fields. Remove any unnecessary fields from the source report.

Target object cannot have more than 100 custom fields.

The custom object in the `Target Object` field contains more than 100 custom fields. Remove any unnecessary fields from the target object.

Your report exceeded the time limit for processing.

The report in the `Source Report` field may contain too much data to process. Reduce the amount of data the report processes when running by limiting the report's date range and remove any unnecessary fields from the source report.

This Reporting Snapshot Unique Name already exists. Please choose a unique name.

The new snapshot you are trying to create has the same unique name as that of an existing snapshot.

A summary field did not return a valid number.

A summary field in the results has not returned a valid number. For example, the field may have attempted to divide by 0. Check your formulas and test for 0 and "null" in calculations if they appear in your data.

There is a problem with this reporting snapshot. The source report format was changed from tabular to summary. The field mappings in the reporting snapshot are no longer correct. You can change the report format back to tabular or update the field mappings in the snapshot definition.

The source report format was changed from tabular to summary, which made the field mappings in the reporting snapshot incorrect. To fix this error, either change the report format back to tabular or update the field mappings in the snapshot definition. This error only applies to reporting snapshots with summary reports.

There is a problem with this reporting snapshot. Source report must be tabular or summary.

The source report format must be either tabular or summary. Matrix reports cannot be used with reporting snapshots.

The grouping level you specified in the reporting snapshot is no longer valid. The running user may no longer have access to that field, the grouping level may have been removed from the source report, or the grouping level was never set.

This error may result when the running user no longer has access to the field specified in the grouping level, or the grouping level was removed from the source report or was never set. This error only applies to reporting snapshots with summary reports. Make sure the running user has access to all necessary fields.

SEE ALSO:

[Creating a Custom Report](#)

Run and Read a Report

Click on a report's name to run it. After running a report, there are a series of tools you can use to help you read the information.

From the report run page in Lightning Experience, you can:

- Show or hide a report chart.
- Edit report filters (except for locked filters).
- Launch the report builder to edit the report.
- Refresh the report.
- Subscribe to the report.
- Export the report.
- Delete the report.

From the report run page in Salesforce Classic, you can:

- Display a Chatter feed of updates and posts about the report.
- View `Report Generation Status`.
- Choose hierarchy options.
- Change top-level groupings using the `Summarize information by` drop-down.
- Change `Time Frame` and `View` options.
- Click **Run Report** to immediately run or schedule the report.
- Click **Show Details** to view all data or **Hide Details** to show only summary information.
- Click **Customize** to open the report in report builder.
- Print or export the report.
- Click **Subscribe** to set up report notifications, which notify you whenever certain metrics in the report meet your conditions.
- Click **Edit** next to the chart to change its properties, or click **Large**, **Medium**, or **Small** to change its size.
- Sort report results.
- Edit or clear applied filter criteria.
- For summary and matrix reports, filter selected rows by a particular field. Select the rows you want to view, choose a field to group by, then click **Drill Down**. For example, if you created an opportunity report that displays deals by industry, you can select the industries that are doing well and group by `Product Name` to see which products are selling in that industry. Click **Clear** to remove the drill-down filter.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To run reports:

- **Legacy Folder Sharing**
Run Reports
- **Enhanced Folder Sharing**
Run Reports

To view reports:

- **Legacy Folder Sharing**
View All Data
- **Enhanced Folder Sharing**
View Reports in Public Folders

Export and Connect Reports to Other Tools

Export or connect a report to another tool, such as Quip, to work with report data outside of Salesforce.

IN THIS SECTION:

[Export a Report](#)

To work with report data in a dedicated tool, such as a spreadsheet, export report data as a Microsoft Excel® (.xlsx) or comma-separated values (.csv) file.

[Open a Report in Quip](#)

Take full advantage of Quip's living documents by working with connected report data in a Quip spreadsheet. @Mention colleagues to discuss data through real-time discussion threads. Harness hundreds of spreadsheet functions. And add spreadsheets into other Quip docs.

[Report on Salesforce Data with Excel](#)

Connect for Office includes an Excel add-in that enables you to securely access your Salesforce reports with Microsoft® Excel®. You create the reports you need in Salesforce, then pull them into an Excel worksheet, and use Excel's formulas, charts, and pivot tables to customize and analyze your data. When Salesforce disables TLS 1.0, we're ending support for Connect for Office.


Export a Report

To work with report data in a dedicated tool, such as a spreadsheet, export report data as a Microsoft Excel® (.xls) or comma-separated values (.csv) file.


You can export an unlimited number of report rows and columns. Most spreadsheet tools have a per-file row and column limit. Common tool-imposed limits are 1,048,576 rows by 16,384 columns, or 65,536 rows by 256 columns.

When exporting reports in the comma-separated values (.csv) format, the locale settings on your user detail page determine the field separator (delimiter) included in the exported file. For example, if your locale setting is English (United States), then the decimal separator is a period ("."). If your locale setting is French (France), then the decimal separator is a comma (","). You can override the default separator for your locale by choosing Comma Delimited (non-locale) .csv from the `Format` dropdown list.

Excel does not display the field separator in .csv format. If you want to work with .csv files in Excel, we recommend that your locale setting in Salesforce match your Regional Options setting in Windows.

- From Reports, next to the report you want to export, click  > **Export**.
 - If you set the "Do not save encrypted pages to disk" option in Internet Explorer, you can't open your report online in Excel. Instead, save the exported report to your computer, and then open it in Excel. To change this setting in Internet Explorer, deselect "Do not save encrypted pages to disk" under Internet options.
 - Reports in the joined format can't be exported, but you can choose a printable view.
- Set an `Encoding` appropriate for your language.
- Set the `Format` to **Excel Format .xls** or **Comma Delimited .csv**.
- Click **Export**.
- If prompted by a browser dialog, choose to save the file.

Your exported report downloads.

 **Note:** For security purposes, Salesforce can require users to pass a CAPTCHA user verification test to export data from their org. This simple text-entry test prevents malicious programs from accessing your org's data. To pass the test, users must correctly type the two words displayed in the overlay's text box. The words entered in the text box must be separated by a space.

SEE ALSO:

[Run Reports in the Background](#)

[Print a Report](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Essentials, Group, Professional, Enterprise, Performance, Unlimited, and Developer Editions**

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To export reports:

- Legacy Folder Sharing**
Export Reports
- Enhanced Folder Sharing**
Export Reports

Open a Report in Quip

Take full advantage of Quip's living documents by working with connected report data in a Quip spreadsheet. @Mention colleagues to discuss data through real-time discussion threads. Harness hundreds of spreadsheet functions. And add spreadsheets into other Quip docs.

EDITIONS

Available in: Lightning Experience

Available in: **Essentials, Group, Professional, Enterprise, Performance, Unlimited, and Developer Editions**

USER PERMISSIONS


To open reports in Quip:

- Run Reports

The screenshot shows a Salesforce report interface. At the top, there's a search bar and navigation tabs for Sales, Home, Chatter, Campaigns, Leads, Accounts, Contacts, Opportunities, Tasks, Files, Forecasts, Dashboards, and More. Below the navigation is a report header for 'Closed Business' with summary statistics: Total Records: 90, Total Amount: \$3,792,432.00. A table of report data is displayed with columns: OPPORTUNITY OWNER, OPPORTUNITY NAME, ACCOUNT NAME, TYPE, STAGE, AMOUNT, and CLOSE DATE. A context menu is open over the table, showing options: Clone, Save, Subscribe, Export, Delete, and Open in Quip (which is highlighted by a mouse cursor).

OPPORTUNITY OWNER	OPPORTUNITY NAME	ACCOUNT NAME	TYPE	STAGE	AMOUNT	CLOSE DATE
Cindy Central	Open Source Inc. - Services - 4K	Open Source Inc.	Services	Closed Won	\$3,800.00	6/9/2015
Ely East	Opportunity Resources Inc - Services - 3K	Opportunity Resources Inc	Services	Closed Won	\$2,600.00	6/16/2015
Sarah Phillips	Jones Audio Corp - Services - 3K	Jones Audio Corp	Services	Closed Won	\$2,600.00	7/16/2015
Ely East	Opportunity Resources Inc - Services - 1K	Opportunity Resources Inc	Services	Closed Won	\$660.00	9/1/2015
Kasey Central	Permadyne - Services - 20K	Permadyne GmbH, LTD	Services	Closed Won	\$20,000.00	9/1/2015
Sarah Phillips	Jones Audio Corp - Services - 21K	Jones Audio Corp	Services	Closed Won	\$20,800.00	9/1/2015
Wendy West	Morpon Brothers - Services - 30K	Morpon Brothers	Services	Closed Won	\$30,000.00	10/2/2015
Cindy Central	Missoula & Sons Inc. - New Business - 25K	Missoula & Sons Inc.	New Business	Closed Won	\$25,200.00	10/2/2015
Wendy West	Morpon Brothers - New Business - 32K	Morpon Brothers	New Business	Closed Won	\$33,267.00	10/30/2015
Cindy Central	Aims Social, Inc. - Services - 46K	Aims Social, Inc.	Services	Closed Won	\$46,000.00	11/28/2015
Paul Partner	Tech Labs - New Business - 41K	Tech Labs	New Business	Closed Won	\$41,700.00	12/30/2015
Jamie Green	Red Studio Designs - Services - 14K	Red Studio Designs	Services	Closed Won	\$13,700.00	2/14/2016
Wendy West	Global Systems - New Business - 23K	Global Systems	New Business	Closed Won	\$22,700.00	2/14/2016
Cindy Central	Big Sky & Sons - Services - 16K	Big Sky & Sons	Services	Closed Won	\$16,000.00	2/29/2016
Cindy Central	Allied Technologies - New Business - 27K	Allied Technologies	New Business	Closed Won	\$26,800.00	3/1/2016
Cindy Central	Allied Technologies - Services - 22K	Allied Technologies	Services	Closed Won	\$22,000.00	3/31/2016

Opening a report in Quip connects the report with a Quip spreadsheet. Once connected, the spreadsheet automatically gets refreshed report data from Salesforce, and the spreadsheet links back to records in Salesforce. For example, the Account Name column links back to Account records.

1. Run the report you want to open in Quip.
2. Click  > **Open in Quip**.
3. If prompted, sign in to Quip.


Your report opens in Quip.

Manage connected report data in the Quip spreadsheet by clicking **Live Data** and hovering over the name of the connected Salesforce report. From the Live Data menu, you can:

- Open the report in Salesforce.
- Manually refresh the report to get the latest data in Quip.
- Turn automatic report refreshes on or off. When automatic refresh is on, then Quip gets the latest refreshed report data from Salesforce whenever you open the spreadsheet.
- Delete the connection between the Salesforce report and the Quip spreadsheet. Deleting the connection doesn't delete the Salesforce report nor the Quip spreadsheet.

Report on Salesforce Data with Excel

Connect for Office includes an Excel add-in that enables you to securely access your Salesforce reports with Microsoft® Excel®. You create the reports you need in Salesforce, then pull them into an Excel worksheet, and use Excel's formulas, charts, and pivot tables to customize and analyze your data. When Salesforce disables TLS 1.0, we're ending support for Connect for Office.

 **Important:** When [Salesforce disables TLS 1.0](#), we're ending support for Connect for Office. This change means that there's no guarantee that Connect for Office can establish a connection between Salesforce and Microsoft® Word or Excel. Even if sales reps can establish a connection, Salesforce no longer provides support or maintenance when there's an issue.

The Excel add-in provides the same access to reports and fields that you normally experience in Salesforce. You can distribute your customized Excel worksheets via the Documents tab, allowing all users to track customized analytics in real time. You can reference data from multiple reports in one worksheet to create a single-page overview of key metrics.

Communication between Excel and Salesforce uses the same secure HTTPS protocol as when you log in via your Web browser.

IN THIS SECTION:

1. [Install Connect for Office](#)
When Salesforce disables TLS 1.0, we're ending support for Connect for Office.
2. [Log Into Connect for Office](#)
You need to log in to Salesforce before you can request data from your Salesforce reports. When Salesforce disables TLS 1.0, we're ending support for Connect for Office.
3. [Import Reports Into Excel with Connect for Office](#)
Import your custom or standard Salesforce reports into Excel so you can further analyze the data using Excel's formulas, charts, and pivot tables. When Salesforce disables TLS 1.0, we're ending support for Connect for Office.
4. [Refresh and Update Data with Connect for Office](#)
Keep your Salesforce reports up to date in Excel by periodically refreshing the report data and any pivot tables you have created. When Salesforce disables TLS 1.0, we're ending support for Connect for Office.

Install Connect for Office

When Salesforce disables TLS 1.0, we're ending support for Connect for Office.

EDITIONS


Available in: **Salesforce Classic**

Available in all editions



USER PERMISSIONS

To access Salesforce reports from Excel:

- **Run Reports**
- AND
- Export Reports**

 **Important:** When [Salesforce disables TLS 1.0](#), we're ending support for Connect for Office. This change means that there's no guarantee that Connect for Office can establish a connection between Salesforce and Microsoft® Word or Excel. Even if sales reps can establish a connection, Salesforce no longer provides support or maintenance when there's an issue.

The system requirements for Connect for Office are:


- Microsoft® Office 2007
 - Microsoft® Windows Vista® (32-bit only) - Until [Salesforce disables TLS 1.0](#).
1. Close all Microsoft® Office programs, including Word, Excel®, and Outlook®.
 2. From your personal settings, enter *Office* in the *Quick Find* box, then select **Connect for Office**.
 -  **Tip:** If you can't see the download page, ask your administrator for access.
 3. Click **Install Now**.
 4. Click **Yes** when prompted to install Connect for Office. We recommend that you install Connect for Office to the default folder suggested by the installer.
 5. After the installation completes, open Excel or Word, and select the **Salesforce** menu to begin using Connect for Office.
 6. The first time you open Word, you are prompted to enable macros from Salesforce. You must enable the macros and accept Salesforce as a macro publisher to use the Word add-in.
-  **Note:** The Connect for Office installer edits the registry on your computer. If your organization imposes security that prevents you from editing the registry, log in as the administrator of your machine before installing Connect for Office or contact your IT department for assistance.

SEE ALSO:


[Personalize Your Salesforce Experience](#)

Log Into Connect for Office

You need to log in to Salesforce before you can request data from your Salesforce reports. When Salesforce disables TLS 1.0, we're ending support for Connect for Office.

 **Important:** When [Salesforce disables TLS 1.0](#), we're ending support for Connect for Office. This change means that there's no guarantee that Connect for Office can establish a connection between Salesforce and Microsoft® Word or Excel. Even if sales reps can establish a connection, Salesforce no longer provides support or maintenance when there's an issue.

1. Open Excel.
2. In Microsoft Office 2003 and earlier, select **Log In** from the **Salesforce** drop-down menu on the Excel toolbar. In Microsoft Office 2007, select the Salesforce tab on the Ribbon, click the **Reporting** drop-down menu, and then select **Log In**.
3. Enter your Salesforce username and password.
4. Click **Login**.

 **Note:** If your organization restricts IP addresses, logins from untrusted IPs are blocked until they're activated. Salesforce automatically sends you an activation email that you can use to log in. The email contains a security token that you must add to the end of your password. For example, if your password is *mypassword*, and your security token is *XXXXXXXXXX*, you must enter *mypasswordXXXXXXXXXX* to log in.


EDITIONS

Available in: Salesforce Classic


Available in all editions

Import Reports Into Excel with Connect for Office

Import your custom or standard Salesforce reports into Excel so you can further analyze the data using Excel's formulas, charts, and pivot tables. When Salesforce disables TLS 1.0, we're ending support for Connect for Office.


 **Important:** When [Salesforce disables TLS 1.0](#), we're ending support for Connect for Office. This change means that there's no guarantee that Connect for Office can establish a connection between Salesforce and Microsoft® Word or Excel. Even if sales reps can establish a connection, Salesforce no longer provides support or maintenance when there's an issue.

1. Create a custom report in Salesforce. You can also use any of the standard reports.
2. Open a blank worksheet in Excel.
3. Select the Salesforce tab on the Ribbon, click the **Reporting** drop-down menu, and then select **Import a Report...**

 **Note:** In Microsoft Office 2003 and earlier, select **Import a Report...** from the **Salesforce** drop-down menu on the Excel toolbar.

4. Select a report from the list of standard and custom Salesforce reports available to you.
5. Specify where you want to put the report data in your Excel file.
 - a. Enter the name of your Excel worksheet in the `Destination worksheet` field.
 - b. In the `Cell` field, enter the uppermost cell where you want to begin putting the data.

If the specified worksheet and cells already contain report data, Connect for Office moves the existing data over to make room for the new report data.

 **Tip:** Avoid renaming worksheets that contain imported reports. When you do that the connection between the worksheet and your report is lost. You must import the report again to refresh the data.


6. Choose **Raw Data** to import the data without formatting, subtotals, or grand totals. Choose **Formatted** to keep the colors, fonts, subtotals, and grand totals from the Salesforce report.

This is useful for importing large matrix reports with the data already summarized into a small table.

 **Tip:**

- The **Raw Data** option is best if you're importing summary or matrix reports for use with Excel formulas and pivot tables.
- Use the **Formatted** option if you're importing large matrix reports with the data already summarized into a small table.

7. Click **OK**.

 **Tip:** You can copy and paste data from Excel into other Office applications. Use the **Paste Special** option, rather than **Paste**, to reference the Excel data as a worksheet object. If the data then changes in Excel, you can right-click the object and update it automatically. See the Microsoft Word help for more information.

Refresh and Update Data with Connect for Office

Keep your Salesforce reports up to date in Excel by periodically refreshing the report data and any pivot tables you have created. When Salesforce disables TLS 1.0, we're ending support for Connect for Office.

EDITIONS


Available in: Salesforce Classic

Available in all editions

USER PERMISSIONS

To access reports in Excel:

- Run Reports
- AND
- Export Reports

-  **Important:** When [Salesforce disables TLS 1.0](#), we're ending support for Connect for Office. This change means that there's no guarantee that Connect for Office can establish a connection between Salesforce and Microsoft® Word or Excel. Even if sales reps can establish a connection, Salesforce no longer provides support or maintenance when there's an issue.

After logging into Salesforce, select any of the following options from the **Salesforce** Ribbon tab (or toolbar in Office 2003 and earlier):

- **Refresh Existing Reports...** - Allows you to choose which reports you want to update in Excel.
 1. From the list of reports you have imported, select the reports to update.
 2. Optionally, select **Update Pivot Tables** to update any pivot tables you have created in Excel for the selected reports. The **Refresh All Reports** menu choice does this automatically.
 3. Click **Refresh Selected** to update the report data.

To remove reports from this list, select the report names and click **Delete Selected**. The reports are not removed from your Excel worksheet or from Salesforce, only from the list of reports available for refreshing.
- **Refresh All Reports** - Refreshes all of the reports that you have imported into your Excel file, including the pivot tables referenced by those reports.

 **Tip:**

- If you write a formula, select an entire column rather than a range of cells, because the number of rows in your report may change when you refresh the report data. For example, use `=Sum (Sheet2!E:E)` to sum column E rather than `=Sum (Sheet2!E1:E200)`.
- If you use the `VLOOKUP` and `HLOOKUP` functions in Excel to join data across different cell ranges, these functions may make report record IDs, which are 15-character alphanumeric IDs, case-sensitive. Make sure to use the correct case when identifying report records. See the Microsoft Excel help for more information.

Organize Reports

Keep your reports at your fingertips by sorting them into folders and deleting unused reports. If you have a lot of reports, you can use the search field to find the one you need.

IN THIS SECTION:

1. [Find a Report](#)
Search for a report by name, description, or who created it or modified it last. Filter, sort, or search within a selected folder to refine your results.
2. [Get the Information You Need From the Reports Tab List View](#)
To see the information you want to see about your reports, you can resize, hide, reorder, sort columns, and select the number of records to display in your list view on the Reports tab.
3. [Print a Report](#)
Print a report from the run page of a report using your browser's print function.
4. [Keep Favorite Report Folders In View](#)
Pin your most-used report and dashboard folders to the top of the folder list so you don't have to scroll down every time you need them.
5. [Hide Unused Report Types](#)
If your users use only a subset of the available standard report types, you can hide the ones they don't need.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

6. [Run Reports in the Background](#)

Run large reports in the background so you can keep working in Salesforce without waiting for results to display. This is a good way to run data-intensive reports that might otherwise time out due to the large number of report results.

7. [Deliver Your Report](#)

To get the information in your report to the people who need it, you can share the report’s URL, make the report available for Chatter feeds, or export the data to another tool, such as Excel. You can also set the report to run on a schedule so that viewers always have the latest information.

8. [Embedded Report Charts](#)

Typically, users have had to navigate to the Reports tab to find data. But you can give them valuable information directly on the pages they visit often. To do that, embed report charts in detail pages for objects. When users see charts on pages, they are empowered to make decisions based on the data they see in the context of the page without going elsewhere. For example, an opportunity record shows important data directly on its detail page.

9. [Delete a Report](#)

You can delete a selected report from the Reports tab or from its run page.

Find a Report

Search for a report by name, description, or who created it or modified it last. Filter, sort, or search within a selected folder to refine your results.

1. On the Reports tab, type in the search box.

Search looks up all folders. Filters are set to *All Items* and *All Types* to display all of the folder’s contents.

Salesforce searches these fields: **Name, Description, Last Modified By, or Created By**. Results are based on an exact match of what you typed with those fields.

If tagging is enabled and added to a custom report or dashboard, search by its tag in the global search box.

2. Refine results using these options:

To refine results by Do this

Type	Select a filter: <ul style="list-style-type: none"> • <i>Reports</i> • <i>Dashboards</i> • <i>All Types</i> <p>Type filters don’t apply to report templates in standard report folders.</p>
View	Select a filter: <ul style="list-style-type: none"> • <i>All Items</i> • <i>Recently Viewed</i> • <i>Items I Created</i> • <i>Items I’m Following</i> <p>View filters.</p>

EDITIONS

Available in: Salesforce Classic and Lightning Experience


Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To search for reports:




- **Legacy Folder Sharing**
Run Reports
- **Enhanced Folder Sharing**
Run Reports AND access to the reports folder

To refine results by	Do this
A selected folder	Select a folder, then type in the search box. Filters are set to <i>All Items</i> and <i>All Types</i> to display all of the folder's contents.
Sorting	Click  for the column and select Sort Ascending or Sort Descending . Sorting applies to all items in the list view, including the ones on subsequent pages.

Get the Information You Need From the Reports Tab List View

To see the information you want to see about your reports, you can resize, hide, reorder, sort columns, and select the number of records to display in your list view on the Reports tab.

- Customize your list view as follows:

Option	Description
To resize a column	Click and drag its right margin to the preferred size.
To hide a column	Click  > Columns on any column and deselect the column you want to hide.
To reorder a column	Drag it to where you'd like it to appear.
To sort a column	Click  for the column and select Sort Ascending or Sort Descending . Sorting applies to all items in the list view, including the ones on subsequent pages.
To change the number of records displayed per page	Click  in the lower left corner of the list and select the desired setting. You can view 10, 25, 50, 100, or 200 records at a time. When you change this setting, you return to the first page of list results. Once set, however, you view the same number of records throughout the list. The record display setting on the Reports tab doesn't affect list views elsewhere in Salesforce.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

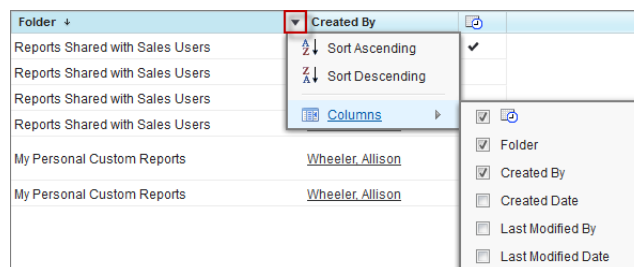
Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To view the Reports tab:

- **Legacy Folder Sharing**
Run Reports
- **Enhanced Folder Sharing**
Run Reports in Public Folders

Select Column Header for Sorting and Hiding Columns



Print a Report

Print a report from the run page of a report using your browser's print function.

- Click **Printable View** from the report's run page.
- From the browser dialog, do one of the following:
 - Open the report with your browser and use your browser's print function.
 - Save the file in Excel and use the print option in Excel.

SEE ALSO:

[Export a Report](#)

Keep Favorite Report Folders In View

Pin your most-used report and dashboard folders to the top of the folder list so you don't have to scroll down every time you need them.

1. In the list of report and dashboard folders, hover over any folder, then click .

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To print reports:

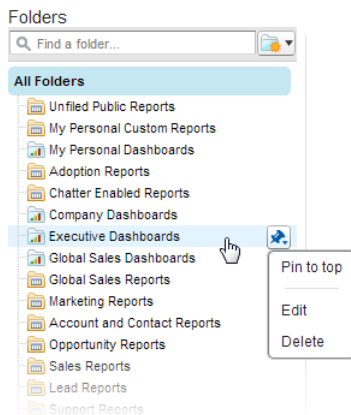
- **Legacy Folder Sharing**
 - Run Reports
 - AND
 - Export Reports
- Enhanced Folder Sharing**
 - Run Reports
 - AND
 - Export Reports

EDITIONS

Available in: Salesforce Classic

Available in: All Editions

Reports & Dashboards



2. Select **Pin to top**.

Your folder moves to the top of the folders list.

Each new folder that you pin goes to the top of the list, above any folders you have already pinned. To move a pinned folder back to the top, just pin it again.

Hide Unused Report Types

If your users use only a subset of the available standard report types, you can hide the ones they don't need.

1. On the Reports tab, click **New Report**.

2. Select **Select Report Types to Hide**.

The green check mark next to a report means it's visible to everyone.

3. To hide the report type, click the check mark to change it to an X.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

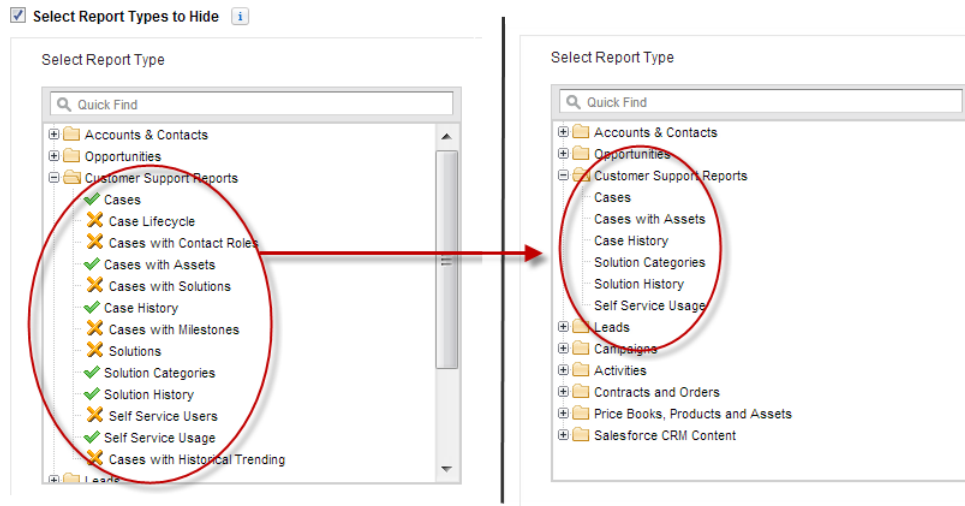
To hide unused reports:

- **Legacy Folder Sharing**
Manage Custom Report Types

Enhanced Folder Sharing

Manage Custom Report Types

Create New Report



Hidden report types don't show up when you use the search box on the Create New Report page.


If you hide all the report types in a folder, the folder is also hidden. However, if you later unhide the report type in the "Select Report Types to Hide" dialog box, users can see the folder.

Run Reports in the Background

Run large reports in the background so you can keep working in Salesforce without waiting for results to display. This is a good way to run data-intensive reports that might otherwise time out due to the large number of report results.

Reports exported to the background run sequentially, one at a time. Therefore, the latest report exported to the background runs after all reports previously exported to the background finish running.

You can export an unlimited number of reports to the background.

 **Note:** Running reports in the background is only supported in the Report Wizard. The Report Builder doesn't support running reports in the background.

IN THIS SECTION:

1. [Export a Report to Run in the Background](#)
To set up a report to run in the background, you have to export it in a special way.
2. [View and Manage Background Reports](#)
Once you've set up a report to run in the background, you can view and manage it from the background report exports list.

SEE ALSO:

- [Create a Custom Report in Accessibility Mode](#)
- [Create a Report](#)
- [Customizing Reports](#)
- [Export a Report](#)

EDITIONS

Available in: Salesforce Classic

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

USER PERMISSIONS

To export reports to the background:

- Background Report Export

To view reports exported to the background by other users:


- Background Report Export
- AND
- View All Data

To manage reports exported to the background by other users:


- Background Report Export
- AND
- Modify All Data

Export a Report to Run in the Background


To set up a report to run in the background, you have to export it in a special way.

 **Note:** Running reports in the background is only supported in the Report Wizard. The Report Builder doesn't support running reports in the background.

1. Create a report in the Report Wizard.
2. Click **Export Details** and choose **Run Background Export** from the drop-down button.


 **Tip:** When running an existing report, click this button to avoid waiting for report results to display.

3. Select a file encoding setting and a file format in which to export the report.
4. Choose how to save the report parameters.
 - Click *Save revisions* to save any parameter changes you made to the report before exporting. Selecting this option overwrites the parameters of the original report.
 - Click *Save revisions to a copy* to create a new report before exporting. If you select this option, enter a name and description for the report, and choose a report folder in which to save the report parameters.

 **Note:** Only parameters are saved, not results. To view report results, you must view report details from the background report exports list.

5. Click **Start Background Export**.


When your report has finished running and its results are ready for viewing, a link to the report details is emailed to you. You can download report results from the report exports list. You can only download data that you have permission to view.

 **Note:** If commas aren't appropriate for your locale, use a tab or other delimiter. Specify your delimiter in Data Loader Settings (**Settings** | **Settings**).


In the unlikely event that a background export of a report fails, an email notification is sent to you. Reports exported to the background can fail for a number of reasons. For example, between the time you exported the report and the export process began, fields may have been deleted from the report, the report may have been deleted, or the status of the custom report type from which the report was created may have been changed to "In Development."

View and Manage Background Reports

Once you've set up a report to run in the background, you can view and manage it from the background report exports list.

 **Note:** Running reports in the background is only supported in the Report Wizard. The Report Builder doesn't support running reports in the background.

1. From Setup, enter *Background Report Exports* in the *Quick Find* box, then select **Background Report Exports**. The background report exports list appears.
2. View the details of a report exported to the background, such as its name, status, and location, by clicking the name of a report in the *Job Name* column.

 **Note:** For security purposes, Salesforce can require users to pass a CAPTCHA user verification test to export data from their org. This simple text-entry test prevents malicious programs from accessing your org's data. To pass the test, users must

EDITIONS

Available in: Salesforce Classic

Available in: **All** editions except **Database.com**

USER PERMISSIONS

To export reports to the background:

- Background Report Export

To view reports exported to the background by other users:

- Background Report Export

AND

View All Data

To manage reports exported to the background by other users:

- Background Report Export

AND

Modify All Data

correctly type the two words displayed in the overlay's text box. The words entered in the text box must be separated by a space.

3. Click **Cancel** or **Del** next to the name of a report to cancel a pending export or to delete a report from the background report exports list.

When a report exported to the background finishes running, it is available for viewing in the background report exports list for 48 hours. After 48 hours, the report is automatically deleted.



Important: Reports deleted from the background report exports list are permanently deleted and *not* sent to the Recycle Bin.

4. Click **Refresh List** to view any reports that have been exported to the background since you began viewing the background report exports list.

Deliver Your Report

To get the information in your report to the people who need it, you can share the report's URL, make the report available for Chatter feeds, or export the data to another tool, such as Excel. You can also set the report to run on a schedule so that viewers always have the latest information.

Administrators, or users with the "Manage Public Reports" and "Create and Customize Reports" permissions, can create custom reports that all users can view. They can also organize reports by creating custom report folders and configuring which groups of users have access to them.

To make a report public, run the report and click **Save As**. Give the report a name and choose a public report folder.

SEE ALSO:

[Export a Report](#)

[Schedule a Report for Refresh](#)

Embedded Report Charts

Typically, users have had to navigate to the Reports tab to find data. But you can give them valuable information directly on the pages they visit often. To do that, embed report charts in detail pages for objects. When users see charts on pages, they are empowered to make decisions based on the data they see in the context of the page without going elsewhere. For example, an opportunity record shows important data directly on its detail page.



IN THIS SECTION:

1. [Add a Report Chart to a Page Layout](#)

To embed a report chart on object pages, edit the object's page layout with the enhanced page layout editor, then add the chart.

2. [Customizing a Report Chart in a Page Layout](#)

After you add a report chart to a page, you can customize it in the Chart Properties dialog box on the page layout editor.

3. [Example of Report Charts on an Account Page](#)

In this example, we've embedded two report charts on an important account page that show deals in the pipeline and open support cases for the account. From looking at the charts, the account executive can quickly gauge the account's activity and health.

4. [Limits on Report Charts in Pages](#)

Consider these limits when embedding charts in detail pages.

Add a Report Chart to a Page Layout

To embed a report chart on object pages, edit the object's page layout with the enhanced page layout editor, then add the chart.

Before you add a chart, check that:

- Its source report is in a folder that's shared with users who need access. Reports in personal report folders are unavailable to add to a page.
 - The source report format is summary or matrix.
 - The source report has a chart.
1. Go to the page layout editor for the object that you're adding a chart to.
 2. Click **Edit** next to the page layout.
 3. Click **Report Charts**.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

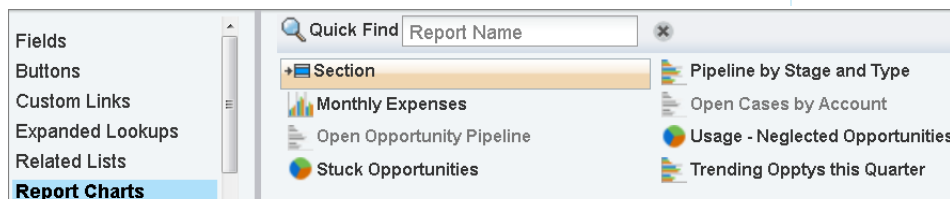
Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions



Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder



4. In the Quick Find box, type the name of the report and click  to find and select the report chart. You can browse up to 200 recently viewed reports by chart type in the Report Charts palette.
5. Drag the chart to a new or existing section of the layout.
6. Click  on the chart to customize it.
7. Click **Save**.

The **Preview As** option is unavailable for report charts.

SEE ALSO:

- [Customizing a Report Chart in a Page Layout](#)
- [Example of Report Charts on an Account Page](#)
- [Limits on Report Charts in Pages](#)
- [Find Object Management Settings](#)
- [Page Layouts](#)

Customizing a Report Chart in a Page Layout

After you add a report chart to a page, you can customize it in the Chart Properties dialog box on the page layout editor.

IN THIS SECTION:

1. [Hiding a Report Chart that Shows an Error](#)
A chart can sometimes, for whatever reason, show an error on the detail page instead of data. Since a chart with an error is not that useful, you have the option to hide it from viewers.
2. [Filtering Report Charts to Show Data Relevant to the Page](#)
Charts usually filter to show relevant data when the chart's report type has a matching ID field for the record, such as Account ID for an account record. Occasionally, charts show data unfiltered. But you can set up a chart to be filterable if its report type has a lookup to the matching ID field.
3. [Refreshing Report Chart Data](#)
Normally, charts refresh data once every 24 hours. But you can change a chart to refresh each time someone opens the page it's on. The refresh option is under the Chart Properties dialog box of the page layout editor. However, we recommend daily refresh over selecting the option, because users will soon reach the refresh limit or will wait for chart data to show until refresh is complete.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

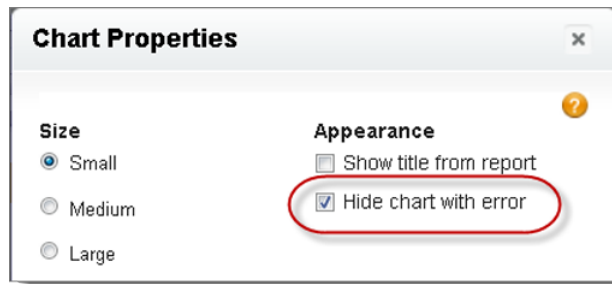
To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Hiding a Report Chart that Shows an Error

A chart can sometimes, for whatever reason, show an error on the detail page instead of data. Since a chart with an error is not that useful, you have the option to hide it from viewers.

To hide such a chart, select **Hide chart with error** from the Chart Properties dialog box in the page layout editor.



A chart can show an error on a page for one or more of these reasons.

- The viewer doesn't have access to the field that's used for filtering.
- The viewer doesn't have access to the report folder.
- The report chart has been deleted from the report.
- The report definition has changed.
- The report itself is no longer available.

Filtering Report Charts to Show Data Relevant to the Page

Charts usually filter to show relevant data when the chart's report type has a matching ID field for the record, such as Account ID for an account record. Occasionally, charts show data unfiltered. But you can set up a chart to be filterable if its report type has a lookup to the matching ID field.

Make a Chart Filterable

When the chart's report type doesn't have a matching ID field for the record, the chart is not filtered. Instead, it shows all data.

A report chart on open cases shows information for all accounts on an account record. To make the chart filterable, edit the layout of the chart's cases custom report type, and add the `Account ID` field via lookup. Now when you view an account record, the chart is filtered.

Pick a Relevant Filter

Sometimes when there are multiple ID fields available to filter, the chart may not show any data. In such situations, select the most relevant ID field from the **Filtered by** drop-down in the Chart Properties dialog box. A chart on open opportunities on account records is filtered by `Partner Account ID`, which isn't that useful. But we can edit the chart properties and choose `Account ID` from the drop-down to filter by the account record.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

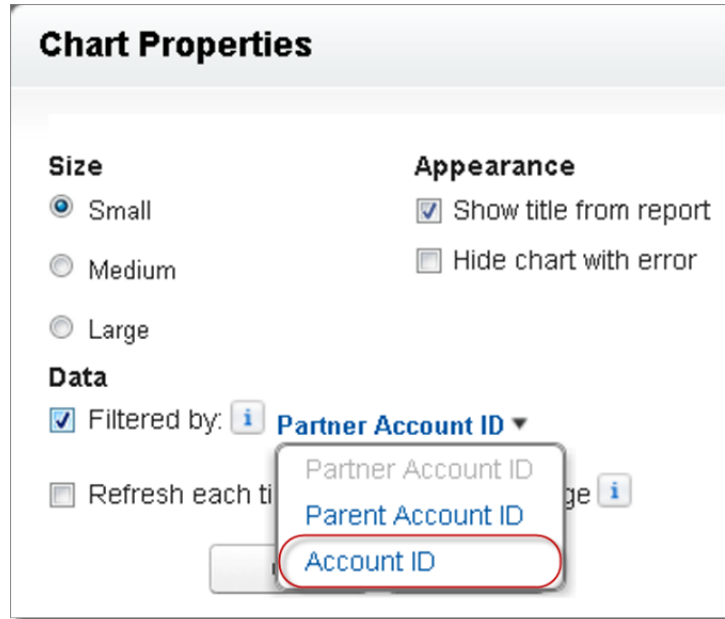
Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder



 **Note:** Charts can't filter for relevant data if the source report has reached the limit of 20 field filters.

Refreshing Report Chart Data

Normally, charts refresh data once every 24 hours. But you can change a chart to refresh each time someone opens the page it's on. The refresh option is under the Chart Properties dialog box of the page layout editor. However, we recommend daily refresh over selecting the option, because users will soon reach the refresh limit or will wait for chart data to show until refresh is complete.

Daily Refresh

Charts refresh data once every 24 hours. If within that time users want the latest, they can click **Refresh** on the chart.

Refresh When User Opens the Page

To change a chart's normal refresh, select **Refresh each time a user opens the page** in the Chart Properties dialog box of the page layout editor. This option triggers a chart refresh each time someone opens the page the chart is on. Selecting the option is not recommended for two reasons.

- There's a risk of reaching the chart refresh limit faster. Refreshes count towards the hourly limit for each user and organization.
- For reports that take longer to run, selecting this option can make users wait to see chart data.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Example of Report Charts on an Account Page

In this example, we've embedded two report charts on an important account page that show deals in the pipeline and open support cases for the account. From looking at the charts, the account executive can quickly gauge the account's activity and health.

EDITIONS

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Report Builder

Report Charts on an Account Page

Account
Acme Inc.

Account Detail

[Edit](#) [Delete](#) [Sharing](#)

Account Name [Acme Inc. \[View Hierarchy\]](#) Account Owner [Ely East \[Change\]](#)

Parent Account	Net Inc.	Industry	Environmental
Type	Reseller	Employees	2,000
Phone	(674) 555-0153	Annual Revenue	\$96,000,000
Fax	(674) 555-0182	Total Sales	\$421,000.00
Website	http://Acme.net		

▼ **Data Insights**

Open Opportunity Pipeline

As of Aug 5, 2013 2:17:15 PM

[Refresh](#)

Open Cases by Account

As of Aug 5, 2013 2:17:16 PM

[Refresh](#)

1. The pipeline chart shows opportunities for the account in various stages including two that were won. The account executive can hover on the chart to get the value of each opportunity (Values are highlighted if the source report chart has hover enabled). She is able to click the chart, go to the report, and get more details for these opportunities.
2. From the charts on open cases, she can see there are a couple of unresolved support issues for the account. She can click the chart, drill into the report for case details and follow up with the support engineers to get them resolved before a crucial meeting with the client.

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Limits on Report Charts in Pages

Consider these limits when embedding charts in detail pages.

- You can have two report charts per page.
- You can only add report charts from the enhanced page layout editor. The mini console and the original page layout editor are not supported.
- On detail pages, users can refresh up to 100 report charts every 60 minutes.
- Your org can refresh up to 3,000 report charts every 60 minutes.

SEE ALSO:

[Add a Report Chart to a Page Layout](#)

[Example of Report Charts on an Account Page](#)

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS


To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Delete a Report

You can delete a selected report from the Reports tab or from its run page.

1. Delete a report in one of two ways:

Option	Description
To delete from the Reports tab	Next to the report, click  > Delete .
To delete from the report's run page	Click Delete .

2. Click **OK**.

Deleted reports are moved to the Recycle Bin. You can't delete reports in others' personal folders. You also can't delete reports used by dashboard components or reporting snapshots unless you first delete the dashboard component or reporting snapshot.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To delete reports in My Personal Custom Reports folder:

- **Legacy Folder Sharing**
Create and Customize Reports
- **Enhanced Folder Sharing**
Create and Customize Reports

To delete reports in public folders:

- **Legacy Folder Sharing**
Manage Public Reports
- **Enhanced Folder Sharing**
Manage Reports in Public Folders

Report Limits

As you report on your data, be aware of these limits and restrictions.

Salesforce Reports and Dashboards Limits

Feature	Personal Edition	Contact Manager	Group Edition	Professional Edition	Enterprise Edition	Unlimited and Performance Edition	Developer Edition
Custom report types (Limits apply to all custom report types regardless of development status.)	N/A			50	200	2,000	400
Dashboard filters				3 per dashboard			
Dynamic dashboards per org	N/A				Up to 5	Up to 10	Up to 3
Field filters per report ¹	20						
Formulas per report	5						
Reporting snapshots	N/A			1 ^{2, 3, 4}	1 ²	2 ²	1 ^{2, 3, 4}
Scheduled dashboard refreshes	N/A				1 ²	2 ²	N/A
Scheduled reports per hour (Emailed reports can be up to 10 MB.)	N/A			1 ^{2, 3, 5}	1 ²	2 ²	1 ^{2, 3, 5}

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

¹ These limits apply to the report builder. If you're using the report wizard, the limit is 10.

² Up to 200 total.

³ Off-peak hours (between 6 PM and 3 AM local time) only.

⁴ Limited to one preferred start time per day.

⁵ Limited to three preferred start times per day.

Salesforce retains historical data for the previous three months, plus the current month.

The following Salesforce Reports and Dashboards limits apply to all supported editions.

Report Limits

- The report builder preview shows a maximum of 20 rows for summary and matrix reports, and 50 rows for tabular.

- You can't have more than 250 groups or 4,000 values in a chart. If you see an error message saying that your chart has too many groups or values to plot, adjust the report filters to reduce the number. In combination charts, all groups and values count against the total.
- Reports display a maximum of 2,000 rows. To view all the rows, export the report to Excel or use the printable view for tabular and summary reports. For joined reports, export is not available, and the printable view displays a maximum of 20,000 rows.
 - Summary and matrix reports display the first 2,000 groupings when Show Details is disabled.
 - Matrix reports display a maximum of 400,000 summarized values.
 - Matrix reports display a maximum of 2,000 groupings in the vertical axis when Show Details is disabled. If there are more than 400,000 summarized values, rows are removed until the 2,000 groupings limit is met, then columns are removed until the number of summarized values moves below 400,000.
 - Matrix reports that return more than 2,000 rows don't show details. If you click **Show Details**, nothing happens. You can only view the report with details hidden.
- Up to five metrics display in the Lightning Experience report header. Metrics such as summarized fields appear in the order that they appear in the report, left to right. The grand total, when shown, always displays.
- When reports that have groupings are viewed in the Salesforce app, they're converted to tabular reports.
- By default, reports time out after 10 minutes.
- In a joined report, each block can have up to 100 columns. A joined report can have up to 5 blocks.
- You can add up to 10 custom summary formulas to each block in a joined report. A joined report can have a total of 50 custom summary formulas.
- Each joined report can have up to 10 cross-block custom summary formulas.
- When you filter on standard long text area fields, such as Description or Solution Details, only the first 1000 characters of the field are searched for matches in reports.
- Only the first 254 characters in a rich text area or a long text area are displayed in a report.
- Summary fields on tabular, summary, and matrix reports can display up to 21-digits.
- Reports can't be filtered on custom long text area fields.
- Joined reports require that the new user interface theme is enabled. Users without the new theme are unable to create, edit, or run joined reports.
- Forecast reports include only opportunities that are set to close within the forecast period, except those assigned to the Omitted forecast category.
- Internet Explorer 6 is not supported for joined reports.
- Acceptable range for values: The maximum value allowed is 9999999999999999. The minimum value allowed is -9999999999999999.

Dashboard Limits

- A dashboard filter can have up to 50 options. By default, 10 options are enabled. Contact Salesforce to extend your limit.
- Each dashboard can have up to 20 components.
- It's not possible to filter on bucket fields. However, it is possible to use a report filtered on a bucket field on the dashboard page.
- A dashboard table or chart can display up to 20 photos.
- You must wait at least one minute between dashboard refreshes.

Report Type Limits

- A custom report type can contain up to 60 object references. For example, if you select the maximum limit of four object relationships for a report type, then you could select fields via lookup from an additional 56 objects. However, users will receive an error message if they run a report from a custom report type and the report contains columns from more than 20 different objects.

- You can add up to 1000 fields to each custom report type.

Reporting Snapshot Limits

- The maximum number of rows you can insert into a custom object is 2,000.
- The maximum number of runs you can store is 200.
- The maximum number of source report columns you can map to target fields is 100.

Filtering Limits

Only the first 255 characters in a custom text field count for filtering purposes.

Embedded Report Charts Limits

- You can have two report charts per page.
- You can only add report charts from the enhanced page layout editor. The mini console and the original page layout editor are not supported.
- On detail pages, users can refresh up to 100 report charts every 60 minutes.
- Your org can refresh up to 3,000 report charts every 60 minutes.

List View Limits

- Only the first 255 characters are shown for custom long text area fields in list views.

Bucket and Bucket Field Limits

- Each report can include up to five bucket fields.
- Each bucket field can contain up to 20 buckets.
- Each bucket can contain up to 20 values.
- Bucket fields are available for use only in the report where they're generated. To use a bucket in multiple reports, create the field for each report, or create a separate formula field for the object that's dependent on the bucket.



Note: These limits don't apply to the use of Other as permitted within the bucket field's setup.

- Buckets and bucket fields aren't available for reports that include external objects.
- If a bucket field's source column has a custom index, and you filter by the bucket field, then the performance gains from the custom index are lost.

Historical Trend Report Limits

- Salesforce retains historical data for the previous three months, plus the current month.
- Up to 5 million rows of historical trending data can be stored for each object. Historical data capture stops when the limit is exceeded. The admin is alerted by email when any object reaches 70 percent of the limit, and again if the limit is exceeded.
- Each historical trend report can contain up to 100 fields. In Opportunities reports, this includes the standard preselected fields, which can't be disabled.
- Formula fields are not supported.
- Row limit filters are not supported.
- The summary report format is not supported.
- You can specify up to five historical snapshot dates in each historical trend report.
- You can use up to four historical filters on each historical trend report.
- These field types are supported: Number, Currency, Date, Picklist, Lookup.
- Dated exchange rates are not supported. When you run the historical trend report, it only uses the latest dated exchange rate.
- Internet Explorer 6 is not supported.

- You can't subscribe to historical trend reports.
- The Report Wizard is not supported. Historical trend reports can only be created with the Report Builder.
- Historical trend reporting with charts is supported in Lightning Experience, but tabular views of historical trend reports aren't available.

External Object Report Limits

If your report includes an external object, the results probably don't reflect the full data set. External objects behave similarly to custom objects, except that they map to data that's stored outside your Salesforce org. A report that includes an external object fetches up to 2,000 records for the primary object and can encounter callout limits while fetching external object data. If the report results in few or no rows, try customizing the report to obtain more relevant external object rows.

Cross Filters

- Each report can have up to three cross filters.
- Each cross filter can have up to five subfilters.
- Filter logic applies only to field filters, not cross filters.

Reports and Dashboards API Limits

The following limits apply to both the Reports and Dashboards REST API and Reports and Dashboards API via Apex.

- Cross filters, standard report filters, and filtering by row limit are unavailable when filtering data.
- Historical trend reports are only supported for matrix reports.
- The API can process only reports that contain up to 100 fields selected as columns.
- A list of up to 200 recently viewed reports can be returned.
- Your org can request up to 500 synchronous report runs per hour.
- The API supports up to 20 synchronous report run requests at a time.
- A list of up to 2,000 instances of a report that was run asynchronously can be returned.
- The API supports up to 200 requests at a time to get results of asynchronous report runs.
- Your organization can request up to 1,200 asynchronous requests per hour.
- Asynchronous report run results are available within a 24-hour rolling period.
- The API returns up to the first 2,000 report rows. You can narrow results using filters.
- You can add up to 20 custom field filters when you run a report.
- Your org can request up to 200 dashboard refreshes per hour.
- Your org can request results for up to 5,000 dashboards per hour.

Troubleshoot Reports

Use these tips to help solve problems that arise when you're working with reports.

IN THIS SECTION:

1. [Why can't I run a report on a custom or external object?](#)

Sometimes an object, its report types, or your access isn't set up completely.


2. [Why do my chart labels overlap?](#)

Sometimes the labels for your charts can overlap and be difficult to read. There may be too much data in the same space, or the segments or wedges of the chart may be too small.

3. [Why doesn't my report return any data?](#)

Check with your administrator to make sure that you have access to the records you're trying to report on. If you're still not seeing any results in your report, try casting a wider net.

4. [Why can't I see formula options in report builder?](#)

If you can't see the  **Add Formula** option in the Fields pane of report builder, change your report format to summary, matrix, or joined. Formulas don't show up for tabular reports.

5. [Why doesn't my report return the data I expect?](#)

Check your filters, groupings, fields, report type, and role or user hierarchy to make sure that you are asking the right questions of your data.

6. [What are some common report limits?](#)

Here are some common report limits. To see a full list of analytics limits, see the Salesforce Limits Quick Reference Guide.

7. [Why am I getting an "obsolete report" error message?](#)

You may be trying to report on data that isn't available.

8. [Improve Report Performance](#)

Many factors can cause a report to perform poorly or to time out. You can address most of them with simple changes, such as using the correct filter operators, applying more filters, and reducing the amount of data.

9. [Why is an old role name appearing in the "role hierarchy" trail of my report?](#)

Changes to role names aren't automatically updated in reports. To see the latest role name, change the `Role name as displayed on reports` field for the role record.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

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Why can't I run a report on a custom or external object?

Sometimes an object, its report types, or your access isn't set up completely.

If you can't run a report on a custom or external object, check with your admin that the following conditions are true.

- Reports are enabled on the custom or external object.
- You have access to the object and its records.
- The object and its custom report types are deployed.

Why do my chart labels overlap?

Sometimes the labels for your charts can overlap and be difficult to read. There may be too much data in the same space, or the segments or wedges of the chart may be too small.

To fix overlapping labels, try the following:

- **Enlarge the chart.** Change the chart size in the report to large or extra large or make the dashboard column wider.
- **Remove extra grouping levels.** Reduce the number of grouping levels by using a different chart type. For example, horizontal bar charts have fewer values than grouped horizontal bar charts.
- **Use horizontal charts.** Horizontal charts use different spacing than vertical charts. The advantage of the horizontal bar charts is that the chart can be extended vertically to show numerous groupings, though the width is fixed. Depending on chart settings, you can also display Chatter photos.
- **Change the scale.** Set the chart to use larger units. For example, show values as multiples of 1000 or 1000000.
- **Group small values.** Select the `Combine Small Groups into 'Others'` option for pie, donut, and funnel charts.

Why doesn't my report return any data?


Check with your administrator to make sure that you have access to the records you're trying to report on. If you're still not seeing any results in your report, try casting a wider net.

- Show more than your own records. For example, select **Show > All accounts**.
- Expand your time frame filters. For example, select All Time for `Range`, or select a broader custom range.
- Choose field filter operators carefully. If you select `Account Owner equals John James`, you limit potential results to exactly "John James." If you don't see the results you expect, consider expanding the selection by using `Account Owner contains James` instead.
- Check your filter logic. Make sure your combination of conditions isn't excluding all data.

[Limiting your report](#) can improve performance, but make sure you're not filtering out the data you want to see.

If your report includes an external object, the results probably don't reflect the full data set. External objects behave similarly to custom objects, except that they map to data that's stored outside your Salesforce org. A report that includes an external object fetches up to 2,000 records for the primary object and can encounter callout limits while fetching external object data. If the report results in few or no rows, try customizing the report to obtain more relevant external object rows.

Why can't I see formula options in report builder?

If you can't see the  **Add Formula** option in the Fields pane of report builder, change your report format to summary, matrix, or joined. Formulas don't show up for tabular reports.

Why doesn't my report return the data I expect?

Check your filters, groupings, fields, report type, and role or user hierarchy to make sure that you are asking the right questions of your data.

Filters

Make sure to include all the data you want.



Tip: To change a report filter, hover over it and click **Edit** or **Remove**. Your filters display when you run your report; click **Edit** on that page to make additional changes.

Groupings

When you group by a field, you remove it from the details of the report. If you export the report, you see the field, though it does not appear in the detail area.

Fields

After checking your groupings, check your fields. If your report contains multiple related records—for example, an account, its opportunities, and their products—look at the detail pages for the account record, opportunity record, and product line item to

ensure that the fields contain data. If the data isn't available in the format you want, work with your Salesforce administrator to add formula fields to get the data. When formula fields are added to an object, they appear in record detail pages and in reports.

Report Type

The report type selected may not be appropriate or the records anticipated may not share the relationship between objects required for the report type. When choosing a report, be sure you understand which fields are available in the report type.

If your report type includes both parent and child objects, but no child fields are used in a report, the report shows parent records whether they have a child record or not.

Hierarchy

Hierarchy options let you drill down to different data sets based on the role or user hierarchy. The selected hierarchy level, or its default role, may affect the data shown.



Note: Hierarchy applies to activity and opportunity reports.

External Objects

If your report includes an external object, the results probably don't reflect the full data set. External objects behave similarly to custom objects, except that they map to data that's stored outside your Salesforce org. A report that includes an external object fetches up to 2,000 records for the primary object and can encounter callout limits while fetching external object data. If the report results in few or no rows, try customizing the report to obtain more relevant external object rows.

What are some common report limits?

Here are some common report limits. To see a full list of analytics limits, see the Salesforce Limits Quick Reference Guide.

Feature	Limit	Editions Info
Bucket fields per report	Up to 5 (each bucket field can have 20 buckets)	Available in Enterprise, Unlimited, Performance, and Developer Editions.
Matrix reports	Up to 400,000 summarized values. Data exceeding this limit is not displayed.	Available in all editions.
Scheduled reports per organization	One or two per hour, based on edition	Available in Professional, Enterprise, Unlimited, Performance, and Developer Editions.
Field filters per report	Up to 20	Available in all editions.
Formulas per report	Up to 5	Available in all editions.
Rows displayed in a report	Up to 2,000. To view all the rows, export the report to Excel or use the printable view for tabular and summary reports. For joined reports, export is not available, and the printable view displays a maximum of 20,000 rows.	Available in all editions.
Rows displayed in the report builder preview	Up to 20 rows for summary and matrix reports, and up to 50 rows for tabular	Available for all editions.

Why am I getting an “obsolete report” error message?

You may be trying to report on data that isn't available.

Data may be unavailable because:

- An object in the report isn't enabled for reporting anymore.
- A lookup relationship used by objects in the report has been deleted or modified.
- An object in the report has been deleted.
- You don't have “View” permissions for an object in the report.

Improve Report Performance

Many factors can cause a report to perform poorly or to time out. You can address most of them with simple changes, such as using the correct filter operators, applying more filters, and reducing the amount of data.

Watch this video for quick tips on [Making Your Reports Run Faster \(Salesforce Classic\)](#).

A report can take anywhere from a few seconds to several minutes to run. Occasionally, a report is so complex that it exceeds the timeout limit and fails. If the report is slow to load, it's usually because it is:

- Querying too many objects
- Dealing with intricate lookups
- Has too many fields

For example, say that you run a sales team and want to see how many Leads each of your salespeople has. You build a report that returns all the leads in your company. Now you have all the data you need, but also some that you don't, and your report takes a long time to run. To make your report run faster, filter it so that it only returns Leads assigned to your team. If you need your report to run even faster, consider filtering by time. Do you need to see Leads from last year, or the year before? If not, add a second filter which scopes your report to this year only. Now your report runs as fast as lightning!

If you can't view a report and want to edit it to avoid the time-out, append `?edit=1` to the report URL. Doing so gets you into edit mode, where you can adjust the criteria. Try these tips to get your reports to run more efficiently.

- When filtering, use the `equals` or `not equal to` operators instead of `contains` or `does not contain`. For example, use `Account Owner equals John James`, not `Account Owner contains John`. Choose **AND** rather than **OR** for filter logic
- To narrow your report's date range, use time frame filters. For example, use `Last 30 Days` instead of `Current FY`.
- Set time frame filters by choosing a `Date Field` and `Range to view`. Only records for that time frame are shown.
- Reduce the number of fields in the report by removing unnecessary columns or fields.
- If you receive an error message saying that your activity report has too many results, filter on a picklist, text, or date field. Alternatively, rerun the report using a different activity data type such as “Activities with Accounts” or “Activities with Opportunities”.
- Add time filters, scope filters, and filter criteria to the report to further narrow the results.

Why is an old role name appearing in the "role hierarchy" trail of my report?

Changes to role names aren't automatically updated in reports. To see the latest role name, change the `Role name as displayed on reports` field for the role record.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Create a Report

Create a report to get an up-to-the-minute view of an aspect of your business, such as the status of customers, opportunities, support cases, and so on.

To create a new report:

1. From the Reports tab, click **New Report**.
2. Select the report type for the report, and click **Create**.
3. Customize your report, then save or run it.

SEE ALSO:

[Customizing Reports](#)

EDITIONS

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Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Creating a Custom Report

You can customize standard reports, or you can build custom reports from scratch to suit the exact needs of your organization.

Users with the “Manage Custom Report Types” permission can define custom report types that extend the types of reports from which all users in their organization can create or update custom reports. A *report type* defines the set of records and fields available to a report based on the relationships between a primary object and its related objects. Reports display only records that meet the criteria defined in the report type. Salesforce provides a set of pre-defined standard report types; administrators can create custom report types as well.

Users with the “Manage Reporting Snapshots” permission can create and schedule snapshots. A reporting snapshot lets you report on historical data. Authorized users can save tabular or summary report results to fields on a custom object, then map those fields to corresponding fields on a target object. They can then schedule when to run the report to load the custom object's fields with the report's data. Reporting snapshots enable you to work with report data similarly to how you work with other records in Salesforce.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To run reports:

- **Legacy Folder Sharing**
Run Reports
- **Enhanced Folder Sharing**
Run Reports


To schedule reports:

- **Legacy Folder Sharing**
Schedule Reports
- **Enhanced Folder Sharing**
Schedule Reports

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

Create a Custom Report in Accessibility Mode

 **Note:** This topic only applies if you're not using report builder. *Report builder* is a visual editor for reports.

To create a new custom report using the custom report wizard:


1. From the Reports tab, choose the **Create New Custom Report** button.
2. Select the type of data for the report, and click **Next**.

To create reports on custom objects, choose the **Other Reports** report type category, unless the custom object has a relationship with a standard object. When the custom object has a master-detail relationship with a standard object or is a lookup object on a standard object, select the standard object for the report type category instead.

To create reports on an external object, choose the **Other Reports** category. To create reports on an external object with a child standard or custom object, select the category containing the custom report type that you created for that relationship.


3. [Choose the report format.](#)
4. Follow the steps of the wizard using the **Next** button. For each report, customize the following:

- **Specify Row and Column Headers:** On the Select Grouping page for summary and matrix reports, choose the fields by which you want to group and subtotal the data. In a summary report, choosing more than one sort field allows you to sub-sort your data. For matrix reports, select summary fields for the row labels and column headings. When grouping by a date field, you can further group the data by a specific time period such as days, weeks, or months.

 **Note:** On the Select Grouping page, if you set `Group Dates By` to "Calendar Month in Year" or "Calendar Day in Month," you won't be able to drill down to those date groupings in reports or dashboards. Users are taken to the unfiltered report instead.

- **Summarize Data:** On the Select Columns to Total page, choose the types of summary information to display for numeric fields.
- **Build Custom Summary Formulas:** On the Select Columns to Total page for summary and matrix reports, create custom summary formulas to calculate additional totals based on existing report summaries. A formula is an algorithm that derives its value from other fields, expressions, or values. See [Build a Custom Summary Formula](#) on page 723.
- **Choose Fields:** On the Select Columns page, choose the fields to display in the report. You can display only those fields that are visible in your page layout and field-level security settings. If you choose the `Description` field or any other long text field, only the first 255 characters are displayed.
- Only the first 254 characters in a rich text area or a long text area are displayed in a report.
- **Order Columns:** On the Order Columns page, select the order for displaying the chosen fields.
- **Limit Report Results:** On the Select Criteria page, choose the appropriate settings from the drop-down lists, then use the filter options filter options to limit the report to records with specific data.

The report wizard supports up to 10 filters. On reports with more than 10, additional filters are dropped and the report shows an error for any filter logic.

 **Tip:** To use a tabular report on a dashboard, first limit the row count, by setting the `Rows to Display` option, the sort column, and the order on the Select Criteria page of the report. You can't use gauge or metric components on dashboards using tabular reports.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing


USER PERMISSIONS

To create, edit, and delete reports:

- **Legacy Folder Sharing**
Create and Customize Reports
AND
Report Builder
- **Enhanced Folder Sharing**
Create and Customize Reports
AND
Report Builder

- **Chart Settings:** On the Select the Chart Type and Report Highlights step of the report wizard, [set chart properties](#) to display your report data in a chart. Charts are available only for summary and matrix reports.


5. Click **Run Report** to view the report, or click **Export Details** to save the report as an Excel file or other format.

 **Tip:** Customizing your reports can require running them a few times as you adjust the report criteria and options. We recommend using a filter that gives you a smaller sampling of data until you are finished customizing the report and ready to save.

Dashboards

Dashboards help you visually understand changing business conditions so you can make decisions based on the real-time data you have gathered with reports. Use dashboards to help users identify trends, sort out quantities, and measure the impact of their activities. Before building, reading, and sharing dashboards, review these dashboard basics.

Watch a Demo:  [An Overview of Dashboards \(Salesforce Classic\)](#)

 **Note:** Dashboards in Group Edition organizations are view-only.

As you prepare to curate your Salesforce data with dashboards, keep these tips in mind:

- Reports provide all the data shown in a dashboard. Dashboards can show data from more than one report.
- When refreshing a dashboard, all the data-providing reports must run. If the reports take a long time to run, then the dashboard does too.
- Dashboards are shared via folders. Whomever has permission to the folder your dashboard is saved in also has access to your dashboard. Ensure that you save your dashboard in an appropriate folder.

Before creating or reading a dashboard, familiarize yourself with these features and concepts.

Dashboard Editor

The Dashboard Editor is a visual, drag-and-drop tool which you use to create dashboards and edit existing ones. The Dashboard Editor is where you add, edit, and arrange dashboard components.

To launch the Dashboard Editor, click **New Dashboard**.

Components

Dashboards are made up of components. Each component contains a chart or metric which shows data from one report. Different components can show data from different reports.

Running User (Viewing As)

In Salesforce, different users have different permissions to access data. A dashboard only displays data that the dashboard's running user can access.

For example, say you're viewing a dashboard describing Leads. Emily is a sales operations manager who sees all Leads, and Marcus is a direct sales specialist who sees only the leads he owns. If Emily is the dashboard's running user, then the dashboard shows data about all the Leads in Salesforce. If Marcus is the running user, then the dashboard only shows data about Leads that Marcus owns.

IN THIS SECTION:

1. [Build a Dashboard](#)

When you're ready to share Salesforce data with colleagues, build a dashboard. Dashboards let you curate data from reports using charts, tables, and metrics. If your colleagues need more information, then they're able to view your dashboard's data-supplying reports.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

2. [Filter a Dashboard](#)

Dashboard filters make it easy to provide different combinations of data from a single dashboard. You don't need separate dashboards for different sets of users — give each group a filter that makes sense for them. When you use a filter on a dashboard, the filtered view is shown again the next time you visit the dashboard.

3. [Dynamic Dashboards: Choose Who People View a Dashboard As](#)

Say that your sales people can only view their own opportunities, but you'd like to review all opportunities closed in the last quarter. Create a dashboard and let people view the dashboard as you (or anyone else who can see all opportunities). When your sales people open the dashboard, they see info about all opportunities instead of only their opportunities. (Their data access in Salesforce remains unchanged. They can only see more data in your dashboard.)

4. [Run and Then Read a Dashboard](#)

Click on a dashboard's name to run it. Dashboard charts are interactive, so be sure to hover and click on them to get more info!

5. [Organize Dashboards](#)

Keep your dashboards at your fingertips by embedding them around Salesforce, printing them, or deleting dashboards that you don't need anymore.

6. [Dashboard Limits](#)

As you build dashboards of your data, be aware of these limits and restrictions.

7. [Why Doesn't My Dashboard Display the Data I Expect?](#)

If you're not seeing data you expect, refresh for latest data, check that you have the right running user, and verify your dashboard data sources.

Build a Dashboard

When you're ready to share Salesforce data with colleagues, build a dashboard. Dashboards let you curate data from reports using charts, tables, and metrics. If your colleagues need more information, then they're able to view your dashboard's data-supplying reports.

IN THIS SECTION:

1. [Build a Lightning Experience Dashboard](#)

Build a Lightning Experience dashboard to provide a graphical view of the Salesforce data in reports.

2. [Build a Salesforce Classic Dashboard](#)

Build a dashboard to provide a graphical view of the data in your reports.

3. [Install the CRM Sample Dashboards from AppExchange](#)

Use these dashboards from the AppExchange as a starting point for building dashboards that meet your business needs.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

USER PERMISSIONS

To build a dashboard

- **Legacy Folder Sharing**
Drag-and-Drop Dashboard Builder

Enhanced Folder Sharing

Drag-and-Drop Dashboard Builder

Build a Lightning Experience Dashboard

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing
Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing
Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing
Manage Dynamic Dashboards

Enhanced Folder Sharing
Manage Dynamic Dashboards

EDITIONS

Available in: Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Build a Lightning Experience dashboard to provide a graphical view of the Salesforce data in reports.

Dashboards are built with source reports, filters, and components.

Source reports are reports that provide data for components. Each component has one source report. Different components can have different source reports. The fields available for dashboard filters are the fields available in the objects that source reports are based on. Create source reports in the Report Builder.

Filters let dashboard readers scope the data they see in the dashboard to a particular view.



Components are the visual "blocks" of a dashboard. Each component is either a chart, gauge, metric, or table.



when you want to show data graphically. You can choose from a variety of





Use a gauge when you have a single value that you want to show within a range of custom values






	Use a metric when you have one key value to display.
	Use a table to show a set of report data in column form.

This topic is about creating dashboards for reports in Lightning Experience. For information on creating dashboards in Salesforce Classic or Analytics, review these articles:

- [Build a Salesforce Classic Dashboard](#)
- [Build Analytics Dashboards](#)

 **Tip:** You can clone a dashboard to quickly create a dashboard with the same properties and components as the one you're viewing. Click **Clone**, modify the dashboard settings, and save.

1. If necessary, create the source reports containing the data you want to display.
 -  **Important:** Be sure to store these reports in folders that intended dashboard viewers can access.
2. From the Dashboards tab, click **New Dashboard**.
3. Name the dashboard.

Optionally, provide a short description. Then, place the dashboard in a folder. Private Dashboards is the default folder.
4. To add a component to the dashboard, click **+ Component**.
 - a. Choose a source report for the component, then click **Select**.
 - b. Customize how the component displays data, then click **Add**.
 - c. Arrange and resize the component as necessary.
 - d. To edit an existing component, click the pencil icon (). To remove a component, click the X icon (.
5. To add a filter to the dashboard, click **+ Filter**.
 - a. From the **Field** drop-down, select a field to filter on. The drop-down shows fields that can be used to filter all the dashboard's components. If there are equivalent fields for your selection, hover over the info icon () to see them.
 - b. Give the filter a **Display Name** to identify it. If the filter has many equivalent fields, we consider using a name that works for all components.
 - c. Assign values to the filter by clicking **Add Filter Value**.
6. To specify who people view the dashboard as, click the gear icon () to open the Properties menu.
 - a. Under **Name**, optionally rename the dashboard.
 - b. Under **Description**, optionally describe the dashboard.
 - c. Under **Folder**, optionally move the dashboard into another folder. To switch folders, first click the X icon () , then select another folder.
 - d. Under **View Dashboard As**, choose who people view the dashboard (and all source reports) as. People could see more or less data than they normally see elsewhere in Salesforce. Be careful not to reveal sensitive information to too broad an audience.
 - **Me** — People view the dashboard as you.

- **Another person** — People view the dashboard as whomever you choose. You are the default person. To choose someone else, click the X icon (✕).
- **The dashboard viewer** — People see data as themselves, according to their own access to data. These types of dashboards are often called *dynamic dashboards*.

Your organization can have up to 5 dynamic dashboards for Enterprise Edition, 10 for Unlimited and Performance Edition, and 3 for Developer Edition. Dynamic dashboards aren't available in other editions. Additional dynamic dashboards may be available for purchase.

Take note of these dynamic dashboard limitations:

- Dynamic dashboards don't support following components.
 - You can't save dynamic dashboards in private folders.
 - You can't schedule refreshes for dynamic dashboards. They must be refreshed manually.
- **Let dashboard viewers choose whom they view the dashboard as** — Optionally, select **Let dashboard viewers choose whom they view the dashboard as** to enable a reader with appropriate user permissions to choose who they view the dashboard as. With the "View My Team's Dashboards" user permission, the reader can view the dashboard as themselves or as anyone beneath them in the role hierarchy. With the "View All Data" user permission, the reader can view the dashboard as anyone.

7. Click **Save**, then click **Done**.

Your dashboard is done. Review and admire your handiwork!

IN THIS SECTION:

[Edit and Customize Lightning Experience Dashboard Components](#)

Get your Lightning Experience dashboard components to show exactly what you want.

[Edit Dashboards with Keyboard Shortcuts in Lightning Experience](#)

From the Dashboard tab, you can create, edit, or delete a dashboard using nothing but your keyboard. Use keystrokes to edit dashboards quickly and easily in Lightning Experience.

Edit and Customize Lightning Experience Dashboard Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

EDITIONS

Available in: Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing


Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

Get your Lightning Experience dashboard components to show exactly what you want.

Each component has a series of properties that help you customize the component until it shows exactly the data that you want. Refer to this table for help customizing each component's properties, and for ideas about when to use each type of component:

Component	Notes about Availability in the Salesforce App
<p>Bar Carts</p> 	<p>Use</p> <p>A bar chart shows values as horizontal lengths, so this format can be good for comparing distance or time. Use a bar chart when you have a summary report with a single grouping, or you only want to display one grouping.</p> <p>For example, to see the amount in each sales stage in a report, select <code>Sum of Amount</code> as the <code>X-axis</code> and <code>Stage</code> as the <code>Y-axis</code>. The chart displays 1 bar for each stage, with the length proportional to the total opportunity amount.</p> <p>Properties</p> <ul style="list-style-type: none"> • Y-Axis and X-Axis – Choose a group (horizontal bar charts) or a measure (vertical bar chart) to display on each axis. If applicable, click + Group or + Measure to chart more groups or measures. • Show Values – Specify whether chart segments display values, or not. • Sort Rows By – Choose how to sort groups displayed in the bar chart. • Max Values Displayed – Specify how many groups display in the bar chart. • Title – Give the chart a title. • Subtitle – Give the chart a subtitle.

Component

Notes about Availability in the Salesforce App

- **Footer** – Give the chart a footer.

Stacked Bar Charts



Use

Use a stacked bar chart when you have multiple groupings and are interested in the proportions between values in each grouping and each grouping's total.

For example, compare the status of leads by campaign, and also to compare the totals for each status. Set record count as the **X-axis**, status as the **Y-axis**, and campaign as the **Stack By** value. The chart displays a single bar for each status, broken down by campaign, with each campaign shown in a different color.

Properties

- **Y-Axis and X-Axis** – Choose a group (horizontal bar charts) or a measure (vertical bar chart) to display on each axis. If applicable, click **+ Group** or **+ Measure** to chart more groups or measures.
- **Stack By** – Choose which group to stack by.
- **Stack to 100%** – Specify whether to stack the bar chart to 100%, or not.

Stack to 100% when you have multiple groupings and are interested in the proportions between values in each grouping and each grouping's total.

- **Sort Rows By** – Choose how to sort groups displayed in the bar chart.
- **Max Values Displayed** – Specify how many groups display in the bar chart.
- **Title** – Give the chart a title.
- **Subtitle** – Give the chart a subtitle.
- **Footer** – Give the chart a footer.

Line Charts



Use

Line charts are good for showing changes in the value of an item over a series of points in time, such as week to week. Use a line chart when you have one important grouping representing an ordered set of data and one value to show.

Line charts are useful for showing data over time. For example, to see the numbers of leads created each month in a report, set record count as the **Y-axis** and created month for the **X-axis**. The chart displays a line connecting the record count totals for each month. Salesforce does not plot missing (null) values.

Component

Notes about Availability in the Salesforce App

Properties

- **X-Axis** – Choose a group to display on the x-axis. If applicable, click **+ Group** to chart another group.
- **Y-Axis** – Choose a measure to display on the y-axis. If applicable, click **+ Measure** to chart another measure.
- **Cumulative** – Specify whether the line chart is cumulative, or not.

Use a cumulative line chart when you have one important grouping representing an ordered set of data and one value to show, summed over time.

For example, see the total number of closed opportunities by day for each of the last three months. Set amount as the **Y-axis**, closing day as the **X-axis**, and closing month as the **Group** value. The chart displays a line for each month, with the line's height representing the cumulative number of closed opportunities up to and including that day.

- **Sort Rows By** – Choose how to sort groups displayed in the chart.
- **Max Values Displayed** – Specify how many groups display in the line chart.
- **Title** – Give the chart a title.
- **Subtitle** – Give the chart a subtitle.
- **Footer** – Give the chart a footer.

Donut Charts



Use

Use a donut chart when you have multiple groupings and want to show both the proportion of a single value for each grouping against the total, and the total amount itself.

For example, see the breakdown of your case queue by case status in a report, and the total number of cases. Set record count for **Value** and status for **Sliced By**. The chart displays a donut made up of wedges, each wedge representing a case status. Wedge size is proportional to the numbers of cases. The total number of cases for all statuses is shown in the middle.

Properties

- **Value** – Choose a measure to display on the donut chart.
- **Sliced By** – Choose a group to slice the donut by.
- **Label Groups** – Specify whether to label sliced wedges with values, percentages, or no labels.

Component

Notes about Availability in the Salesforce App

- **Sort Rows By** – Choose how to sort groups displayed in the chart.
- **Max Values Displayed** – Specify how many groups display in the donut chart.
- **Title** – Give the chart a title.
- **Subtitle** – Give the chart a subtitle.
- **Footer** – Give the chart a footer.

Funnel Charts



Use

Use a funnel chart when you have multiple groupings in an ordered set and want to show the proportions among them.

For example, to see the number of opportunities in each stage in a report, set amount for `Value` and stage for `Color By`. Since the `Opportunity: Stage` field is an ordered picklist, the stages are sorted in the same order as the picklist. Funnel charts are useful for showing the flow of opportunities through the stages; a substantially larger segment can indicate a bottle-neck at that stage.

Properties

- **Value** – Choose a measure to display on the funnel chart.
- **Color By** – Choose a group to display in the funnel chart.
- **Label Groups** – Specify whether to label sliced wedges with values, percentages, or no labels.
- **Show Values** – Specify whether chart segments display values, or not.
- **Show Percentages** – Specify whether chart segments display percentages, or not.
- **Sort Rows By** – Choose how to sort groups displayed in the chart.
- **Max Values Displayed** – Specify how many groups display in the funnel chart.
- **Title** – Give the chart a title.
- **Subtitle** – Give the chart a subtitle.
- **Footer** – Give the chart a footer.

Scatter Charts



Use

Use scatter charts to show meaningful information using one or two groups of report data plus measures.

For example, see how stage duration correlates with the number of activities for opportunities. Group your report by `Opportunity Name`. Then set `X-Axis` on the chart to `Record Count` and `Y-Axis` to `Stage Duration`.

Component
Notes about Availability in the Salesforce App

The chart shows a dot for each opportunity. At a glance, you can tell if the stage duration is shorter for opportunities that have more activities.

Properties

- **X-Axis** – Choose a measure for the x-axis.
 - **Y-Axis** – Choose a measure for the y-axis.
 - **Detail** – Choose a group to plot on the scatter chart.
 - **Add** – Choose a second group to plot on the scatter chart.
 - **Sort Rows By** – Choose how to sort groups displayed in the chart.
 - **Max Values Displayed** – Specify how many groups display in the scatter chart.
 - **Title** – Give the chart a title.
 - **Subtitle** – Give the chart a subtitle.
 - **Footer** – Give the chart a footer.
-

Gauge Charts**Use**

A gauge is used to see how far you are from reaching a goal. It displays a single value, such as closed deals.

For example, use a gauge to see how close you are to meeting your target revenue.

Properties

- **Measure** – Choose a measure for the gauge chart.
 - **Shorten Number** – Choose whether to shorten numbers, or not.

Shorten numbers to display approximations that take up less space (for example, 1,876 becomes 1.9k), or view the full number for to-the-digit accuracy.
 - **Show Range** – Choose whether to show or hide a range.
 - **Segment Ranges** – Choose breakpoints and colors for segments on the gauge.
 - **Title** – Give the chart a title.
 - **Subtitle** – Give the chart a subtitle.
 - **Footer** – Give the chart a footer.
-

Metric Components**Use**

Use a metric when you have one key value to display.

For example, show the total number of customer support cases filed today.

Component
Notes about Availability in the Salesforce App

Properties

- **Measure** – Choose a measure for the metric chart.
 - **Shorten Number** – Choose whether to shorten numbers, or not.
Shorten numbers to display approximations that take up less space (for example, 1,876 becomes 1.9k), or view the full number for to-the-digit accuracy.
 - **Show Range** – Choose whether to show or hide a range.
 - **Segment Ranges** – Choose breakpoints and colors for segments on the component.
 - **Title** – Give the component a title.
 - **Subtitle** – Give the component a subtitle.
 - **Footer** – Give the component a footer.
-

Legacy Table Components**Use**

A legacy table component shows columns of data from a custom report in a dashboard. You can use color and scale to help users interpret the report data the legacy table displays.


The default two-column table uses the first grouping and summary field from the chart in the source report. If the report has no chart, default columns are based on the first grouping and summary field in the report.

Two-column legacy tables do not allow null values.

To use a tabular report as the source report, `Rows to Display` must be set for that report.

Properties

- **Columns** – The columns from the source report displayed in the table component.
 - **Show Chatter Photos** – Choose whether to display Chatter photos, or not.
Display Chatter photos for up to 20 records in a horizontal bar chart component whose source report is grouped by a user or group name field. If there are more than 20 records with photos, record names are shown instead of photos.
 - **Add Conditional Highlighting** – Highlight values in the table based on breakpoints and colors set in segment ranges.
 - **Segment Ranges** – Choose breakpoints and colors for segments on the gauge. Only available when conditional highlighting is included.
-

Component	Notes about Availability in the Salesforce App
<p>Lightning Table (Beta)</p> 	<ul style="list-style-type: none"> • Sort Rows By – Choose how to sort groups displayed in the chart. • Max Values Displayed – Specify how many groups display in the component. • Title – Give the component a title. • Subtitle – Give the component a subtitle. • Footer – Give the component a footer. <p>Use</p> <p>Show up to 200 records and 10 columns and from any field in a source report’s report type.</p> <p>Lightning tables aren’t available in Salesforce Classic. You can’t add them from the Classic dashboard builder, nor can you see them when you view a dashboard in Salesforce Classic.</p> <p>Dashboard filters aren’t applied to Lightning tables.</p> <p>Properties</p> <ul style="list-style-type: none"> • Columns – Choose columns from fields in the source report’s report type. To add a column, click + Column. • Sort Column – Specify a column to sort the table by. Then, choose either Ascending, Descending, or nothing depending on how you want to sort the table. • Max Values Displayed – Specify how many groups display in the component. • Title – Give the component a title. • Subtitle – Give the component a subtitle. • Footer – Give the component a footer.

Edit Dashboards with Keyboard Shortcuts in Lightning Experience

USER PERMISSIONS	EDITIONS
<p>To create dashboards:</p> <ul style="list-style-type: none"> • Legacy Folder Sharing Run Reports AND Manage Dashboards • Enhanced Folder Sharing Run Reports AND Create and Customize Dashboards 	<p>Available in: Lightning Experience</p> <hr/> <p>Available in: Group (View Only), Professional, Enterprise, Performance, Unlimited, and Developer Editions</p> <hr/> <p>Available in: both Legacy Folder Sharing and Enhanced Folder Sharing</p>

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

From the Dashboard tab, you can create, edit, or delete a dashboard using nothing but your keyboard. Use keystrokes to edit dashboards quickly and easily in Lightning Experience.

Use these handy keyboard shortcuts while building or editing a dashboard.

Keyboard Shortcut	Description
Tab	Focus on next item in the dashboard
Shift+Tab	Focus on previous item in the dashboard
Spacebar	Select a component to move or a component corner to resize
Arrow keys	Move or resize a widget
Enter	Click a button
Ctrl+Z	Undo
Ctrl+Y	Redo
Ctrl+S	Save
Ctrl+N	Add component
Esc	Cancel pending component move or resize

As you tab through dashboard components, notice that the option to have a screen reader read each chart's dataset appears, **Read Chart Dataset (Screen Reader)**.

For more information about using screen readers with Salesforce, see [Recommendations for Salesforce Accessibility](#) in the Salesforce help.

Build a Salesforce Classic Dashboard

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic


Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Build a dashboard to provide a graphical view of the data in your reports.

This topic is about creating dashboards from reports in Salesforce Classic. For information on creating dashboards in Salesforce Classic or Analytics, review these articles:

- [Build a Lightning Experience Dashboard](#)
- [Build Analytics Dashboards](#)

 **Tip:** You can clone a dashboard to quickly create a dashboard with the same properties and components as the one you're viewing. Click **Clone**, modify the dashboard settings, and save.

1. Create the custom reports containing the data you want to display.

 **Important:** Be sure to store these reports in folders that your intended dashboard viewers can access.

2. Click the Dashboards tab.
3. Click **Go To Dashboard List**.
4. Click **New Dashboard**.
To modify an existing dashboard, click its name from the list.
5. Customize your dashboard and click **Save**.

IN THIS SECTION:

[Work with Salesforce Classic Dashboards](#)

A *dashboard* shows data from source reports as visual components, which can be charts, gauges, tables, metrics, or Visualforce pages. The components provide a snapshot of key metrics and performance indicators for your organization.

[Edit Dashboards in Accessibility Mode in Salesforce Classic](#)

In Salesforce Classic, you can edit dashboards in Accessibility mode.

SEE ALSO:

[Delete a Dashboard](#)

[Install the CRM Sample Dashboards from AppExchange](#)

Work with Salesforce Classic Dashboards

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing
Run Reports, Manage Dashboards AND View All Data

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

A *dashboard* shows data from source reports as visual components, which can be charts, gauges, tables, metrics, or Visualforce pages. The components provide a snapshot of key metrics and performance indicators for your organization.

Dashboard builder is a drag-and-drop interface for creating and modifying dashboards. You can use it to customize the whole dashboard, a column in the dashboard, or a component in the dashboard.



Tip: Dashboard builder uses a compressed page header to let you see more of the screen. To view your application tabs, simply close the builder or click the Salesforce logo.

To customize a dashboard, view it and click **Edit**.

IN THIS SECTION:

[Add a Dashboard Component in Salesforce Classic](#)

Add components by dragging a component type onto the dashboard, then dropping a data source (report, s-control, or Visualforce page) onto it.

[Modify a Dashboard Component in Salesforce Classic](#)

A dashboard component is a visual representation of the data in a report. You can change where the component’s data comes from, what the data looks like in the component, and what kind of component it is.

SEE ALSO:

[Add a Dashboard Filter](#)

[Build a Salesforce Classic Dashboard](#)

Add a Dashboard Component in Salesforce Classic

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

Add components by dragging a component type onto the dashboard, then dropping a data source (report, s-control, or Visualforce page) onto it.

1. On the dashboard where you want to add a component, click **Edit**.
You can continue to edit the dashboard while components and data sources are loading.
2. Drag the component type you want from the Components tab onto your dashboard.



Tip: You can also drop the data source first, then drop a component type onto it.

To select the kind of component you need, consider the type of data you're showing and the uses it will serve.



Use a chart when you want to show data graphically. You can choose from a variety of chart types.



Use a gauge when you have a single value that you want to show within a range of custom values



Use a metric when you have one key value to display.



- Enter metric labels directly on components by clicking the empty text field next to the grand total.
- Metric components placed directly above and below each other in a dashboard column are displayed together as a single component.







Use a table to show a set of report data in column form.

Visualforce Page	Use a Visualforce page when you want to create a custom component or show information not available in another component type. Visualforce Pages are only available in Salesforce Classic.
Custom S-Control	Custom s-controls can contain any type of content that you can display in a browser, for example a Java applet, an Active-X control, an Excel file, or a custom HTML Web form. Custom S-Controls are only available in Salesforce Classic.

3. Drag a report from the Data Sources tab onto the component you just dropped on the dashboard.
 - You can show a joined report that includes a chart on a dashboard. Edit the joined report dashboard component and select **Use chart as defined in the source report**.
 - If the dashboard has a filter, the data source must contain the filter field or an equivalent. If it doesn't, the filter may not work.
 - Some custom forecast and lead reports aren't available for dashboards.
 - For Visualforce components, the data source must be a Visualforce page.

 **Tip:** Each folder can contain up to 200 data sources. To home in on the right data source quickly, try Quick Find or the **Recent**, **My**, and **All** filters.
4. Click  on your dashboard component.
5. On the Component Data tab, choose which summary fields and groupings in the underlying report you want to display in your component.

 **Tip:** Make more fields available for a dashboard component by adding them to the source report chart. For example, create a combination chart on the report using vertical columns and lines. The additional groupings in the report chart are available to use in dashboard components.
6. On the Formatting tab, specify how your component shows its data. Your formatting choices depend on the component type you choose.

 **Note:** For Visualforce pages and s-controls, set the `Height`.
7. Click **OK**.
8. Drag, drop and click to rearrange components on the dashboard.
 - Grab components by the header bar and drag them to the right location on the dashboard.
 - Click  for a data source to remove it from the component.
 - Click  for a component to remove it from the dashboard.
 - Click component header, title, and footer fields to edit them.
 - Change colors for picklist values displayed in dashboard components. You need the "Customize Application" permission to update picklists.
 - Optionally, for filtered dashboards, choose a different field in the `Filtered By` drop-down.

Modify a Dashboard Component in Salesforce Classic

USER PERMISSIONS

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Legacy Folder Sharing

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Manage Dynamic Dashboards

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A dashboard component is a visual representation of the data in a report. You can change where the component's data comes from, what the data looks like in the component, and what kind of component it is.

Dashboard builder is a drag-and-drop interface for creating and modifying dashboards. Drag, drop and click to rearrange components on the dashboard. Hover details and drill-down are available when you view and not when you edit a dashboard.

IN THIS SECTION:

1. [Make Fields Available in a Dashboard Component](#)

Make more fields available for a dashboard component by adding them to the source report chart.

2. [Choose Where Users Go When Clicking a Dashboard Component](#)

You can edit a dashboard component so that when users click the component, they can drill down to the source report, filtered report, record detail page, or other URL.

3. [Custom Four-Column Table](#)

Table visuals are useful to list values of several items against some criteria. The fields you add to the source report chart are the ones available for the table columns in dashboards.

4. [Dashboard Component Types](#)

Dashboard components can be charts, tables, gauges, metrics, or other components that you can create with VisualForce.

5. [Chart Types](#)

You can show data in reports and dashboards in the form of bars, columns, lines, shapes, or other elements. Which is right depends on what the data is about and what you want to show with it.

6. [Data Settings for Dashboard Chart Components](#)

Choose the data you want to show on your report or dashboard chart. The chart automatically selects groupings and summary values from your report. You can override some of those choices to focus on the data you need to share.

7. [Visual Settings for Dashboard Chart Components](#)

Choose the type of chart that fits the data you are sharing, then apply the visual settings that will communicate the data most effectively.

SEE ALSO:

[Add a Dashboard Filter](#)

Make Fields Available in a Dashboard Component

Make more fields available for a dashboard component by adding them to the source report chart.

For example, create a [combination chart](#) on the report using vertical columns and lines. The additional groupings in the report chart are available to use in dashboard components.

Choose Where Users Go When Clicking a Dashboard Component

You can edit a dashboard component so that when users click the component, they can drill down to the source report, filtered report, record detail page, or other URL.

Edit a component and set the `Drill Down to` option on the Component Data tab. Choose one of these options:

- **Source Report**—Takes the user to the full source report for the dashboard component.
- **Filtered Source Report**—When users click individual groups, X-axis values, or legend entries, they are taken to the source report filtered by what they clicked.

For example, if you had a stacked vertical column chart of opportunities grouped by stage, with months as the X-axis, you could click an individual stage in a bar, a month on the X-axis, or a legend entry for a stage to drill down to the filtered source report. (Not available for gauges, metrics, or tables.)

- **Record Detail Page**—When users click chart or table elements, axis values, or legend entries, they are taken to the detail page for that record. You can only choose this option for tables and charts that use a source report grouped by record name, record owner, or feed post. (Not available for gauges or metrics.)
- **Other URL**—Takes the user to the URL that you specify. You can't add URLs that begin with "mailto:" or "javascript:" to dashboard components.

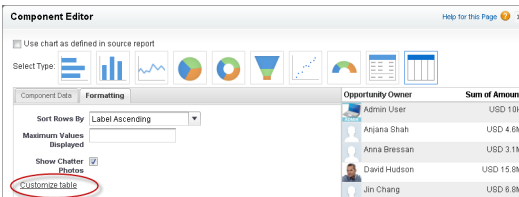
Custom Four-Column Table

Table visuals are useful to list values of several items against some criteria. The fields you add to the source report chart are the ones available for the table columns in dashboards.

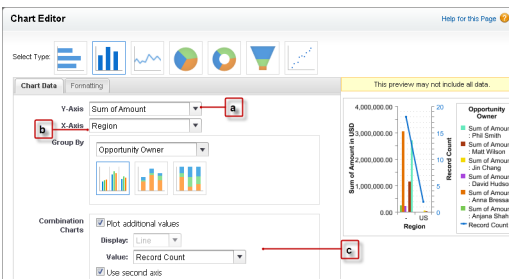
Tables show two columns of data by default. They can show totals and up to four columns of data if you customize. You can also personalize the table and show users' Chatter photos as long as the table doesn't have more than 20 rows.

Before you customize a table, make sure your source report is in matrix or summary format and *contains* a chart.

1. To create a four-column table, edit a table component on a dashboard and click the **Customize Table** link. Customized tables allow null values in the results. Default two-column tables do not.



2. Which fields you can use in the table depends on the fields you picked in the source report chart:



- a. The chart must contain groupings and at least one summary.
- b. The first grouping in the report chart becomes the first column of the table. To show a different field as the first column in the table, select the desired grouping in the report chart.
- c. Use a combination vertical bar or a scatter chart in the report to make more fields available for the table.

Example

You can use a table to show:

- Top sales reps for the quarter with the number of opportunities each won.
- Number of cases by product in the last three months.
- Number of accounts by region, the total number of opportunities available, and those won.

Take a look at this customized four-column table that shows the top sales reps by region with the number and value of opportunities they won.

Top Sales Reps by Region			
Region	Opportunity Owner	Record Count	Sum of Amount
US	David Hudson	15	USD 13.0M
US	Phil Smith	3	USD 7.6M
EMEA	Jim Chang	3	USD 6.7M
EMEA	Anna Bressan	6	USD 3.7M
US	Anjana Shah	2	USD 3.1M
EMEA	Matt Wilson	1	USD 1.1M
APAC	Karen Adams	1	USD 150K
Total		31	USD 35.4M

Dashboard Component Types

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Dashboard components can be charts, tables, gauges, metrics, or other components that you can create with VisualForce.



Component Type	Image	Description
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Chart		Use a chart when you want to show data graphically. You can choose from a variety of chart types.
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Gauge		Use a gauge when you have a single value that you want to show within a range of custom values. For example, to create a dashboard that measures where your current closed opportunity amounts fall within a range of values, set the <code>Minimum Value</code> , <code>Breakpoint #1 Value</code> , <code>Breakpoint #2 Value</code> , and <code>Maximum Value</code> for the gauge. The ranges that you set can indicate poor, acceptable, and good performance. Set appropriate colors for each of these ranges to visually indicate progress. To create a gauge with only two ranges, leave <code>Breakpoint #2 Value</code> blank.
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Component Type	Image	Description
		Select <code>Show Percentage</code> or <code>Show Total</code> to display those values on the gauge. Values exceeding the maximum are shown as greater than 100%.
Metric		Use a metric when you have one key value to display. For example, if you have a report showing the total amount for all opportunities in the <code>Closed</code> , <code>Commit</code> , and <code>Base Case</code> stages in the current month, you can name that value and use it as a revenue target for the month displayed on the dashboard.
Table		Use a table to show a set of report data in column form. For example, to see the top 20 opportunities by amount, set <code>Maximum Values Displayed</code> to <code>20</code> , click Customize Table and select opportunity name, amount, and other columns to display, choose the sort order, and set conditional highlighting. Available columns include all chart groupings and report summary fields, as well as the second-level grouping defined in the report.
Visualforce Page	N/A	Use a Visualforce page when you want to create a custom component or show information not available in another component type. For example, a Visualforce page can display data from an external system or show Salesforce data in a custom way. Visualforce pages must meet certain requirements to be displayed in dashboards; otherwise, they don't appear in the <code>Visualforce Page</code> drop-down list. See Creating Visualforce Dashboard Components .
Custom S-Control	N/A	Custom s-controls can contain any type of content that you can display in a browser, for example a Java applet, an Active-X control, an Excel file, or a custom HTML Web form. Important: Visualforce pages supersede s-controls. Organizations that haven't previously used s-controls can't create them. Existing s-controls are unaffected, and can still be edited.

SEE ALSO:

[Modify a Dashboard Component in Salesforce Classic](#)

Chart Types

You can show data in reports and dashboards in the form of bars, columns, lines, shapes, or other elements. Which is right depends on what the data is about and what you want to show with it.

IN THIS SECTION:

1. [Bar Charts](#)

A bar chart shows values as horizontal lengths, so this format can be good for comparing distance or time. Use a bar chart when you have a summary report with a single grouping, or you only want to display one grouping.

2. [Column Charts](#)

A column chart is very much like a bar chart, but it can be a better format for showing relative counts of things, such as leads or dollars. Use a column chart when you have a summary report with a single grouping, or you only want to display one grouping.

3. [Line Charts](#)

Line charts are good for showing changes in the value of an item over a series of points in time, such as week to week or quarter to quarter. Use a line chart when you have one important grouping representing an ordered set of data and one value to show.

4. [Pie Charts](#)

Use a pie chart when you have multiple groupings and want to show the proportion of a single value for each grouping against the total.

5. [Donut Charts](#)

Use a donut chart when you have multiple groupings and want to show not only the proportion of a single value for each grouping against the total, but also the total amount itself.

6. [Funnel Charts](#)

Use a funnel chart when you have multiple groupings in an ordered set and want to show the proportions among them.

7. [Scatter Charts](#)

Use scatter charts to show meaningful information using one or two groups of report data plus summaries.

SEE ALSO:

[Scatter Charts](#)

[Modify a Dashboard Component in Salesforce Classic](#)

[Create a Custom Report in Accessibility Mode](#)

[Show Different Data Sets in One Chart](#)

[Data Settings for Dashboard Chart Components](#)

[Visual Settings for Dashboard Chart Components](#)

Bar Charts

A bar chart shows values as horizontal lengths, so this format can be good for comparing distance or time. Use a bar chart when you have a summary report with a single grouping, or you only want to display one grouping.



For example, to see the amount in each sales stage in a report, select `Sum of Amount` as the `X-axis` and `Stage` as the `Y-axis`. The chart displays one bar for each stage, with the length proportional to the total opportunity amount.

The advantage of the horizontal bar charts is that the chart can be extended vertically to show numerous groupings, though the width is fixed. Depending on chart settings, you can also display Chatter photos.

EDITIONS

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IN THIS SECTION:

1. [Grouped Bar Charts](#)

Use a grouped bar chart when you have multiple groupings, and you want to compare values within a secondary grouping, but not the totals.

2. [Stacked Bar Charts](#)

Use a stacked bar chart when you have multiple groupings and are interested in the proportions between values in each grouping, as well as each grouping's total.

3. [Bar Charts Stacked to 100%](#)

Use a bar chart stacked to 100 percent when you have multiple groupings and are interested in the proportions between values in each grouping, as well as each grouping's total.

SEE ALSO:

[Data Settings for Dashboard Bar and Column Chart Components](#)

[Formatting Settings for Dashboard Bar Chart Components](#)

Grouped Bar Charts

Use a grouped bar chart when you have multiple groupings, and you want to compare values within a secondary grouping, but not the totals.



For example, to compare the amount of deals closed each month by lead source in a report, set amount as the **X-axis**, source as the **Y-axis**, and closing month as the **Groupings** value. The chart displays a set of bars for each source, one bar for each month. The monthly differences within a particular source are easy to compare.

You can also compare a given month across sources, but comparing the total number of leads for each source may be difficult.

 **Tip:** Use a stacked chart to compare totals.

Stacked Bar Charts

Use a stacked bar chart when you have multiple groupings and are interested in the proportions between values in each grouping, as well as each grouping's total.



For example, to compare the status of leads by campaign in a report, and also to compare the totals for each status, set record count as the **X-axis**, status as the **Y-axis**, and campaign as the **Groupings** value. The chart displays a single bar for each status, broken down by campaign, with each campaign shown in a different color.

The proportion of each campaign in each status is easy to compare, as are the totals for each status, but comparing a single campaign's contribution to different statuses, or to the total, may be difficult.

Bar Charts Stacked to 100%

Use a bar chart stacked to 100 percent when you have multiple groupings and are interested in the proportions between values in each grouping, as well as each grouping's total.



For example, to compare the status of leads by campaign in a report, and also to compare the totals for each status, set record count as the **X-axis**, status as the **Y-axis**, and campaign as the **Groupings** value. The chart displays a single bar for each status, broken down by campaign, with each campaign shown in a different color.

The proportion of each campaign in each status is easy to compare, as are the totals for each status, but comparing a single campaign's contribution to different statuses, or to the total, may be difficult.

Column Charts

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A column chart is very much like a bar chart, but it can be a better format for showing relative counts of things, such as leads or dollars. Use a column chart when you have a summary report with a single grouping, or you only want to display one grouping.



For example, to see the number of leads by lead source in a report, set record count as the *Y-axis* and source as the *X-axis*. The chart displays one column for each source, with the height proportional to the total number of leads. The width of column charts is constrained by dashboard column size and report chart size. Horizontal bar charts may be better for large numbers of groupings. Column charts are good when showing values by date, since dates traditionally run along the X-axis.

IN THIS SECTION:

1. [Grouped Column Charts](#)

Use a grouped column chart when you have multiple groupings, and you want to compare values within a secondary grouping, but not the totals.

2. [Stacked Column Charts](#)

Use a stacked column chart when you have multiple groupings and you're interested in the proportions between values in each grouping, as well as each grouping's total.

3. [Stacked Bar Charts](#)

Use a stacked bar chart when you have multiple groupings and are interested in the proportions between values in each grouping, as well as each grouping's total.

4. [Column Chart Stacked to 100 Percent](#)

Use a column chart stacked to 100 percent when you have multiple groupings and are interested in the proportions between values in each grouping, as well as each grouping's total.

Grouped Column Charts

Use a grouped column chart when you have multiple groupings, and you want to compare values within a secondary grouping, but not the totals.



For example, to compare the number of opportunities created each month by campaign source in a report, set record count as the *Y-axis*, created month as the *X-axis*, and source as the *Groupings* value. The chart displays a set of bars for each month, one bar for each campaign source. The differences between sources within a particular month are easy to compare.

You can also compare a particular source across months, but comparing the total number of opportunities for each month may be difficult.

 **Tip:** Use a stacked chart to compare totals.

Stacked Column Charts

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Use a stacked column chart when you have multiple groupings and you're interested in the proportions between values in each grouping, as well as each grouping's total.



For example, to compare the number of opportunities created each month by campaign source in a report, and also to compare the totals for each month, set record count as the *Y-axis*, created month as the *X-axis*, and source as the *Groupings* value. The chart displays a single bar for each month, broken down by source, with each source shown in a different color.

The proportion of each source in each month is easy to compare, as are the monthly totals, but comparing a single source's contribution to different months, or to the total, may be difficult.

Stacked Bar Charts

Use a stacked bar chart when you have multiple groupings and are interested in the proportions between values in each grouping, as well as each grouping's total.



For example, to compare the status of leads by campaign in a report, and also to compare the totals for each status, set record count as the *X-axis*, status as the *Y-axis*, and campaign as the *Groupings* value. The chart displays a single bar for each status, broken down by campaign, with each campaign shown in a different color.

The proportion of each campaign in each status is easy to compare, as are the totals for each status, but comparing a single campaign's contribution to different statuses, or to the total, may be difficult.

Column Chart Stacked to 100 Percent

Use a column chart stacked to 100 percent when you have multiple groupings and are interested in the proportions between values in each grouping, as well as each grouping's total.



For example, to compare the number of opportunities created each month by campaign source in a report, and also to compare the totals for each month, set record count as the *Y-axis*, created month as the *X-axis*, and source as the *Groupings* value. The chart displays a single bar for each month, broken down by source, with each source shown in a different color. The proportion of each source in each month is easy to compare, as are the monthly totals, but comparing a single source's contribution to different months, or to the total, may be difficult.

Line Charts

Line charts are good for showing changes in the value of an item over a series of points in time, such as week to week or quarter to quarter. Use a line chart when you have one important grouping representing an ordered set of data and one value to show.



Line charts are useful for showing data over time. For example, to see the numbers of leads created each month in a report, set record count as the *Y-axis* and created month for the *X-axis*. The chart displays a line connecting the record count totals for each month. Salesforce does not plot missing (null) values.

If a missing value occurs in the middle of a data set, Salesforce displays a gap in the line.

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IN THIS SECTION:

1. [Grouped Line Charts](#)

Use a grouped line chart when you have multiple groupings—each with one important secondary grouping representing an ordered set of data—and one value to show.

2. [Cumulative Line Charts](#)

Use a cumulative line chart when you have one important grouping representing an ordered set of data and one value to show, summed over time.

3. [Grouped Cumulative Line Charts](#)

Use a cumulative line chart when you have one important grouping representing an ordered set of data and one value to show, summed over time. Use a grouped line chart when you have multiple groupings—each with one important secondary grouping representing an ordered set of data—and one value to show.

Grouped Line Charts

Use a grouped line chart when you have multiple groupings—each with one important secondary grouping representing an ordered set of data—and one value to show.



For example, to see monthly leads by lead source in a report, set record count as the `Y-axis`, created month as the `X-axis`, and source as the `Groupings` value. The chart displays a line for each source, connecting that source's record count totals for each month. Each line spans the earliest to the latest month containing data. Comparing the total numbers for each month may be difficult.

Salesforce does not plot missing (null) values. If a missing value occurs in the middle of a data set, Salesforce displays a gap in the line.

Cumulative Line Charts

Use a cumulative line chart when you have one important grouping representing an ordered set of data and one value to show, summed over time.



For example, to see the total amount of closed opportunities by day in the current month in a report, set amount as the `Y-axis` and closing day as the `X-axis`. The chart displays one line, with the line's height representing the cumulative amount of closed opportunities up to and including that day. You can't see the amount for any single day—only the cumulative amount.

If the data set contains a missing (null) value, Salesforce continues the line using the previous value in the data set.

Grouped Cumulative Line Charts

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Use a cumulative line chart when you have one important grouping representing an ordered set of data and one value to show, summed over time. Use a grouped line chart when you have multiple groupings—each with one important secondary grouping representing an ordered set of data—and one value to show.



For example, to see the total amount of closed opportunities by day for each of the last three months in a report, set amount as the **Y-axis**, closing day as the **X-axis**, and closing month as the **Groupings** value. The chart displays a line for each month, with the line's height representing the cumulative amount of closed opportunities up to and including that day.

Pie Charts

Use a pie chart when you have multiple groupings and want to show the proportion of a single value for each grouping against the total.



For example, to see the breakdown of your case queue by case status in a report, set record count for **Values** and status for **Wedges**. The chart displays a circle made up of wedges, each wedge representing the cases in a case status. Wedge size is proportional to the numbers of cases.

Pie charts are not ideal for comparing values that are close together or numerous small values.

Select **Show Labels**, **Show Values**, or **Show Wedge %** to include that information on the chart. (Only available with Chart Analytics 2.0.)

Donut Charts

Use a donut chart when you have multiple groupings and want to show not only the proportion of a single value for each grouping against the total, but also the total amount itself.



For example, to see the breakdown of your case queue by case status in a report, as well as the total number of cases, set record count for **Values** and status for **Wedges**. The chart displays a donut made up of wedges, each wedge representing a case status. Wedge size is proportional to the numbers of cases. The total number of cases for all statuses is shown in the middle.

Select **Show Labels**, **Show Values**, **Show Wedge %**, or **Show Total** to include that information on the chart.

Funnel Charts

Use a funnel chart when you have multiple groupings in an ordered set and want to show the proportions among them.



For example, to see the amount of opportunities in each stage in a report, set amount for **Values** and stage for **Segments**. Since the **Opportunity: Stage** field is an ordered picklist, the stages are sorted in the same order as the picklist, with each segment representing the amount for that stage. Funnel charts are useful for showing the flow of opportunities through the stages; a substantially larger segment may indicate a bottle-neck at that stage.

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Select `Show Labels`, `Show Values`, or `Show Segment %` to include that information on the chart.

Scatter Charts

Use scatter charts to show meaningful information using one or two groups of report data plus summaries.



For example, to see how stage duration correlates with the number of activities for opportunities, group your report by `Opportunity Name` and plot the scatter chart by the grouping. Then set `X-Axis` on the chart to `Record Count` and `Y-Axis` to `Stage Duration`. The chart will show a dot for each opportunity. You can tell at a glance if the stage duration is shorter for opportunities that have more activities.

Because a scatter chart shows data grouped by summarized values, you need at least one grouping in your report. Choose a report format that allows groupings, such as, summary, matrix, or joined. You also need at least one summarized field in the report to show data on the axes of the chart. Otherwise, the chart will show record count on the axes. Scatter charts automatically show data from the source report or you can manually choose what information to display for groupings and summaries.

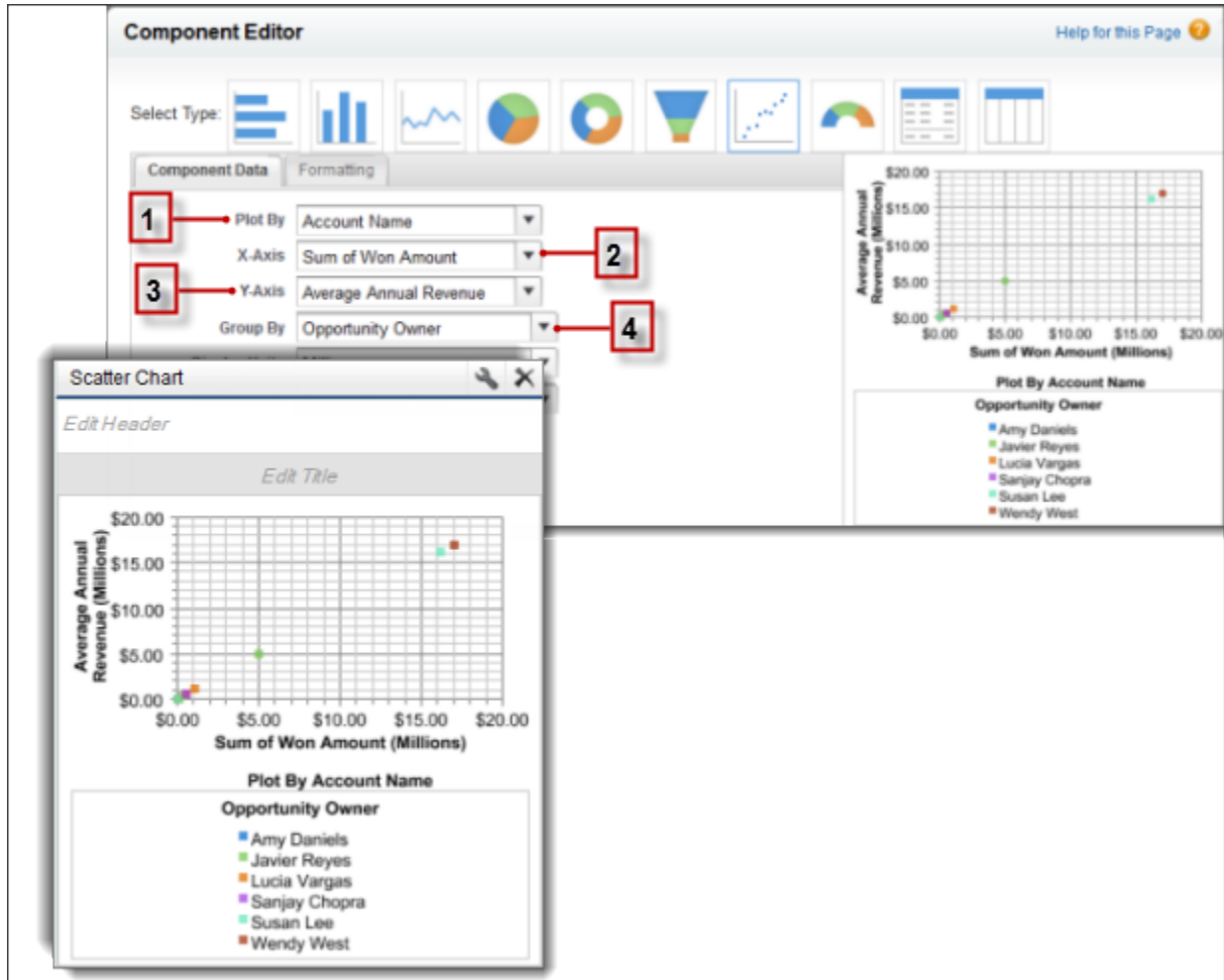
EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

If your source report has	The X-axis automatically displays	The Y-axis automatically displays
No summary fields	Record count.	Record count.
One or more summary fields	First summary.	<ul style="list-style-type: none"> • Either record count or the second summary in report charts. • The first summary in dashboard charts even if the source report has multiple summaries. But you can manually choose a different summary to show on the axis.

This is a report on closed won opportunities grouped by account and opportunity owner. A scatter chart can reveal the potential for tapping into accounts with a higher annual revenue.



This chart builds on some key fields:

- 1. Plot By** automatically chooses the first report grouping. We manually chose the second grouping to show opportunities won by Account Name.
- 2. X-axis** shows record count when there are no summarized fields or autoselects the first summary field. Since summary is more useful, the chart shows Sum of Won Amount.
- 3. Y-axis** here shows a manually selected summary field, Average Annual Revenue.
- 4. Group By** is not set by default. Since the report has another grouping, the chart groups data further by the manually selected Opportunity Owner grouping. The colored dots in the chart and legend show this grouping.

The scatter chart component type in dashboards has these limitations:

- It doesn't show tabular reports.
- You can't sort by labels or values.
- You can only change how Y-axis units are displayed.

- You can manually define the range for Y-axis alone.

SEE ALSO:

[Chart Types](#)

[Modify a Dashboard Component in Salesforce Classic](#)

[Data Settings for Dashboard Scatter Chart Components](#)

[Formatting Settings for Dashboard Scatter Chart Components](#)

[Data Settings for Dashboard Scatter Chart Components](#)

[Formatting Settings for Dashboard Scatter Chart Components](#)

Data Settings for Dashboard Chart Components

Choose the data you want to show on your report or dashboard chart. The chart automatically selects groupings and summary values from your report. You can override some of those choices to focus on the data you need to share.

IN THIS SECTION:

1. [Scatter Charts](#)

Use scatter charts to show meaningful information using one or two groups of report data plus summaries.

2. [Data Settings for Dashboard Bar and Column Chart Components](#)

Horizontal bar and vertical column charts are useful for comparing the values of one or more report groupings. Use the Component Data tab to select the groupings and summaries you want your bar or column chart to display.

3. [Data Settings for Dashboard Funnel Chart Components](#)

Funnel charts are useful for showing the flow of opportunities through stages.

4. [Data Settings for Dashboard Scatter Chart Components](#)

Scatter charts are useful to show one or two groups of report data plus summaries. These data settings for the scatter chart are available in the dashboard component editor under **Component Data**.

5. [Data Settings for Dashboard Gauge Components](#)

A gauge is used to see how far you are from reaching a goal. It displays a single value, such as closed deals.

6. [Data Settings for Dashboard Line Chart Components](#)

Line charts are useful for showing data over time.

7. [Data Settings for Dashboard Metric Components](#)

The settings on the Component Data tab define how your dashboard metric component gets and manages the data it displays.

8. [Data Settings for Dashboard Pie and Donut Chart Components](#)

A pie chart or a donut chart is good for showing the relative shares of different quantities. Use the component data tab to select the values your pie or donut chart will compare.

9. [Data Settings for Dashboard Table Components](#)

A table component shows columns of data from a custom report in a dashboard. The settings on the Component Data tab control how a table component gets and manages the data it displays.

Scatter Charts

Use scatter charts to show meaningful information using one or two groups of report data plus summaries.



For example, to see how stage duration correlates with the number of activities for opportunities, group your report by `Opportunity Name` and plot the scatter chart by the grouping. Then set `X-Axis` on the chart to `Record Count` and `Y-Axis` to `Stage Duration`. The chart will show a dot for each opportunity. You can tell at a glance if the stage duration is shorter for opportunities that have more activities.

Because a scatter chart shows data grouped by summarized values, you need at least one grouping in your report. Choose a report format that allows groupings, such as, summary, matrix, or joined. You also need at least one summarized field in the report to show data on the axes of the chart. Otherwise, the chart will show record count on the axes. Scatter charts automatically show data from the source report or you can manually choose what information to display for groupings and summaries.

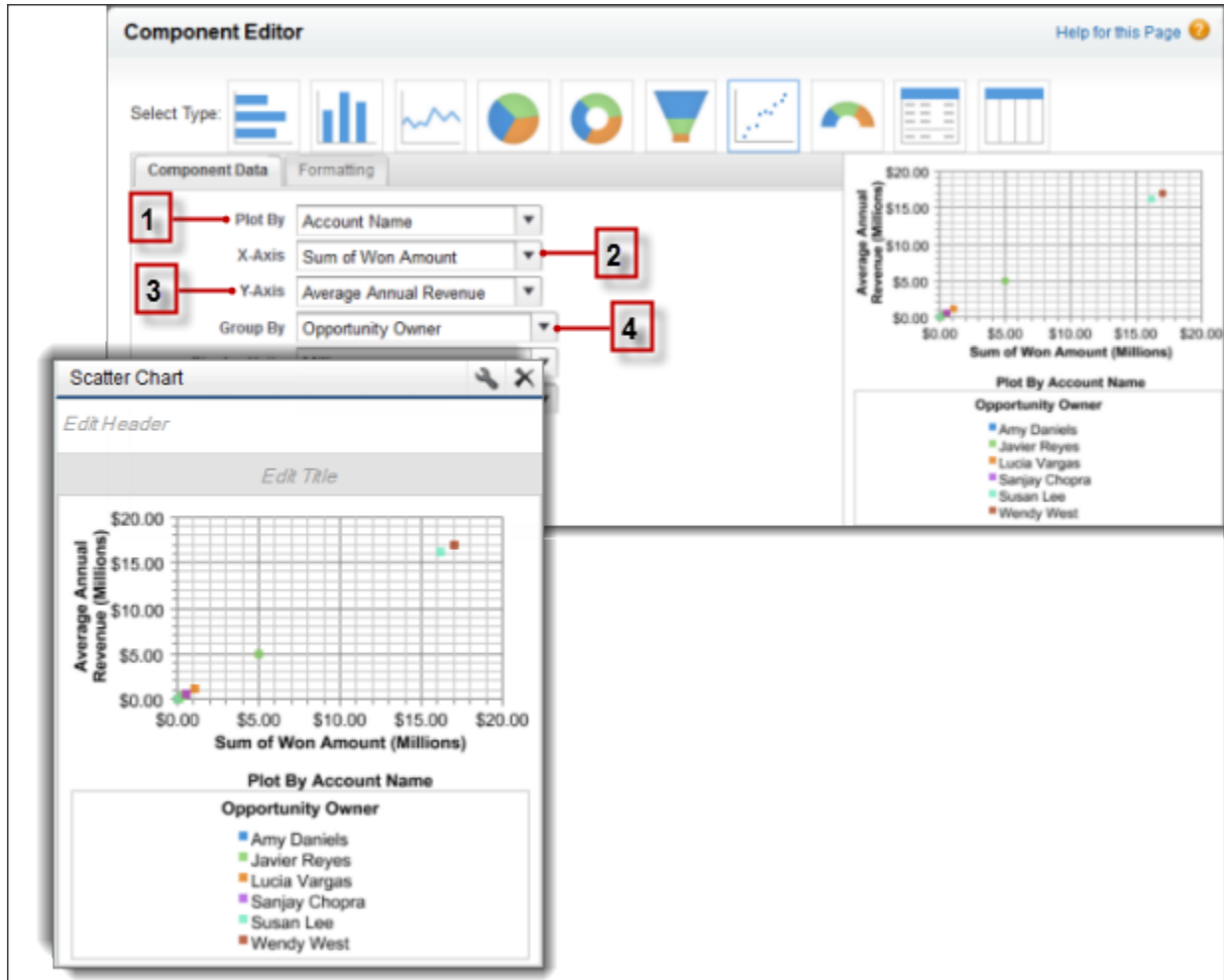
EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

If your source report has	The X-axis automatically displays	The Y-axis automatically displays
No summary fields	Record count.	Record count.
One or more summary fields	First summary.	<ul style="list-style-type: none"> • Either record count or the second summary in report charts. • The first summary in dashboard charts even if the source report has multiple summaries. But you can manually choose a different summary to show on the axis.

This is a report on closed won opportunities grouped by account and opportunity owner. A scatter chart can reveal the potential for tapping into accounts with a higher annual revenue.



This chart builds on some key fields:

- 1. Plot By** automatically chooses the first report grouping. We manually chose the second grouping to show opportunities won by `Account Name`.
- 2. X-axis** shows record count when there are no summarized fields or autoselects the first summary field. Since summary is more useful, the chart shows `Sum of Won Amount`.
- 3. Y-axis** here shows a manually selected summary field, `Average Annual Revenue`.
- 4. Group By** is not set by default. Since the report has another grouping, the chart groups data further by the manually selected `Opportunity Owner` grouping. The colored dots in the chart and legend show this grouping.

The scatter chart component type in dashboards has these limitations:

- It doesn't show tabular reports.
- You can't sort by labels or values.
- You can only change how Y-axis units are displayed.

- You can manually define the range for Y-axis alone.

SEE ALSO:

- [Chart Types](#)
- [Modify a Dashboard Component in Salesforce Classic](#)
- [Data Settings for Dashboard Scatter Chart Components](#)
- [Formatting Settings for Dashboard Scatter Chart Components](#)
- [Data Settings for Dashboard Scatter Chart Components](#)
- [Formatting Settings for Dashboard Scatter Chart Components](#)

Data Settings for Dashboard Bar and Column Chart Components

USER PERMISSIONS

To create dashboards:

- Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

- Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

- Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

- Legacy Folder Sharing**
Run Reports, Manage Dashboards AND View All Data
- Enhanced Folder Sharing**
Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

- Legacy Folder Sharing**
Manage Dynamic Dashboards
- Enhanced Folder Sharing**
Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Horizontal bar and vertical column charts are useful for comparing the values of one or more report groupings. Use the Component Data tab to select the groupings and summaries you want your bar or column chart to display.

Choose what values to display on the axes of your chart. Depending on the chart type, axis values can be record count, summary fields, or groupings defined in the report. For example, to see the amount in each sales stage in a report, select `Sum of Amount` as the X-axis and `Stage` as the Y-axis. The chart displays one bar for each stage, with the length proportional to the total opportunity amount.

Setting	Description
X-Axis	Choose what values to display on the horizontal axis of your bar, column, scatter, or line chart. Depending on the chart type, axis values can be summary fields or groupings. To use the second grouping or summary field defined in the source report's chart, select <code>Auto</code> . When the source report has a chart, Auto picks the values used by the chart. If the X-axis corresponds to a custom summary formula that has the <code>Where Will this Formula Be Displayed?</code> option set to a grouping level other than <code>All summary levels</code> , then the Y-axis and Groupings selection must correspond to that custom summary formula's grouping level.
Y-Axis	Choose what values to display on the vertical axis of your bar, column, scatter, or line chart. Depending on the chart type, axis values can be summary fields or groupings. To use the second grouping or summary field defined in the source report's chart, select <code>Auto</code> . When the source report has a chart, Auto picks the values used by the chart. If the Y-axis corresponds to a custom summary formula that has the <code>Where Will this Formula Be Displayed?</code> option set to a grouping level other than <code>All summary levels</code> , then the X-axis and Groupings selection must correspond to that custom summary formula's grouping level.
Group By	Choose how to group information on your chart. This option is available only if the underlying report has more than one grouping. To use the second grouping or summary field defined in the source report's chart, select <code>Auto</code> .
Combination Chart	Select this option to plot additional values on this chart. The chart type you chose must allow combination charts.
Display Units	Choose a scale for displaying your chart values. For table components, this setting applies only to the first column. For best results, choose <code>Auto</code> to let Salesforce select appropriate units.
Drill Down to	Select where users go when they click a dashboard component: the full source report for the dashboard component; the source report filtered by the group, X-axis value, or legend entry they clicked; the detail page for a chart or table element, axis value, or legend entry; or a URL that you specify. (You can't use URLs that begin with "mailto:" or "javascript:"). Filtered and record detail page drill-down are disabled when viewing dashboard charts with more than 200 values.

SEE ALSO:

[Formatting Settings for Dashboard Bar Chart Components](#)

[Data Settings for Dashboard Funnel Chart Components](#)

USER PERMISSIONS

To create dashboards:

- Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

- Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

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- Enhanced Folder Sharing**
Edit My Dashboards

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Run Reports, Manage Dashboards AND View All Data
- Enhanced Folder Sharing**
Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

- Legacy Folder Sharing**
Manage Dynamic Dashboards
- Enhanced Folder Sharing**
Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Funnel charts are useful for showing the flow of opportunities through stages.

Choose what values to display on the axes of your chart. Depending on the chart type, axis values can be record count, summary fields, or groupings defined in the report.

Setting	Description
Display Units	Choose a scale for displaying your chart values. For table components, this setting applies only to the first column. For best results, choose Auto to let Salesforce select appropriate units.
Drill Down to	Select where users go when they click a dashboard component: the full source report for the dashboard component; the source report filtered by the group, X-axis value, or legend entry they clicked; the detail page for a chart or table element, axis value, or legend entry; or a URL that you specify. (You can't use URLs that begin with "mailto:" or "javascript:"). Filtered and record detail page drill-down are disabled when viewing dashboard charts with more than 200 values.

Setting	Description
Values	Choose what to display as values for your pie chart, donut chart, funnel chart, gauge, or metric. To use the second grouping or summary field defined in the source report's chart, select <i>Auto</i> . When the source report has a chart, Auto picks the values used by the chart. In gauges and metrics, Auto shows the value of the first summary field.
Segments	Choose what to display as segments for your funnel chart. To use the second grouping or summary field defined in the source report's chart, select <i>Auto</i> . When the source report has a chart, Auto picks the values used by the chart.

SEE ALSO:

[Formatting Settings for Funnel Dashboard Components](#)

Data Settings for Dashboard Scatter Chart Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing
Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing
Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing
Manage Dynamic Dashboards

Enhanced Folder Sharing
Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Scatter charts are useful to show one or two groups of report data plus summaries. These data settings for the scatter chart are available in the dashboard component editor under **Component Data**.

Group and set the scale to help users make sense of the data you are displaying.

Setting	Description
Plot By	Choose the grouping to display on your chart. To always use the first grouping or use what's in the source report's chart, pick <i>Auto</i> .
X-Axis	Choose the values to display on the horizontal axis.
Y-Axis	Choose what values to display on the vertical axis of your bar, column, scatter, or line chart. Depending on the chart type, axis values can be summary fields or groupings. To use the second grouping or summary field defined in the source report's chart, select <i>Auto</i> . When the source report has a chart, <i>Auto</i> picks the values used by the chart. If the Y-axis corresponds to a custom summary formula that has the <code>Where Will this Formula Be Displayed?</code> option set to a grouping level other than <code>All summary levels</code> , then the X-axis and Groupings selection must correspond to that custom summary formula's grouping level.
Group By	Choose how to group information on your chart. This option is available only if the underlying report has more than one grouping. To use the second grouping or summary field defined in the source report's chart, select <i>Auto</i> .
Display Units	Change the measure for values displayed on the Y-axis of the chart.
Drill Down to	Select where users go when they click the chart. Options include the source report, the filtered source report, record detail page, or a URL you specify. Filtered report and record detail page options are unavailable when the chart has more than 200 values.

SEE ALSO:

[Scatter Charts](#)

[Modify a Dashboard Component in Salesforce Classic](#)

[Formatting Settings for Dashboard Scatter Chart Components](#)

Data Settings for Dashboard Gauge Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

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Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

A gauge is used to see how far you are from reaching a goal. It displays a single value, such as closed deals.

Setting	Description
Values	Choose what to display as values for your pie chart, donut chart, funnel chart, gauge, or metric. To use the second grouping or summary field defined in the source report's chart, select <i>Auto</i> . When the source report has a chart, Auto picks the values used by the chart. In gauges and metrics, Auto shows the value of the first summary field.
Display Units	Choose a scale for displaying your chart values. For table components, this setting applies only to the first column. For best results, choose Auto to let Salesforce select appropriate units.
Drill Down to	Select where users go when they click a dashboard component: the full source report for the dashboard component; the source report filtered by the group, X-axis value, or legend entry they clicked; the detail page for a chart or table element, axis value, or legend entry; or a URL that you specify. (You can't use URLs that begin with "mailto:" or "javascript:.") Filtered and record detail page drill-down are disabled when viewing dashboard charts with more than 200 values.

SEE ALSO:

[Formatting Settings for Dashboard Gauge Components](#)

Data Settings for Dashboard Line Chart Components

USER PERMISSIONS

To create dashboards:

- Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

- Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Run Reports AND Create and Customize Dashboards

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Manage Dashboards in Public Folders

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- Legacy Folder Sharing**
Manage Dynamic Dashboards
- Enhanced Folder Sharing**
Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Line charts are useful for showing data over time.

For example, to see the numbers of leads created each month in a report, set record count as the *Y-axis* and created month for the *X-axis*. The chart displays a line connecting the record count totals for each month.

Setting

Description

Y-Axis

Choose what values to display on the vertical axis of your bar, column, scatter, or line chart. Depending on the chart type, axis values can be summary fields or groupings. To use the second grouping or summary field defined in the source report's chart, select *Auto*. When the source report has a chart, Auto picks the values used by the chart. If the Y-axis corresponds to a custom summary formula that has the *Where Will this Formula Be Displayed?* option set to a grouping level other than *All summary levels*, then the X-axis and Groupings selection must correspond to that custom summary formula's grouping level.

Setting	Description
X-Axis	Choose what values to display on the horizontal axis of your bar, column, scatter, or line chart. Depending on the chart type, axis values can be summary fields or groupings. To use the second grouping or summary field defined in the source report's chart, select <i>Auto</i> . When the source report has a chart, Auto picks the values used by the chart. If the X-axis corresponds to a custom summary formula that has the <i>Where Will this Formula Be Displayed?</i> option set to a grouping level other than <i>All summary levels</i> , then the Y-axis and Groupings selection must correspond to that custom summary formula's grouping level.
Group By	Choose how to group information on your chart. This option is available only if the underlying report has more than one grouping. To use the second grouping or summary field defined in the source report's chart, select <i>Auto</i> .
Combination Chart	Select this option to plot additional values on this chart. The chart type you chose must allow combination charts.
Display Units	Choose a scale for displaying your chart values. For table components, this setting applies only to the first column. For best results, choose Auto to let Salesforce select appropriate units.
Drill Down to	Select where users go when they click a dashboard component: the full source report for the dashboard component; the source report filtered by the group, X-axis value, or legend entry they clicked; the detail page for a chart or table element, axis value, or legend entry; or a URL that you specify. (You can't use URLs that begin with "mailto:" or "javascript:.") Filtered and record detail page drill-down are disabled when viewing dashboard charts with more than 200 values.

SEE ALSO:

[Formatting Settings for Dashboard Line Chart Components](#)

Data Settings for Dashboard Metric Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

The settings on the Component Data tab define how your dashboard metric component gets and manages the data it displays.

Setting	Description
Values	Choose what to display as values for your pie chart, donut chart, funnel chart, gauge, or metric. To use the second grouping or summary field defined in the source report's chart, select <i>Auto</i> . When the source report has a chart, Auto picks the values used by the chart. In gauges and metrics, Auto shows the value of the first summary field.
Display Units	Choose a scale for displaying your chart values. For table components, this setting applies only to the first column. For best results, choose Auto to let Salesforce select appropriate units.
Drill Down to	Select where users go when they click a dashboard component: the full source report for the dashboard component; the source report filtered by the group, X-axis value, or legend entry they clicked; the detail page for a chart or table element, axis value, or legend entry; or a URL that you specify. (You can't use URLs that begin with "mailto:" or "javascript:"). Filtered and record detail page drill-down are disabled when viewing dashboard charts with more than 200 values.

SEE ALSO:

[Formatting Settings for Dashboard Metric Components](#)

Data Settings for Dashboard Pie and Donut Chart Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

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Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

A pie chart or a donut chart is good for showing the relative shares of different quantities. Use the component data tab to select the values your pie or donut chart will compare.

Use a pie chart when you have multiple groupings and want to show the proportion of a single value for each grouping against the total.

For example, to see the breakdown of your case queue by case status in a report, set record count for `values` and status for `wedges`. The chart displays a circle made up of wedges, each wedge representing the cases in a case status.

Setting**Description**

`values`

Choose what to display as values for your pie chart, donut chart, funnel chart, gauge, or metric. To use the second grouping or summary field defined in the source report's chart, select `Auto`. When the source report has a chart, Auto picks the values used by the chart. In gauges and metrics, Auto shows the value of the first summary field.

Setting	Description
Wedges	Choose what to display as wedges for your pie or donut chart. To use the second grouping or summary field defined in the source report's chart, select <i>Auto</i> . When the source report has a chart, Auto picks the values used by the chart.
Display Units	Choose a scale for displaying your chart values. For table components, this setting applies only to the first column. For best results, choose Auto to let Salesforce select appropriate units.
Drill Down to	Select where users go when they click a dashboard component: the full source report for the dashboard component; the source report filtered by the group, X-axis value, or legend entry they clicked; the detail page for a chart or table element, axis value, or legend entry; or a URL that you specify. (You can't use URLs that begin with "mailto:" or "javascript:"). Filtered and record detail page drill-down are disabled when viewing dashboard charts with more than 200 values.

SEE ALSO:

[Formatting Settings for Pie and Donut Dashboard Components](#)

Data Settings for Dashboard Table Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

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To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing
Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Enhanced Folder Sharing

Manage Dynamic Dashboards

A table component shows columns of data from a custom report in a dashboard. The settings on the Component Data tab control how a table component gets and manages the data it displays.

Field	Description
Display Units	Choose a scale for displaying your chart values. For table components, this setting applies only to the first column. For best results, choose Auto to let Salesforce select appropriate units.
Drill Down to	Select where users go when they click a dashboard component: the full source report for the dashboard component; the source report filtered by the group, X-axis value, or legend entry they clicked; the detail page for a chart or table element, axis value, or legend entry; or a URL that you specify. (You can't use URLs that begin with "mailto:" or "javascript:.") Filtered and record detail page drill-down are disabled when viewing dashboard charts with more than 200 values.

SEE ALSO:

[Formatting Settings for Dashboard Table Components](#)

Visual Settings for Dashboard Chart Components

Choose the type of chart that fits the data you are sharing, then apply the visual settings that will communicate the data most effectively.

IN THIS SECTION:

1. [Formatting Settings for Dashboard Bar Chart Components](#)
Horizontal bar and vertical column charts are useful for comparing the values of one or more report groupings. Set the scale and sorting to help you make sense of the data you are displaying.
2. [Formatting Settings for Funnel Dashboard Components](#)
Use color to show the status of a value through stages in a funnel chart.
3. [Formatting Settings for Dashboard Scatter Chart Components](#)
Scatter charts are useful to show one or two groups of report data plus summaries. These settings for the scatter chart are available in the dashboard component editor under **Formatting**.
4. [Formatting Settings for Dashboard Gauge Components](#)
Set the breakpoints and colors on your gauge component to help users interpret the current value of the field you are tracking.
5. [Formatting Settings for Dashboard Line Chart Components](#)
Line charts are useful for showing data over time. Use sorting and scale to help your users make sense of the data on your line chart.
6. [Formatting Settings for Dashboard Metric Components](#)
A metric component displays one value at a point in time. Use color to help users make sense of the data in the metric component.
7. [Formatting Settings for Pie and Donut Dashboard Components](#)
A pie chart is good for showing the relative shares of different quantities. Use the formatting tab to choose how to configure and label the divisions in your pie chart.

8. [Formatting Settings for Dashboard Table Components](#)

A table component shows columns of data from a custom report in a dashboard. You can use color and scale to help users interpret the report data the table displays.

Formatting Settings for Dashboard Bar Chart Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing
Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing
Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing
Manage Dynamic Dashboards

Enhanced Folder Sharing
Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Horizontal bar and vertical column charts are useful for comparing the values of one or more report groupings. Set the scale and sorting to help you make sense of the data you are displaying.

Setting

Description

Sort Rows By

Choose a sorting element to determine what element you want displayed first in the horizontal axis of any horizontal chart or the vertical axis of any vertical chart. For a table, choose the sort order for the default two-column table to be ascending or descending by row labels or values.

Maximum Values Displayed

Set the maximum number of elements to include in the top-level grouping of the horizontal axis of a horizontal chart, vertical axis of a vertical chart, or selected axis of a stacked bar chart. For a table, set the

Setting	Description
	maximum number of rows to include. For example, if you want to list only your top five salespeople, create an opportunity report that lists total opportunity amounts by owner and enter 5 in this field.
Legend Position	Choose a place to display the legend in relation to your chart.
Show Chatter Photos	Display Chatter photos for up to 20 records in a horizontal bar chart component whose source report is grouped by a user or group name field. If there are more than 20 records with photos, record names are shown instead of photos. Set <i>Grouping Display</i> to <i>None</i> to show photos. Set the <i>Drill Down to</i> option to <i>Record Detail Page</i> to take users directly to user profile or group pages when they click photos. Chatter must be enabled for photos to be displayed. Depending on your organization's setup, you may not see photos on tables and charts.
Show Values	Display the values of individual records or groups on the chart. This only applies to certain chart types.
Enable Hover	Display values, labels, and percentages when hovering over charts. Hover details depend on chart type. Percentages apply to pie, donut, and funnel charts only. Hover is disabled if your chart has more than 200 data points.

Formatting Settings for Funnel Dashboard Components

USER PERMISSIONS

To create dashboards:

- Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

- Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

- Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

- Legacy Folder Sharing**
Run Reports, Manage Dashboards AND View All Data
- Enhanced Folder Sharing**
Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

- Legacy Folder Sharing**
Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Enhanced Folder Sharing

Manage Dynamic Dashboards

Use color to show the status of a value through stages in a funnel chart.

Setting	Description
Sort Rows By	Choose a sorting element to determine what element you want displayed first in the horizontal axis of any horizontal chart or the vertical axis of any vertical chart. For a table, choose the sort order for the default two-column table to be ascending or descending by row labels or values.
Maximum Values Displayed	Set the maximum number of elements to include in the top-level grouping of the horizontal axis of a horizontal chart, vertical axis of a vertical chart, or selected axis of a stacked bar chart. For a table, set the maximum number of rows to include. For example, if you want to list only your top five salespeople, create an opportunity report that lists total opportunity amounts by owner and enter 5 in this field.
Legend Position	Choose a place to display the legend in relation to your chart.
Combine Small Groups into "Others"	Click this link to create a custom table. The Maximum Values Displayed field is populated with the value you entered, and the first two columns are prepopulated with the default columns. To customize a table, the source report must be summary or matrix format and contain a chart.
Show Values	Display the values of individual records or groups on the chart. This only applies to certain chart types.
Show Segment %	Display the percentage value for each segment of funnel charts.
Enable Hover	Display values, labels, and percentages when hovering over charts. Hover details depend on chart type. Percentages apply to pie, donut, and funnel charts only. Hover is disabled if your chart has more than 200 data points.

Formatting Settings for Dashboard Scatter Chart Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Enhanced Folder Sharing
Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing
Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing
Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing
Manage Dynamic Dashboards

Enhanced Folder Sharing
Manage Dynamic Dashboards

Scatter charts are useful to show one or two groups of report data plus summaries. These settings for the scatter chart are available in the dashboard component editor under **Formatting**.

Tweak data displayed on the dashboard scatter chart using these settings.

Setting	Description
Sort Rows By	Currently sorting is unavailable.
Maximum Values Displayed	Set the maximum number of dots to show on the chart. When set to 5 for example, the chart shows 5 dots. These are the top 5 ascending values in the grouping used by the Plot By field of the scatter chart.
Axis Range	Keep automatic or choose manual to enter minimum and maximum values for the Y-axis range. If there are values outside the manual range, Y-axis automatically extends to include them.
Legend Position	Choose a place to display the legend in relation to your chart.
Show Details on Hover	Display values or labels when hovering over charts.

Formatting Settings for Dashboard Gauge Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

Set the breakpoints and colors on your gauge component to help users interpret the current value of the field you are tracking.

Optionally, set conditional highlighting by defining up to three value ranges and colors. You need to also set the minimum and maximum for the scale. You must set highlighting to follow a component and receive alerts in your Chatter feed when the value crosses a threshold.

Setting	Description
Minimum	The lowest value on the chart.
Low Range Color	Select a color to represent the low range, up to the first breakpoint.
Breakpoint 1	The value that separates the middle and high range colors on the dashboard.
Middle Range Color	Select a color to represent the middle range, between the first and second breakpoints.
Breakpoint 2	Place the chart above or below your report.
High Range Color	Select a color to represent the high range, beyond the second breakpoint.
Maximum	The highest value on the chart.
Show %	Display the percentage value for each wedge of pie and donut charts, or for each segment of funnel charts. On a gauge, show the percentage value of the point where the needle is pointing.
Show Total	Display the total value for the chart. For a table, include the sum total for number and currency summary fields.

SEE ALSO:

[Modify a Dashboard Component in Salesforce Classic](#)

Formatting Settings for Dashboard Line Chart Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Line charts are useful for showing data over time. Use sorting and scale to help your users make sense of the data on your line chart.

Setting	Description
Sort Rows By	Choose a sorting element to determine what element you want displayed first in the horizontal axis of any horizontal chart or the vertical axis of any vertical chart. For a table, choose the sort order for the default two-column table to be ascending or descending by row labels or values.
Maximum Values Displayed	Set the maximum number of elements to include in the top-level grouping of the horizontal axis of a horizontal chart, vertical axis of a vertical chart, or selected axis of a stacked bar chart. For a table, set the maximum number of rows to include. For example, if you want to list only your top five salespeople, create an opportunity report that lists total opportunity amounts by owner and enter 5 in this field.
Y-Axis Range	Choose a manual or automatic axis range for the vertical axis of a bar, line, or column chart. If you choose manual, enter numbers for the minimum and maximum axis values to be displayed. If there are data points outside the range that you set, the axis automatically extends to include those values when you generate the chart.

Setting	Description
Legend Position	Choose a place to display the legend in relation to your chart.
Enable Hover	Display values, labels, and percentages when hovering over charts. Hover details depend on chart type. Percentages apply to pie, donut, and funnel charts only. Hover is disabled if your chart has more than 200 data points.

Formatting Settings for Dashboard Metric Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

A metric component displays one value at a point in time. Use color to help users make sense of the data in the metric component.

Optionally, set conditional highlighting by defining up to three value ranges and colors. You must set highlighting to follow a component and receive alerts in your Chatter feed when the value crosses a threshold.

Note:

- Enter metric labels directly on components by clicking the empty text field next to the grand total.

- Metric components placed directly above and below each other in a dashboard column are displayed together as a single component.
- If you don't define breakpoint values or if you leave them blank, alerts won't be sent for the component.

Setting	Description
Low Range Color	Select a color to represent the low range, up to the first breakpoint.
Breakpoint 1	The value that separates the middle and high range colors on the dashboard.
Middle Range Color	Select a color to represent the middle range, between the first and second breakpoints.
Breakpoint 2	Place the chart above or below your report.
High Range Color	Select a color to represent the high range, beyond the second breakpoint.

SEE ALSO:

[Modify a Dashboard Component in Salesforce Classic](#)

Formatting Settings for Pie and Donut Dashboard Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

A pie chart is good for showing the relative shares of different quantities. Use the formatting tab to choose how to configure and label the divisions in your pie chart.

Setting	Description
Sort Rows By	Choose a sorting element to determine what element you want displayed first in the horizontal axis of any horizontal chart or the vertical axis of any vertical chart. For a table, choose the sort order for the default two-column table to be ascending or descending by row labels or values.
Maximum Values Displayed	Set the maximum number of elements to include in the top-level grouping of the horizontal axis of a horizontal chart, vertical axis of a vertical chart, or selected axis of a stacked bar chart. For a table, set the maximum number of rows to include. For example, if you want to list only your top five salespeople, create an opportunity report that lists total opportunity amounts by owner and enter 5 in this field.
Legend Position	Choose a place to display the legend in relation to your chart.
Combine Small Groups into "Others"	Click this link to create a custom table. The Maximum Values Displayed field is populated with the value you entered, and the first two columns are prepopulated with the default columns. To customize a table, the source report must be summary or matrix format and contain a chart.
Show Values	Display the values of individual records or groups on the chart. This only applies to certain chart types.
Show %	Display the percentage value for each wedge of pie and donut charts.
Enable Hover	Display values, labels, and percentages when hovering over charts. Hover details depend on chart type. Percentages apply to pie, donut, and funnel charts only. Hover is disabled if your chart has more than 200 data points.
Show Total	Display the total value for the chart. For a table, include the sum total for number and currency summary fields.

Formatting Settings for Dashboard Table Components

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

A table component shows columns of data from a custom report in a dashboard. You can use color and scale to help users interpret the report data the table displays.

You can use the default two-column table or create a custom table with up to four columns and totals.

The default two-column table uses the first grouping and summary field from the chart in the source report. If the report has no chart, default columns are based on the first grouping and summary field in the report.

Customized tables allow null values in the results. Default two-column tables do not.

To use a tabular report as the source report, `Rows to Display` must be set for that report.

Optionally, set conditional highlighting by defining up to three value ranges and colors. Highlighting only applies to the first summary field column in the table.

Setting	Description
Sort Rows By	Choose a sorting element to determine what element you want displayed first in the horizontal axis of any horizontal chart or the vertical axis of any vertical chart. For a table, choose the sort order for the default two-column table to be ascending or descending by row labels or values.
Maximum Values Displayed	Set the maximum number of elements to include in the top-level grouping of the horizontal axis of a horizontal chart, vertical axis of a vertical chart, or selected axis of a stacked bar chart. For a table, set the maximum number of rows to include. For example, if you want to list only your top five salespeople, create an opportunity report that lists total opportunity amounts by owner and enter 5 in this field.
Show Chatter Photos	Display Chatter photos for up to 20 records in a horizontal bar chart component whose source report is grouped by a user or group name field. If there are more than 20 records with photos, record names are shown instead of photos. Set <i>Grouping Display</i> to <i>None</i> to show photos. Set the <i>Drill Down to</i> option to <i>Record Detail Page</i> to take users directly to user profile or group pages when they click photos. Chatter must be enabled for photos to be displayed. Depending on your organization's setup, you may not see photos on tables and charts.
Customize Table	Click this link to create a custom table. The <i>Maximum Values Displayed</i> field is populated with the value you entered, and the first two columns are prepopulated with the default columns. To customize a table, the source report must be summary or matrix format and contain a chart.
Table Columns	Specify up to four columns to display in the table. Available columns can be any grouping or summary field used in the chart. Update the report's chart or groupings to make more columns available for the dashboard table.
Sort Ascending	Sort the custom table in A-to-Z or smallest-to-largest order in a column. You can't sort on second-level groupings.
Sort Descending	Sort the custom table in Z-to-A or largest-to-smallest order in a column. You can't sort on second-level groupings.
Show Total	Display the total value for the chart. For a table, include the sum total for number and currency summary fields.
Reset Table to Defaults	Go back to the default two-column table.
Low Range Color	Select a color to represent the low range, up to the first breakpoint.
Breakpoint 1	The value that separates the low and middle range colors on the dashboard.
Middle Range Color	Select a color to represent the middle range, between the first and second breakpoints.
Breakpoint 2	Breakpoint 2
High Range Color	Select a color to represent the high range, beyond the second breakpoint.

SEE ALSO:

[Modify a Dashboard Component in Salesforce Classic](#)

Edit Dashboards in Accessibility Mode in Salesforce Classic

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

In Salesforce Classic, you can edit dashboards in Accessibility mode.








Important: This topic applies only if you're *not* using the dashboard builder. *Dashboard builder* is a drag-and-drop interface for creating and modifying dashboards.

A *dashboard* shows data from source reports as visual components, which can be charts, gauges, tables, metrics, or Visualforce pages. To customize a dashboard, view it and click **Edit**.

From the Dashboard Edit page, you can:

- See the running user for the dashboard in the `Displaying data as` field.
- Click **Dashboard Properties** to change the title, folder, running user, and more.
- Click **Done** to view the dashboard. All changes you make to the dashboard are saved as you make them.
- Click the **Delete** button to delete the entire dashboard.
- Click **Add Component** in any column.

- Click **Narrow**, **Medium**, or **Wide** to set a column's width.
 -  **Note:** If your component is a pie or donut chart with `Show Values` or `Show Percentages` enabled and `Legend Position` set to `Right`, the dashboard column width must be `wide` for values and percentages to show on the dashboard.
- Click , , , and  to rearrange components in the dashboard.
- Click **Edit** to modify component properties like the component type, display units, source report, and more.
- Click **Delete** to remove a component from the dashboard. Deleted components don't get stored in the Recycle Bin.
- Click a dashboard component or its elements to drill down to the source report, filtered report, record detail page, or other URL. If you drill down on a filtered component, the dashboard filters are applied to the source report.

IN THIS SECTION:

1. [Set Dashboard Properties in Accessibility Mode](#)
2. [Adding and Editing Dashboard Components in Accessibility Mode](#)
3. [Dashboard Component Properties in Accessibility Mode](#)

SEE ALSO:

- [Adding and Editing Dashboard Components in Accessibility Mode](#)
- [Build a Salesforce Classic Dashboard](#)
- [Set Dashboard Properties in Accessibility Mode](#)

Set Dashboard Properties in Accessibility Mode

Important: This topic applies only if you're *not* using the dashboard builder. *Dashboard builder* is a drag-and-drop interface for creating and modifying dashboards.

To set dashboard properties:

1. [Edit a dashboard](#) and click **Dashboard Properties**.
2. Do the following:
 - Enter a title and description for the dashboard.
 - If you have the “Customize Application” permission, enter a unique name to be used by the API and managed packages.
 - Select the number of columns for this dashboard. Each dashboard can have two or three columns.

Important: Before removing a column, move its components to another column; otherwise, they may not be visible.
 - Select a folder to store the dashboard. The folder should be accessible by all of your intended viewers.
 - Choose the `Dashboard Running User` to set visibility settings for the dashboard:
 - Select `Run as specified user` and set the `Running User` field to show all dashboard users the same data, regardless of their personal security settings. If you don't have “View All Data,” you can only choose yourself.
 - Select `Run as logged-in user` to show data to each user according to his or her access level.
 - Set the `View Edit Page as` field to preview the dashboard edit page from the point of view of the selected user.
 - If you have the “View My Team's Dashboards” or “View All Data” permission, select `Let authorized users change running user` to enable those with permission to change the running user on the dashboard edit page. Users with “View My Team's Dashboards” can view the dashboard as any user below them in the role hierarchy. Users with “View All Data” can edit the dashboard and view it as any user in their organization.
 - Under Component Settings, select the title color and size, text color, and background fade. If you don't want a gradient, choose the same color for both `Starting Color` and `Ending Color`.

3. Click **Save**.

SEE ALSO:

[Set Up Dynamic Dashboards in Salesforce Classic](#)

[Choose a Running User in Salesforce Classic](#)

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

USER PERMISSIONS

To create dashboards:

- **Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- **Enhanced Folder Sharing**
Run Reports AND Create and Customize Dashboards

To create, edit, and delete dynamic dashboards:

- **Legacy Folder Sharing**
Manage Dynamic Dashboards
- **Enhanced Folder Sharing**
Manage Dynamic Dashboards

To enable choosing a different running user for the dashboard:

- View My Team's Dashboards OR View All Data

Adding and Editing Dashboard Components in Accessibility Mode

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

 **Important:** This topic applies only if you're *not* using the dashboard builder. *Dashboard builder* is a drag-and-drop interface for creating and modifying dashboards.

A *dashboard* shows data from source reports as visual components, which can be charts, gauges, tables, metrics, or Visualforce pages. The components provide a snapshot of key metrics and performance indicators for your organization. Each dashboard can have up to 20 components.

To add a dashboard component:

1. Edit a dashboard.
2. Click **Add Component** from the top of any column and define component properties.
3. Choose the **Custom Report** to use for your dashboard. If you chose the **Visualforce Page**, or **Custom S-Control** component, select a page or s-control and enter the display height. You can show a joined report that includes a chart on a dashboard. Edit the joined report dashboard component and select **Use chart as defined in the source report**.



Note:

- Custom forecast and lead reports that you created using a standard report may not be available in the Custom Report list.
- To use a tabular report on a dashboard, first limit the row count, by setting the Rows to Display option, the sort column, and the order on the Select Criteria page of the report. You can't use gauge or metric components on dashboards using tabular reports.

4. Enter the appropriate settings for the component type you selected: Choose settings on the Formatting tab for the component type you selected:

- [Formatting Settings for Dashboard Bar Chart Components](#)
- [Formatting Settings for Dashboard Scatter Chart Components](#)
- [Formatting Settings for Dashboard Gauge Components](#)
- [Formatting Settings for Dashboard Metric Components](#)
- [Formatting Settings for Dashboard Table Components](#)

5. Click **Save**.



Note: Metric components placed directly above and below each other in a dashboard column are displayed together as a single component.

SEE ALSO:

- [Chart Types](#)
- [Modify a Dashboard Component in Salesforce Classic](#)

Dashboard Component Properties in Accessibility Mode

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Edit My Dashboards

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing

Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders


To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing


Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

 **Important:** This topic applies only if you're *not* using the dashboard builder. *Dashboard builder* is a drag-and-drop interface for creating and modifying dashboards.

The following settings may vary according to the component type you select.

Field	Description
Component Type	Select vertical or horizontal bar chart, line chart, pie or donut chart, table, metric, gauge, Visualforce page, or custom s-control.
Header	Enter text to display at the top of the dashboard component.
Footer	Enter text to display at the bottom of the dashboard component.
Title	Enter a title to identify the dashboard component.
Display Units	Choose a scale for displaying your chart values. For table components, this setting applies only to the first column. For best results, choose Auto to let Salesforce select appropriate units.
Drill Down to	<p>Select what happens when users click a dashboard component:</p> <ul style="list-style-type: none"> • Source Report—Takes the user to the full source report for the dashboard component. • Filtered Source Report—When users click individual groups, X-axis values, or legend entries, they are taken to the source report filtered by what they clicked. <p>For example, if you had a stacked vertical column chart of opportunities grouped by stage, with months as the X-axis, you could click an individual stage in a bar, a month on the X-axis, or a legend entry for a stage to drill down to the filtered source report. (Not available for gauges, metrics, or tables.)</p> <ul style="list-style-type: none"> • Record Detail Page—When users click chart or table elements, axis values, or legend entries, they are taken to the detail page for that record. You can only choose this option for tables and charts that use a source report grouped by record name, record owner, or feed post. (Not available for gauges or metrics.) • Other URL—Takes the user to the URL that you specify. You can't add URLs that begin with "mailto:" or "javascript:" to dashboard components. <p> Note: Filtered and record detail page drill-down are disabled for dashboard charts with more than 200 values.</p>

Field	Description
Drill Down URL	Specify the URL that users go to when they click the dashboard component. Use this option to send users to another dashboard, report, record detail page, or other system that uses a Web interface.

SEE ALSO:

[Modify a Dashboard Component in Salesforce Classic](#)

[Dashboard Component Types](#)

Install the CRM Sample Dashboards from AppExchange

Use these dashboards from the AppExchange as a starting point for building dashboards that meet your business needs.

The CRM sample dashboards package from AppExchange offers best-practice dashboards with underlying reports that are based on your organization's standard objects and fields. You can use these sales, marketing, service, and support dashboards to track business processes and key performance metrics for yourself, your team, and your company. Dashboards in this package include:

- **Sales & Marketing Dashboards**

- Marketing Executive Dashboard
- Sales Executive Dashboard
- Sales Manager Dashboard
- Salesperson Dashboard

- **Customer Service Dashboards**

- Agent Supervisor Overview Dashboard
- Service Executive Overview Dashboard
- Service KPIs Dashboard

1. In AppExchange, search for "Salesforce CRM Dashboards" and click **Get It Now**.
2. To install the sample dashboards, install the package.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

USER PERMISSIONS

To install packages:

- Download AppExchange Packages

Filter a Dashboard

USER PERMISSIONS

To add filters to dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To add filters to dashboards you created in public folders:

Legacy Folder Sharing

Only available in Enhanced Folder Sharing

Enhanced Folder Sharing

Edit My Dashboards OR Manage Dashboards in Public Folders

To add filters to dashboards you didn't create:

Legacy Folder Sharing

Run Reports, Manage Dashboards, and View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To add filters to dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

To view, refresh, and apply filters to dashboards you created:

Legacy Folder Sharing

Run Reports

Enhanced Folder Sharing

Run Reports

To view, refresh, and apply filters to dashboards in public folders:

Legacy Folder Sharing

Run Reports

Enhanced Folder Sharing

Run Reports and View Dashboards in Public Folders

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions


Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Dashboard filters make it easy to provide different combinations of data from a single dashboard. You don't need separate dashboards for different sets of users — give each group a filter that makes sense for them. When you use a filter on a dashboard, the filtered view is shown again the next time you visit the dashboard.

Each filter has a name, a filter operator and one or more values. In Lightning Experience, each filter can have up to 50 options. In Salesforce Classic, each filter can have up to 10 options. Each dashboard can have up to 3 filters. Contact Salesforce to increase the filter options limit in Salesforce Classic. A maximum of 50 filter options is possible.

You can filter on picklists, lookups, and checkboxes, and on text, numeric, date, and datetime fields.

When you change filters on a dashboard, the dashboard shows previously cached data, if it exists. If no data exists, the dashboard fetches the latest. Either way, the dashboard’s “Last Refreshed” date shows you the timestamp for the data you’re viewing. Click **Refresh** to get the most recent data.

 **Note:** As you prepare to filter dashboards, keep these dashboard filter limitations in mind.

- You can’t add filters to dashboards that contain Visualforce or s-control components.
- It’s not possible to filter on bucket fields. However, it is possible to use a report filtered on a bucket field on the dashboard page.
- Filters aren’t applied when you schedule or email a dashboard.
- You can’t filter data on a joined report in dashboard view or add a filter to a dashboard that only has joined reports.
- You can’t use custom summary formulas in dashboard filters.

IN THIS SECTION:

1. [Add a Dashboard Filter](#)

To create a dashboard filter, select a field that contains the type of information you want to filter, then define how the filter returns the data.

2. [Apply a Dashboard Filter](#)

Filter a dashboard to analyze the information interactively. After you filter a dashboard, the filtered view is preserved so that the next time you see the dashboard, data is filtered in the same view.

3. [Dashboard Filter Examples](#)

Filters on a dashboard allow you to choose different views of data. After you filter a dashboard, the filtered view is preserved so that the next time you see the dashboard, data is filtered in the same view. Without dashboard filters, you’d have to create multiple dashboards, each with its own set of filtered reports.

Add a Dashboard Filter

USER PERMISSIONS

To add filters to dashboards you created:

Legacy Folder Sharing

Run Reports AND Manage Dashboards

Enhanced Folder Sharing

Run Reports AND Create and Customize Dashboards

To add filters to dashboards you created in public folders:

Legacy Folder Sharing

Only available in Enhanced Folder Sharing

Enhanced Folder Sharing

Edit My Dashboards OR Manage Dashboards in Public Folders

To add filters to dashboards you didn’t create:

Legacy Folder Sharing

Run Reports, Manage Dashboards, and View All Data

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To add filters to dynamic dashboards:

Legacy Folder Sharing


Manage Dynamic Dashboards


Enhanced Folder Sharing

Manage Dynamic Dashboards

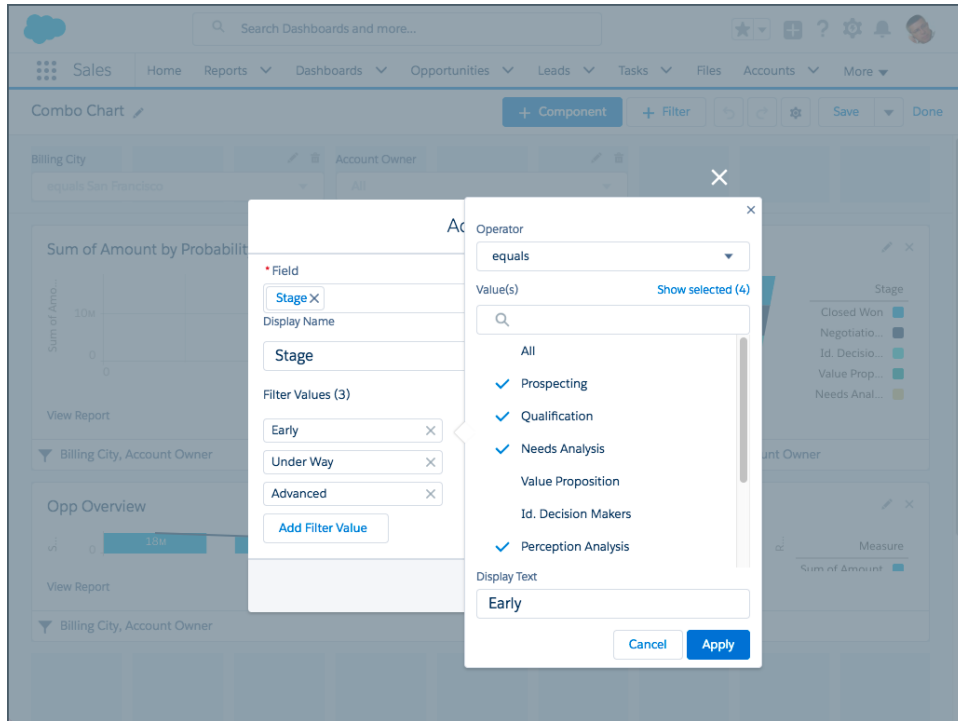
To create a dashboard filter, select a field that contains the type of information you want to filter, then define how the filter returns the data.

The field you select for the filter could have *equivalent fields*. Equivalent fields share the same underlying object as the field you select for the filter. You can use equivalent fields to filter components that don't have the exact field you selected for the filter, or to filter some components differently. For example, if you filter on the `Account Owner` field, equivalent fields include `Opportunity Owner` or `Opportunity Created by`, as all three are part of the User object.

When you edit a dashboard, you can see how each component is being filtered under the filter icon () in Lightning Experience or the `Filtered By` in Salesforce Classic. If equivalent fields are available for a component, you can select a different field to filter the component.

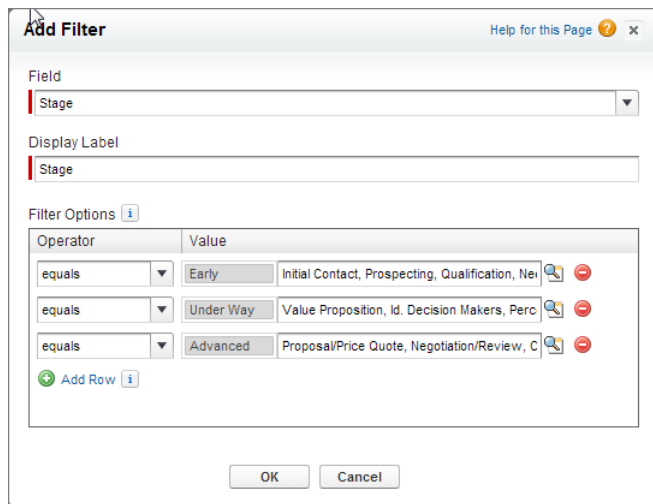
1. Edit a dashboard, then click **+ Filter** in Lightning Experience or **Add Filter** in Salesforce Classic.
2. From the `Field` drop-down, select a field to filter on. The drop-down shows fields that can be used to filter all the dashboard's components. If there are equivalent fields for your selection, hover over the info icon () to see them.
3. Give the filter a `Display Name` to identify it. If the filter has many equivalent fields, we consider using a name that works for all components.
4. Assign values to the filter.

In Lightning Experience, click **Add Filter Value**, choose an `Operator`, and set a `Value`. Optionally, set custom `Display Text`. Then, click **Apply**.



In Salesforce Classic, under Filter Options, select an operator and provide one or more values to filter by.

Use the `Display Text` field to give your filter a name. For example, on a sales dashboard, you might gather several stages of Opportunities into a group called “Early.” This lets users quickly filter the dashboard to show only data relevant to deals that are in the early stages of development.




- In Lightning Experience, click **Add**. In Salesforce Classic, click **OK**. If equivalent fields are available for a component, you can select which one to use to filter the component.

In Lightning Experience, to modify an existing filter, click the pencil icon (✎). To delete an existing filter, click the garbage icon (🗑).

In Salesforce Classic, to modify or delete an existing filter, from the filter drop-down, select **Edit Filter** or **Remove Filter**.

Apply a Dashboard Filter

Filter a dashboard to analyze the information interactively. After you filter a dashboard, the filtered view is preserved so that the next time you see the dashboard, data is filtered in the same view.

 **Note:** All components on the dashboard aren't necessarily filtered on the same field. The person who created or edited the dashboard specifies which field is used.

1. Open a dashboard.
2. Select an option from the filter drop-down.
Each filter has one or more options you can choose to narrow your selection further.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

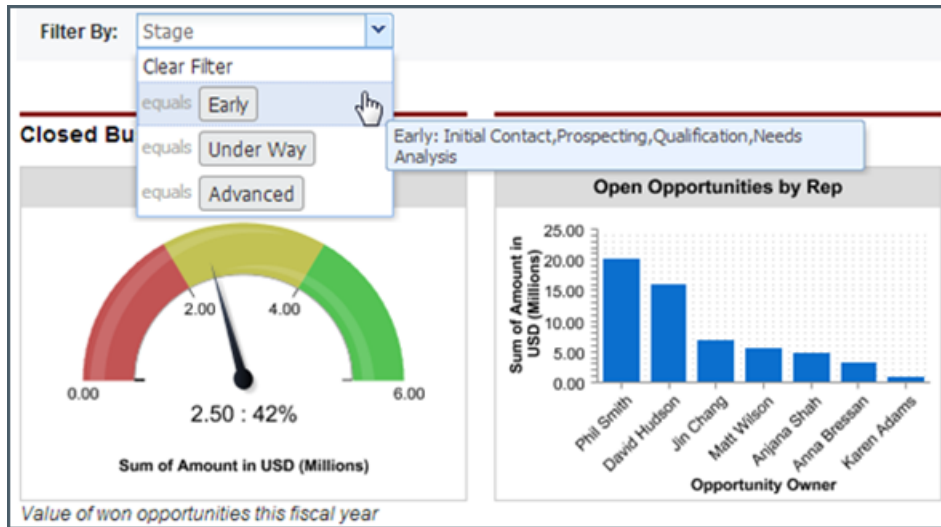
USER PERMISSIONS

To view, refresh, and apply filters to dashboards you created:

- **Legacy Folder Sharing**
Run Reports
- **Enhanced Folder Sharing**
Run Reports

To view, refresh, and apply filters to dashboards in public folders:

- **Legacy Folder Sharing**
Run Reports
- **Enhanced Folder Sharing**
Run Reports and View Dashboards in Public Folders



3. To see data unfiltered, select **Clear Filter** or **All** from the filter drop-down.

Dashboard Filter Examples

USER PERMISSIONS

To add filters to dashboards you created:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To add filters to dashboards you created in public folders:

Legacy Folder Sharing
Only available in Enhanced Folder Sharing

Enhanced Folder Sharing
Edit My Dashboards OR Manage Dashboards in Public Folders

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

To add filters to dashboards you didn't create:

Legacy Folder Sharing

Run Reports, Manage Dashboards, and View All Data

Enhanced Folder Sharing

Manage Dashboards in Public Folders

To add filters to dynamic dashboards:

Legacy Folder Sharing

Manage Dynamic Dashboards

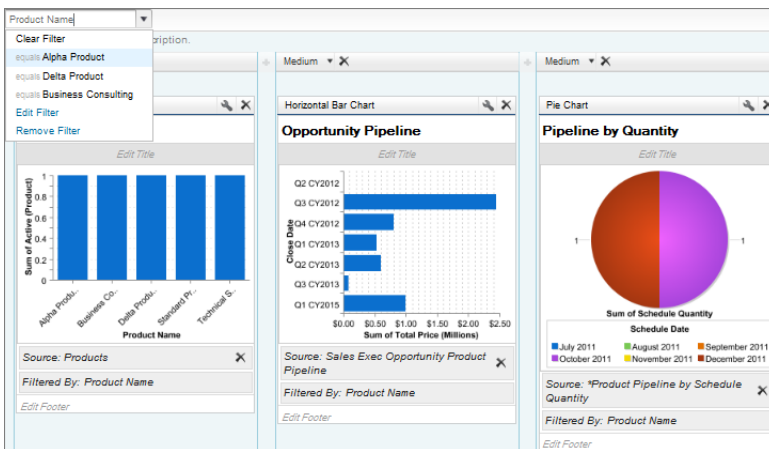
Enhanced Folder Sharing

Manage Dynamic Dashboards

Filters on a dashboard allow you to choose different views of data. After you filter a dashboard, the filtered view is preserved so that the next time you see the dashboard, data is filtered in the same view. Without dashboard filters, you'd have to create multiple dashboards, each with its own set of filtered reports.

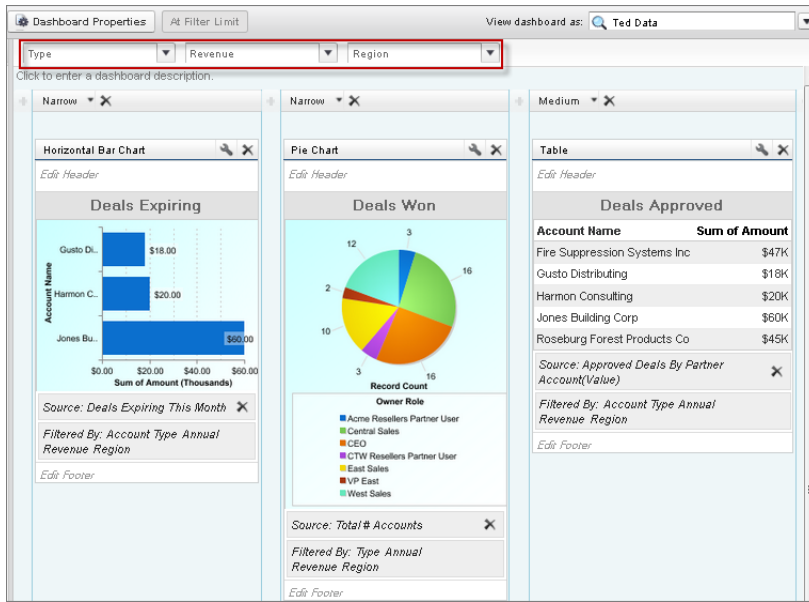
Sales Performance by Products

Create a sales dashboard that lets viewers track sales performance by products. To do so, create a dashboard with key performance indicators, like closed revenue. Add a filter on the `Product Name` field so viewers can see performance by product.



Deals for Different Account Segments

Show how different types of deals are performing across different account segments by creating a dashboard with two filters. Create a filter for `Annual Revenue` that contains several ranges that reflect how your organization segments accounts, then create a filter on `opportunity Type`, and finally add a filter to show deals by `Region`. Create this as a dynamic dashboard to let the entire sales organization use it: managers can use it to view the performance of their teams, while reps can use it to monitor their own performance.



Dynamic Dashboards: Choose Who People View a Dashboard As

Say that your sales people can only view their own opportunities, but you'd like to review all opportunities closed in the last quarter. Create a dashboard and let people view the dashboard as you (or anyone else who can see all opportunities). When your sales people open the dashboard, they see info about all opportunities instead of only their opportunities. (Their data access in Salesforce remains unchanged. They can only see more data in your dashboard.)

IN THIS SECTION:

[Dynamic Dashboards: Choose Who People View a Dashboard as in Lightning Experience](#)

Scope the data that dashboard readers see by specifying who they view the dashboard as. Remember, when you specify who people view the dashboard as you can give dashboard readers a broader view of data than they normally have. Be sure to control access to your dashboard by saving it in an appropriate dashboard folder.

[Choose a Running User in Salesforce Classic](#)

Select a *running user* to specify which data to display in a dashboard.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Dynamic Dashboards: Choose Who People View a Dashboard as in Lightning Experience

USER PERMISSIONS

To create dashboards:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Run Reports AND Create and Customize Dashboards

To edit and delete dashboards you created in public folders:

Legacy Folder Sharing
Run Reports AND Manage Dashboards

Enhanced Folder Sharing
Edit My Dashboards

To edit and delete dashboards you didn't create in public folders:

Legacy Folder Sharing
Run Reports, Manage Dashboards AND View All Data

Enhanced Folder Sharing
Manage Dashboards in Public Folders

To create, edit, and delete dynamic dashboards:

Legacy Folder Sharing
Manage Dynamic Dashboards

Enhanced Folder Sharing
Manage Dynamic Dashboards

To specify who people view a Lightning Experience dashboard as:

Legacy Folder Sharing
View My Team's Dashboards OR View All Data

Enhanced Folder Sharing
View My Team's Dashboards OR View All Data

To enable dashboard readers to choose who they view the dashboard as:

Legacy Folder Sharing
View My Team's Dashboards OR View All Data

Enhanced Folder Sharing
View My Team's Dashboards OR View All Data

EDITIONS

Available in: Lightning Experience


Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Scope the data that dashboard readers see by specifying who they view the dashboard as. Remember, when you specify who people view the dashboard as you can give dashboard readers a broader view of data than they normally have. Be sure to control access to your dashboard by saving it in an appropriate dashboard folder.

People view dashboards as a specified user — whomever is listed above the dashboard next to “Viewing as.” Specify who people view the dashboard as while creating or editing a dashboard.

If you have “View All Data,” you can choose any user in your organization to be a running user of the dashboard. If you have “View My Team’s Dashboards,” you can choose any user below you in the role hierarchy.


1. Edit a dashboard.
2. Open the Properties menu by clicking .
3. Under **View Dashboard As**, select who people view the dashboard as:
 - **Me** — Dashboard readers see data in the dashboard according to your access to data.
For example, if you can only see Opportunities in Canada, then dashboard readers only see data about Opportunities in Canada.
 - **Another person** — Dashboard readers see data in the dashboard according to the data access level of whomever you specify.
For example, if you choose someone who can see Opportunities from any country, then dashboard readers see data about Opportunities from all countries.
 - **The dashboard viewer** — Dashboard readers see data as themselves, according to their own access to data. These types of dashboards are often called *dynamic dashboards*.
Your organization can have up to 5 dynamic dashboards for Enterprise Edition, 10 for Unlimited and Performance Edition, and 3 for Developer Edition. Dynamic dashboards aren’t available in other editions. Additional dynamic dashboards may be available for purchase.
Take note of these dynamic dashboard limitations:
 - Dynamic dashboards don’t support following components.
 - You can’t save dynamic dashboards in private folders.
 - You can’t schedule refreshes for dynamic dashboards. They must be refreshed manually.
4. Optionally, select **Let dashboard viewers choose whom they view the dashboard as** to enable a reader with appropriate user permissions to choose who they view the dashboard as. With the “View My Team’s Dashboards” user permission, the reader can view the dashboard as themselves or as anyone beneath them in the role hierarchy. With the “View All Data” user permission, the reader can view the dashboard as anyone.
5. From the Properties window, click **Save**. Then, from the Dashboard Builder, click **Save** again.

When people open your dashboard, they see data as the person that you specified.


Choose a Running User in Salesforce Classic

Select a *running user* to specify which data to display in a dashboard.

Each dashboard has a *running user*, whose security settings determine which data to display in a dashboard.


 **Note:** The “Manage Dynamic Dashboards” permission, required for selecting a running user, isn’t available in **Professional** Edition.


If you have “View All Data,” you can choose any user in your organization to be a running user of the dashboard. If you have “View My Team’s Dashboards,” you can choose any user below you in the role hierarchy.

 **Note:** Dashboard components that use Visualforce ignore the running user; content displays only if the viewing user has access to the Visualforce page. Other components in the dashboard are not affected.


Users with a Salesforce Platform or Salesforce Platform One user license can only view a dashboard if the dashboard running user also has the same license type. Users with user licenses that don’t have full dashboard access can only see dashboards with running users of the same license type. Consider creating separate dashboards for users with different license types.

To select a dashboard’s running user in Salesforce Classic:

1. Edit a dashboard.
2. Click the  button next to the `View dashboard as` field.

 **Note:** If you don’t have “Manage Dynamic Dashboards” permission, just enter a running user and skip to the final step. Enter “*” to see all available users.

3. Choose a running user setting.
 - **Run as specified user.** The dashboard runs using the security settings of that single, specific user. All users with access to the dashboard see the same data, regardless of their own personal security settings. This approach is perfect for sharing the big picture across a hierarchy or motivating team members by showing peer performance within a team. If you don’t have “View All Data,” you can only choose yourself. If you have “View My Team’s Dashboards,” you can choose any user below you in the role hierarchy.
 - **Run as logged-in user.** A *dynamic dashboard* runs using the security settings of the user viewing the dashboard. Each user sees the dashboard according to his or her own access level. This approach helps administrators share one common set of dashboard components to users with different levels of access.
4. Optionally, select `Let authorized users change running user` to enable those with permission to change the running user on the dashboard view page.
 - Users with “View My Team’s Dashboards” can view the dashboard as any user below them in the role hierarchy.
 - Users with “View All Data” can edit the dashboard and view it as any user in their organization.
 - Users with “Enable Other User’s Dashboard” can edit the dashboard if they have access to it, even if they aren’t the running user and don’t have “View All Data.”

 **Note:** If you have “View All Data” or “View My Team’s Dashboards,” you can preview the dashboard *edit* page as a different user, but you must select `Let authorized users change running user` to change the running user from the dashboard *view* page.

5. Click **OK**.

EDITIONS

Available in: Salesforce Classic

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

USER PERMISSIONS

To enable choosing a different running user for the dashboard:

- View My Team’s Dashboards OR View All Data

6. In the `View dashboard as` field, enter a running user.
7. Save your dashboard.

IN THIS SECTION:

[Provide Individualized Views of a Dashboard in Salesforce Classic with Dynamic Dashboards](#)

Dynamic dashboards enable each user to see the data they have access to. With a dynamic dashboard, you can control data visibility without having to create a separate dashboard, with its own running user and folder, for each level of data access.

[Set Up Dynamic Dashboards in Salesforce Classic](#)

Create a folder to hold the dashboard and its underlying reports, then create the dashboard.

Provide Individualized Views of a Dashboard in Salesforce Classic with Dynamic Dashboards

Dynamic dashboards enable each user to see the data they have access to. With a dynamic dashboard, you can control data visibility without having to create a separate dashboard, with its own running user and folder, for each level of data access.

Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Administrators control access to dashboards by storing them in folders with certain visibility settings. Dashboard folders can be public, hidden, or restricted to groups, roles, or territories. If you have access to a folder, you can view its dashboards.

Folders control access to the dashboard, but the *running user* determines access to data. The running user options are:

- **Run as specified user.** The dashboard runs using the security settings of that single, specific user. All users with access to the dashboard see the same data, regardless of their own personal security settings. This approach is perfect for sharing the big picture across a hierarchy or motivating team members by showing peer performance within a team. If you don't have "View All Data," you can only choose yourself. If you have "View My Team's Dashboards," you can choose any user below you in the role hierarchy.
- **Run as logged-in user.** A *dynamic dashboard* runs using the security settings of the user viewing the dashboard. Each user sees the dashboard according to his or her own access level. This approach helps administrators share one common set of dashboard components to users with different levels of access.

With a dynamic dashboard, you can control data visibility without having to create a separate dashboard, with its own running user and folder, for each level of data access. A single dynamic dashboard can display a standard set of metrics across all levels of your organization.

You can create up to three filters for each dynamic dashboard. Filtering dynamic dashboards gives administrators additional flexibility in creating dashboards. For example, you can create an organization-wide sales scorecard that contains sales rep and product filters. This allows individual sales managers to view their reps' performance collectively as well as individually. It also lets them view sales by product to understand which products specific reps are or aren't selling.

Managers with the "View My Team's Dashboards" or "View All Data" permission can set an option to preview the dashboard from the point of view of users under them in the role hierarchy.

Your organization can have up to 5 dynamic dashboards for Enterprise Edition, 10 for Unlimited and Performance Edition, and 3 for Developer Edition. Additional dynamic dashboards may be available for purchase.

USER PERMISSIONS

To create, edit, and delete dynamic dashboards:

- **Legacy Folder Sharing**
Manage Dynamic Dashboards

Enhanced Folder Sharing

Manage Dynamic Dashboards

 **Note:**

- Dynamic dashboards don't support following components.
- You can't save dynamic dashboards to personal folders.
- You can't schedule refreshes for dynamic dashboards. They must be refreshed manually.

Example Business Scenario

Let's say that your opportunity team consists of one vice president, four sales managers, and 40 sales reps—10 reps per manager. You've been asked to create dashboards that display the following metrics, restricted by role and hierarchy:

Role	Total Bookings	Close Rates by Competitor	Number of Activities by Meeting Type
Sales Rep	✓		✓
Sales Manager	✓	✓	
VP of Sales	✓	✓	

Sales reps should only see their own data; managers should only see data for the reps they manage; and the VP should see data across the entire team. In this scenario, you'd typically have to create 45 different dashboards—one for every single person. You'd also have to create multiple folders to manage access rights.

With dynamic dashboards, you can create just *two* dashboards and store them in a single folder:

- Create a dynamic dashboard for sales reps with the following components:
 - A gauge of total bookings
 - A table of activities by meeting type
- Create a dynamic dashboard for managers and the VP with the following components:
 - A gauge of total bookings
 - A column chart of close rates by competitor
- Optionally, create filters that let viewers further refine their dashboard views. For example, create a filter on key accounts to let viewers focus on bookings, activities, and competitive threats for each account.

All users only see data that they can access. Sales reps see their own bookings and activities. Managers see bookings and close rates for the reps they manage. The VP sees bookings and close rates for the whole team. Because the metrics are the same for managers and the VP, you can use the same dynamic dashboard for both roles. The dynamic dashboards feature reduces the number of required dashboards from 45 to two!

SEE ALSO:

[Filter a Dashboard](#)

[Build a Salesforce Classic Dashboard](#)

[Set Up Dynamic Dashboards in Salesforce Classic](#)

Set Up Dynamic Dashboards in Salesforce Classic

Create a folder to hold the dashboard and its underlying reports, then create the dashboard.


Available in: Salesforce Classic

Available in: **Enterprise, Performance, Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

Your organization can have up to 5 dynamic dashboards for Enterprise Edition, 10 for Unlimited and Performance Edition, and 3 for Developer Edition. Additional dynamic dashboards may be available for purchase.

Take note of these dynamic dashboard limitations:

- Dynamic dashboards don't support following components.
 - You can't save dynamic dashboards in private folders.
 - You can't schedule refreshes for dynamic dashboards. They must be refreshed manually.
1. Create folders accessible to all dashboard viewers to store dynamic dashboards and corresponding component source reports.
 2. From the Dashboards tab, create a new dashboard or edit an existing one.
 3. Click the  button next to the `View dashboard as` field.



Note: If you don't have "Manage Dynamic Dashboards" permission, just enter a running user and skip to the final step. Enter "*" to see all available users.

4. Select `Run as logged-in user`.
5. Optionally, select `Let authorized users change running user` to enable those with permission to change the running user on the dashboard view page.
 - Users with "View My Team's Dashboards" can view the dashboard as any user below them in the role hierarchy.
 - Users with "View All Data" can edit the dashboard and view it as any user in their organization.
 - Users with "Enable Other User's Dashboard" can edit the dashboard if they have access to it, even if they aren't the running user and don't have "View All Data."
6. Click **OK**.
7. In the `View dashboard as` field, enter a running user.
8. Save your dashboard.
9. Set the appropriate `Show` option on the report run page.
For example, if you choose "My Team's Opportunities," each dynamic dashboard viewer can see all opportunities for the team.



Tip: To avoid restricting the dashboard's view of the data:

- Make sure advanced filters don't include specific record owners (for example, *Opportunity Owner equals Frank Smith*).

USER PERMISSIONS

To create, edit, and delete dynamic dashboards:

- **Legacy Folder Sharing**
Manage Dynamic Dashboards
- **Enhanced Folder Sharing**
Manage Dynamic Dashboards

- Don't click `Save Hierarchy Level` when saving opportunity reports.

SEE ALSO:

[Add a Dashboard Filter](#)

[Provide Individualized Views of a Dashboard in Salesforce Classic with Dynamic Dashboards](#)

[Choose a Running User in Salesforce Classic](#)

Run and Then Read a Dashboard

Click on a dashboard's name to run it. Dashboard charts are interactive, so be sure to hover and click on them to get more info!

- Users with a Salesforce Platform or Salesforce Platform One user license can only view a dashboard if the dashboard running user also has the same license type. Users with user licenses that don't have full dashboard access can only see dashboards with running users of the same license type. Consider creating separate dashboards for users with different license types.
- Dashboards in **Group** Edition organizations are view-only.

IN THIS SECTION:

1. [Refresh Dashboard Data](#)

Click **Refresh** to load the latest data into the dashboard. The data is as current as the date and time displayed after `As of . . .` at the top right corner of the dashboard.

2. [Schedule a Dashboard Refresh](#)

In Enterprise Edition, Unlimited Edition, and Performance Edition, you can schedule dashboards to refresh daily, weekly, or monthly.

3. [Expand Dashboard Components to See a Larger Version in Lightning Experience](#)

Sometimes a chart or table is just a little too small. Open it in a window so you can see all the details.

4. [View Filtered Source Reports in Lightning Experience](#)

Want to know more about the data shown in a dashboard chart? Click a chart segment, axis label, or legend to view a filtered version of the source report.

EDITIONS

Available in: Salesforce Classic and Lightning Experience


Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

Refresh Dashboard Data

Click **Refresh** to load the latest data into the dashboard. The data is as current as the date and time displayed after **As of . . .** at the top right corner of the dashboard.

1. Click **Refresh** to replenish your dashboard with the most recent data. When dashboard data is being refreshed, the **Refresh** button changes to **Refreshing...** You can leave the dashboard and do other things in Salesforce while the data refreshes. When the dashboard has finished refreshing, Salesforce 1 tells you that the dashboard is ready through the right-hand notification panel. Since push notifications aren't enabled for dashboard refreshes, you're notified only in the app and not in through email.

 **Tip:** If your dashboard data doesn't refresh after ten minutes, the refresh automatically stops. If necessary, click **Refresh** again.

When you refresh a dashboard, the dashboard data refreshes for anyone else in your organization that has access to that dashboard. Additional refreshes submitted during a refresh and up to one minute after the completion of a refresh are ignored; users view the most current data.

When you change filters on a dashboard, the dashboard shows previously cached data, if it exists. If no data exists, the dashboard fetches the latest. Either way, the dashboard's "Last Refreshed" date shows you the timestamp for the data you're viewing. Click **Refresh** to get the most recent data.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

USER PERMISSIONS

To view dashboards:

- Run Reports AND access to dashboard folder

Schedule a Dashboard Refresh

In Enterprise Edition, Unlimited Edition, and Performance Edition, you can schedule dashboards to refresh daily, weekly, or monthly.

Note:

- Users with the “View Setup and Configuration” permission can view all the dashboards scheduled to refresh for your organization on the All Scheduled Jobs page. To view the All Scheduled Jobs page, from Setup, enter *Scheduled Jobs* in the Quick Find box, then select **Scheduled Jobs**. Users with “Modify all Data” permission can click **Del** next to a specific scheduled dashboard refresh to permanently delete all instances of the scheduled refresh.
- Users with Salesforce Platform User Licenses can’t subscribe to dashboards.

You can also set up Salesforce to send an email with an HTML version of the dashboard when the refresh completes. For email applications that don’t support HTML, the email includes text and a link to the dashboard.

1. On the Dashboards tab, select a dashboard using the `View Dashboard` field.
2. Click **Refresh** and choose **Schedule Refresh**


Filters aren’t applied when you schedule or email a dashboard.

Each dashboard has a *running user*, whose security settings determine which data to display in a dashboard.

 **Note:** If the running user becomes inactive, the dashboard doesn’t run.

3. Select notification settings.

- Click `To me` to send an email to your user’s address.
- Click `To others...` to send an email to additional Salesforce users.

 **Note:** Portal users receive report and dashboard refresh email notifications when the `Allow Reports and Dashboards to Be Sent to Portal Users` option is enabled.

- Dashboard refresh notifications may not display properly in Outlook 2007.
- In HTML-formatted dashboard refresh notifications, users can click the name of the dashboard to log in to Salesforce and view the dashboard.
- To send a dashboard refresh notification to other users, store the dashboard in a public folder with access granted to others. Other users can’t access dashboards in your personal folders. To add a dashboard to a public folder, edit the dashboard properties.
- Users can click components in a dashboard refresh notification to view the source report in Salesforce.
- Dashboard components that include Visualforce pages and s-controls may not display in dashboard refresh notifications. Users must view them in Salesforce.
- Dashboard refresh notifications can be viewed offline in email clients.
- If a dashboard has filters, only the unfiltered version is emailed.
- By default, Salesforce sends images in dashboard emails as `.png` (Portable Network Graphic) files, which are not supported in Lotus Notes. When you enable the `Use Images Compatible with Lotus Notes in Dashboard Emails` > option, Salesforce uses `.jpg` images, which Lotus Notes supports, when sending dashboard emails. The “Schedule Dashboard” permission is required to view this option.

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

USER PERMISSIONS

To schedule and email a dashboard refresh:

- **Legacy Folder Sharing**
Schedule Dashboards
- **Enhanced Folder Sharing**
Schedule Dashboards

To delete the schedule to refresh a dashboard:

- **Legacy Folder Sharing**
Modify All Data
- **Enhanced Folder Sharing**
Modify All Data

 **Note:** Dashboard emails that contain images compatible with Lotus Notes are substantially larger and the image quality can be lower.

4. Schedule the refresh.

a. Set the `Frequency` field.

Click the `Daily`, `Weekly`, or `Monthly` fields to show more options.


The total number and frequency of your scheduled dashboard refreshes depends on your Salesforce edition. Enterprise, Unlimited, and Performance Editions can have up to 200 scheduled dashboard refreshes. Unlimited and Performance Edition users can schedule up to two dashboard refreshes an hour per day. Enterprise Edition users can schedule up to one dashboard refresh an hour per day. Additional scheduled dashboards may be available for purchase. Contact your Salesforce representative for information.

b. Specify dates in the `Start` and `End` fields.

Dashboards refresh in the time zone of the user who scheduled the refresh. For example, if the `Time Zone` field on your user record is set to Pacific Standard Time (PST), and you schedule a dashboard to refresh every day at 2:00 PM, then the dashboard will refresh every day between 2:00 PM and 2:29 PM PST. If you view and save a schedule in a time zone different from the one in which it was previously scheduled, the time slot could potentially change.

c. Under `Preferred Start Time`, click **Find available options...** to choose a time.

The dashboard refresh runs within 30 minutes of your preferred start time. For example, if you select 2:00 PM, the refresh may happen any time between 2:00 PM and 2:29 PM, depending on availability.

 **Note:** Your preferred start time may not be available if other users have already selected it.

- If you schedule a dashboard to refresh on a specific day of every month, it only refreshes on months that have that specific day. For example, if you schedule a refresh for the 31st of every month, the dashboard won't refresh on 30-day months. To refresh on the last day of every month, choose "Last" from the `on day of every month` drop-down list.
- Dashboards won't refresh as scheduled if the running user doesn't have access to the dashboard folder.
- If a dashboard has filters, only the unfiltered version is refreshed.
- You can't schedule refreshes for dynamic dashboards. They must be refreshed manually.

5. Click **Save**.

To delete a scheduled dashboard refresh, click **Refresh > Schedule Refresh > Unschedule Dashboard**.

The scheduled refresh is permanently deleted, and not sent to the Recycle Bin. Deleting the scheduled refresh does not affect the dashboard itself.


SEE ALSO:

[Apply a Dashboard Filter](#)

[Refresh Dashboard Data](#)

Expand Dashboard Components to See a Larger Version in Lightning Experience

Sometimes a chart or table is just a little too small. Open it in a window so you can see all the details.

1. Open a dashboard.
2. Hover over a component and click .

A larger version of the dashboard component overlays the dashboard. Optionally, click the left and right arrows to cycle through expanded versions of the dashboard's components.

View Filtered Source Reports in Lightning Experience

Want to know more about the data shown in a dashboard chart? Click a chart segment, axis label, or legend to view a filtered version of the source report.

EDITIONS

Available in: Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

USER PERMISSIONS

To expand dashboard components:

- Run Reports

EDITIONS

Available in: Lightning Experience

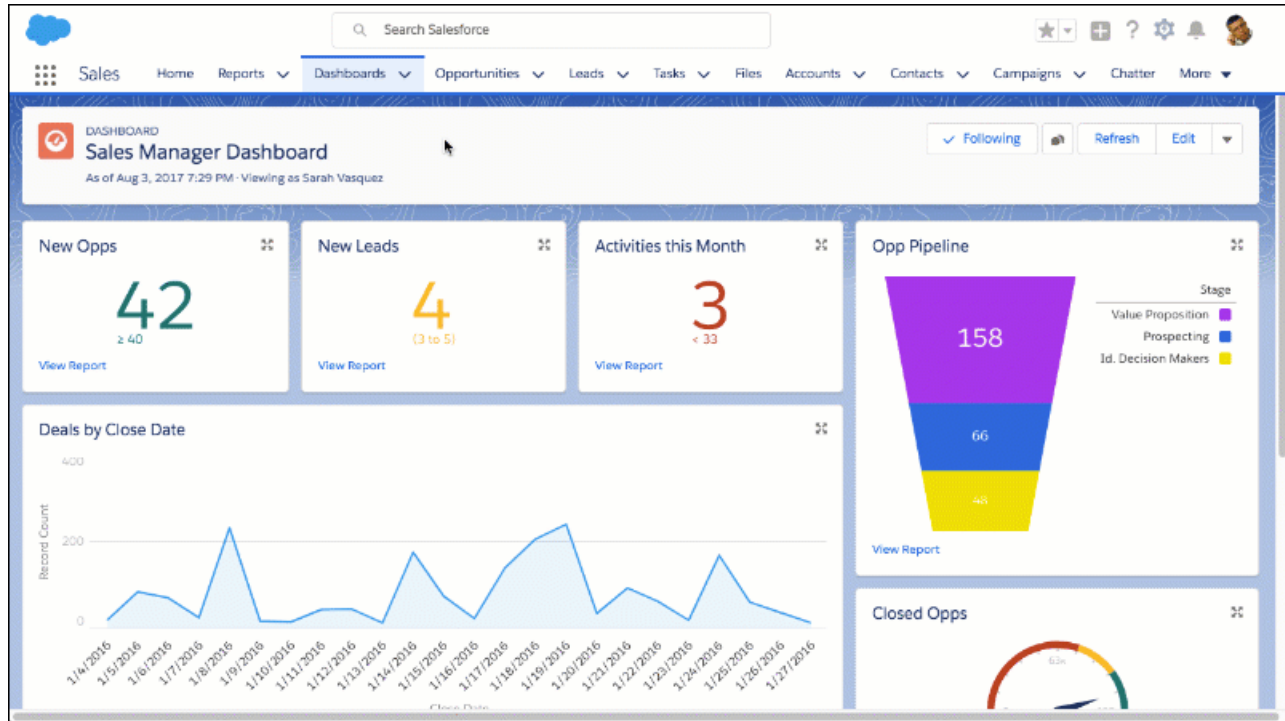
Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

USER PERMISSIONS

To view filtered source reports:

- Run Reports



For example, click the Prospecting segment of an opportunity pipeline funnel chart to open and filter the source report by Stage equals Prospecting.

1. Open a dashboard.
2. Click a chart segment, axis label, or legend.

The source report opens. The segment you click (plus any applied dashboard filters) appear as linked filters when the report opens.

To open the filtered source report in a new tab, hold down **CTRL** on Windows® or **Command** on MacOS® and click a chart segment.

If a chart displays one of these types of data, then the source report won't filter:

- Encrypted strings
- Dates fields with month-in-year or day-in-month granularity

Organize Dashboards

Keep your dashboards at your fingertips by embedding them around Salesforce, printing them, or deleting dashboards that you don't need anymore.

IN THIS SECTION:

1. [Embed Dashboards on the Home Tab and in Lightning Apps](#)
Embed dashboards to surface insights right where people work.
2. [Print a Dashboard](#)
Print dashboards using your browser's print option.
3. [Delete a Dashboard](#)
It's a good idea to delete dashboards that you no longer need.

Embed Dashboards on the Home Tab and in Lightning Apps

Embed dashboards to surface insights right where people work.

For example, add the Sales Pipeline dashboard to the Home tab to give your sales team the information they need when they log in to Salesforce.

Embedded dashboards are fully interactive. Refresh them, apply filters, and click chart segments to drill into filtered reports.

Dashboards need space to display charts and tables. If an embedded dashboard is squished into too small a space, then a collapsed version displays instead of the full dashboard. The collapsed version links back to the full dashboard.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

EDITIONS

Available in: Lightning Experience

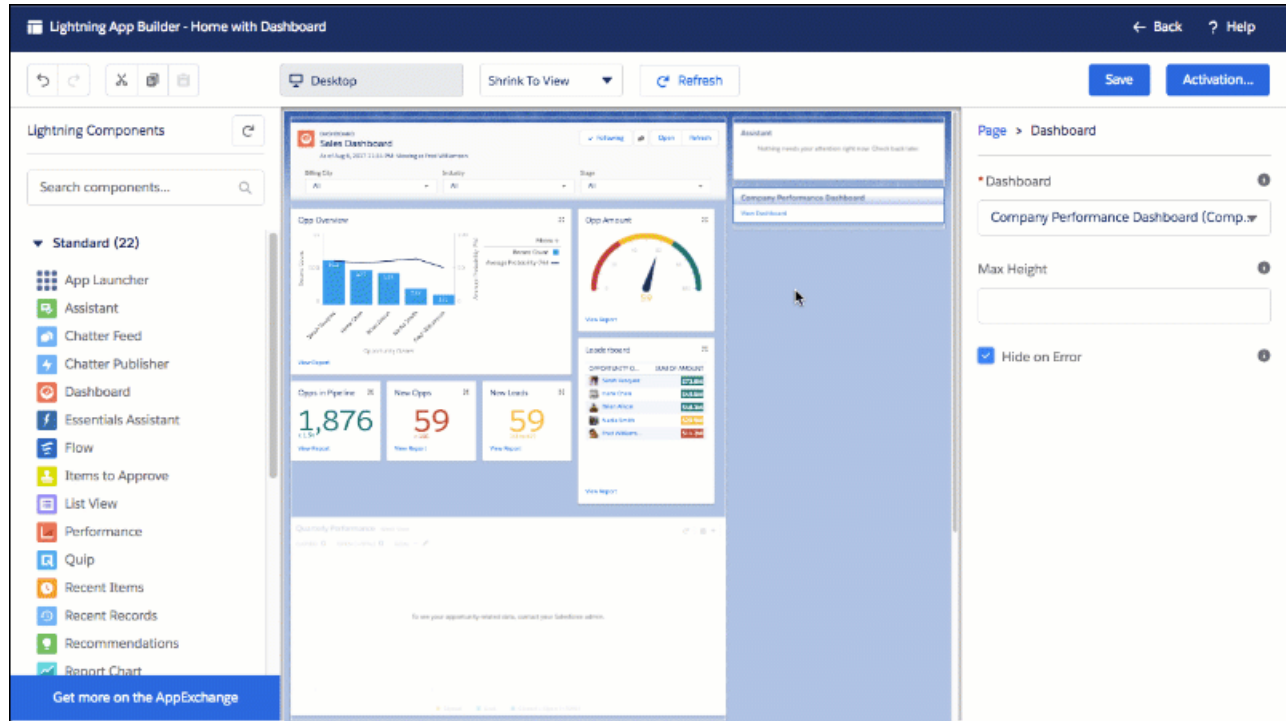
Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

USER PERMISSIONS

To embed dashboards on the Lightning Home tab and in Lightning apps:

- Customize Application



1. From Setup, enter *App Builder* in the *Quick Find* box, then select **Lightning App Builder**.
2. Click **New**.
3. Choose where to embed the dashboard. (Record pages don't support embedded dashboards.)
 - To embed a dashboard on an app page, select **App Page**.
 - To embed a dashboard on the Home tab, select **Home Page**.
 Click **Next**
4. Give your app page or home tab layout a label. Then, click **Next**.
5. Choose a layout. Then, click **Finish**.
6. Drag and drop the **Dashboard** standard component into place.
7. From the Dashboard drop-down list, choose a dashboard to embed.
8. Optionally, specify a maximum height and choose to show or hide the dashboard if an error prevents it from loading.
9. Click **Save**.
10. Click **Activate**.

Go visit the newly updated Home tab, or your Lightning app, and marvel at the embedded dashboard!

Print a Dashboard

Print dashboards using your browser's print option.

- Set the paper orientation to print in landscape format so that it is wide enough for all three columns of dashboard components.
- If necessary, resize your columns and remove the browser-imposed headers and footers.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

USER PERMISSIONS

To print dashboards:

- Run Reports AND access to dashboard folder

Delete a Dashboard

It's a good idea to delete dashboards that you no longer need.

Deleting a dashboard also deletes the components within it. It doesn't delete the custom reports used by the components.

Deleted dashboards are moved to the Recycle Bin.

To delete a dashboard in Lightning Experience, open the dashboard and then click **Delete**.

To delete a dashboard in Salesforce Classic:

1. Click the Dashboards tab.
2. Click **Go To Dashboards List**.
3. Choose the folder where the dashboard is stored.
4. Click **Del** next to the name of the dashboard.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: both Legacy Folder Sharing and Enhanced Folder Sharing

USER PERMISSIONS

To delete dashboards:

- **Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- Enhanced Folder Sharing**
Run Reports AND Create and Customize Dashboards (If the dashboard is in a private folder.)

Edit My Dashboards (If the dashboard is in a shared folder.)

To delete dashboards created by another user:

- **Legacy Folder Sharing**
Run Reports, Manage Dashboards AND View All Data
- Enhanced Folder Sharing**
Manage Dashboards in Public Folders

Dashboard Limits

As you build dashboards of your data, be aware of these limits and restrictions.

Salesforce Reports and Dashboards Limits

Feature	Personal Edition	Contact Manager	Group Edition	Professional Edition	Enterprise Edition	Unlimited and Performance Edition	Developer Edition
Custom report types (Limits apply to all custom report types regardless of development status.)	N/A			50	200	2,000	400
Dashboard filters				3 per dashboard			
Dynamic dashboards per org	N/A				Up to 5	Up to 10	Up to 3
Field filters per report ¹	20						
Formulas per report	5						
Reporting snapshots	N/A			1 ^{2, 3, 4}	1 ²	2 ²	1 ^{2, 3, 4}
Scheduled dashboard refreshes	N/A				1 ²	2 ²	N/A
Scheduled reports per hour (Emailed reports can be up to 10 MB.)	N/A			1 ^{2, 3, 5}	1 ²	2 ²	1 ^{2, 3, 5}

¹ These limits apply to the report builder. If you're using the report wizard, the limit is 10.

² Up to 200 total.

³ Off-peak hours (between 6 PM and 3 AM local time) only.

⁴ Limited to one preferred start time per day.

⁵ Limited to three preferred start times per day.

Salesforce retains historical data for the previous three months, plus the current month.

The following Salesforce Reports and Dashboards limits apply to all supported editions.

Report Limits

- The report builder preview shows a maximum of 20 rows for summary and matrix reports, and 50 rows for tabular.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

- You can't have more than 250 groups or 4,000 values in a chart. If you see an error message saying that your chart has too many groups or values to plot, adjust the report filters to reduce the number. In combination charts, all groups and values count against the total.
- Reports display a maximum of 2,000 rows. To view all the rows, export the report to Excel or use the printable view for tabular and summary reports. For joined reports, export is not available, and the printable view displays a maximum of 20,000 rows.
 - Summary and matrix reports display the first 2,000 groupings when Show Details is disabled.
 - Matrix reports display a maximum of 400,000 summarized values.
 - Matrix reports display a maximum of 2,000 groupings in the vertical axis when Show Details is disabled. If there are more than 400,000 summarized values, rows are removed until the 2,000 groupings limit is met, then columns are removed until the number of summarized values moves below 400,000.
 - Matrix reports that return more than 2,000 rows don't show details. If you click **Show Details**, nothing happens. You can only view the report with details hidden.
- Up to five metrics display in the Lightning Experience report header. Metrics such as summarized fields appear in the order that they appear in the report, left to right. The grand total, when shown, always displays.
- When reports that have groupings are viewed in the Salesforce app, they're converted to tabular reports.
- By default, reports time out after 10 minutes.
- In a joined report, each block can have up to 100 columns. A joined report can have up to 5 blocks.
- You can add up to 10 custom summary formulas to each block in a joined report. A joined report can have a total of 50 custom summary formulas.
- Each joined report can have up to 10 cross-block custom summary formulas.
- When you filter on standard long text area fields, such as Description or Solution Details, only the first 1000 characters of the field are searched for matches in reports.
- Only the first 254 characters in a rich text area or a long text area are displayed in a report.
- Summary fields on tabular, summary, and matrix reports can display up to 21-digits.
- Reports can't be filtered on custom long text area fields.
- Joined reports require that the new user interface theme is enabled. Users without the new theme are unable to create, edit, or run joined reports.
- Forecast reports include only opportunities that are set to close within the forecast period, except those assigned to the Omitted forecast category.
- Internet Explorer 6 is not supported for joined reports.
- Acceptable range for values: The maximum value allowed is 9999999999999999. The minimum value allowed is -9999999999999999.

Dashboard Limits

- A dashboard filter can have up to 50 options. By default, 10 options are enabled. Contact Salesforce to extend your limit.
- Each dashboard can have up to 20 components.
- It's not possible to filter on bucket fields. However, it is possible to use a report filtered on a bucket field on the dashboard page.
- A dashboard table or chart can display up to 20 photos.
- You must wait at least one minute between dashboard refreshes.

Report Type Limits

- A custom report type can contain up to 60 object references. For example, if you select the maximum limit of four object relationships for a report type, then you could select fields via lookup from an additional 56 objects. However, users will receive an error message if they run a report from a custom report type and the report contains columns from more than 20 different objects.

- You can add up to 1000 fields to each custom report type.

Reporting Snapshot Limits

- The maximum number of rows you can insert into a custom object is 2,000.
- The maximum number of runs you can store is 200.
- The maximum number of source report columns you can map to target fields is 100.

Filtering Limits

Only the first 255 characters in a custom text field count for filtering purposes.

Embedded Report Charts Limits

- You can have two report charts per page.
- You can only add report charts from the enhanced page layout editor. The mini console and the original page layout editor are not supported.
- On detail pages, users can refresh up to 100 report charts every 60 minutes.
- Your org can refresh up to 3,000 report charts every 60 minutes.

List View Limits

- Only the first 255 characters are shown for custom long text area fields in list views.

Bucket and Bucket Field Limits

- Each report can include up to five bucket fields.
- Each bucket field can contain up to 20 buckets.
- Each bucket can contain up to 20 values.
- Bucket fields are available for use only in the report where they're generated. To use a bucket in multiple reports, create the field for each report, or create a separate formula field for the object that's dependent on the bucket.



Note: These limits don't apply to the use of Other as permitted within the bucket field's setup.

- Buckets and bucket fields aren't available for reports that include external objects.
- If a bucket field's source column has a custom index, and you filter by the bucket field, then the performance gains from the custom index are lost.

Historical Trend Report Limits

- Salesforce retains historical data for the previous three months, plus the current month.
- Up to 5 million rows of historical trending data can be stored for each object. Historical data capture stops when the limit is exceeded. The admin is alerted by email when any object reaches 70 percent of the limit, and again if the limit is exceeded.
- Each historical trend report can contain up to 100 fields. In Opportunities reports, this includes the standard preselected fields, which can't be disabled.
- Formula fields are not supported.
- Row limit filters are not supported.
- The summary report format is not supported.
- You can specify up to five historical snapshot dates in each historical trend report.
- You can use up to four historical filters on each historical trend report.
- These field types are supported: Number, Currency, Date, Picklist, Lookup.
- Dated exchange rates are not supported. When you run the historical trend report, it only uses the latest dated exchange rate.
- Internet Explorer 6 is not supported.

- You can't subscribe to historical trend reports.
- The Report Wizard is not supported. Historical trend reports can only be created with the Report Builder.
- Historical trend reporting with charts is supported in Lightning Experience, but tabular views of historical trend reports aren't available.

External Object Report Limits

If your report includes an external object, the results probably don't reflect the full data set. External objects behave similarly to custom objects, except that they map to data that's stored outside your Salesforce org. A report that includes an external object fetches up to 2,000 records for the primary object and can encounter callout limits while fetching external object data. If the report results in few or no rows, try customizing the report to obtain more relevant external object rows.

Cross Filters

- Each report can have up to three cross filters.
- Each cross filter can have up to five subfilters.
- Filter logic applies only to field filters, not cross filters.

Reports and Dashboards API Limits

The following limits apply to both the Reports and Dashboards REST API and Reports and Dashboards API via Apex.

- Cross filters, standard report filters, and filtering by row limit are unavailable when filtering data.
- Historical trend reports are only supported for matrix reports.
- The API can process only reports that contain up to 100 fields selected as columns.
- A list of up to 200 recently viewed reports can be returned.
- Your org can request up to 500 synchronous report runs per hour.
- The API supports up to 20 synchronous report run requests at a time.
- A list of up to 2,000 instances of a report that was run asynchronously can be returned.
- The API supports up to 200 requests at a time to get results of asynchronous report runs.
- Your organization can request up to 1,200 asynchronous requests per hour.
- Asynchronous report run results are available within a 24-hour rolling period.
- The API returns up to the first 2,000 report rows. You can narrow results using filters.
- You can add up to 20 custom field filters when you run a report.
- Your org can request up to 200 dashboard refreshes per hour.
- Your org can request results for up to 5,000 dashboards per hour.

Why Doesn't My Dashboard Display the Data I Expect?

If you're not seeing data you expect, refresh for latest data, check that you have the right running user, and verify your dashboard data sources.

If your dashboard data doesn't look as you expect, check the following:

- **Running user.** Remember that you're viewing the dashboard from the perspective of the running user. What you see is based on that user's access rights. For dynamic dashboards, you can only see what you yourself can access.
- **Refresh Dashboard.** If you are viewing old data, click **Refresh** to refresh your dashboard.
- **Data sources.** Verify that your data sources (reports, s-controls, or Visualforce pages) contain the information you want displayed in the dashboard components.

For further information regarding dashboard running user and dashboard refresh, review the articles [Choose a Dashboard Running User](#) on page 979 and [Refresh Dashboard Data](#) on page 984.

Report and Dashboard Folders

Use report and dashboard folders to organize your reports and dashboards. To share reports and dashboards, you share the folder, not the report or dashboard itself.

By default, all orgs created after the Summer '13 Salesforce release use enhanced folder sharing. If your org is using Salesforce Classic and doesn't have Enhanced Analytics Folder Sharing enabled, see [Turn On Enhanced Sharing for Reports and Dashboards](#) in the Salesforce Help.

Enhanced folder sharing offers these advantages in comparison to legacy folder sharing.

- Sharing at the user, group, or role level, or a combination of these
- Sharing with individual users
- Fine-grained access levels for each folder share
- Same permission structure used for both reports and dashboards

Enhanced folder sharing supports these access levels.

- Viewer—View folders and their content, run reports, and refresh dashboards.
- Editor—All viewer access, plus the ability to add content to a folder, edit all the content in a folder, and delete content from a folder.
- Manager—All viewer and editor access, plus the ability to rename and delete folders and edit, delete, or remove shares.

If you have orgs created before the Summer '13 release and don't want to reassign permissions for the legacy reports and dashboards, you can continue to use legacy folder sharing in Salesforce Classic. With legacy folder sharing:

- Salesforce determines a folder's accessibility and visibility to a user as read only or read write.
- Read only—When a folder is visible to a user, the user can see and run the reports stored in that folder.
- Read and write—Users with read-write permission on folder can save reports to the folder. When saving, the users see only the report folders for which they have write permission.

Notes about folder sharing:

- To open a report or dashboard, you need:
 - Access to the folder in which the report or dashboard is saved
 - The necessary user permission

For example, to run a report you need access to the folder in which it's saved and the "Run Reports" user permission.

- The concept of shared/not shared folders is different from the concept of public and private folders:
 - The reports or dashboards in a private folder are always invisible to everyone except the person who created the folder.
 - The reports or dashboards in any folder that is not private are visible to everyone who has permission to view the reports or dashboards.
- The following folder names are different in Salesforce Classic and Lightning Experience, but the folders are the same.

Salesforce Classic	Lightning Experience
Unfiled Public Reports	Public Reports
Unfiled Public Dashboards	Public Dashboards
My Personal Custom Reports	Private Reports


EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Essentials, Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Access Levels for Report and Dashboard Folders

Each user, group, or role can have its own level of access to a report and dashboard folder. Viewers can see the data. Editors can determine what data is shown. Managers can control access.

 **Tip:** If you're not ready to share a report or dashboard, keep it in a personal folder that only you can access. The My Personal Custom Reports folder and the My Personal Dashboards folder are already set up for you. Create more folders if you need them. When you create a folder, it is accessible only to you and to users with administrative permissions, until you share it.

SEE ALSO:

- [Share a Report or Dashboard Folder in Salesforce Classic](#)
- [Compare Access Levels for Report and Dashboard Folders](#)

Viewer Access to Report and Dashboard Folders

Viewer access allows you to view the reports or dashboards in a folder, but does not determine access to folder contents. Permissions set for the reports and dashboards themselves determine your access to the contents. For example, if you have Viewer access to a reports folder and Create and Customize Reports permission to a report in the folder, you can rename or delete the report.

All users have at least Viewer access to report and dashboard folders that have been shared with them. Some users have administrative user permissions that give them greater access.

View access is useful in a case such as the following. Samir is a sales rep who likes to start his day by checking his position on the sales leader board, which appears on the Master Sales dashboard. He has to refresh the dashboard to get the latest standings, so he needs to view the data in the underlying reports. But he doesn't want to edit the reports or the dashboard. All he needs is Viewer access to the folder that contains the Master Sales dashboard.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

EDITIONS

Available in: Salesforce Classic and Lightning Experience


Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

Editor Access to Report and Dashboard Folders

Editor access allows you to view and save the reports or dashboards in a folder, but does not determine access to folder contents. Permissions set for the reports and dashboards themselves determine your access to the folder contents. For example, if you have Editor access to a folder and Run Reports permission to a report in the folder, you can run the report but not make changes.

Editor access is useful in a case such as the following. Allison, a sales manager, wants to provide a different sales dashboard for each of the three regional teams. Editor access to the folder that contains the Master Sales dashboard allows her to move the underlying reports into the correct folders and then modify them to show the appropriate data.

 **Note:** You can't give Editor access to standard report folders. By default, all users get Viewer access to these folders.

Manager Access to Report and Dashboard Folders

Manager access allows you to view, share, save, rename, and delete the reports or dashboards in a folder, but does not determine access to folder contents. Permissions set for the reports and dashboards themselves determine your access to the folder contents. For example, if you have Manager access to a folder and Run Reports permission to a report in the folder, you can run the report, but not edit or delete it.

Manager access is useful in a case such as the following. Alan is a sales administrator who manages too many reports to pay attention to them all individually. He creates a report folder called Regional Reports. As the creator, he has Manage rights to the folder. He gives Sales Reps, a public group, Viewer access. And he makes Allison, the sales manager, another Manager on the folder.

 **Note:** You can't give Manager access to standard report folders. By default, all users get Viewer access to these folders.

Compare Access Levels for Report and Dashboard Folders

Use this chart for a quick view of what Viewer, Editor, and Manager access enables users to do with enhanced folder sharing for report and dashboard folders.

	Viewer	Editor	Manager
View reports or dashboards in the folder	✓	✓	✓
See who has what level of access to the folder	✓	✓	✓
Save a report or dashboard in the folder		✓	✓
Rename a report or dashboard in the folder			✓
Delete a report or dashboard from the folder			✓
Share a folder			✓
Change the folder's name			✓

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing

	Viewer	Editor	Manager
Change the folder's sharing settings			
Delete a folder			

Working with reports and dashboards requires user permissions in addition to folder permissions. For information about required user permissions, see [User Permissions for Sharing Reports and Dashboards](#).

SEE ALSO:

[Turn On Enhanced Folder Sharing for Reports and Dashboards](#)

Access to Dashboard Folders

Permissions control folder access. Users must have certain permissions to access public, hidden, or shared dashboard folders.

Public Folders

The following permissions apply to folders with these visibility settings:

- This folder is accessible by all users, including portal users
- This folder is accessible by all users, except for portal users

Access Level	Permissions Needed to Access Read-Only Folders	Permissions Needed to Access Read/Write Folders
Read	Run Reports	Run Reports
Write New	All of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards • View All Data 	Both of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards
Modify/Delete	All of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards • View All Data 	All of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards • View All Data

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **All Editions** except **Database.com**

Report folders not available in: **Contact Manager, Group, and Personal Editions**

Hidden Folders

The following permissions apply to folders that have this visibility setting:

- This folder is hidden from all users

Access Level	Permissions Needed to Access Read-Only Folders	Permissions Needed to Access Read/Write Folders
Read	Both of the following: <ul style="list-style-type: none"> • Run Reports • View All Data 	Both of the following: <ul style="list-style-type: none"> • Run Reports • View All Data
Write New	All of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards • View All Data 	All of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards • View All Data
Modify/Delete	All of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards • View All Data 	All of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards • View All Data

Shared Folders

Access Level	Permissions Needed to Access Read-Only Folders	Permissions Needed to Access Read/Write Folders
Read	Run Reports	Run Reports
Write New	All of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards • View All Data 	Both of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards
Modify/Delete	All of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards • View All Data 	All of the following: <ul style="list-style-type: none"> • Run Reports • Manage Dashboards • View All Data

User Permissions for Sharing Reports and Dashboards

Each level of access to a report or dashboard folder consists of a combination of user permissions. As an administrator, you can further fine-tune users' access to dashboards and reports by assigning or removing one or more permissions.

When analytics folder sharing is enabled, all users get Viewer access to report and dashboard folders, except users with higher administrative permissions. To give users broader privileges, assign Editor or Manager folder access and give report and dashboard user permissions as needed.

User Permission	Description
Create and Customize Dashboards	Create, edit, and delete dashboards in the My Personal Dashboards folder. Create dashboards and save to any shared folder if sharing rights allow.
Create and Customize Reports	Create, edit, and delete reports in the My Personal Custom Reports folder. Create reports and save to any shared folder if sharing rights allow.
Create Dashboard Folders	Create dashboard folders and manage them if sharing rights allow.
Create Report Folders	Create report folders and manage them if sharing rights allow.
Edit My Dashboards	Edit, move, save, and delete dashboards that you created in shared folders.
Edit My Reports	Edit, move, save, and delete reports that you created in shared folders.
Manage Dashboards in Public Folders	Create, edit, and delete dashboards, ¹ and manage their sharing in all public dashboard folders. This permission does not extend to others' personal folders. This permission allows users to edit and share dashboards in all folders, including hidden folders. They also get these permissions: <ul style="list-style-type: none"> • Create and Customize Dashboards • Create Dashboard Folders • Edit My Dashboards • View Dashboards in Public Folders <p>(¹ To edit a dynamic dashboard, users also need Manage Dynamic Dashboards and View My Team's Dashboards permissions.)</p>
Manage Reports in Public Folders	Create, edit, and delete reports, and manage their sharing in all public report folders. This permission does not extend to others' personal folders. This permission allows users to edit and share reports in all folders, including hidden folders. They also get these permissions: <ul style="list-style-type: none"> • Create and Customize Reports

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing

- Create Report Folders
- Edit My Reports
- View Reports in Public Folders

View Dashboards in Public Folders

View dashboards in public dashboard folders. This permission does not extend to others' personal folders.

View Reports in Public Folders

View reports in public report folders. This permission does not extend to others' personal folders.

SEE ALSO:

- [Share a Report or Dashboard Folder in Salesforce Classic](#)
- [Compare Access Levels for Report and Dashboard Folders](#)

Create a Report or Dashboard Folder in Lightning Experience

You can create report and dashboard folders in Lightning Experience.

1. On the Reports or Dashboards tab, click **New Folder**.
2. Name the folder. The folder name must be unique. You cannot have more than one report or dashboard folder with the same name as another report or dashboard folder.
3. Click **Save**.

The folder is now listed on the Reports or Dashboards menu under Created by Me. You can select the folder when saving a report or dashboard.

EDITIONS

Available in: Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing

USER PERMISSIONS

To create report folders:

- Create Report Folders


To create dashboard folders:

- Create Dashboard Folders

Share a Report or Dashboard Folder in Lightning Experience

You can use enhanced folder sharing to share a report or dashboard folder with users, groups, or roles. Enhanced folder sharing is the default option for all orgs created after 2013.

You can share a report or dashboard folder with up to 25 users, groups, or roles from the UI. You can share a folder with up to 500 users, groups, or roles using the folder sharing REST API.

1. Click  next to the folder name on any page that lists report or dashboard folders.
2. Click **Share**.
3. Form the Share With dropdown, select who you want to share with.

EDITIONS

Available in: Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing

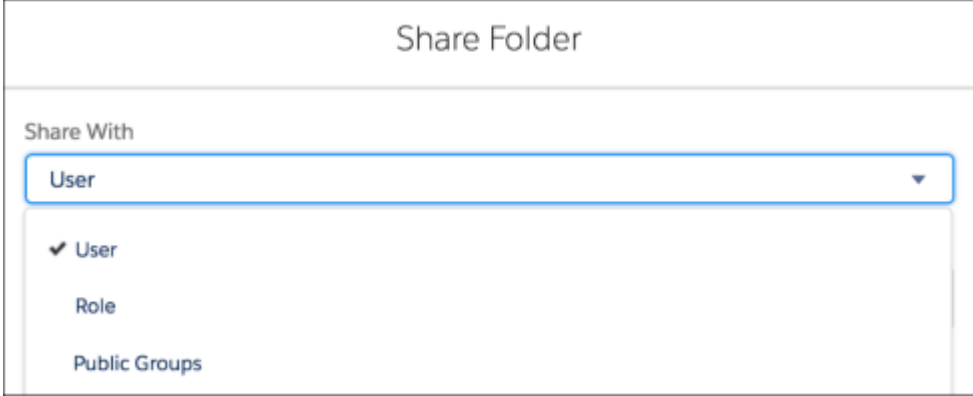
USER PERMISSIONS

To share report folders:

- Manage Reports in Public Folders

To share dashboard folders:

- Manage Dashboards in Public Folders



Share Folder

Share With

User

- ✓ User
- Role
- Public Groups

4. For Name, enter the name you want to match. The name must match the category (user, group, or role). For example, if you select **User** as the category, specify the name of a user.
5. Select the folder access level for the user, role, or group.

Share Folder

Share With
Role

Name
Manager Sales - East X

Share

Access
Can view
Can edit
Can manage

Who Can Access

6. Click **Share**. The sharing setting is applied to the Who Can Access list. Continue to add entries as needed. You can share with users, groups, roles, or a combination. If a user is identified in more than one entity, the greatest permission is granted. For example, a group is added with view only, but a user in the group is also added with edit or manage permissions. In this case, the edit or manage permissions apply to that user. To delete a Who Can Access entry, click **X** to the right of the entry. To modify access level for an entry, select a new access level.

Share Folder

Share With
Role

Name
Access
Can view

Share

Who Can Access


Fred Williamson
User
Can manage X

Manager Sales - East
Role
Can edit X

7. When you are done, click **X** in the upper corner of the dialog box to close it and return to the page you were on. The folder is now listed on the Reports or Dashboards menu. You can select the folder when saving a report or dashboard.

Rename a Report or Dashboard Folder in Lightning Experience

You can rename report or dashboard folders in Lightning Experience.

1. Click  next to the folder name on any page that lists report or dashboard folders.
2. Select **Rename**.
3. Enter the new name.
4. Click **Save**.

The folder name is updated.

EDITIONS

Available in: Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing

USER PERMISSIONS

To create report folders:


- Manage Reports in Public Folders

To create dashboard folders:

- Manage Dashboards in Public Folders

Move Dashboards Between Folders in Lightning Experience

Move dashboards between folders to organize the dashboards and control access.

1. Open a dashboard.
2. Click **Edit**.
3. Click  and select **Save As**.
4. Delete the current folder entry, and select the new folder.
5. Click **Save**.

The dashboard is saved to the specified folder.

EDITIONS

Available in: Lightning Experience

Available in: **Group** (View Only), **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Available in: Enhanced Folder Sharing

USER PERMISSIONS

To create, edit, and delete public dashboard folders:

- Create Dashboard Folders

To move dashboards you created from one folder to another in Lightning Experience:


- Edit My Dashboards

To move dashboards you didn't create from one folder to another in Lightning Experience:

- Manage Dashboards in Public Folders

Move Reports Between Folders in Lightning Experience

Move reports between folders to organize the reports and control access.

1. Open a report.
2. Click **Edit**.
3. Click  and select **Save As**.
4. Delete the current folder entry, and select the new folder.
5. Click **Save**.

The report is saved to the specified folder.

EDITIONS

Available in: Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing

USER PERMISSIONS

To create, edit, and delete public dashboard folders:

- Create Dashboard Folders

To move dashboards you created from one folder to another in Lightning Experience:

- Edit My Dashboards

To move dashboards you didn't create from one folder to another in Lightning Experience:

- Manage Dashboards in Public Folders

Share a Report or Dashboard Folder in Salesforce Classic

Enhanced folder sharing is the default option for all orgs created after the Summer '13 Salesforce release. If you have orgs created before Summer '13 and don't want to reassign permissions for the legacy reports and dashboards, you can use legacy folder sharing in Salesforce Classic.

Note: To give access to a folder, you must have either Manager access to that folder, the Manage Reports in Public Folders permission (for report folders), or the Manage Dashboards in Public Folders permission (for dashboard folders).

When you create a folder, you're its manager. Only you and others with administrative permissions can see it.

If a folder does not have Manager access, it's public, and users with the View Reports in Public Folders permission can view it. Depending on their object access, these users can also run the report.

You can share a report or dashboard folder with up to 25 users, groups, or roles at one time. You can share a folder with up to 100 users, groups, or roles using the folder sharing REST API.

EDITIONS

Available in: Salesforce Classic

Available in: **Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Legacy Folder Sharing

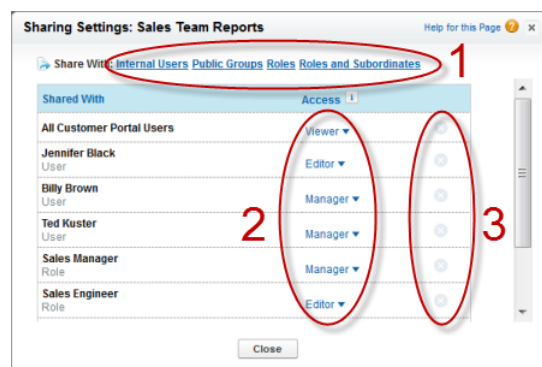
USER PERMISSIONS

To share a report folder with public groups:

- Run Reports AND Manage Dashboards OR Manage Reports in Public Folders

To share a dashboard folder with public groups:

- Run Reports AND Manage Dashboards OR Manage Reports in Public Folders



Share your folder by user, by user group, or by role (1). Choose the access level you want each user, group, or role to have (2). Stop sharing the folder with the user, group, or role (3).



SEE ALSO:

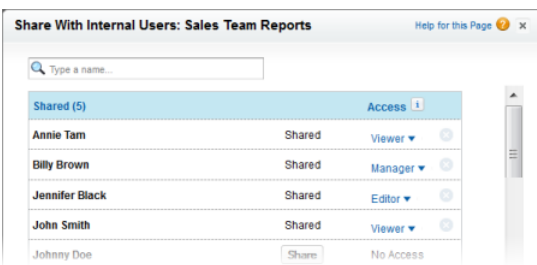
[Access Levels for Report and Dashboard Folders](#)

[User Permissions for Sharing Reports and Dashboards](#)

Share a Report or Dashboard Folder with an Individual User in Salesforce Classic

Enhanced folder sharing is the default option for all orgs created after the Summer '13 Salesforce release. If you have orgs created before Summer '13 and don't want to reassign permissions for the legacy reports and dashboards, you can use legacy folder sharing in Salesforce Classic.

1. On the Reports tab, hover over a report folder in the left pane, click , and then select **Share**.
2. Select **Internal Users**.
 -  **Note:** Internal users doesn't include customer portal or partner portal users.
3. Find the user you want, click **Share**, and choose an access level.
To search, start typing a name.



4. Click **Done**, review your changes, and click **Close**.

EDITIONS

Available in: Salesforce Classic

Available in: **Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Legacy Folder Sharing

USER PERMISSIONS

To share a report folder with public groups:


- Run Reports AND Manage Dashboards OR Manage Reports in Public Folders

To share a dashboard folder with public groups:


- Run Reports AND Manage Dashboards OR Manage Reports in Public Folders

Share a Report or Dashboard with a Group in Salesforce Classic

Enhanced folder sharing is the default option for all orgs created after the Summer '13 Salesforce release. If you have orgs created before Summer '13 and don't want to reassign permissions for the legacy reports and dashboards, you can use legacy folder sharing in Salesforce Classic.

1. On the Reports tab, hover over a report folder in the left pane, click , and then select **Share**.
2. Select **Public Groups**.
3. Find the group you want, and click **Share**.
To search, start typing a name.



4. Choose the sharing level you want to give this group.
 **Note:** Portal users can only have Viewer access to reports, and they can't use dashboards.
5. Click **Done**, review your changes, and click **Close**.

EDITIONS

Available in: Salesforce Classic

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Legacy Folder Sharing

USER PERMISSIONS

To share a report folder with public groups:

- Run Reports AND Manage Dashboards OR Manage Reports in Public Folders

To share a dashboard folder with public groups:


- Run Reports AND Manage Dashboards OR Manage Reports in Public Folders

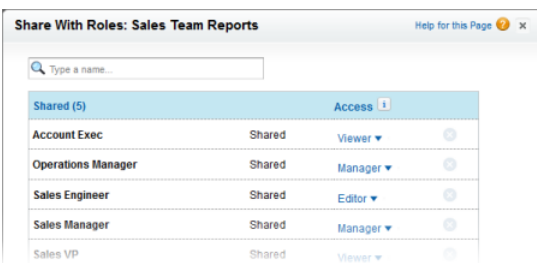
Share a Report or Dashboard by Role in Salesforce Classic

Enhanced folder sharing is the default option for all orgs created after the Summer '13 Salesforce release. If you have orgs created before Summer '13 and don't want to reassign permissions for the legacy reports and dashboards, you can use legacy folder sharing in Salesforce Classic.

You can give report or dashboard folder access to users in a role, or to those users plus users in roles subordinate to that role.

For example, suppose the VP of Sales role and its subordinates have Viewer access to a dashboard folder, while the role itself (VP of Sales) has Manager access. In this case, a user in the VP of Sales role has greater control than someone with a role that's lower in the role hierarchy. If the VP of Sales leaves the company, whoever next assumes that role can manage dashboards in the folder.

1. On the Reports tab, hover over a report folder in the left pane, click , and then select **Share**.
2. Select **Roles** or **Roles and Subordinates**.
 - To give access to all users who have the role, select **Roles**.
 - To give access to those users plus everyone with a role below them in the role hierarchy, select **Roles and Subordinates**.
3. Find the role you want, click **Share**, and choose a level of access.
To search, start typing a name.



4. Click **Done**, review your changes, and click **Close**.

EDITIONS

Available in: Salesforce Classic

Available in: **Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Legacy Folder Sharing

USER PERMISSIONS

To share a report folder with public groups:

- Run Reports AND Manage Dashboards OR Manage Reports in Public Folders

To share a dashboard folder with public groups:

- Run Reports AND Manage Dashboards OR Manage Reports in Public Folders

Move a Report or Dashboard Between Folders in Salesforce Classic

It's a good practice to keep reports and dashboards organized in folders that reflect their function and audience. You can drag and drop reports and dashboards from one folder to another.

Note: You need edit access to folders before moving items between them. Moving items using drag-and-drop isn't supported in accessibility mode.

Move a report or dashboard between folders by dragging them from the list view to a report or dashboard folder on the Folders pane.

1. On the Reports tab list view, click and hold an item.

EDITIONS

Available in: Salesforce ClassicSalesforce Classic

Available in: **Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Enhanced Folder Sharing and Legacy Folder Sharing

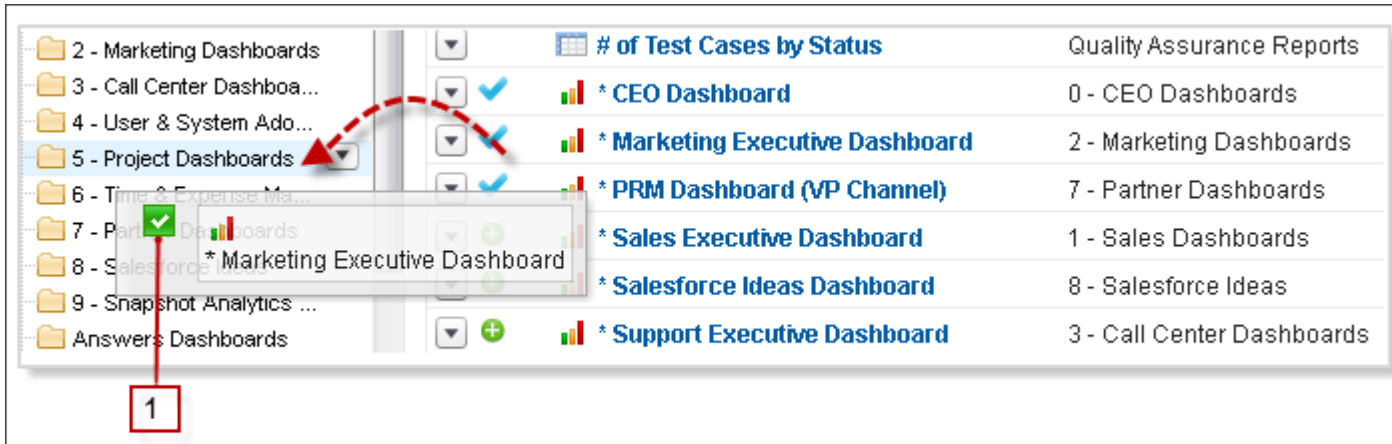
USER PERMISSIONS

To move reports:

- **Legacy Folder Sharing**
Run Reports AND Manage Dashboards
- **Enhanced Folder Sharing**
Edit My Reports



2. Drag the item to its destination folder in the Folders pane.



As you drag an item across a folder, a green check mark (1) indicates that the item can be moved into the selected folder. Conversely, a red icon (no) means that the item can't be moved into the selected folder.

Keep the following in mind when moving items.

- Drag one item at a time.
- You can't move items from installed AppExchange packages or standard report folders into other folders.
- Move reports into report folders and dashboards into dashboard folders.

Delete an Empty Report or Dashboard Folder

You can delete an empty report or dashboard folder in Lightning Experience or Salesforce Classic. If the folder contains reports or dashboards, you must use Salesforce Classic to delete it.

1. Click next to the folder name from any page that lists folders.
2. Click **Delete**.
3. Click **Delete** to confirm.

The folder is deleted.

EDITIONS

Available in: Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited,** and **Developer** Editions

Available in: Enhanced Folder Sharing


USER PERMISSIONS

To delete report or dashboard folders:

- Create Report or Dashboard Folders

Delete a Report or Dashboard Folder with Contents

You can delete an empty report or dashboard folder in Lightning Experience or Salesforce Classic. If the folder contains reports or dashboards, you must use Salesforce Classic.

1. If you are using Lightning Experience, switch to Salesforce Classic.
2. Click  next to the folder name from any page that lists folders.
3. Click **Delete**.
4. Click **Delete** to confirm.
5. A message indicates that you must empty the recycle bin. Go to the Home tab, click **Recycle Bin**, and click **Empty your recycle bin**.

The bin is emptied, and the folder is deleted.

EDITIONS

Available in: Lightning Experience

Available in: **Group, Professional, Enterprise, Performance, Unlimited, and Developer** Editions

Available in: Enhanced Folder Sharing

USER PERMISSIONS

To delete report or dashboard folders:

- Create Report or Dashboard Folders

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