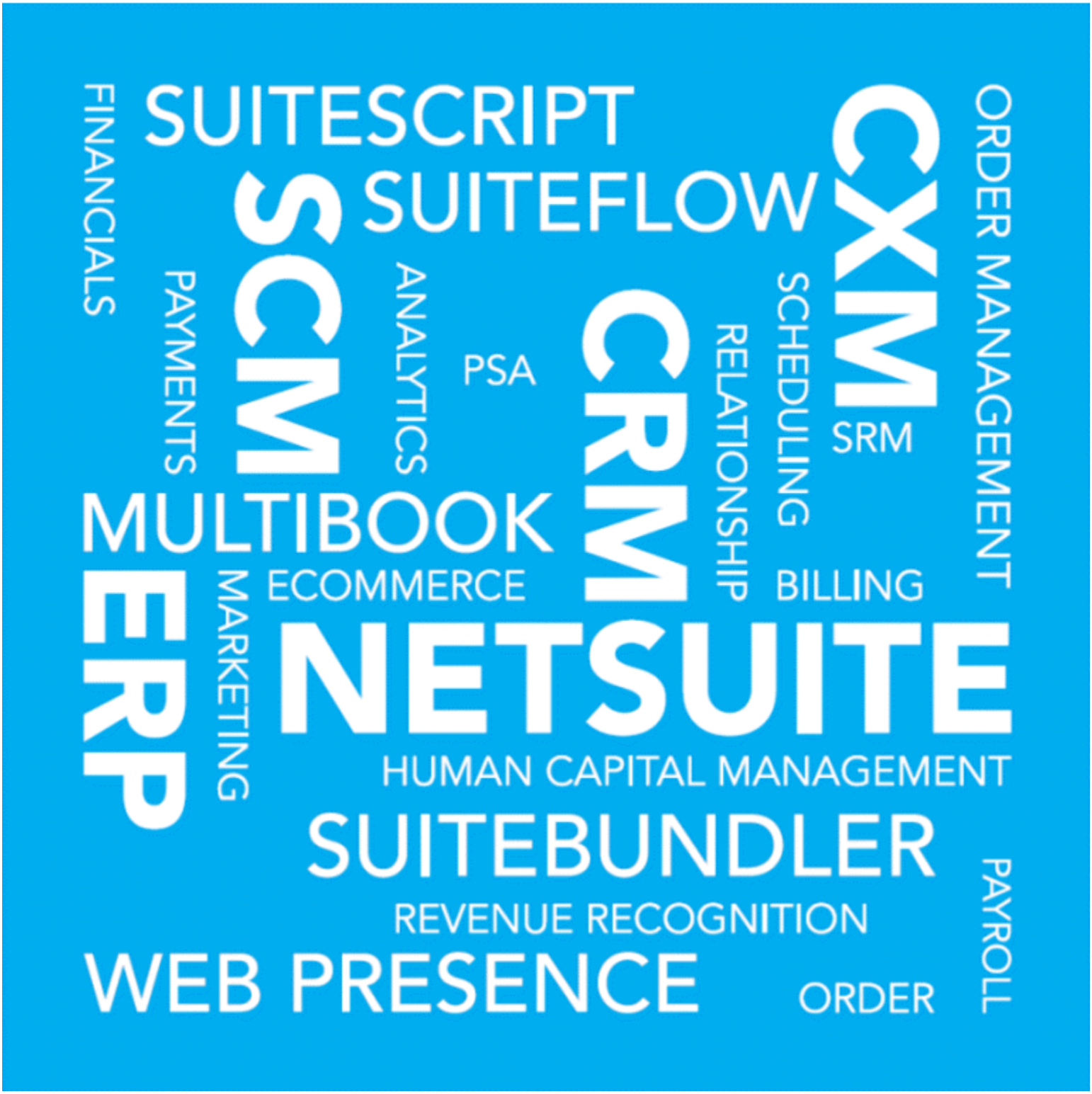
Application Performance Management Guide



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Application Performance Management (APM)

The Application Performance Management SuiteApp enables you to observe and manage the performance of your NetSuite customizations and business critical operations. You can use the dashboard, data visualizations, page time summary, script analysis, and script queue monitor to review and improve the speed of the NetSuite user interface.

Note: Application Performance Management provides information about the responsiveness of the user interface. Performance data related to web services and CSV imports are not available.

To get started, see:

- Application Performance Management Overview
- Benefits of Application Performance Management
- Installing the Application Performance Management SuiteApp
- Getting Started with Application Performance Management
- Accessing Application Performance Management

For more information, see:

- Configuring the Dashboard and Record Pages Portlet
- Using the Application Performance Management Tools
- Using the Script Queue Monitor Dashboard in APM
- Frequently Asked Questions: Application Performance Management

Application Performance Management Overview

The Application Performance Management SuiteApp compiles information into a performance dashboard that is useful for performance troubleshooting. You can use this SuiteApp to monitor and manage NetSuite performance for business critical operations.

Visual indicators on the dashboard highlight performance issues and anomalies, with more details available on portlets and quick links. Aside from the performance dashboard, this SuiteApp also includes dashboards for page time summary, SuiteScript analysis, and script queue monitor.

To install the Application Performance Management SuiteApp, see Installing the Application Performance Management SuiteApp.

To learn how to navigate and set up the performance dashboard, see Getting Started with Application Performance Management and Configuring the Dashboard and Record Pages Portlet.

To work with response time details and script or workflow analysis, see Using the Application Performance Management Tools.

To work with script queue, scheduled script execution analysis, and SuiteCloud Processors script analysis, see Using the Script Queue Monitor Dashboard in APM.

To work with web services analysis, see Analyzing Web Services Performance.

To work with search performance analysis, see Analyzing Search Performance.

Benefits of Application Performance Management

The Application Performance Management SuiteApp is designed to help you to:

- Identify performance opportunities or degradation. Prioritize issues based on usage and traffic.
- View performance metrics for your most important record pages and assess system health and trends.
- Drill down for greater levels of detail about specific record types, operations, and instances.
- View response times by client, server, and network.
- Monitor performance of user event scripts, workflows, RESTlets, scheduled scripts, and Suitelets.
- Check the overall health of script queues and scheduled script executions.

Installing the Application Performance Management SuiteApp

Prerequisites for Application Performance Management (APM) SuiteApp

- Verify that you have permission to access APM. Administrators can access APM and provide APM access to other roles and employees. See Setting Up APM Access for Roles and Employees.
- If you want to access the SuiteScript Analysis tool, verify that Server SuiteScript is enabled.

  Go to Setup > Company > Enable Features. Click the **SuiteCloud** tab. Verify that the **Server SuiteScript** box is checked.

Steps for Installing the APM SuiteApp

Application Performance Management is available as a SuiteApp which can be installed in your account.

Note: If you have installed the Script Performance Monitor SuiteApp, it will be removed during installation of the Application Performance Management SuiteApp. In place of the Script Performance Monitor, you can use the Page Time Summary, SuiteScript Analysis, and Script Queue Monitor tools that are provided with the Application Performance Management SuiteApp.

To install the APM SuiteApp:

1. Go to Customization > SuiteBundler > Search & Install Bundles.
2. In the **Keywords** field, enter the bundle ID or name for the APM SuiteApp.
   - Bundle Name: Application Performance Management
   - Bundle ID: 67350
3. Click **Search**.
4. From the search results, click the link for the Application Performance Management bundle.
5. On the Bundle Details page, click **Install**.
   - Application Performance Management is a managed bundle. After you install it, future updates are automatically pushed to your account.

- When you see the popup window asking for your permission for these future updates, click OK to proceed with the installation.

6. On the Preview Bundle Install page, click **Install Bundle**.
7. On the Installed Bundles page, click **Refresh** to verify when the installation is finished.
8. When the installation is finished, log out and then log back in.

The Application Performance Management tools are available at Customization > Peformance. For more information, see Accessing Application Performance Management.

By default, account administrators can access APM. Administrators can set up APM access for other roles and employees. For more information, see Setting Up APM Access for Roles and Employees.

Getting Started with Application Performance Management

The Application Performance Management SuiteApp includes a powerful set of tools designed for a range of purposes. To get started, do the following:

- To check prerequisites and install the Application Performance Management SuiteApp, see Installing the Application Performance Management SuiteApp.
- To access this SuiteApp, see Accessing Application Performance Management.
- To learn about the Dashboard, Page Time Summary, SuiteScript Analysis, and Script Queue Monitor, see the following topics:
  - Getting to Know the Performance Dashboard
  - Using the Application Performance Management Tools
  - Using the Script Queue Monitor Dashboard in APM
  - Analyzing Web Services Performance
  - Analyzing Search Performance
- To change what appears on the dashboard, see Configuring the Dashboard and Record Pages Portlet.
- To learn more about supported graphs and data visualizations, see the following topics:
  - Getting to Know the Performance Dashboard
  - Reviewing Information on the Performance Dashboard
  - Server Time Breakdown Chart
  - Using the Performance Chart

Accessing Application Performance Management

After installation, you can access Application Performance Management (APM) by going to Customization > Performance.

By default, account administrators can access APM. Administrators can set up APM access for other roles and employees. For more information, see Setting Up APM Access for Roles and Employees.

To access specific components of APM, see:

- Accessing the Performance Dashboard
- Accessing the Page Time Summary

- Accessing SuiteScript Analysis
- Accessing the Script Queue Monitor Dashboard
- Accessing the Web Services Performance Dashboard
- Accessing the Search Performance Analysis Dashboard
- Accessing the Search Performance Details Dashboard

Setting Up APM Access for Roles and Employees

If you are an administrator, you can set up APM access for other roles and employees.

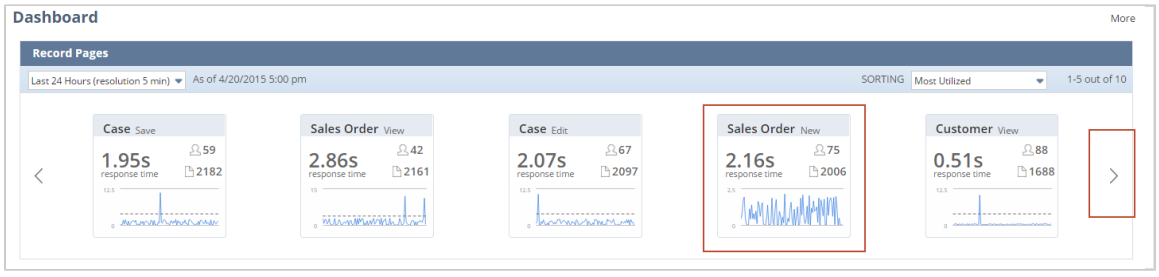
To set up APM access for other roles and employees:

1. Go to Customization > Performance > APM Setup.
   - To provide access to specific roles (CEO for example), select the **Roles** tab.
   - To provide access to an individual, select the **Employees** tab.
2. Select the role or employee name from the dropdown list.
   1. To provide access to the Top 10 Most Utilized portlet that appears on the Performance Dashboard, check the box in the Top 10 Most Utilized column.
   2. Click **Add**.
3. Repeat Step 2 for each role and employee that you want to provide access to APM.
4. Click **Save**.

For information about NetSuite roles, see the help topic NetSuite Users & Roles.

Getting to Know the Performance Dashboard

The performance dashboard is a starting place for you to identify and troubleshoot system performance. Visual indicators alert you to performance issues and anomalies that you can investigate using the portlets and quick links.



For a quick orientation, see Accessing the Performance Dashboard, Navigating the Performance Dashboard, and Configuring the Performance Dashboard.

Accessing the Performance Dashboard

Go to Customization > Performance > Dashboard.

Navigating the Performance Dashboard

Metrics for record operations are shown on tiles on the Record Pages portlet. You can view performance metrics such as response time, number of users, and record instances.

Use the navigation buttons (< >) at the side of the portlet to view other tiles. Click a tile to see more details about a particular record operation. To learn more about record tiles, see About the Record Operation Tiles and Working with Data Visualizations.

Configuring the Performance Dashboard

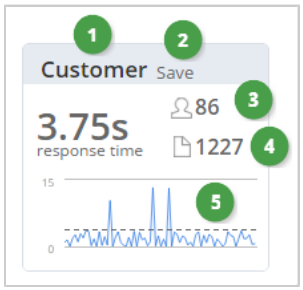
You can customize the dashboard so that you can monitor and sort performance data for the time period and record page operation that you specify. If the top 10 most utilized is enabled for your role, the dashboard displays the data for the ten most highly used record types and operations. To enable the Top 10 Most Utilized portlet for specific roles or employees, see Setting Up APM Access for Roles and Employees.

To configure the record pages or filter the data shown on the Record Pages portlet, see Configuring the Dashboard and Record Pages Portlet.

About the Record Operation Tiles

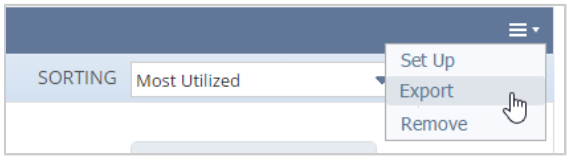
By default, the dashboard displays the 10 most utilized record operations. You can configure the dashboard to show up to 20 record tiles. For more information see, Changing the Record Page Operations That You Watch.

The record operation tiles use a concise format that lets you view key metrics and a miniaturized trend graph at a glance.



Tile Element	Description
1	Record type
2	Record operation
3	Number of users
4	Number of instances
5	Response time trendline

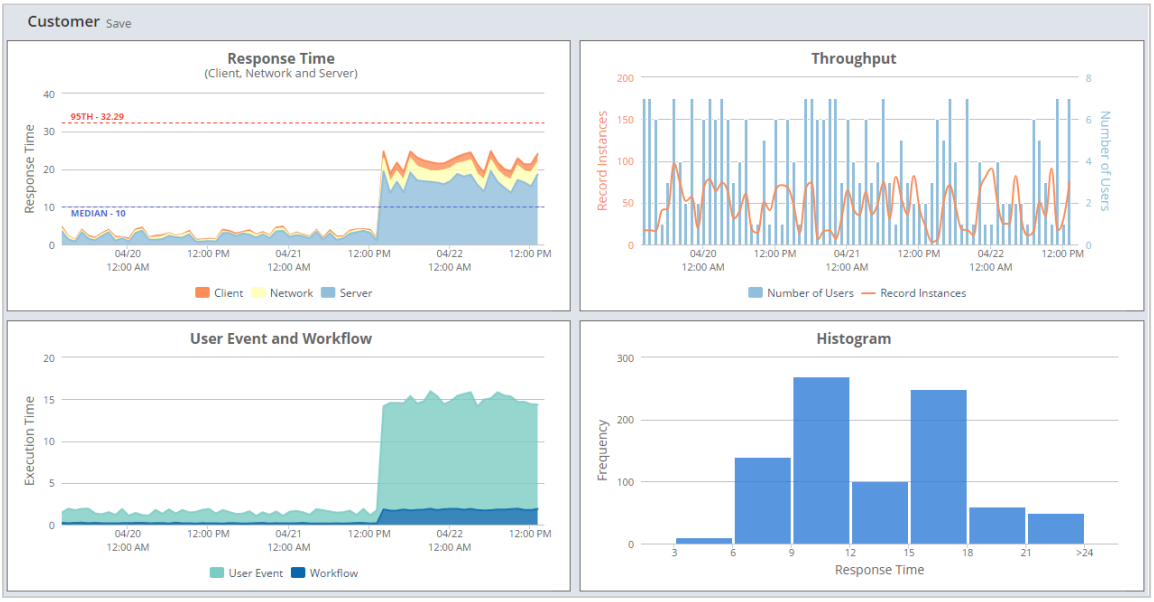
You can export the information captured on the record tiles into an Excel file. To download the file, click the menu at the top right corner of the Record Pages portlet and select **Export**.



To view more details about a record page and operation, click a tile. The data visualizations associated with that record type and operation are appears below the tiles. For more information, see Working with Data Visualizations and Reviewing Information on the Performance Dashboard.

Working with Data Visualizations

When you click a record tile, the following data visualizations appear on the performance dashboard:



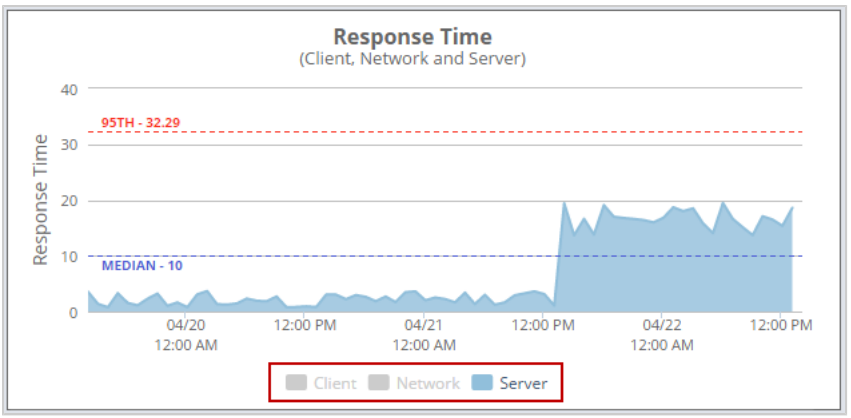
For information about each graph on the performance dashboard, see Reviewing Information on the Performance Dashboard.

You can interact with performance data visualizations in several ways. You can show more data, hide data, and use quick links to drill down for more details. For more information, see the following topics:

- Showing or Hiding Data on the Performance Graphs
- Viewing an Individual Data Point or a Group of Data Points on the Performance Graphs
- Viewing a Page Time Summary

Showing or Hiding Data on the Performance Graphs

At the bottom of the graph, click an item on the legend to hide or display that segment of data.



Viewing an Individual Data Point or a Group of Data Points on the Performance Graphs

Do one of the following:

- To view details about a specific data point, place your cursor over a data on the graph.
- To zoom in, press and drag your cursor over a vertical section on the graph that you to zoom in to.
- To return to the original view (zoom out), on the upper right corner of the graph, click **Reset Zoom**.

Viewing a Page Time Summary

Click a data point on a graph. A new window opens with a page time summary about that instance. For more information, see Monitoring Performance with the Page Time Summary.

Configuring the Dashboard and Record Pages Portlet

You can modify, filter, and sort the record pages and performance data displayed on the dashboard.

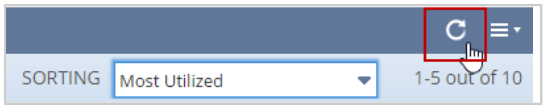
The Record Pages portlet provides options to help you focus on different aspects of performance. You can set the time range of performance data, change how record page tiles are ordered, and monitor additional record pages and operations.

For more information, see:

- Refreshing the Data on the Performance Dashboard
- Setting the Date and Time Range That You Want to Monitor
- Changing the Record Page Operations That You Watch
- Changing Chart Preferences
- Reordering the Record Tiles

Refreshing the Data on the Performance Dashboard

To refresh the data shown on the portlet, click the refresh icon at the upper right corner of the Record Pages portlet.

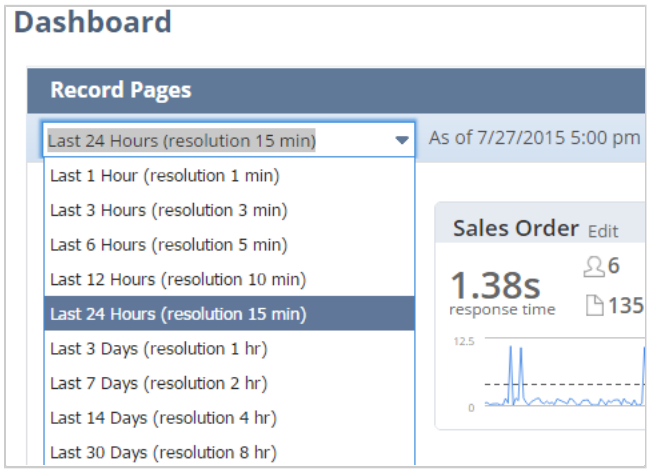


Setting the Date and Time Range That You Want to Monitor

By default, the performance dashboard shows the data for the last 24 hours. You can change the date range by selecting one of the preset filters or you can create a custom date range. To discover when an issue started, you might need to set the date range to a larger time period.

The resolution value sets the plot point intervals on the x-axis of the data visualizations.

To change the date range, click the dropdown list at the top left corner of the Record Pages portlet. This list shows preset filters and custom date filters that you added. To add a custom date range to the list, see Adding a Custom Date and Time Range Filter.



Adding a Custom Date and Time Range Filter

If you want to review performance for time periods other than those provided by the preset date and time range filters, you can create custom filters.

To add or remove a custom date and time range filter:

1. Click the menu at the top right corner of the Record Pages portlet.
2. Select **Set Up**.
3. On the Setup Record Pages popup window, click **Custom Date & Time**.
   - To add a custom filter, click **Add Date & Time**. Select a start date, start time, end date, and end time. Click **Add**.

     Note: A custom date and time range filter cannot span more than 30 days.
   - To remove a custom filter that you added, click the X icon for the filter.
   - To remove all custom filters that you added, click **Remove All**.
4. Click **Save**. The changes are reflected in the dropdown list for the date filter. Newly added custom filters are listed at the bottom of the list.

Changing the Record Page Operations That You Watch

The record page operations for which performance data is available are called watch lists. You can add up to 10 more record page operations to the default set.

To add or remove a record page operation:

1. Click the menu at the top right corner of the Record Pages portlet.
2. Select **Set Up**.

3. On the Setup Record Pages popup window, click **Watch List**.
   - To add a record page operation, click **Add Watch List**. Select a record type and operation. Click **Add**.
   - To remove a record operation that you added, click the X icon for the record operation.
   - To remove all record operation that you added, click **Remove All**.

   > **Note:** You can remove only the record page operations that you added. You cannot change the record page operations shown by default.

4. Click **Save**.

Changing Chart Preferences

By default, the response time histogram shows the data for all the record tiles on the portlet, with a time interval of 1. You can change the chart preferences for the histogram from the portlet set up menu.

To change chart preferences:

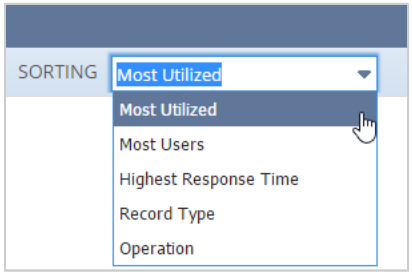
1. Click the menu at the top right corner of the Record Pages portlet.
2. Click **Set Up**.
3. On the Setup Record Pages popup window, click **Chart Preferences**.
   - To change the response time interval for the bar graphs on the histogram, enter a new value in the **Interval** field.
   - To change the data shown on the histogram, select **Show All Record Tiles** or **Show Watchlist Only** in the Record Tiles field.
4. Click **Save**.

Reordering the Record Tiles

You can change how the record operation tiles are arranged on the performance dashboard.

Click the **Sorting** dropdown list and select one of the following sorting options:

- **Most Utilized** – Arranges the record tiles by highest number of instances.
- **Most Users** – Arranges the record tiles by highest number of users.
- **Highest Response Time** – Arranges the record tiles by highest response time.
- **Record Type** – Arranges the record tiles in alphabetical order according to record type.
- **Operation** – Arranges the record tiles in alphabetical order according to operation.



Using the Application Performance Management Tools

The Application Performance Management SuiteApp is organized to provide varying levels of detail, depending on your needs. You can use the data aggregates, summaries, and visualizations to guide you to the individual logs and instances that contribute to poor response times.

The performance dashboard shows a broader scope of data. From there, you can navigate to the Page Time Summary page to review greater detail about scripts, workflows, and record instances.

For a deeper look at the relationship between script performance and response times, use the SuiteScript Analysis tool.

For a better understanding of the overall health of your script queues and scheduled script executions, use the Script Queue Monitor dashboard.

For more information, see:

- Reviewing Information on the Performance Dashboard
- Monitoring Performance with the Page Time Summary
- Using Page Time Details
- Analyzing Scripts
- Using the Script Queue Monitor Dashboard in APM
- Analyzing Web Services Performance
- Analyzing Search Performance

Reviewing Information on the Performance Dashboard

The performance dashboard shows the following graphs when you click a record operation tile:

- Response Time Graph
- Throughput Graph
- User Event and Workflow Graph
- Response Time Histogram

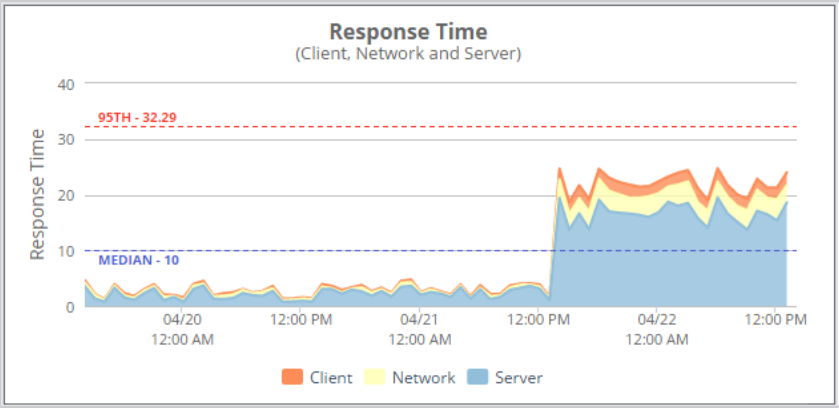
For information about record operation tiles, see About the Record Operation Tiles.

For information about working with the graphs on the performance dashboard, see Working with Data Visualizations.

Response Time Graph

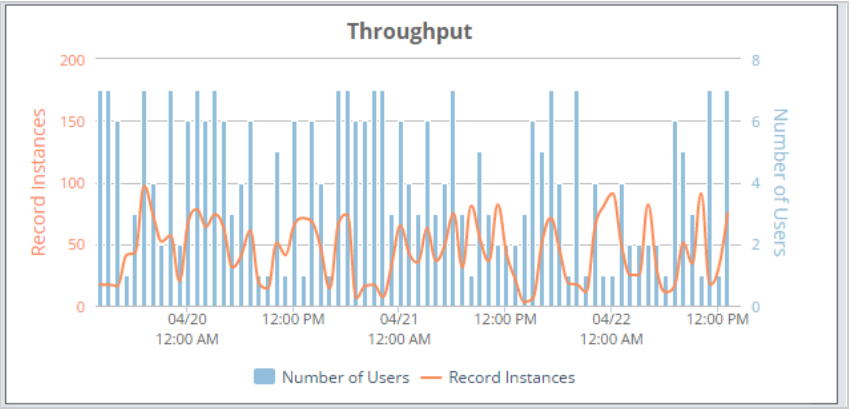
The Response Time graph displays the median response time of record pages over time. You can use this graph to view changes in total request speed and assess its impact on end users.

Each color represents the portion of time used by the client, network, or server. From the graph, you can determine which component used the bulk of the response time.



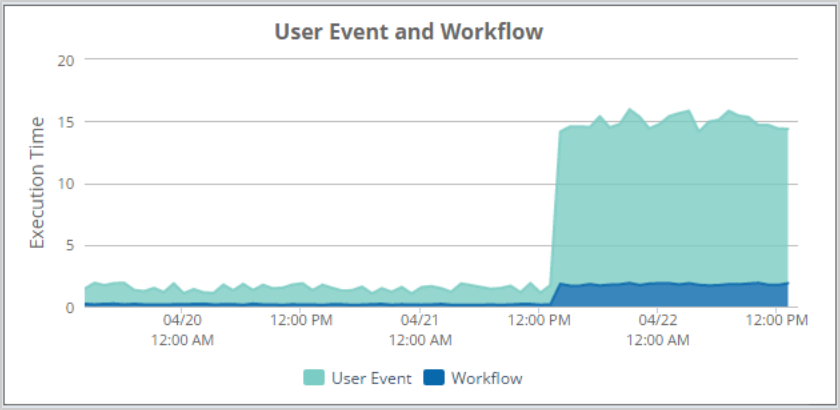
Throughput Graph

The Throughput graph displays the number of record instances and number of users over a time period. You can use this graph to identify periods of heavy usage and consider offloading traffic outside the peak times.



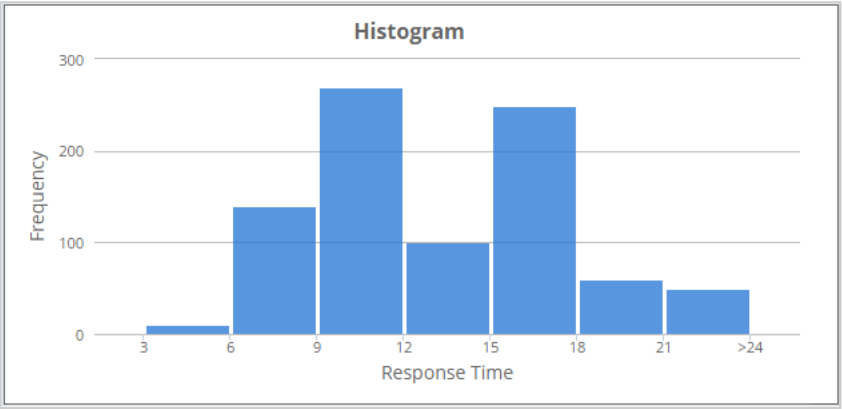
User Event and Workflow Graph

The User Event and Workflow graph displays the time it took to execute user event scripts and workflows on a record page. This graph is designed to help you identify the impact of customizations and possible performance bottlenecks.



Response Time Histogram

The response time histogram is a bar graph that displays record instances grouped by response time. This histogram can help you understand whether a high response time was caused only by an anomaly.



Monitoring Performance with the Page Time Summary

The Page Time Summary is a troubleshooting tool that displays performance logs by record type. This page includes summary performance log information and a list of instances. It displays a server time breakdown chart for the currently selected instance.

Note: Only user interface changes are logged on the Page Time Summary page.

You can use the Page Time Summary page to measure the performance of user event scripts and workflows, and quickly identify customizations that take an unusually long time to execute.

For each record instance, you can identify the overall time it took for all scripts and workflows deployed on that record type to execute.

Important: This data is kept for a 30 day period and then purged from the system.

To modify the aggregations included in the Summary section of the Performance Logs portlet, click the menu at the top right corner of the portlet and select **Set Up**. Clear the box if you do not want the column to show in the Summary section.

Note: Performance is measured only on a per record and per script basis. Identifying the performance of individual API calls is not supported.

Accessing the Page Time Summary

To access the Page Time Summary page, do one of the following:

- Go to Customization > Performance > Page Time Summary.
- From the Performance Dashboard, click a data point on one of the graphs. For more information, see Working with Data Visualizations.

About Performance Logs

A performance log includes each instance of the selected operation on the selected record.

For example, if the selected record type is sales order and the selected operation is save, the performance log lists an entry for each save of a sales order record.

Each entry lists the following information. Note that all time entries are shown in seconds.

Column	Description
Date and Time	Date and time of the instance.
Email	The email address of the user who is logged in when the operation was performed.
Client	The time it took for the client to format and send the data to the NetSuite server, plus the time it took to display the data when the server responded.
Network	The time it took for the data to move back and forth between the client and the NetSuite server.
SuiteScript	The total time it took for all triggered scripts to execute.
Workflow	The total time it took for all triggered workflows to execute.
Server	The total page load time spent on retrieving information from the NetSuite server.
Total	The total request speed between all triggered scripts, triggered workflows, the client, and the network.
View Details	Click the icon in this column to open the Page Time Details for the instance. For more information, see Using Page Time Details.

Filtering Performance Log Details

To set the filters for the performance log details, click the plus icon in the Filters section on the Page Time Summary page. Set the filters and click Refresh to update the values on the Page Time Summary page.

The following filters are available:

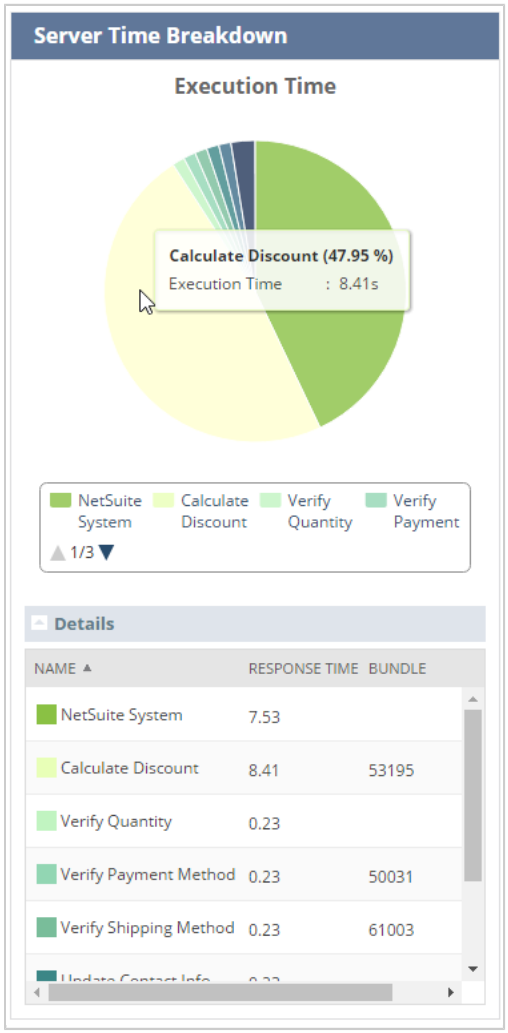
Filter	Description
Record Type	The record type where the scripts were deployed. This field shows all scriptable record types.
Operation	The UI operation that triggered the script. ■ **View** – The script ran when the user clicked View on an existing record (beforeLoad). ■ **Edit** – The script ran when the user clicked Edit on an existing record (beforeLoad). ■ **New** – The script ran when the user clicked New to create a record (beforeLoad). ■ **Save** – The script ran when the user clicked Save or Submit (beforeSubmit), or the script ran after the user clicked Save or Submit (afterSubmit).
Email	The email address of the user logged in when the script ran. If left blank, the search defaults to all emails.
Start Date / End Date Start Time / End Time	The date and time ranges of the search.
Response Time	The amount of time to execute a record instance. You can set the response time filter to greater than or less than a particular value, or between an upper and lower limit.

Server Time Breakdown Chart

This pie chart shows each script that executed on the associated instance in the Performance Log. It also shows the percentage of time taken up by the system. All time values are displayed in seconds.

To view the Server Time Breakdown chart:

1. Click an instance in the Performance Log list.
2. On the Server Time Breakdown portlet:
   - Place your cursor over a section of the pie chart to view the execution time.
   - The scripts, workflows, and the NetSuite system are listed on the legend below the pie chart. You can click an item on the legend to hide or display that segment of data. Click the up and down arrows to view the legend for the other data.
   - On the Details section, you can view the response time for the NetSuite server, user event scripts, and workflows. The bundle ID is also shown for scripts and workflows are that included in a bundle.

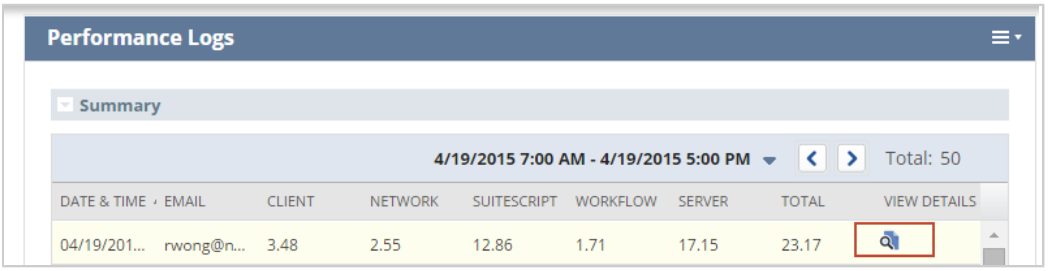


Using Page Time Details

From the Page Time Summary, you can drill down to each record instance to view the execution time of each individual script.

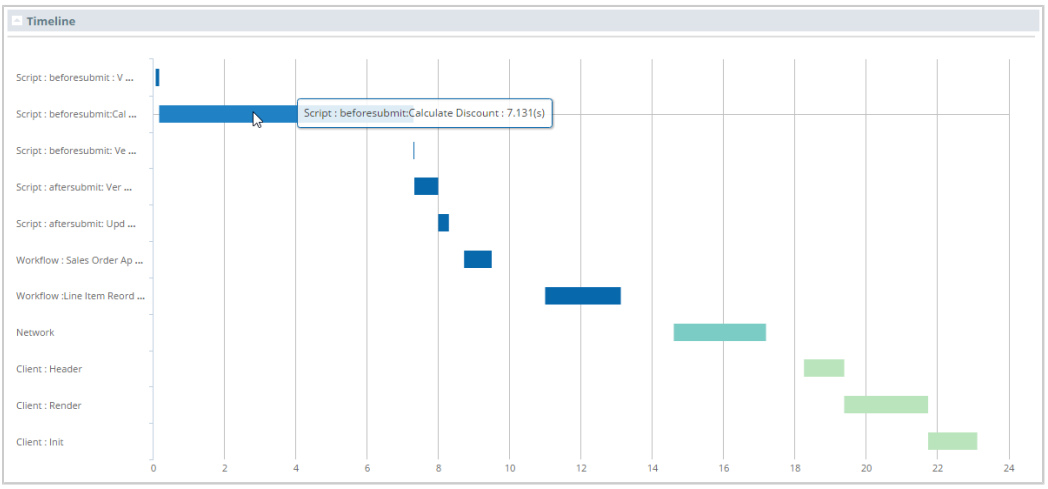
To view page time details and timeline:

1. In the Performance Logs section, place your cursor in the View Details column. Click the View Details icon. This action opens the Page Time Details on a separate page.



2. On the Page Time Details page, you can view a timeline that shows the details on how much time is spent to execute a particular record page. These time segments are arranged chronologically.

   To view the execution time, place your cursor over a section of data on the timeline. In the following example, the largest segment of time was used to execute the beforeSubmit function for the Calculate Discount script.



   You can also track the timing of the following client components on the timeline for page details:

   - **Client : Header** — The amount of time to render the head element of the page. Most static assets, including CSS and JavaScript, are loaded during this time.

     Network delays can contribute to lengthy client header times. If you suspect slow asset loading, review your firewall and network connection settings. You might also improve speed by adjusting browser cache settings.
   - **Client : Render** — The amount of time for the browser to render the response after the head element finished (the time taken between the Client : Header and Client : Page Init timings).

     An older browser or insufficient RAM and CPU capability can contribute to longer rendering time.
   - **Client : Page Init** — The amount of time used by the Page Init function. This function contains user defined client scripts triggered by the pageInit client event type, and standard page init

operations. If the Page Init function triggers other client scripts as part of the page init, the timing is recorded.

To improve this time, investigate client script implementations for the page. A variety of factors affect Page Init timing, such as third party calls from client scripts, or logic that triggers other client script validations. An outdated browser and JavaScript engine will also negatively impact performance.

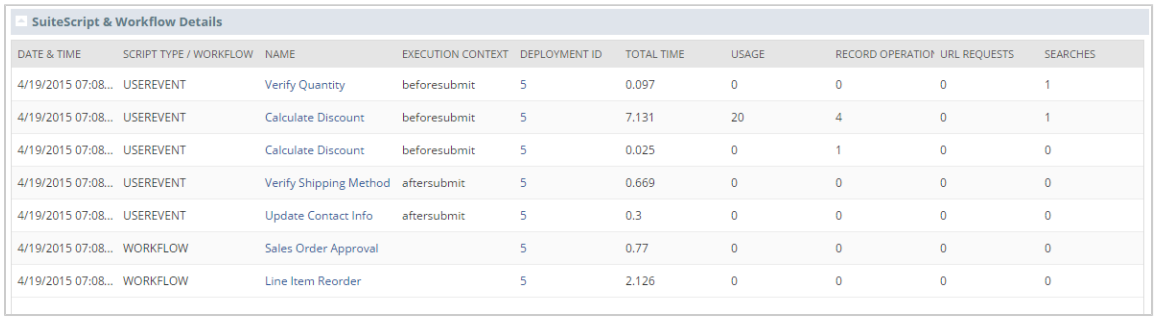
> **Note:** On the page details timeline, gaps between server components are part of the overall NetSuite server time. For example, in the preceding screenshot, the gap between Workflow Sales Order Approval and Workflow Line Item Reorder signifies NetSuite server time that is not associated with your NetSuite customizations.

3. Below the timeline, you can view the SuiteScript and Workflow Details section. For more information, see About SuiteScript and Workflow Details.

About SuiteScript and Workflow Details

On Page Time Details page, the SuiteScript and Workflow Details section appears below the timeline.

You can click on a column header to sort the list by that column's values.



SuiteScript & Workflow Details

DATE & TIME	SCRIPT TYPE / WORKFLOW	NAME	EXECUTION CONTEXT	DEPLOYMENT ID	TOTAL TIME	USAGE	RECORD OPERATION	URL REQUESTS	SEARCHES
4/19/2015 07:08...	USEREVENT	Verify Quantity	beforesubmit	5	0.097	0	0	0	1
4/19/2015 07:08...	USEREVENT	Calculate Discount	beforesubmit	5	7.131	20	4	0	1
4/19/2015 07:08...	USEREVENT	Calculate Discount	beforesubmit	5	0.025	0	1	0	0
4/19/2015 07:08...	USEREVENT	Verify Shipping Method	aftersubmit	5	0.669	0	0	0	0
4/19/2015 07:08...	USEREVENT	Update Contact Info	aftersubmit	5	0.3	0	0	0	0
4/19/2015 07:08...	WORKFLOW	Sales Order Approval		5	0.77	0	0	0	0
4/19/2015 07:08...	WORKFLOW	Line Item Reorder		5	2.126	0	0	0	0

Each entry includes the following details about each script or workflow that was run during the selected time period:

- Date and time
- Script type/Workflow
- Script or workflow name – Click the value in this column to view the SuiteScript analysis. For more information, see Analyzing Scripts.
- Execution context – The type of action that triggered a user event script.
- Deployment ID – Click the value in this column to see the script deployment record.
- Total time – The total time, measured in seconds, required for all triggered scripts and workflows to execute.
- Usage – The number of governance units consumed.
- Record operations
- URL Requests
- Searches – The number of searches executed.

Analyzing Scripts

You can use SuiteScipt Analysis to learn about when a script was installed and how it performed in the past.

You can also view the timing of execution for locked scripts that came with a bundle.

To learn more, see:

- Accessing SuiteScript Analysis
- Finding a Script
- Using SuiteScript Details
- Using the Performance Chart

Accessing SuiteScript Analysis

To access the SuiteScript Analysis page, do one of the following:

- Go to Customization > Performance > SuiteScript Analysis.
- From Page Time Details page, in the SuiteScript and WorkFlow Details section, click the name of the script in the **Name** column.

Finding a Script

To search for a specific script to analyze on the SuiteScript Analysis page:

1. On the SuiteScript Analysis page, click the plus icon in the Filters section to expand the filters.
2. Specify values for the filters. The following filters are available:

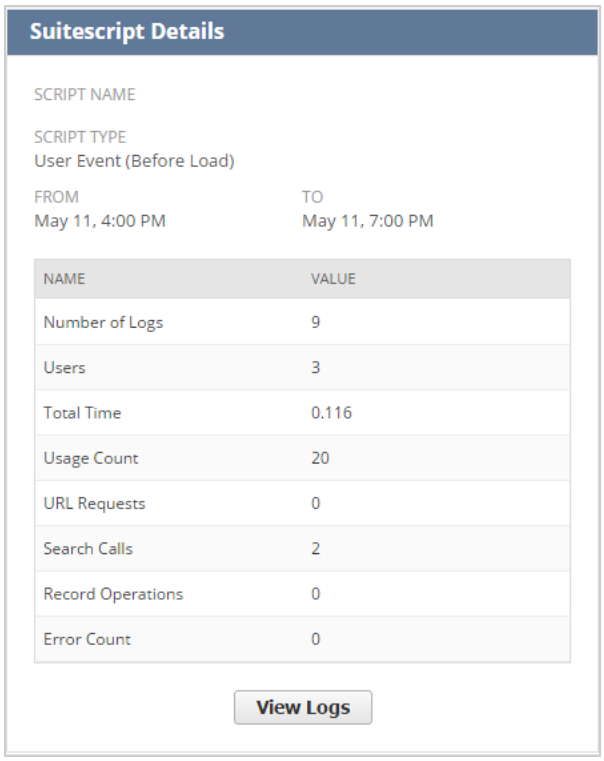
Filter	Description
Start Date / End Date Start Time / End Time	The date and time ranges of the search.
Script Type	The type of script. When you set the script type, the Script Name filter is automatically populated with script records corresponding to the script type.
Script Name	The name of the script record.
Context	The type of action used to trigger a user event script.

3. Click **Refresh**.

Using SuiteScript Details

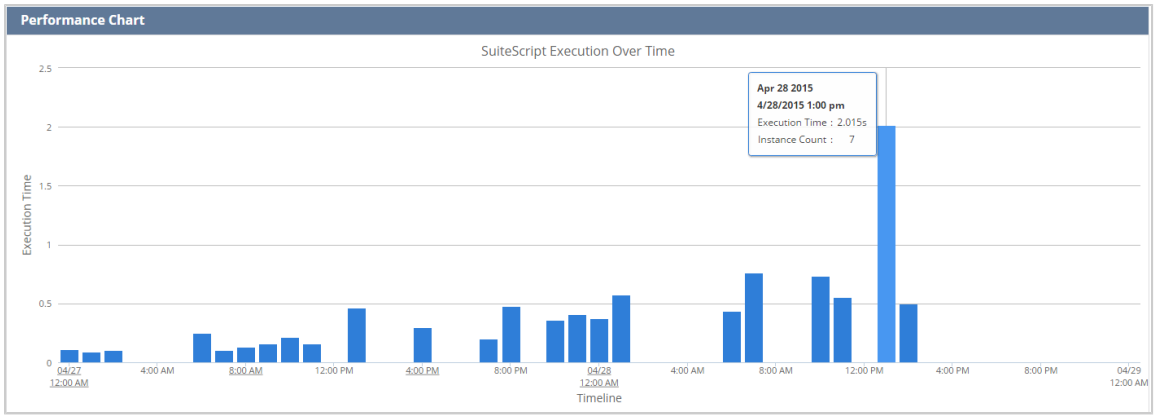
The SuiteScript Details portlet provides the details of the performance chart on its left. This portlet includes metrics collected during script execution, such as the number of logs, URL Requests, and record operations during the selected time range.

To see the individual instances of the executed script and related summary data in SuiteScript Details, click **View Logs**.

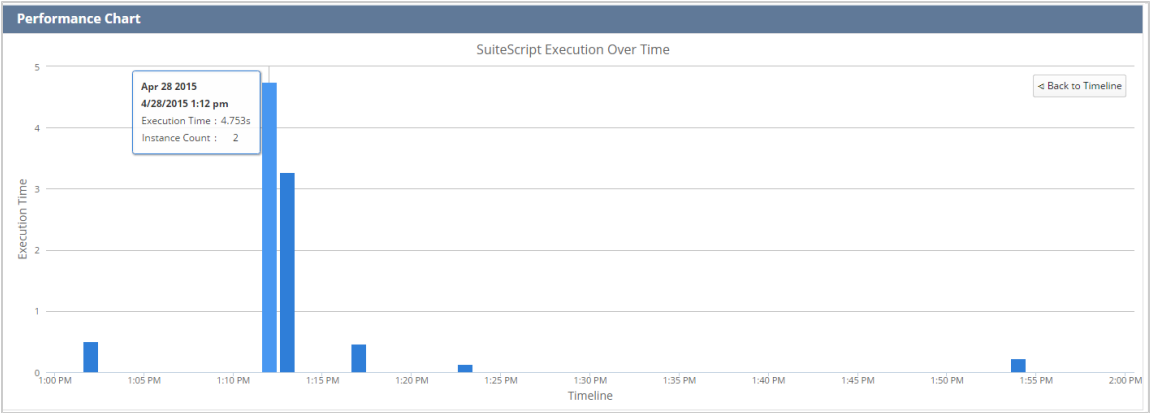


Using the Performance Chart

The Performance Chart displays an aggregate of SuiteScript execution over time. For precise details about the median execution time, place your cursor over a bar in the chart.



To view execution time for each instance in a particular hour, click a bar with multiple instances.



The Performance Chart refreshes and displays the execution time values within a particular hour. In this example, the higher response times occurred only between 1:10PM and 1:15PM.

Click the back button on the chart to return to the default Performance Chart view.

Using the Script Queue Monitor Dashboard in APM

Note: This help topic is about the Script Queue Monitor dashboard that is integrated in the Application Performance Management SuiteApp (Bundle ID: 67350). With new visuals and metrics, this dashboard is substantially improved upon the existing Script Queue Monitor (Beta) SuiteApp (Bundle ID: 56125).

You can continue to use the existing Script Queue Monitor (Beta) SuiteApp if it is installed in your account. However, NetSuite highly recommends that you use the Script Queue Monitor dashboard in the APM SuiteApp to better understand the overall health of your script queues and scheduled script executions. For information about installing the APM SuiteApp, see Installing the Application Performance Management SuiteApp.

Scheduled scripts are used in many critical business processes. You can greatly enhance the performance and efficiency of scheduled script execution by running them on multiple queues or multiple SuiteCloud processors. You can purchase one or more SuiteCloud Plus licenses to gain access to a greater number of SuiteCloud Processors. For more details, see SuiteCloud Processors SuiteCloud Processors and SuiteCloud Plus Settings.

Note: The Script Queue Monitor Dashboard of APM does not support map/reduce scripts.

The Script Queue Monitor dashboard in APM is designed to help NetSuite administrators identify gaps in their script queue usage and to properly plan their scheduled script deployments to different queues. It also supports script deployments which run on SuiteCloud Processors and are not assigned to any queue.

This dashboard provides charts and status details for scheduled script instances running on multiple queues and SuiteCloud Processors. Account administrators can use the visuals provided by the dashboard portlets to review and manage script queue and processor usage. This information can inform the retargeting of scheduled script deployments to different queues and SuiteCloud Processors, to maximize the benefit obtained from SuiteCloud Plus.

The Script Queue Monitor dashboard can also help you to:

- Understand your queue availability and efficiency at a glance
- Understand SuiteCloud Processors script efficiency at a glance

- Isolate possible causes of congestion and identify impacted scripts
- Analyze patterns of script executions

Accessing the Script Queue Monitor Dashboard

To access the Script Queue Monitor dashboard, go to Customization > Performance > Script Queue Monitor. To set the time frame for the data on the dashboard, see Setting the Date Range for APM Script Queue Monitor.

For information about the portlets on the Script Queue Monitor dashboard, read the following topics:

- Using the Overview Portlet on APM Script Queue Monitor
- Using the Queue Utilization Portlet on APM Script Queue Monitor
- Using the Queue Status Portlet on APM Script Queue Monitor
- Using the Script Instance Heat Map Portlet on APM Script Queue Monitor

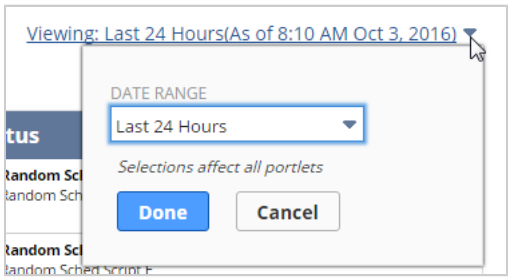
For information about scheduled scripts and SuiteCloud Plus, read the following topics:

- SuiteScript 2.0 Scheduled Script Type
- SuiteCloud Plus Settings
- Scheduled Scripts on Accounts with Multiple Processors (SuiteCloud Plus)

Setting the Date Range for APM Script Queue Monitor

By default, the Script Queue Monitor dashboard shows the data for the last 24 hours. This time frame applies to all dashboard portlets.

To change the date range, click the **Viewing** link at the top right corner of the dashboard. Click the **Date Range** dropdown list to select a preset time frame or set a custom date range. Click **Done** to apply your selection.



The following table shows the available date range options. The resolution value is used to set the plot point intervals on the x-axis of the data visualization on the Script Instance Heat Map portlet.

Date Range	Resolution
Last 1 hour	3 minutes
Last 3 hours	10 minutes
Last 6 hours	15 minutes
Last 12 hours	30 minutes
Last 24 hours (default)	1 hour
Last 3 days	3 hours

Date Range	Resolution
Last 7 days	8 hours
Last 14 days	12 hours
Last 30 days	1 day
Custom	7 days (for 31 to 90 days custom date range) 14 days (for 91 to 180 days custom date range) 30 days (for 181 to 390 days custom date range) 90 days (for more than 390 days custom date range)

Using the Overview Portlet on APM Script Queue Monitor

The Overview portlet on the Script Queue Monitor dashboard provides information about the overall health of your script queues. This portlet shows KPIs that can help you to discover script queue congestion and inefficiency.

A summary shows the number of scripts completed, scripts failed, average queue wait time, and average queue utilization. Note that scheduled scripts running on SuiteCloud Processors are not included in this summary.

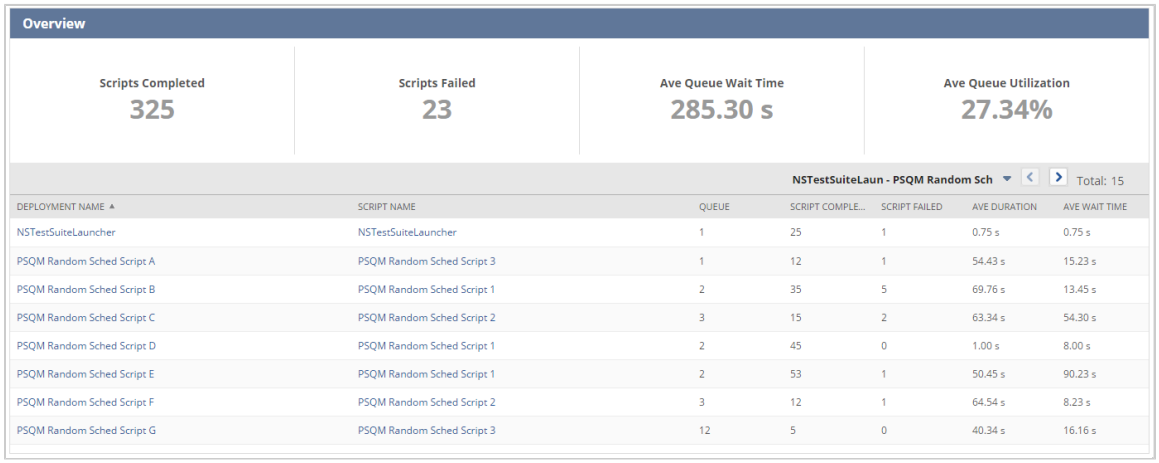
Average queue wait time is the sum of wait times per queue divided by the number of queues in the date range. Average queue utilization is the sum of utilization per queue divided by the total number of queues. Utilization here refers to the sum of the processing times per queue divided by the total processing time in the date range.

Field	Formula
Average Queue Wait Time	(Q 1 total wait time + Q 2 total wait time + ... + Q n total wait time) ÷ total number of queues
Utilization	(script 1 processing time+ script 2 processing time+ ... + Q n processing time) ÷ total processing time in date range
Average Queue Utilization	(Q 1 utilization + Q 2 utilization + ... + Q n utilization) ÷ total number of queues

A table shows relevant information about script instances aggregated by deployment name, script name, average queue duration, and average queue wait time. Click the column name to sort the table contents.

SuiteCloud Processors script instances are labeled **-None-** under the Queue column.

Click the link in the Deployment Name column to go to the script deployment record. Click the link in the Script Name column to go to the scheduled script record.



DEPLOYMENT NAME	SCRIPT NAME	QUEUE	SCRIPT COMPLE...	SCRIPT FAILED	AVE DURATION	AVE WAIT TIME
NSTestSuiteLauncher	NSTestSuiteLauncher	1	25	1	0.75 s	0.75 s
PSQM Random Sched Script A	PSQM Random Sched Script 3	1	12	1	54.43 s	15.23 s
PSQM Random Sched Script B	PSQM Random Sched Script 1	2	35	5	69.76 s	13.45 s
PSQM Random Sched Script C	PSQM Random Sched Script 2	3	15	2	63.34 s	54.30 s
PSQM Random Sched Script D	PSQM Random Sched Script 1	2	45	0	1.00 s	8.00 s
PSQM Random Sched Script E	PSQM Random Sched Script 1	2	53	1	50.45 s	90.23 s
PSQM Random Sched Script F	PSQM Random Sched Script 2	3	12	1	64.54 s	8.23 s
PSQM Random Sched Script G	PSQM Random Sched Script 3	12	5	0	40.34 s	16.16 s

Using the Queue Utilization Portlet on APM Script Queue Monitor

The Queue Utilization portlet on the Script Queue Monitor dashboard shows the following charts:

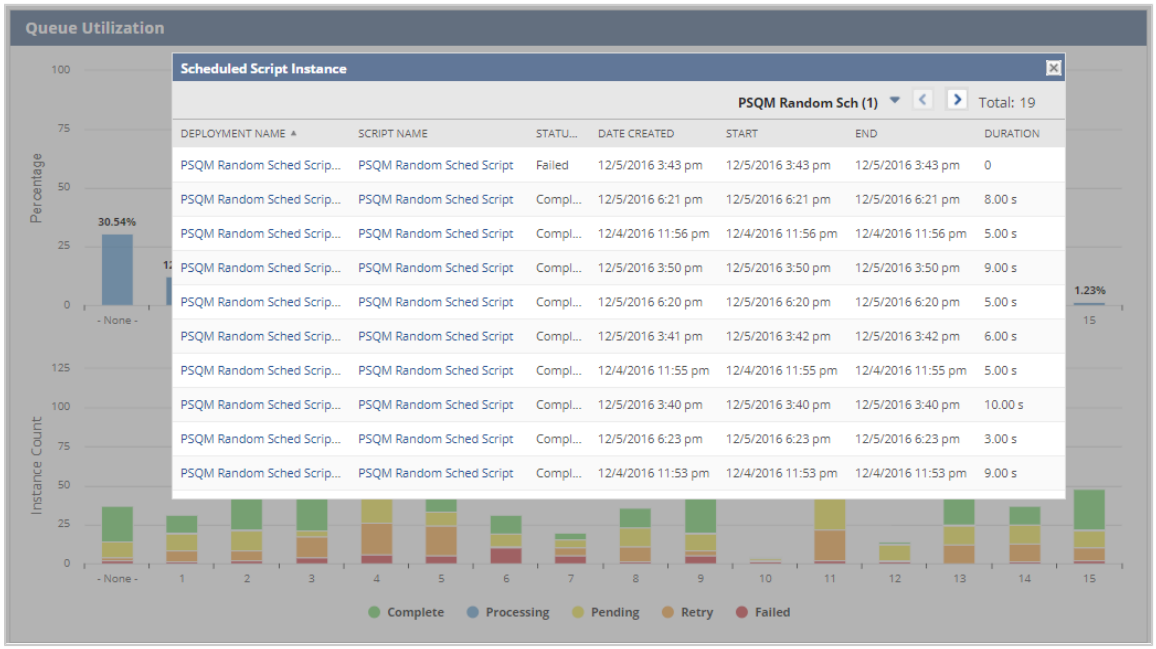
- **Percentage** – Shows the percentage utilization of a script queue.
- **Instance Count** – Shows the number of script instances based on status.

Place your cursor over a bar to get additional details for a specific queue.

To view data on SuiteCloud Processors scheduled scripts, point to or click the values labeled **-None-**.

Click a bar on the percentage utilization chart to see more details.

Click a bar on the instance count chart to see details about the script instances for the queue. You can click the link in the Deployment Name column to go to the script deployment record, or click the link in the Script Name column to go to the scheduled script record.



Using the Queue Status Portlet on APM Script Queue Monitor

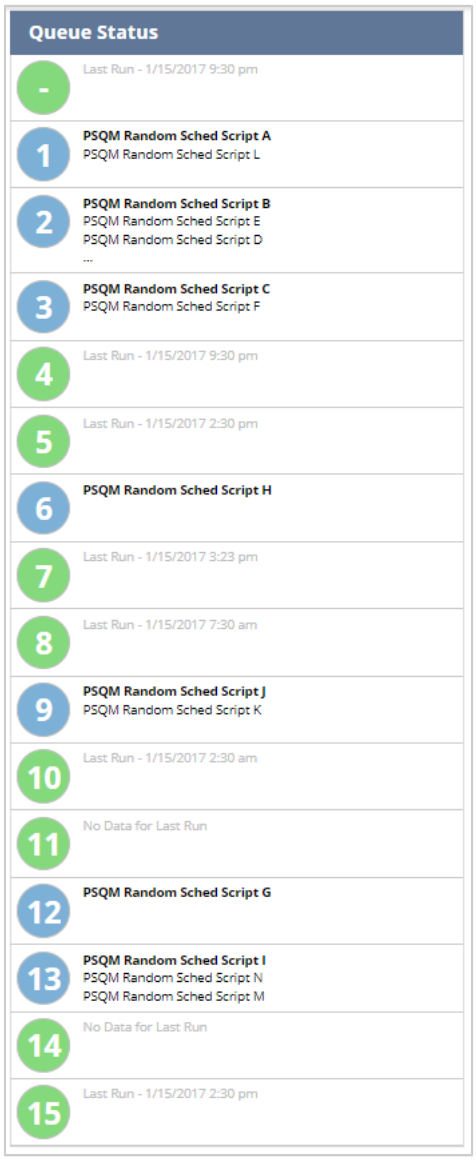
The Queue Status portlet shows the real-time status of your script queues. From this portlet, you can identify busy and available queues, and view pending scripts.

To view the status of SuiteCloud Processors scheduled scripts, refer to the row labeled with a hyphen (-).

Click the ellipsis (...) to load other pending scripts in the queue.

- **Blue (Busy)** – Indicates that a scheduled script is currently running in this queue. Shows the name of the scheduled script instance that is currently running in bold, and shows the name of upcoming scheduled script instances in regular font. If available, click the ellipsis icon at the bottom of the row to expand or collapse the list.
- **Green (Available)** – Indicates that no script is currently running in this queue. Shows the date and time when the last run was completed.

You can use this information for retargeting of scheduled script deployments to different queues or SuiteCloud Processors.

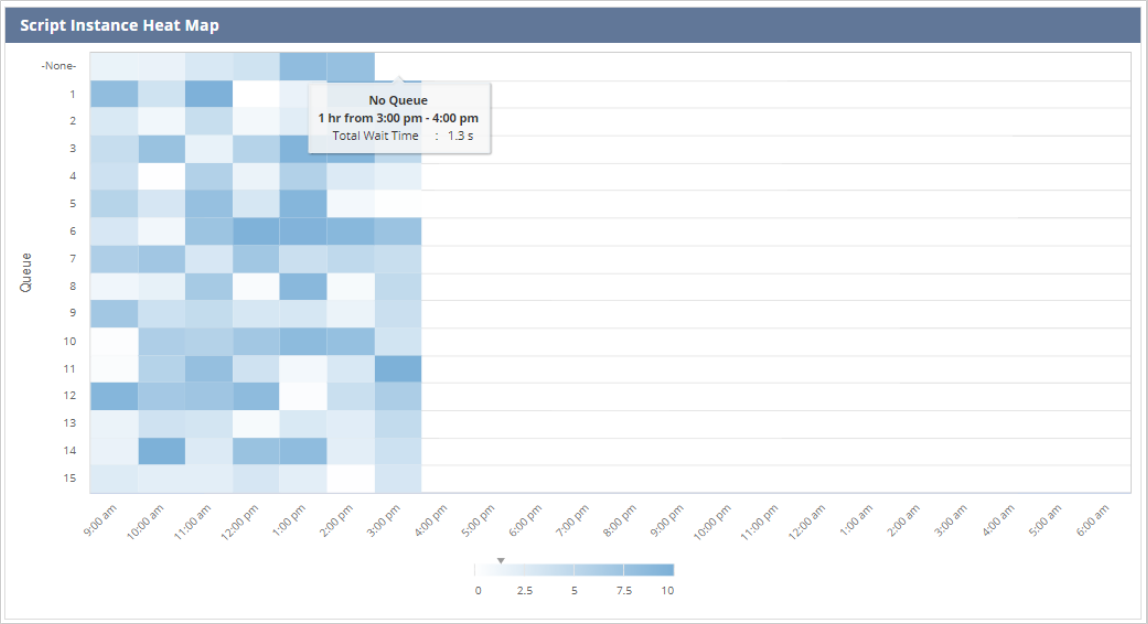


Using the Script Instance Heat Map Portlet on APM Script Queue Monitor

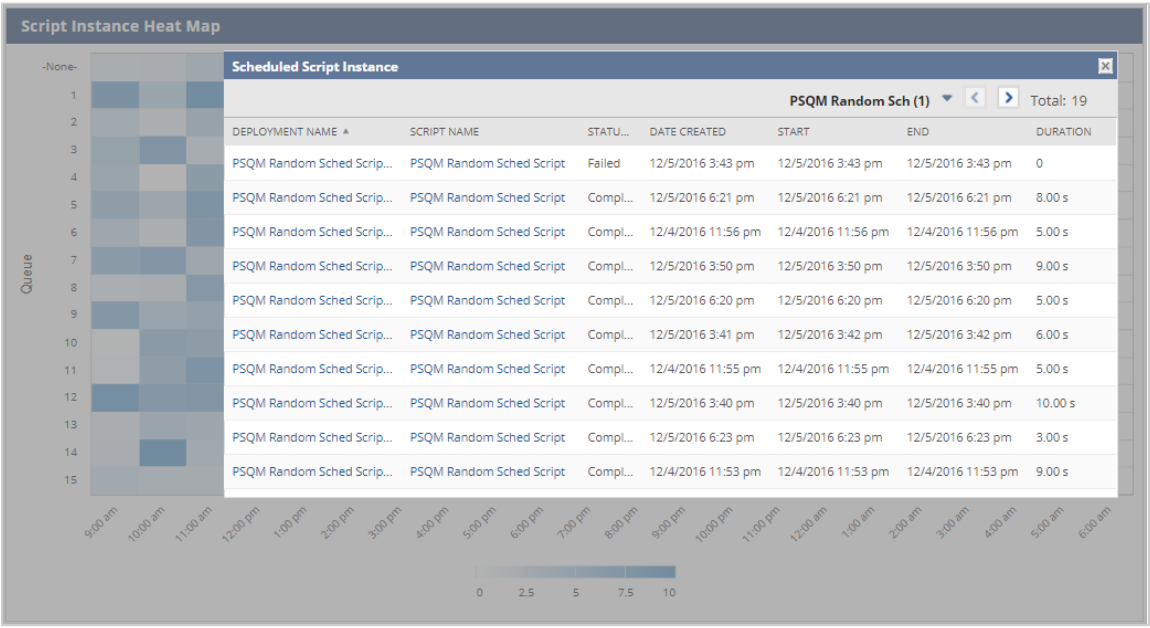
This portlet includes a heat map chart that shows script executions over a timeline. The script instance heat map chart can help you to analyze script execution patterns and identify peak and off-peak time periods for a specific queue.

To view instances of SuiteCloud Processors scheduled scripts, refer to the row labeled **-None-**.

Place your cursor over a cell on the heat map chart to see additional details for a specific queue.



Click a cell on the heat map chart to see details about the script instances at a particular time for a specific queue. You can click the link in the Deployment Name column to go to the script deployment record, or click the link in the Script Name column to go to the scheduled script record.



Analyzing Web Services Performance

Businesses rely on web services to extend their applications' functions across multiple platforms, programming languages, and locations. Web services positively impact real-world operations, so

it is vital that they run smoothly. With the Web Services Analysis dashboard, you can monitor the performance of your web services in real time.

The Web Services Analysis dashboard aggregates data on web services operations and record processing without the need for you to set up several saved searches. You can view charts and summary lists of statistics in one clean UI. The dashboard gives you a quick view of your web services integrations, so you are equipped with data for efficient error-handling, implementation, and maintenance.

Note: Only synchronous operations and requests are supported in the Web Services Analysis dashboard. To know more about the difference between synchronous and asynchronous request processing, read the help topic Synchronous Versus Asynchronous Request Processing.

Accessing the Web Services Performance Dashboard

To start using the Web Services Analysis dashboard, go to Customization > Performance > Web Services Analysis.

Important: Administrators who are already using the Application Performance Management (APM) SuiteApp need to save access again for other roles and employees so they can use the Web Services Analysis dashboard. For more information, see Setting Up APM Access for Roles and Employees.

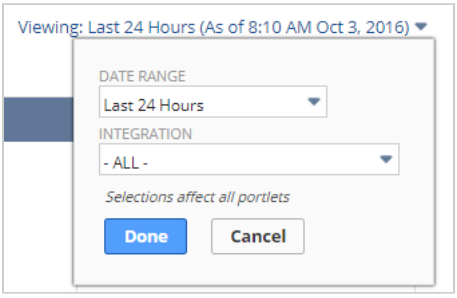
Find out more about each portlet when you read the following topics:

- Filtering Data in Web Services Analysis
- Monitoring Top Web Services Operations
- Monitoring Top Web Services Record Processing
- Monitoring the Status of Web Services
- Monitoring the API Version Usage of Web Services

Filtering Data in Web Services Analysis

To filter data for all portlets on the Web Services Analysis dashboard, click the **Viewing** link at the upper right corner of the page.

You can set the data according to the following filters:



- **Date Range** — Select a preset or custom time frame from the dropdown list. Similar to the Script Queue Monitor dashboard, the resolution value is used to set the plot point intervals on the x-axis of data visualizations. The following table shows the available date range options:

Date Range	Resolution
Last 1 hour	3 minutes
Last 3 hours	10 minutes
Last 6 hours	15 minutes
Last 12 hours	30 minutes
Last 24 hours (default)	1 hour
Last 3 days	3 hours
Last 7 days	8 hours
Last 14 days	12 hours
Last 30 days	1 day
Custom	7 days (for 31 to 90 days custom date range) 14 days (for 91 to 180 days custom date range) 30 days (for 181 to 390 days custom date range) 90 days (for more than 390 days custom date range)

- **Integration** — Select the web service integration you want to see.

Click **Done** to apply your selection. To apply changes in data filters, click **Refresh** on the upper left corner of the page.

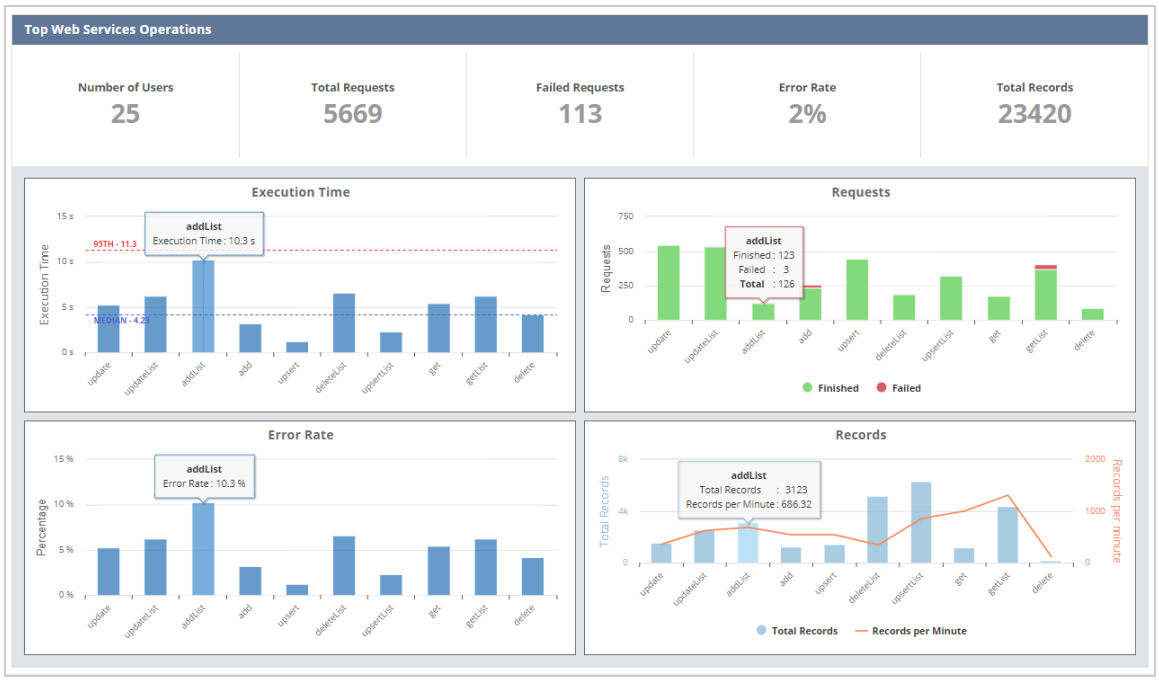
Monitoring Top Web Services Operations

The Top Web Services Operations portlet on the Web Services Analysis dashboard displays operations performance statistics. You can use this portlet to establish operations-related trends in web services, detect inconsistencies, and make informed decisions when modifying or adding web services operations.

The Top Web Services Operations portlet shows the number of users, total requests, failed requests, error rate, and total records. It also displays the following charts:

- **Execution Time** - This chart shows the average time it takes for each web service operation to execute, in seconds.
- **Requests** – This chart shows the total number of requests for each operation, stacked to show the finished and failed counts.
- **Error Rate** – This chart shows the percentage of error for each operation.
- **Records** – This combination chart overlays total records per operation with total records per minute.

Each chart can display up to 10 operations at a time.



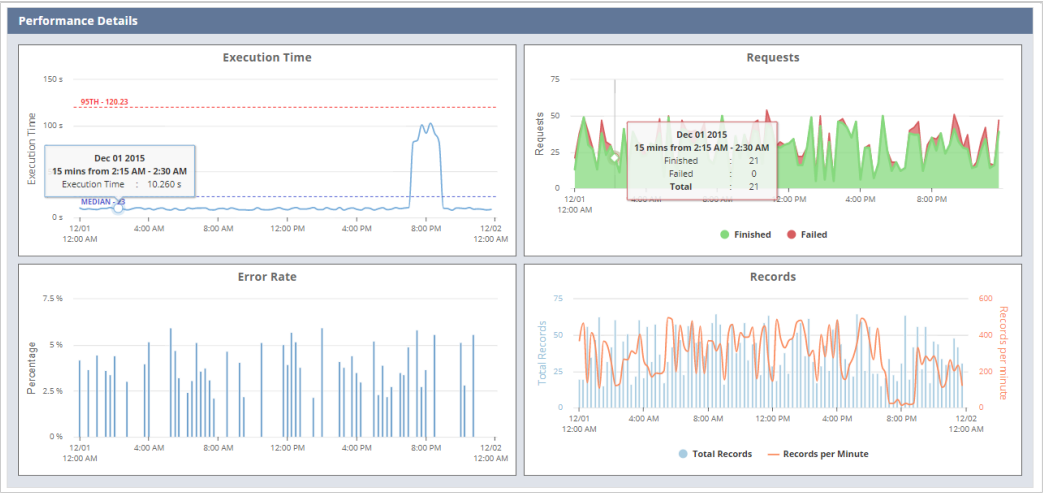
Viewing the Web Services Operation Details

The Top Web Services Operations portlet displays a summary of operation-related data when you point your cursor over specific instances in the graphs.

To see more details about each operation, click a data point. The Web Services Operation Details page appears with the following information:

- **Web Services Operation Details** – This is a summary of data specific to the web service operation, including total records and request counts, error rate, and execution time.

- **Performance Details** – These four charts map the web service operation's execution time, error rate, requests, and records at specific points in time.

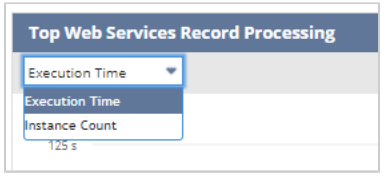


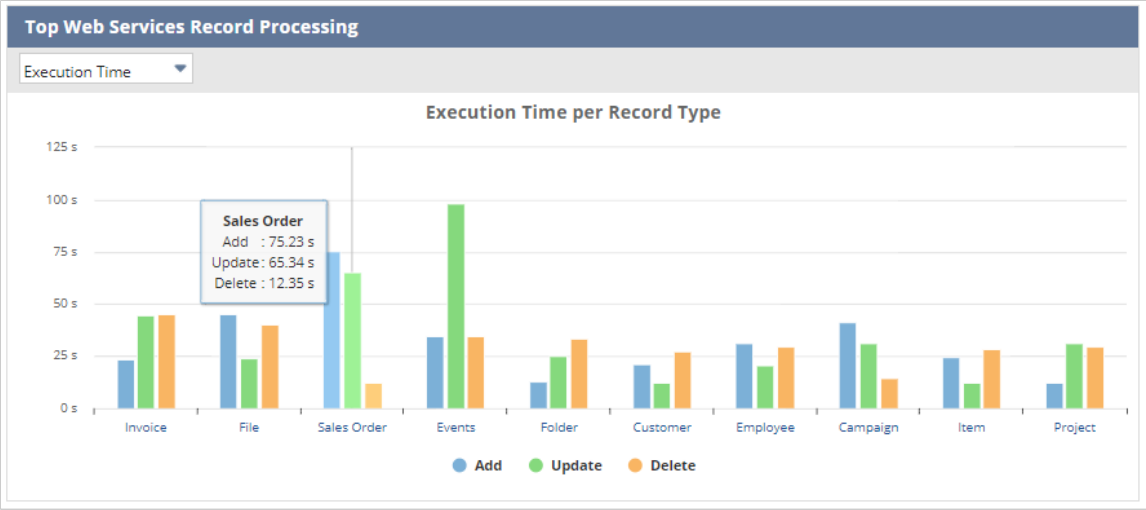
- **Top Records Performance** – This line graph compares the execution time of each record type at specific points in time. It can display up to five record types at a time.

Monitoring Top Web Services Record Processing

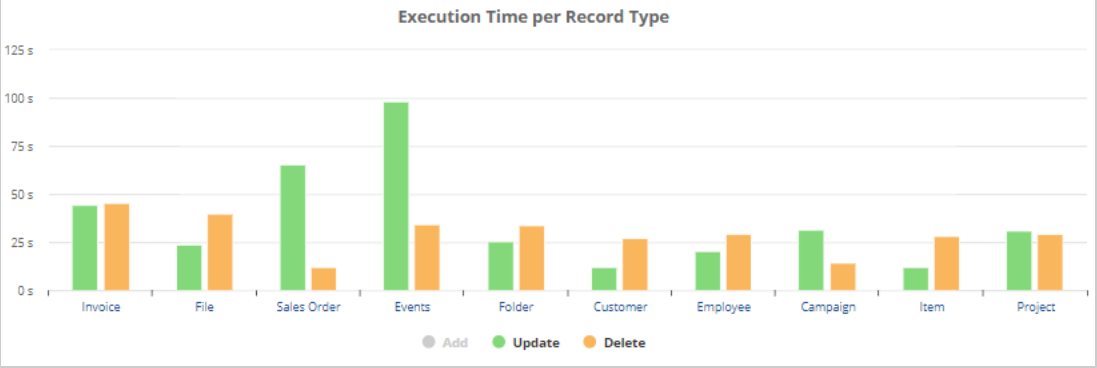
The Top Web Services Record Processing portlet on the Web Services Analysis dashboard clusters a series of operations-related data points according to record type. You can use this portlet to pinpoint and address areas of concern in record processing.

To change the data points in the series, click the dropdown arrow at the upper left corner of the portlet. You can select between Execution Time and Instance Count. Each chart can display up to 10 record types at a time.

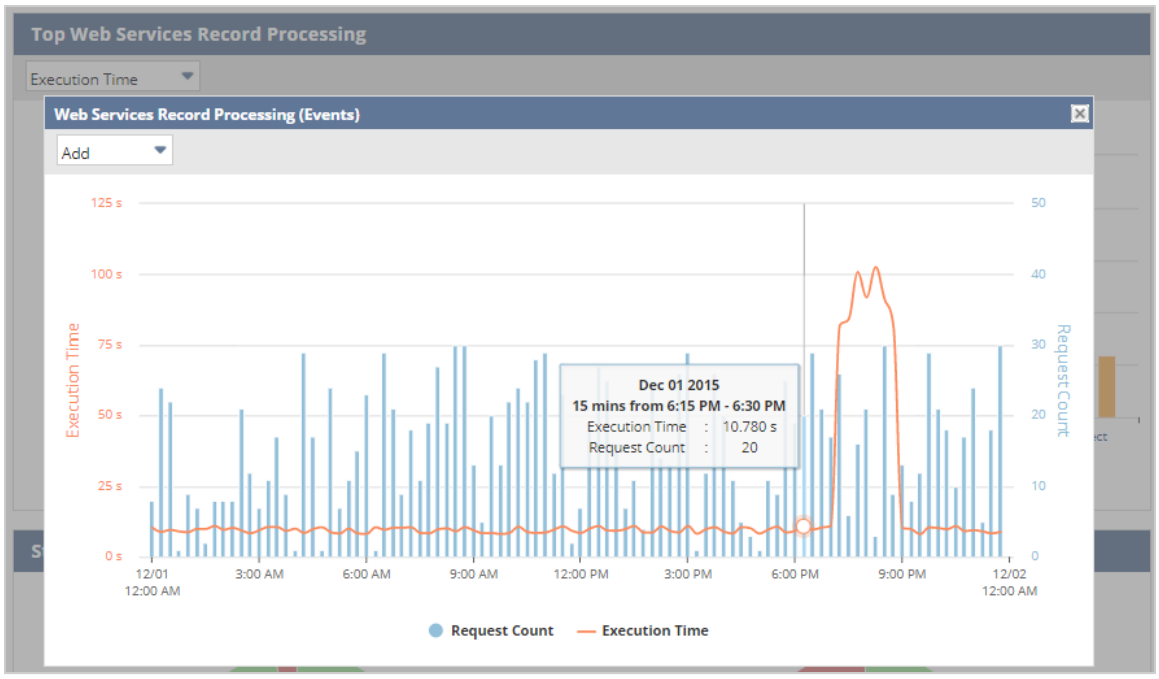




You can also click any operation from the legend to exclude it from the chart.

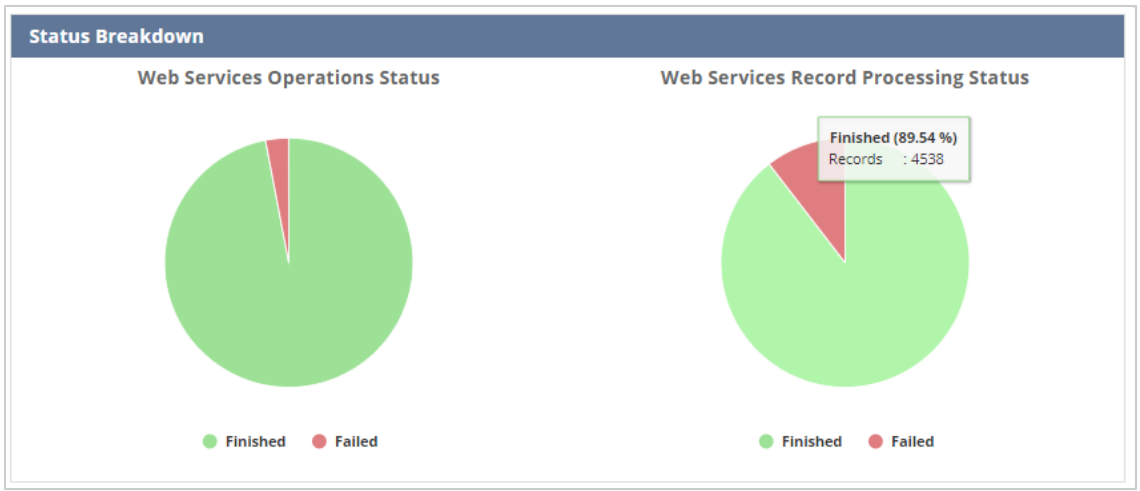


To find more information about each record type, click its name or data point. A pop-up combination chart appears, showing data about a web service operation for the specific record type at specific points in time. Select an operation from the dropdown arrow at the upper left corner of the popup window.

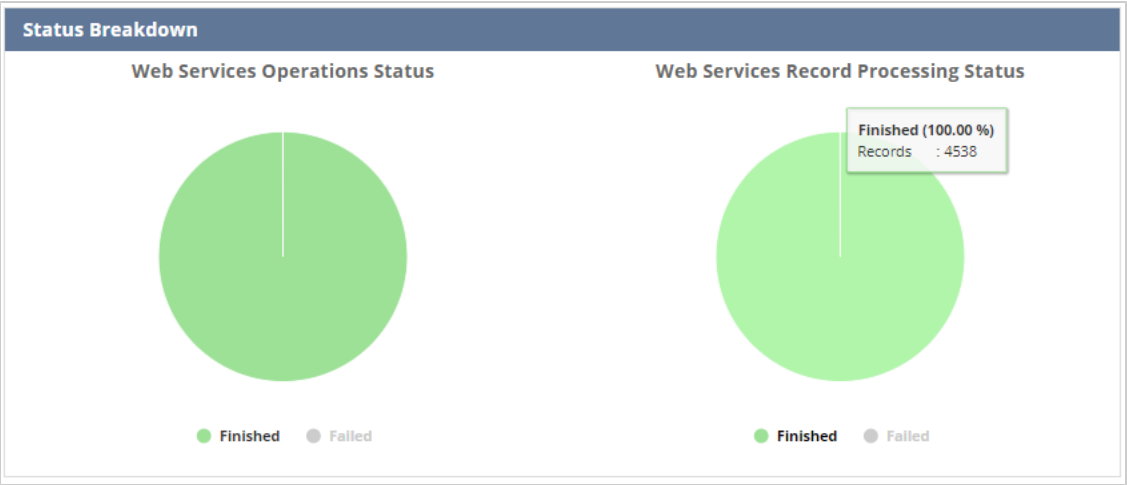


Monitoring the Status of Web Services

The Status Breakdown portlet on the Web Services Analysis dashboard displays the status of web services operations and record processing using pie charts. You can use this portlet to monitor the health of web services operations and record processing and respond to failures or errors as they happen. You can see the percentage and number of requests or records when you point to a section in the pie chart.



You can also click any status from the legend to exclude it from the chart.

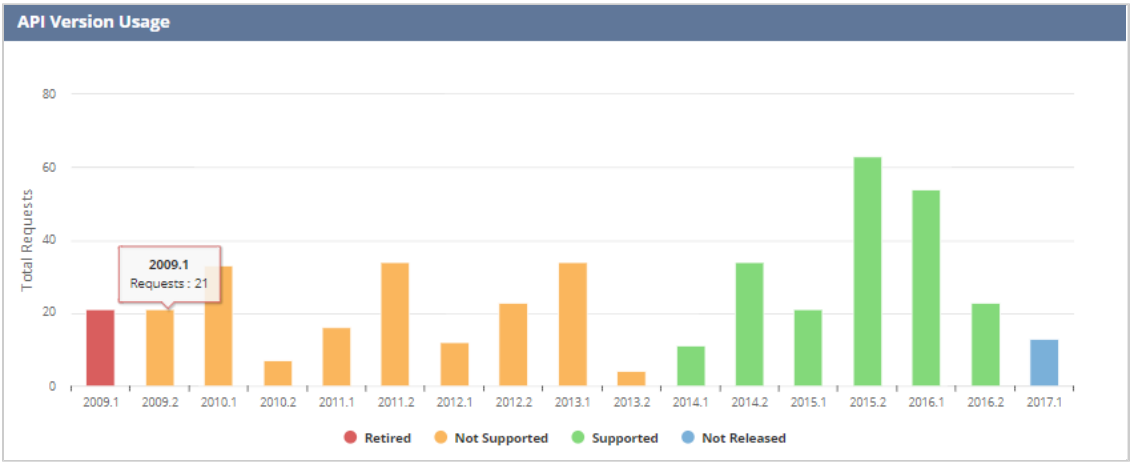


Monitoring the API Version Usage of Web Services

The API Version Usage portlet on the Web Services Analysis dashboard displays the total web service requests for each API version. These versions are color-coded according to their level of support. This portlet lets you monitor and predict the impact of API changes on your web services.

The API versions are color-coded and classified according to the following levels of support:

- **Retired** – The web services API is no longer in the system. These versions are no longer supported.
- **Not Supported** – The web services API is still in the system. But these versions are no longer supported.
- **Supported** – The web services API exists and can be used. These versions are supported.
- **Not Released** – The web services API exists and can be used. These versions are not yet released.



Analyzing Search Performance

Saved searches empower businesses with up-to-date and precise business intelligence for strategic decision-making. You can catch potential issues related to saved search performance by monitoring them in real time. In the Application Performance Management (APM) SuiteApp, NetSuite provides several tools for you to view and analyze the performance of your saved searches.

Important: Administrators who are already using the Application Performance Management (APM) SuiteApp need to save access again for other roles and employees so they can use the search performance tools. For more information, see Setting Up APM Access for Roles and Employees.

To know more about each tool, read the following topics:

- Using the Search Performance Analysis Dashboard
- Using the Search Performance Details Dashboard

Using the Search Performance Analysis Dashboard

The Search Performance Analysis dashboard is a visual tool for monitoring multiple saved searches on one page. The dashboard presents saved searches in the form of tiles, which contains helpful metrics updated in real time. You can use this tool to quickly identify saved search performance issues and anomalies. Looking at the dashboard also lets you promptly compare statistics between various saved searches.

To start, read Using the Saved Searches Portlet.

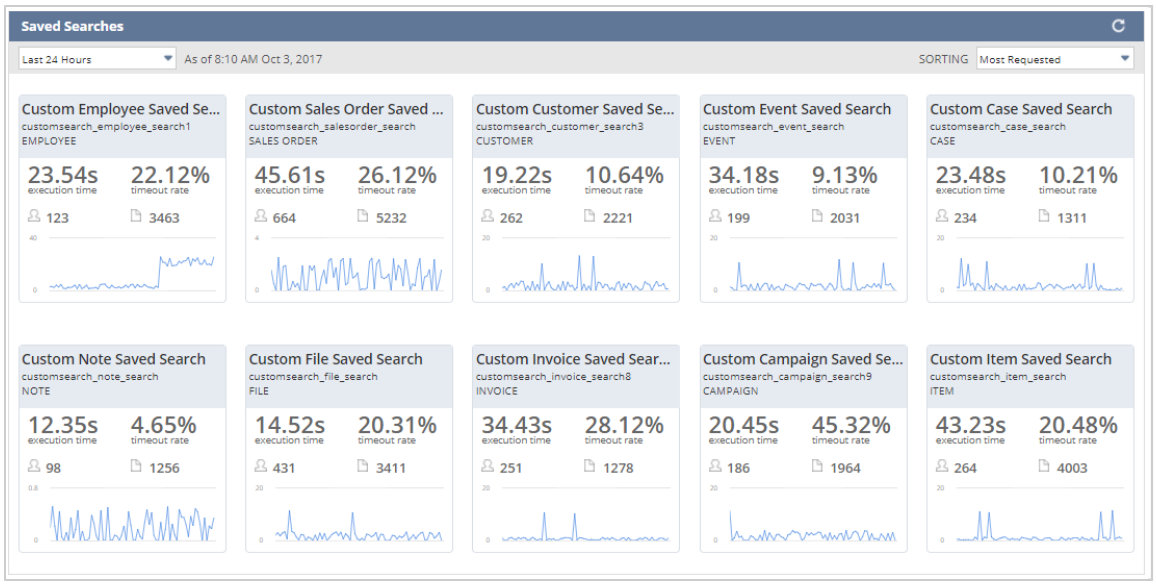
Accessing the Search Performance Analysis Dashboard

To start using the Search Performance Analysis dashboard, go to Customization > Performance > Search Performance Analysis.

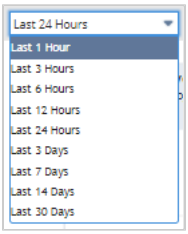
Using the Saved Searches Portlet

Saved searches are presented in the form of tiles. The portlet displays the top ten saved searches based on your filters. Each tile contains the following information:

- **Execution Time** – Shows the median number of seconds it took for the saved search to execute within the specified period.
- **Timeout Rate** – Shows the percentage of timeouts during saved search executions relative to the total requests within the specified period.
- **Number of Users** – Shows the total number of users who accessed the saved search within the specified period.
- **Number of Requests** – Shows the total number of requests for the saved search within the specified period.
- **Execution Time Line Graph** – Shows a line graph of the median execution time within the specified period.



You can update the duration of data presented using the dropdown list on the upper left corner of the page. You can select between the following:



If you need to access information within a custom time frame, click the saved search tile. This action takes you to the Search Performance Details Dashboard, where you can filter data according to start date/time and end date/time. To know more, read Filtering Data on the Search Performance Details Dashboard.

You can also sort the data according to the most requested, most timeouts, most users, or highest execution time. To sort, select from the dropdown list on the upper right corner of the page.

Using the Search Performance Details Dashboard

The Search Performance Details Dashboard provides you with more in-depth statistics about the performance of each saved search. The dashboard consists of two portlets and provides summary lists, charts, and logs about a specific saved search. It can be used for gathering data during performance reviews and critical investigations.

To start, read the following topics:

- Accessing the Search Performance Details Dashboard
- Filtering Data on the Search Performance Details Dashboard

To know more about the available portlets on the dashboard, see:

- Viewing Saved Search Details
- Viewing Saved Searches by Context

Accessing the Search Performance Details Dashboard

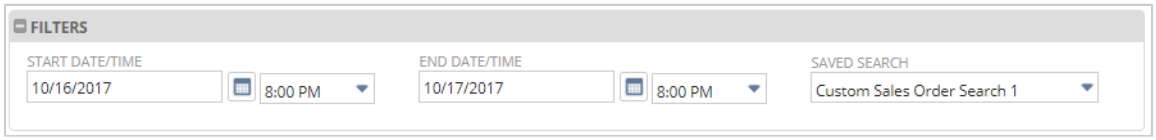
You can go to the Search Performance Analysis dashboard by choosing one of the following paths:

- Go to Customization > Performance > Search Performance Details.
- Go to Customization > Performance > Search Performance Analysis and click a saved search tile.

Filtering Data on the Search Performance Details Dashboard

You can filter data on the Search Performance Details dashboard according to the following:

- **Start Date/Time and End Date/Time** – You can specify the start and end dates by clicking the corresponding calendar icons and selecting the correct dates. You can change the start and end times by using the corresponding dropdown lists.
- **Saved Search** – You can choose to show data for all saved searches or for a specific saved search using the saved search dropdown list.



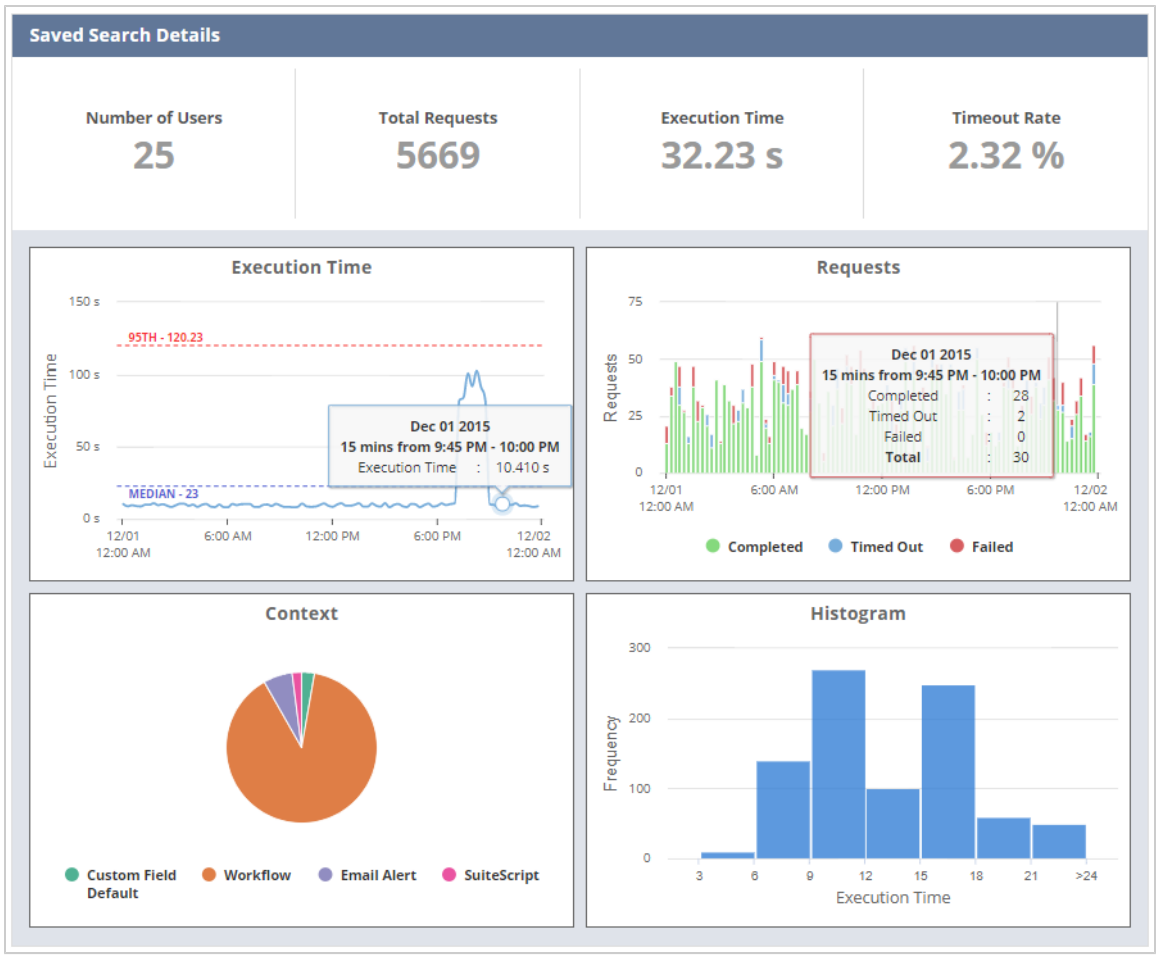
To apply changes in data filters, click **Refresh** on the upper left corner of the page.

Viewing Saved Search Details

The Saved Search Details portlet displays summary lists and four charts, which show performance statistics in detail. You can find the following charts on the portlet:

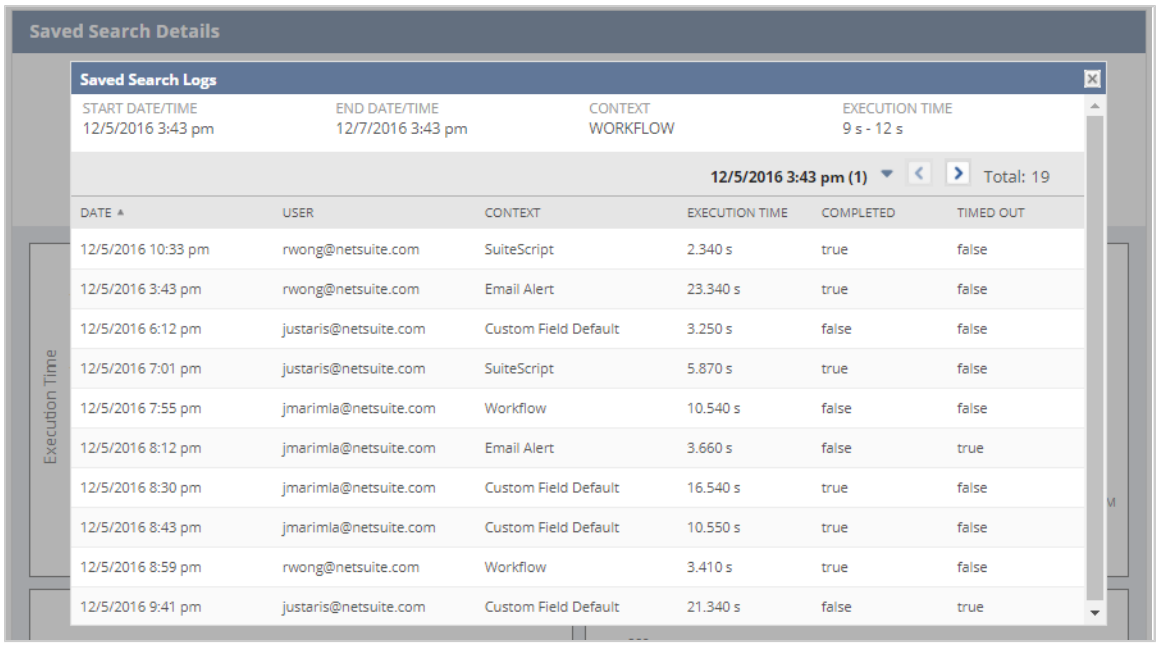
- **Execution Time** – Shows a line graph comparing the median execution time of saved searches over a specific period.
- **Requests** – Shows a combination bar and line chart, which overlaps timeout counts with successful or failed status data over a specific period.
- **Context** – Shows a pie graph to display the proportion of contexts that used the saved search within the specified duration.
- **Histogram** – Shows a histogram comparing the total number of saved searches in various execution time intervals.

You can point to any value on the portlet's charts to see a summary of data relevant to the chart.



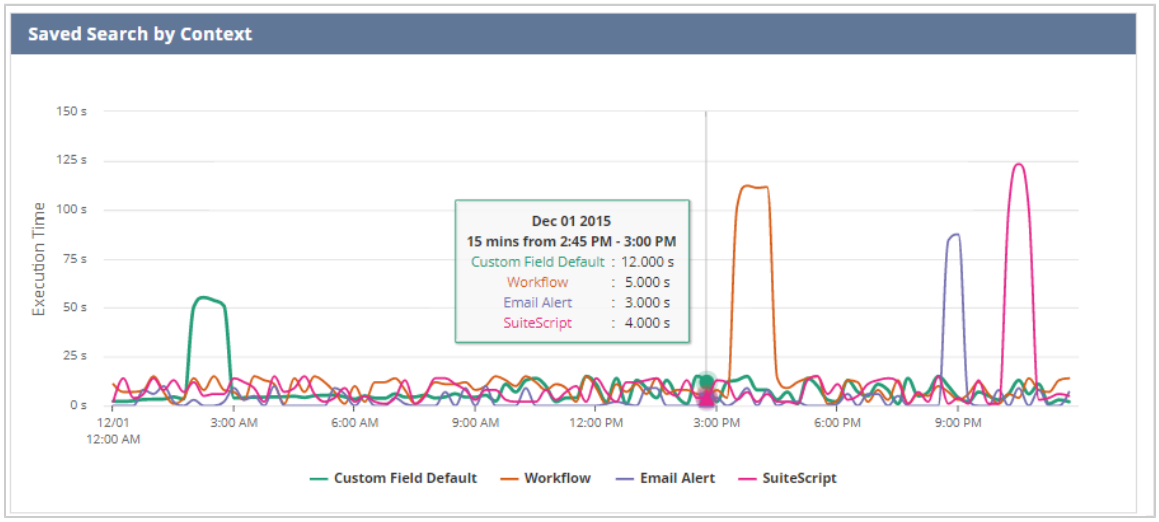
Viewing Saved Search Logs

You can view logs for each saved search when you click a value on any of the charts. The logs record the date, user, context, execution time, success, and timeout.

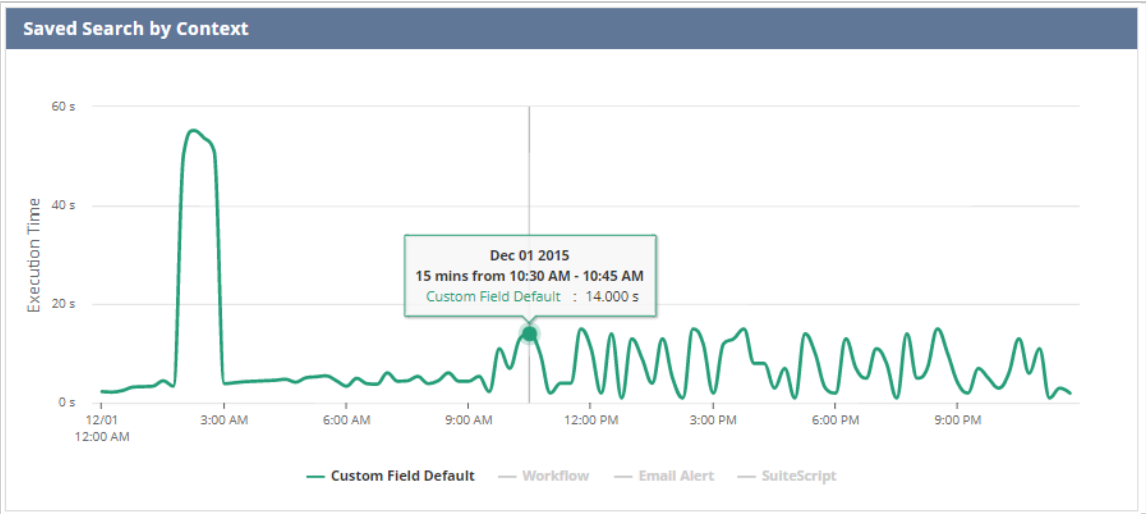


Viewing Saved Searches by Context

The Saved Searches by Context portlet lets you analyze changes in execution time among several contexts over a specific period. This portlet can help you find trends in running saved searches depending on which context is used and when they were run.



You can also click an item on the legend to hide or display that segment of data.



Frequently Asked Questions: Application Performance Management

See the following questions and answers for more information about the Application Performance Management SuiteApp (APM).

Is there a cost associated with the APM?

No. This SuiteApp is available for installation at no cost. See Installing the Application Performance Management SuiteApp for instructions.

Will installation of the APM cause slower performance in my NetSuite account?

No. The SuiteApp reads from data stored in the back end. It does not create any additional overhead for your existing customizations aside from the scripts used to display the dashboard.

Can the layout of the APM be customized?

This feature is not available at this time.

Can the displayed content in each pane of the APM be restricted?

This feature is not available at this time.

How many record tiles can the Performance Dashboard show?

The Performance Dashboard can show up to 20 record tiles. By default, the dashboard displays the 10 most used record operations and can be configured to show an additional 10. For more details, see About the Record Operation Tiles.

Can the APM get data from a date prior to the date this SuiteApp was installed?

Yes.

What is the time range of past data that the APM can retrieve?

The APM's Performance Dashboard can display data from up to 30 days in the past. This time range is the maximum preset option in the time interval dropdown list, and custom date and time ranges cannot exceed this span.

The Page Time Summary search can retrieve data from up to 2 days less than the past month. An "Error encountered in search" message appears when this limit is reached.

The SuiteScript Analysis search can retrieve data from up to 2 days less than the past month. An "Error encountered in search" message appears when this limit is reached.

What time zone is used in the APM?

All time values shown in APM follow the Pacific time zone (GMT -08:00).

Is the raw data used by the APM available for access?

No. This data is not available in its raw form. It is represented by the aggregations and visualizations that APM provides.

Can the data shown in the APM be exported as a Microsoft Excel, CSV, or PDF file?

You can export the data from the Performance Dashboard, Page Time Summary, and SuiteScript Analysis into a CSV file. The maximum number of data rows that can be exported is 10,000.

Does the APM show the number of records affected and the median length of time required to process one record?

Yes, this information is shown in the record tiles on the Performance Dashboard.

In the time interval dropdown on the Performance Dashboard, what does (resolution x min/hour) mean?

Resolution means the time interval used for the aggregation. For example, a resolution of 5 minutes means that each point in the trend graph represents an aggregate of 5 minutes. The resolution value sets the plot point intervals on the x-axis of the data visualizations. For more information about the time interval dropdown list, see Setting the Date and Time Range That You Want to Monitor.

What value is captured by the response time shown in the record tiles?

This value is the median of each response time in the total time for the specified combination of record, operation, and time.

Is there any legend in the APM or associated email alert indicating when performance is not normal?

This feature is not available at this time.

On the Page Time Details page, what are Client: Header, Client: Render, and Client: Init?

Client: Header is the amount of time to render the head element of the page. Client: Render is the amount of time for the browser to render the response after the head element finished rendering. Client: Init is the amount of time used by the Page Init function. For more information, see Using Page Time Details.

Does the APM make it possible to determine which script or workflow is causing a high SuiteScript or workflow time?

This information can be determined through analysis of the Page Time Summary and Page Time Details.

Can the APM tell if a script is slow due to a slow search?

This feature is not available at this time.

Does the APM include performance data from scripts associated with other SuiteApps?

Yes.

Does the APM provide a way to determine if a script is currently running?

Script performance log data is only captured after scripts have been executed successfully. If data for a script is shown in the APM, the script has stopped running.

Does the APM provide a way to determine which part of a script execution is causing slower performance?

This feature is not available at this time.

Does the SuiteScript Analysis tool also reflect the run time of workflows?

No.

Is there an analysis tool for workflows similar to the SuiteScript Analysis tool?

Workflow times are included in the Page Time Summary. A dedicated analysis tool for workflows is not available at this time.

What is the relationship between the execution time and instance count numbers shown when you place your cursor over the SuiteScript Analysis Performance Chart?

The time it took for each instance to execute is based on the execution time. The execution time is represented as an aggregation.

How long does it take for the APM to reflect script optimizations made after reviewing APM data?

The change in performance should take effect very quickly. You should be able to observe the impact on performance in APM data almost in real time.

Why does a script run much more slowly in my NetSuite account than the same script runs in my friend's NetSuite account?

Each NetSuite instance is different. Many factors other than configuration can impact performance.

What should I do if I think that the number of seconds averaged per operation is not fast enough?

If you require investigation of performance data from the APM, please file a case with NetSuite Customer Support.

Does the APM provide information about web services performance?

Yes, this information is available on the Web Services Analysis dashboard. For more information, see Analyzing Web Services Performance.

Does the APM provide information about web store performance?

This feature is not available at this time.

Does the APM provide information about performance of scheduled scripts using multiple queues?

Yes, this information is available on the Script Queue Monitor dashboard. For more information, see Using the Script Queue Monitor Dashboard in APM.