

RUCKUS

SmartCell Insight User Guide, 5.5.6

Supporting SmartCell Insight 5.5.6

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Overview

This *SmartCell Insight User Guide* provides instructions about how the Ruckus Wireless™ SmartCell Insight (SCI) application works, the reports that it generates, and how to use these reports.

This guide is written for service operators and system administrators who are responsible for managing, configuring, and troubleshooting Wi-Fi networks. This guide assumes basic working knowledge of local area networks, wireless networking, and wireless devices.

NOTE

Refer to the release notes shipped with your product to be aware of certain challenges when upgrading to this release.

Most user guides and release notes are available in Adobe Acrobat Reader Portable Document Format (PDF) or HTML on the Ruckus Wireless Support Web site at <https://support.ruckuswireless.com/contact-us>.

Document Conventions

The following two tables list the text and notice conventions that are used throughout this guide.

TABLE 1 Text conventions

Convention	Description	Example
monospace	Represents information as it appears on screen	[Device name]>
monospace bold	Represents information that you enter	[Device name]> set ipaddr 10.0.0.12 ruckus# show running-config ap-heartbeat
default font bold	UI components such as screen or page names, keyboard keys, software buttons, and field names CLI command names and keywords	On the Start menu, click All Programs . ruckus# show running-config ap-heartbeat
italics	Publication titles CLI command modifiers and variables.	Refer to the <i>SmartZone™ (SZ) 100 and Virtual SmartZone Essentials (vSZ-E) Command Reference</i> for more information ap- mac

TABLE 2 Notice conventions

Notice Type	Description
NOTE	Information that describes important features or instructions
CAUTION	Information that alerts you to potential loss of data or potential damage to an application, system, or device
WARNING	Information that alerts you to potential personal injury

Related Documentation

For a complete list of documents that accompany this release, refer to the Release Notes.

Documentation Feedback

Ruckus Wireless is interested in improving its documentation and welcomes your comments and suggestions.

You can email your comments to Ruckus Wireless at: docs@ruckuswireless.com

When contacting us, please include the following information:

- Document title
- Document part number (on the cover page)
- Page number (if appropriate)

SmartCell Insight Overview

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SmartCell Insight Introduction

SmartCell Insight (SCI) is a big data analytics and reporting platform that enables efficient management of wireless networks. SCI provides visibility into network performance, operation, and planning of Ruckus wireless networks.

SCI also provides predictive analytics through automated machine learning, without requiring manual configuration.

SCI uses scale-out architecture with support for clustering. A single instance of SCI can collect, process, correlate and aggregate data from more than 100,000 access points.

NOTE

Data migration in SCI clusters is not supported.

SCI helps manage and optimize a wireless network by providing analytics, reporting, and key performance indicators (KPIs) about devices, users, applications, access points, controllers, and more. SCI has several pre-built dashboards/reports, in addition to the ability to slice-and-dice data in Data Explorer to create custom reports.

SCI supports Ruckus SmartZone and Ruckus ZoneDirector controllers.

NOTE

All values in the reports, except AP counts, are approximate values unless otherwise stated.

Definition of Terms

The following are terms used in SCI.

TABLE 3 Definition of Terms

Term	Definition
User Traffic	
User Traffic	Traffic volume, which is transmitted and received in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic. User Traffic = Rx User + Tx User
Rx User	Traffic volume, which is received by AP (Access Point) in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic.
Tx User	Traffic volume, which is transmitted by AP (Access Point) in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic
Management Traffic	
Management Traffic	Traffic volume, which is transmitted and received in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic. Abbreviations <i>Mgmt</i> or <i>Mgt</i> are frequently used in the user interface. Mgmt Traffic = Rx Mgmt + Tx Mgmt

TABLE 3 Definition of Terms (continued)

Term	Definition
Rx Mgmt	Traffic volume, which is received by AP (Access Point) in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.
Tx Mgmt	Traffic volume, which is transmitted by AP (Access Point) in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic
Total Traffic	
Total Traffic	Is the sum of the user traffic and management traffic.
Rx Total	Is the sum of the Rx user traffic and management traffic.
Tx Total	Is the sum of the Tx user traffic and management traffic.
Relationship between various traffic metrics	
<ul style="list-style-type: none"> • Total Traffic = User Traffic + Management Traffic = Rx Total + Tx Total • Rx Total = Rx User + Rx Management • Tx Total = Tx User + Tx Management • User Traffic = Rx User + Tx User • Management Traffic = Rx Management + Tx Management 	
Average Traffic Rate	Traffic volume divided by the selected time period, displayed in bits per second. For example, if the traffic volume for a 15 minutes period is 100GB, the average traffic rate is 889Mbps.
Unique Client	<p>A Wi-Fi client, uniquely identified by its MAC address.</p> <p>NOTE <i>All Radios</i> unique count will not be larger than the sum of the 2.4GHz and 5GHz radios. This is because a Wi-Fi client could connect to both radios within the selected time granularity, and <i>All Radios</i> unique count will consider this client as a single count.</p>
Session	<p>In SCI, session refers to IEEE 802.11 session. This is an OSI Layer 2 session that is established when a Wi-Fi client associates to an access point and it ends when the client disassociates from the access point.</p> <p>NOTE This is NOT the same as OSI Layer 7 application layer sessions, like a HTTP session, telnet session, etc. More often than not, a single IEEE 802.11 session cannot support multiple application layer sessions, and the creation and termination of IEEE 802 sessions are often transparent to the user at the application layer.</p>

Navigating the SCI User Interface

The SCI user interface consists of four major sections: a header panel at the top, a navigation bar to the left of the screen, an expandable Schedules panel, and the main content panel.

Use the navigation bar on the left side of the screen to access any of the built-in reports, customize the way you view your data using the Data Explorer, or configure administrator settings.

The following image illustrates the four main sections of the SCI user interface. Refer to the table below for descriptions of each web interface element.

FIGURE 1 SCI web interface elements

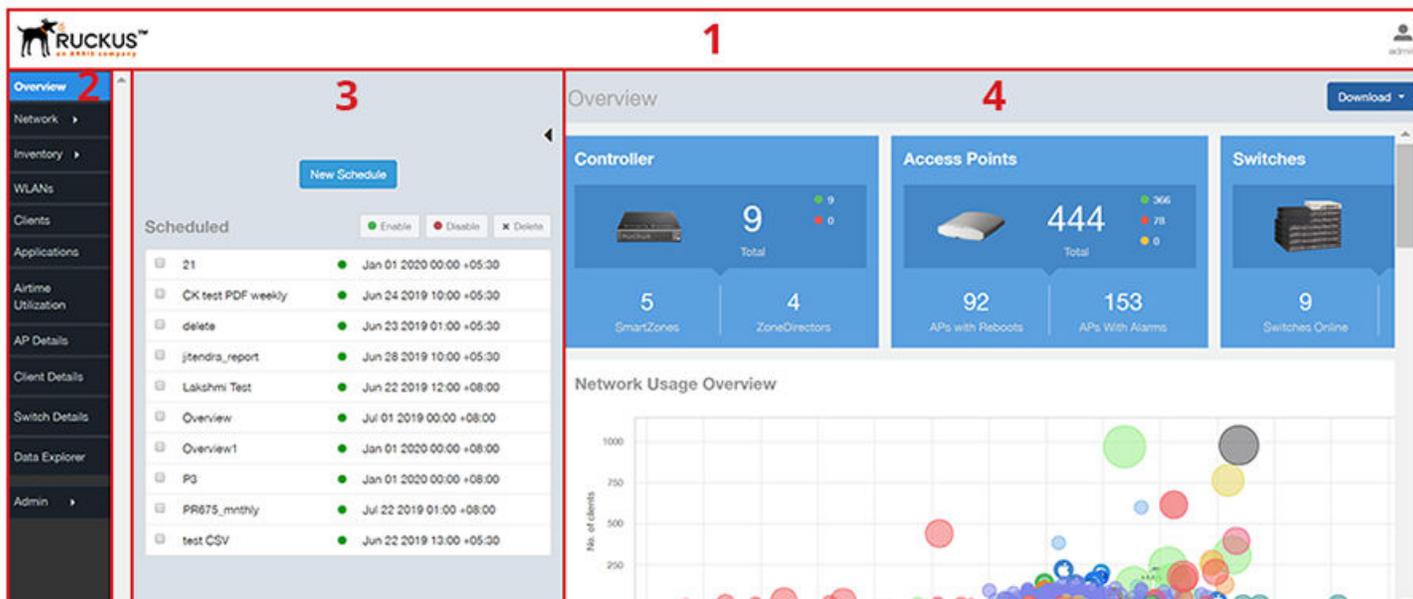


TABLE 4 SCI web interface elements

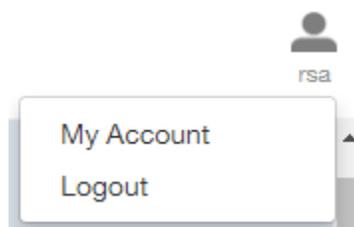
No.	Name	Description
1	Header Panel	Displays the currently logged in user profile. Click the user icon  to update the profile or change the password as required.
2	Navigation Bar	Contains links that take you to the various dashboards and the Data Explorer cubes and Admin console.
3	Schedules Panel	Allows you to create schedules for generating and delivering reports.
4	Content Panel	This large section contains the content of the page you are currently viewing.

Header Panel

The header panel contains information about the user.

When you click the user icon  a pop-up appears with two options.

FIGURE 2 User Information pop-up



Click the:

- **My Account** link to launch the My Account screen and enter user information.
- **Logout** link to log out of SCI.

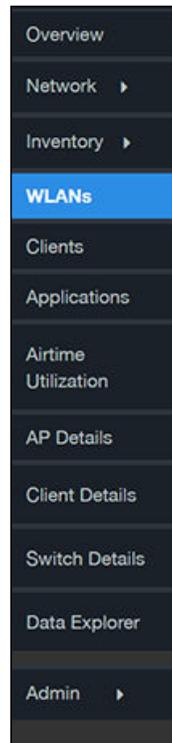
FIGURE 3 My Account

The screenshot displays the 'My Account' interface. At the top, there is a header bar with the text 'My Account'. Below this, the 'Profile' section contains four input fields: 'Email:*' with the value 'ops@ruckuslbs.com', 'Username:*' with 'admin', 'First Name:*' with 'First', and 'Last Name:*' with 'Last'. A blue 'Update Profile' button is positioned below these fields. The 'Password' section follows, featuring three input fields: 'Current Password:', 'New Password:' (with a placeholder 'Minimum 8 characters'), and 'Confirm Password:' (also with 'Minimum 8 characters'). A blue 'Change Password' button is located at the bottom of this section.

You can add profile information such as email ID for the user, and click the **Update Profile** button to save the change. You can also enter, change and confirm your password, and click the **Change Password** button to save the changes.

Using the Navigation Bar

Use the navigation bar to access all dashboards of the SCI, as shown in the following figure.



The main actions you can take from the navigation bar include:

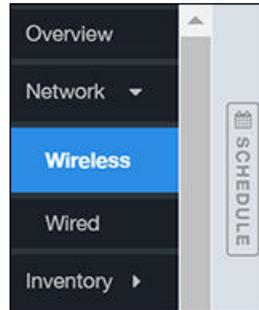
- Using the **Admin** console. The Admin console is where you add controllers to your network. The admin console also shows the health of the system and checks for updates. Links to view the status of external sources that SCI uses, such as Hadoop, Spark and Druid, are also provided.
- Using **Data Explorer**. Data Explorer is a custom reporting tool that allows you to manipulate an OLAP (Online Analytical Processing) cube to address the needs of a wide variety of users. Refer to [Data Explorer and Data Cubes](#) on page 115 for details.
- Generating reports. The remaining dashboards in SCI can be used to generate reports.
 - To filter the content displayed, click either the **AP - SSID - Radio** filter or the **Time Period** filter. For more information about using filters to generate specific reports, refer to the [Working With Filters](#) on page 27
 - To download a copy of the content currently displayed on the screen, click **Download**, and select **CSV** or **PDF** as the file type.

Using the Scheduler

The Scheduler allows you to create schedules to generate reports to be sent out to recipients.

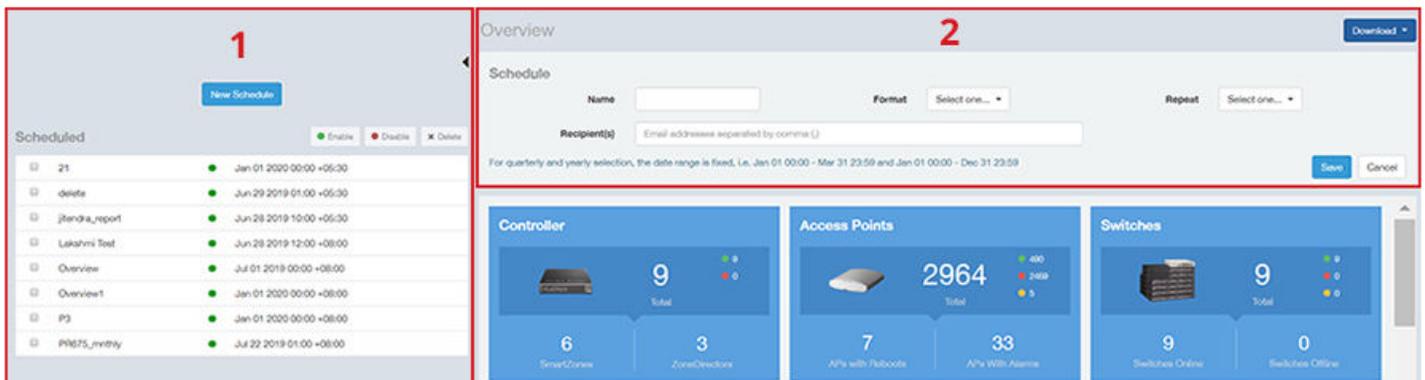
To invoke the Scheduler, click the thin "Schedule" frame just to the right of the navigation bar in any of the report dashboards. The example below is from the Overview dashboard.

FIGURE 4 Schedule frame to click to invoke Scheduler



The Scheduler allows you to create reports at set dates and times. The area numbered 1 in the figure below contains the Schedules frame. The black arrow head at the top right hand corner of the Schedules frame works like a toggle switch, and allows you to expand or collapse the frame. Select the **New Schedule** button on the top of the Scheduler to create a new schedule. The **Create Schedule** screen appears, as shown in the area numbered 2 in the figure below.

FIGURE 5 Scheduler on the Overview Dashboard



- **Name:** Enter the name of the schedule.
- **Format:** Select the format of the report from the drop down list, either PDF or CSV.
- **Repeat:** Select a time frame for the schedule, whether Daily, Weekly, Monthly, Quarterly, or Yearly. If you select Daily, you also need to set the hour from the Hour drop down list. If you select Weekly, you also need to set the Day of Week and Hour. If you select Monthly, you also need to set the Day of Month and Hour. If you set Quarterly or Yearly, the date range is fixed before hand.
- **Recipient(s):** Enter the email addresses of one or more recipients. If you have more than one email address to enter, separate the email addresses with a comma.

Click **Save** to save the schedule details. A new schedule is created and listed in the Schedule frame numbered 1 in the figure above.

NOTE

The Scheduler creates reports one hour after the specified time regardless of whether data exists.

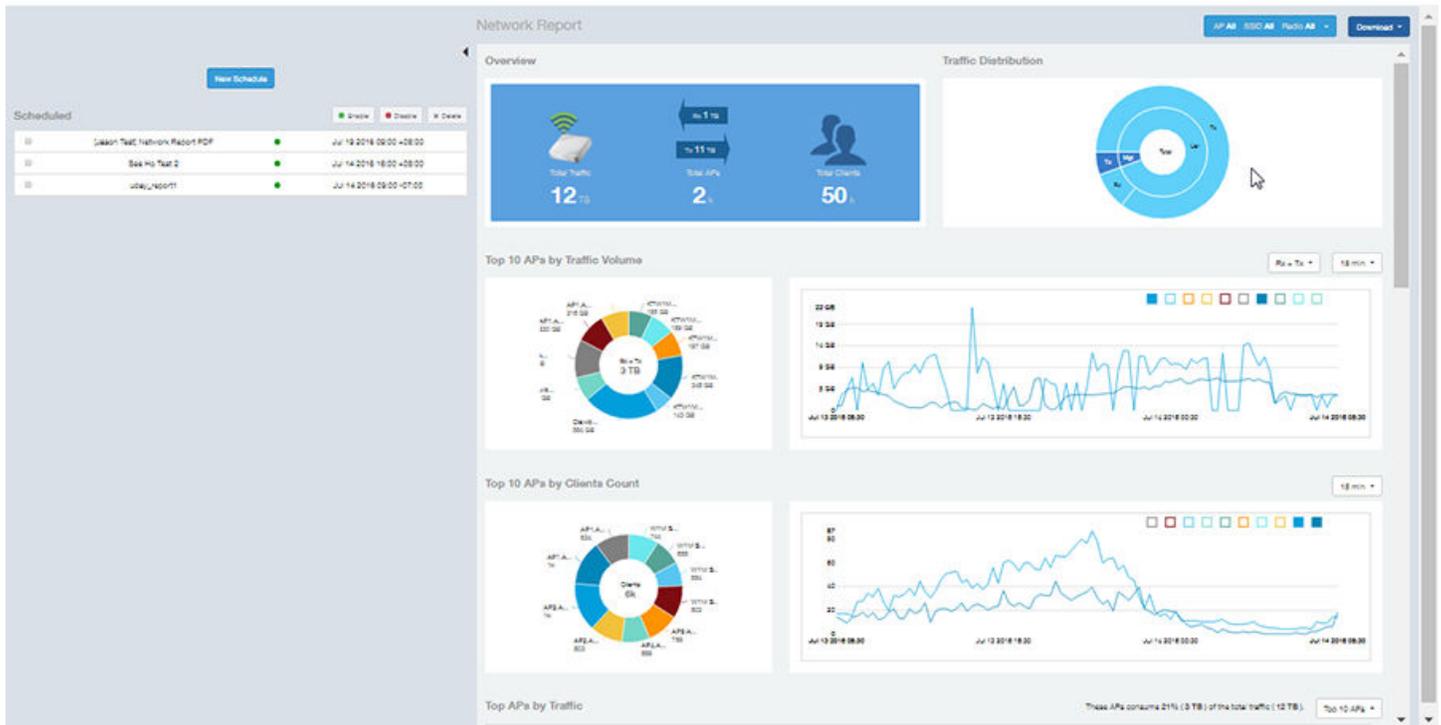
The Schedule frame contains the list of created schedules, and above this list of schedules, the **Enable**, **Disable**, and **Delete** buttons. Select the schedule from the list and click the:

- **Enable** button to activate the schedule.
- **Disable** button to deactivate the schedule.

- **Delete** button to remove the schedule.

The schedule frame is integrated into all the report dashboards. All the filters and functionality of the dashboards can be used to create reports to be sent at specific dates and times to recipients. A sample Network Wireless dashboard is shown in the figure below. Refer to the specific dashboard for the description of how the dashboard and filters work.

FIGURE 6 Network - Wireless Dashboard Containing Schedules



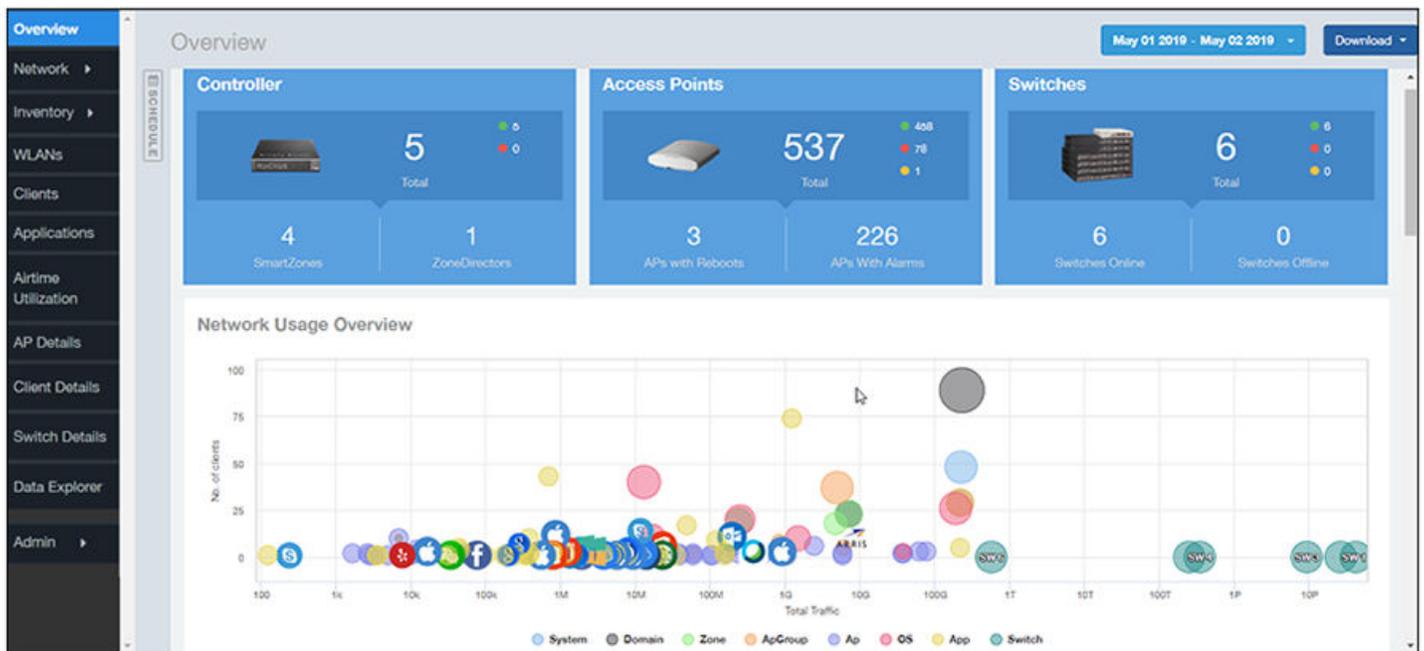
Overview Dashboard

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Using the Overview Dashboard: Content Panel

The Overview Dashboard is the main dashboard that is displayed when you log in to SCI. It provides an overview of some important statistics of your WiFi network, shown in the figures below.

FIGURE 7 Overview Dashboard : Top Portion



The top portion of the **Overview Dashboard** shows the following files:

- **Controller:** Displays the number of controllers being used in your Wi-Fi network. The green and red dots show the number of active (green) and inactive (red) controllers.
- **Access Points:** Shows the number of APs in the network. The green, red, and yellow dots show the number of active APs (green), inactive APs (red), and provisioned, in discovery, or rebooting APs (yellow).
- **Switches:** Shows the number of switches in the network. The green, red, and yellow dots show the number of active switches (green), inactive switches (red), and provisioned, in discovery, or rebooting switches (yellow).
- **Network Usage Overview:** Shows the relationship between the number of clients and the total traffic in the network. The bubble chart contains bubbles of different colors that indicate different dimensions of the network, including application, domain, OS type, zone, AP, system, AP group, switch, and SSID. Pause the pointer on an individual bubble to display the number of connected clients and traffic information. Bubble sizes vary depending on their values (except for APs and Switches).

Overview Dashboard

Using the Overview Dashboard: Content Panel

FIGURE 8 Overview Dashboard: SmartCell Insight

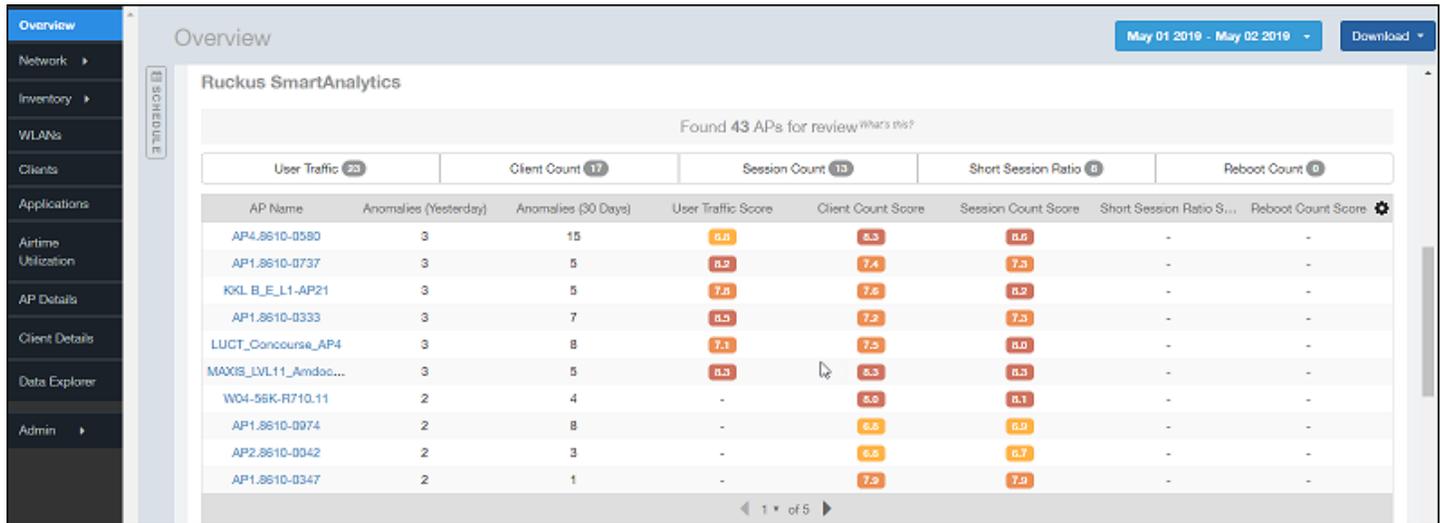
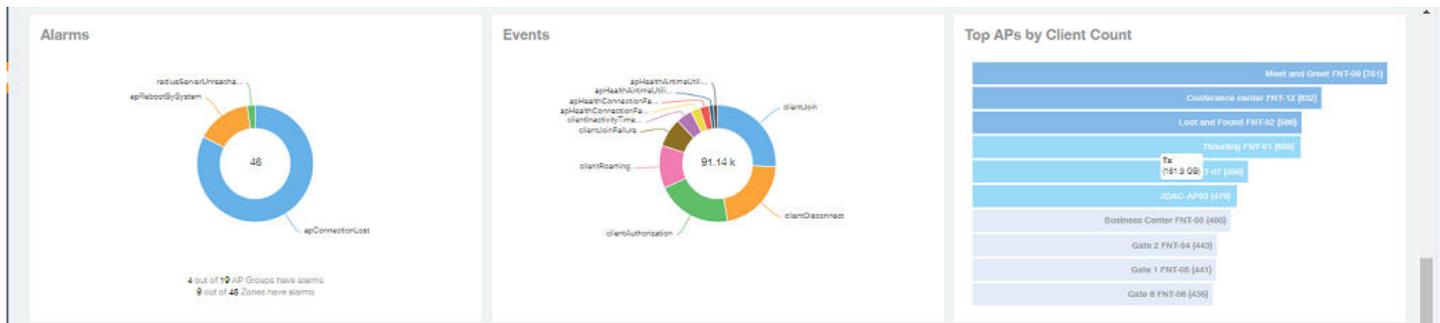


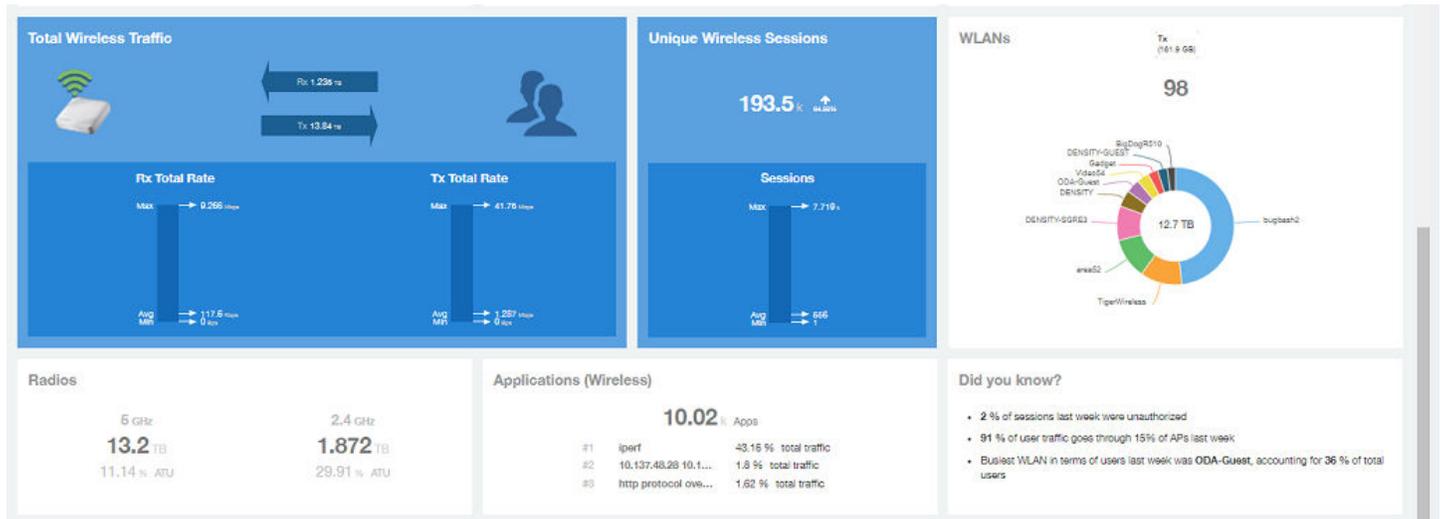
FIGURE 9 Overview Dashboard: Middle Portion



The middle portion of the **Overview Dashboard** shows the following tiles:

- **Alarms:** Displays the most frequently occurring alarms in the network. Pause the pointer over a color or name to display the full name of the alarm. Go to the Data Explorer dashboard for more information about alarms.
- **Events:** Displays the most frequently occurring events in the network. Pause the pointer over a color or name to display the full name of the event. Go to the Data Explorer dashboard for more information about events.
- **Top APs by Client Count:** Displays the APs being accessed by the most clients. This information is also represented in more detail in the **Wireless Report**.

FIGURE 10 Overview Dashboard: Lower Portion



The lower portion of the **Overview Dashboard** shows the following tiles:

- **Total Traffic:** Shows statistics about traffic received and transmitted by the access points, including the maximum and minimum rates of traffic. Go to the **Wireless Report** for more information about traffic.
- **Total Unique Sessions:** Shows the number of IEEE 802.11 sessions between all clients and APs on the network. Go to the **Data Explorer** dashboard for more information about sessions.
- **WLANs:** Displays the top SSIDs by traffic, which is also shown in the **WLANs Report**. Pause the pointer over a portion of the donut display to obtain more information about each SSID.
- **Radios:** Displays client data usage, in terabytes, for both the 2.4 GHz and 5.0 GHz networks. For more information about radios, go to the **Airtime Utilization Reports**.
- **Applications:** Shows the applications being used more frequently by the clients in the network. For more information about applications usage, go to the **Applications Reports**.
- **"Did you know?":** Provides a short, bulleted list about your system, such as the average duration of a session for a week, or the busiest SSID. The "Did you know?" section is updated every time you return to the **Overview Dashboard**.

Using Ruckus Smart Analytics

Ruckus Smart Analytics uses advanced analytics techniques to identify APs that are exhibiting different-from-normal behavior, and flags them for review.

If an AP is flagged for review, it does not necessarily mean that there is a problem with the AP. It just means that Ruckus Smart Analytics detected outside-of-normal behavior for that AP. An AP is flagged for review under the following conditions:

- **User Traffic:** An AP is flagged for review when the User Traffic is unusually high or low compared to the expected trends
- **Client Count:** An AP is flagged for review when the Client Count is unusually high or low compared to the expected trends
- **Session Count:** An AP is flagged for review when the Session Count is unusually high or low compared to the expected trends
- **Short Session Ratio:** An AP is flagged for review when the ratio of short sessions per total sessions becomes unusually high.
- **Reboot Count:** An AP is flagged for review when the number of times the AP has been rebooted is unusually high.

The following figure shows an example of Ruckus Smart Analytics output, which appears only on the Overview dashboard:

FIGURE 11 Default Display Example of Ruckus SmartAnalytics

The screenshot shows the Ruckus SmartAnalytics dashboard. At the top, it says "Found 51 APs for review" with a link "What's this?". Below this are five tabs: "User Traffic 16", "Client Count 12", "Session Count 10", "Short Session Ratio 14", and "Reboot Count 9". The main table has columns for AP Name, Anomalies (Yesterday), Anomalies (30 Days), User Traffic Score, Client Count Score, Session Count Score, Short Session Ratio, and Reboot Count Score. The scores are color-coded: deep red (9-10), orange red (8-9), amber (7-8), deep yellow (6-7), and bright yellow (5-6). A gear icon is on the right of the Reboot Count Score column. At the bottom, there is a pagination control showing "1 of 6".

AP Name	Anomalies (Yesterday)	Anomalies (30 Days)	User Traffic Score	Client Count Score	Session Count Score	Short Session Ratio...	Reboot Count S...
AP1	3	0	7.4	7.1	7.3	-	-
AP2	2	20	8.5	-	-	8.1	-
AP3	2	1	-	6.8	7.9	-	-
AP4	2	0	-	6.6	6.7	-	-
AP5	2	0	-	6.8	7.0	-	-
AP6	2	1	-	7.0	7.1	-	-
AP7	2	11	-	7.7	7.8	-	-
AP8	2	7	-	8.2	7.4	-	-
AP9	2	0	-	7.4	7.4	-	-
AP10	1	0	-	-	6.9	-	-

After the first few days, the system begins showing results, but the accuracy of the results improves over time, as the system learns more about the AP user traffic, client and session patterns. The results are usually accurate after one month, when the system completes learning and understands the short-term, medium-term and long-term trends for each of these metrics for each AP. The list of APs for review is refreshed every 24 hours.

NOTE

At the top of the SmartAnalytics display, shown above, each anomaly type (User Traffic, Client Count, Session Count, Short Session Ratio, and Reboot Count) has a number in grey. These numbers indicate the total number of access points flagged for possible problems for the corresponding anomaly type.

Actions You Can Perform on the Smart Analytics Display

The default display of the Ruckus SmartAnalytics information shows all possible anomalies for all access points that you have currently selected. You can do the following:

- To interpret the color coding and associated scores, note that the closest the score is to 10, the more likely there is to be an issue with the AP for the corresponding anomaly type:
 - Deep red = a score in the range of 9 to 10
 - Orange red = a score in the range of 8 to 9
 - Amber = a score in the range of 7 to 8
 - Deep yellow = a score in the range of 6 to 7
 - Bright yellow = a score in the range of 5 to 6
- Click on any AP to go to the AP Details dashboard for that AP, where you can then view anomaly charts for details, as shown in [How to View Details from the Ruckus Smart Analytics Display](#).
- Use the gear icon on the upper right of the SmartAnalytics display to customize the output.
- Click on any of the Anomaly tabs to display the output for only the tabs you select. For example, if you want to view only the access points that have a possible anomaly with reboot count, highlight the Reboot Count tab only. The following figure shows a sample display for this scenario (note that the Reboot Count tab has been selected and appears in gray below):

FIGURE 12 Ruckus SmartAnalytics Output When Filtering on Reboot Count Only

Ruckus SmartAnalytics									
Found 51 APs for review <small>What's this?</small>									
User Traffic 16		Client Count 12		Session Count 10		Short Session Ratio 14		Reboot Count 9	
AP Name	Anomalies (Yesterday)	Anomalies (30 Days)	User Traffic Score	Client Count Score	Session Count Score	Short Session Ratio...	Reboot Count S...		
AP11	1	30	-	-	-	-	8.6		
AP12	1	0	-	-	-	-	7.1		
AP13	1	3	-	-	-	-	6.6		
AP14	1	2	-	-	-	-	6.6		
AP15	1	2	-	-	-	-	6.4		
AP16	1	2	-	-	-	-	6.4		
AP17	1	0	-	-	-	-	6.4		
AP18	1	4	-	-	-	-	6.2		
AP19	1	2	-	-	-	-	6.2		

- To sort anomalies by one of the scores, click on the desired column, then use the arrow that appears. The screen below shows sorting on Client Score Count, with the highest score on top.

Ruckus SmartAnalytics									
Found 51 APs for review <small>What's this?</small>									
User Traffic 16		Client Count 12		Session Count 10		Short Session Ratio 14		Reboot Count 9	
AP Name	Anomalies (Yesterday)	Anomalies (30 Days)	User Traffic Score	Client Count Score ▼	Session Count Score	Short Session Ratio...	Reboot Count S...		
AP1	2	0	-	8.6	8.7	-	-		
AP2	2	7	-	8.2	7.4	-	-		
AP3	2	11	-	7.7	7.8	-	-		
AP4	1	4	-	7.6	-	-	-		
AP5	2	0	-	7.4	7.4	-	-		
AP6	3	0	7.4	7.1	7.3	-	-		
AP7	2	1	-	7.0	7.1	-	-		
AP8	1	0	-	6.9	-	-	-		
AP9	2	1	-	6.8	7.9	-	-		
AP10	2	0	-	6.8	7.0	-	-		

How to View Details from the Ruckus Smart Analytics Display

From the Ruckus Smart Analytics output, you can click on an AP/MAC Address link, which takes you to the AP Details Dashboard, where graphical representations of each anomaly type for that AP are shown (see the illustrations below for examples).

The following figures show examples of each anomaly type, with extra detail provided when you place your cursor over a portion of the chart.

FIGURE 13 Client Count

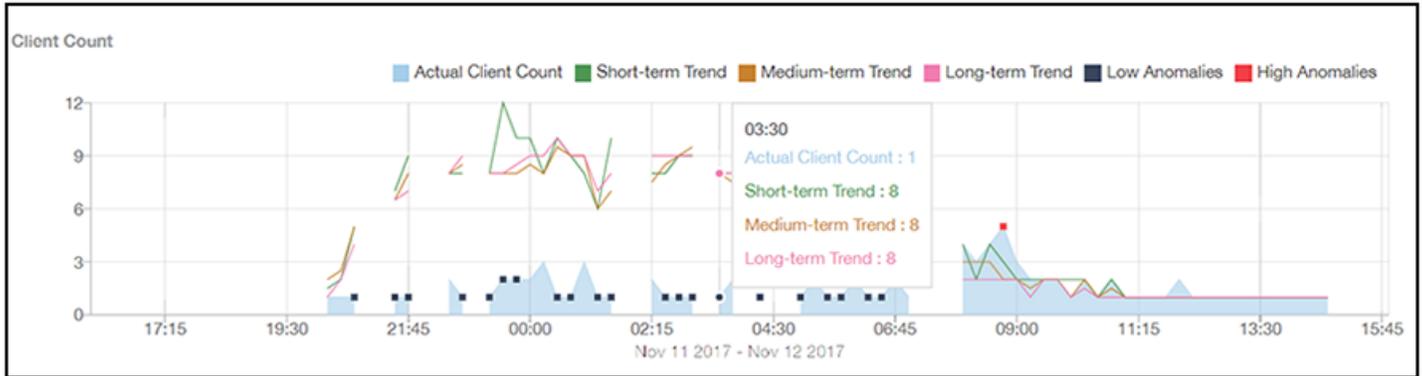


FIGURE 14 User Traffic

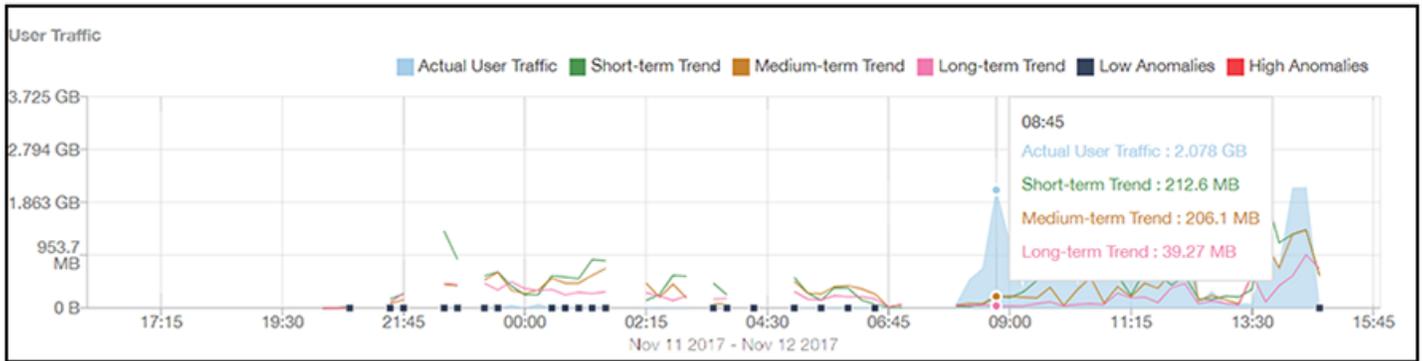


FIGURE 15 Session Count

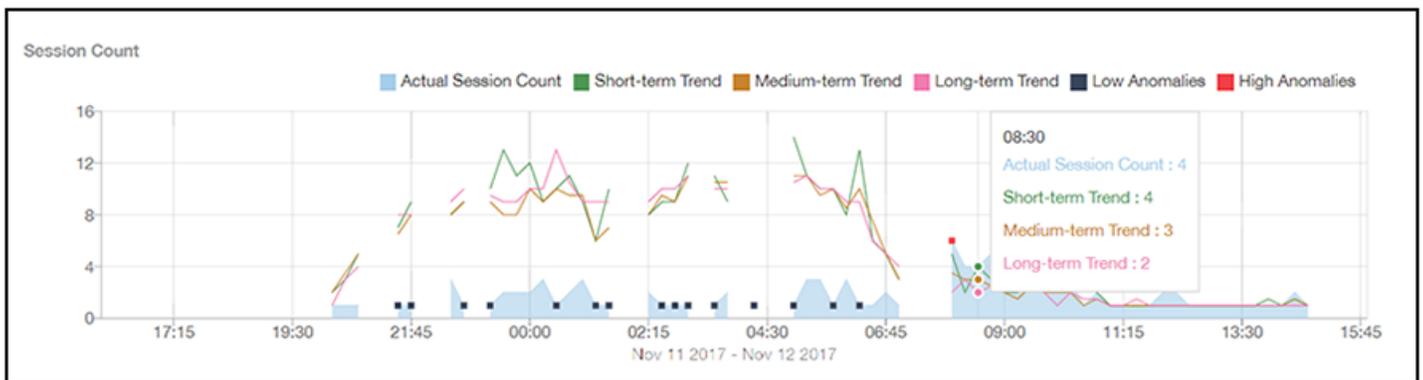


FIGURE 16 Short Session Ratio

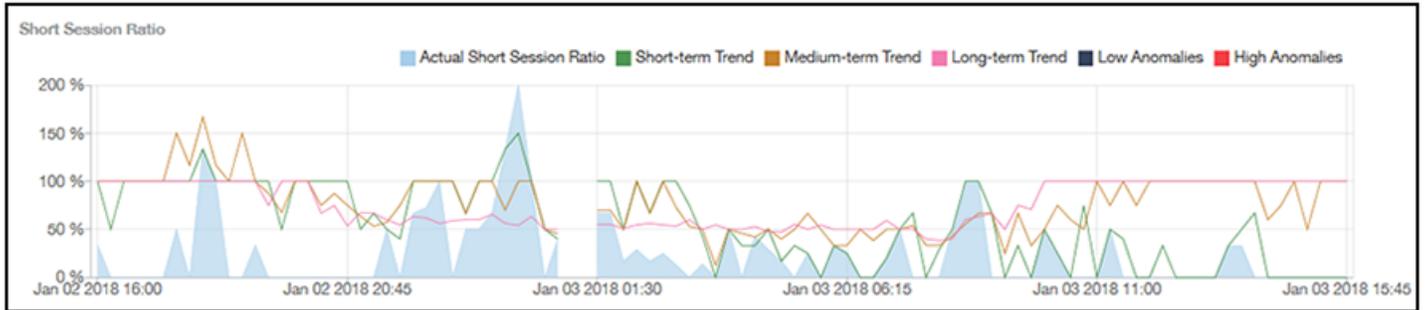
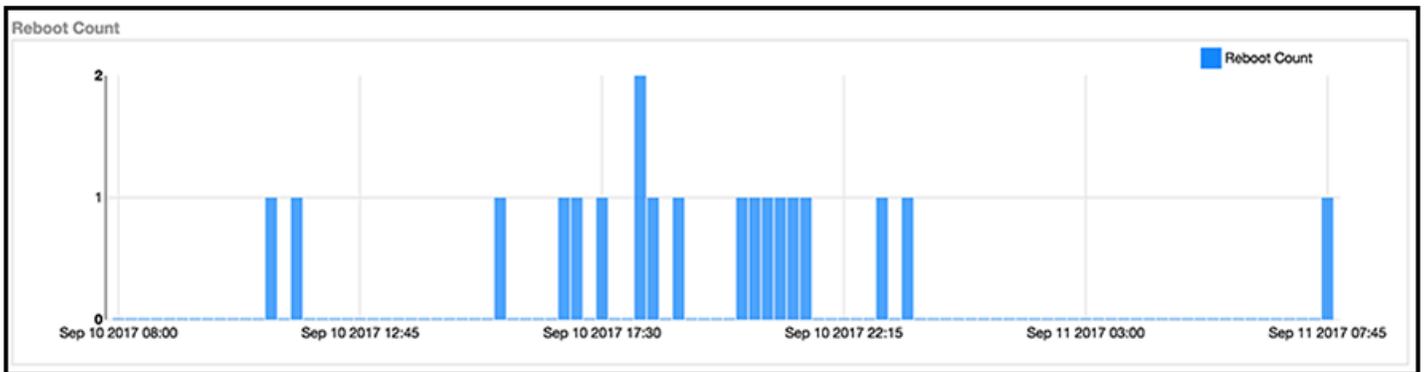


FIGURE 17 Reboot Count



Filters

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- AP, Switch, SSID and Radio filter..... 27
- Date Filter..... 32
- Export..... 32
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- Time Filter..... 33
- AP Filters..... 34
- SSID Filter..... 34
- Client Filter..... 35
- Application Filter..... 35
- Alarms Filter..... 35
- Events Filter..... 36
- Sessions Filter..... 36

Working With Filters

Filters are built into the report dashboards so that you can segregate and drill down into the data.

By selecting APs and setting a date range, you can examine specific subsets of data for any AP or group of APs for any time period in any of your wireless networks. For example, if you want to see just the total traffic and client counts for a certain AP on a certain day, you could use the Network Overview report, and simply select that AP and date only.

The same filters are available on all dashboards:

- **AP/Switch/SSID/Radio** (Also contains the **Saved Filters**.)
- **Date Filter**

Once you have filtered the data, you can use the **Export** button to download the current dashboard reports in CSV or PDF format.

FIGURE 18 AP/Radio Filter, Date Filter, Saved Filters, and Export button



AP, Switch, SSID and Radio filter

Use these filters to generate SCI dashboards.

Saved Filters is a global filter that shows filters for all reports at all times and is not populated only based on the report you are viewing - it applies to the entire application, and both AP and switch filters are seen in one view.

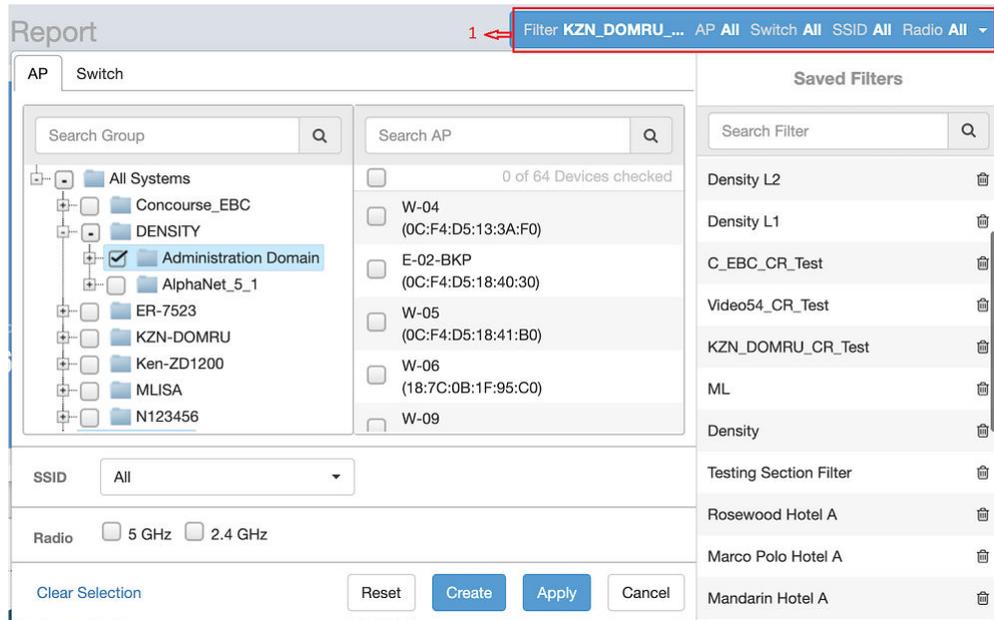
Custom AP, Switch, SSID and Radio Filter: The user can select APs, Switch, SSID and Radio (numbered **1** in the figure below) to view and analyze data.

You can use the search function within the **Saved Filters** section to find a filter.

Filters

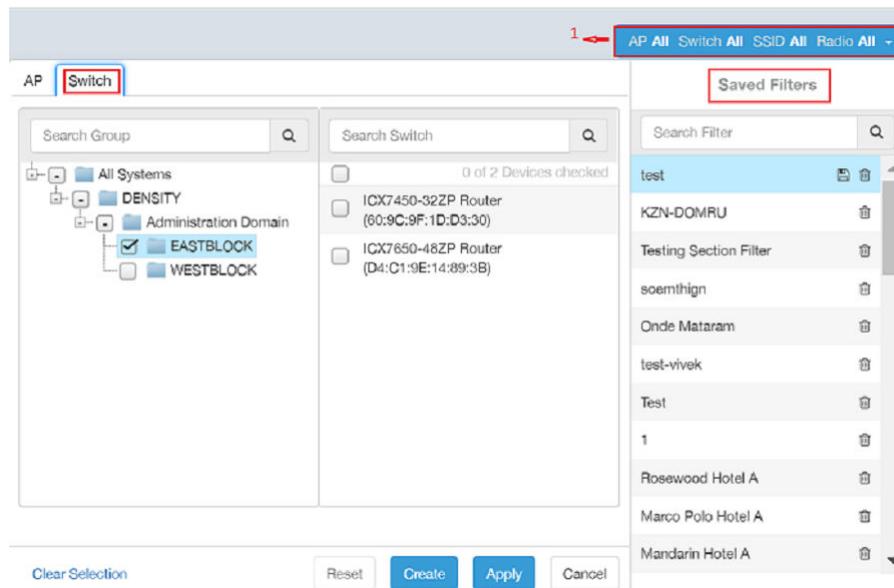
AP, Switch, SSID and Radio filter

FIGURE 19 Custom AP and Radio Filter



- The APs area contains a nested list of APs. You need to click on one of the system names and continue to expand the list to drill down to the APs. The hierarchy of the list is: System > Controller > Domain > Zone > AP group > AP. You can select the AP, or/and controller, or/and zone as per your requirement. If you select a particular zone or AP group, the total number of APs is displayed. You can search the APs by AP name, and AP MAC. You can also search by controller, zone, AP group, and even a partial string.
- The SSID dropdown lists contains a nested list of SSID. You can select the SSID and by default all SSID is selected. You can select or deselect all SSID or a particular SSID.
- Radio select 5 or 2.4 or both GHz.
- The Switch area contains a nested list of switches. You need to click on one of the system names and continue to expand the list to drill down to the switches. The hierarchy of the list is: System > Controller > Domain > Zone > switch. You can select the switch, or/and controller as per your requirement. If you select a particular switch group, the total number of switches are displayed. You can search the switches by switch name, and switch MAC address. You can also search by controller, zone, switch group, and even a partial string.

FIGURE 20 Custom Switch and Radio Filter



Follow these steps to:

1. Choose the AP, Switch, SSID and Radio filters.
2. Click the **Apply** button to apply the currently selected filter options (nothing is saved on the database).
3. Use the **Reset** button to clear the previously applied filter.
4. Click the **Create** button to create a filter
5. Click **Cancel** to cancel the filter selection.
6. Use the **Clear Selection** option to clear all the elements above.

Using Saved Filters

SCI allows you to create custom filters and then save them for future use. For all dashboards that support filters, you can create any number of customized filters from which to run reports. This can be useful if you want to use a specific filter repeatedly for a specific set of APs, for example.

The bar at the top of a dashboard that support filters is shown below:

FIGURE 21 Radio, Date and Export bar



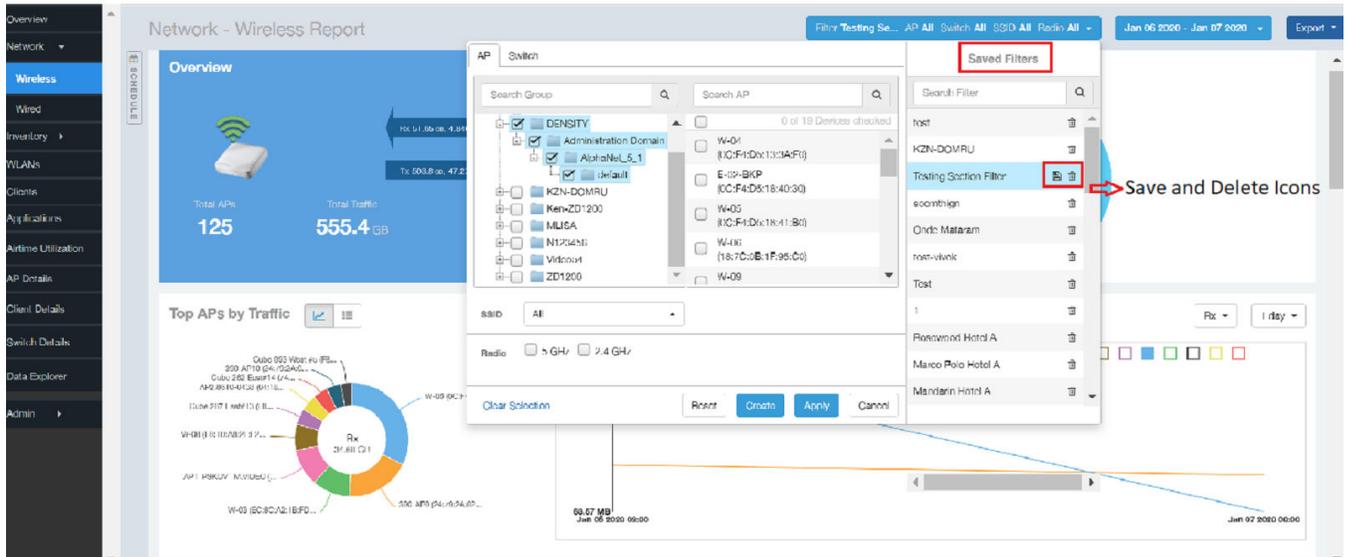
The following steps show an example of how to create and save a new filter:

1. Open a dashboard for which you want to create a filter. For example, if you want to create a saved filter for the Network Wireless dashboard, the upper portion of that dashboard is shown below.

Filters

AP, Switch, SSID and Radio filter

FIGURE 22 Network Wireless Dashboard



2. Make the desired selections to any filter.
3. To save these settings so that they can be used again at a later time, click the **Update** icon.

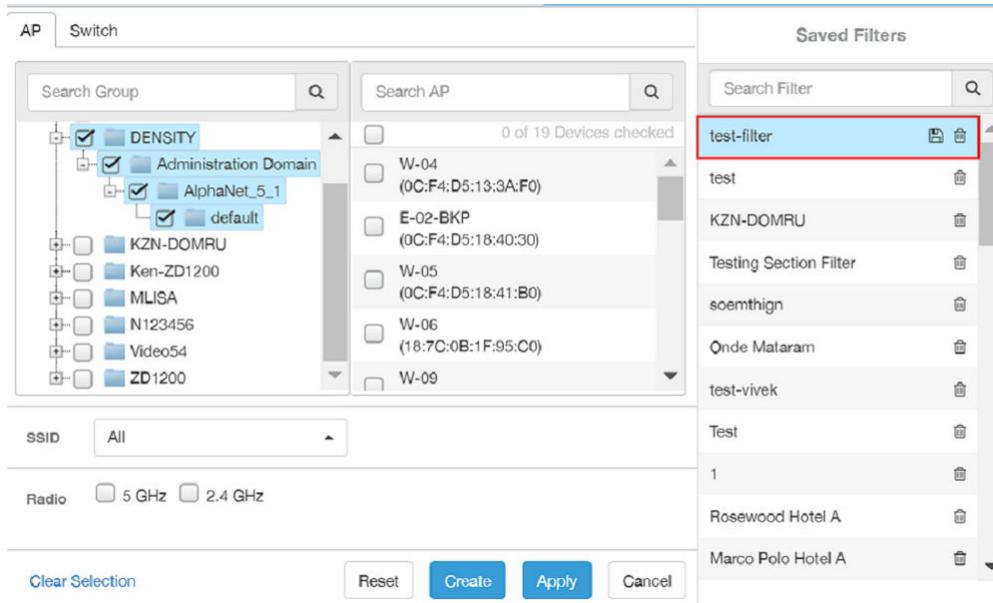
This icon allows you to make changes to an existing saved filter, including changing the filter name if desired. Make any changes you wish to the filter selections, then select Update.

4. Click the **Create** button to create a filter. A dialogbox is displayed requesting the name of the filter. Enter the name of the filter and click **Create**. The filter that is created is displayed under the **Saved Filters** section.

FIGURE 23 Creating a Filter

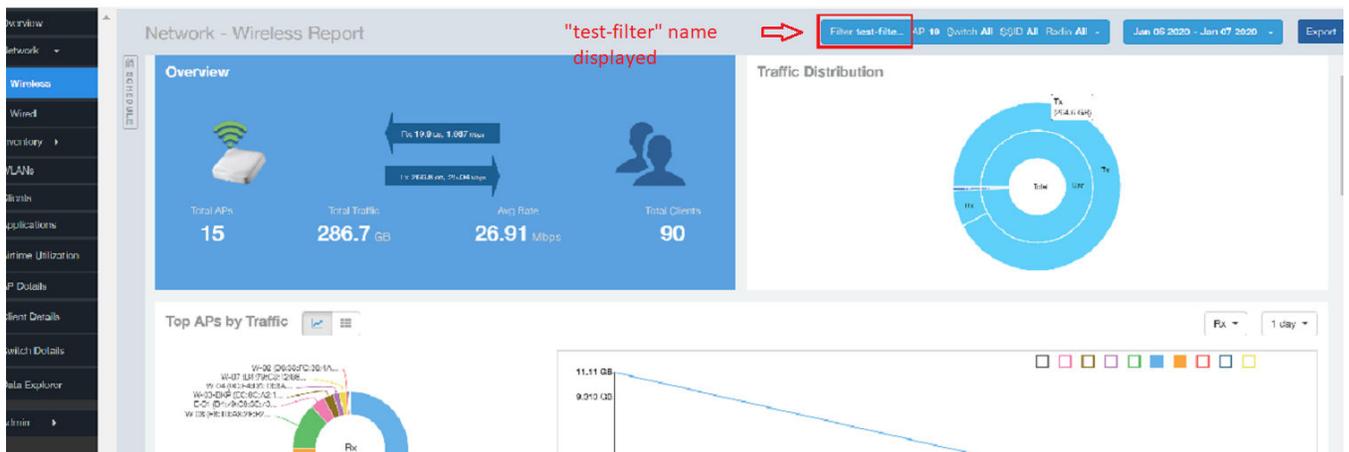


FIGURE 24 New filter created and listed and under Saved Filters



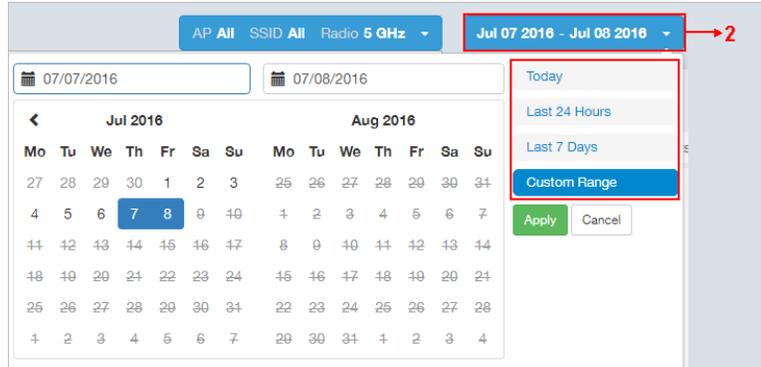
- Click **Apply** to incorporate the filter changes to the Network Wireless dashboard in this example. The dashboard is updated based on the filter changes.

You can also view the name of the filter in the dashboard to confirm that the right filter is applied.



Date Filter

FIGURE 25 Custom Date Filter



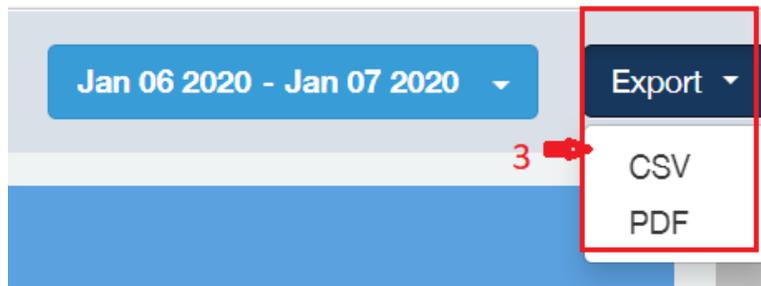
Custom Date Select a date range to update the dashboard. You can plot time for a certain period which could be today, last 24 hours, last 7 days, or a custom range (default value). This filter is numbered as 2 in the figure above.

Click on **Apply** to save the specified filters and to update the dashboard.

Export

Use the export option to export the report in either CSV or PDF format.

FIGURE 26 Export option



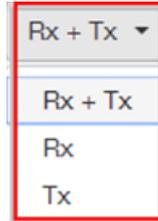
This filter (numbered 3 in the figure above) is available on most dashboards.

Click on the format required. The report is downloaded, which needs to be opened and saved to the selected drive.

Rx+Tx Filter

Use Rx+Tx filters to choose operating ranges in various dashboards.

FIGURE 27 Rx+Tx filter



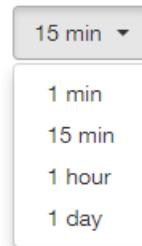
Select the Rx+Tx (default value), Rx, or Tx operating ranges. This filter can be used in the Network, WLAN and Application dashboards.

Time Filter

Time filter for various dashboards allows you to specify the level of granularity.

The smaller the amount of time you specify, the more detail will appear in the corresponding dashboard.

FIGURE 28 Time filter

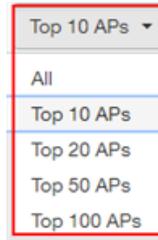


Specify the time frame of 1 minute, 15 minutes (default value), 1 hour or 1 day for applicable dashboards.

AP Filters

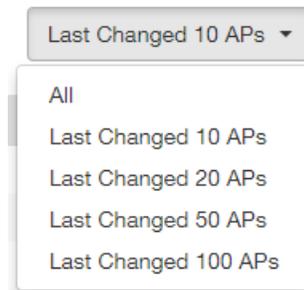
AP filters for various dashboards.

FIGURE 29 Top 100 APs



Specify the APs filter of top 10 (default value), 20, 50, or 100 for applicable dashboards.

FIGURE 30 Last Changed 10 APs



Specify the changed APs to display; the default is 10.

SSID Filter

SSID filter for WLAN dashboard.

FIGURE 31 SSID filter



Specify the SSID filter of top 10 (default value), 20, 50, or 100 SSIDs for WLAN traffic and client sections.

Client Filter

Use the Client filter for determining client usage.

FIGURE 32 Client filter



Specify the client filter of top 10 (default value), 20, 50, or 100 for client and trends section in the Client dashboard.

Application Filter

Application filter for the Applications dashboard:

FIGURE 33 Application filter

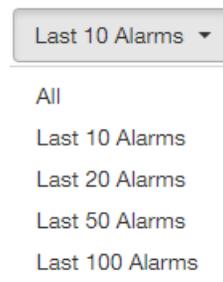


Specify the application filter of top 10 (default value), 20, 50, or 100 for the Applications dashboard sections of traffic and client reports.

Alarms Filter

Specify the last 10 (default value), 20, 50, or 100 alarms to display on applicable dashboards.

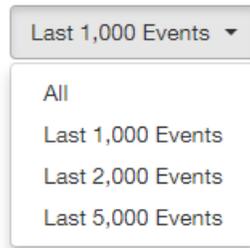
FIGURE 34 Alarms Filter



Events Filter

Specify the last 1,000 (default value), 2000, or 5,000 events to display on applicable dashboards.

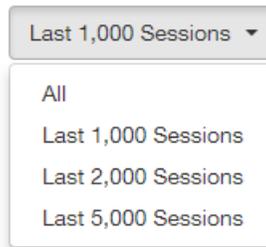
FIGURE 35 Events Filter



Sessions Filter

Specify the last 1,000 (default value), 2000, or 5,000 sessions in applicable dashboards.

FIGURE 36 Sessions Filter



Network Report Dashboard

- [Wireless Network Report](#)..... 37
- [Wired Network Report](#)..... 42

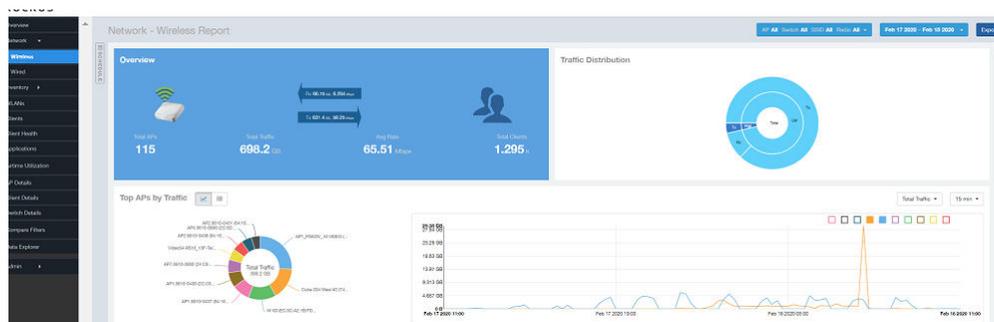
Wireless Network Report

The **Wireless Network Report** provides details of traffic, clients, and trends by APs, SSIDs, radio, or clients over time.

From the navigation bar, select **Network > Wireless**.

The following figure shows only the upper portion of the **Wireless Network Report** update.

FIGURE 37 Wireless Network Report (Upper Portion Only)



The **Wireless Network Report** consists of the following components:

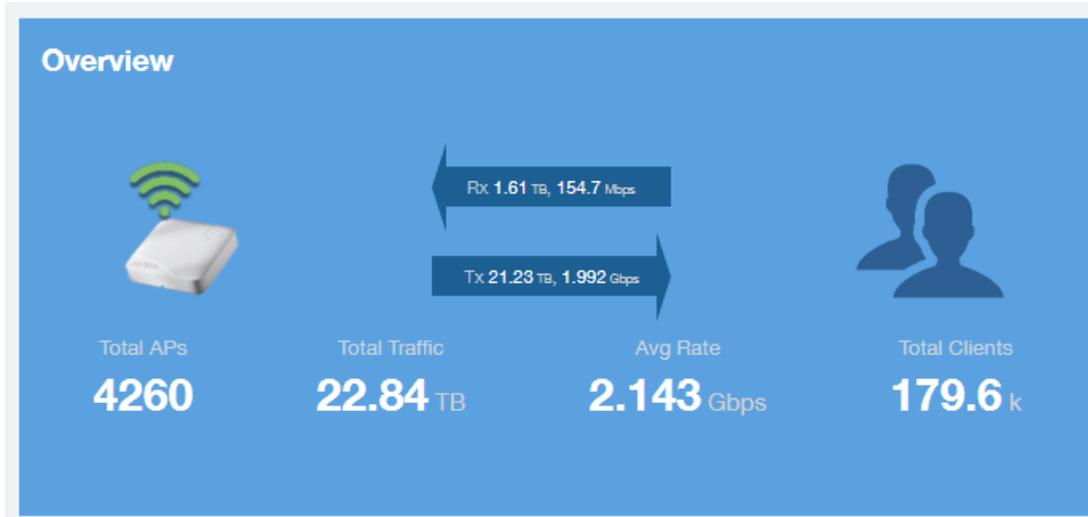
- Overview tile
- Traffic Distribution chart
- Top APs by Traffic tile
- Top APs by Client Count graph
- Traffic Trend graphs
- Traffic Over Time graph

Overview Tile

The **Overview** tile of the **Wireless Network Report** provides a general overview of the entire network. It displays the following information, based on your selection of APs, SSID, radio, and date range filters.

- Total number of APs
- Total traffic and the average traffic rate
- Total traffic received and transmitted and the average traffic rate
- Total number of clients on the network

FIGURE 38 Wireless Network Report: Overview Tile



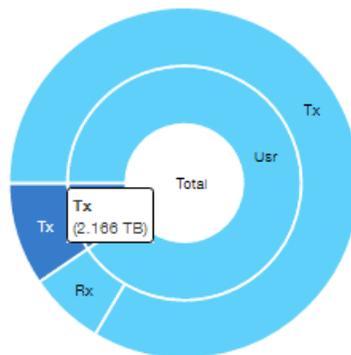
Traffic Distribution Tile

The **Traffic Distribution** donut chart displays the distribution of traffic types. Use this chart to display management traffic compared to user traffic, for example, based on your selection of APs, SSID, radio, and date range filters.

- Tx = Transmitted traffic
- Rx = Received traffic
- Mgmt = Management traffic
- Usr = User traffic
- Total = Total of all traffic

FIGURE 39 Wireless Network Report: Traffic Distribution Tile

Traffic Distribution



Top APs by Traffic Tile

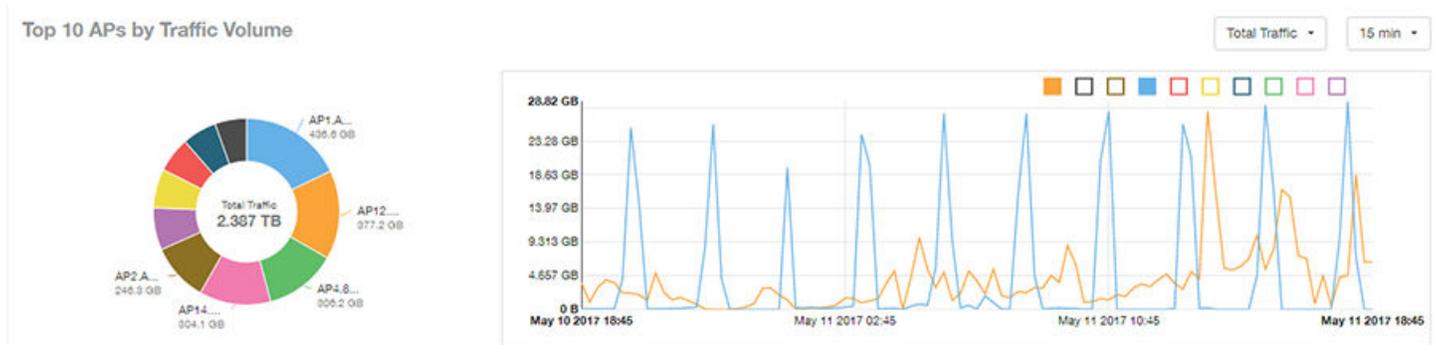
The Top APs by Traffic tile contains a donut chart and a graph. The donut chart and graph displays the APs with the highest traffic volume in the network.

In the tile, use the menus to specify the traffic type (Tx, Rx, or Tx+Rx) and the time period. Click any of the colored squares to display the selected AP details in the line graph.

NOTE

The **Traffic Type** menu applies to both the donut chart and the line graph, but the time period applies to the line graph only. This restriction applies to all reports that appear in this format (a donut chart and line graph with the Rx-Tx traffic type and a time period menu).

FIGURE 40 Wireless Network Report: Top APs by Traffic (Chart and Graph)



NOTE

If you pause the pointer over the line graph, an information box is displayed containing the selected AP details.

In the **Top APs by Traffic** table, you can view a list of the APs with the highest traffic volume, sorted according to the selected table columns. Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column.

You can select whether to display the top 10, 20, 50, or 100 APs by traffic volume from the filter. The number of rows per page can be defined using the **Rows per page** option in the table settings menu. Use the chart and table icons (📊 📄) to toggle between the chart and table views.

FIGURE 41 Wireless Network Report: Top APs by Traffic (Table)

Top APs by Traffic These APs consume 10.45 % (2.387 TB) of the total traffic (22.84 TB). Top 10 APs

Index	AP Name	AP IP Address	Controller Name	Rx Total	Tx Total	Total Traffic	Clients	⚙️
1	Your_Co_APName1	10.x.y.1	Your_Co_CTName1	731.1 MB	436.9 GB	436.6 GB	53	
2	Your_Co_APName2	10.x.y.2	Your_Co_CTName2	10.84 GB	368.3 GB	377.2 GB	119	
3	Your_Co_APName3	10.x.y.3	Your_Co_CTName3	20.73 GB	265.5 GB	306.2 GB	42	
4	Your_Co_APName4	10.x.y.4	Your_Co_CTName4	7.841 GB	296.3 GB	304.1 GB	82	
5	Your_Co_APName5	10.x.y.5	Your_Co_CTName5	8.963 GB	237.3 GB	246.3 GB	91	
6	Your_Co_APName6	10.x.y.6	Your_Co_CTName6	4.222 GB	174.5 GB	178.7 GB	255	
7	Your_Co_APName7	10.x.y.7	Your_Co_CTName7	4.47 GB	161.5 GB	166 GB	28	
8	Your_Co_APName8	10.x.y.8	Your_Co_CTName8	10.01 GB	138.7 GB	148.7 GB	67	
9	Your_Co_APName9	10.x.y.9	Your_Co_CTName9	3.707 GB	142.7 GB	146.4 GB	39	
10	Your_Co_APName10	10.x.y.10	Your_Co_CTName10	2.9 GB	131.3 GB	134.2 GB	120	

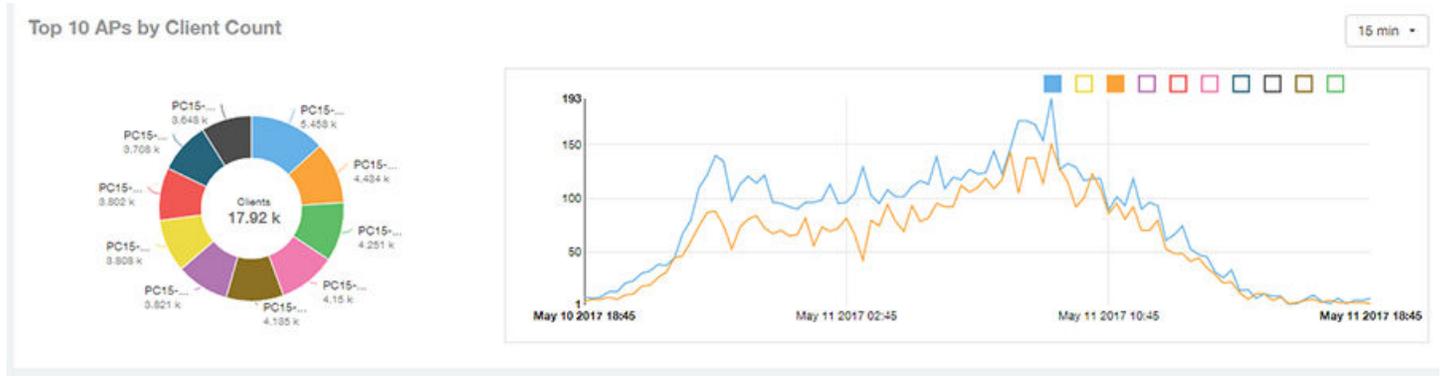
⏪ 1 of 1 ⏩

Top APs by Client Count Tile

The **Top APs by Client Count** tile contains a donut chart and a graph. The donut chart and graph along display the APs with the most clients on the network.

In the tile, use the menu to specify the time period of 15 minutes, 1 hour, or 1 day. If you pause the pointer over the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares to display the selected AP details in the line graph.

FIGURE 42 Wireless Network Report: Top APs by Client Count (Chart and Graph)



In the **Top APs by Client Count** table, click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. You can select the top 10, 20, 50, or 100 APs count from the table settings menu. The number of rows per page can be defined using the **Rows per page** option in the table settings menu. Use the chart and table icons (📊 📄) to toggle between the chart and table views.

FIGURE 43 Wireless Network Report : Top APs by Client Count (Table)

Top APs by Client Count

These APs consume 0.14 % (32.15 GB) of the total traffic (22.84 TB). Top 10 APs

Index	AP Name	AP IP Address	Controller Name	Clients	Rx Total	Tx Total	Total Traffic
1	Your_Co_APName1	10.x.y.1	Your_Co_CTName1	5,458 k	288.9 MB	2,416 GB	2,698 GB
2	Your_Co_APName2	10.x.y.2	Your_Co_CTName2	4,434 k	323.9 MB	1,171 GB	1,487 GB
3	Your_Co_APName3	10.x.y.3	Your_Co_CTName3	4,251 k	1,528 GB	989.4 MB	2,474 GB
4	Your_Co_APName4	10.x.y.4	Your_Co_CTName4	4,115 k	190.3 MB	1,961 GB	2,147 GB
5	Your_Co_APName5	10.x.y.5	Your_Co_CTName5	4,135 k	363.1 MB	4,182 GB	4,536 GB
6	Your_Co_APName6	10.x.y.6	Your_Co_CTName6	3,821 k	289.3 MB	828.4 MB	1,092 GB
7	Your_Co_APName7	10.x.y.7	Your_Co_CTName7	3,808 k	589.6 MB	13.12 GB	13.68 GB
8	Your_Co_APName8	10.x.y.8	Your_Co_CTName8	3,802 k	254.3 MB	1,049 GB	1,297 GB
9	Your_Co_APName9	10.x.y.9	Your_Co_CTName9	3,708 k	169.9 MB	583.9 MB	753.8 MB
10	Your_Co_APName10	10.x.y.10	Your_Co_CTName10	3,648 k	156.9 MB	1.85 GB	2,003 GB

⏪ 1 ▼ of 1 ⏩

Traffic Trend Graphs

The **Traffic Trend** graphs of the **Wireless Network Report** display the traffic by usage and radio over time.

If you pause the pointer over the line graph, an information box is displayed containing the selected AP details.

Traffic by Usage: You can select the traffic by usage details from the check boxes listed in the legend on top of the graph: user, total received traffic, total transmitted traffic, the total received and transmitted traffic, and the management traffic. You can select a date range or a specific date on the line graph. You can specify a time period.

Traffic by Radio: You can select the traffic by the following radio details from the check boxes listed in the legend on top of the graph: 5 GHz, 2.4 GHz, and total traffic by radio details. You can select a date range or a specific date on the line graph. These options apply to the corresponding average traffic rate graphs as well.

FIGURE 44 Wireless Network Report: Traffic Trend Graphs



Traffic Over Time Table

The **Traffic Over Time** table of the **Wireless Network Report** allows you to compare traffic over multiple time periods.

Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column.

FIGURE 45 Wireless Network Report: Traffic Over Time Table

Traffic Over Time							May 10 2017 - May 11 2017	15 min
Time Period	2.4 GHz	5 GHz	Rx Total	Tx Total	Total Traffic	Clients		
May 10 2017 18:45 - 18:59	134.2 GB	28.65 GB	11.67 GB	151.2 GB	162.9 GB	9,069 k		
May 10 2017 19:00 - 19:14	119.6 GB	26.39 GB	11.17 GB	134.8 GB	146 GB	10,22 k		
May 10 2017 19:15 - 19:29	126.1 GB	28.09 GB	11.34 GB	142.9 GB	154.2 GB	10,41 k		
May 10 2017 19:30 - 19:44	140.5 GB	27.97 GB	12.32 GB	156.1 GB	168.4 GB	10,69 k		
May 10 2017 19:45 - 19:59	141.8 GB	30.01 GB	12.89 GB	158.9 GB	171.6 GB	10,78 k		
May 10 2017 20:00 - 20:14	142.3 GB	31.95 GB	12.47 GB	161.7 GB	174.2 GB	10,76 k		
May 10 2017 20:15 - 20:29	171 GB	32.49 GB	18.18 GB	165.3 GB	203.4 GB	11,15 k		
May 10 2017 20:30 - 20:44	151.8 GB	34.87 GB	12.3 GB	174.4 GB	186.7 GB	11,67 k		
May 10 2017 20:45 - 20:59	134.5 GB	33.98 GB	11.79 GB	156.7 GB	168.5 GB	12,19 k		
May 10 2017 21:00 - 21:14	145.1 GB	33.59 GB	11.84 GB	166.8 GB	178.7 GB	12,37 k		

Wired Network Report

The **Wired Network Report** provides details of total traffic, APs, and clients on the network. It also contains information regarding the received and transmitted traffic between them.

From the navigation bar, select **Network > Wired**.

FIGURE 46 Wired Network Report (Upper Portion Only)



The **Wired Network Report** consists of the following components:

- Overview tile
- Traffic Distribution by Switch Model and Port Speed tile
- Top Switches by Traffic tile
- Top Switches by PoE Usage tile
- Top Switches by Errors tile
- Traffic Trend tile

- Error Trend tile

Overview Tile

The Overview tile of the **Wired Network Report** provides the following information, based on your selection of the AP, SSID, Radio, and Date Range filters:

- Total number of APs
- Total traffic and the average traffic rate
- Total traffic received and transmitted and the average traffic rate
- Total clients on the network

FIGURE 47 Wired Network Report: Overview Tile

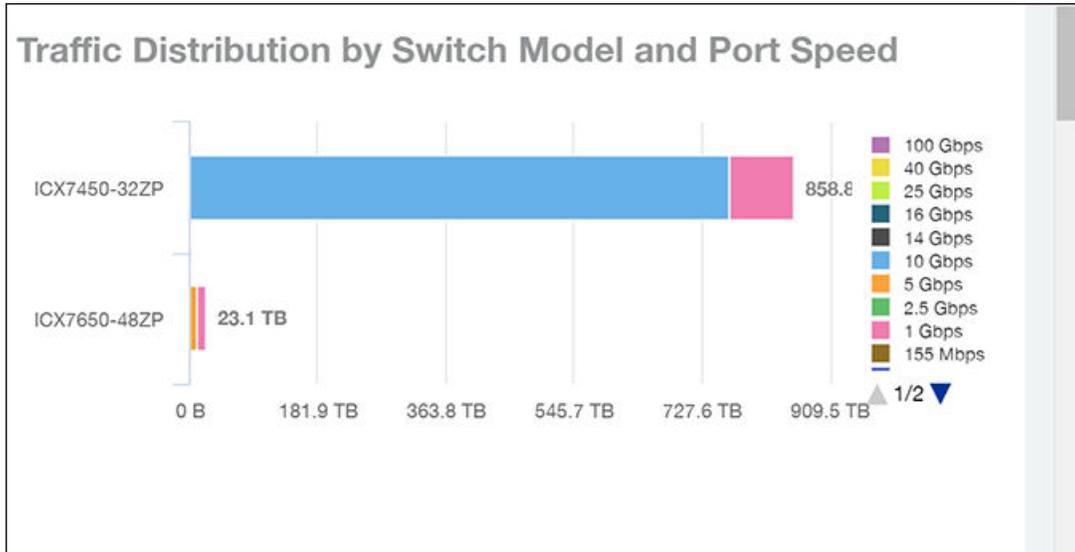


Traffic Distribution by Switch Model and Port Speed Chart

The **Traffic Distribution by Switch Model and Port Speed** chart of the **Wired Network Report** displays the distribution of traffic by port speed for each switch model being used.

Use this chart to display traffic distribution based on your selection of APs, SSID, Radio, and Date Range filters.

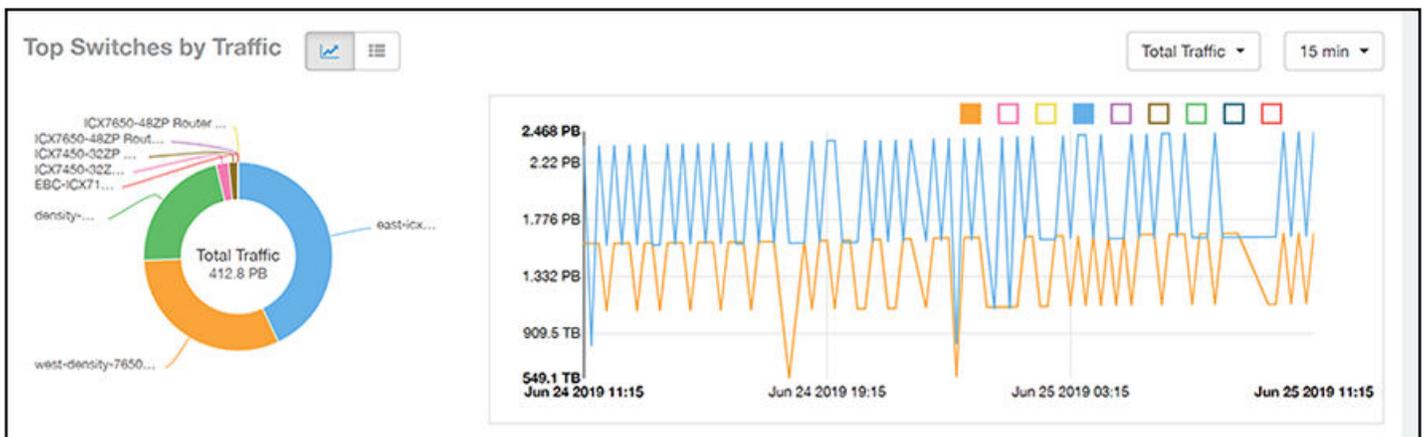
FIGURE 48 Wired Network Report: Traffic Distribution by Switch Model and Port Speed Chart



Top Switches by Traffic Tile

The **Top Switches by Traffic** donut chart and graph of the **Wired Network Report** display which wired switches have the most traffic. You can use the traffic menu to show total traffic, transmitted traffic only, or received traffic only; and use the time menu to specify the time granularity. If you pause the pointer over the donut chart or the line graph, an information box is displayed containing the details on the selected data points. You can click one of the areas of the donut chart to go to the Switch Details dashboard for the corresponding switch. Click any of the colored squares to display the selected switch details in the line graph.

FIGURE 49 Wired Network Report Top Switches by Traffic Tile



Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. You can select the top 10 (default value), 20, 50, or 100 switches to display, or display all of the switch models. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 50 Wired Network Report Top Switches by Traffic Table

Top Switches by Traffic 🔍 ☰ These Switches consume 100 % (412.8 PB) of the total traffic (412.8 PB). Top 10 Switches ▾

Index	Switch Name	Rx	Tx	Total Traffic
1	east-icxstack-density	87.61 PB	88.89 PB	177.5 PB
2	west-density-7650-stack	64.17 PB	65.22 PB	129.4 PB
3	density-main-switch	45.06 PB	45.33 PB	90.4 PB
4	ICX7450-32ZP Switch	4.316 PB	4.499 PB	8.815 PB
5	ICX7450-32ZP Router	3.224 PB	3.25 PB	6.474 PB
6	ICX7650-48ZP Router	91.87 TB	91.94 TB	183.8 TB
7	ICX7650-48ZP Router	4.813 TB	2.964 TB	7.776 TB
8	EBC-ICX7150-48ZP-SW01	3.12 TB	3.499 TB	6.619 TB
9	ICX7250-24P Switch	83.22 GB	120.2 GB	203.4 GB

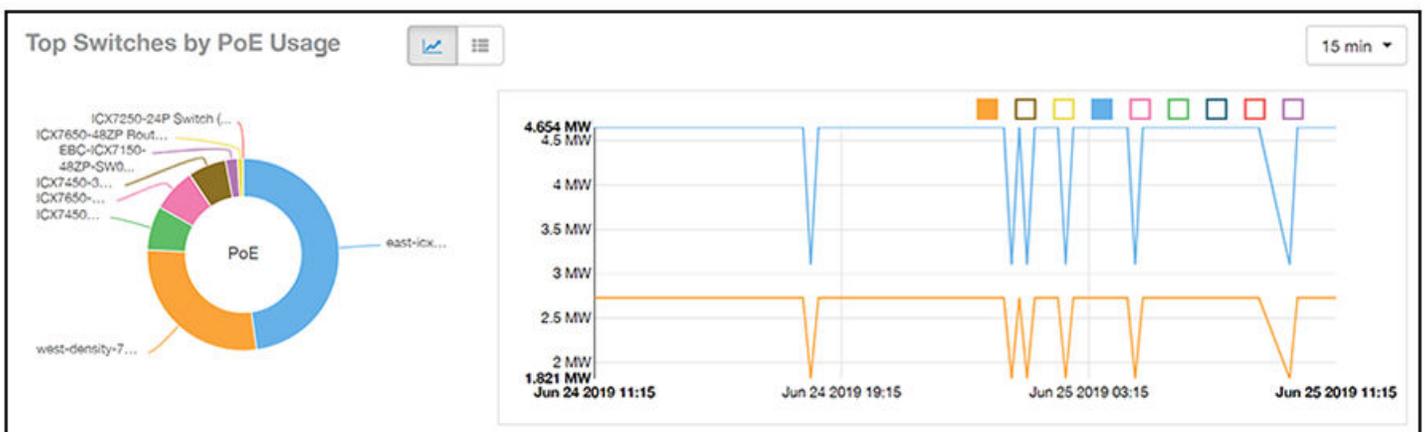
◀ 1 ▾ of 1 ▶

Top Switches by PoE Usage Tile

The **Top Switches by PoE Usage** donut chart and graph of the **Wired Network Report** display which wired switches are utilizing the most power over the Internet. You can use the menu to specify the time granularity.

If you pause the pointer over the donut chart or the line graph, an information box is displayed containing the details on the selected data points. You can click one of the areas of the donut chart to go to the **Switch Details** dashboard for the corresponding switch. Click any of the colored squares to display the selected switch details in the line graph.

FIGURE 51 Wired Network Report: Top Switches by PoE Usage Tile



Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. You can select the top 10 (default value), 20, 50, or 100 switches to display, or display all of the switch models. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 52 Wired Network Report: Top Switches by PoE Usage Table

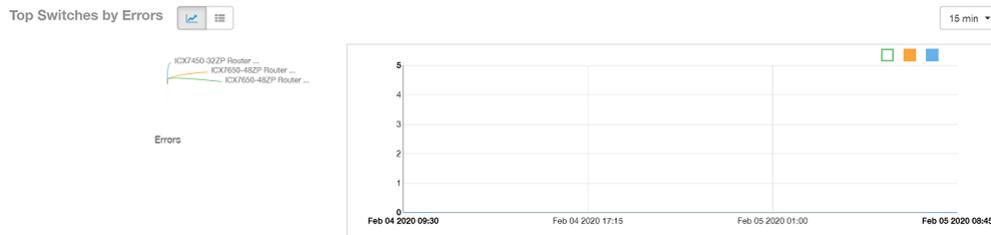
Index	Switch Name	PoE Utilization	PoE Total	% of PoE Utilized
1	east-icxstack-density	4.654 MW	8.88 MW	52.41 %
2	west-density-7650-stack	2.731 MW	4.488 MW	60.85 %
3	ICX7450-32ZP Router	727.1 KW	2.244 MW	32.4 %
4	ICX7650-48ZP Router	720 KW	4.488 MW	16.04 %
5	ICX7450-32ZP Switch	625.8 KW	4.488 MW	13.94 %
6	EBC-ICX7150-48ZP-SW01	195.9 KW	740 KW	26.48 %
7	ICX7650-48ZP Router	92.4 KW	4.488 MW	2.06 %
8	ICX7250-24P Switch	0 mW	370 KW	0 %
9	density-main-switch	0 mW	2.22 MW	0 %

Top Switches by Errors Tile

The **Top Switches by Errors** donut chart and graph of the **Wired Network Report** display the error count for switches.

If you pause the pointer over the donut chart or the line graph, an information box is displayed containing the details on the selected data points. You can click one of the areas of the donut chart to go to the **Switch Details** dashboard for the corresponding switch. Click any of the colored squares to display the selected switch details in the line graph.

FIGURE 53 Wired Network Report: Top Switches by Errors Tile



Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. You can select the top 10 (default value), 20, 50, or 100 errors to display, or display all of the errors. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 54 Wired Network Report: Top Switches by Error Table

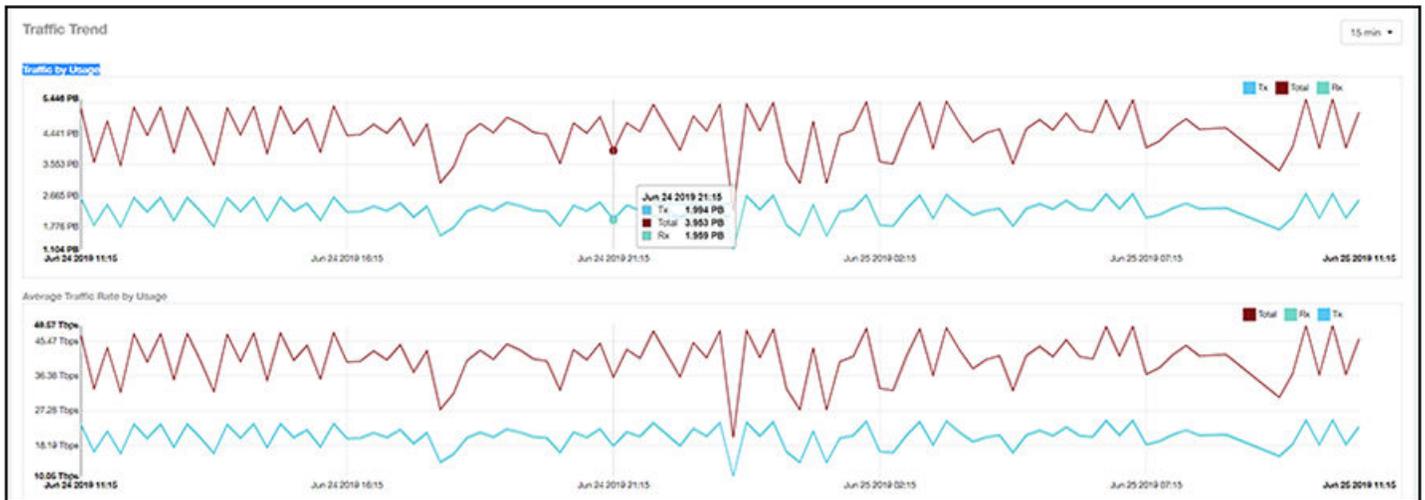
Index	Switch Name	In Errors	Out Errors	Errors
1	ICX7450-32ZP Router	0	0	0
2	ICX7650-48ZP Router	0	0	0
3	ICX7650-48ZP Router	0	0	0

Traffic Trend Graph

The **Traffic Trend** graph of the **Wired Network Report** contains two line graphs that provide traffic information about the wired switches in the network.

Use the menu to specify the time granularity of the graphs.

FIGURE 55 Wired Network Report: Traffic Trend Graph

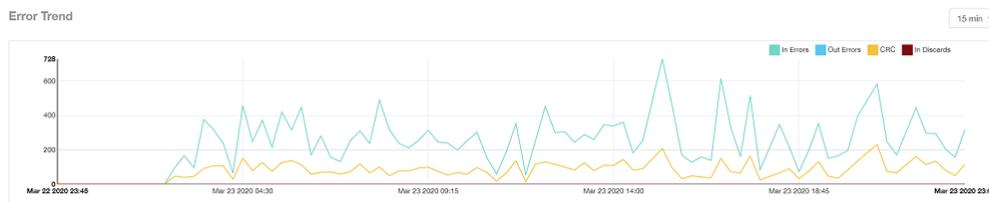


Error Trend Graph

The **Error Trend** graph of the **Wired Network Report** contains a line graph that provides the error count information over time: In Errors, Out Errors, CRC, and In Discards.

Use the menu to specify the time granularity of the graph.

FIGURE 56 Wired Network: Error Trend Graph



Inventory Dashboard

- [Inventory - APs Report](#).....49
- [Inventory - Controllers Report](#).....57
- [Inventory - Switches Report](#).....60

Inventory - APs Report

The Inventory - APs Report provides details on AP inventory, such as AP reboots, AP software version, AP models and AP Alarms.

The following figure shows only the upper portion of the Inventory - APs dashboard that appears when you click **Inventory > APs** on the navigation bar.

FIGURE 57 Inventory - APs Dashboard (upper portion)



The Inventory - APs Report consists of the following components:

- Overview tile
- Top APs By Offline Duration tile
- AP Count Trend tile
- AP Status Trends tile
- Top AP Models tile
- Top AP Software Versions tile
- Top 10 AP Reboot Reasons tile
- Top APs by Reboot Counts tile
- Top 10 AP Alarm Types tile
- APs Configured in Multiple Systems tile
- AP Details for Online/Offline Status tile
- AP Details for Other Statuses tile

NOTE

All counts shown in bar charts, pie charts and tables are exact counts. The counts in trend charts are approximate.

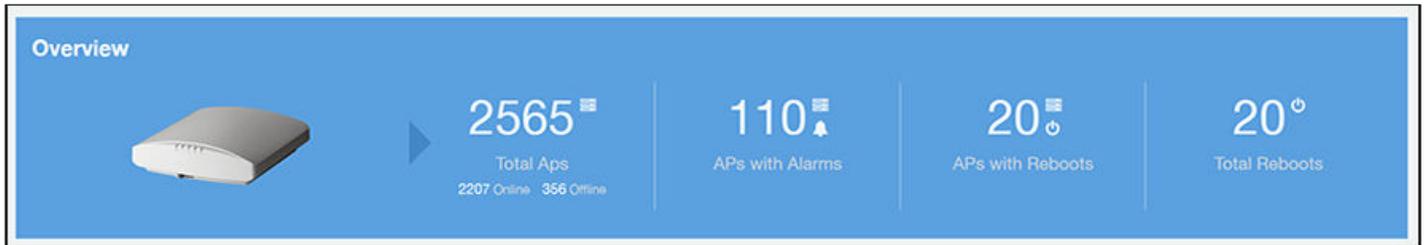
Overview Tile

The **Overview** tile provides a general overview of the APs on the network.

It displays the following information, based on your selection of APs, radio, and date range filters:

- Total APs
- APs with alarms
- APs with reboots
- Total reboots

FIGURE 58 Inventory - APs Report: Overview Tile

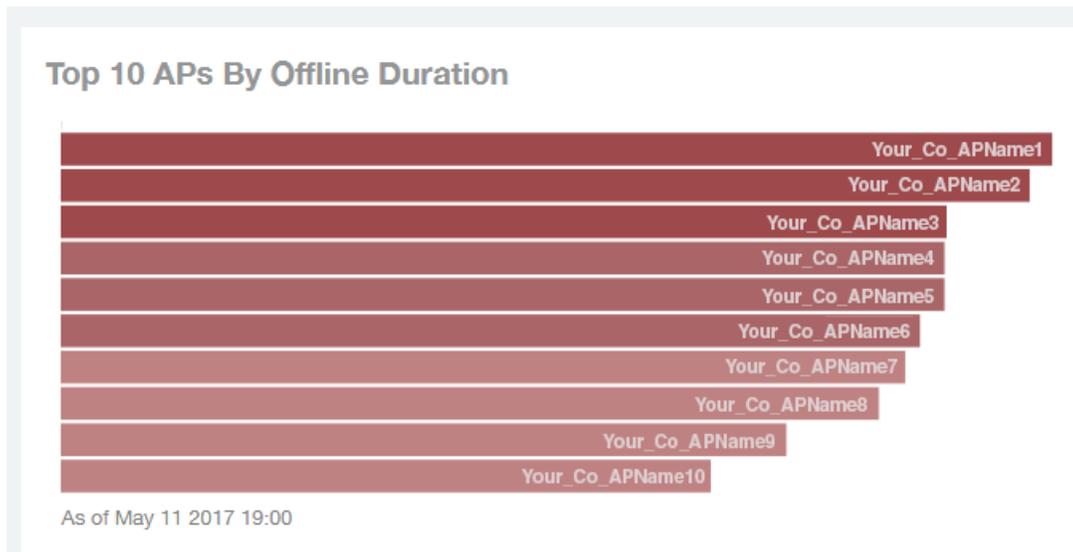


Top APs by Offline Duration Tile

The **Top APs by Offline Duration** tile contains a bar chart and a table. The chart/table along with the Inventory - APs Report displays the top 10 APs in the network that have been disconnected for the longest duration.

In the bar chart, use the menu to specify the time period. If you pause the pointer over the bar graph, an information box is displayed that allows you to obtain details on the selected data points.

FIGURE 59 Inventory - APs Report: Top APs by Offline Duration (Chart)



Use the chart and table icons ( ) to toggle between the chart and table views.

The table view displays the top APs based on which ones have been offline for the longest time, The APs are listed by AP name, IP address, location, model, controllers, and duration in the table.

Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. You can select the top 10, 20, 50, or 100 APs by offline duration. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 60 Inventory - APs Report: Top APs by Offline Duration (Table)

Top APs by Offline Duration							Top 10 APs
Index	AP Name	AP IP Address	AP Location	AP Model	Controller Name	Offline Duration	⚙️
1	Your_Co_APName1	10.x.y.1	Your_Co_APSite1	ZF-R710	Your_Co_CTName1	2y	
2	Your_Co_APName2	10.x.y.2	Your_Co_APSite2	ZF-R700	Your_Co_CTName1	1y 11mo	
3	Your_Co_APName3	10.x.y.3	Your_Co_APSite3	ZF-R600	Your_Co_CTName1	1y 9mo	
4	Your_Co_APName4	10.x.y.4	Your_Co_APSite4	ZF-R510	Your_Co_CTName1	1y 9mo	
5	Your_Co_APName5	10.x.y.5	Your_Co_APSite5	ZF-R500	Your_Co_CTName1	1y 9mo	
6	Your_Co_AccessPoint1	172.16.z.1	Your_Co_APLocn1	ZF-T710	Your_Co_Controller2	1y 8mo	
7	Your_Co_AccessPoint2	172.16.z.2	Your_Co_APLocn2	ZF-T301	Your_Co_Controller2	1y 8mo	
8	Your_Co_AccessPoint3	172.16.z.3	Your_Co_APLocn3	ZF-T300	Your_Co_Controller2	1y 7mo	
9	Your_Co_AccessPoint4	172.16.z.4	Your_Co_APLocn4	ZF-P300	Your_Co_Controller2	1y 5mo	
10	Your_Co_AccessPoint5	172.16.z.5	Your_Co_APLocn5	ZF-T610	Your_Co_Controller2	1y 3mo	

AP Count Trend Graph

The **AP Count Trend** graph depicts how many APs in your network are being utilized over time.

To show APs being used over certain time periods, use the menu to specify the time period. If you pause the pointer over the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares to display the selected AP details in the line graph..

FIGURE 61 Inventory - APs Report: AP Count Trend Graph



AP Status Trends Tile

The AP Status Trends tile contains a donut chart and a graph that display the top APs by connection and uptime status, such as online, offline, provisioned, discovery, and other classifications.

Use the drop-down menu to specify the time granularity. If you pause the pointer over the donut chart and the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares to display the selected AP details in the line graph.

FIGURE 62 Inventory - APs Report: AP Status Trends Tile

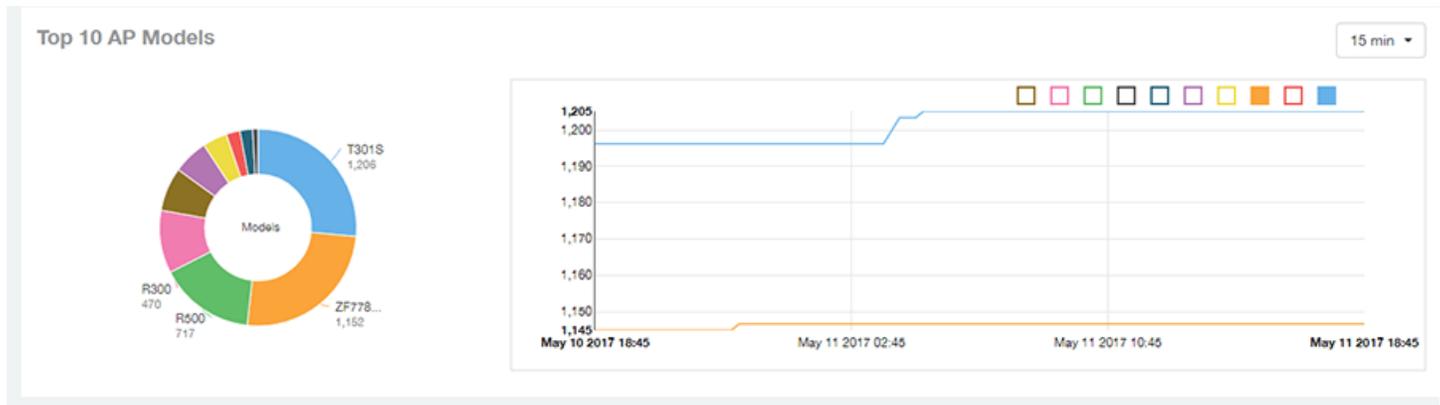


Top AP Models

The **Top AP Models** tile contains a donut chart and a graph. The donut chart and graph display the model type that is most often used in your network.

In the chart, use the menu to specify the time period. If you pause the pointer over the donut chart and the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares to display the selected AP details in the line graph.

FIGURE 63 Inventory - APs Report: Top AP Models (Chart and Graph)



Use the chart and table icons ( ) to toggle between the chart and table views.

Click the gear icon () to select the columns to display, and click any column heading to sort the table by that column. You can select the top 10, 20, 50, or 100 models to display. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 64 Inventory - APs Report: Top AP Models (Table)

Top AP Models Top 10 Models ▾

Index	AP Model	Number of APs w/ the Model	% of APs w/ the Model
1	ZF-R710	1,206	25.94 %
2	ZF-R700	1,152	24.77 %
3	ZF-R600	717	15.42 %
4	ZF-R510	470	10.11 %
5	ZF-R500	327	7.03 %
6	ZF-H610	263	5.66 %
7	ZF-H500	184	3.96 %
8	ZF-R310	103	2.22 %
9	ZF-R300	94	2.02 %
10	ZF-R610	40	0.86 %

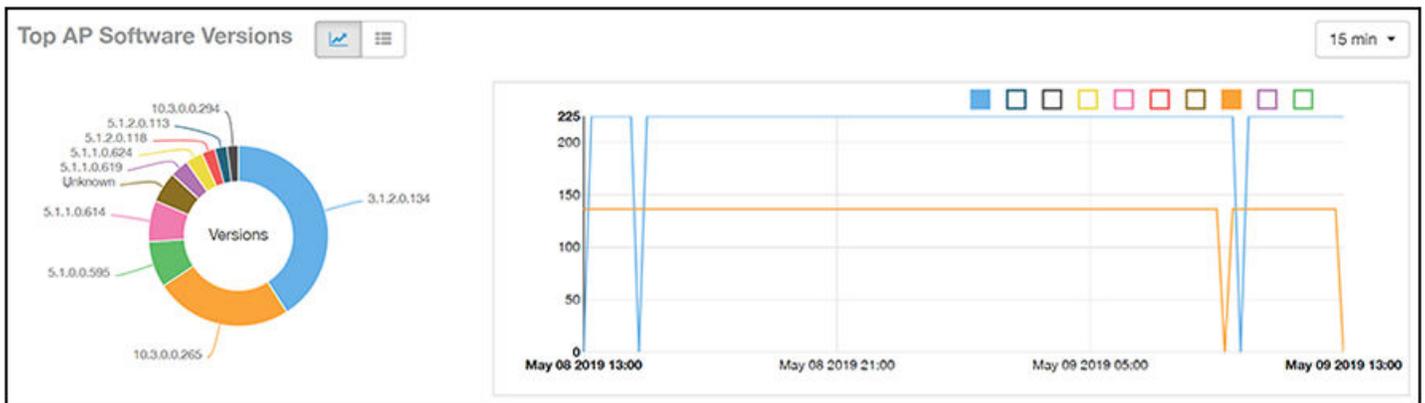
◀ 1 ▾ of 1 ▶

Top AP Software Versions Tile

The **Top AP Software Versions** tile are represented as a chart and table. The donut chart and graph displays the most-used software versions in your network, and show how many APs are using each version.

In the chart, use the menu to specify the time period. If you pause the pointer over the donut chart and the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares to display the selected AP details in the line graph.

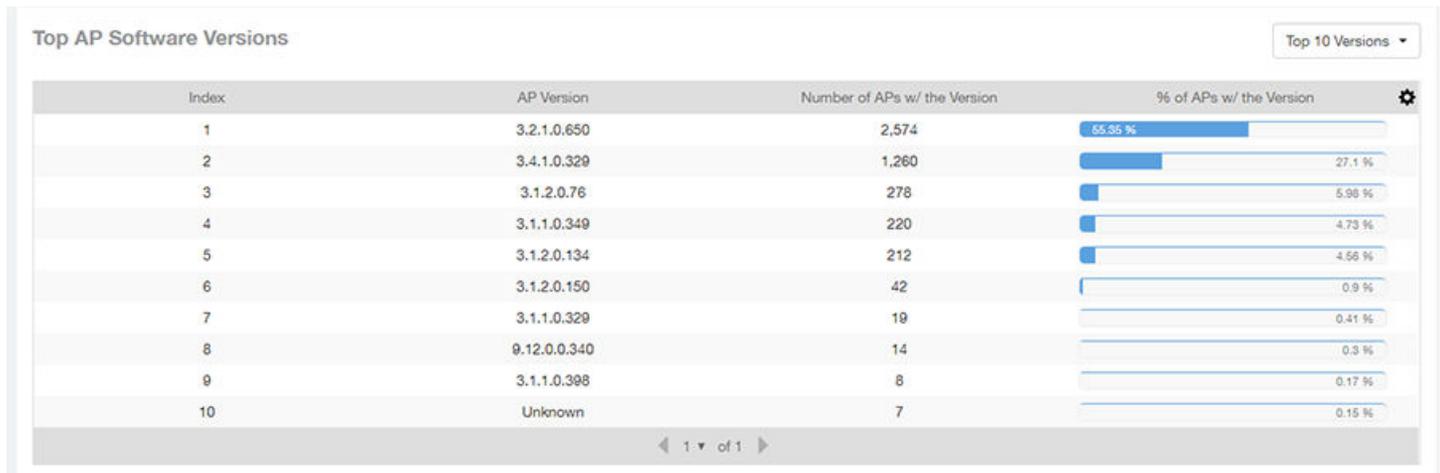
FIGURE 65 Inventory - APs Report: Top AP Software Versions (Graph and Chart)



Use the chart and table icons () to toggle between the chart and table views.

Click the gear icon () to select the columns to display, and click any column heading to sort the table by that column. You can also select the top 10 (default value), 20, 50, or 100 clients to display, or display all AP models. You can select the top 10, 20, 50, or 100 models to display. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 66 Inventory - APs Report: Top AP Software Versions (Table)

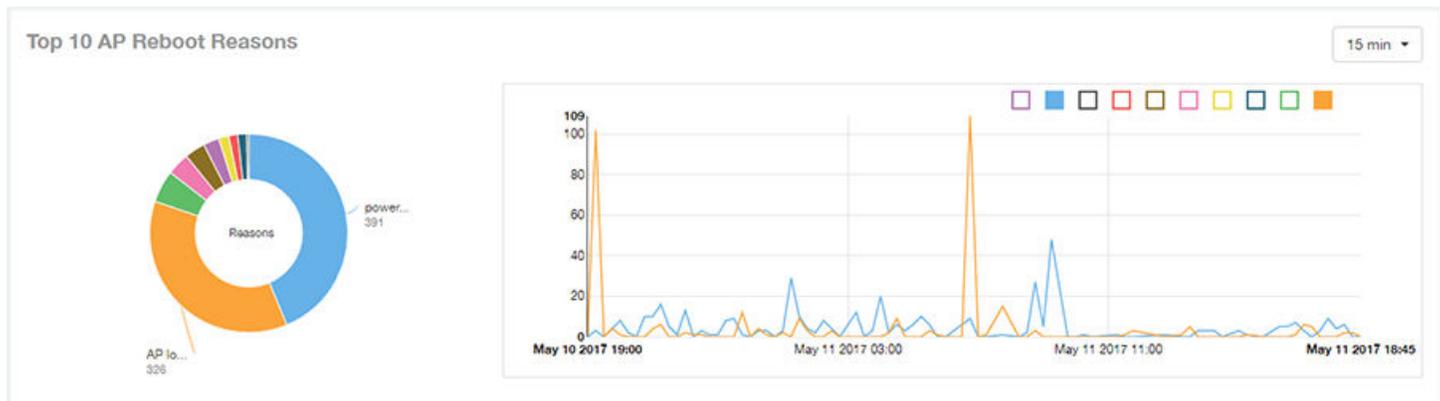


Top 10 AP Reboot Reasons Tile

The Top 10 AP Reboot Reasons tile contains a donut chart and a graph that display the ten most common reasons why APs in your network have rebooted.

Use the menu to specify the time granularity. If you pause the pointer over the donut chart and the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares display the selected AP details in the line graph.

FIGURE 67 Inventory - APs Report: Top 10 AP Reboot Reasons Tile

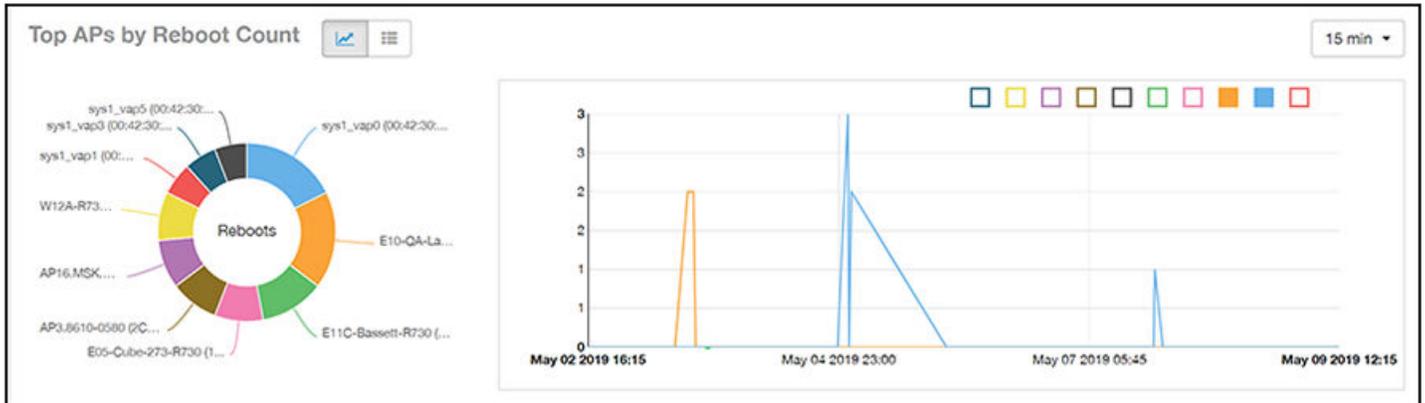


Top APs by Reboot Count Tile

The **Top APs by Reboot Count** tile contains a donut chart and a graph. The donut chart and graph display the top ten APs in your network that have rebooted most frequently.

Use the menu to specify the time granularity. If you pause the pointer over the donut chart and the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares to display the selected AP details in the line graph.

FIGURE 68 Inventory - APs Report: Top APs by Reboot Count (Chart and Graph)



Use the chart and table icons () to toggle between the chart and table views.

Click the gear icon () to select the columns to display, and click any column heading to sort the table by that column. You can select the top 10, 20, 50, or 100 models to display. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 69 Inventory - APs Report: Top APs by Reboot Count (Table)

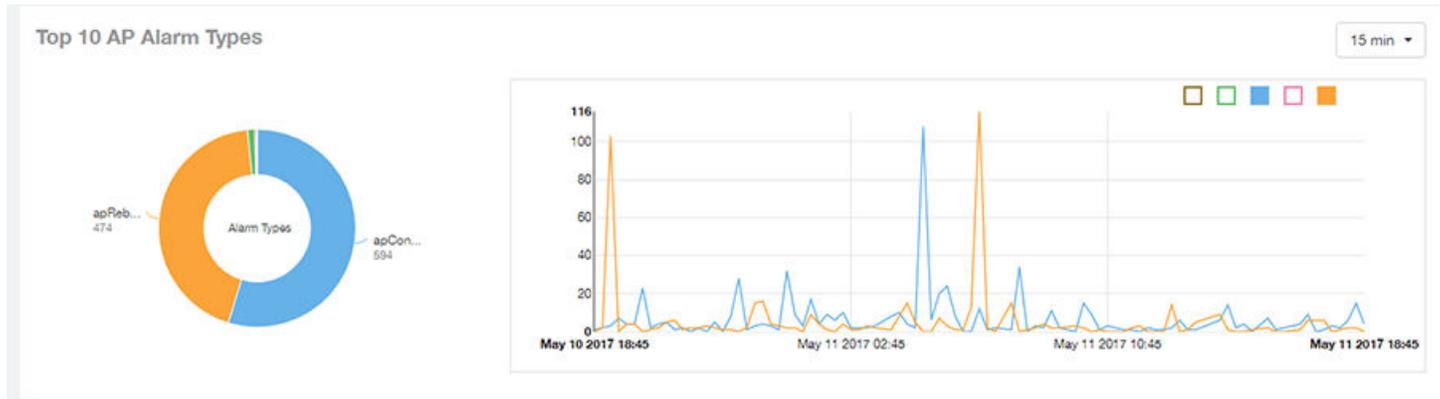
Index	AP Name	AP IP Address	AP Location	# of Reboots	Last Reboot Date	Reason for Last Reboot
1	Your_Co_APName1	10.x.y.1	Your_Co_APsite1	16	May 11 2017 18:03	unknown reason
2	Your_Co_APName2	10.x.y.2	Your_Co_APsite2	13	May 11 2017 10:00	unknown reason
3	Your_Co_APName3	10.x.y.3	Your_Co_APsite3	8	May 11 2017 18:17	power cycle
4	Your_Co_APName4	10.x.y.4	Your_Co_APsite4	8	May 11 2017 18:17	power cycle
5	Your_Co_APName5	10.x.y.5	Your_Co_APsite5	8	May 11 2017 18:17	power cycle
6	Your_Co_AccessPoint1	172.16.z.1	Your_Co_APLcon1	6	May 11 2017 08:34	system recovery by wat...
7	Your_Co_AccessPoint2	172.16.z.2	Your_Co_APLcon2	5	May 11 2017 00:28	AP rebooted by control...
8	Your_Co_AccessPoint3	172.16.z.3	Your_Co_APLcon3	5	May 11 2017 15:47	AP lost SCG more than...
9	Your_Co_AccessPoint4	172.16.z.4	Your_Co_APLcon4	4	May 11 2017 00:28	AP rebooted by control...
10	Your_Co_AccessPoint5	172.16.z.5	Your_Co_APLcon5	4	May 10 2017 21:35	power cycle

Top 10 AP Alarm Types Tile

The **Top 10 AP Alarm Types** donut chart and line graph display the ten alarm types that have most frequently occurred to APs in your network.

Use the menu to specify the time period. If you pause the pointer over the donut chart and the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares to display the selected AP details in the line graph.

FIGURE 70 Inventory - APs Report: Top 10 AP Alarm Types Tile



APs Configured in Multiple Systems Tile

The **APs Configured in Multiple Systems** table of the **Inventory - APs Report** shows you information about APs that have been associated with more than one controller.

In the **Controller Name** column, all controllers that the AP has been associated with are listed, separated by commas. The last-known controller that this AP has been associated with is listed in the **Last Controller Name** column.

Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. You can select the top 10, 20, 50, or 100 models to display. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 71 Inventory - APs Report: APs Configured in Multiple Systems Table

APs Configured in Multiple Systems					Last Changed 10 APs ▾
AP Name	Controller Name	Controller Count	Last Status	Last Controller Name	⚙️
Your_Co_APName1	Your_Co_CTName1, Your...	2	online	Your_Co_CTName1	
Your_Co_APName2	Your_Co_CTName5, Your...	2	online	Your_Co_CTName5	
Your_Co_APName3	Your_Co_CTName4, Your...	2	online	Your_Co_CTName4	

◀ 1 ▾ of 1

AP Details for Online/Offline Status Table

The **AP Details for Online/Offline Status** table of the **Inventory - APs Report** displays its status details based on AP name, IP address, location, model name, controller name, last status, and last status change.

Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. You can select the top 10, 20, 50, or 100 models to display. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 72 Inventory - APs Report: AP Details for Online/Offline Status Table

AP Details for Online/Offline Status Last Changed 10 APs ▾

Index	AP Name	AP IP Address	AP Location	AP Model	Controller Name	Last Status	Last Status Change 
1	Your_Co_APName1	10.x.y.1	Your_Co_APSite1	ZF-R710	Your_Co_CTName1	Offline	2d 16h ago
2	Your_Co_APName2	10.x.y.2	Your_Co_APSite2	ZF-R700	Your_Co_CTName1	Offline	2d 16h ago
3	Your_Co_APName3	10.x.y.3	Your_Co_APSite3	ZF-R600	Your_Co_CTName1	Offline	2d 16h ago
4	Your_Co_APName4	10.x.y.4	Your_Co_APSite4	ZF-R510	Your_Co_CTName1	Offline	2d 16h ago
5	Your_Co_APName5	10.x.y.5	Your_Co_APSite5	ZF-R500	Your_Co_CTName1	Offline	2d 16h ago
6	Your_Co_AccessPoint1	172.16.z.1	Your_Co_APLocn1	ZF-T710	Your_Co_Controller2	Offline	2d 16h ago
7	Your_Co_AccessPoint2	172.16.z.2	Your_Co_APLocn2	ZF-T301	Your_Co_Controller2	Offline	2d 16h ago
8	Your_Co_AccessPoint3	172.16.z.3	Your_Co_APLocn3	ZF-T300	Your_Co_Controller2	Offline	2d 16h ago
9	Your_Co_AccessPoint4	172.16.z.4	Your_Co_APLocn4	ZF-P300	Your_Co_Controller2	Offline	2d 16h ago
10	Your_Co_AccessPoint5	172.16.z.5	Your_Co_APLocn5	ZF-T610	Your_Co_Controller2	Offline	2d 16h ago

◀ 1 ▾ of 1 ▶

AP Details for Other Statuses Table

The **AP Details for Other Statuses** table of the **Inventory - APs Report** displays the details for APs that are currently in a status other than online or offline.

Click the gear icon () to select the columns to display, and click any column heading to sort the table by that column. You can select the top 10, 20, 50, or 100 models to display. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 73 Inventory - APs Report: AP Details for Other Statuses Table

AP Details for Other Statuses Last Changed 10 APs ▾

Index	AP Name	AP IP Address	AP Location	AP Model	Controller Name	Last Status 
1	Your_Co_APName1	10.x.y.1	Your_Co_APSite1	ZF-R710	Your_Co_CTName1	Provisioned
2	Your_Co_APName2	10.x.y.2	Your_Co_APSite2	ZF-R700	Your_Co_CTName1	Provisioned
3	Your_Co_APName3	10.x.y.3	Your_Co_APSite3	ZF-R600	Your_Co_CTName1	Unknown
4	Your_Co_APName4	10.x.y.4	Your_Co_APSite4	ZF-R510	Your_Co_CTName1	Discovery
5	Your_Co_APName5	10.x.y.5	Your_Co_APSite5	ZF-R500	Your_Co_CTName1	Provisioned
6	Your_Co_AccessPoint1	172.16.z.1	Your_Co_APLocn1	ZF-T710	Your_Co_Controller2	Provisioned
7	Your_Co_AccessPoint2	172.16.z.2	Your_Co_APLocn2	ZF-T301	Your_Co_Controller2	Provisioned

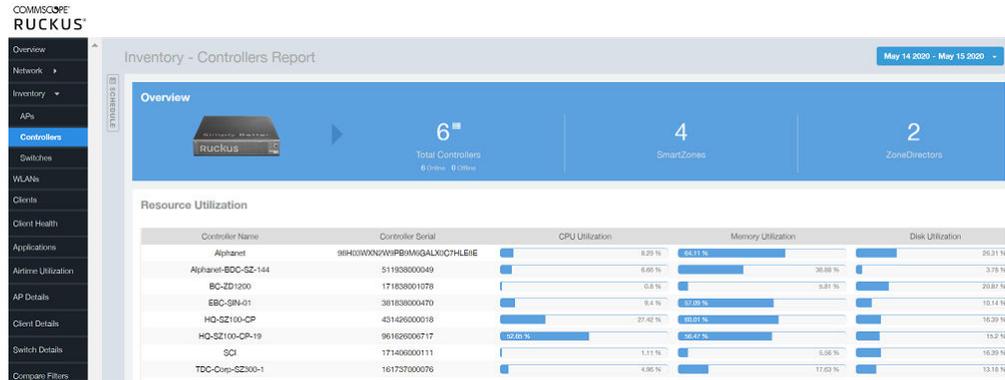
◀ 1 ▾ of 1 ▶

Inventory - Controllers Report

The **Inventory - Controllers Report** provides details on controller inventory, including resource and license utilization.

The following figure shows only the upper portion of the **Inventory - Controllers** dashboard that appears when you click **Inventory > Controllers** on the navigation bar.

FIGURE 74 Inventory - Controllers Dashboard (Upper Portion Only)



The **Inventory - Controllers Report** consists of the following components:

- Overview tile
- Resource Utilization table
- License Utilization table
- KRACK Assessment table

NOTE

All counts in the **Inventory - Controllers Report** are exact counts.

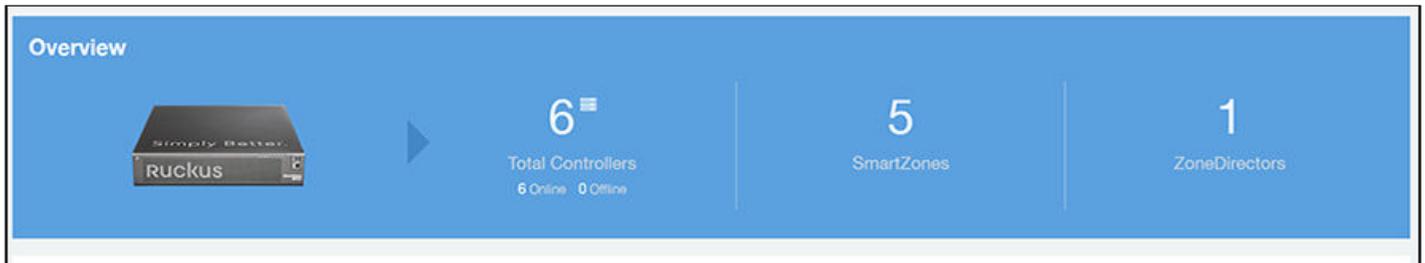
Overview Tile

The **Inventory - Controllers Report** overview section provides a general overview of the controllers on the network.

This overview section displays the following, based on your selection of AP, Radio and Date Range filters:

- Total number of controllers (and how many are online and offline)
- Number of SmartZone controllers
- Number of ZoneDirector controllers

FIGURE 75 Inventory - Controllers Report: Overview Tile



Resource Utilization Table

The **Resource Utilization** table of the **Inventory - Controllers Report** displays the CPU, memory, and disk utilization Zone percentages for each controller in your system.

Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. Click any column heading to sort by that value. You can select the top 10 (default value), 20, 50, or 100 controllers to display, or display all of the controller names. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 76 Inventory - Controllers Report: Resource Utilization Table

Controller Name	Controller Serial	CPU Utilization	Memory Utilization	Disk Utilization
SCI-PUSH-XML	511408000113	2.36 %	5.9 %	15.58 %
SINLBS-VSZ01	983VF4KRN6UFN00JLL2SV75G...	5.5 %	65.18 %	11.68 %
sci-push-xml-2	501408000926	0.29 %	3.35 %	15.53 %
vSPoT-ZD-CI-RKSGP	481408000086	1.03 %	22.63 %	12.4 %

License Utilization Table

The **License Utilization** table of the **Inventory - Controllers Report** displays the number of available and consumed licenses for the APs for each system.

Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. Click any column heading to sort by that value. You can select the top 10 (default value), 20, 50, or 100 systems to display, or display all of the system names. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

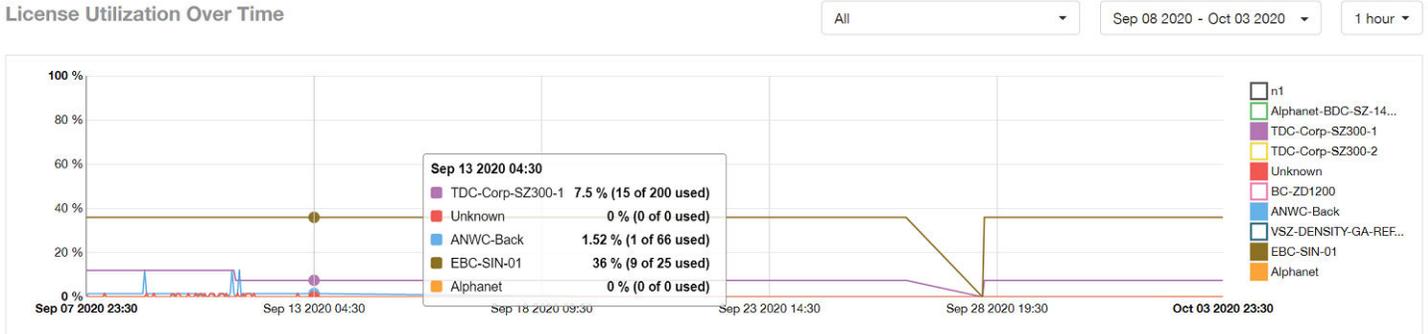
FIGURE 77 Inventory - Controllers Report: License Utilization Table

System Name	APs Managed	APs Up	APs Down	AP License Total	License Consumed	License Available	License Utilization
SCI-PUSH-XML-P...	3	2	1	5	2	3	40 %
SCI_14_ZD	14	10	4	50	10	40	20 %
SCI_14_vSZ	1	0	1	10001	1	10000	0.01 %
SCI_PUSH_XML-2	1	1	0	5	1	4	20 %

License Utilization Over Time Graph

The **License Utilization Over Time** graph of the **Inventory - Controllers Report** displays the quantity of licenses used over time, in percentage. You can pause the pointer over to graph to determine the licenses consumed at that time. You can select all licenses or select the check boxes to view specific license trends, and also searched by the license name within the search box. Additionally, you can view license utilization over a range of dates and duration such as license utilized in 1 day, 1 hour, 15min and 1 min.

FIGURE 78 Inventory - Controllers Report: License Utilization Over Time Graph



KRACK Assessment Table

The KRACK Assessment table of the Inventory - Controllers Report shows the KRACK vulnerability status of all APs that are filtered to be displayed.

FIGURE 79 Inventory - Controllers Report: KRACK Assessment Table

KRACK Assessment 0.19 % (8/4249) of APs in all systems are patched.

System Name	Zone	APs Patched	APs Patched (%)	Recommendation
SYSTEM 1	Zone 1	0/218	0 %	Patch your APs
SYSTEM 2	Zone A	8/8	100 %	Turn on unpatch
SYSTEM 3	Default Zone	0/214	0 %	Patch your APs
SYSTEM 4	Zone A	0/1	0 %	Patch your APs
SYSTEM 5	Default Zone	0/1	0 %	Patch your APs
SYSTEM 6	Zone 1	0/1	0 %	Patch your APs
SYSTEM 7	Default Zone	0/10	0 %	Patch your APs
SYSTEM 8	California Zone	0/1	0 %	Patch your APs
SYSTEM 9	Default Zone	0/3	0 %	Patch your APs
SYSTEM 10	Zone 10	0/1	0 %	Patch your APs

1 of 5

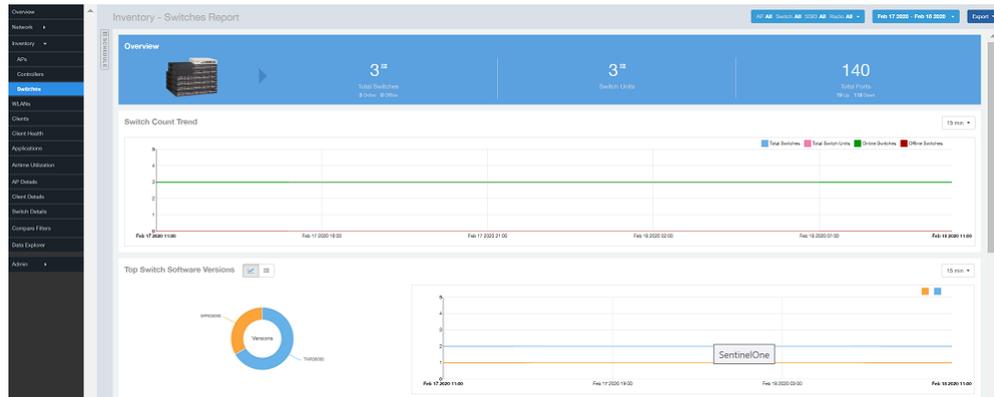
You can follow the recommendations displayed to patch your APs. For information and instructions, refer to: <https://support.ruckuswireless.com/krack-ruckus-wireless-support-resource-center>.

Inventory - Switches Report

The Inventory - Switches Report provides details on switch inventory, including switch models and software versions that are being used the most.

The following figure shows only the upper portion of the Inventory - Switches dashboard that appears when you click **Inventory > Switches** on the navigation bar.

FIGURE 80 Inventory - Switches Report (Upper Portion Only)



The **Inventory - Switches Report** consists of the following components:

- Overview tile
- Switch Count Trend Graph
- Top Switch Software Versions tile
- Top Switch Models tile
- Port Status Trend tile

NOTE

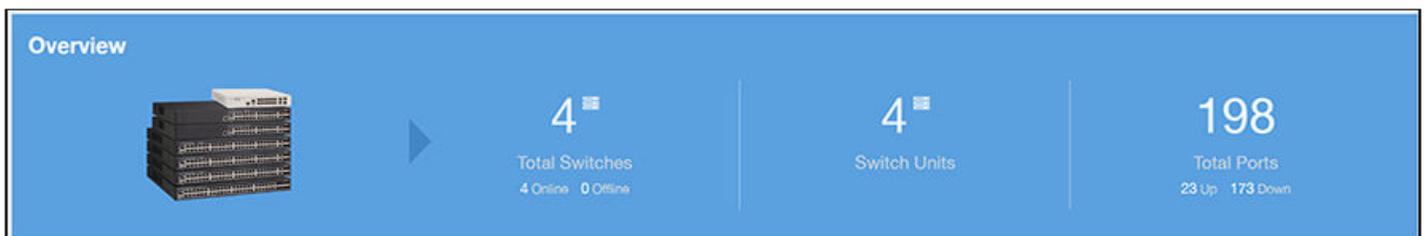
All counts in the line graphs, donut charts, and tables of the **Inventory - Switches Report** are exact counts. The counts in trend graphs are approximate.

Overview Tile

The **Overview** tile of the **Inventory - Switches Report** provides the following information, based on your selection of filters:

- Total number of switches (and how many are online and offline)
- Number of switch units
- Total number of ports (and how many are up and down)

FIGURE 81 Inventory - Switches Report: Overview Tile



Switch Count Trend Graph

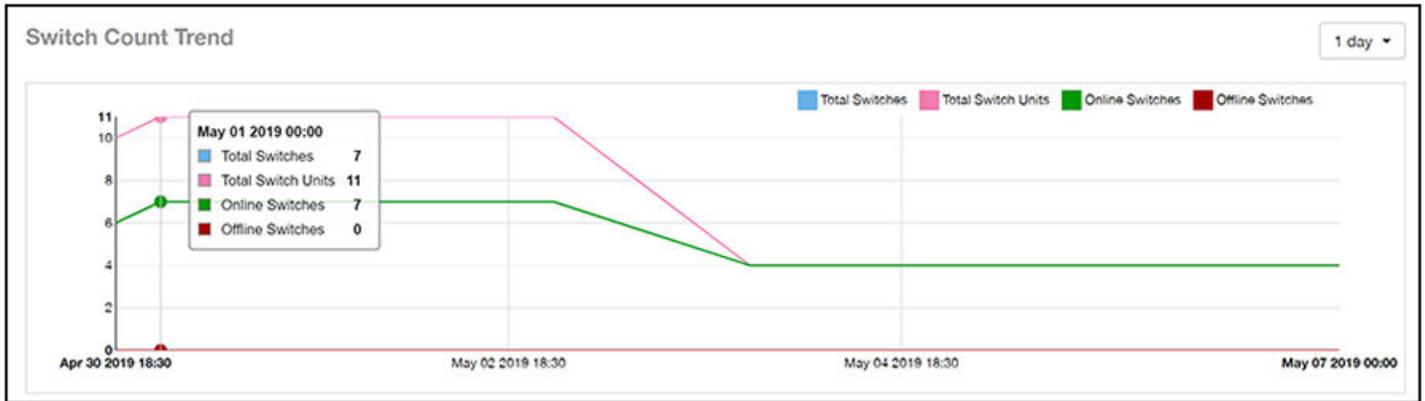
The **Switch Count Trend** graph of the **Inventory - Switches Report** displays the trend of total switches, total switch units, online status, and offline status over specified time intervals.

Inventory Dashboard

Inventory - Switches Report

Use the menu to specify the time granularity. If you pause the pointer over the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares to display the selected switch details in the line graph.

FIGURE 82 Inventory - Switches Report: Switch Count Trend Graph

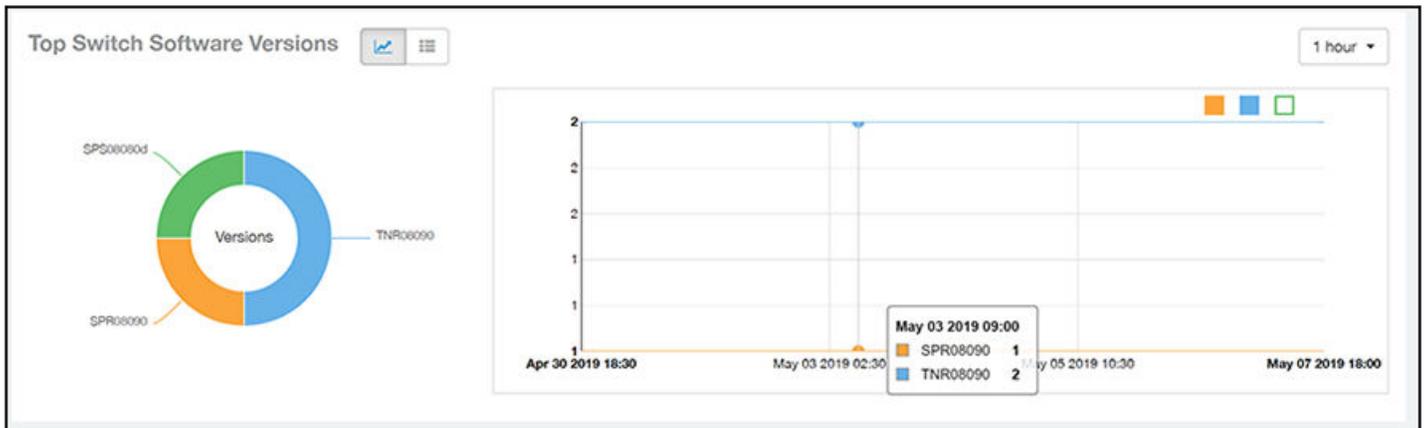


Top Switch Software Versions Tile

The **Top Switch Software Versions** donut chart and graph of the **Inventory - Switches Report** display the most-used switch software versions in your network, and show the number of switches using each version.

Use the menu to specify the time granularity. If you pause the pointer over the donut chart and the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares to display the selected switch details in the line graph.

FIGURE 83 Inventory - Switches Report: Top Switch Software Versions Tile



Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. The table is sorted on the top switch software version by default. You can select the top 10 (default value), 20, 50, or 100 software versions to display, or display all of the software versions. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 84 Inventory - Switches Report: Top Switch Software Versions Table

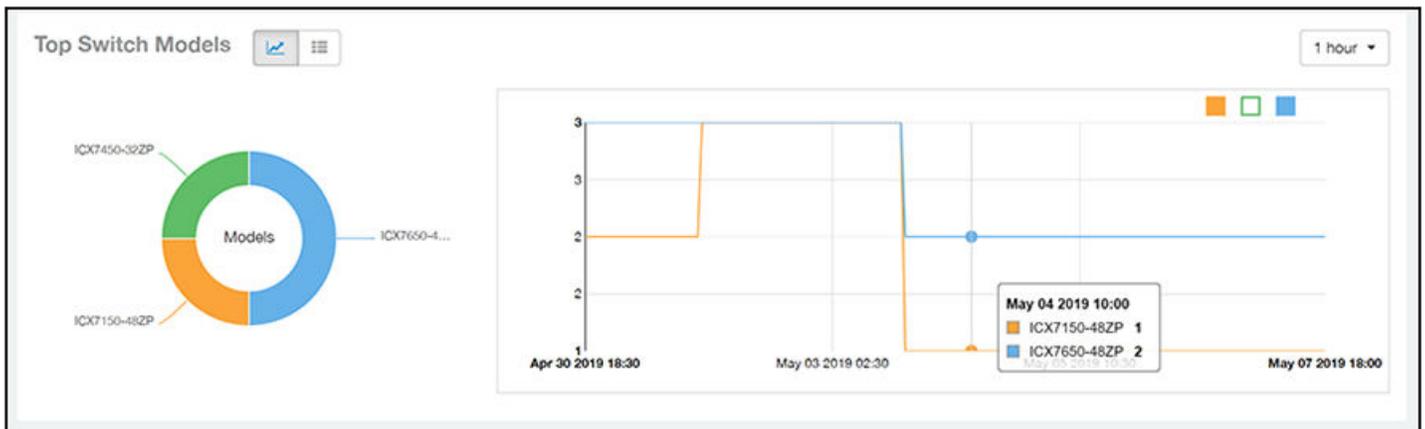
Index	Switch Version	Number of Switches w/ the Version	% of Switches w/ the Version
1	SPS08090b	3	60 %
2	SPS08090a	1	20 %
3	TNS08090b	1	20 %

Top Switch Models Tile

The **Top Switch Models** donut chart and line graph of the **Inventory - Switches Report** display the model type that is most often used in your network.

Use the menu to specify the time granularity. If you pause the pointer over the donut chart and the line graph, an information box is displayed containing the details on the selected data points. Click any of the colored squares to display the selected switch details in the line graph.

FIGURE 85 Inventory - Switches Report: Top Switch Models Tile



Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column. The table is sorted on the top switch model by default. You can select the top 10 (default value), 20, 50, or 100 models to display, or display all of the switch models. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

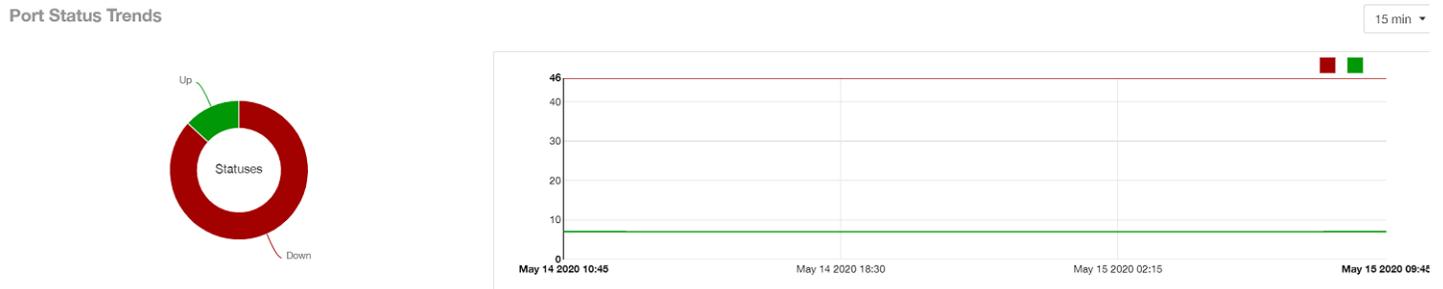
FIGURE 86 Inventory - Switches Report: Top Switch Models Table

Index	Switch Model	Number of Switches w/ the Model	% of switches w/ the Model
1	ICX7150-48ZP	3	60 %
2	ICX7450-32ZP	1	20 %
3	ICX7650-48ZP	1	20 %

Port Status Trends Tile

The **Port Status Trends** donut chart and line graph of the **Inventory - Switches Report** display the status of the ports as up and down.

FIGURE 87 Inventory - Switches Report: Port Status Trends Tile



WLANs Report Dashboard

- WLAN Report65

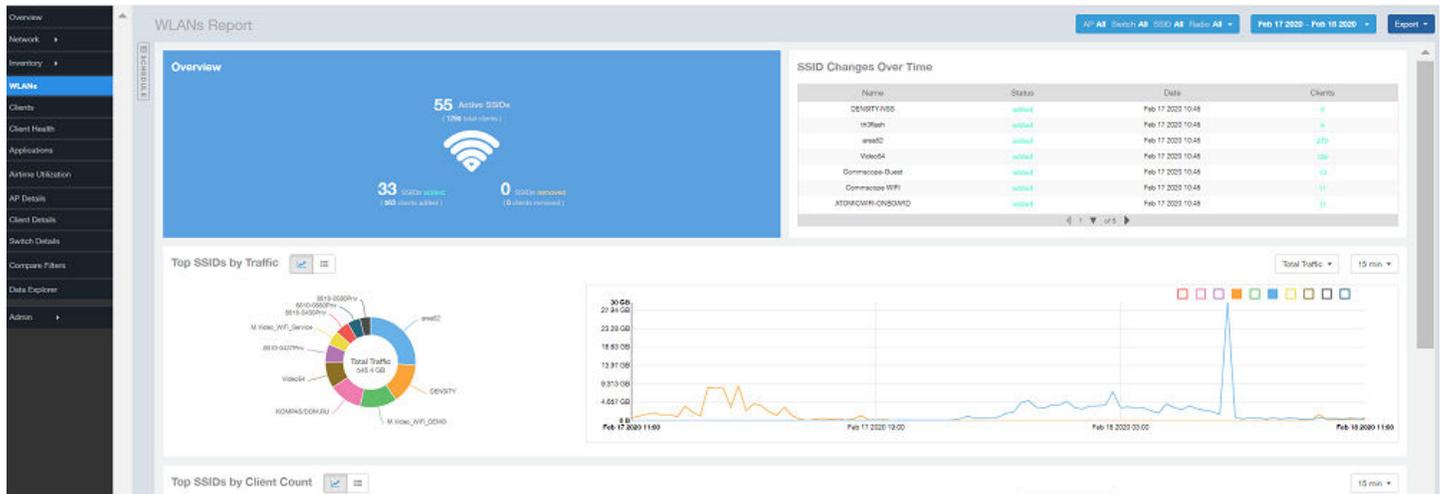
WLAN Report

The **WLAN Report** contains information about the added SSIDs, including which are active and which have been removed.

The report includes details about SSID changes over time, SSIDs by received and transmitted traffic, the client count over a time range, and the trend of the SSIDs based on traffic count and volume. The **WLAN Report** allows you to filter the information based on APs, SSID and radio, day and date, and receive and transmit (Rx+Tx) filters.

From the navigation bar, select **Report > WLAN**.

FIGURE 88 WLAN Report (Upper Portion Only)



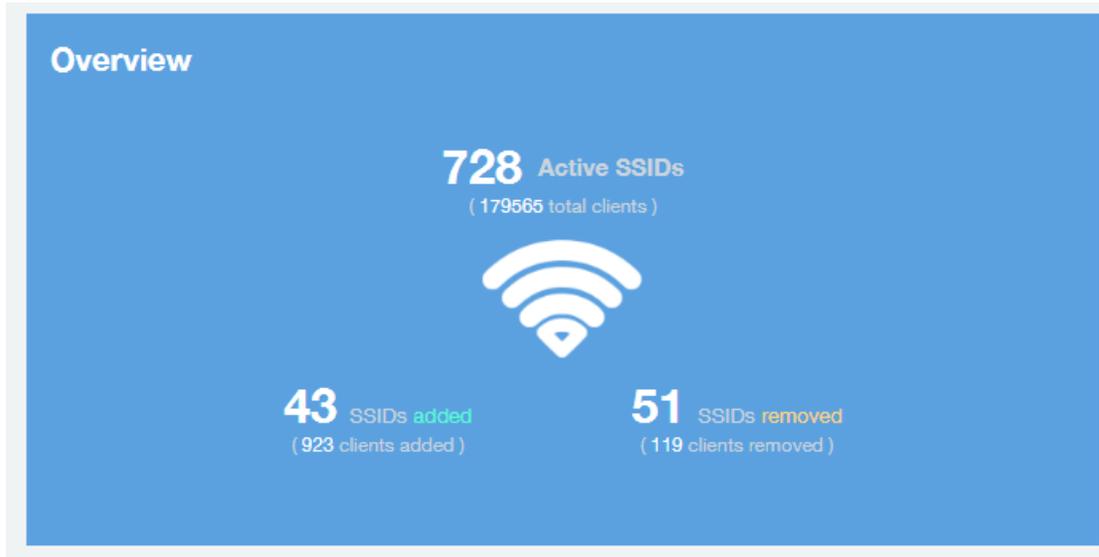
The WLANs Report consists of the following components:

- Overview tile
- SSID Changes Over Time table
- Top 10 SSIDs by Traffic tile
- Top 10 SSIDs by Client Count tile
- Active SSIDs Trend graph

Overview Tile

The **Overview** tile of the **WLAN Report** shows the total number of active SSIDs, and the number of added and removed SSIDs over the selected period.

FIGURE 89 WLAN: Overview Tile



SSID Changes Over Time Tile

The **SSID Changes Over Time** table display of the **WLAN Report** shows the most recent SSID changes.

FIGURE 90 WLAN: SSID Changes Over Time Table

Name	Status	Date	Clients
Your_Co_SSIDName1	removed	May 11 2017 14:00	17
Your_Co_SSIDName2	added	May 10 2017 23:45	78
Your_Co_SSIDName3	added	May 10 2017 21:00	25
Your_Co_SSIDName4	added	May 10 2017 23:45	73
Your_Co_SSIDName5	removed	May 10 2017 23:15	1
Your_Co_SSIDName6	removed	May 10 2017 19:15	1
Your_Co_SSIDName6	removed	May 10 2017 19:15	1

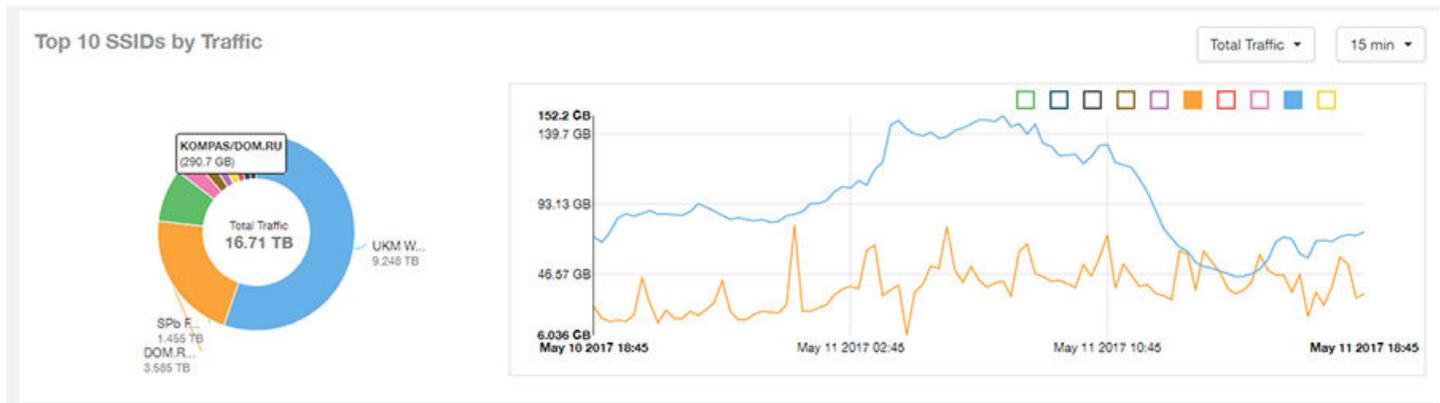
Top SSIDs by Traffic Table

Use the **Top SSIDs by Traffic** donut pie chart and graph of the **WLANs Report** to view which wireless networks are generating the most traffic, to compare usage of the top WLANs over different time periods, and to compare Tx and Rx statistics independently.

The **Top SSIDs by Traffic** tile contains a donut chart and a graph.

In the graph, click any of the colored squares to display the corresponding SSID details in the line graph. You can use the traffic menu to choose whether to display transmitted data only, received data only, or total traffic data.

FIGURE 91 WLAN: Top SSIDs by Traffic Tile



Use the chart and table icons () to toggle between the chart and table views.

In the **Top SSIDs by Traffic** table, you can sort the table by total traffic, clients, AP count, or alphabetically by SSID name. Click the gear icon () to select the columns to display, and click any column heading to sort the table by that column. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

You can select the top 10 (default), 20, 50, or 100 SSIDs by traffic volume, or list all SSIDs.

FIGURE 92 WLAN: Top SSIDs by Traffic (Table)

The figure shows a table titled 'Top SSIDs by Traffic'. A summary at the top right states: 'These SSIDs consume 73.15 % (16.71 TB) of the total traffic (22.84 TB).' The table has 7 columns: Index, SSID Name, Rx Total, Tx Total, Total Traffic, Clients, and APs. The first 10 rows of data are as follows:

Index	SSID Name	Rx Total	Tx Total	Total Traffic	Clients	APs
1	Your_Co_SSIDName1	594.3 GB	6.678 TB	9.248 TB	18.45 k	974
2	Your_Co_SSIDName2	151.3 GB	3.437 TB	3.585 TB	44.44 k	1,105 k
3	Your_Co_SSIDName3	157 GB	1.301 TB	1,455 TB	66.74 k	961
4	Your_Co_SSIDName4	61.92 GB	480.3 GB	542.3 GB	11.44 k	213
5	Your_Co_SSIDName5	23.43 GB	374.6 GB	398.2 GB	1,096 k	26
6	Your_Co_SSIDName6	11.38 MB	337.6 GB	337.6 GB	1	959
7	Your_Co_SSIDName7	25.13 GB	299.3 GB	324.5 GB	101	6
8	Your_Co_SSIDName8	26.94 GB	278.2 GB	305.2 GB	3,941 k	50
9	Your_Co_SSIDName9	12.63 GB	278 GB	290.7 GB	288	20
10	Your_Co_SSIDName10	20.05 GB	259.9 GB	279.9 GB	4,754 k	280

Top SSIDs by Client Count Tile

Use the **Top SSIDs by Client Count** donut chart and graph of the **WLAN Report** to view which wireless networks are most congested in terms of client count, and to compare client counts over different time periods.

The **Top SSIDs by Client Count** tile contains a donut chart and a graph.

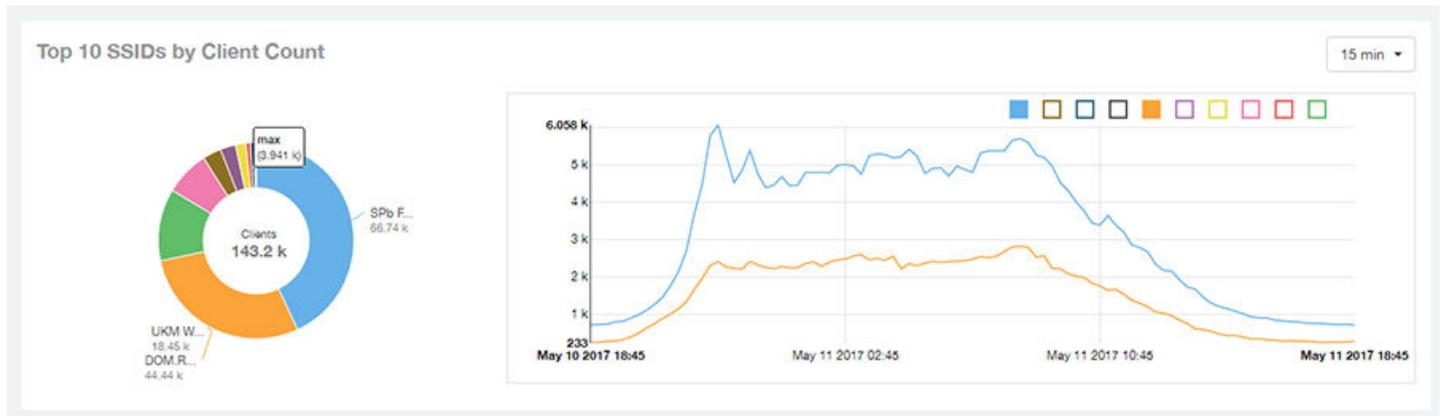
WLANs Report Dashboard

WLAN Report

In the graph, click any of the colored squares to display the corresponding SSID details in the line graph.

If you pause a pointer over the line graph, an information box is displayed containing the selected SSID names and client counts at the chosen data point.

FIGURE 93 WLAN: Top SSIDs by Client Count Tile



Use the chart and table icons ( ) to toggle between the chart and table views.

In the **Top SSIDs by Client Count** table, you can sort the table by total traffic, clients, AP count, or alphabetically by SSID name. Click the gear icon () to select the columns to display, and click any column heading to sort the table by that column. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

You can select the top 10 (default), 20, 50, or 100 SSIDs by client count, or list all SSIDs.

FIGURE 94 WLAN: Top SSIDs by Client Count (Table)

Index	SSID Name	Clients	Rx Total	Tx Total	Total Traffic	APs
1	Your Co_SSIDName1	66.74 k	157 GB	1.301 TB	1.455 TB	961
2	Your Co_SSIDName2	44.44 k	151.3 GB	3.437 TB	3.589 TB	1,105 k
3	Your Co_SSIDName3	18.45 k	554.3 GB	8.678 TB	9.248 TB	974
4	Your Co_SSIDName4	11.44 k	61.92 GB	480.3 GB	542.3 GB	213
5	Your Co_SSIDName5	4.754 k	20.05 GB	259.9 GB	279.9 GB	280
6	Your Co_SSIDName6	3.941 k	26.94 GB	278.2 GB	305.2 GB	50
7	Your Co_SSIDName7	2.656 k	9.192 GB	100.3 GB	109.5 GB	170
8	Your Co_SSIDName8	1.18 k	2.87 GB	34.78 GB	37.65 GB	5
9	Your Co_SSIDName9	1.096 k	23.43 GB	374.8 GB	398.2 GB	26
10	Your Co_SSIDName10	344	621.7 MB	8.391 GB	8.993 GB	14

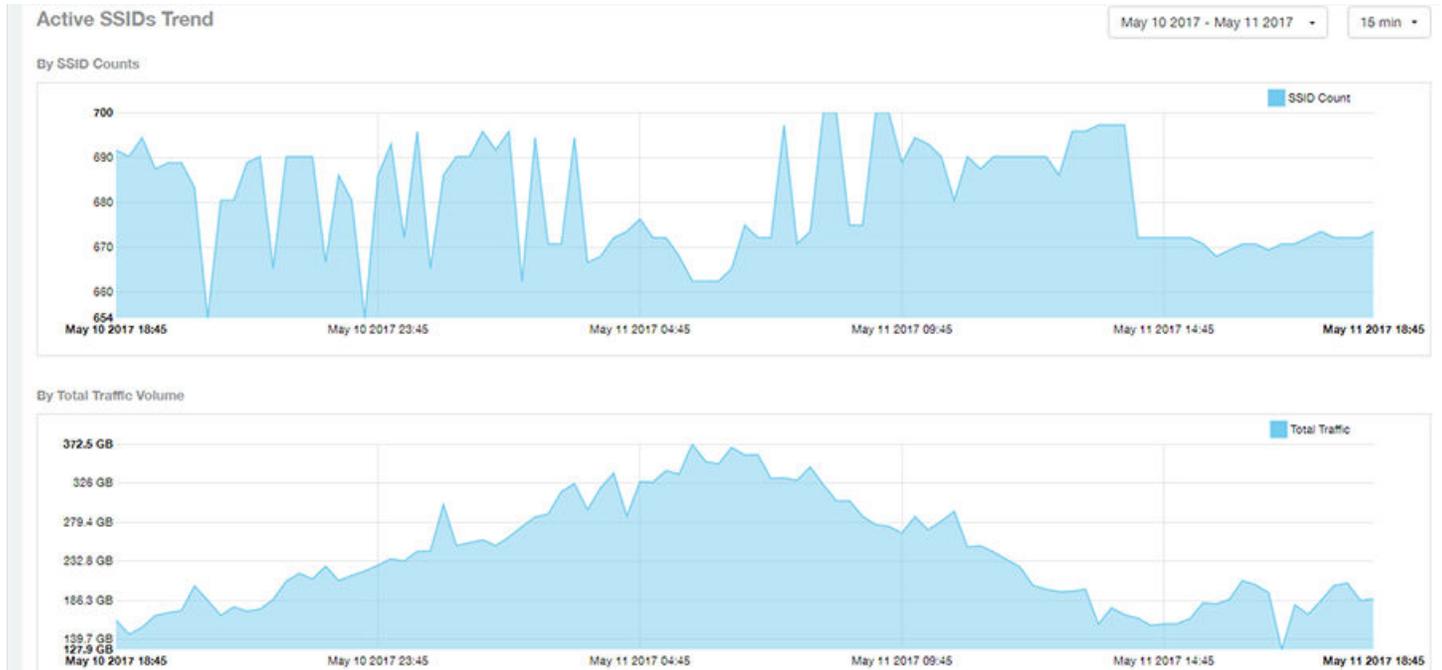
Active SSIDs Trend Graphs

The **Active SSIDs Trend** graphs of the **WLAN Report** show the: total number of SSIDs over time, and the total traffic volume over time.

Delete this line here. A repeat of the opening paragraph.

Pause the pointer over the graphs to display the total SSID count or total traffic volume at any specific data point.

FIGURE 95 WLAN: Active SSIDs Trend Graphs



Clients Report Dashboard

- Clients Report..... 71

Clients Report

The **Clients Report** provides you with the details of traffic and trends over time from the client perspective.

The **Clients Report** provides an overview of the total traffic, both received and transmitted, and the total number of clients over time. It also contains details of the top unique clients by traffic, both received and transmitted, and unique client trends over time, by client count and by traffic.

From the navigation bar, select **Report > Clients**.

FIGURE 96 Clients Report (Upper Portion Only)



The Clients Report consists of the following components:

- Overview tile
- Top 10 Unique Clients by Traffic graph
- Top 10 OS by Client Count tile
- Clients Details table
- Unique Clients Trend Over Time graphs

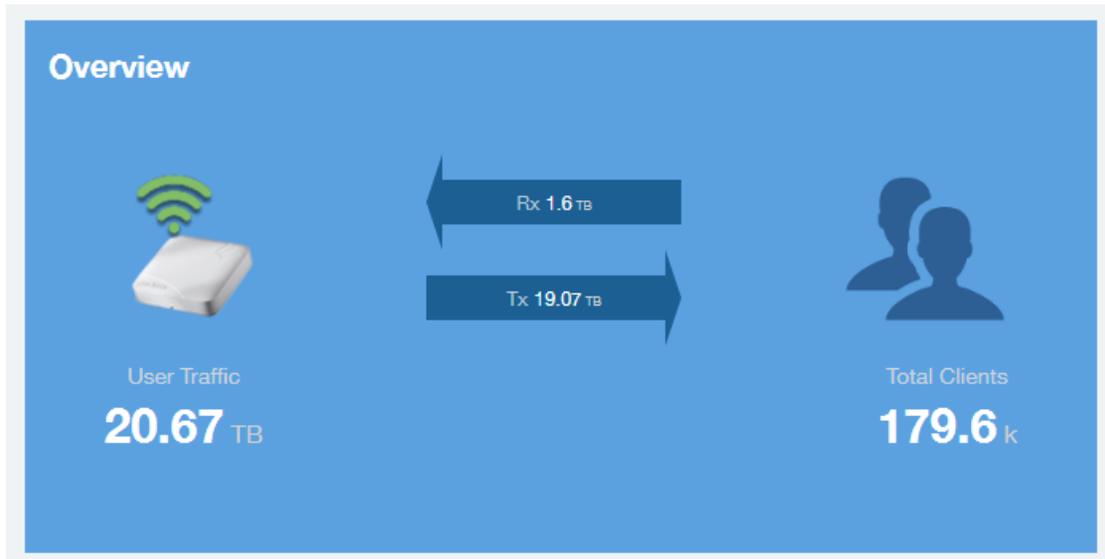
Overview Tile

The **Overview** tile of the **Clients Report** provides information about the total traffic, both received and transmitted, and the total number of clients over the selected time period.

The **Overview** tile displays the following information, based on your selection of APs, radio, and date range filters:

- Total user traffic
- Total received and transmitted user traffic
- Total number of clients on the network

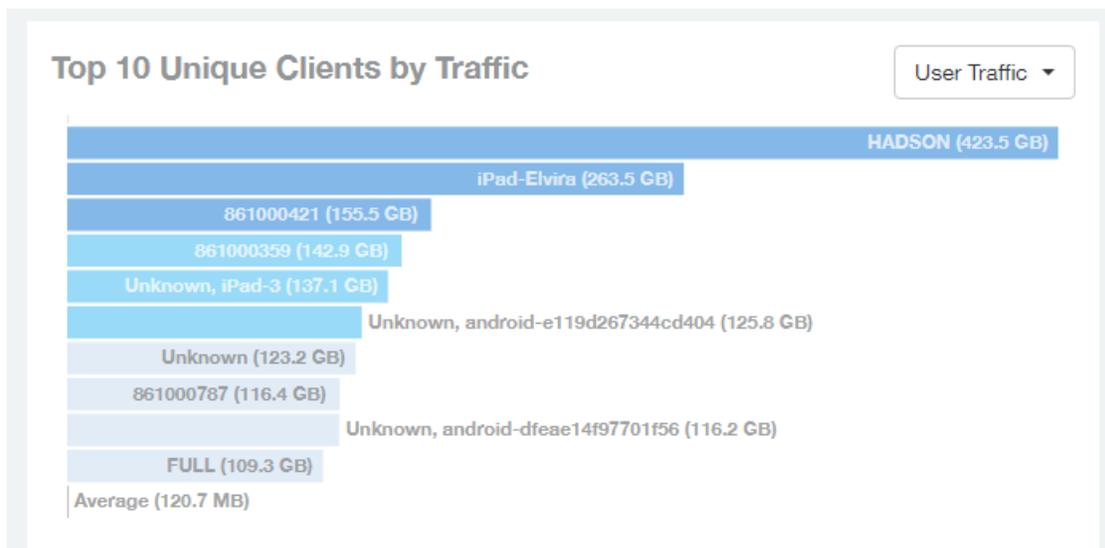
FIGURE 97 Clients: Overview Tile



Top 10 Unique Clients by Traffic Chart

The **Top 10 Unique Clients by Traffic** chart of the **Clients Report** provides you with information about the top ten unique clients by traffic, which you can filter on received traffic, transmitted traffic, and total traffic.

FIGURE 98 Clients: Top 10 Unique Clients by Traffic



Clients Details

The **Clients Details** table of the **Clients Report** shows a list of clients with the highest traffic volume in the network as per the selected components.

Click the gear icon to select the columns to display, and click any column heading to sort the table by that column. By default, the table is sorted by total traffic (Rx + Tx). You can select the top 10 (default), 20, 50, or 100 clients to display. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 99 Clients: Clients Details Table

Clients Details These clients consume 8.1 % (1.673 TB) of all user traffic (20.67 TB). Top 10 Clients

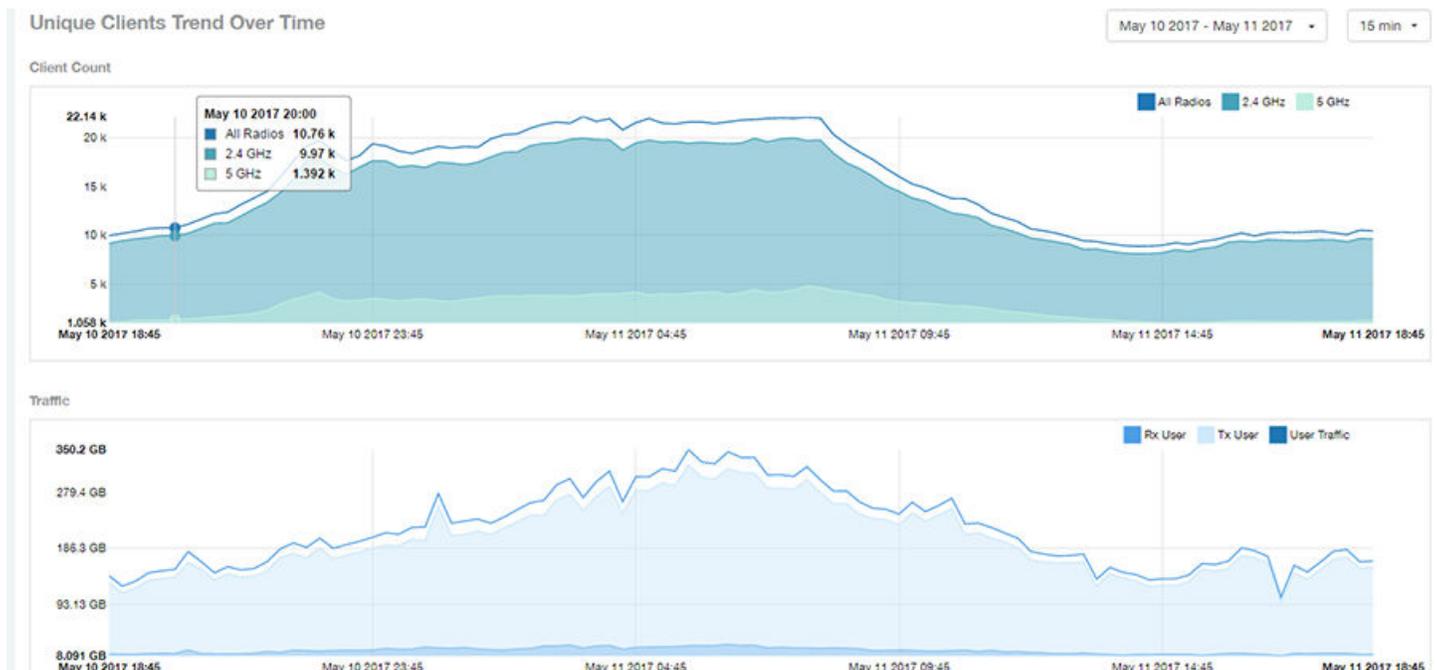
Index	Hostname	MAC Address	IP Address	Username	Sessions	Rx User	Tx User	User Traffic
1	Your_Co_HostName1	FE:DC:BA:89:67:01	10.x.y.1	Your_Co_UserName1	1	190.7 MB	423.3 GB	423.5 GB
2	Your_Co_HostName2	FE:DC:BA:89:67:02	10.x.y.2	Your_Co_UserName2	1	13.8 GB	249.7 GB	263.5 GB
3	Your_Co_HostName3	FE:DC:BA:89:67:03	10.x.y.3	Your_Co_UserName3	9	3.956 GB	151.5 GB	155.5 GB
4	Your_Co_HostName4	FE:DC:BA:89:67:04	10.x.y.4	Your_Co_UserName4	12	3.502 GB	139.4 GB	142.9 GB
5	Your_Co_HostName5	FE:DC:BA:89:67:05	10.x.y.5	Your_Co_UserName5	15	1.066 GB	136 GB	137.1 GB
6	Your_Co_HostName6	FE:DC:BA:89:67:06	10.x.y.6	Your_Co_UserName6	41	1.396 GB	124.4 GB	125.8 GB
7	Your_Co_HostName7	FE:DC:BA:89:67:07	10.x.y.7	Your_Co_UserName7	35	645.4 MB	122.6 GB	123.2 GB
8	Your_Co_HostName8	FE:DC:BA:89:67:08	10.x.y.8	Your_Co_UserName8	13	4.239 GB	112.2 GB	116.4 GB
9	Your_Co_HostName9	FE:DC:BA:89:67:09	10.x.y.9	Your_Co_UserName9	7	3.55 GB	112.6 GB	116.2 GB
10	Your_Co_HostName10	FE:DC:BA:89:67:10	10.x.y.10	Your_Co_UserName10	1	1.438 GB	107.9 GB	109.3 GB

◀ 1 ▼ of 1 ▶

Unique Clients Trend Over Time Graphs

Use the **Unique Clients Trend Over Time Graphs** graphs of the **Clients Report** to view a breakdown of unique clients by radio type over time.

FIGURE 100 Clients: Unique Clients Trend Over Time Graph



Top 10 OS by Client Count Tile

The **Top 10 OS by Client Count** donut chart and graph of the **Clients Report** provides you with information about the ten operating systems being used the most by the clients in your network.

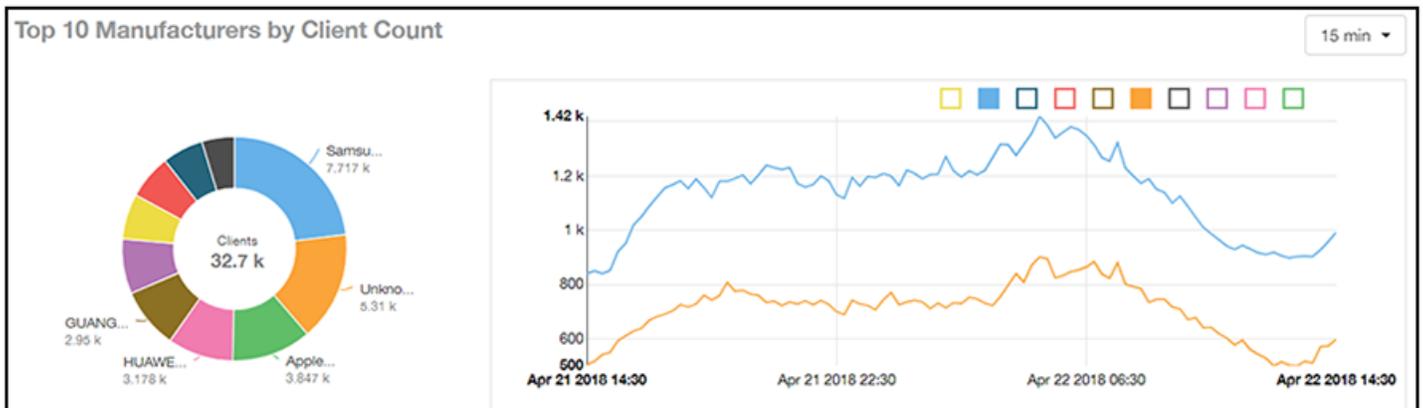
FIGURE 101 Clients: Top 10 OS by Client Count Tile



Top 10 Manufacturers by Client Count Tile

The **Top 10 Manufacturers by Client Count** donut chart and graph of the **Clients Report** provides you with information about the ten manufacturers of wireless equipment most represented in your network.

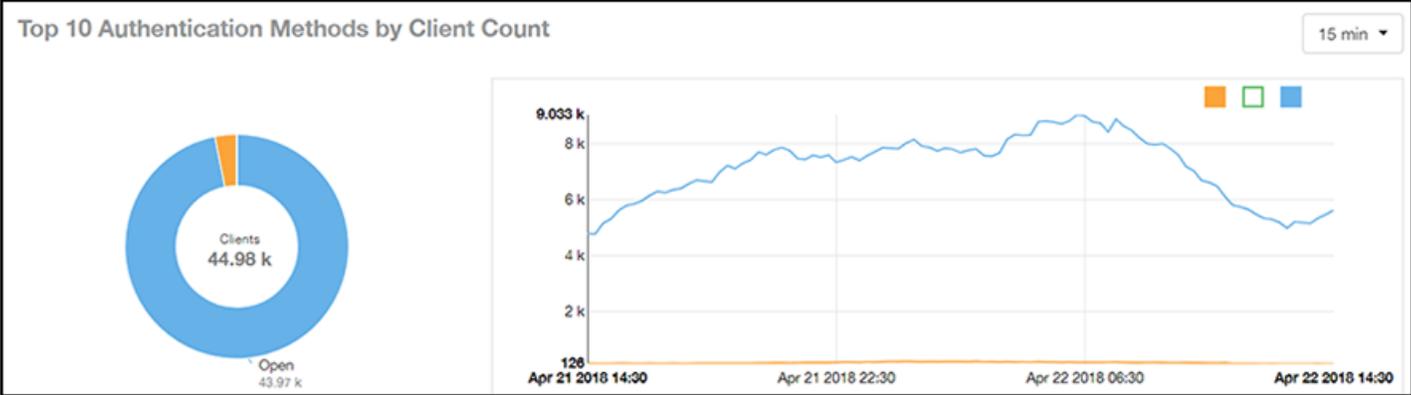
FIGURE 102 Clients: Top 10 Manufacturers by Client Count Tile



Top 10 Authentication Methods by Client Count Tile

The **Top 10 Authentication Methods by Client Count** donut chart and graph of the **Clients Report** provides you with information about the top ten methods most commonly used in your system to authenticate users.

FIGURE 103 Clients - Top 10 Authentication Methods by Client Count Tile



Client Health Dashboard

- Client Health Report.....77

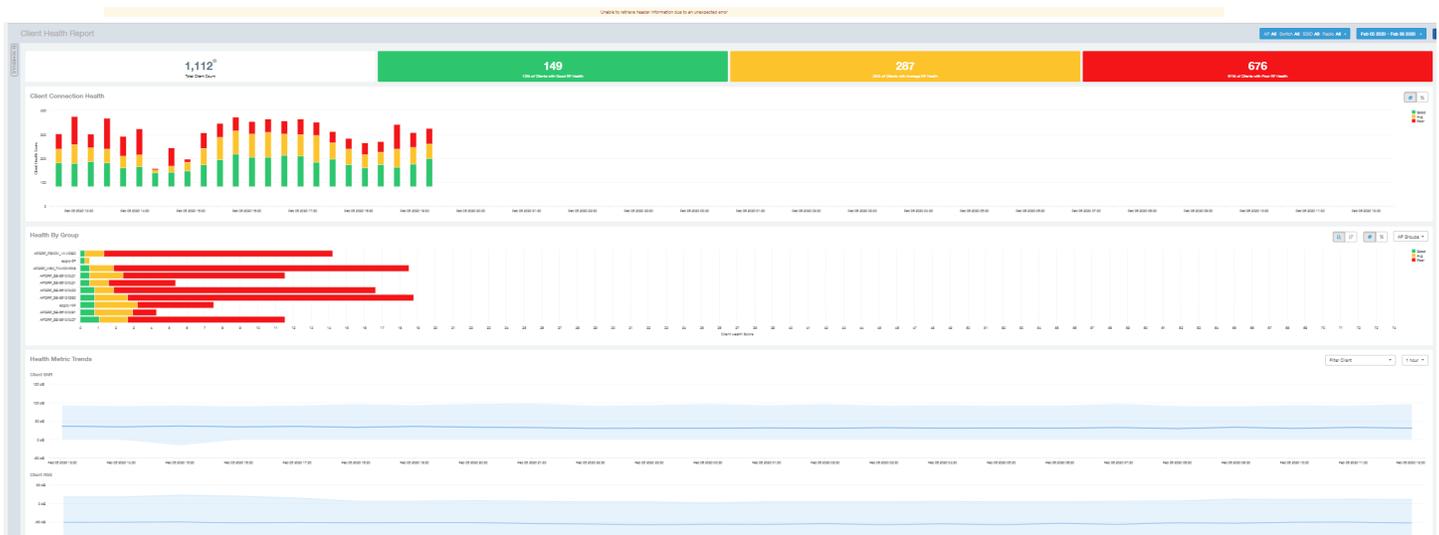
Client Health Report

The Client Health Report page calculates and displays a client health score to quickly assess the health of client connections.

The score is determined by the following metrics:

- RSSI
- SNR
- Throughput
- MCS (for transmission)

FIGURE 104 Client Health Report (Upper Portion Only)



The Client Health Report consists of the following components:

- Header tile
- Client Connection Health tile
- Health by Group tile
- Health Metric Trends graphs

Header Tile

The header tile shows a summary of client health data for the selected time, by displaying the total clients that have been assigned the client score, and the status of these clients based on their RF health. The RF health is depicted as three colored boxes; each color indicating a status. The client count for each RF health status is also displayed.



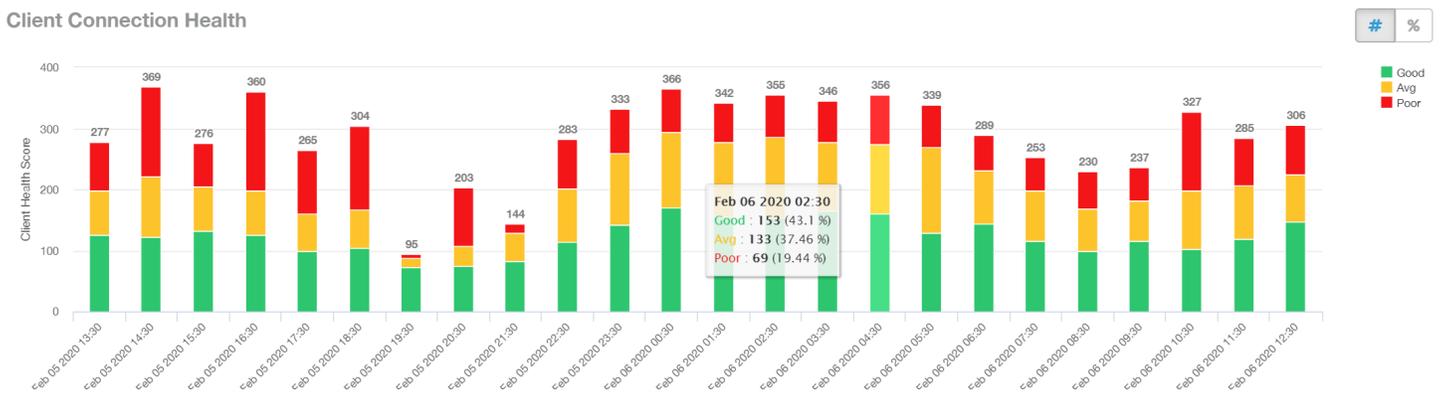
The green box shows the number of clients with good RF health. The yellow box shows the number of clients with average RF health and the red box displays the number of clients with poor RF health. The numbers are determined by the threshold that you set as per your expectations of client health in the network.

For example, here, out of 1112 clients in total, 149 have good RF health, 287 have average RF health, and 676 clients have poor RF health.

Client Connection Health Tile

The Client Connection Health chart displays the client health score against a specific time range such as an hour, for example. You can toggle to view the chart in two ways - as (# icon) count, or as (% icon) percentage. Count shows the client health score as good, average, and poor as a stacked color bar, and Percentage shows the percentage of clients at a time (aggregation) as a 100% stacked color bar. You can hover over the bar graph to view more details.

FIGURE 105 Client Health Score: Client Connection Health

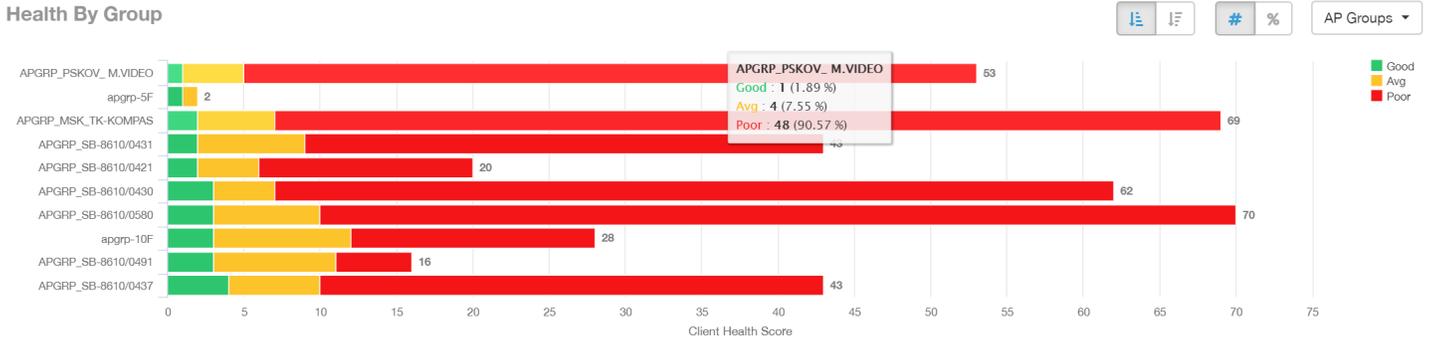


You can toggle the boxes on and off to display or not display clients classified by their score. For example, to only view the clients with a good score, you can disable the yellow and red boxes; you will only see the clients with a good RF health in the graph.

Health by Group Tile

The Health by Group chart displays the impact of RF health across the group hierarchy, which helps identify top performing and worst performing clients in the network. The group hierarchy level available are System, Domain, Zone, AP, and AP Group. Based on the group selected from the dropdown, stacked color bars are displayed depicting the client score for the group selected.

FIGURE 106 Client Health Score: Health by Group



You can toggle to view the chart in two ways - as (# icon) count, or as (% icon) percentage. Count shows the client health score as good, average, and poor as a stacked color bar, and Percentage shows the percentage of clients at a time (aggregation) as a 100% stacked color bar. You can hover over the bar graph to view more details.

NOTE

The top performing values or good scores are used to sort the data.

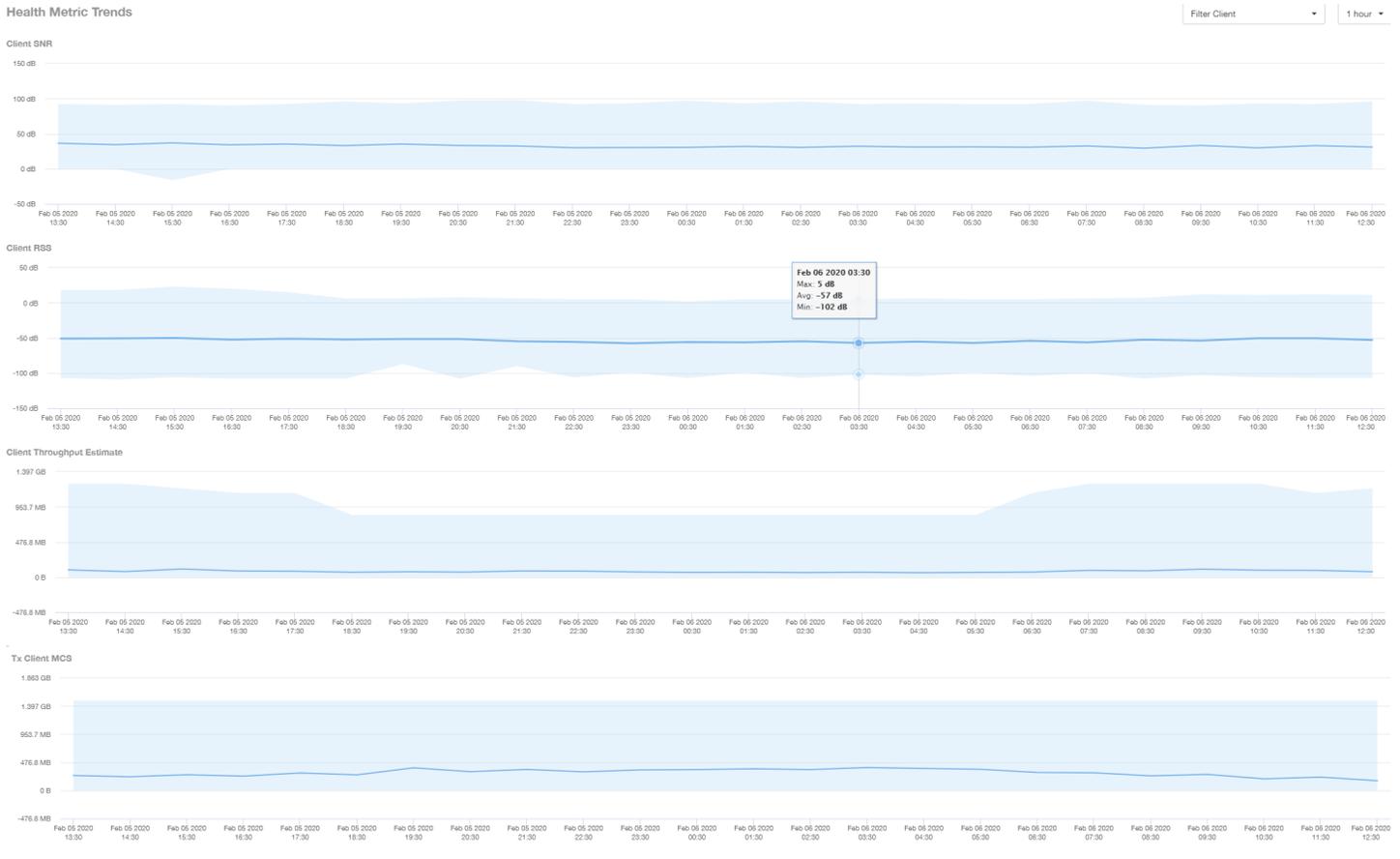
The ascending and descending order icons sort the groups as groups with highest percentage or count of good clients, and highest percentage or count of poor clients, respectively.

You can toggle the boxes on and off to display or not display clients classified by their score.

Health Metric Trends Graphs

The Health Metric Trend graphs show the raw metrics that are used to compute the client health score; this impacts the header tile, client connection tile, and the health by group tile. The raw metrics used for the computation are RSSI, SNR, MCS (Tx) and client throughput. The graphs are plotted over a range of time. You can also select the time range from the drop-down. Options include 1 hour, 1 day and so on.

FIGURE 107 Client Health Score: Health Metric Trends Graphs



To understand the basis for the health score at a particular date and time, you can view the individual charts for RSSI, SNR, MCS (Tx) and client throughput, at the same date and time. This analysis identifies the raw metric that contributed to the health score computation.

All the four charts display the trends for all the clients that are connected. To view trends for specific clients, you can select the client from the **Filter Client** drop-down. By default, all clients are selected.

Applications Report Dashboard

- Applications Report..... 81

Applications Report

The **Applications Report** provides the details of the applications accessed by the user.

From the navigation bar, select **Report > Applications**.

The **Applications Report** contains the details of the applications accessed by the user and predefined by SCI. The overview contains the list of recognized applications. The rest of the report contains the top ten applications by traffic volume received and transmitted over time, client count, traffic, and clients.

FIGURE 108 Applications Dashboard (Upper Portion Only)



Airtime Utilization Report Dashboard

- Airtime Utilization Report.....83

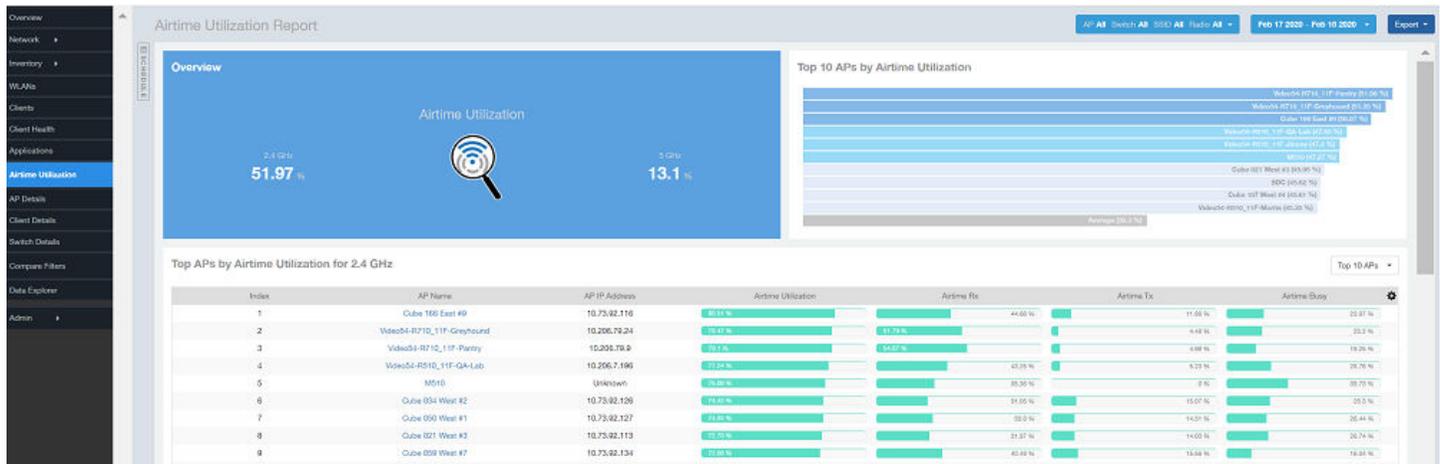
Airtime Utilization Report

The **Airtime Utilization Report** provides an overview of airtime utilization.

From the navigation bar, select **Report > Airtime Utilization**.

The **Airtime Utilization Report** lists the APs by airtime utilization for radio 2.4 GHz and 5 GHz. It also lists the airtime utilization trend over time based on APs and radio.

FIGURE 109 Airtime Utilization Report (Upper Portion Only)



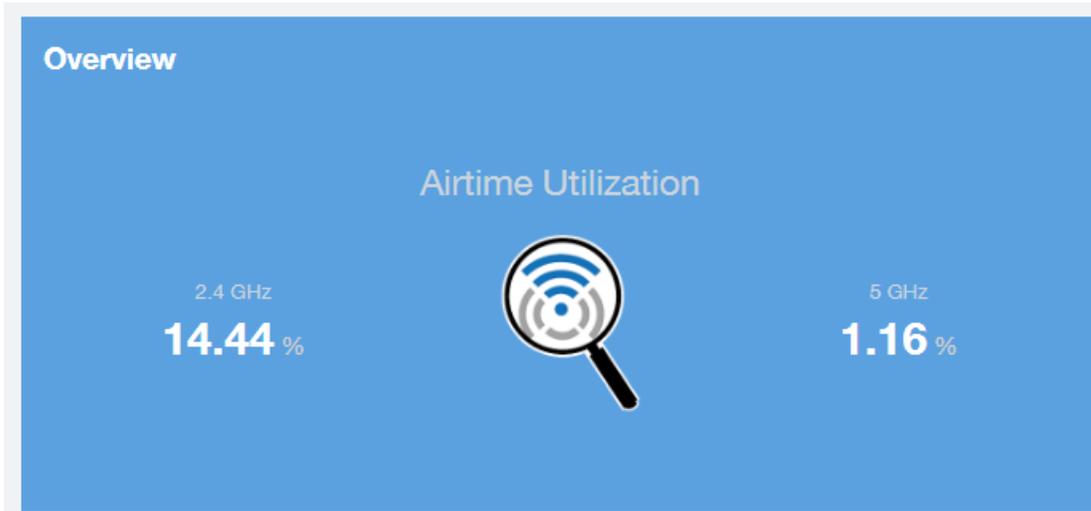
The Airtime Utilization Report consists of the following components:

- Overview tile
- Top 10 APs by Airtime Utilization chart
- Top APs by Airtime Utilization for 2.4 GHz table
- Top APs by Airtime Utilization for 5 GHz table
- Airtime Utilization Trend graphs

Overview Tile

The **Overview** tile of the **Airtime Utilization Report** displays the aggregate utilization rates for all of the 2.4-GHz and 5-GHz radios on all APs for the selected time period.

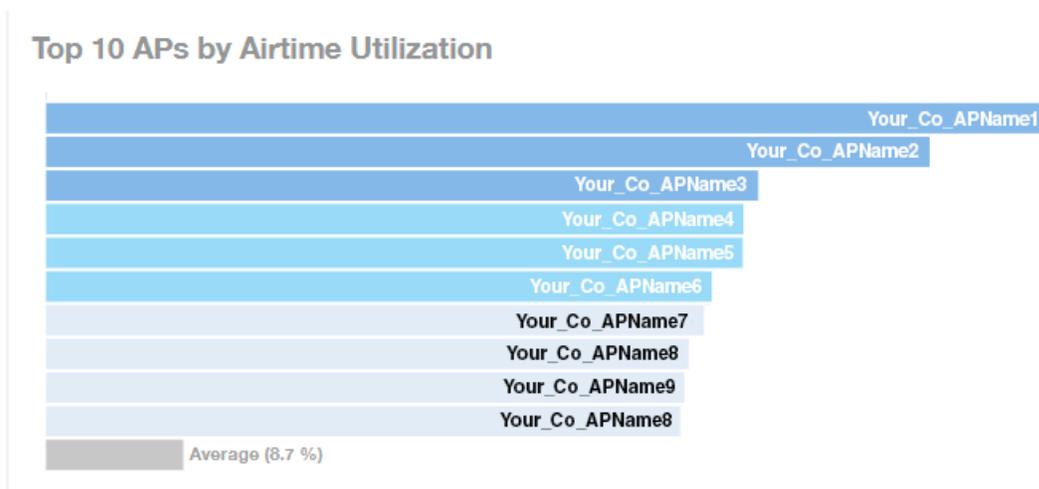
FIGURE 110 Airtime Utilization: Overview Tile



Top 10 APs by Airtime Utilization Chart

Use the **Top 10 APs by Airtime Utilization** chart to view which APs have the highest airtime utilization percentage rates.

FIGURE 111 Top 10 APs by Airtime Utilization Chart



Top APs by Airtime Utilization for 2.4 GHz Table

The **Top APs by Airtime Utilization for 2.4 GHz** table displays which APs have the highest utilization on the 2.4 GHz radio.

Use this table to view a list the top APs with the highest airtime utilization sorted according to the selected columns. Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column.

You can select the top 10 (default), 20, 50, or 100 APs by airtime utilization to display. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 112 Top APs by Airtime Utilization for 2.4 GHz Table

Top APs by Airtime Utilization for 2.4 GHz Top 10 APs ▾

Index	AP Name	AP IP Address	Controller Name	Airtime Utilization	Airtime Rx	Airtime Tx	Airtime Busy	⚙️
1	Your_Co_APName1	10.x.y.1	Your_Co_CTName1	69.07 %	17.04 %	0 %	62.03 %	
2	Your_Co_APName2	10.x.y.2	Your_Co_CTName2	63.56 %	30.74 %	0 %	32.82 %	
3	Your_Co_APName3	10.x.y.3	Your_Co_CTName3	62.14 %	48.92 %	6.86 %	6.37 %	
4	Your_Co_APName4	10.x.y.4	Your_Co_CTName4	59.02 %	47.19 %	4.09 %	7.75 %	
5	Your_Co_APName5	10.x.y.5	Your_Co_CTName5	56.97 %	40.54 %	11.92 %	4.52 %	
6	Your_Co_APName6	10.x.y.6	Your_Co_CTName6	56.39 %	23.04 %	0.03 %	33.32 %	
7	Your_Co_APName7	10.x.y.7	Your_Co_CTName7	56.02 %	26.77 %	0 %	29.25 %	
8	Your_Co_APName8	10.x.y.8	Your_Co_CTName8	53.36 %	42.26 %	3.86 %	7.24 %	
9	Your_Co_APName9	10.x.y.9	Your_Co_CTName9	52.73 %	43.24 %	4.36 %	5.13 %	
10	Your_Co_APName10	10.x.y.10	Your_Co_CTName10	52.64 %	45.71 %	2.45 %	4.48 %	

◀ 1 ▾ of 1 ▶

Top APs by Airtime Utilization for 5 GHz Table

The **Top APs by Airtime Utilization for 5 GHz** table of the **Airtime Utilization Report** displays which APs have the highest utilization on the 5 GHz radio.

Use this table to view a list of the top APs with the highest airtime utilization sorted by the selected columns. Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column.

You can select the top 10 (default), 20, 50, or 100 APs by airtime utilization to display. The number of rows in a page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 113 Top APs by Airtime Utilization for 5 GHz Table

Top APs by Airtime Utilization for 5 GHz Top 10 APs ▾

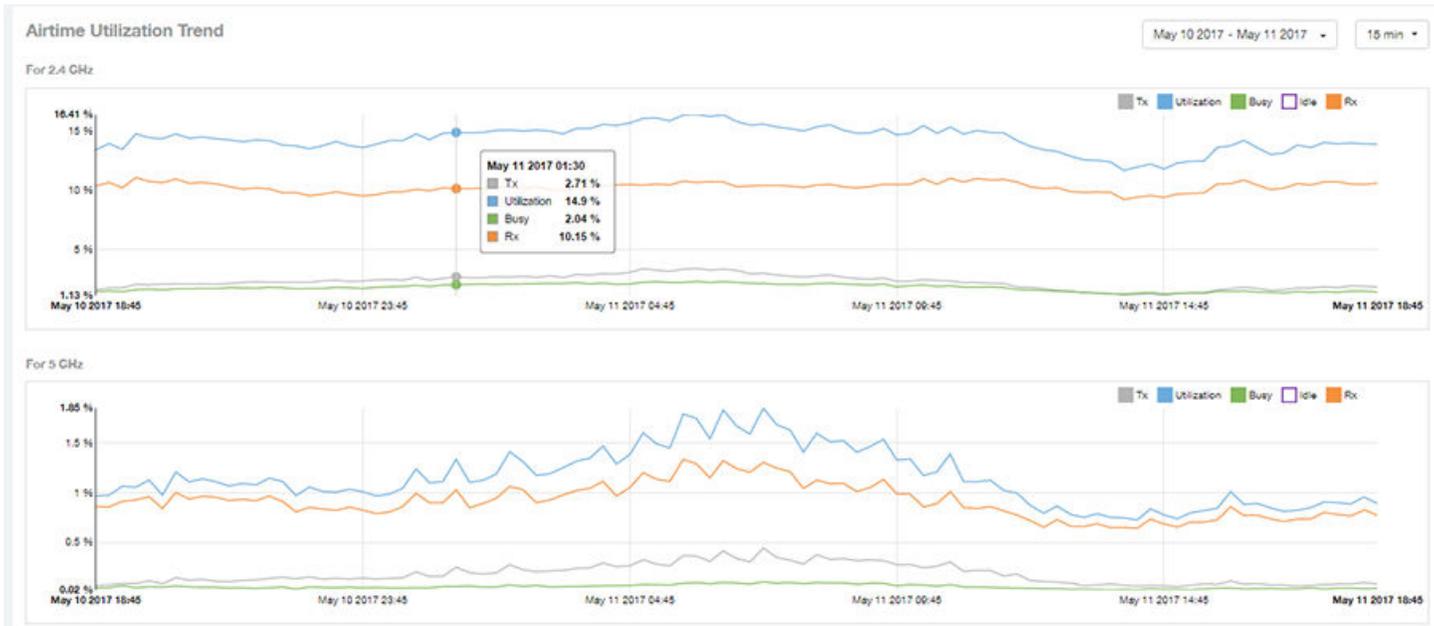
Index	AP Name	AP IP Address	Controller Name	Airtime Utilization	Airtime Rx	Airtime Tx	Airtime Busy	⚙️
1	Your_Co_APName1	10.x.y.1	Your_Co_CTName1	74.25 %	72.91 %	0 %	1.34 %	
2	Your_Co_APName2	10.x.y.2	Your_Co_CTName1	59.35 %	58.26 %	0 %	1.09 %	
3	Your_Co_APName3	10.x.y.3	Your_Co_CTName1	58.29 %	57.54 %	0 %	0.76 %	
4	Your_Co_APName4	10.x.y.4	Your_Co_CTName1	56.36 %	53.99 %	0.36 %	1.01 %	
5	Your_Co_APName5	10.x.y.5	Your_Co_CTName1	55.05 %	53.78 %	0.45 %	0.85 %	
6	Your_Co_AccessPoint1	172.16.z.1	Your_Co_Controller2	54.36 %	54.18 %	0.05 %	0.12 %	
7	Your_Co_AccessPoint2	172.16.z.2	Your_Co_Controller2	54.05 %	53.81 %	0 %	0.27 %	
8	Your_Co_AccessPoint3	172.16.z.3	Your_Co_Controller2	49.03 %	48.77 %	0.08 %	0.18 %	
9	Your_Co_AccessPoint4	172.16.z.4	Your_Co_Controller2	48.88 %	47.47 %	0.95 %	0.45 %	
10	Your_Co_AccessPoint5	172.16.z.5	Your_Co_Controller2	46.03 %	45.96 %	0.02 %	0.05 %	

◀ 1 ▾ of 1 ▶

Airtime Utilization Trend Graph

The **Airtime Utilization Trend** graph shows the airtime utilization trends for 2.4-GHz and 5-GHz radios in percentages over time.

FIGURE 114 Airtime Utilization Trend Graph Trends



Airtime Utilization Over Time Table

Use the **Airtime Utilization Over Time** table to compare utilization rates between time periods, and to examine specific airtime utilization data, such as time spent busy or idle, transmitting or receiving,, and user traffic compared management traffic.

FIGURE 115 Airtime Utilization Over Time Table

Time Period	2.4 GHz Utilization	2.4 GHz Rx	2.4 GHz Tx	2.4 GHz Busy	5 GHz Utilization	5 GHz Rx	5 GHz Tx	5 GHz Busy
May 10 2017 18:45 - 18:59	13.43 %	10.37 %	1.61 %	1.45 %	0.97 %	0.86 %	0.06 %	0.04 %
May 10 2017 19:00 - 19:14	13.96 %	10.67 %	1.76 %	1.82 %	0.98 %	0.86 %	0.07 %	0.04 %
May 10 2017 19:15 - 19:29	13.46 %	10.22 %	1.78 %	1.46 %	1.07 %	0.91 %	0.09 %	0.07 %
May 10 2017 19:30 - 19:44	14.78 %	11.09 %	2.07 %	1.63 %	1.06 %	0.93 %	0.09 %	0.04 %
May 10 2017 19:45 - 19:59	14.48 %	10.76 %	2.04 %	1.66 %	1.13 %	0.96 %	0.11 %	0.06 %
May 10 2017 20:00 - 20:14	14.37 %	10.66 %	2.1 %	1.61 %	0.98 %	0.84 %	0.08 %	0.06 %
May 10 2017 20:15 - 20:29	14.77 %	10.96 %	2.11 %	1.7 %	1.21 %	1 %	0.16 %	0.06 %
May 10 2017 20:30 - 20:44	14.41 %	10.61 %	2.1 %	1.71 %	1.11 %	0.94 %	0.12 %	0.06 %
May 10 2017 20:45 - 20:59	14.62 %	10.67 %	2.11 %	1.73 %	1.14 %	0.96 %	0.13 %	0.06 %
May 10 2017 21:00 - 21:14	14.37 %	10.66 %	2.08 %	1.72 %	1.11 %	0.96 %	0.11 %	0.06 %

AP Details Report Dashboard

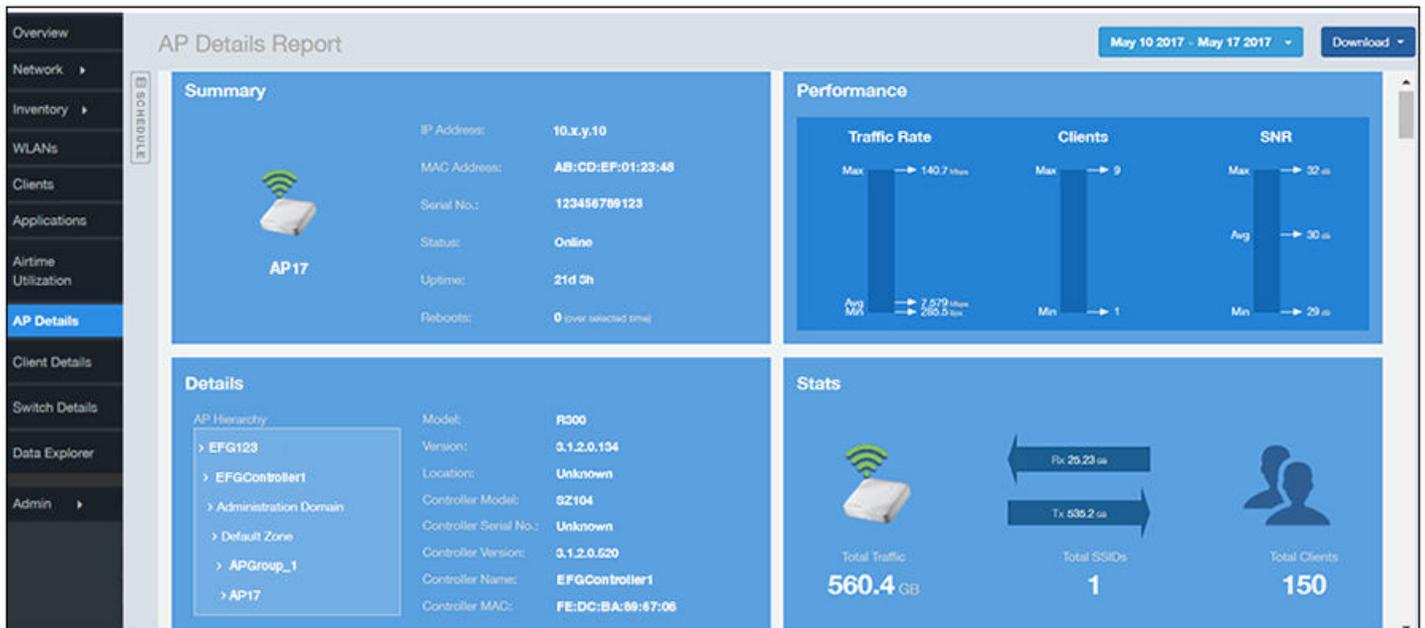
- AP Details Report.....87

AP Details Report

The **AP Details Report** provides details about one specific access point.

You can reach this report by either clicking on a hyperlink of an AP name from another dashboard, or by clicking **AP Details** on the navigation bar. If you click **AP Details** to get to the AP Details Report, you then need to enter the MAC address of the AP whose details you want to view.

FIGURE 116 AP Details Report (upper portion)



The **AP Details Report** consists of the following components:

- Summary tile
- Performance tile
- Details tile
- Stats tile
- Uptime History graph
- Traffic Trend graphs
- Unique Clients Trend Over Time graphs
- Top 10 Clients by Traffic Volume tile
- Top 10 Applications by Traffic Volume tile
- Top SSIDs by Traffic table

AP Details Report Dashboard

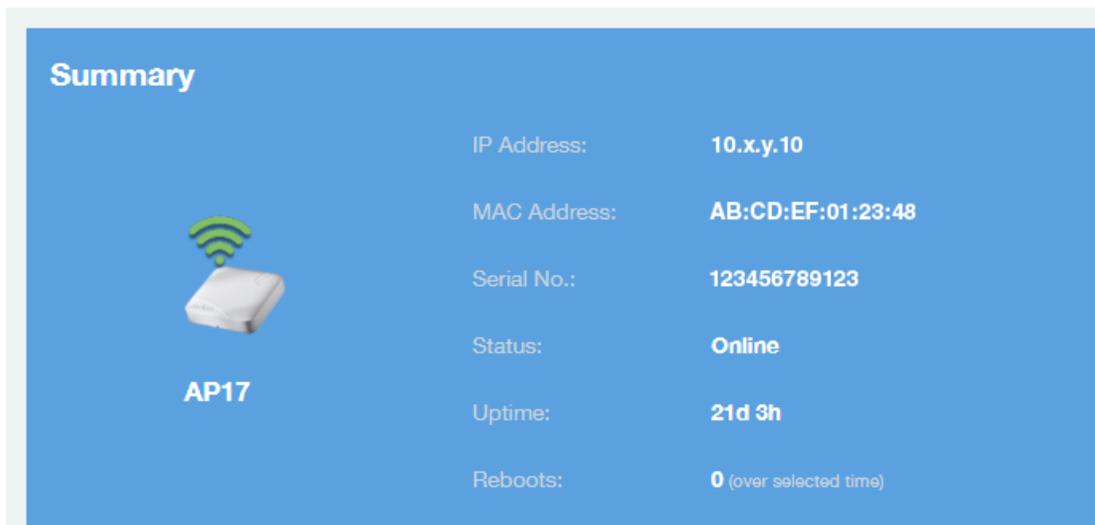
AP Details Report

- Sessions table
- RSS Trend graph
- SNR Trend graph
- Airtime Utilization Trend graphs
- Clients Details table
- Alarms table
- Events table
- Anomalies graph

Summary Tile

The **Summary** tile of the **AP Details Report** displays basic information about a specific AP.

FIGURE 117 AP Details: Summary Tile



Performance Tile

The **Performance** tile of the **AP Details Report** displays performance data about the specified AP.

FIGURE 118 AP Details: Performance Tile

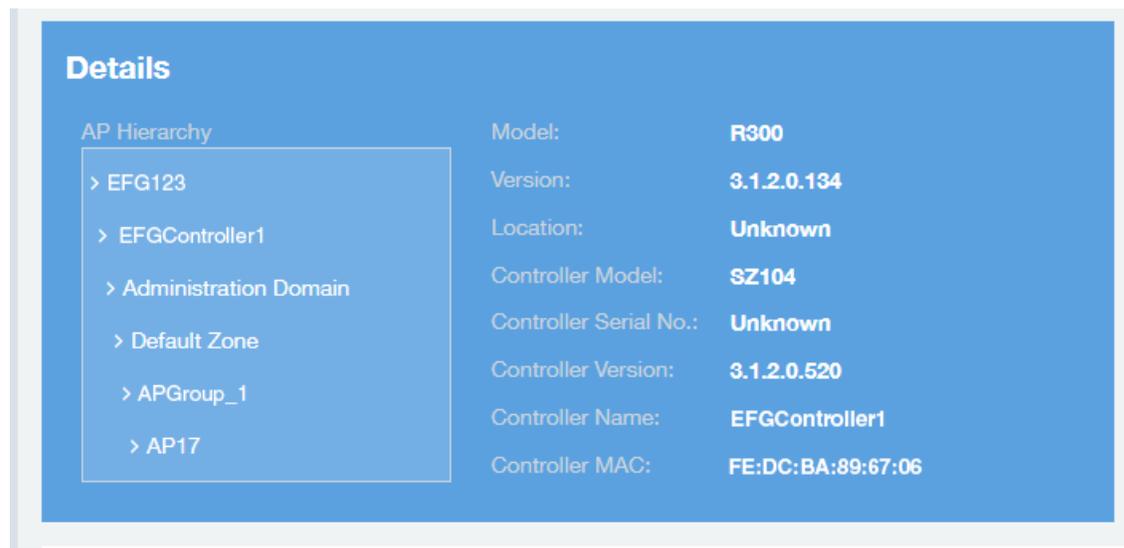


Details Tile

The **Details** tile of the **AP Details Report** contains some details about the specified AP, including its hierarchy in the network.

The AP shown in this example is named AP17. It belongs to a group of access points that has been named APGroup_1. EFGController1 in this example is one of the controllers being used on a wireless network named EFG123.

FIGURE 119 AP Details: Details Tile



Stats Tile

The **Stats** tile of the **AP Details Report** displays some traffic statistics about the specified AP.

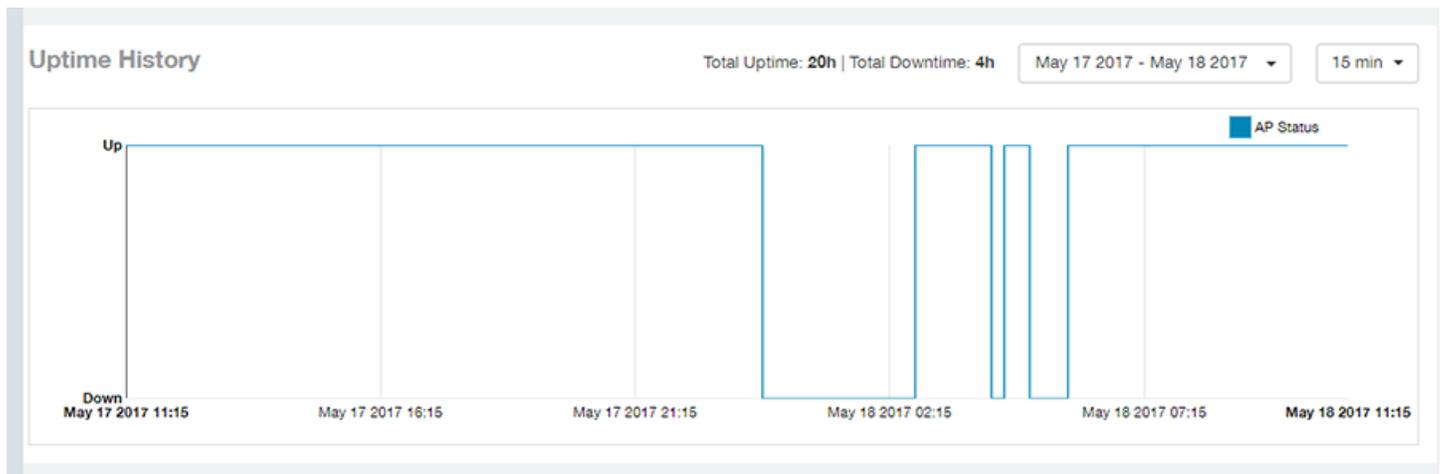
FIGURE 120 AP Details: Stats Tile



Uptime History Graph

The **Uptime History** graph of the **AP Details Report** shows when this AP has been up or down over different time periods. The blue bar indicates when the AP has been up or down. Use the menus to specify the time frame and the granularity of the graph.

FIGURE 121 AP Details: Uptime History Graph



Traffic Trend Graphs

The **Traffic Trend** graphs of the **AP Details Report** contain four line graphs that provide information about the specified AP: two types of line graphs that depict traffic by usage and two types of line graphs that depict traffic by radio type for this AP.

Use the menus to specify the time frame and the granularity of the graphs.

FIGURE 122 AP Details: Traffic Trend Graphs



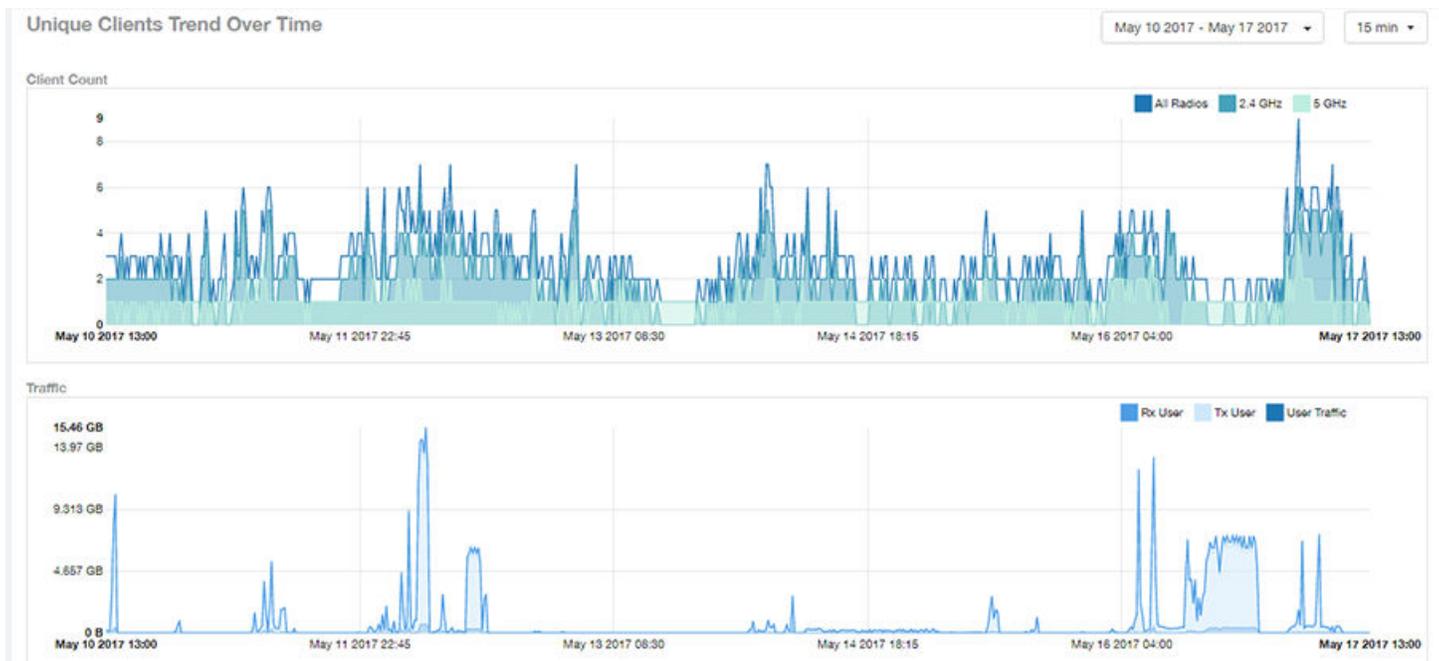
Unique Clients Trend Over Time Graphs

The **Unique Clients Trend Over Time** graphs of the **AP Details Report** contain two line graphs that provide information about unique clients associated with the specified AP over a certain time period.

One graph shows the number of unique clients and the other shows the traffic generated by unique clients.

Use the menus to specify the time frame and the granularity of the graphs.

FIGURE 123 AP Details: Unique Clients Trend Over Time Graphs



Top 10 Clients by Traffic Volume Tile

The **Top 10 Clients by Traffic Volume** donut chart and line graph of the **AP Details Report** depict the clients that have generated the largest volume of traffic over this AP for a specified period of time.

Use the menus to specify the time type and the granularity of the graph. In the graph, click any of the colored squares to display the corresponding client details in the line graph.

NOTE

If you click one of the clients listed in the donut chart, you will be taken to the **Client Details Report** for that client.

FIGURE 124 AP Details: Top 10 Clients by Traffic Volume Tile



Top 10 Applications by Traffic Volume Tile

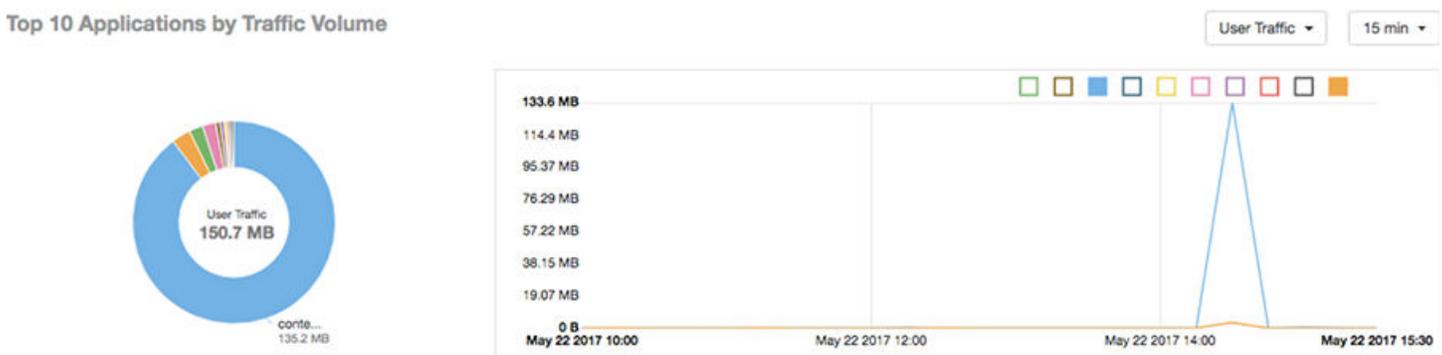
The **Top 10 Applications by Traffic Volume** donut chart and line graph of the **AP Details Report** depict the applications that have generated the largest volume of traffic over this AP for a specified period of time.

Use the menus to specify the traffic type and the granularity of the graph. In the graph, click any of the colored squares to display the corresponding application details in the line graph.

NOTE

Click the table icon to display a table showing the same information.

FIGURE 125 AP Details: Top 10 Applications by Traffic Volume Tile



Top SSIDs by Traffic Table

The **Top SSIDs by Traffic** table of the **AP Details Report** lists the SSIDs that have generated the most traffic associated with this AP.

A service set identifier (SSID) is a logical group of APs. An AP can belong to multiple SSIDs. Use the menu to specify the number of SSIDs to display.

FIGURE 126 AP Details: Top SSIDs by Traffic Table

Index	SSID Name	Rx Total	Tx Total	Total Traffic	Clients	APs
1	Your_Co_SSID_Name1	11.02 GB	201.3 GB	212.3 GB	32	1

Sessions Table

The **Sessions** table of the **AP Details Report** provides details for the number of client sessions that you specify for this AP.

Use the menu to specify how many sessions to display.

If you click one of the client links in the **Hostname** column, you are directed to the **Client Details Report** for that client.

FIGURE 127 AP Details: Sessions Table

First Connection	Disconnect Time	Session Duration	Hostname	SSID	Radio	Rx User	Tx User	User Traffic
May 17 2017 14:30	May 17 2017 14:46	16m 6s	EFGHost1	EFGSSID1	5 GHz	13.04 KB	13.35 KB	26.38 KB
May 17 2017 13:08	May 17 2017 14:23	1h 14m	EFGHost2	EFGSSID1	5 GHz	39.36 KB	40.04 KB	79.42 KB
May 17 2017 14:02	May 17 2017 14:03	36.27s	EFGHost3	EFGSSID1	2.4 GHz	16.6 KB	15.52 KB	32.12 KB
May 17 2017 12:55	May 17 2017 12:59	3m 57s	EFGHost4	EFGSSID1	2.4 GHz	7.681 KB	14.39 KB	22.07 KB
May 17 2017 12:41	May 17 2017 12:43	2m 33s	EFGHost5	EFGSSID1	5 GHz	13.61 KB	13.41 KB	27.02 KB
May 17 2017 09:19	May 17 2017 12:34	3h 15m	EFGHost6	EFGSSID1	5 GHz	134.7 KB	150.2 KB	285 KB

RSS Trend Graph

The **RSS Trend** graph of the **AP Details Report** depicts the received signal strength trends over time for this AP.

Use the menus to specify the time frame and the granularity of the graph.

FIGURE 128 AP Details: RSS Trend Graph



SNR Trend Graph

The SNR Trend graph of the AP Details Report depicts the signal-to-noise ratio over time for this AP. Use the menus to select the time frame and the granularity for the graph.

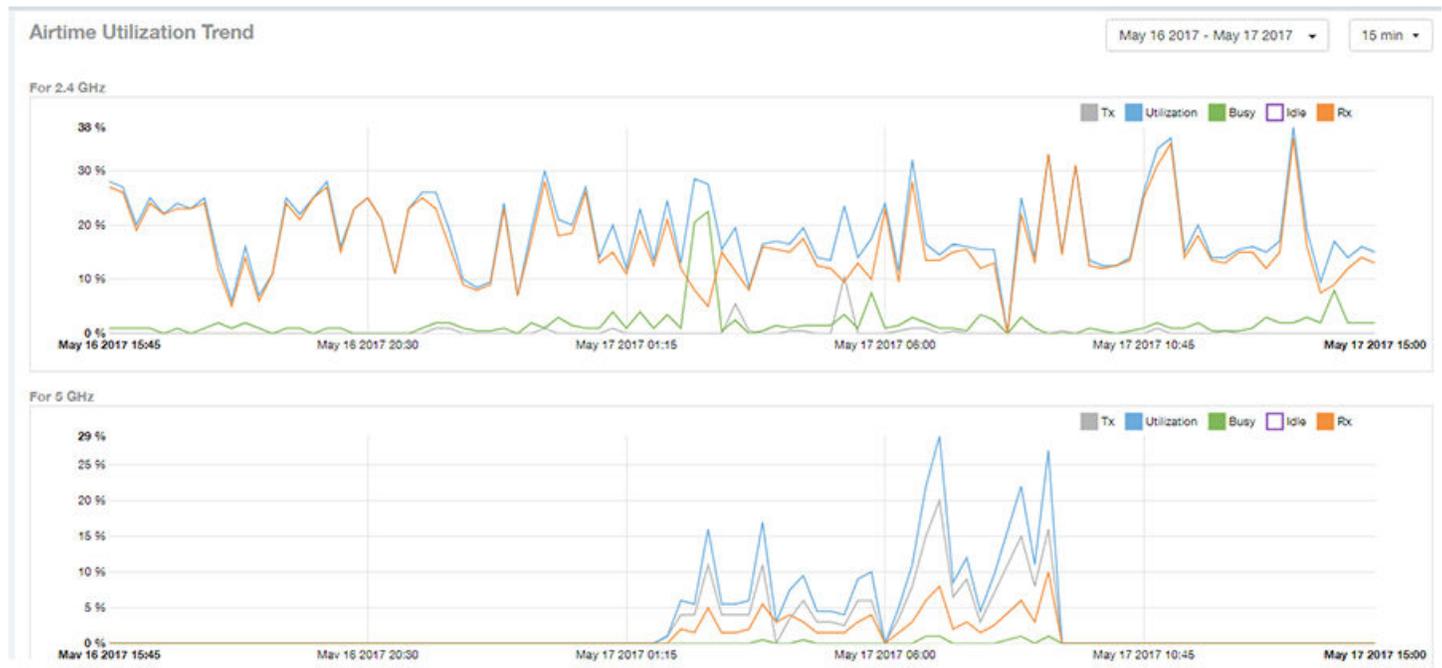
FIGURE 129 AP Details: SNR Trend Graph



Airtime Utilization Trend Graphs

The Airtime Utilization Trend graphs of the AP Details Report depict the airtime utilization for this AP, by radio type, over a specified time period. Use the menus to select the time frame and the granularity for the graphs.

FIGURE 130 AP Details: Airtime Utilization Trend Graphs



Clients Details Table

The **Clients Details** table of the **AP Details Report** provides details for the number of top clients that you specify for this AP.

Use the menu to specify how many top clients to display.

If you click one of the client links in the **Hostname** column, you are directed to the **Client Details Report** for that client.

FIGURE 131 AP Details: Clients Details Table

Clients Details These clients consume **100 % (206.1 GB)** of all user traffic (206.1 GB). Top 10 Clients

Index	Hostname	IP Address	Username	Sessions	Rx User	Tx User	User Traffic
1	EFGHost1	10.x.y.1	Your_Co_UserName1	25	10.47 GB	199 GB	203.4 GB
2	EFGHost2	10.x.y.2	Your_Co_UserName2	8	71.58 MB	1.529 GB	1.599 GB
3	EFGHost3	10.x.y.3	Your_Co_UserName3	6	66.91 MB	447.6 MB	514.5 MB
4	EFGHost4	10.x.y.4	Your_Co_UserName4	2	64.17 MB	357 MB	421.2 MB
5	EFGHost5	10.x.y.5	Your_Co_UserName5	6	27.72 MB	63.57 MB	91.29 MB
6	EFGHost6	10.x.y.6	Your_Co_UserName6	62	6.688 MB	53.04 MB	59.73 MB
7	EFGHost7	10.x.y.7	Your_Co_UserName7	9	785.6 KB	810.9 KB	1.559 MB
8	Your_Co_UserName8	10.x.y.8	Your_Co_UserName8	1	140.4 KB	815.2 KB	955.6 KB
9	Your_Co_UserName9	10.x.y.9	Your_Co_UserName9	1	185.3 KB	272.4 KB	457.7 KB
10	Your_Co_UserName10	10.x.y.10	Your_Co_UserName10	3	147.8 KB	174.1 KB	321.8 KB

◀ 1 of 1 ▶

Alarms Table

The **Alarms** table of the **AP Details Report** lists the alarms generated for this AP for the time period that you specify.

Use the menu to specify how many alarms to display.

Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column.

FIGURE 132 AP Details: Alarms Table

Time	Alarm Code	Alarm Type	Severity	Reason
May 18 2017 11:15	302	apRebootBySystem	Major	AP lost Gateway more than 18...
May 18 2017 10:01	303	apConnectionLost	Major	Unknown
May 17 2017 22:24	302	apRebootBySystem	Major	AP lost Gateway more than 18...
May 17 2017 21:21	303	apConnectionLost	Major	Unknown
May 17 2017 18:54	302	apRebootBySystem	Major	AP lost Gateway more than 18...

Events Table

The **Events** table of the **AP Details Report** lists the events generated for this AP for the time period that you specify.

Use the menu to specify how many events to display.

Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column.

FIGURE 133 AP Details: Events Table

Time	Event Code	Event Type	Reason
May 17 2017 14:57	202	clientJoin	Unknown
May 17 2017 14:46	205	clientInactivityTimeout	Unknown
May 17 2017 14:30	202	clientJoin	Unknown
May 17 2017 14:23	205	clientInactivityTimeout	Unknown
May 17 2017 14:03	204	clientDisconnect	Unknown
May 17 2017 14:02	209	clientRoaming	Unknown
May 17 2017 13:08	202	clientJoin	Unknown
May 17 2017 12:59	205	clientInactivityTimeout	Unknown
May 17 2017 12:55	209	clientRoaming	Unknown
May 17 2017 12:48	306	apChannelChanged	Unknown

Anomalies Graph

The **Anomalies** graph of the **AP Details Report** provides information about any behavior that may be out of the normal range for this AP, such as high reboot count, unusually high or low user traffic, unusually high or low client count, or unusually high or low session count.

For more information about anomalies, as well as screen shots of each type, refer to the *Using Ruckus Smart Analytics* section of the *SmartCell Insight User Guide*.

Client Details Report Dashboard

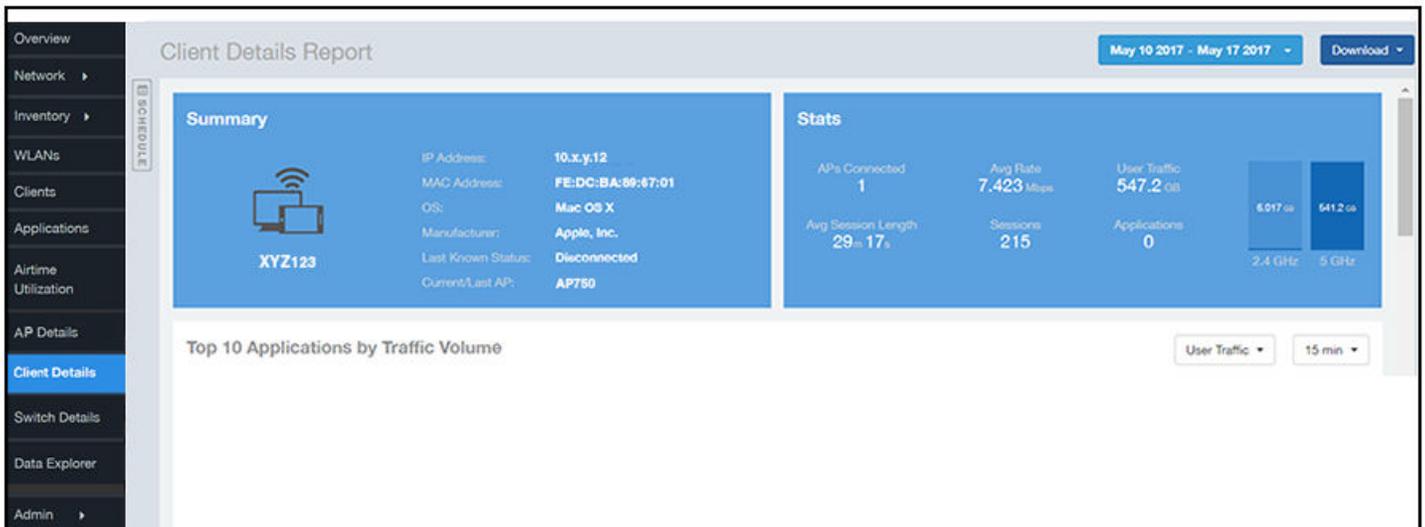
- Client Details Report..... 99

Client Details Report

The Client Details report provides details about one specific client.

You can reach this report by either clicking on a hyperlink of a client name from another dashboard, or by clicking **Client Details** on the navigation bar. If you click **Client Details** to get to this screen, you then need to enter the MAC address of the client whose details you want to view.

FIGURE 134 Client Details Report (upper portion)



The Wired Report consists of the following components:

- Summary tile
- Stats tile
- Traffic Trend tile
- RSS Trend tile
- SNR Trend tile
- Sessions tile

Summary Tile

The Summary section of the Client Details report displays basic information about a specific client.

The hostname for the client shown in this example is XYZ123.

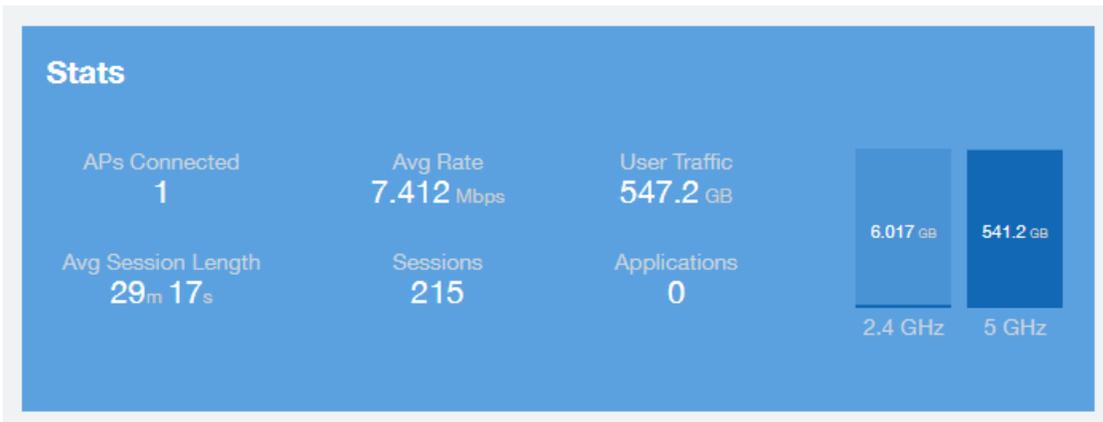
FIGURE 135 Client Details - Summary



Stats Tile

The Stats section of the Client Details report shows statistics for the specified client.

FIGURE 136 Client Details - Stats



Client Details Stats

The Client Details - Top 10 Applications by Traffic Volume pie chart and graph show the applications run by this client that have the largest traffic volume.

Use the menus to specify the traffic type and the granularity of the graph. In the graph, click any of the colored squares to display the corresponding application details in the line graph.

NOTE

You can click the Table icon to toggle to a table of this same information.

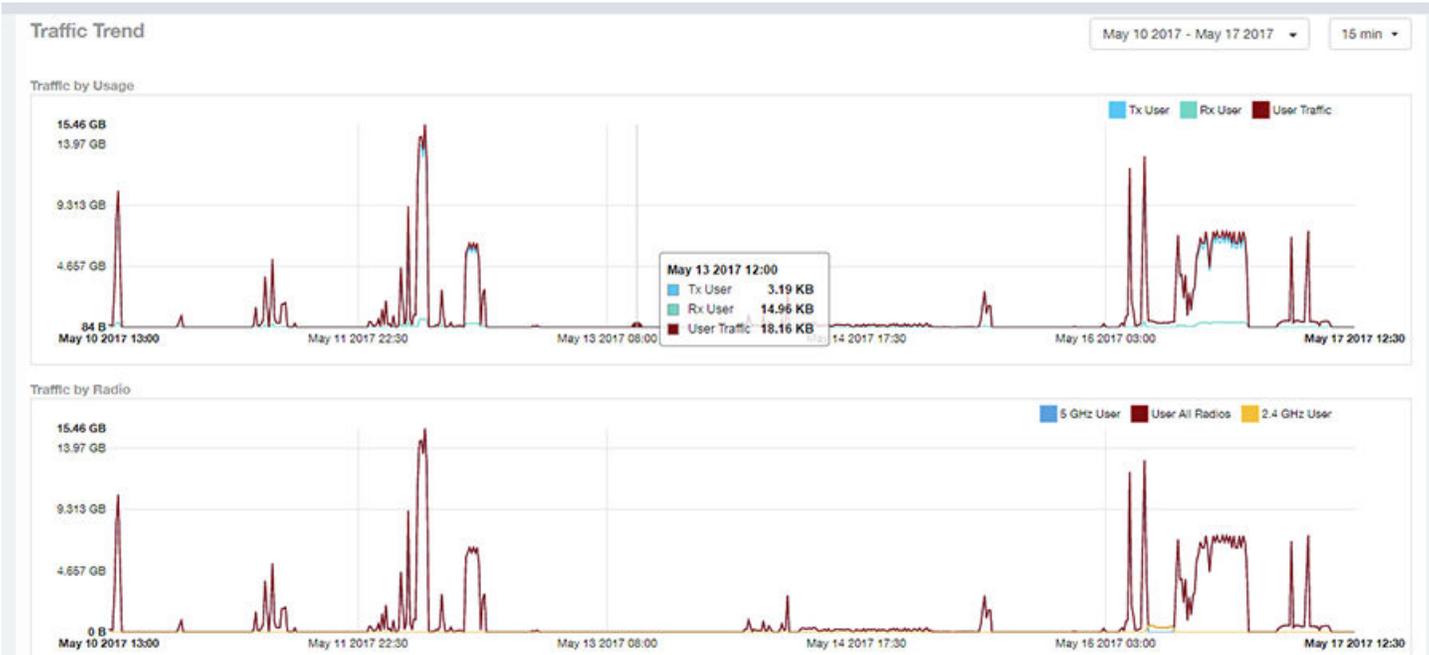
FIGURE 137 Client Details: Top 10 Applications by Traffic Volume Tile



Traffic Trend Tile

The Traffic Trend graphs of the Client Details report depict traffic by usage and traffic by radio type for the client. Use the menu to select the time frame and granularity for the graphs.

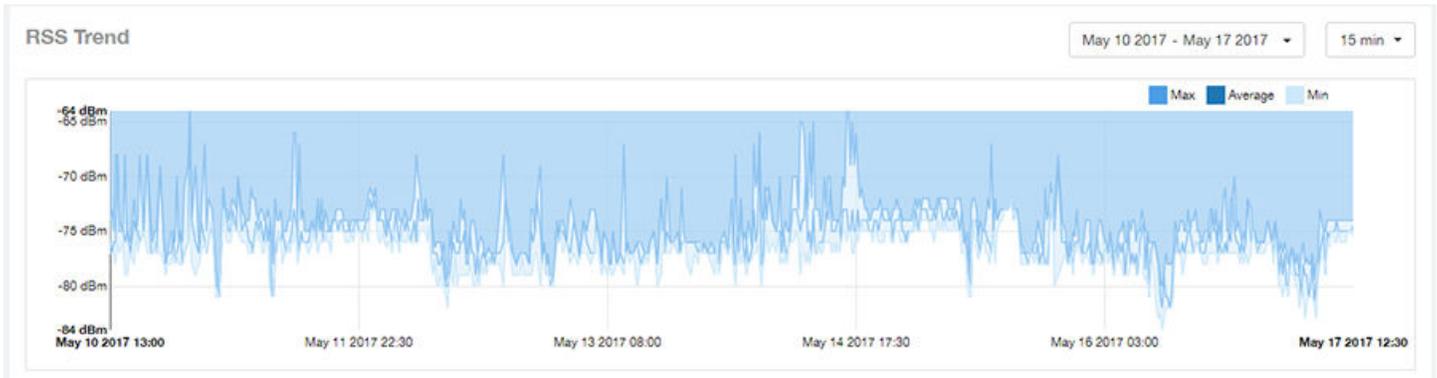
FIGURE 138 Client Details - Traffic Trend Graphs



RSS Trend Tile

The RSS Trend graph of the Client Details report depicts the received signal strength trends over time for this client. Use the menus to specify the time frame and the granularity of the graph.

FIGURE 139 Client Details - RSS Trend Graph

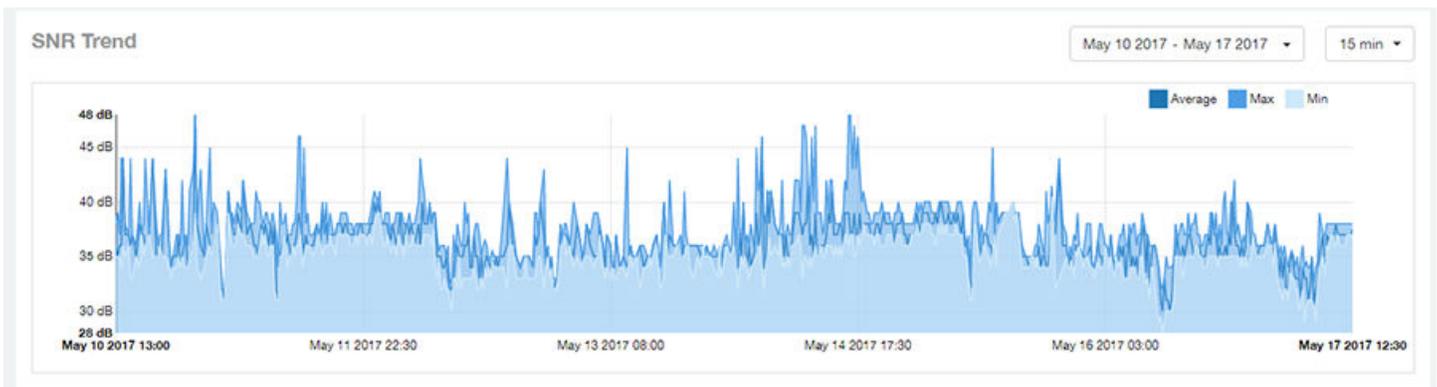


SNR Trend Tile

The SNR Trend graph of the Client Details report depicts the signal-to-noise ratio over time for this client.

Use the menu to select the time frame and granularity for this graph.

FIGURE 140 Client Details - SNR Trend Graph



Sessions tile

The Sessions table of the Client Details report provides details for sessions between this client and associated access points.

Use the menu to select the number of sessions you want to display.

Click the gear icon (⚙️) to select the columns to display, and click any column heading to sort the table by that column.

NOTE

If you click one of the **AP Name** links, you will be taken to the **AP Details Report** for that AP.

FIGURE 141 Client Details: Sessions Table

Sessions Last 1,000 Sessions ▾								
First Connection	Disconnect Time	Session Duration	AP Name	SSID	Radio	Rx User	Tx User	User Traffic
May 17 2017 12:41	May 17 2017 12:43	2m 33s	AP750	SSID17	5 GHz	13.61 KB	13.41 KB	27.02 KB
May 17 2017 09:19	May 17 2017 12:34	3h 15m	AP750	SSID17	5 GHz	134.7 KB	150.2 KB	285 KB
May 17 2017 07:55	May 17 2017 09:19	1h 24m	AP750	SSID17	5 GHz	116.4 MB	2.418 GB	2.532 GB
May 17 2017 07:19	May 17 2017 07:46	27m 6s	AP750	SSID17	5 GHz	37.69 MB	763.9 MB	801.6 MB
May 17 2017 06:17	May 17 2017 07:16	58m 59s	AP750	SSID17	5 GHz	113.9 MB	1.714 GB	1.826 GB
May 17 2017 04:16	May 17 2017 06:17	2h	AP750	SSID17	5 GHz	178.9 MB	3.484 GB	3.669 GB
May 17 2017 04:13	May 17 2017 04:15	2m 20s	AP750	SSID17	5 GHz	130.8 KB	104.9 KB	235.6 KB
May 17 2017 04:12	May 17 2017 04:12	16.28s	AP750	SSID17	5 GHz	53.41 KB	145.5 KB	198.9 KB
May 17 2017 02:17	May 17 2017 04:12	1h 55m	AP750	SSID17	5 GHz	169 MB	3.295 GB	3.46 GB
May 17 2017 02:15	May 17 2017 02:15	26.6s	AP750	SSID17	5 GHz	66.72 KB	1.41 MB	1.475 MB

◀ 1 ▾ of 22 ▶

Switch Details Report Dashboard

- [Switch Details Report](#)..... 105

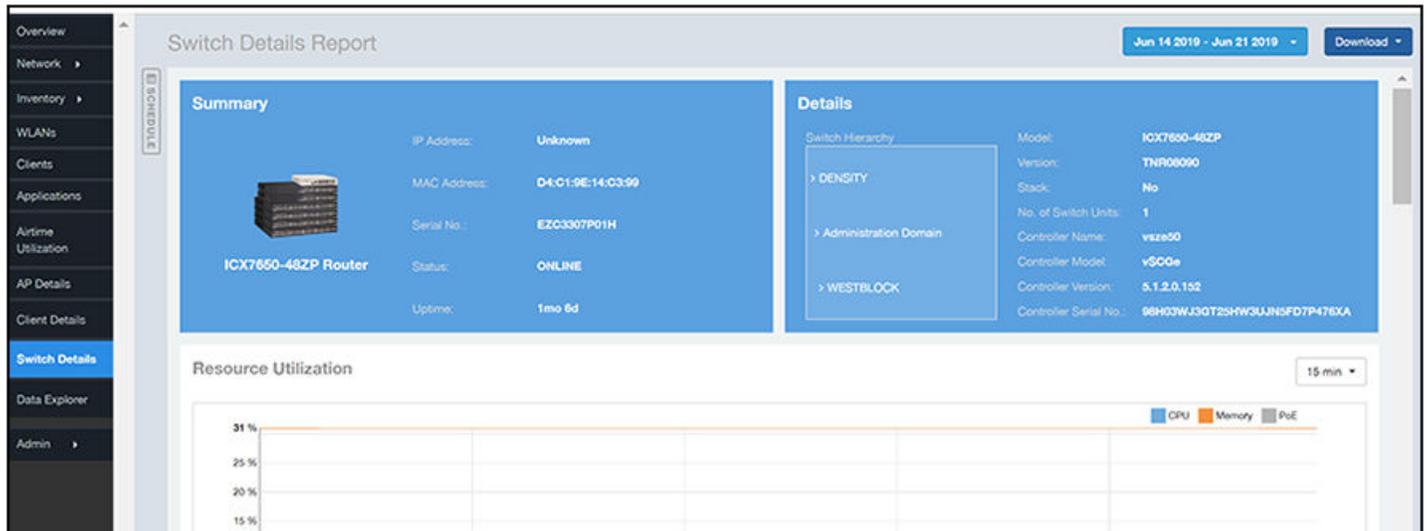
Switch Details Report

The Switch Details report provides details about one specific switch.

You can reach this report by either clicking on a hyperlink of a switch name from another dashboard, or by clicking **Switch Details** on the navigation bar. If you click **Switch Details** to get to this screen, you then need to enter the MAC address of the switch whose details you want to view.

The following figure shows only the upper sections of the Switch Details report:

FIGURE 142 Switch Details Report (upper portion)



The Switch Details Report consists of the following components:

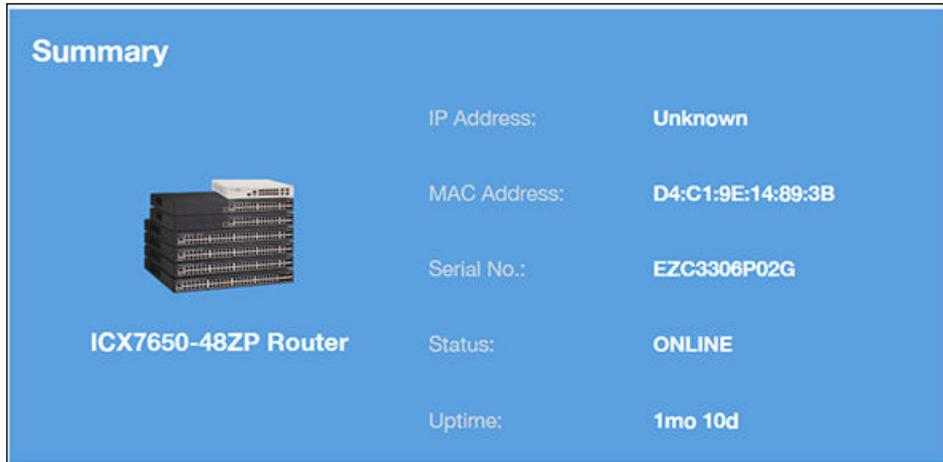
- Summary tile
- Details tile
- Resource Utilization tile
- Top Ports By Traffic tile
- Traffic Trend tile
- LLDP Neighbor List tile
- Uptime History tile

Summary Tile

The Summary section of the Switch Details report displays basic information about a specific switch.

The switch shown in this example is named ICX7650-48ZP Router.

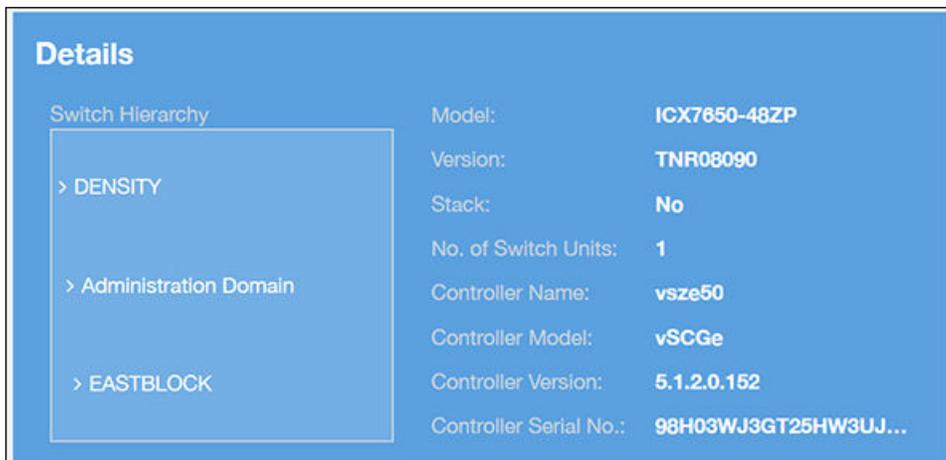
FIGURE 143 Switch Details - Summary



Details Tile

The Details section of the Switch Details report contains information about the specified switch, including its hierarchy in the network.

FIGURE 144 Switch Details - Details

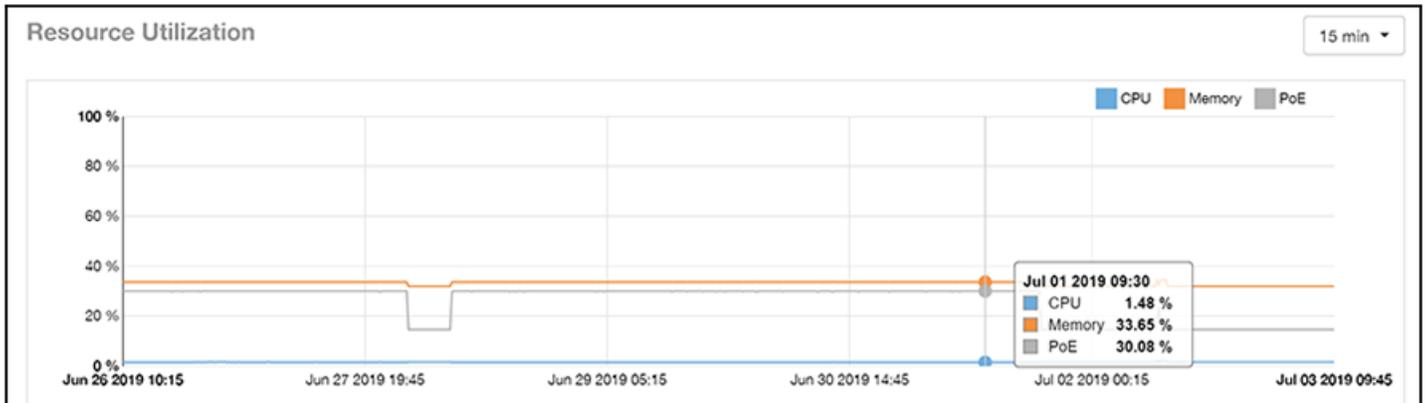


Resource Utilization Tile

The Resource Utilization table of the Switch Details Report displays the CPU, memory and disk utilization percentages for each switch in your system.

You can hover to view resource utilization at different times; you can toggle the boxes on and off to display or not display the data they represent.

FIGURE 145 Switch Details - Resource Utilization

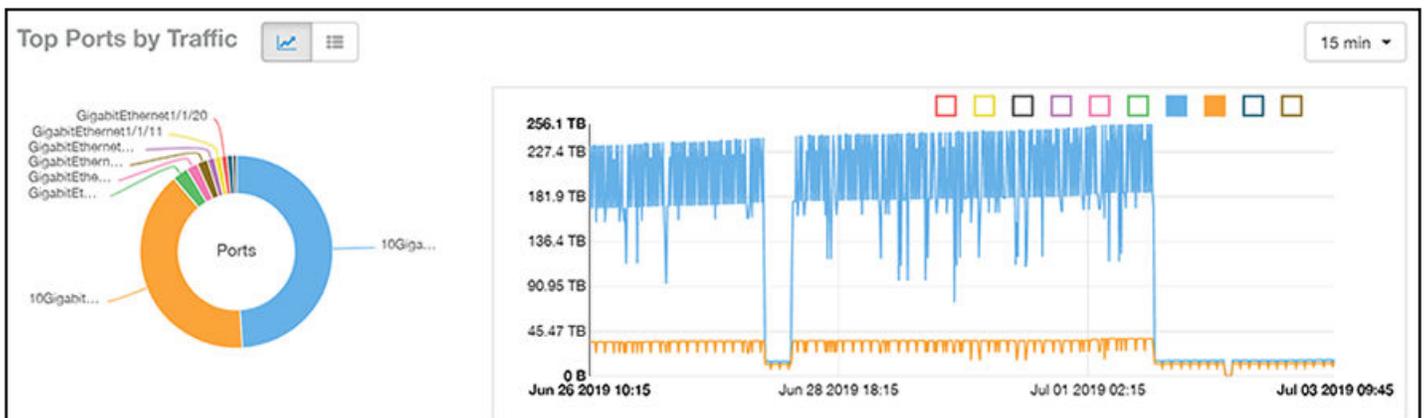


Top Ports By Traffic Tile

The Top Ports By Traffic pie chart and line graph of the Switch Details report depict the ports that have generated the largest volume of traffic over this switch for a specified period of time.

Use the drop-down menus to specify the time frame and the granularity of the graph. Click any of the colored squares to toggle display of the corresponding ports.

FIGURE 146 Switch Details - Top Ports By Traffic

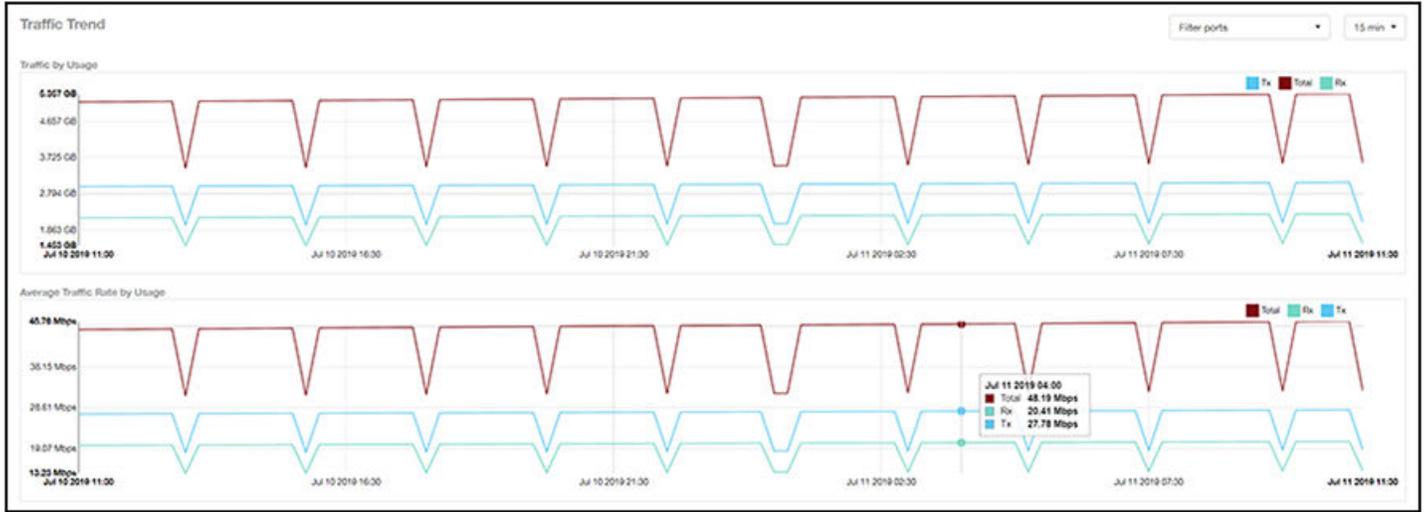


Traffic Trend Tile

The Traffic Trend section of the Switch Details report contains two line graphs that provide information about the specified switch: one that depicts traffic by usage, and one that shows the average traffic rate by usage.

You can hover over portions of the line graph to view different types of traffic at certain time intervals, and you can click any of the colored squares to toggle display of the corresponding type of traffic.

FIGURE 147 Switch Details - Traffic Trend



LLDP Neighbor List Tile

The LLDP Neighbor List table of the Switch Details report provides information about all the LLDP neighbors of the specified switch.

Click the gear icon  to select the list of columns to display. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 148 Switch Details - LLDP Neighbor List

LLDP Neighbor List						
Remote Device Name	Remote Port Mac	Remote Port Type	Remote Port	Local Port	Local Port Mac	Remote Port Descr... 
EBC-ICX7150-48ZP-SW0	D4:C1:9E:4B:83:E0	Bridge	GigabitEthernet1/1/48	GigabitEthernet1/1/24	60:9c:9f:ab:95:bf	Unknown

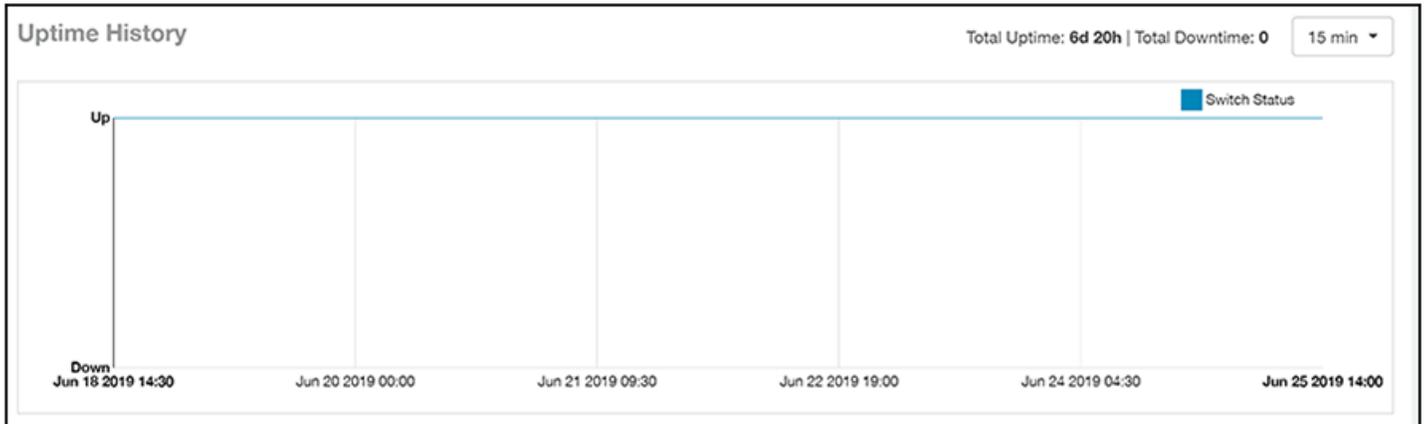
◀ 1 ▼ of 1 ▶

Uptime History Tile

The Uptime History line graph of the Switch Details report shows when this switch has been up or down over different time periods.

The blue bar indicates when the switch has been up or down. Use the drop-down menu to specify the timeframe and the granularity of the graph.

FIGURE 149 Switch Details - Uptime History



Comparison Reports Dashboard

- Compare Filters 111

Compare Filters

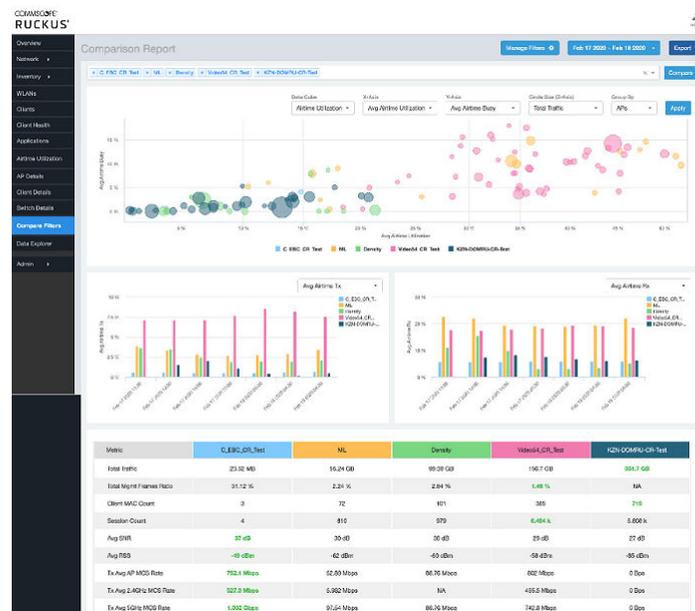
Compare Filters help compare sets of data within the networks against one another to provide a better understanding of network health based on various dimensions such as network deployments, brand, region to name a few.

NOTE

Comparison reports are only available for Admin and Super admin users.

The following figure shows only the upper sections of the Compare Filters page:

FIGURE 150 Comparison Report



The Comparison Report consists of the following components:

- Compare Filters tile
- Overview tile
- Metric Over Time tiles
- Comparison table

Compare Filters Tile

You can select the filters you want to compare from the Compare Filter drop-down.

Comparison Reports Dashboard

Compare Filters

The drop-down displays existing saved filters and those created newly as well, and you can compare up to a maximum five filters at a time. After selecting the filter, click **Compare** to initiate data comparison between the filters selected. The order of the filter selection is maintained across all the graphs and table. This report cannot be scheduled.

The **Compare** button is disabled if you select more than five filters or less than one filter.

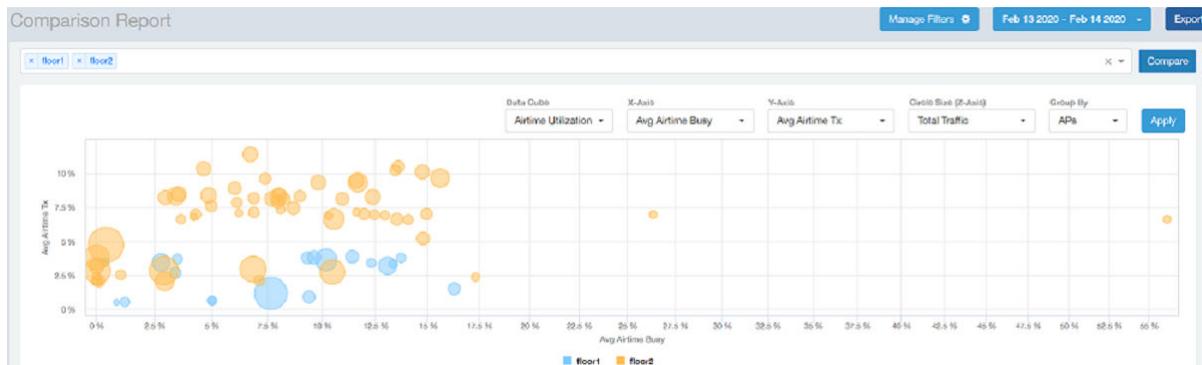
FIGURE 151 Comparison Reports - Compare Filters



Overview Tile

The Overview section displays a scatter-plot of data being compared from the filters selected. You can select the following parameters to plot the Overview graph:

FIGURE 152 Comparison Report - Overview scatter plot



- DataCube: select from Airtime Utilization, Network, and Clients from the menu.
- X axis and Y axis: select the parameter to display on the axis. The options in these menus change based on the data cube selection. For example, if you selected Airtime Utilization, then some of the parameters you can choose to display in the X and Y axis include Avg Airtime Utilization, Avg Airtime Busy, Avg Airtime Tx/Rx, and Total Traffic.
- Circle Size (Z Axis): displays the data by the size of the circle. For example, the Total Traffic value in GB is shown as a smaller circle in comparison to the one in TB.

NOTE

Each filter data is represented as a circle with a specific color for the filter. For example, in this image the scatter plot circles displayed are for the **floor1** filter in blue and **floor2** filter in yellow.

- Group By: this option allows you to group the scatter plots based on the AP, Ap Group, Zone, System, Domain, and WLAN/SSIDs. Pausing the pointer over the circle displays a summary of the data point.

Click **Apply** to apply these parameters. Based on the parameters selected, the Overview graph is refreshed and plotted for your analysis.

You can toggle the circles below the chart (on and off) to display or not display the filters they represent.

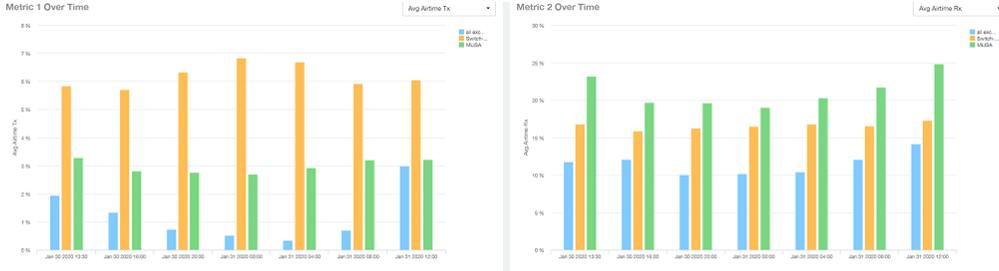
NOTE

No two parameters in the X, Y, Z axis fields can be the same.

Metric Over Time Tiles

The two Metric charts compare a variety of potential metrics in a historical view, as a bar graph. You can select any two matrices in both the charts to compare. All the metrics are available in the drop-down for comparison. The X axis of the chart displays a time range, and the Y axis parameter can be selected from the drop-down provided. The bar graphs are displayed after the Y axis selection and the colors of the bar pertain to the respective filters selected. Pausing the pointer over the bar displays a summary of the data point. You can toggle the boxes in the chart (on and off) to display or not display the filters they represent.

FIGURE 153 Comparison Report - Metric Over Time



Comparison Table

The Comparison Table shows columns of comparison filters and rows of all metrics that are compared. You can use the gear icon to select the columns you want to display and also select the number of rows to display. For each metric of a filter, the data comparison is done and data that is top performing is highlighted green as shown in the figure.

FIGURE 154 Comparison Reports - Table

Metric	10 ERTelecom APs	Switch-1	MLISA
Total Traffic	0 B	613.2 GB	54.47 GB
Total Mgmt Frames Ratio	0 %	1.34 %	2.58 %
Client MAC Count	0	1,212 k	77
Session Count	0	14,39 k	934
Client Health Score (Good)	0 %	78.91 %	74.15 %
Avg SNR	0 dB	30 dB	31 dB
Avg RSS	0 dBm	-58 dBm	-59 dBm
Tx Avg AP MCS Rate	0 Bps	486.7 Mbps	75.96 Mbps
Tx Avg 2.4GHz MCS Rate	0 Bps	417.8 Mbps	6.557 Mbps
Tx Avg 5GHz MCS Rate	0 Bps	542.1 Mbps	141 Mbps
Tx Client MCS Rate	0 Bps	318 Mbps	153.5 Mbps
Avg Throughput Estimate	0 Bps	89.95 Mbps	168.7 Mbps

Data Explorer Dashboard

- [Data Explorer and Data Cubes.....](#) 115
- [Data Cube Filters.....](#) 127
- [Creating a Data Explorer Dashboard.....](#) 153
- [Actions You Can Perform on an Existing Dashboard.....](#) 158
- [Exporting Raw Data Using the SCI Virtual Machine Command Line Interface.....](#) 163

Data Explorer and Data Cubes

Data Explorer and its individual cubes allow you to view, filter, and manipulate data in many different ways .

Data Exploration

Data exploration is the act of examining the minute details of an Online Analytical Processing (OLAP) cube.

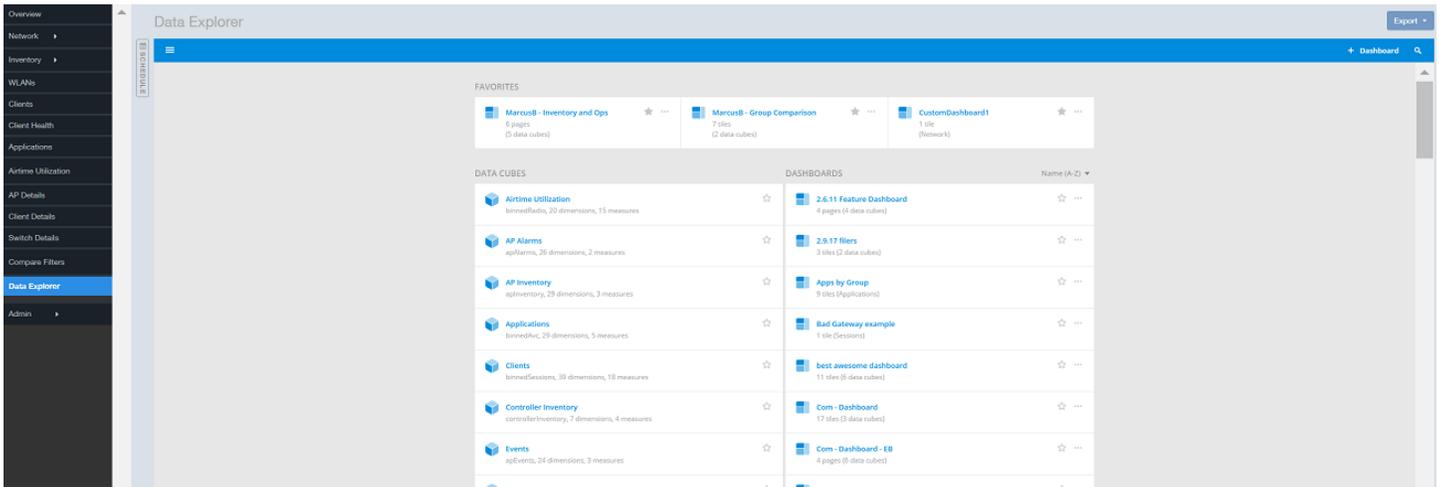
Consider your data to be a three-dimensional cube that you would like to explore, both inside out and outside in, so that you can glean more insights from your data. Of course, most real world data sets will have more than three dimensions, but the concepts from a 3D cube can be directly extended to a multidimensional hypercube.

With an OLAP cube, there are five operations that you can perform:

1. **Slice:** Think of slicing a piece of cheese; you make a single cut to the cheese to expose the insides. A typical slice operation is the time slice. Instead of reviewing all the data of the last 30 days, you slice the data to expose only Day 1.
2. **Dice:** Consider dicing a block of cheese; you make multiple cuts and separate the block into a number of smaller pieces. A typical dice operation involves taking a slice of data, such as the Day 1 data, and cutting it further to filter by the controller name and AP group. A smaller piece of the original OLAP cube results from the slice and dice operations.
3. **Drill Up and Drill Down:** In order to delve into the details, you can drill down to a specific AP in an AP group, and drill down further to a specific client host name. Conversely, you could search for a client MAC address and drill up to find the AP and controller to which it belongs.
4. **Roll Up:** The roll up operation typically involves numbers known as measures. After the slice, dice, and drill down of your data, you can roll up the numbers to gain a better understanding of the whole, for example, the total transmit traffic for the selected APs.
5. **Pivot:** The pivot operation allows you to view the data from a different perspective. For example, you have a table showing a list of controllers and the APs belonging to each controller. You may pivot the table to show a list of the APs and the controllers to which they belong. Think of pivoting as changing the hierarchy between the dimensions.

As you use the custom reporting, you can refer to these five operations.

FIGURE 155 Data Explorer and Data Cubes



Data Explorer allows you to explore the data under various categories, using your own permutations and combinations, unlike the other canned reports available.

NOTE

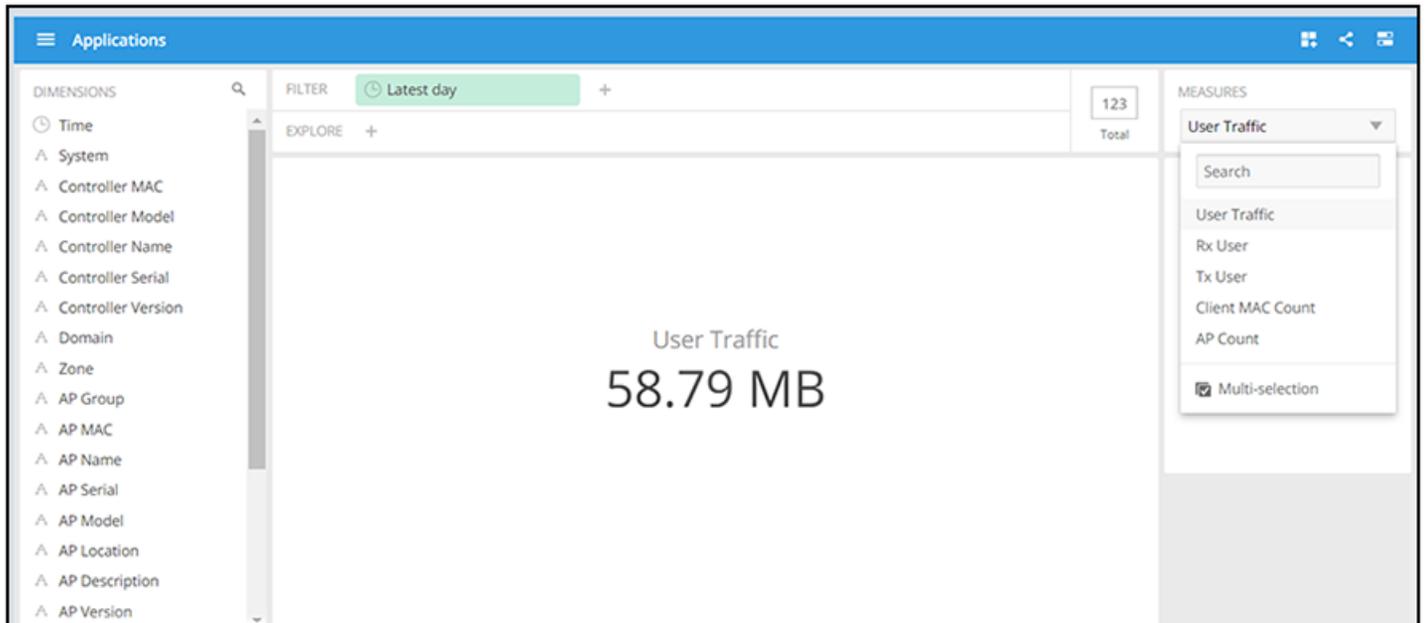
The **Schedule** tab is for use only with dashboards you create, not with data cubes themselves.

For information on how to use data cube filters, which are common to all the data cubes, refer to [Data Cube Filters](#) on page 127. You can also create and save dashboards, which allows you to customize reports by using data from any or all of the data cubes. Refer to [Creating a Data Explorer Dashboard](#) on page 153 and [Actions You Can Perform on an Existing Dashboard](#) on page 158 for more information.

Applications

The **Applications** cube allows you to explore the application data your system uses.

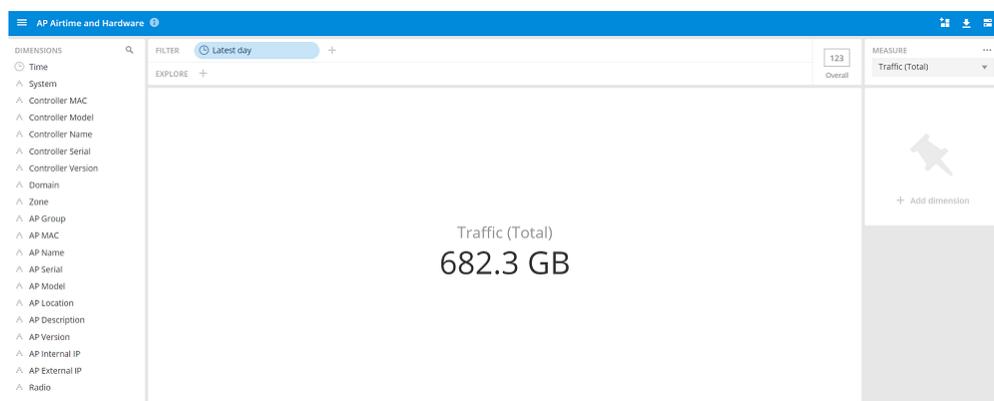
FIGURE 156 Data Explorer: Applications



AP Airtime and Hardware

The **AP Airtime and Hardware** cube allows you to query, search and aggregate data related to the airtime utilization and CPU/memory/storage utilization of the APs.

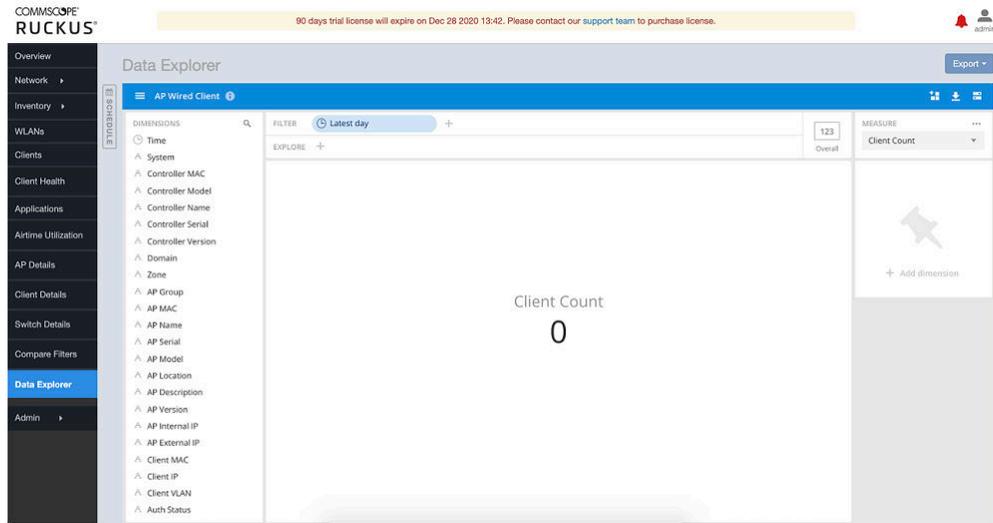
FIGURE 157 Data Explorer: AP Airtime and Hardware



AP Wired Device

The **AP Wired Device** cube allows you to explore the AP wired clients in the system.

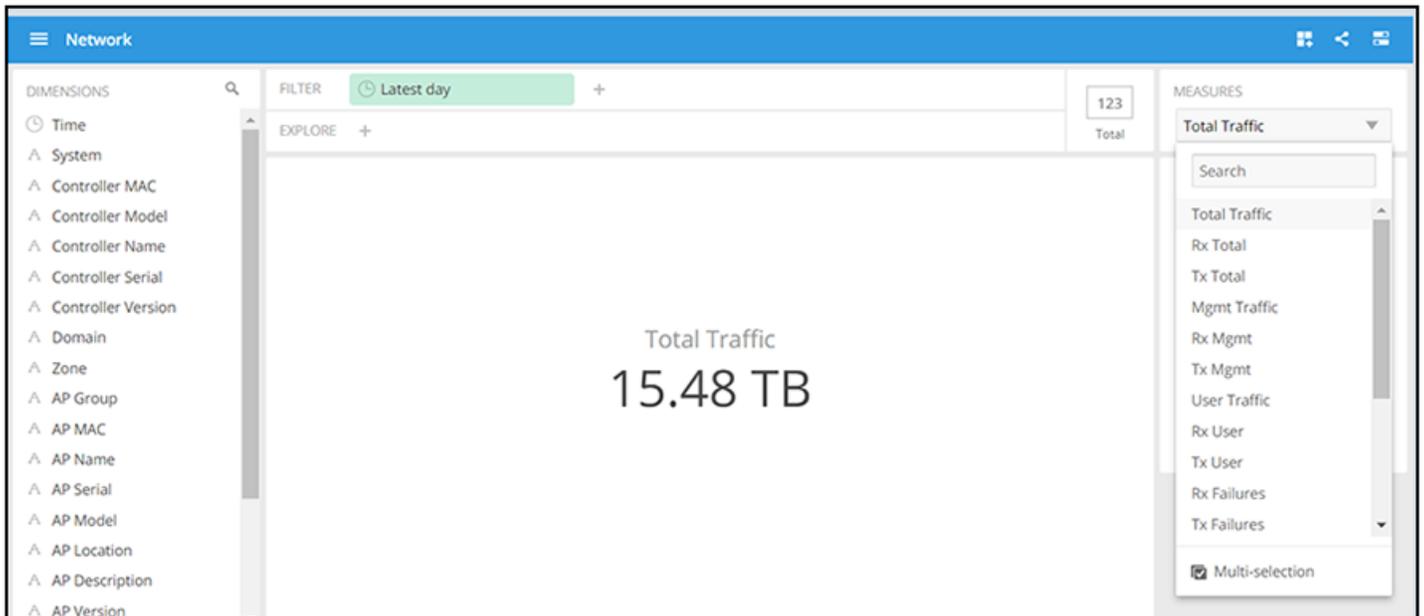
FIGURE 158 Data Explorer: AP Wired Device



AP Info and Statistics

The **AP Info and Statistics** cube allows you to explore network traffic data and its usage.

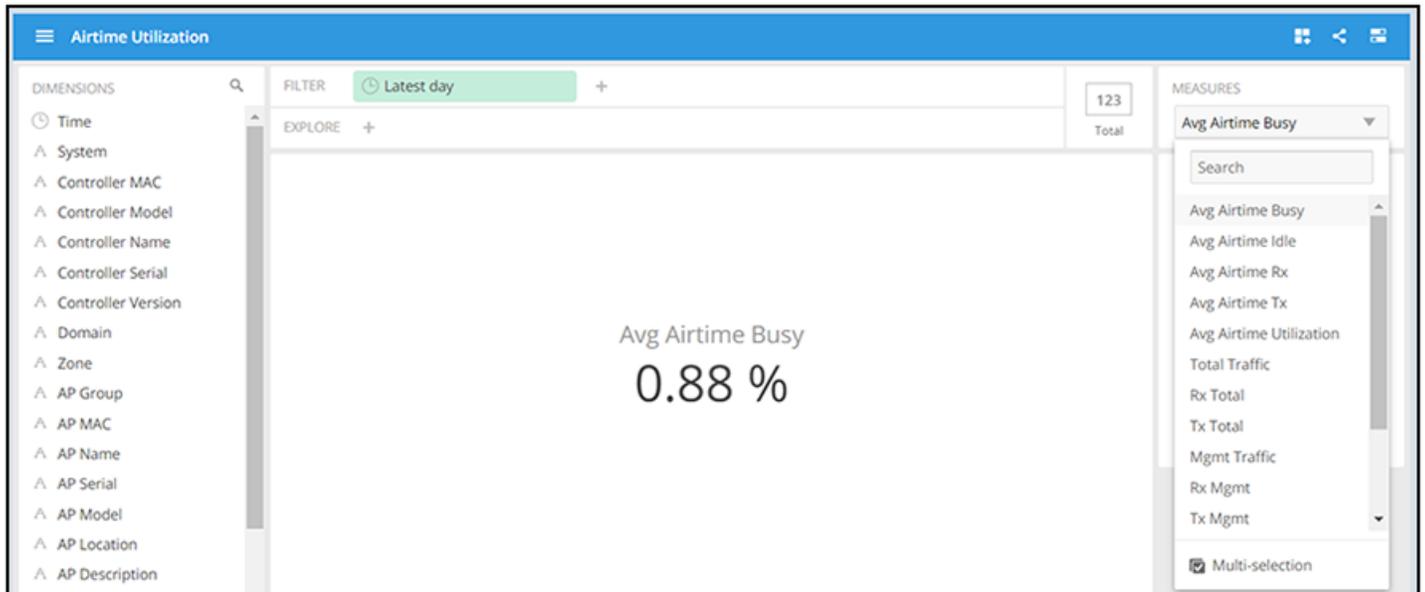
FIGURE 159 Data Explorer: AP Info and Statistics



Airtime Utilization

The **Airtime Utilization** cube allows you to explore the airtime utilization data in your system.

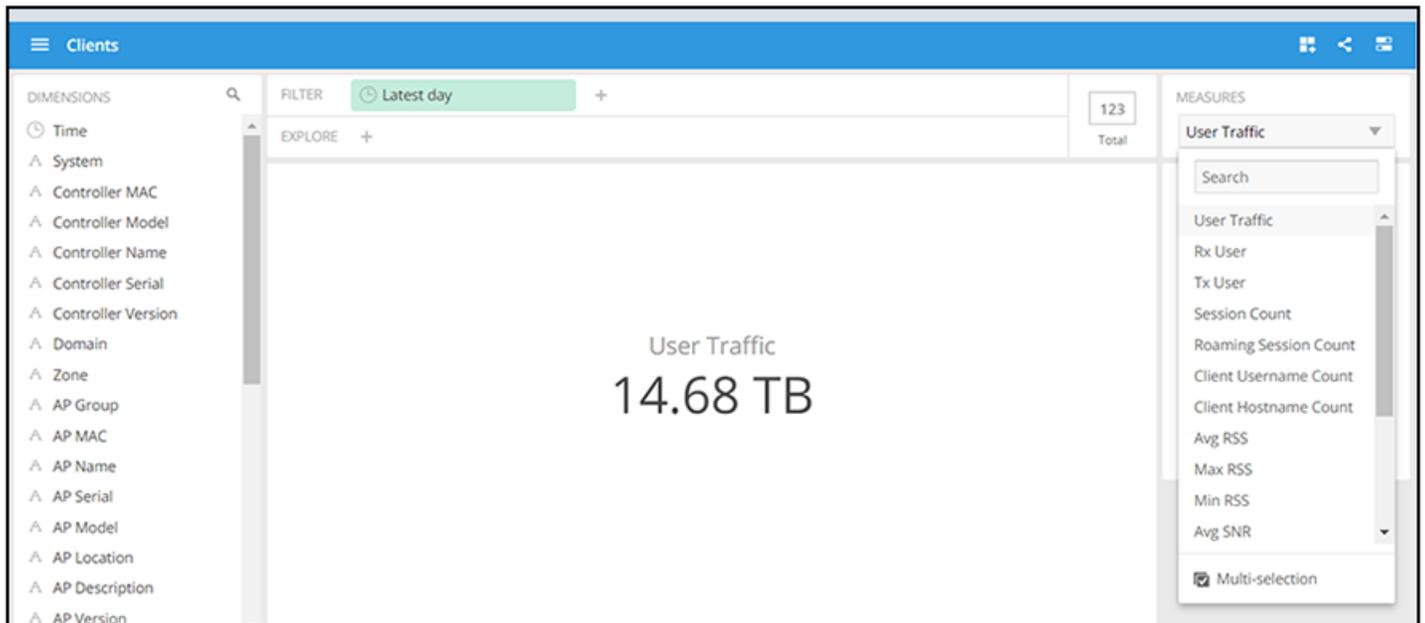
FIGURE 160 Data Explorer: Airtime Utilization



Client Info and Statistics

The **Client Info and Statistics** cube allows you to explore client data for your system.

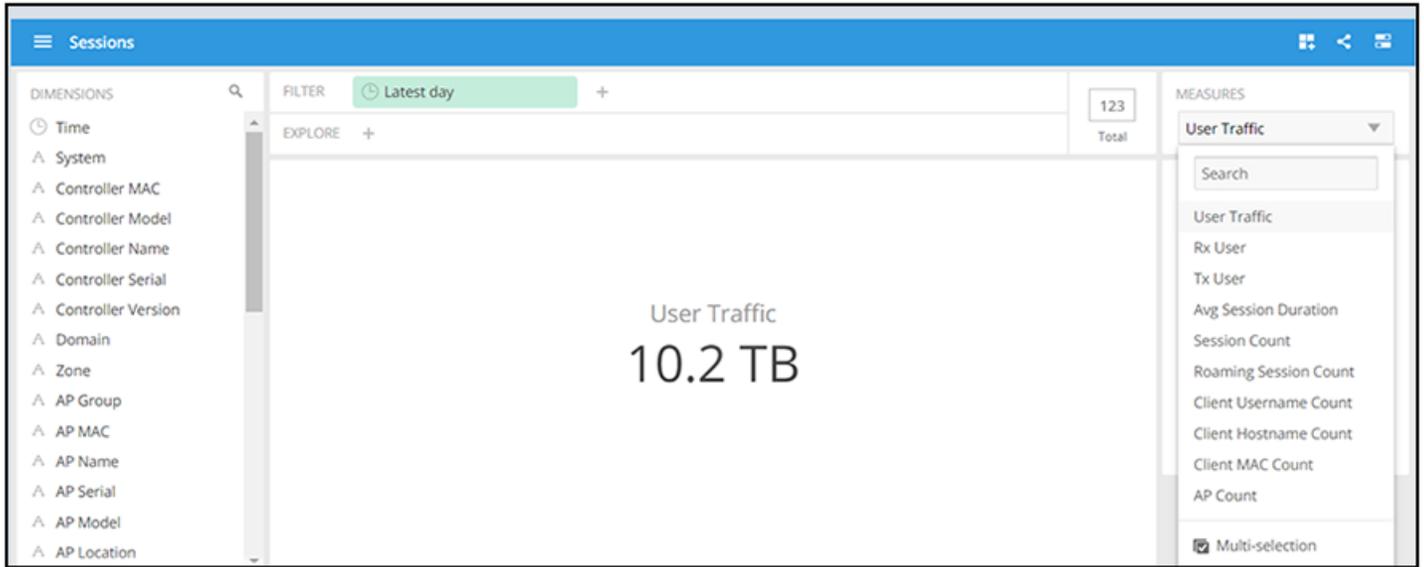
FIGURE 161 Data Explorer: Client Info and Statistics



Client Sessions

The **Client Sessions** cube allows you to explore data about the various sessions in your system.

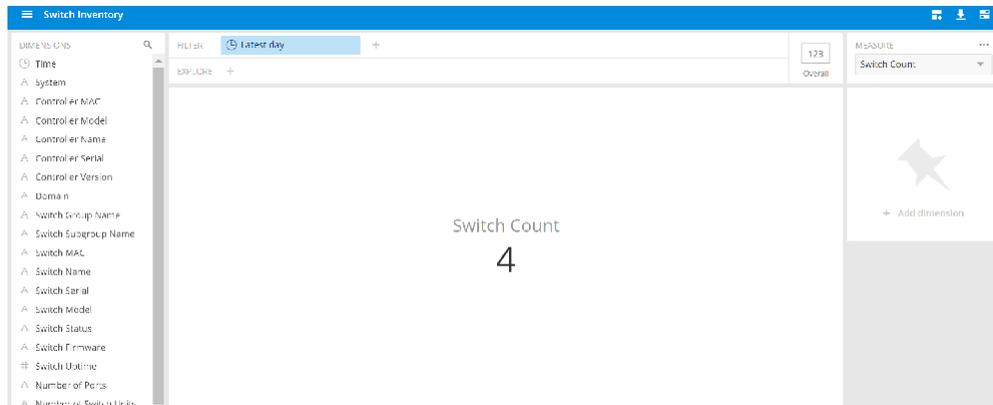
FIGURE 162 Data Explorer: Client Sessions



Switch Inventory

The **Switch Inventory** cube allows you to view information about the switch configuration data your system uses.

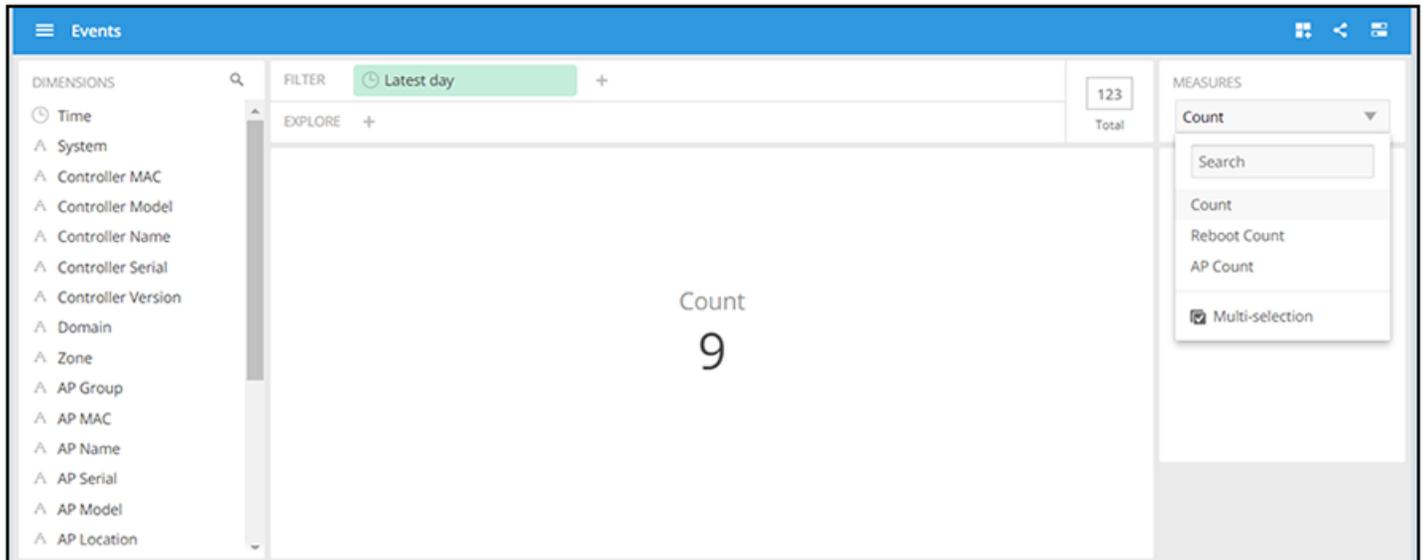
FIGURE 163 Data Explorer: Switch Inventory



AP Events

The **AP Events** cube allows you to view data about events that have occurred in your system.

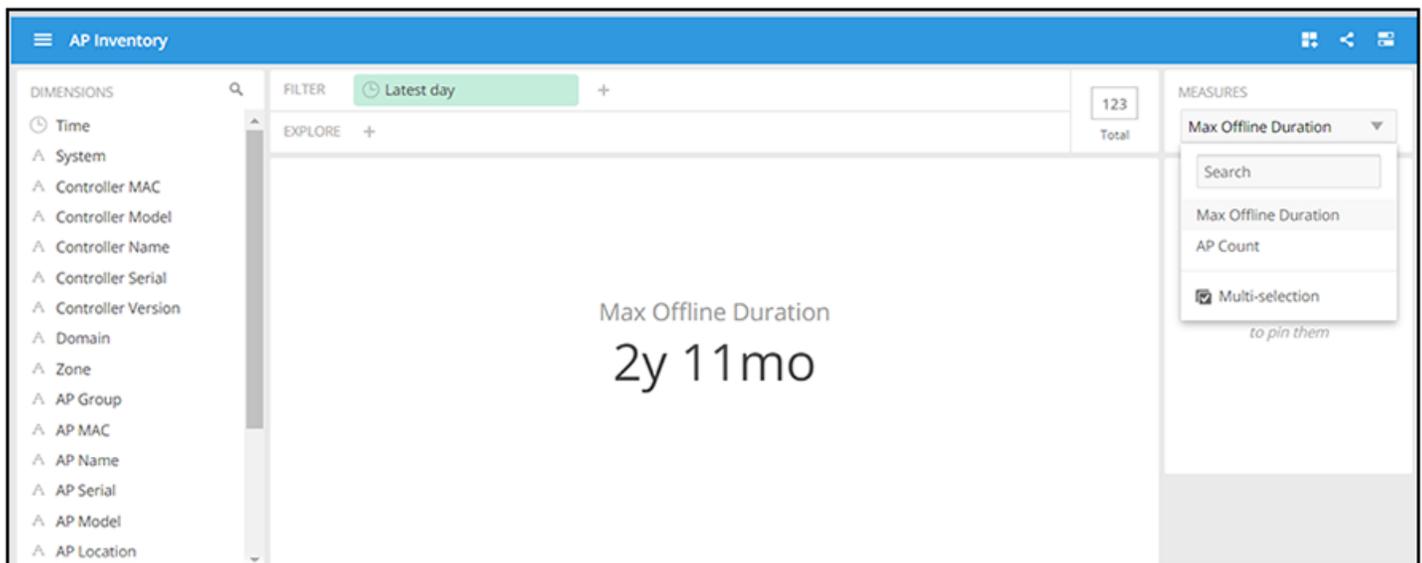
FIGURE 164 Data Explorer: AP Events



AP Inventory

The **AP Inventory** cube allows you to view information about the various AP models your system uses.

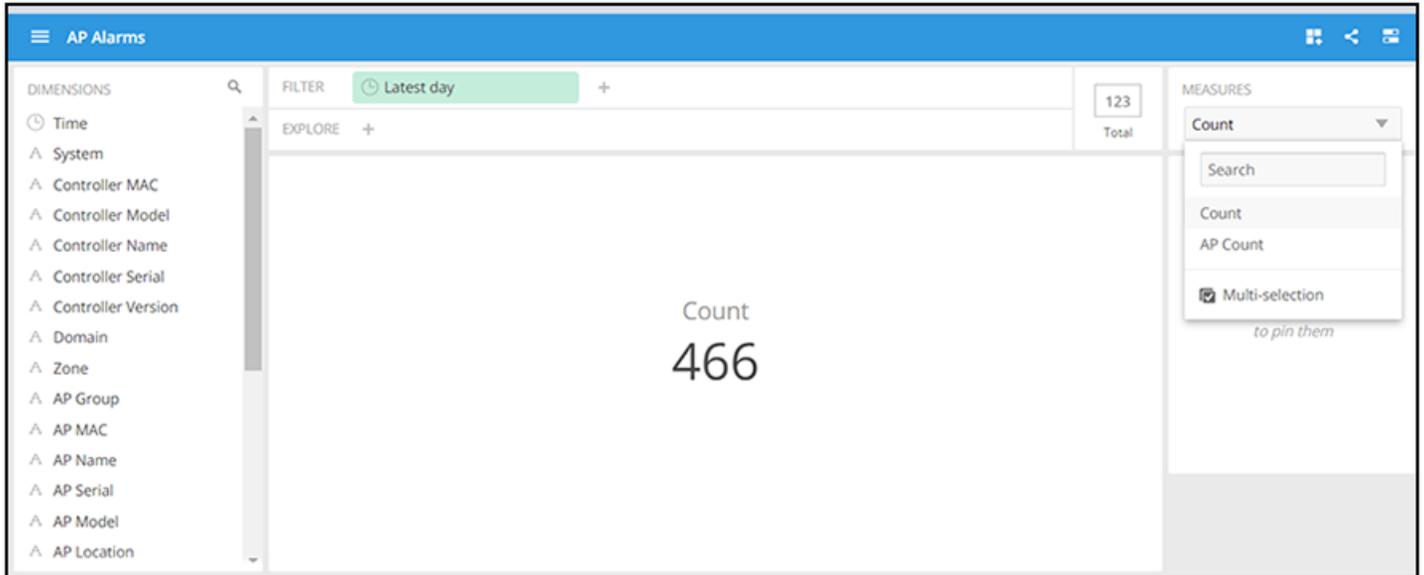
FIGURE 165 Data Explorer: AP Inventory



AP Alarms

The **AP Alarms** cube allows you to view information about alarms in your system.

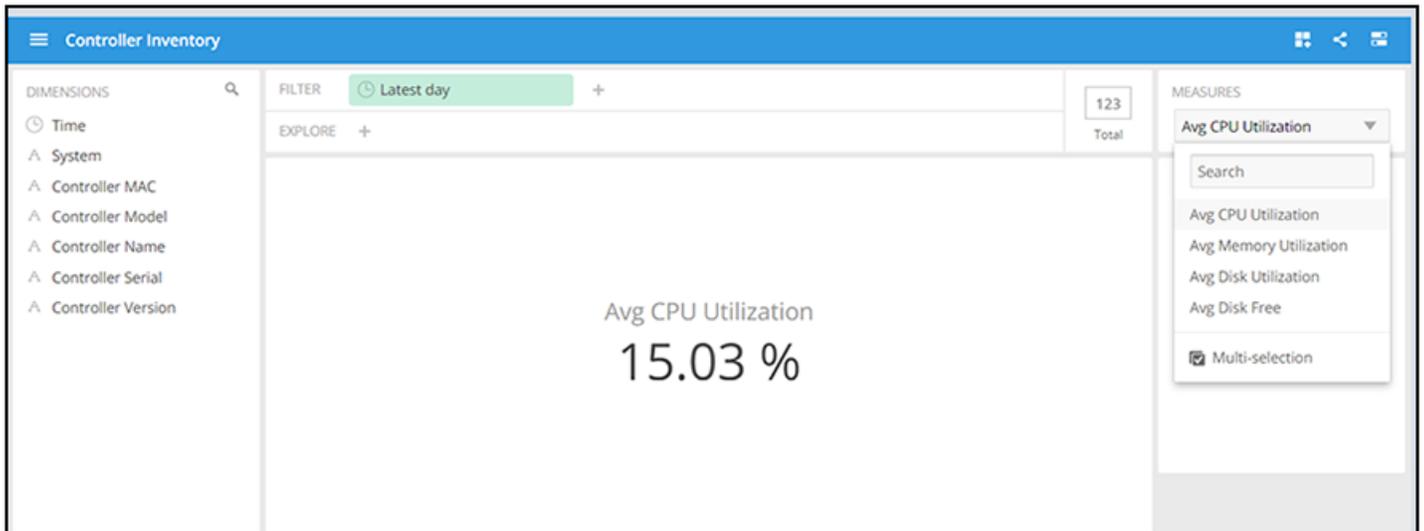
FIGURE 166 Data Explorer: AP Alarms



Controller Inventory

The **Controller Inventory** cube allows you to view CPU, memory, and disk utilization for the controllers in the system.

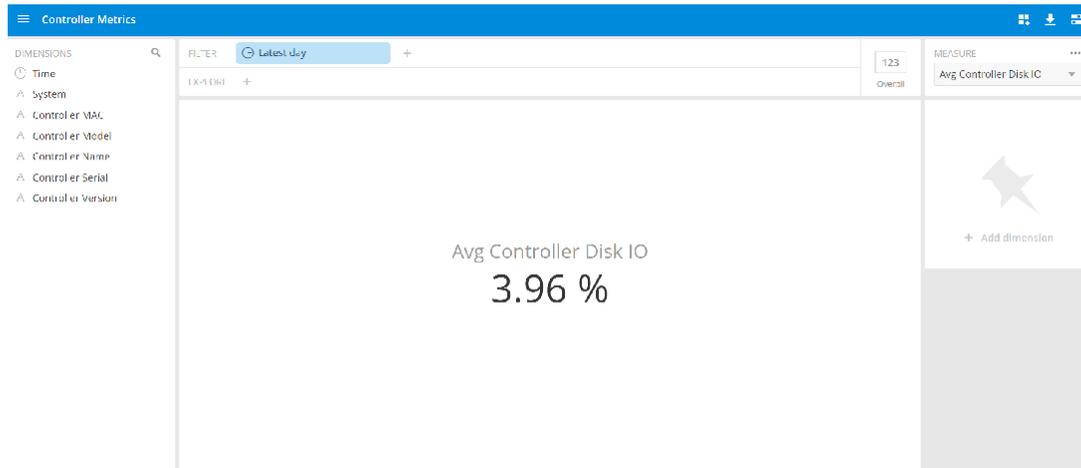
FIGURE 167 Data Explorer: Controller Inventory



Controller Metrics

The **Controller Metrics** cube allows you to view the computed client metrics (such as client TTC) in your system.

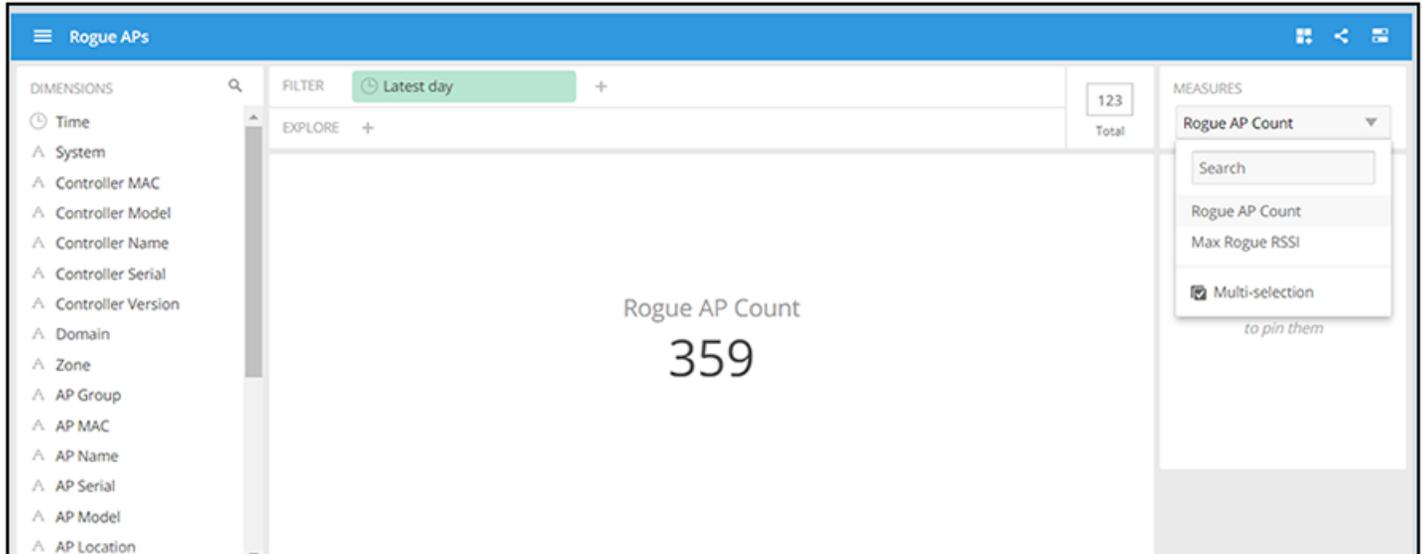
FIGURE 168 Data Explorer: Controller Metrics



AP Rogues

The **AP Rogues** cube allows you to view information about APs that have been flagged as "Rogue" because they cannot be identified by existing APs in your system.

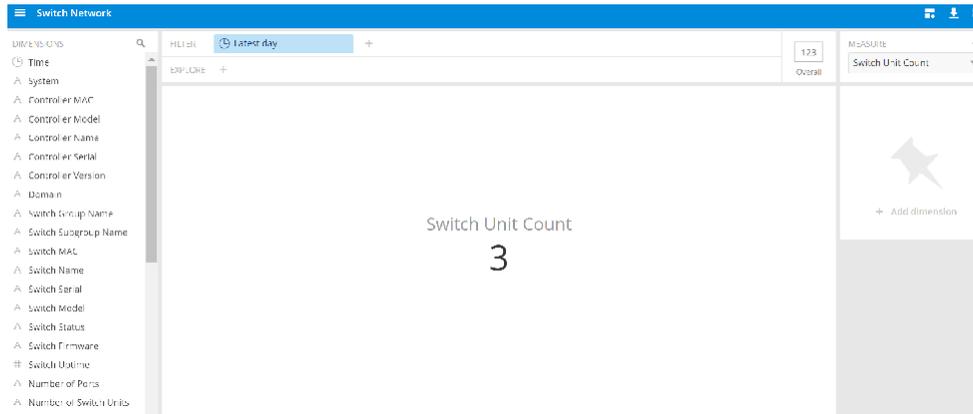
FIGURE 169 Data Explorer: AP Rogues



Switch Network

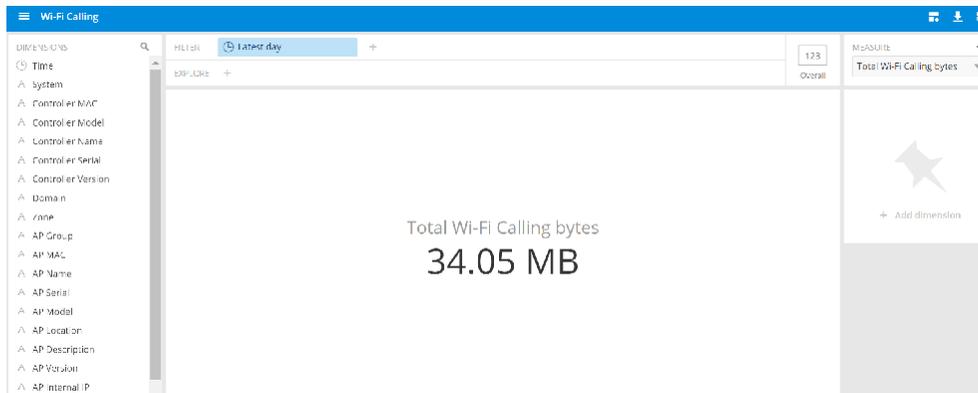
The **Switch Network** cube allows you to explore switch traffic data and its usage.

FIGURE 170 Data Explorer: Switch Network



AP Wi-Fi Calling

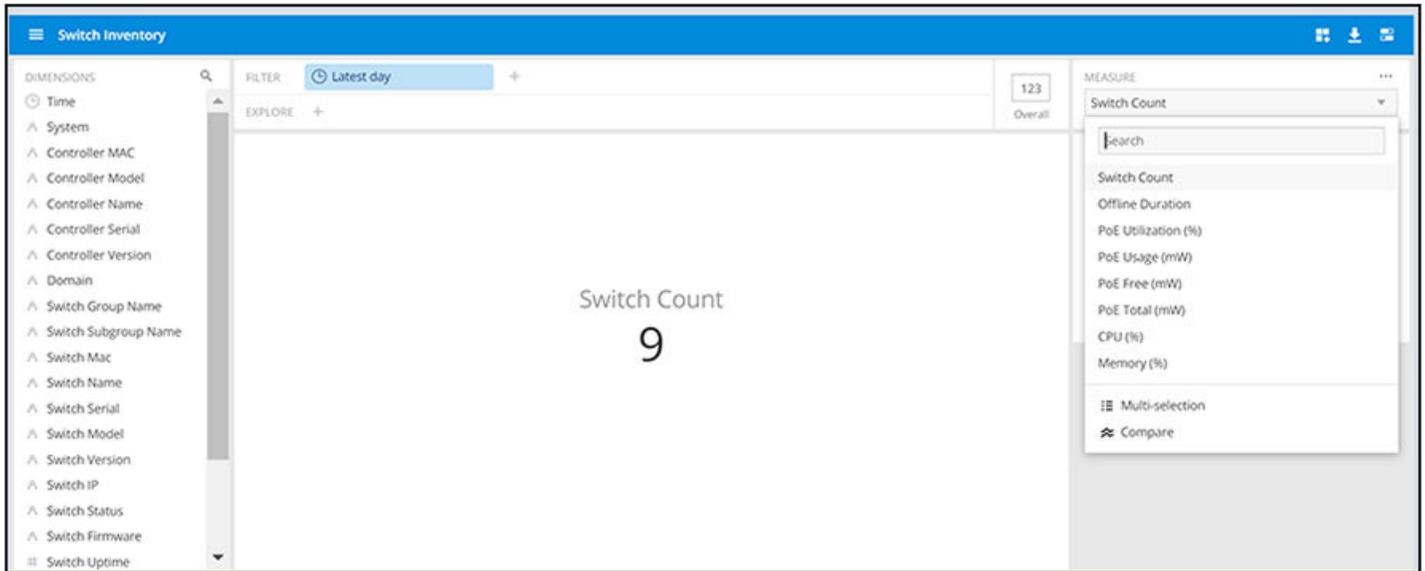
FIGURE 171 Data Explorer: AP Wi-Fi Calling



Switch Inventory

The Switch Inventory cube allows you to view CPU, memory, and power over Ethernet (PoE) utilization for the switches in the system.

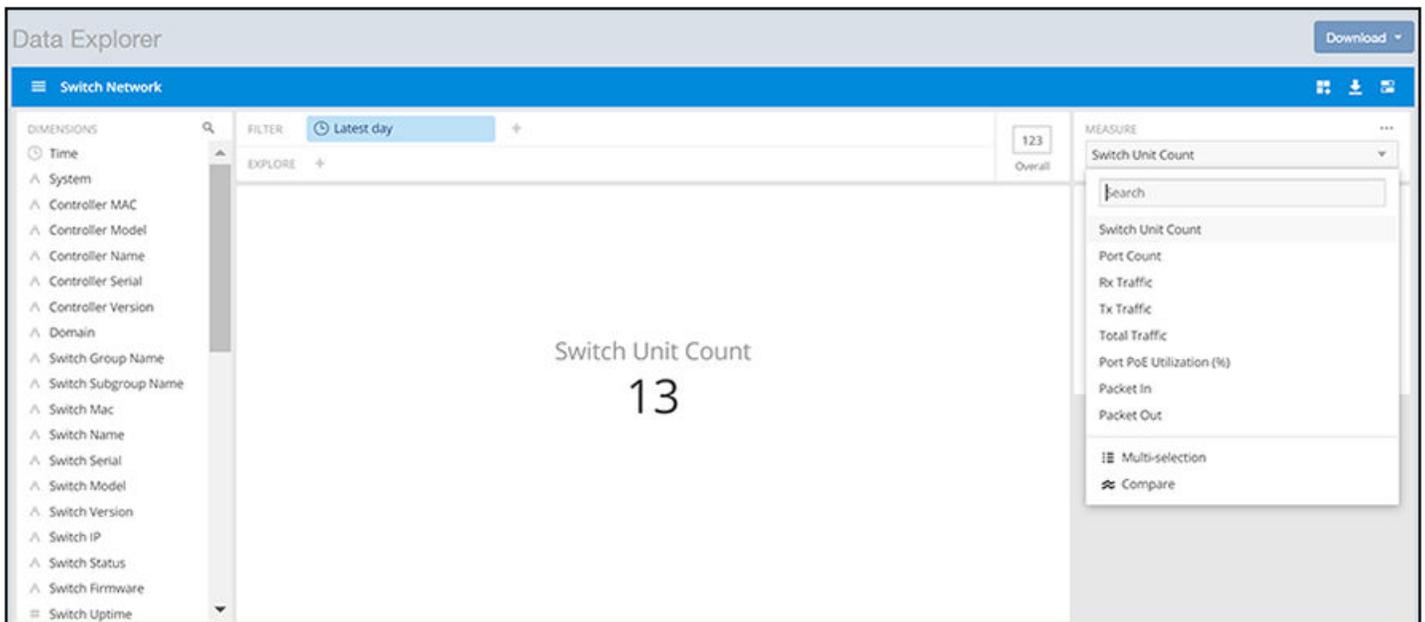
FIGURE 172 Switch Inventory



Switch Network

The Switch Network cube allows you to view traffic, packets, and port power over Ethernet (PoE) utilization on the network switches.

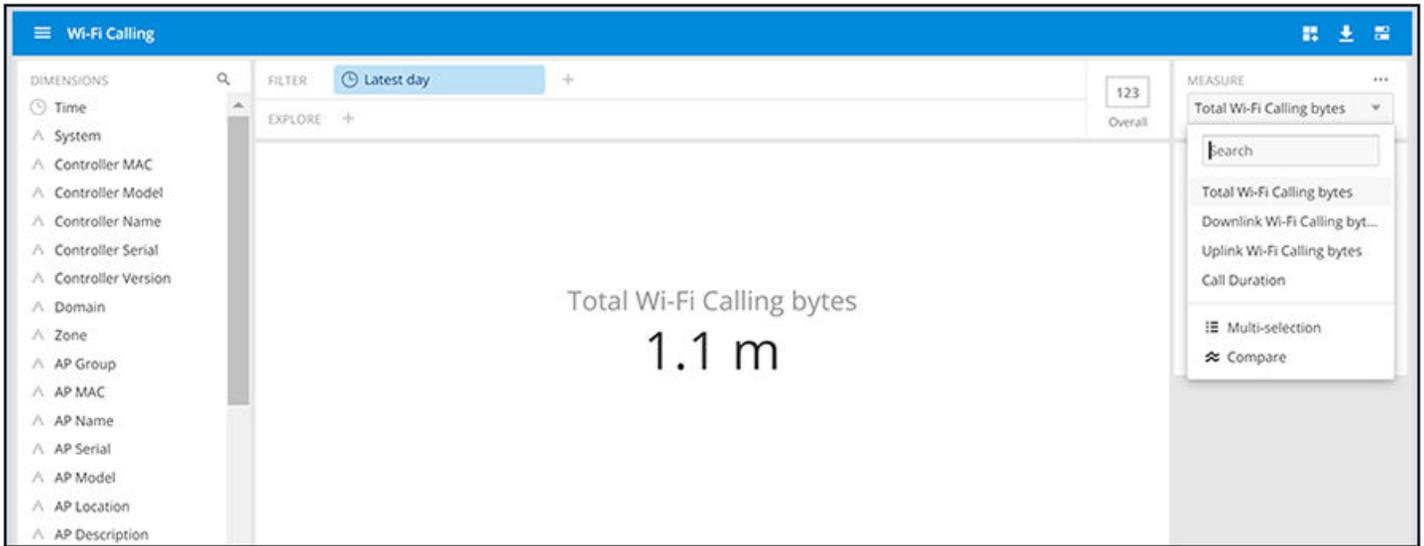
FIGURE 173 Switch Network



WiFi-Calling

The WiFi-Calling cube allows you to view statistics such as uplink and downlink bytes and call duration.

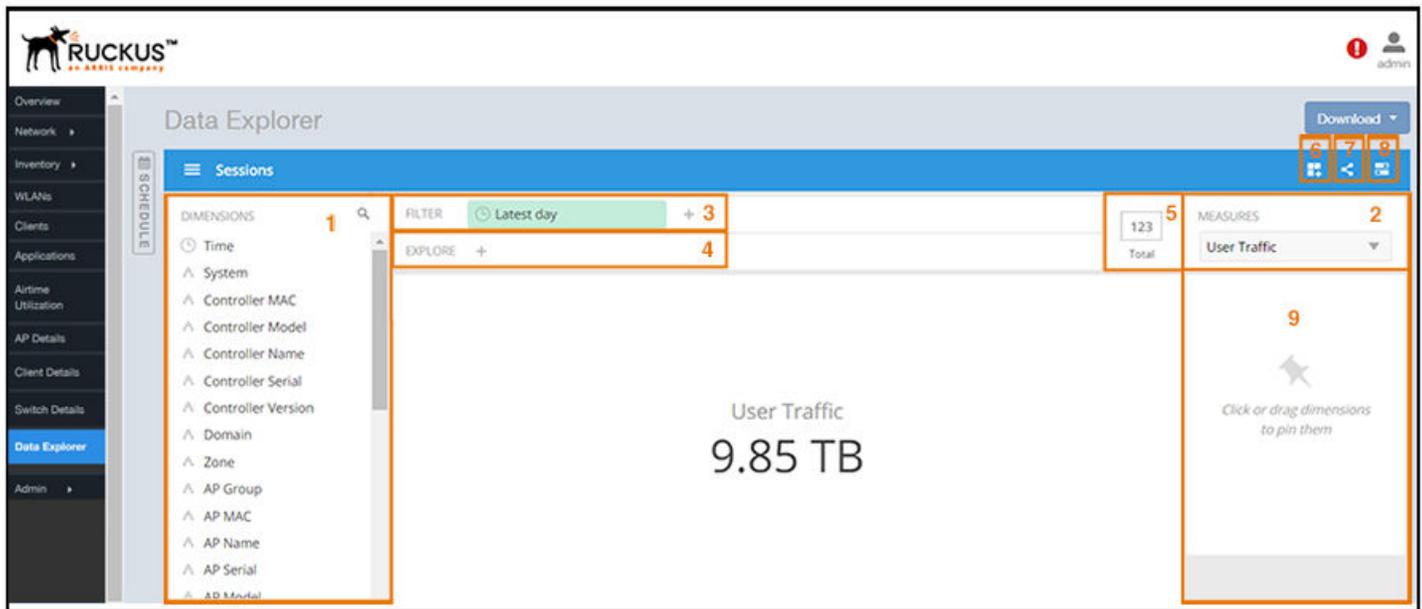
FIGURE 174 WiFi-Calling



Data Cube Filters

Data cubes contain groups of data sets, some of which exist in multiple cubes. The data cube filters are common to all the data cubes and are explained in detail in the sections below.

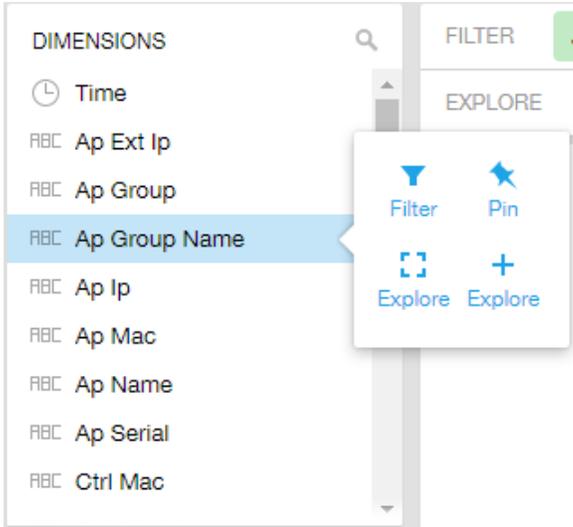
FIGURE 175 Data Cube Filters



The data cube filters are explained in detail in the sections below.

Dimensions

FIGURE 176 Dimensions



Number 1 in [Data Cube Filters](#). Lists industry standard details for Radio such as Time, AP name, System, and Zone name. You can use one or more dimensions to:

- Filter - on one or more dimensions. The default dimension is Time.
- Explore - on one or more dimensions. Every dimension used in Explore can be sorted by one or more selected measures, and the number to be listed in the table can be selected (5, 10, 25, 50, 100, 500 or 1000). You can also change the sorting order of the dimensions to be explored and pivot or change the hierarchy.
- Pin - one or more dimensions on the Pinboard for easy reference.

You can use the scroll bar on the screen for each data cube to view the supported dimensions for that cube. The following table lists and describes all the dimensions that are supported on one or more data cubes in SCI:

TABLE 5 Dimensions

Dimension name	Description	Supported Data Cubes
Alarm Code	Unique string assigned by the controller to an alarm.	AP Alarms
Alarm State	Indicates if the alarm is outstanding.	AP Alarms
Alarm Type	Description for access point and controller alarms.	AP Alarms
Alarm UUID	Unique string assigned by the controller to an alarm.	AP Alarms
AP Description	Description string of the access point that is configured in the controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling

TABLE 5 Dimensions (continued)

Dimension name	Description	Supported Data Cubes
AP External IP	External IP address of the access point.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling
AP Group	AP Groups configured in the controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling
AP Internal IP	Internal IP address of the access point.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling
AP Latitude	Latitude of GPS coordinates	AP Inventory
AP Longitude	Longitude of GPS coordinates	AP Inventory
AP Location	Location string of the access point that is configured in the controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling

TABLE 5 Dimensions (continued)

Dimension name	Description	Supported Data Cubes
AP MAC	Base MAC address of the access point.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling
AP Model	Description of the access point model type.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling
AP Name	Name of the access point configured in the controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling
AP Serial	Serial number of the access point.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling

TABLE 5 Dimensions (continued)

Dimension name	Description	Supported Data Cubes
AP Version	Firmware version number of the access point.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling
AP Tx Power	Indicates the transmission power of the AP	Clients
Application Category	Amount of user traffic by category	Applications
Application Name	Name of the application accessed by the WiFi client.	Applications
Authentication Method	The WiFi encryption and authentication method adopted.	<ul style="list-style-type: none"> • Clients • Sessions
BSSID	Basic service set identifier	Network
Cable modem firmware	Firmware version of the cable modem.	AP Inventory
Cable modem IP	IP address of the cable modem.	AP Inventory
Cable modem MAC	MAC address of the cable modem.	AP Inventory
Event Category Alarm Category	Category for access point and controller alarms or events.	<ul style="list-style-type: none"> • Events • AP Alarms
Channel	The WiFi channel number used.	<ul style="list-style-type: none"> • Network • Clients • Sessions
Client IP	Internal IP address of the WiFi client.	<ul style="list-style-type: none"> • Clients • Sessions
Client MAC	MAC address of the WiFi client.	<ul style="list-style-type: none"> • Applications • Clients • Sessions • Wifi-Calling
Client Radio Mode	Possible values are: ac, n, a, g, b, or "unknown" (if SmartZone version is prior to 3.6).	<ul style="list-style-type: none"> • Clients • Sessions
Client BTM Capability	Indicates the BSS transition management capability of the client	<ul style="list-style-type: none"> • Clients • Sessions
Channel Bandwidth	Indicates the channel bandwidth	Network
Connection Status	Connection status of the access point: Online, Offline, Discovery, Provisioned.	<ul style="list-style-type: none"> • AP Inventory

TABLE 5 Dimensions (continued)

Dimension name	Description	Supported Data Cubes
Controller MAC	MAC address of the controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Controller Inventory • Rogue AP • Switch Inventory • Switch Network • Wifi-Calling
Controller Model	Description of the model of the controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Controller Inventory • Rogue AP • Switch Inventory • Switch Network • Wifi-Calling
Controller Name	Name of the configured controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Controller Inventory • Rogue AP • Switch Inventory • Switch Network • Wifi-Calling

TABLE 5 Dimensions (continued)

Dimension name	Description	Supported Data Cubes
Controller Serial	Serial number of the controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Controller Inventory • Rogue AP • Switch Inventory • Switch Network • Wifi-Calling
Controller Version	Firmware version number of the controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Controller Inventory • Rogue AP • Switch Inventory • Switch Network • Wifi-Calling
Disconnect Time	Disconnect time of a session.	Sessions
Domain	Domains configured in the controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Switch Inventory • Switch Network • Wifi-Calling
Event Code	Code number for access point and controller events.	Events
Event Type	Description for access point and controller events.	Events
First Connection	First connection time of a session.	Sessions
FQDN of ePDG	Fully qualified domain name of Evolved Packet Data Gateway.	Wifi-Calling

TABLE 5 Dimensions (continued)

Dimension name	Description	Supported Data Cubes
Hostname	Hostname configured in the WiFi client.	<ul style="list-style-type: none"> • Clients • Sessions
Peer is Ruckus AP	Indicates if the connected device on this port is a Ruckus AP.	Switch Network
LAG Name	Link aggregation name of the port.	Switch Network
Last Status Change	Date and time of the last change in Connection Status of the access point.	AP Inventory
OS Manufacturer	Manufacturer information for the WiFi client.	<ul style="list-style-type: none"> • Clients • Sessions
Number of Ports	The number of ports on the switch.	<ul style="list-style-type: none"> • Switch Inventory • Switch Network
Operators	WiFi operators.	Wifi-Calling
Number of Switch Units	The number of individual hardware switches (which may or may not be stacked).	<ul style="list-style-type: none"> • Switch Inventory • Switch Network
Optics	The optics, by Gbits per second, being used in the switch network.	Switch Network
OS Type	OS information for the WiFi client.	<ul style="list-style-type: none"> • Clients • Sessions
Port	Port of the application accessed by the WiFi client.	Applications
Port MAC	The MAC addresses of individual ports on a switch.	Switch Network
Port Name	All the port names being used in the switch network.	Switch Network
Port Number	All the port numbers being used in the switch network.	Switch Network
Port Status	The up/down operating status of the port.	Switch Network
Port Link Status	The up/down status of all port links in the switch network.	Switch Network
Port Admin Status	The admin-configured port status (up/down).	Switch Network
Port Speed	All the port speeds in use in the switch network.	Switch Network
Port VLANs	All the port VLANs in use in the switch network.	Switch Network
Radio	Indicates the radio frequency band: 2.4GHz or 5GHz.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Wifi-Calling
Event Reason Alarm Reason	Additional description for access point and controller alarms or events, if available.	<ul style="list-style-type: none"> • Events • AP Alarms
Remote Device Name	The name of the device connected to the switch/port, as learned from LLDP.	Switch Network
Remote Port Mac	The MAC address of the device connected to the switch/port.	Switch Network
Remote Port Type	The functionality of the device connected to the switch/port, as learned from LLDP.	Switch Network
Remote Port Description	The description of the device connected to the switch/port, as learned from LLDP.	Switch Network

TABLE 5 Dimensions (continued)

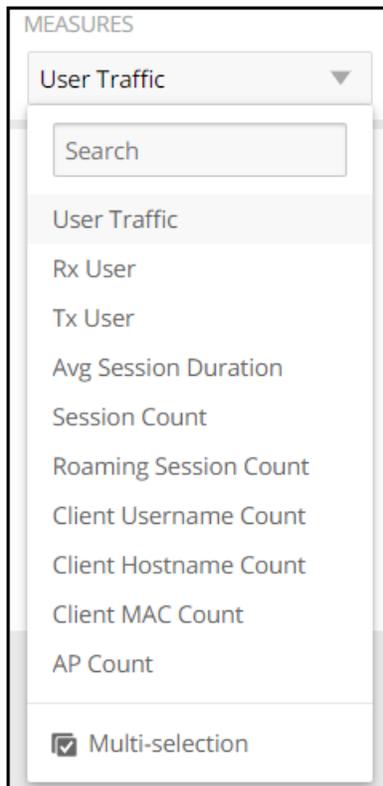
Dimension name	Description	Supported Data Cubes
Remote Port	The port used by the remote device to connect to this switch/port, as learned from LLDP.	Switch Network
Roaming Session ID	A unique session ID that is created when a client roams to multiple APs within a short-enough time span that the client is connected to these APs simultaneously.	<ul style="list-style-type: none"> • Clients • Sessions
Rogue AP MAC	MAC Address of the detected Rogue AP.	Rogue AP
Rogue Channel	The WiFi channel that the rogue AP was operating on.	Rogue AP
Rogue Encryption	The WiFi encryption and authentication method adopted by the rogue AP.	Rogue AP
Rogue Radio	The radio band (2.4GHz or 5GHz) that the rogue AP was operating on.	Rogue AP
Rogue SSID	SSID of the detected Rogue AP.	Rogue AP
Rogue Type	Possible types are: ignore, known, rogue, and malicious	Rogue AP
Router ID	The router IDs being used in the network.	<ul style="list-style-type: none"> • Switch Inventory • Switch Network
Session ID	ID string assigned to a session.	<ul style="list-style-type: none"> • Clients • Sessions
Session Type	Indicates whether the session is authorized or unauthorized.	<ul style="list-style-type: none"> • Clients • Sessions
Event Severity Alarm Severity	Severity level for access point and controller alarms or events.	<ul style="list-style-type: none"> • Events • AP Alarms
SSID	Service set identifier (SSID) configured in the controller.	<ul style="list-style-type: none"> • Applications • Network • Clients • Sessions • Wifi-Calling
Switch Firmware	Firmware versions being used by the switches in the network.	<ul style="list-style-type: none"> • Switch Inventory • Switch Network
Switch Group Name	Names of all the switch groups in the network.	<ul style="list-style-type: none"> • Switch Inventory • Switch Network
Switch MAC	MAC addresses of the switches in the network.	<ul style="list-style-type: none"> • Switch Inventory • Switch Network
Switch Model	Model numbers of the switches in the network.	<ul style="list-style-type: none"> • Switch Inventory • Switch Network
Switch Name	Names of the switches in the network.	<ul style="list-style-type: none"> • Switch Inventory • Switch Network
Switch Serial	Serial numbers of the switches in the network.	<ul style="list-style-type: none"> • Switch Inventory • Switch Network
Switch Status	Online/offline/flagged status of the switches in the network.	<ul style="list-style-type: none"> • Switch Inventory • Switch Network

TABLE 5 Dimensions (continued)

Dimension name	Description	Supported Data Cubes
Switch Subgroup Name	Names of the switch subgroups in the network.	<ul style="list-style-type: none"> • Switch Inventory • Switch Network
System	System ID of the controller or the SmartZone Cluster.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Controller Inventory • Rogue AP • Switch Inventory • Switch Network • Wifi-Calling
Time	Allows the data to be viewed in terms of data points with timestamps. Time granularity of 1 minute, 15 minutes, 1 hour, 1 day and 1 week can be chosen.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Controller Inventory • Rogue AP • Switch Inventory • Switch Network • Wifi-Calling
Username	Username of the user account associated with the WiFi client.	<ul style="list-style-type: none"> • Clients • Sessions
Zone	Zones configured in the controller.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms • Rogue AP • Wifi-Calling

Measures

FIGURE 177 Measures



Number 2 in [Data Cube Filters](#) with the drop-down list shown. Select one or more measures by which you want to sort the selected dimension.

Based on the selected cube, measures can vary.

You can use the drop-down lists on the screen for each data cube to view the supported measures for that cube. The following table lists and describes all the measures that are supported on one or more data cubes in SCI:

NOTE

For more information about traffic-related terms, refer to the [Definition of Terms](#) on page 11 section.

TABLE 6 Measures

Measure name	Description	Supported Data Cubes
AP Count	Unique number of access points.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions • Events • AP Inventory • AP Alarms
AP Uptime	Uptime percentage for an access point.	AP Inventory

TABLE 6 Measures (continued)

Measure name	Description	Supported Data Cubes
AP-to-SZ Ping Latency	Average time, in milliseconds, for the AP to transmit a packet to the SZ controller, and receive the packet back.	Network
Avg AP-to-Client Latency	Average time, in seconds, to complete transmission or for the packet to transmit from ethernet ingress to radio egress	Network
Avg Airtime Busy	Average of the airtime busy metric.	Airtime Utilization
Avg Airtime Idle	Average of the airtime idle metric.	Airtime Utilization
Avg Airtime Rx	Average of the airtime receive metric.	Airtime Utilization
Avg Airtime Tx	Average of the airtime transmit metric.	Airtime Utilization
Avg Tx Retry Rate	Average of the transmission (Tx) packet retry rate on radio	Airtime Utilization
Avg Airtime Utilization	Average of the total airtime utilization.	Airtime Utilization
Avg CPU Utilization	Average CPU utilization for the controller.	Controller Inventory
Avg AP CPU Utilization	Average AP CPU utilization rate as a percentage	Airtime Utilization
Avg AP Memory Utilization	Average AP memory utilization rate as a percentage	Airtime Utilization
Avg AP Storage Utilization	Average AP storage utilization rate as a percentage	Airtime Utilization
Avg Disk Free	Average free disk space for the controller.	Controller Inventory
Avg Disk Utilization	Average disk utilization for the controller.	Controller Inventory
Avg Memory Utilization	Average memory utilization for the controller.	Controller Inventory
Avg Noise Floor	Average noise floor power in dBm.	Clients
Avg RSS	Average received signal strength of the access point in dBm.	Clients
Avg Session Duration	Average time duration for a session.	Sessions
Total Session Duration	Total time duration for a session.	Sessions
Avg SNR	Average signal to noise ratio at the access point in dB.	Clients
Avg Throughput Estimate	Average throughput estimate for the WiFi client.	Clients
Call Duration	Length of call to the nearest second.	WiFi Calling
Client Hostname		<ul style="list-style-type: none"> • Clients • Sessions
Client MAC Count	Unique number of WiFi clients.	<ul style="list-style-type: none"> • Applications • Clients • Sessions
Client Username		<ul style="list-style-type: none"> • Clients • Sessions
Count		<ul style="list-style-type: none"> • Events • AP Alarms
CPU (%)	Percentage of CPU currently in use.	Switch Inventory
Downlink Wifi-Calling Bytes	Number of bytes being used only in the downlink communications of the wifi calling.	WiFi-Calling
Failed Associations	Number of failed associations.	Network
Failed Authentications	Number of failed open authentications	Network

TABLE 6 Measures (continued)

Measure name	Description	Supported Data Cubes
Mgmt Traffic (Total)	Traffic volume, which is transmitted and received in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.	<ul style="list-style-type: none"> Network Airtime Utilization
Max Offline Duration	The maximum offline duration within the selected time range.	AP Inventory
Max Rogue SNR	The maximum detected SNR of the rogue AP.	Rogue AP
Max RSS	Maximum received signal strength of the access point in dBm.	Clients
Max SNR	Maximum signal to noise ratio at the access point in dB.	Clients
Memory (%)	Percentage of memory currently in use.	Switch Inventory
Min RSS	Minimum received signal strength of the access point in dBm.	Clients
Min SNR	Minimum signal to noise ratio at the access point in dB.	Clients
Offline Duration	Duration given in milliseconds.	Switch Inventory
PoE Utilization (%)	Percentage of available power over Ethernet wattage being utilized.	Switch Inventory
PoE Usage (mW)	Power over Ethernet usage.	Switch Inventory
PoE Free (mW)	Available power over Ethernet not currently being used.	Switch Inventory
PoE Total (mW)	PoE usage plus PoE free.	Switch Inventory
Port Count	Number of ports for a given switch that are part of the corresponding dimension.	Switch Network
Port PoE Utilization (%)	Percentage of PoE used by a specific port out of the total of PoE being used by the switch at the specified time.	Switch Network
Reboot Count		Events
Roaming Session Count	The number of roaming sessions for a specific client. A roaming session occurs when a client roams quickly enough to remain connected to multiple APs simultaneously. If you find a client that has a large number of roaming sessions, you can use various dimensions in Data Explorer to obtain details about the APs.	<ul style="list-style-type: none"> Clients Sessions
Rogue AP Count	The number of Rogue APs detected by all the APs in your network.	Rogue AP
AP Rx Failures	Receive packets which failed to be processed due to insufficient buffer in AP.	Network
Mgmt Traffic (Uplink)	Traffic volume, which is received by AP (Access Point) in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.	<ul style="list-style-type: none"> Network Airtime Utilization
Rx Traffic	Traffic received for each dimension measure.	Switch Network
Traffic (Uplink)	Sum of the User Traffic (Uplink) and management traffic.	<ul style="list-style-type: none"> Network Airtime Utilization

TABLE 6 Measures (continued)

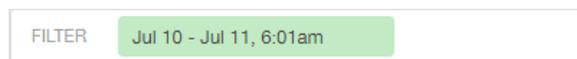
Measure name	Description	Supported Data Cubes
User Traffic (Uplink)	Traffic volume, which is received by AP (Access Point) in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions
Session Count	Number of unique sessions.	<ul style="list-style-type: none"> • Clients • Sessions
Successful Associations	Number of successful associations.	Network
Successful Authentications	Number of successful open authentications	Network
Successful Authentication Ratio	Ratio of number of successful open authentications over total number of open authentications.	Network
Switch Count	Number of switches for each corresponding dimension.	Switch Inventory
Switch Unit Count	Number of switch units for each corresponding dimension.	Switch Network
Data Frame Ratio (Total)	Percentage of all Tx and Rx packets that are data.	Network
Mgmt Frame Ratio (Total)	Percentage of all Tx and Rx packets that are management.	Network
Traffic (Total)	Sum of the user and management traffic.	<ul style="list-style-type: none"> • Network • Airtime Utilization • Switch Network
Total Wifi-Calling Bytes	Total number of downlink WiFi calling bytes plus uplink WiFi calling bytes.	WiFi-Calling
Broadcast Frames (Downlink)	Number of broadcast packets transmitted by the network.	Network
Tx Client MCS Rate	Client transmission data rate.	Clients
AP Tx Dropped Data Frames	Tx data frames that are dropped by the message queue.	Network
AP Tx Failures	Transmit packets which failed to be processed due to insufficient buffer in AP.	Network
Mgmt Traffic (Downlink)	Traffic volume, which is transmitted by AP (Access Point) in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.	<ul style="list-style-type: none"> • Network • Airtime Utilization
Multicast Frames (Downlink)	Number of multicast packets transmitted by the network.	Network
Traffic (Downlink)	Sum of the User Traffic (Downlink) and management traffic.	<ul style="list-style-type: none"> • Network • Airtime Utilization
Tx Traffic	Traffic transmitted for each corresponding dimension.	Switch Network
Unicast Frames (Downlink)	The number of data packets transmitted by the network that are not broadcast or multicast packets.	Network

TABLE 6 Measures (continued)

Measure name	Description	Supported Data Cubes
User Traffic (Downlink)	Traffic volume, which is transmitted by AP (Access Point) in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic.	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions
Uplink Wifi-Calling Bytes	Number of bytes being used only in the uplink communications of the wifi calling.	WiFi-Calling
User Traffic (Total)	Traffic volume, which is transmitted and received in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic. User Traffic (Total) = User Traffic (Uplink) + User Traffic (Downlink)	<ul style="list-style-type: none"> • Applications • Network • Airtime Utilization • Clients • Sessions

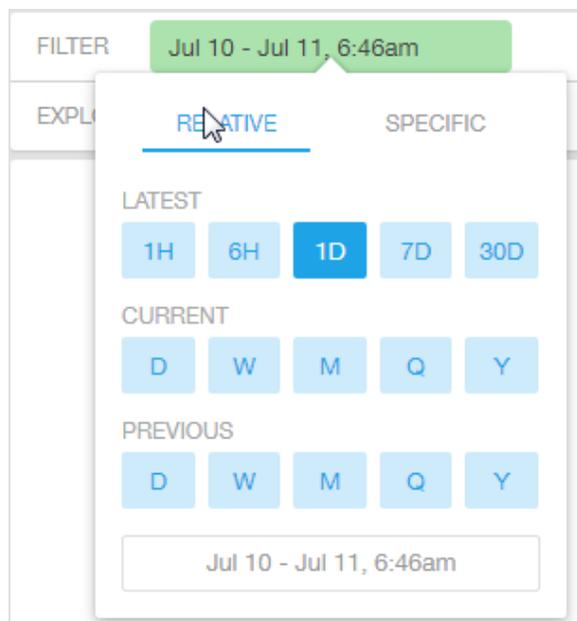
Filter

FIGURE 178 Filter



Number 3 in [Data Cube Filters](#). Segregates the data by dimensions such as Time Range, and other dimensions. You can filter on one or more dimensions, and change the sorting hierarchy as required. You can also define the dimensions based on specific properties of the dimension, for example, Time has relative and specific settings. The default dimension is Time, as the databases are very large and can crash the system without this filter.

FIGURE 179 Time - Relative Settings

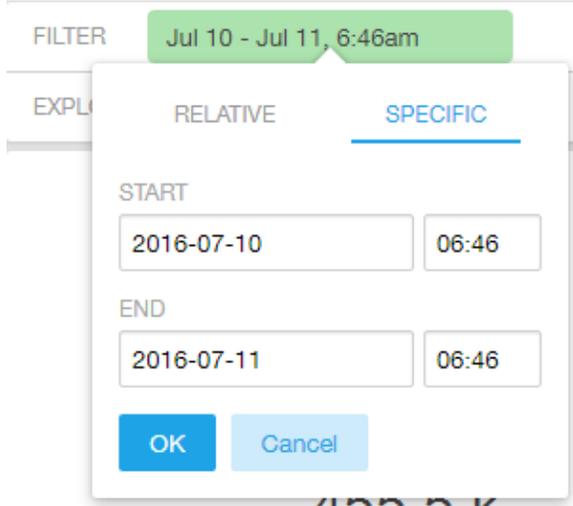


Data Explorer Dashboard
Data Cube Filters

You can specify the following:

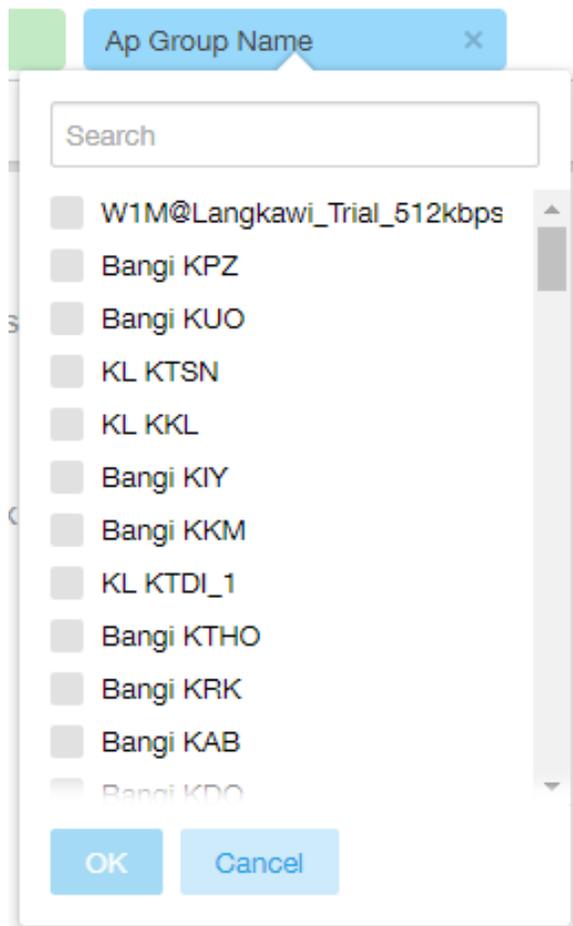
- Latest time of 1 hour, 6 hours, 1 day, 7 days, or 30 days.
- Current time of day, week, month, quarter, or year.
- Previous time of day, week, month, quarter, or year.

FIGURE 180 Time - Specific Settings



You can specify the start and end dates and times and click **OK** to save the details.

FIGURE 181 Dimension Options



You can search the list of the dimension and choose specific entries. By default all the data that matches the dimension is listed.

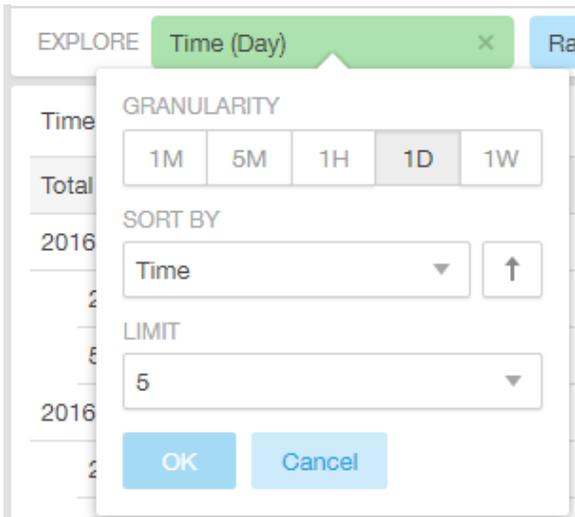
Explore

FIGURE 182 Explore



Number 4 in [Data Cube Filters](#). Enables visualization based on dimensions and time (data granularity).

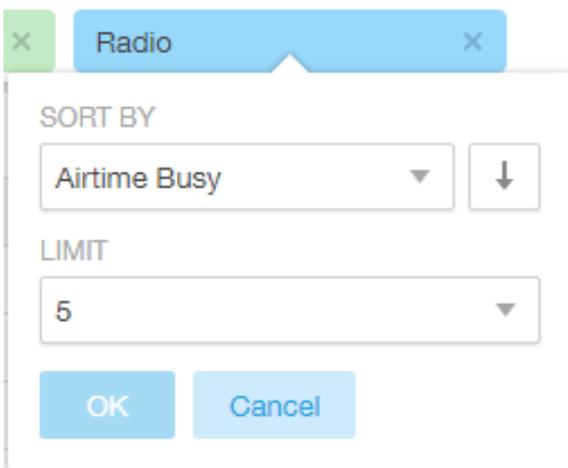
FIGURE 183 Explore Time



Use this filter to:

- Set the data granularity to 1 minute, 5 minutes, 1 hour, 1 day, or 1 week.
- Sort by any of the measures related to the dimension.
- Limit the number of rows displayed for the dimension to 5, 10, 25, 50, 100, 500 or 1000.

FIGURE 184 Sort Dimension by Measure



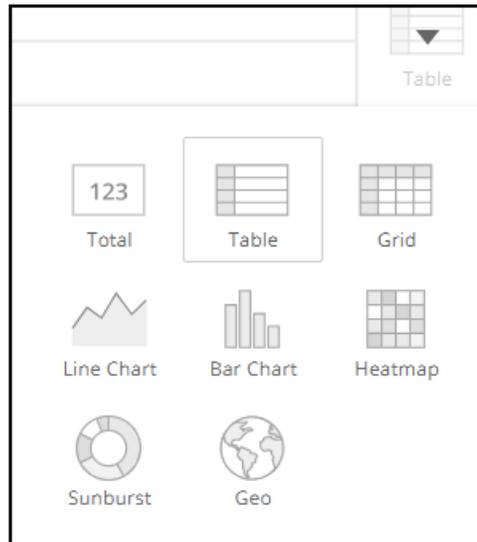
Use this filter to:

- Sort by any of the measures related to the dimension.
- Limit the number of rows displayed for the dimension to 5, 10, 25, 50, 100, 500 or 1000.

You can explore on one or more dimensions using a methodology similar to pivot tables, and change the sorting hierarchy as required. You can define the number of rows to be listed on the screen.

View Outputs

FIGURE 185 View Outputs



Number 5 in [Data Cube Filters](#). Create outputs from visualization in the forms shown above. The default view is Totals.

Add to Dashboard

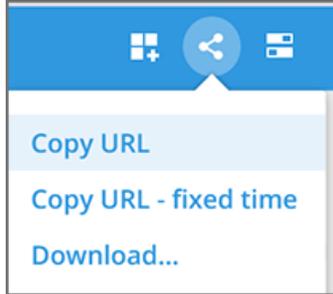
FIGURE 186 Add to Dashboard



Number 6 in [Data Cube Filters](#). Allows you to add a tile you are currently developing to an existing dashboard or to a dashboard that you want to create.

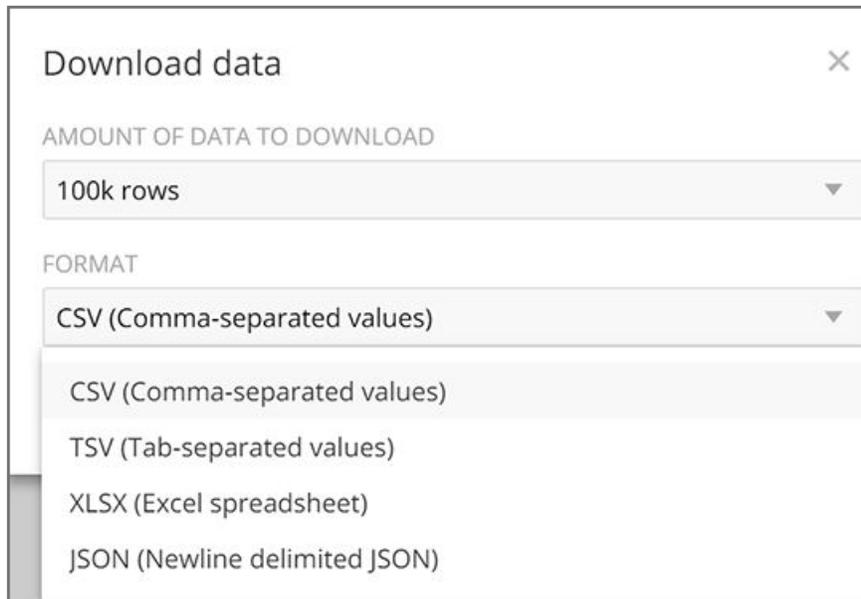
Share Link

FIGURE 187 Share Link



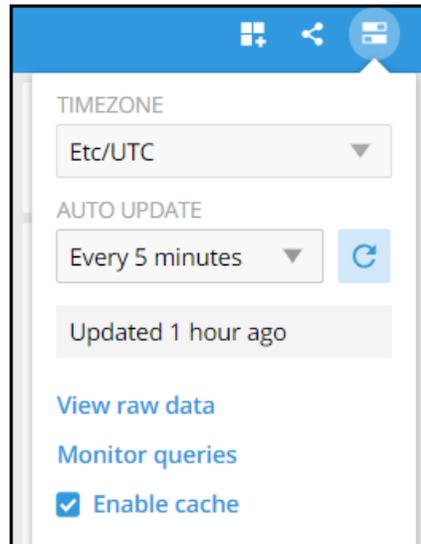
Number 7 in [Data Cube Filters](#). You can share the URL, Export to various formats, View raw data, or download the information. The following figure shows the various formats you can choose for downloading data. You can also select the number of rows to download:

FIGURE 188 Selecting the Amount of Data to Download and the Desired Format



Options

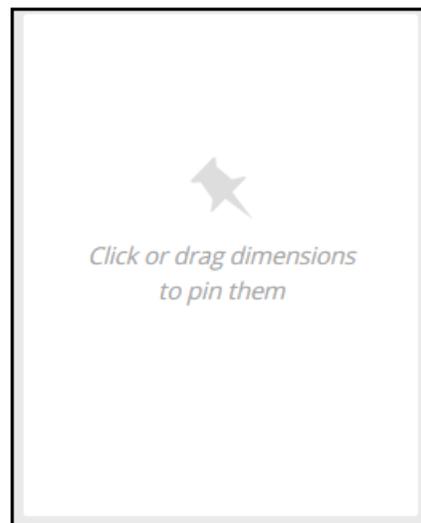
FIGURE 189 Options



Number 8 in [Data Cube Filters](#). Allows you to set the time zone as well as to perform the other functions shown.

Pinboard

FIGURE 190 Pinboard

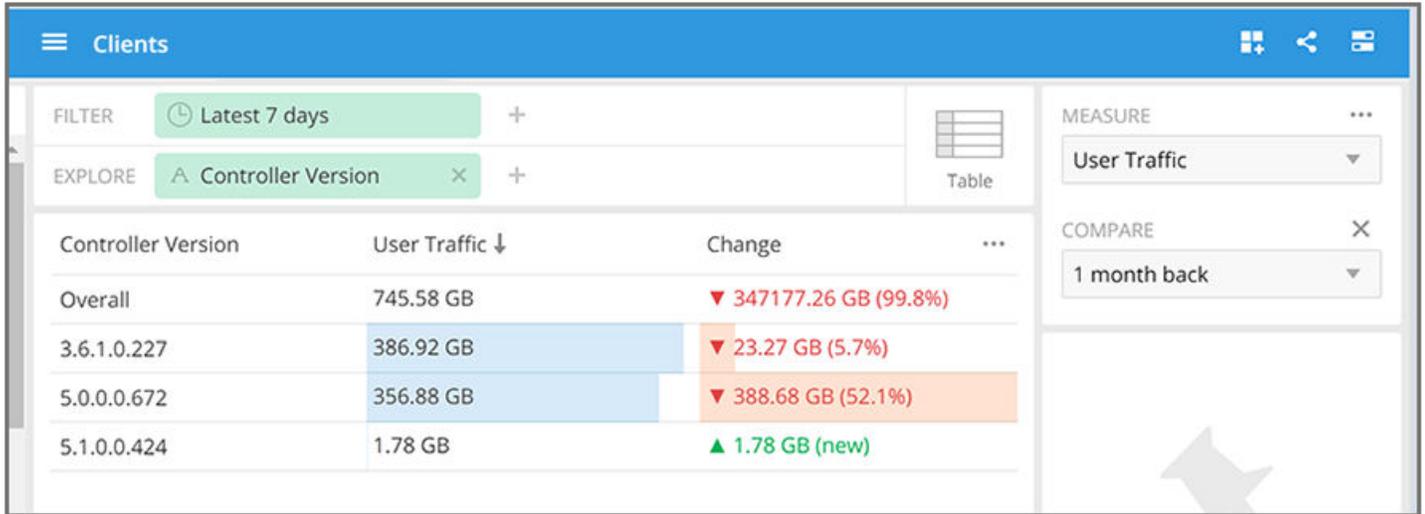


Number 9 in [Data Cube Filters](#). Click or drag dimensions and pin them on the pinboard. Retain the dimensions for ready reference during visualization.

Time Compares

The Time Compares feature allows you to compare the current data of specified dimensions and measures to the same dimensions and measures during previous time periods. An example is shown in the following figure, where the Controller Version dimension has been chosen along with the User Traffic measure. The Change column indicates how much user traffic has gone up or down for the corresponding controller version over the specified period of time. The method of specifying time periods is described later.

FIGURE 191 Time Compares

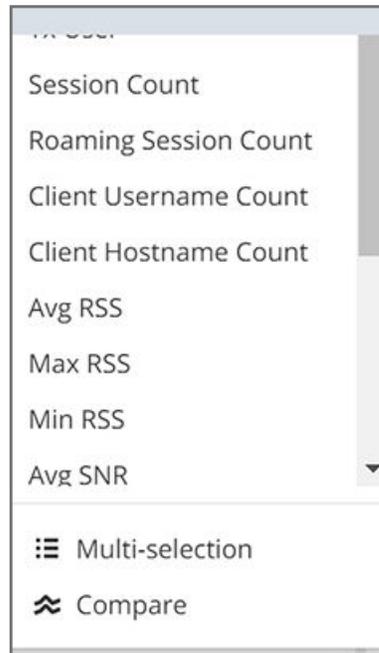


Creating a Data Comparison

The following procedure demonstrates how you can create a data comparison from scratch, using the figure above as an example:

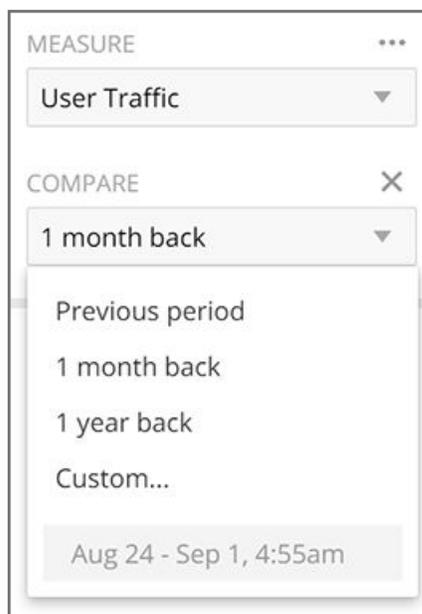
1. From Data Explorer, select one of the data cubes. (In the figure above, the Clients data cube is being used.)
2. Drag one or more dimensions into the center pane. In the above example, Controller Version is the only dimension.
3. From the Measure drop-down list, you can select one or more measure (use Multi-Selection for more than one). By default, User Traffic is already selected in this example.
4. From the Measure drop-down list, select Compare:

FIGURE 192 Selecting Compare from the Measure Drop-Down List



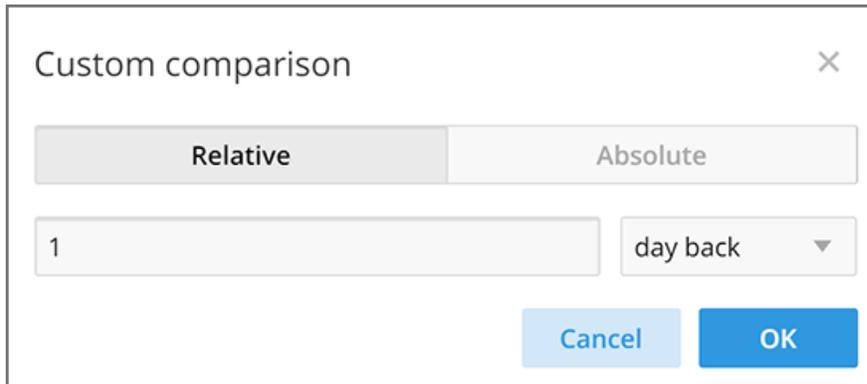
5. If you have already invoked the Compare feature, the previous time period you selected is automatically used, and a display such as the one in [Figure 191](#) appears. However, if you have not yet used Compare, or if you want to change the current time-period, invoke the **Compare** drop-down list:

FIGURE 193 Using the Compare Drop-Down



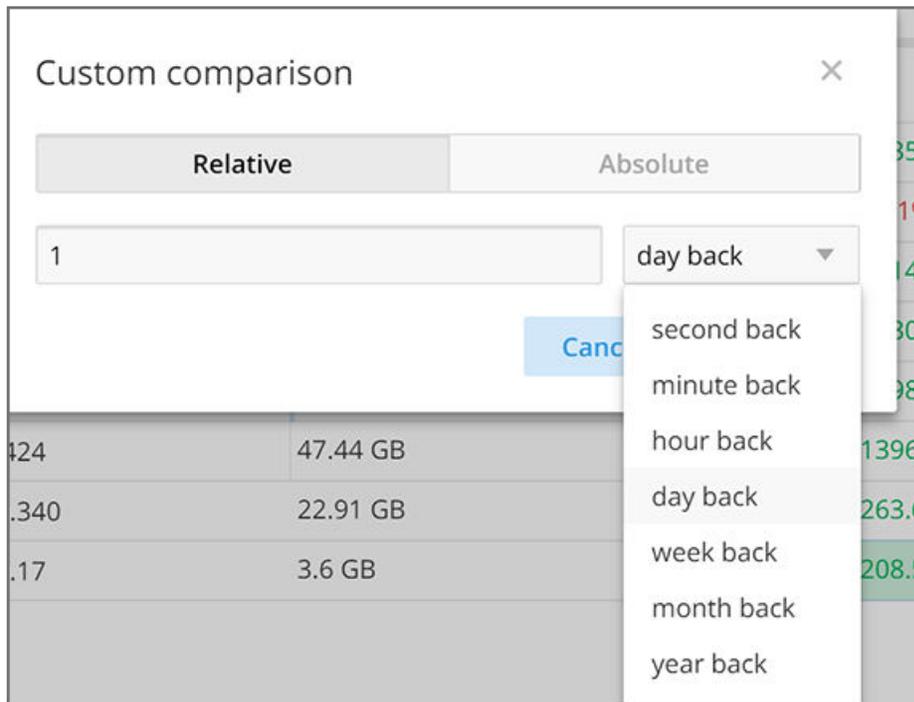
6. You can select one of the listed time periods or you can customize your choice.
7. (Optional) To customize your choice, click **Custom**. The following pop-up appears:

FIGURE 194 Custom Comparison Pop-Up Window



- If you want to use one of the selections from the **Relative** tab, click the drop-down arrow to view the following possibilities:

FIGURE 195 List of Choices from the Relative Drop-Down List



You can also change the Number 1 to a different number to correspond to your choice in the drop-down list. Click **OK** to have this selection take effect.

- If you want to create a custom time-period, click the **Absolute** Tab:

FIGURE 196 Custom Comparison - Absolute Tab

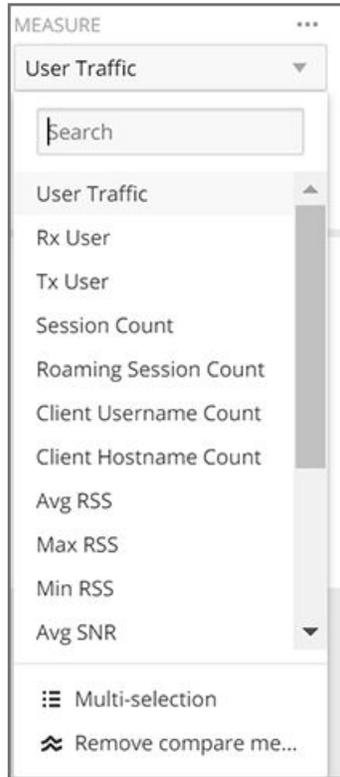
The screenshot shows a dialog box titled "Custom comparison" with a close button (X) in the top right corner. At the top, there are two tabs: "Relative" and "Absolute", with "Absolute" being the active tab. Below the tabs, the "START TIME" is set to "2018-09-26" and "17:46". A checkbox labeled "Auto adjust end date" is checked. Below that, the "END TIME" is set to "2018-09-27" and "17:46". At the bottom right, there are two buttons: "Cancel" and "OK".

You can change the times as desired, or you can have the end date automatically adjusted to exactly one day later, then click **OK** for your choices to take effect.

Removing the Compare Feature

If you want to remove the Compare feature from the data display, go back to the Measure drop-down list, and select Remove Compare Measure, as shown in the following figure:

FIGURE 197 Removing the Compare Measure



Creating a Data Explorer Dashboard

You can create custom dashboards in the Data Explorer portion of SCI to focus on data you are interested in that encompasses any or all of the nine existing data cubes. These dashboards can be saved so that you can create reports for this unique data set whenever you wish.

The steps below guide you through an example of creating a dashboard in Data Explorer.

1. Click **+ Dashboard** in the upper-right portion of the Data Explorer page in SCI.

The **New dashboard** screen is displayed:

FIGURE 198 New Dashboard screen



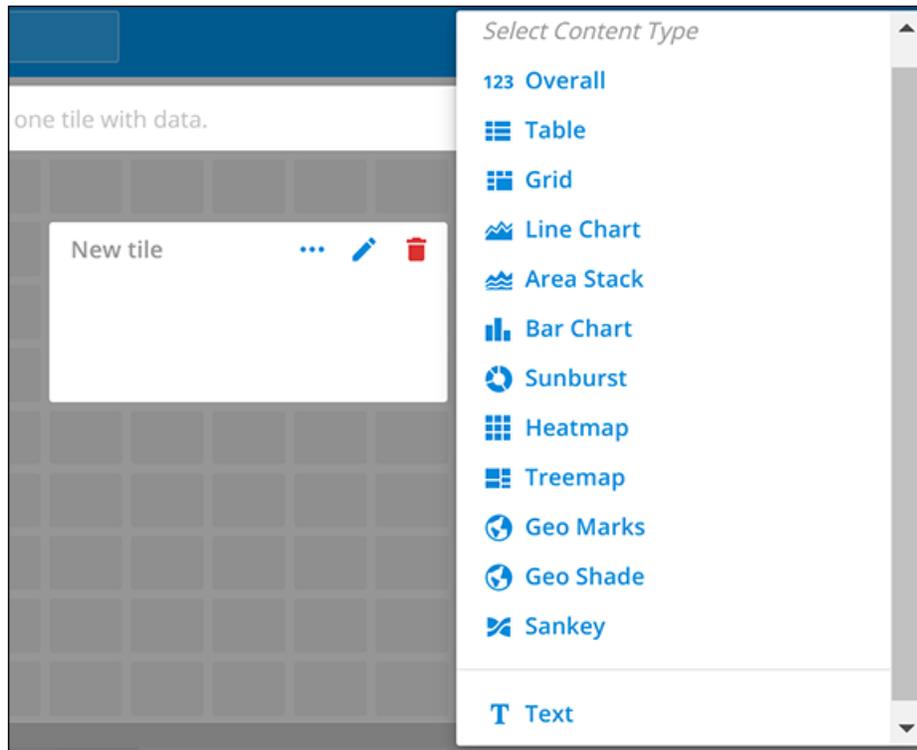
2. Highlight the "New dashboard" text and give the dashboard a name (**DemoDB** in this example):

FIGURE 199 Naming the New Dashboard



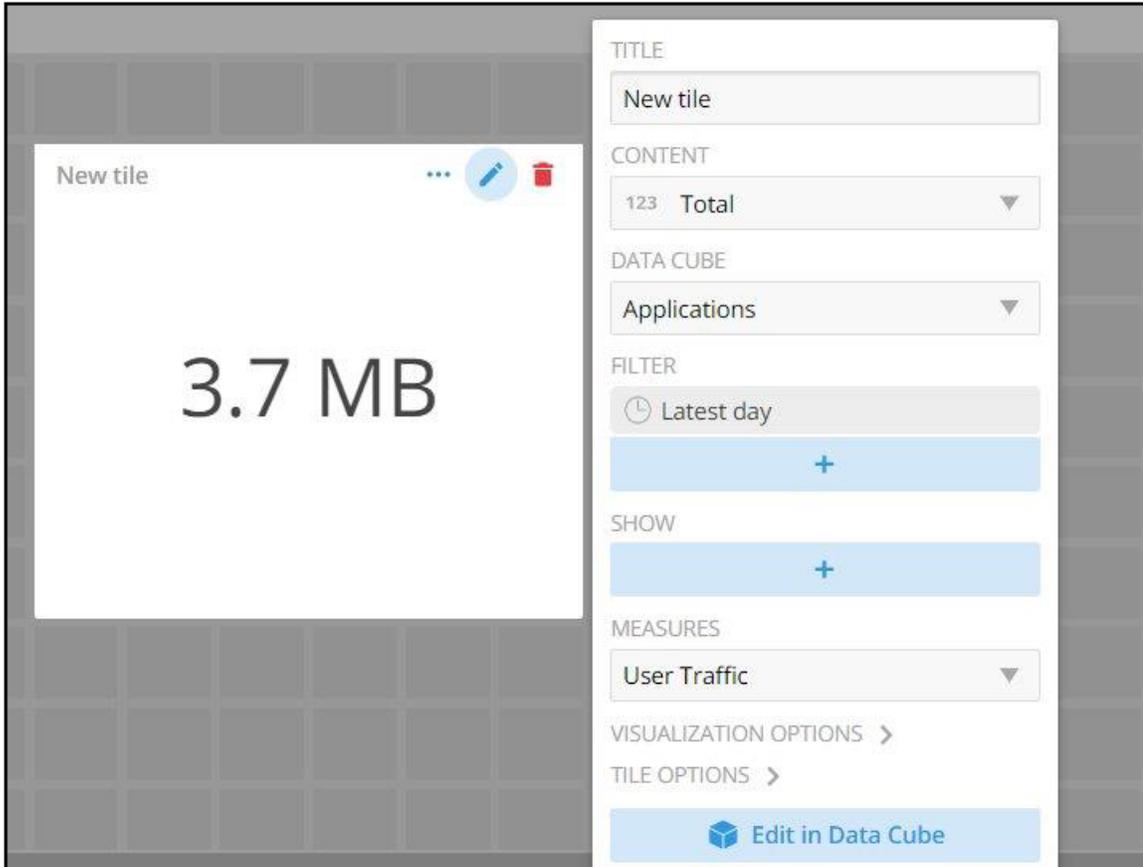
3. Drag your cursor to highlight any number of small boxes on this screen. A popup configuration window appears, as shown in the following figure:

FIGURE 200 Adding a Tile to Your Dashboard by Using the Popup



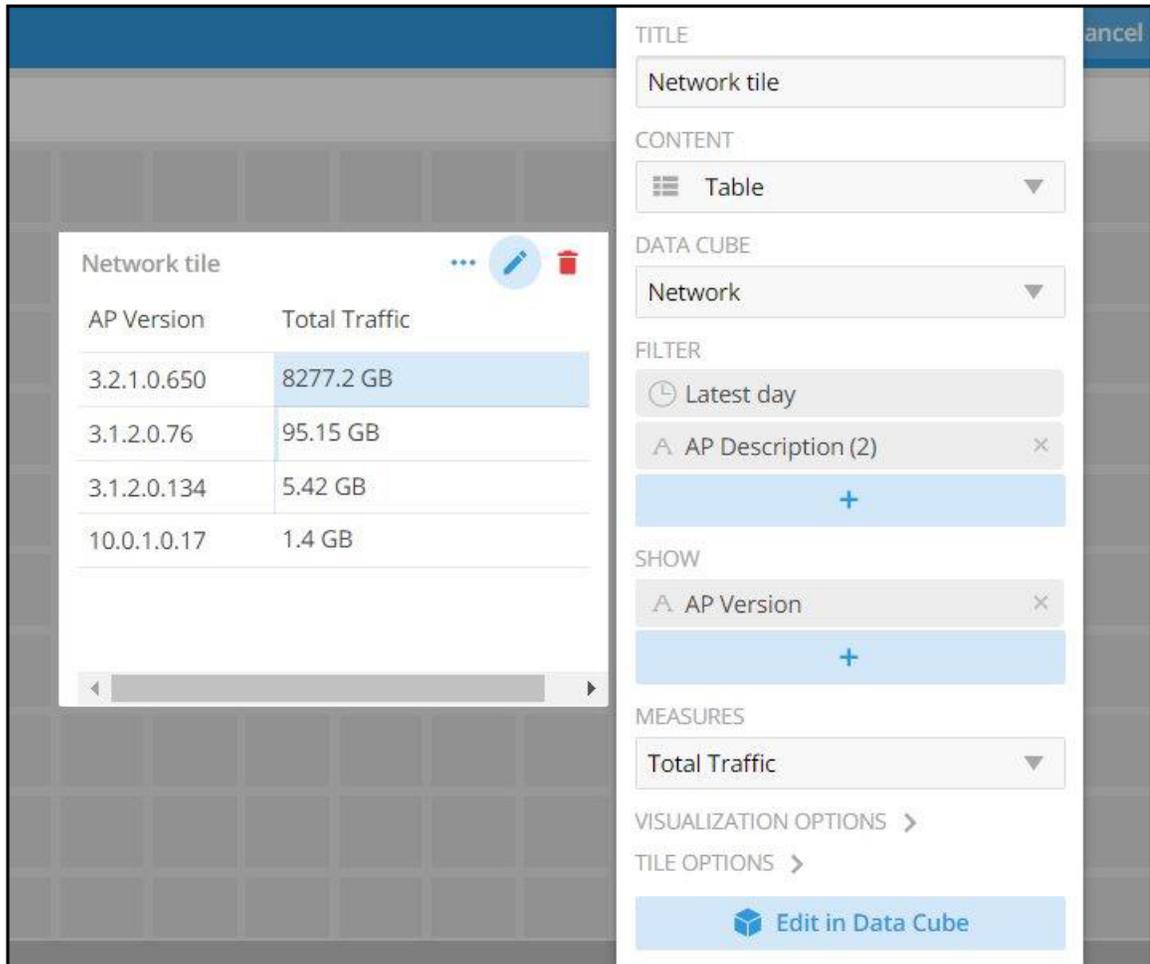
- Using the popup and the icons, continue to build your tile. For example, you could select the following the Content Type **123 Total**.
The following popup appears:

FIGURE 201 New-Tile Popup After Selecting Content Type of 123 Total



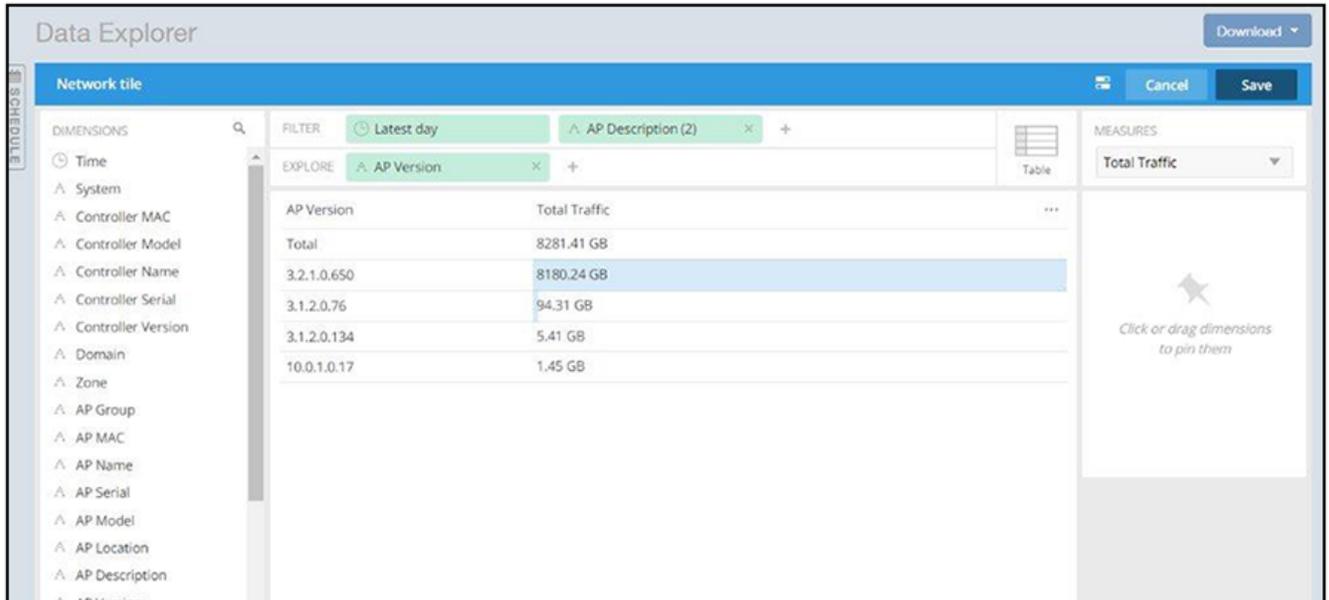
- Next, you can customize this tile by making the selections you want, as shown in the following example:

FIGURE 202 New-Tile Popup After Doing Some Customization



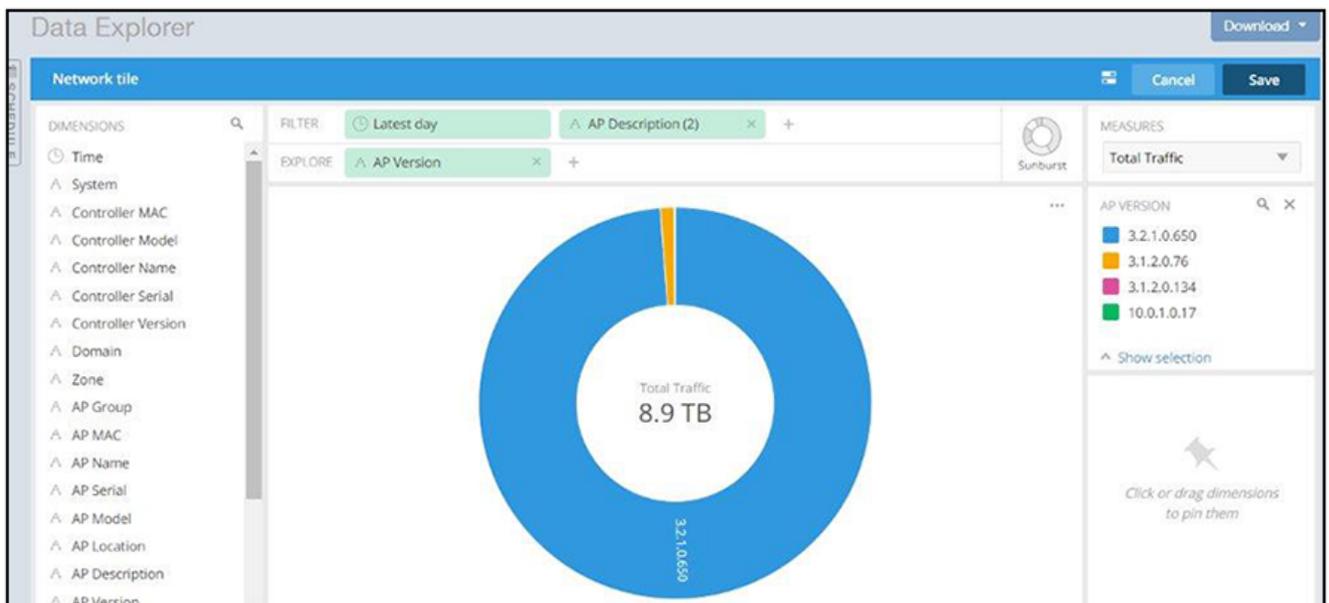
- You could then click the option to Edit in Data Cube, which brings you to the following mode:

FIGURE 203 Editing New Tile in the Data Cube



- You can continue to make edits to the tile. For example, you can hover over the Table icon and change the way the data is represented. The example below shows this data in a sunburst representation.

FIGURE 204 Sunburst Representation of Tile in Data Cube



Data Explorer Dashboard

Actions You Can Perform on an Existing Dashboard

8. When you are done with your selections for the first tile you are adding to your dashboard, click **Save** in the upper-right portion of the screen.
9. Using the steps demonstrated above, you can continue to add as many tiles as you want to your dashboard.

Actions You Can Perform on an Existing Dashboard

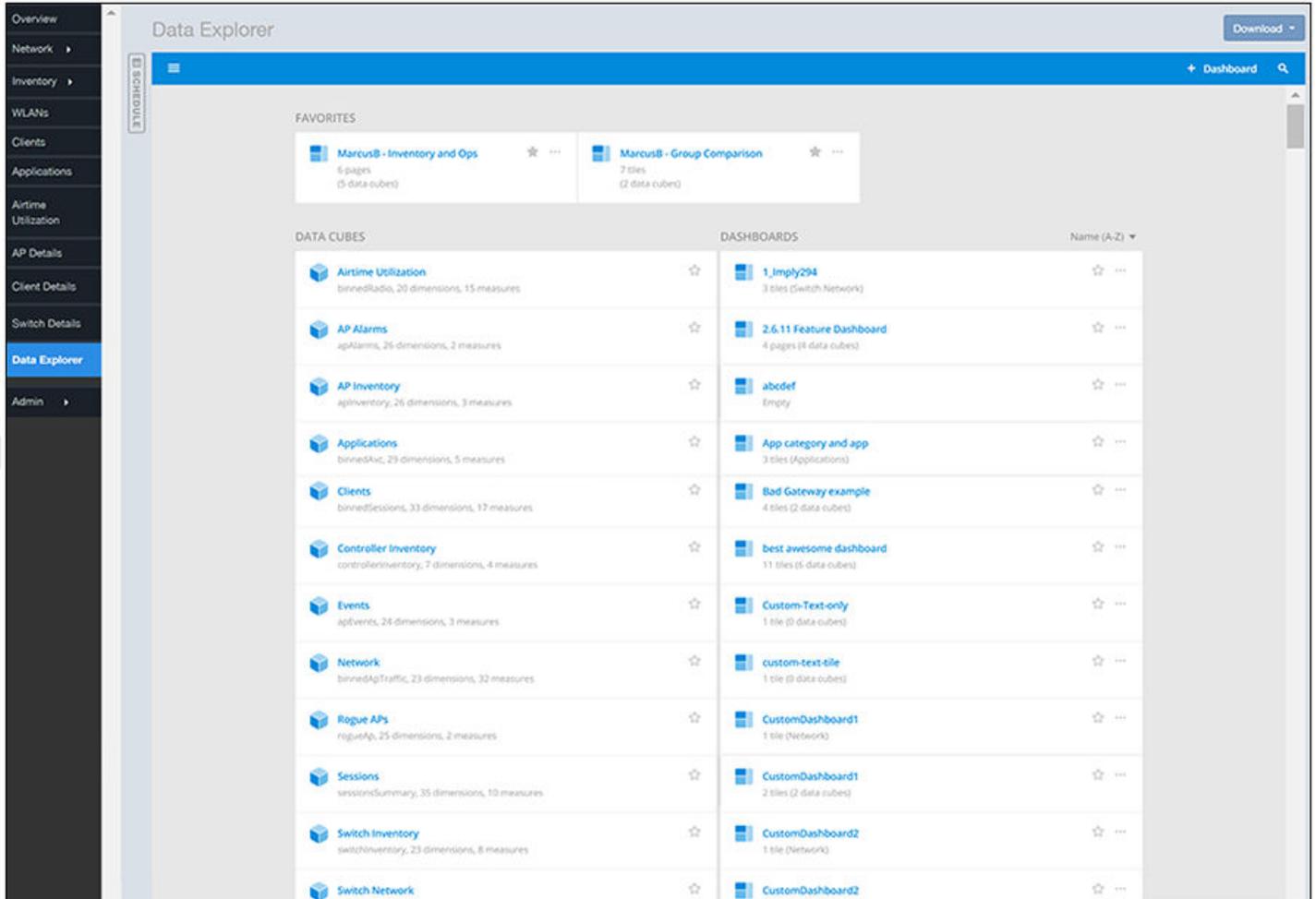
You can perform many actions on an existing dashboard, such as adding or removing tiles, editing existing tiles, deleting tiles and deleting the entire dashboard.

Opening a Dashboard

When you click the Data Explorer tab in SCI, you get a display of all the data cubes on the left side of the window, and a list of existing dashboard on the right side. To open a dashboard, do one of the following:

- Locate the dashboard you are interested in from the list on the right side of the screen, and click on it.
- Click the Options menu (the three horizontal-lines "hamburger" bar near the upper-left portion of the screen), then either use the Search area or locate the desired dashboard to open it.

FIGURE 205 Existing Dashboards Listed on Main Data Explorer Window



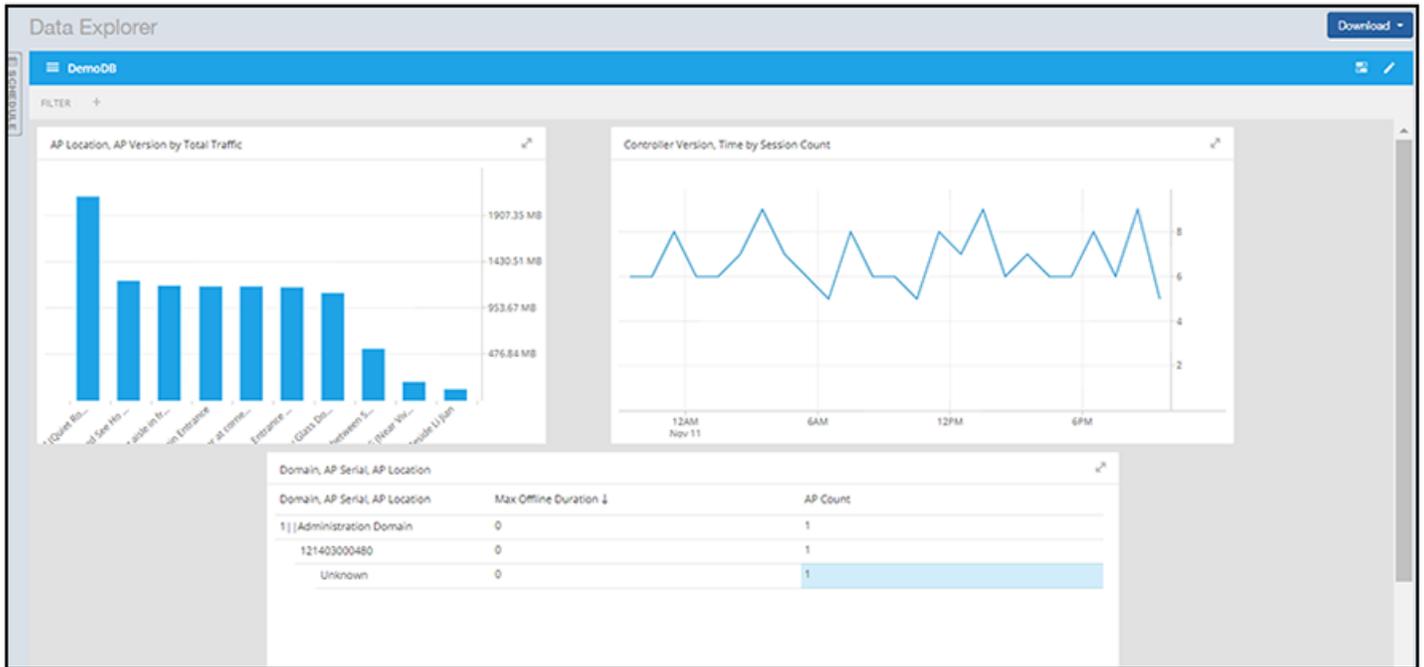
Editing a Dashboard

To perform various editing functions on a dashboard, first open the dashboard you want, as in the example below:

Data Explorer Dashboard

Actions You Can Perform on an Existing Dashboard

FIGURE 206 Dashboard example with three tiles



In the upper-right portion of the screen, the following icons are displayed:

FIGURE 207 Dashboard-Editing buttons



The following table identifies each icon and the actions you can perform:

TABLE 7 Icons for Editing a Dashboard

Icon	Name of Icon	Actions You Can Perform
	Dashboard options	Clicking this icon allows you to change the following settings: <ul style="list-style-type: none"> • Time zone • Auto-update interval • Enabling/disabling cache

TABLE 7 Icons for Editing a Dashboard (continued)

Icon	Name of Icon	Actions You Can Perform
	Edit this dashboard	<p>Clicking this icon allows you to do the following:</p> <ul style="list-style-type: none"> ● Rearrange or resize the tiles by using your cursor. ● Make changes to specific tiles within the dashboard by using the icons that appear for each tile: <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">  </div> <ul style="list-style-type: none"> - Use the three dots to duplicate the tile. - Use the Pencil icon to add or remove dimensions and measures for the tile as well as to change the representation of the data for the tile. - Use the garbage-can icon to delete the tile from the dashboard. ● Click on the Options tab in the upper-right portion of the screen: This invokes another screen containing general information about the dashboard. From there, there are two tabs - one called "General" and one called "Sharing." In the General tab, you can do the following: <ul style="list-style-type: none"> - Rename the dashboard - Add or modify a description of the dashboard - Change the color theme - Decide whether to enforce the time filter - Delete the dashboard. <p>In the Sharing tab, you can set who you want to view and edit the dashboard.</p> <p>NOTE Remember to click Save to save your changes.</p>

Using the Explain Feature

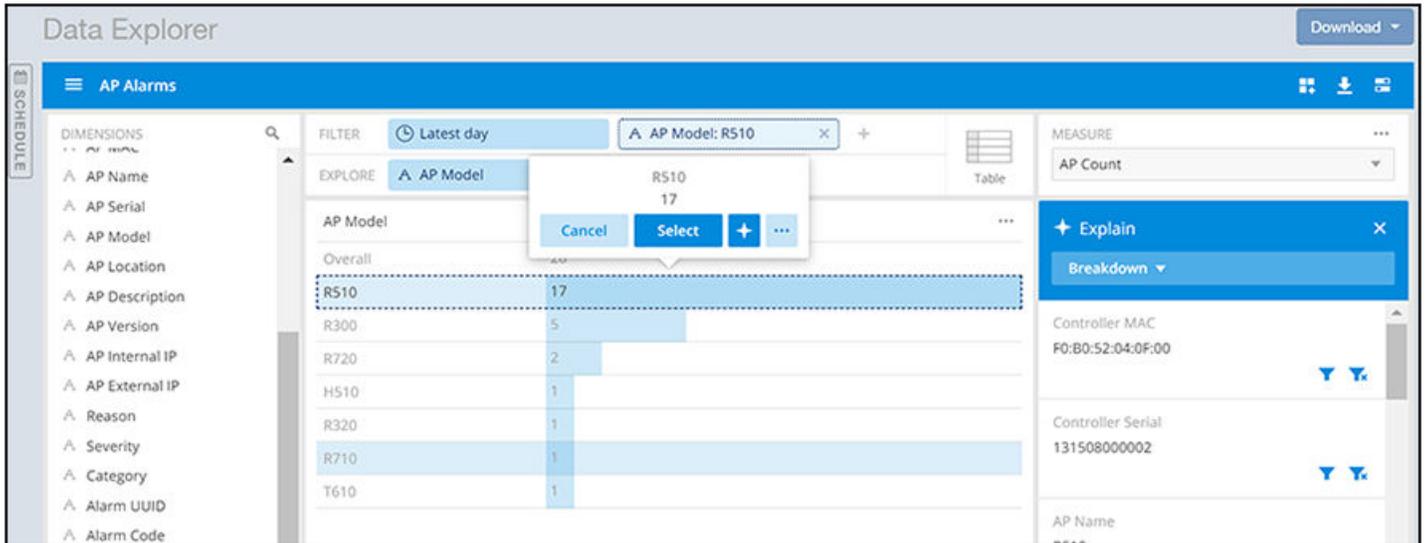
The Explain feature allows you to select a portion of data and receive automated explanations of what is contributing to that data.

In the following figure, the row of data called "R510" is selected. When you select a portion of data, a popup appears above the data selected. If you then click the Star icon in that popup, the Explain feature is invoked, as shown in the right pane below.

Data Explorer Dashboard

Actions You Can Perform on an Existing Dashboard

FIGURE 208 Explain Feature Invoked



The Explain feature includes three different algorithms:

- Breakdown (shown in the example figure above): Shown when you select a single slice of data. It will find the contributing factors to the selected slice.
- Change Compare: Shown when you select a comparison, Explain finds the contributing factors in the current value versus the comparison.
- Trend Analysis: Shown when you select a trend such as a spike, dip, rise, or fall. Explain automatically detects the trend and then finds the contributing factors.

Applying Filters At the Dashboard Level

Once you have created a custom dashboard, you can apply global filters, default filters, global measures and global comparisons at the dashboard level, meaning that these selections would be applied to all the tiles in your dashboard at once.

To accomplish this, click the pencil icon in the upper right of the dashboard (not the individual pencil icons for each time). Then, make the desired selections. In the example below, the default filter is Controller Serial, and the Global Measures and Global Comparisons are turned on by clicking their on/off switches so that they move to the right. After you select the desired settings, click **Save**.

FIGURE 209 Applying Filters to a Dashboard



Exporting Raw Data Using the SCI Virtual Machine Command Line Interface

You can use the SCI VM command line interface to export larger amounts of raw data than can be obtained with the user interface. This data can come from any data cubes, dimensions, filters, etc. that you want.

Follow these steps to export the raw data you are interested in.

NOTE

It is recommended to never run more than one export command at a time because data could accidentally be overwritten.

1. Log in to your SCI VM.
2. Navigate to the following directory:

```
/storage/ rsa-api/ export /configs
```

3. Locate the file called config-template.yml
4. Open the file using a text editor.

The file contains instructions on what to do. You will need to either comment out certain lines or un-comment certain lines in the file, as directed, and will need to fill in the desired values of data cubes, dimensions, and other items as directed.

5. Once you have made the changes in the config-template.yml file, be sure to save it under a different name that is meaningful to you, while leaving the original config-template.yml file in tact for future use.

NOTE

If you are using SFTP, place the key file in the following directory:

```
/storage/rsa-api/ export /keys
```

6. Run the following command to export the raw data:

```
sudo docker exec -it rsa-api yarn export-raw <config-file-name>
```

where <config-file-name> is the name of your customized .yml file.

The raw data should be returned to the command line interface. Refer to the following topics for more information:

- [Template File for Exporting Raw Data](#) on page 164
- [Raw Data Output for Dimensions and Measures](#) on page 165

Template File for Exporting Raw Data

This is the example config-template.yml that you can copy and edit according to the desired output.

```
#
# This is an example configuration file in YAML format. Lines starting with '#' are comments.
# Refer to http://www.yaml.org for detailed specification. Please change values accordingly.
#
# All attributes are required unless specified as 'Optional'.
#
# Version: 1.0
# Date: 17 Oct 2017
#
source:
# The data source name (case-sensitive). Refer to detailed API reference guide regarding how to
# retrieve the actual value of data source name. Alternatively you may get it from URL
# while accessing a particular Data cube via Data Explorer.
#
# Example: access Data cube 'Clients' by accessing URL (replace {HOST} with your SCI master node
# IP address, authentication may be required):
#
# https://{HOST}/report/dataExplorer#/d/binnedSessions/Clients
#
# The 'dataSource' of 'Clients' is 'binnedSessions' in this example
dataSource: 'foo'

# ISO 8601 timestamp (e.g, yyyy-MM-ddTHH:mmZ)
#
# Examples:
# (1) '1970-01-01T00:00Z' for UTC
# (2) '2017-01-01T00:00+0300' for UTC +3
# (3) '2017-01-01T00:00-0800' for UTC -8
# (4) '2017-01-01T00:00+0530' for UTC +5:30
#
# Make sure that 'startTime' is before 'endTime'.
startTime: '2017-01-01T00:00:00Z'
endTime: '2017-02-01T00:00:00Z'

# Optional (comment out if it does not apply)
#
# In the format of '<key>': [a list of values], e.g., 'system': ['foo', 'bar']
#
# The key name refers to the actual case-sensitive value (not display name) of a particular
# dimension of a data cube. Refer to detailed API reference guide regarding how to retrieve the values of
# dimensions. Alternatively, you may export a few rows (i.e., 1 minute) without filter and check
# out the title of the CSV file for all filter dimension names
#
# For a particular filter, results match any of the values specified in the list for that specific
# key would be returned. If multiple filters specified, only results match all of them would be
# returned.
#
# Example:
#
# (1) Get all rows for 'system' equals to 'foo' or 'bar'
#
# filters:
# 'system': ['foo', 'bar']
#
# (2) Get all rows for 'system' equals to 'foo', AND 'ctrlMac' equals '99:F6:66:2A:B2:80'
#
# filters:
# 'system': ['foo']
# 'ctrlMac': ['99:F6:66:2A:B2:80']
```

```

#
# Uncomment and change the following lines to apply filters
# filters:
# '<key1>': ['value1', 'value2']
# '<key2>': ['value1', 'value2']

destination:
# 'ftp' or 'sftp' only (case-sensitive)
protocol: 'ftp'

# The hostname or IP address of the FTP server
host: 'localhost'

# FTP login username
# For 'sftp', it refers to the SSH login username
user: 'ftp-username'

# Required by 'ftp' protocol only
# FTP server login password
password: 'ftp-password'

# Required by 'sftp' protocol only
# File name only of the SSH public key. The file must exist in directory
# '/storage/rsa-api/export/keys' on 'SCI' master host
#
# privateKey: 'changeme.pem'

# Apply to 'sftp' protocol only
# Passphrase for 'privateKey' if any, leave it with empty value '' or remove it otherwise
#
# passphrase: 'changeme'

# The prefix for exported file names. If it contains path of sub-directories (e.g.,
# 'path/to/dir/example'), those directories (i.e., 'path/to/dir') must exist on FTP server
# beforehand
prefix: 'example'

```

Raw Data Output for Dimensions and Measures

The output you generate from raw data contains dimensions and measurements for the various data cubes.

Refer to the following tables:

- [Table 8](#)
- [Table 9](#)

The following table lists and describes all the dimensions that can be displayed in the raw-data output you generate.

TABLE 8 Dimensions

Dimension name	Description	Supported Data Sources
alarmCode	Unique string assigned by the controller to an alarm.	<ul style="list-style-type: none"> • AP Alarms
alarmState	Indicates if the alarm is outstanding.	<ul style="list-style-type: none"> • AP Alarms
alarmType	Description for access point and controller alarms.	<ul style="list-style-type: none"> • AP Alarms
alarmUUID	Unique string assigned by the controller to an alarm.	<ul style="list-style-type: none"> • AP Alarms

TABLE 8 Dimensions (continued)

Dimension name	Description	Supported Data Sources
apDescription	Description string of the access point that is configured in the controller.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms
apExtIp	External IP address of the access point.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms
apFwVersion	Firmware version number of the access point.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms
apGroupName	AP Groups configured in the controller.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms
apIp	Internal IP address of the access point.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms

TABLE 8 Dimensions (continued)

Dimension name	Description	Supported Data Sources
apLocation	Location string of the access point that is configured in the controller.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms
apMac	Base MAC address of the access point.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms
apModel	Description of the access point model type.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms
apName	Name of the access point configured in the controller.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms
app	Name of the application accessed by the WiFi client.	<ul style="list-style-type: none"> • Applications
apSerial	Serial number of the access point.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms
AuthMethod	The WiFi encryption and authentication method adopted.	<ul style="list-style-type: none"> • Clients • Sessions

TABLE 8 Dimensions (continued)

Dimension name	Description	Supported Data Sources
category	Category for access point and controller alarms or events.	<ul style="list-style-type: none"> AP Events AP Alarms
channel	The WiFi channel number used.	<ul style="list-style-type: none"> Network Clients Sessions
clientIp	Internal IP address of the WiFi client.	<ul style="list-style-type: none"> Clients Sessions
clientMac	MAC address of the WiFi client.	<ul style="list-style-type: none"> Applications Clients Sessions
connectionStatus	Connection status of the access point: Online, Offline, Discovery, Provisioned.	<ul style="list-style-type: none"> AP Inventory
ctrlFwVersion	Firmware version number of the controller.	<ul style="list-style-type: none"> Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms Controller Inventory
ctrlMac	MAC address of the controller.	<ul style="list-style-type: none"> Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms Controller Inventory
ctrlModel	Description of the model of the controller.	<ul style="list-style-type: none"> Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms Controller Inventory

TABLE 8 Dimensions (continued)

Dimension name	Description	Supported Data Sources
ctrlName	Name of the configured controller.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms • Controller Inventory
ctrlSerial	Serial number of the controller.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms • Controller Inventory
disconnectTime	Disconnect time of a session.	<ul style="list-style-type: none"> • Sessions
domains	Domains configured in the controller.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms
eventCode	Code number for access point and controller events.	<ul style="list-style-type: none"> • AP Events
eventType	Description for access point and controller events.	<ul style="list-style-type: none"> • AP Events
firstConnection	First connection time of a session.	<ul style="list-style-type: none"> • Sessions
hostname	Hostname configured in the WiFi client.	<ul style="list-style-type: none"> • Clients • Sessions
lastStatusChangeTime	Date and time of the last change in Connection Status of the access point.	<ul style="list-style-type: none"> • AP Inventory
manufacturer	Manufacturer information for the WiFi client.	<ul style="list-style-type: none"> • Clients • Sessions
memoryUtilization	Percentage of memory being used by the controller.	<ul style="list-style-type: none"> • Controller Inventory
osType	OS information for the WiFi client.	<ul style="list-style-type: none"> • Clients • Sessions
port	Port of the application accessed by the WiFi client.	<ul style="list-style-type: none"> • Applications

TABLE 8 Dimensions (continued)

Dimension name	Description	Supported Data Sources
radio	Indicates the radio frequency band: 2.4GHz or 5GHz.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions
radioMode	Possible values are: ac, n, a, g, b, or "unknown" (if SmartZone version is prior to 3.6).	<ul style="list-style-type: none"> • Clients • Sessions
reason	Additional description for access point and controller alarms or events, if available.	<ul style="list-style-type: none"> • AP Events • AP Alarms
roamingSessionId	A unique session ID that is created when a client roams to multiple APs within a short-enough time span that the client is connected to these APs simultaneously.	<ul style="list-style-type: none"> • Clients • Sessions
sessionId	ID string assigned to a session.	<ul style="list-style-type: none"> • Clients • Sessions
sessionType	Indicates whether the session is authorized or unauthorized.	<ul style="list-style-type: none"> • Clients • Sessions
severity	Severity level for access point and controller alarms or events.	<ul style="list-style-type: none"> • AP Events • AP Alarms
ssid	Service set identifier (SSID) configured in the controller.	<ul style="list-style-type: none"> • Applications • Network traffic • Clients • Sessions
system	System ID of the controller or the SmartZone Cluster.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms • Controller Inventory
timestamp	Timestamps are represented in UTC timezone format.	<ul style="list-style-type: none"> • Airtime Utilization • Network traffic • Applications • AP Events • AP Alarms • AP Inventory • Clients • Controller Inventory • Sessions
username	Username of the user account associated with the WiFi client.	<ul style="list-style-type: none"> • Clients • Sessions

TABLE 8 Dimensions (continued)

Dimension name	Description	Supported Data Sources
zoneName	Zones configured in the controller.	<ul style="list-style-type: none"> • Applications • Network traffic • Airtime Utilization • Clients • Sessions • AP Events • AP Inventory • AP Alarms

The following table lists and describes all the measures that can be displayed in the raw-data output you generate.

TABLE 9 Measures

Measure name	Description	Supported Data Sources
airtimeBusy	Average of the airtime busy metric in percentage form.	<ul style="list-style-type: none"> • Airtime Utilization
airtimeIdle	Average of the airtime idle metric in percentage form.	<ul style="list-style-type: none"> • Airtime Utilization
airtimeRx	Average of the airtime receive metric in percentage form.	<ul style="list-style-type: none"> • Airtime Utilization
airtimeTx	Average of the airtime transmit metric in percentage form.	<ul style="list-style-type: none"> • Airtime Utilization
airtimeUtilization	Average of the total airtime utilization in percentage form.	<ul style="list-style-type: none"> • Airtime Utilization
Avg 2.4 GHz Capacity	Average 2.4 GHz capacity over a specified period of time, measured in Mbps.	Network
Avg 5 GHz Capacity	Average 5 GHz capacity over a specified period of time, measured in Mbps.	Network
Avg Capacity Per Ap	Average capacity per access point over a specified period of time, measured in Mbps.	Network
count	A count for each event and alarm type.	<ul style="list-style-type: none"> • AP Events • AP Alarms
cpuUtilization	Average CPU utilization for the controller in percentage form.	<ul style="list-style-type: none"> • Controller Inventory
disconnectDuration	Indicated how many milliseconds an AP has been disconnected.	<ul style="list-style-type: none"> • AP Inventory
diskFree	Average free disk space, in bytes, for the controller.	<ul style="list-style-type: none"> • Controller Inventory
diskUtilization	Average disk utilization, in percentage, for the controller.	<ul style="list-style-type: none"> • Controller Inventory
failedAssoc	Number of failed associations.	Network
diskTotal	Total amount of disk space, in bytes, on the controller.	<ul style="list-style-type: none"> • Controller Inventory
firstRss	First received signal strength of the access point in dBm.	<ul style="list-style-type: none"> • Clients
firstSnr	First signal to noise ratio at the access point in dB.	<ul style="list-style-type: none"> • Clients
lastRss	Last received signal strength of the access point in dBm.	<ul style="list-style-type: none"> • Clients

TABLE 9 Measures (continued)

Measure name	Description	Supported Data Sources
lastSnr	Last signal to noise ratio at the access point in dB.	<ul style="list-style-type: none"> • Clients
licenseCount	Total number of licenses available on the controller?	<ul style="list-style-type: none"> • Controller Inventory
licenseUtilization	Percentage of available licenses currently being used on the controller.	<ul style="list-style-type: none"> • Controller Inventory
maxRss	Maximum received signal strength of the access point in dBm.	<ul style="list-style-type: none"> • Clients
maxSnr	Maximum signal to noise ratio at the access point in dB.	<ul style="list-style-type: none"> • Clients
memoryUtilization	Average memory utilization for the controller, given in percentage form.	<ul style="list-style-type: none"> • Controller Inventory
mgmtRxBytes	Traffic volume, which is received from AP (Access Point) in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.	<ul style="list-style-type: none"> • Network traffic • Airtime Utilization
mgmtTraffic	Traffic volume, which is transmitted and received in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.	<ul style="list-style-type: none"> • Network traffic • Airtime Utilization
mgmtTxBytes	Traffic volume, which is transmitted by AP (Access Point) in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.	<ul style="list-style-type: none"> • Network traffic • Airtime Utilization
minRss	Minimum received signal strength of the access point in dBm.	<ul style="list-style-type: none"> • Clients
minSnr	Minimum signal to noise ratio at the access point in dB.	<ul style="list-style-type: none"> • Clients
noiseFloor	Average noise floor power in dBm.	<ul style="list-style-type: none"> • Clients
newAssoc	Number of successful associations.	Network
rxFail_r	Receive packets which failed to be processed due to insufficient buffer in AP.	Network
rxBytes	Sum of userRxBytes and mgmtRxBytes.	<ul style="list-style-type: none"> • Network traffic • Airtime Utilization • Applications • Clients • Sessions
Session Count	Number of unique sessions.	<ul style="list-style-type: none"> • Clients • Sessions
sessionDuration	The length of a session, given in milliseconds.	<ul style="list-style-type: none"> • Sessions
throughputEstimate	Average throughput estimate for the WiFi client.	<ul style="list-style-type: none"> • Clients
traffic	Sum of the user and management traffic.	<ul style="list-style-type: none"> • Network traffic • Airtime Utilization • Applications • Clients • Session
txBcastFrames_r	Number of broadcast packets transmitted by the network.	Network
txDropDataFrames_r	Tx data frames that are dropped by the message queue.	Network

TABLE 9 Measures (continued)

Measure name	Description	Supported Data Sources
txFail_r	Transmit packets which failed to be processed due to insufficient buffer in AP.	Network
txBytes	Sum of userTxBytes and mgmtTxBytes.	<ul style="list-style-type: none"> ● Network traffic ● Airtime Utilization ● Applications ● Clients ● Sessions
txMcastFrames_r	Number of multicast packets transmitted by the network.	Network
txUcastFrames_r	The number of data packets transmitted by the network that are not broadcast or multicast packets.	Network
userRxBytes	Traffic volume, which is received by AP (Access Point) in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic.	<ul style="list-style-type: none"> ● Applications ● Network traffic ● Airtime Utilization ● Clients ● Sessions
userTraffic	Traffic volume, which is transmitted and received in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic. User Traffic = Rx User + Tx User	<ul style="list-style-type: none"> ● Applications ● Network traffic ● Airtime Utilization ● Clients ● Sessions
userTxBytes	Traffic volume, which is transmitted by AP (Access Point) in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic.	<ul style="list-style-type: none"> ● Applications ● Network traffic ● Airtime Utilization ● Clients ● Sessions

PII Hashing

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Hashing Data-Source Attributes

You can use the SCI VM command line interface to hash various data-source attributes.

Follow these steps to hash the attributes you are interested in.

1. Log in to your SCI VM.
2. Navigate to the following directory:

```
/storage/rsa-api/hashing/configs
```

3. Locate the file called config.template.yml
4. Open the file using a text editor.

The file contains instructions on what to do. You will need to either comment out certain lines or un-comment certain lines in the file, as directed, and specify the desired data-source attributes that you want hashed.

5. Once you have made the changes in the config.template.yml file, be sure to save it under a different name that is meaningful to you, while leaving the original config.template.yml file in tact for future use.
6. Run the following command to perform hashing on the desired attributes:

```
sudo docker exec -it rsa-api yarn configure-hashing <config-file-name>
```

where <config-file-name> is the name of your customized .yml file.

Template File for PII Hashing

Use the example config.template.yml file to copy and edit according to the desired attributes to hash.

```
# This is an example configuration file for PII data hashing in YAML format.
# Lines starting with '#' are comments. Refer to http://www.yaml.org for detailed specification.
# Please change values accordingly. It expects content in the following format:
#
# <datasource>: [<attribute>]
#
# where <datasource> refers to the data source name and <attribute> refers to the field to be hashed.
# Multiple attributes are separated by comma. Note that only data sources with `clientMac` dimension
# are hashable.
#
# !!! WARNING !!!
#
# Values of attributes given in this configuration file will be hashed to meaningless strings and
# they are NOT reversible. Resetting hash for those attributes only affect future values.
#
# Version: 1.0
# Date:    18 Jan 2018
#
# Example:
example: ['attr1', 'attr2', 'attr3']

# Hash `clientMac`, `hostname`, `username` and `clientIp` for data source `binnedSessions`
```

PII Hashing

Template File for PII Hashing

```
# Uncomment to apply changes. You may add or remove one or more attributes.
#binnedSessions: ['clientMac', 'hostname', 'username', 'clientIp']

# Hash `clientMac` for data source `binnedAvc`
# Uncomment to apply changes. You may add or remove one or more attributes.
#binnedAvc: ['clientMac']

# Hash `clientMac`, `hostname`, `username` and `clientIp` for data source `sessionsSummary`
# Uncomment to apply changes. You may add or remove one or more attributes.
#sessionsSummary: ['clientMac', 'hostname', 'username', 'clientIp']
```

Admin Dashboard

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Admin Console

The Admin pages provide options for configuring SCI's administrative settings, performing diagnostics and system updates, and defining user roles and creating resource groups.

The Admin section is divided into the following pages:

- Status and Updates
- Diagnostics
- Settings
- License
- PCI
- Users & Roles

NOTE

For information on SCI installation, refer to the SCI Installation Guide, available from support.ruckuswireless.com

Status and Update

The Status & Update page lists the active SCI nodes, alerts you to any important notifications, and displays the current firmware version.

Nodes

The following illustration shows an example of the Status and Update screen when the **Node** tab is selected.

FIGURE 210 Status and Update Screen with Node Tab selected

ID	Node IP	Node Token	Node Type	Node State
data-3b62d48d	10.0.0.168	6805196779	data	●
data-96a3c9fc	10.0.0.240	4499070968	data	●
master-e7d3ce7a	10.0.2.162	3843798771	master	●

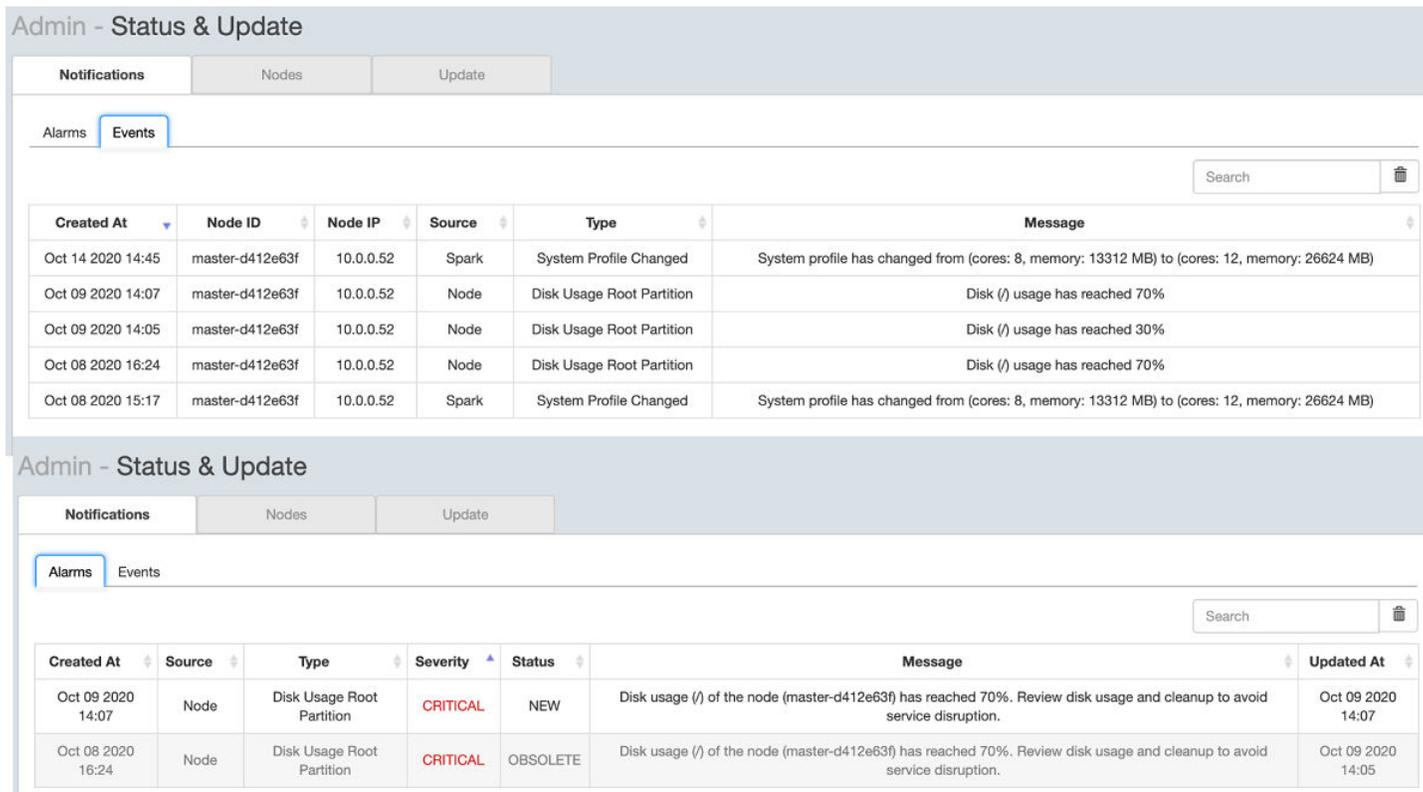
The Nodes section lists the active SCI nodes, and includes the following information on each node:

- **Node ID:** The ID number of the node
- **Node IP:** The IP address of the node
- **Node Token:** The Token number or SSH password of the node. This token number is required for a node to connect to another node. The number is available on the UI so that it is a ready reference to the user who wants to connect to a specific node.
- **Node Type:** The type of node. There are two types of nodes, namely master and data nodes. One or more data nodes are required as the system scales and grows larger.
- **Node State:** The node state is green when in use and red when disconnected and not in use.

Notifications

The following illustration shows an example of the Status and Update screen when the **Notifications** tab is selected. The Notifications tab displays two tabs for **Alarms** and **Events**. The Events tab displays more information as to when the event was created, node and IP address, type and general description about the event. The Alarm tab displays information about the time the alarm was created, type, status and source of the alarm. The severity level of alarms is *critical* and *warning*.

FIGURE 211 Status and Update Screen with Notifications Tab selected



In addition, an email notification is sent out every 15 minutes to the email address provided in the **My Account screen > Profile** section of the SCI UI, which you open by clicking on the admin icon in the upper right of the SCI user interface, as shown in the following figure.

FIGURE 212 Email Address to Receive Notifications



To receive notifications, you must also be sure that you have configured the outgoing mail server (SMTP) in the Admin dashboard > Settings section.



If any notifications are present in this section of the SCI UI, a red notifications icon appears in the upper-right portion of the SCI user interface next to the admin icon. (This icon disappears once the issue has been handled.)

The following table lists examples of the two types of notifications that you could receive, along with possible solutions.

TABLE 10 Notifications and Possible Corrective Actions

Notification	Description	Action(s) to Try
Your master node (IP: 10.x.y.1) has reached 83 percent disk usage.	This notification appears whenever one of the SCI nodes has a disk usage of 80% or more. This notification indicates that you could potentially run out of disk space on SCI.	<ul style="list-style-type: none"> Reduce the data retention period by going to the Admin > Settings screen, "Data Retention" section. For more information, refer to the Settings on page 183 section, "Data Retention" portion. Copy your data to a new SCI with more disk space. If you need assistance, contact Ruckus support. Add new data nodes. Because the Hadoop Distributed File System (HDFS) replication factor is two, you need at least two data nodes in your SCI cluster.
Your Spark cluster (Spark master IP: 10.x.y.2) was unable to accept a job submission.	This notification appears when an ETL Spark job is taking a long time, and SCI is unable to submit the next job. This could mean that SCI is unable to ingest data from the controllers and that SCI is unable to continue to collect data.	Go to Admin > Diagnostics > Spark Master . Search for "Running Applications." If this section shows more than one job running, check again in a half hour. If there is still more than one job shown running in the "Running Application" section, contact Ruckus customer support to ensure that you are not losing data.

TABLE 11 Notifications as Events and Alarms

Notification or Event Name	Description	Action(s) to Try
Spark Job Submission Failure	This alarm is raised when RSA service fails to submit a job to the Spark cluster	None
System Profile change	This event is triggered when when SCI VM resources change	Revert to the standard VM resources
Receive-GPB Restarted	This alarm is raised when RecieveGPB restarts. There could be multiple reasons for this to occur	View the receiveGPB logs from the finishes/killed ReceiveGPB driver and investigate the reason for shutdown or failure
Rsa Service Stopped	This alarm is raised when Spark service shuts down	No action is required. This message conveys to the administrator that the spark configuration has been changed
Config Overridden	This event is triggered when external resource configuration is applied to Spark jobs	Check: <ul style="list-style-type: none"> System function If HDFS is running fine Resources are used per plan If there are no issues with the above, restart the druid cluster
Druid jobs waiting	This alarm is raised when Druid waiting jobs count exceeds certain limits	Check: <ul style="list-style-type: none"> System function If HDFS is running fine Resources are used per plan If there are no issues with the above, restart the druid cluster
Spark jobs deleted	This alarm is raised when Spark cluster has too many waiting jobs and some of them are deleted to allow processing of latest data	This could be because there is too much data coming in, or the system size is less. Check if resources are as per plan and if all Spark workers are up and running

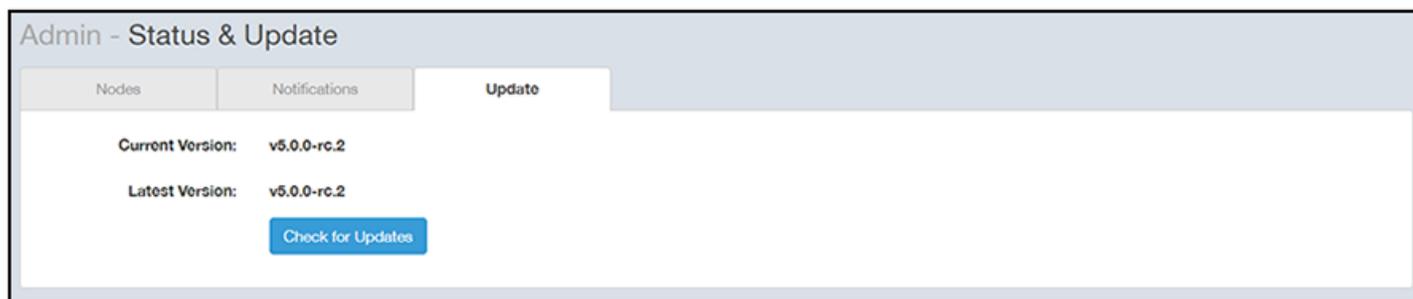
TABLE 11 Notifications as Events and Alarms (continued)

Notification or Event Name	Description	Action(s) to Try
druid jobs submission failure (Compactor/Indexer/Prune)	This alarm is raised when RSA service fails to submit a job to the druid cluster for a data source	This message provides information that data ingestion is not working right on the cluster. Verify druid cluster and HDFS functions. If there are no issues, contact customer support
Raw Data Dropped	This alarm is raised when Spark drops the data stamped with a future time stamp	Review the Events tab to get a list of SZ systems and ensure NTP synchronization is corrected on the SZ system to prevent future data drops
Disk storage monitoring (/storage)	This alarm is raised when one of the SCI nodes has a disk usage of 50% or more for /storage partition. This notification indicates that you could potentially run out of disk space on SCI	Review retention period, review the HDD space available, clean up the unnecessary log files to free up space. You can also add additional data nodes.
Disk storage monitoring (/)	This alarm is raised when one of the SCI nodes has a disk usage of 40% or more for root (/) partition. This notification indicates that you could potentially run out of disk space on SCI.	Disk utilization on the primary HDD is more so clean up the log files, and old docker images
ADD job completed	This event is triggered when ADD job completes successfully	None
ImPLY data service restarted	This alarm is raised when ImPLY-data service restarts on one of the nodes	This could be because the druid data node lost connectivity to the master node therefore, check network connectivity between the data node and the master node

Update

The following illustration shows an example of the Status and Update screen when the **Update** tab is selected.

FIGURE 213 Status and Update Screen with Update Tab selected



The Update section contains the details of the current version of SCI that you are running and the latest version of SCI that is available (if any).

Diagnostics

The Diagnostics admin page provides links to external tools that can be used to troubleshoot issues in database storage and data transformation.

The following links to diagnostic tools are provided:

- **Data ingestion and ETL jobs:**The Spark Master UI provides details of workers, running applications, running drivers, completed applications and completed drivers.

Admin Dashboard

Diagnostics

For more details, see <http://spark.apache.org/docs/latest/spark-standalone.html>

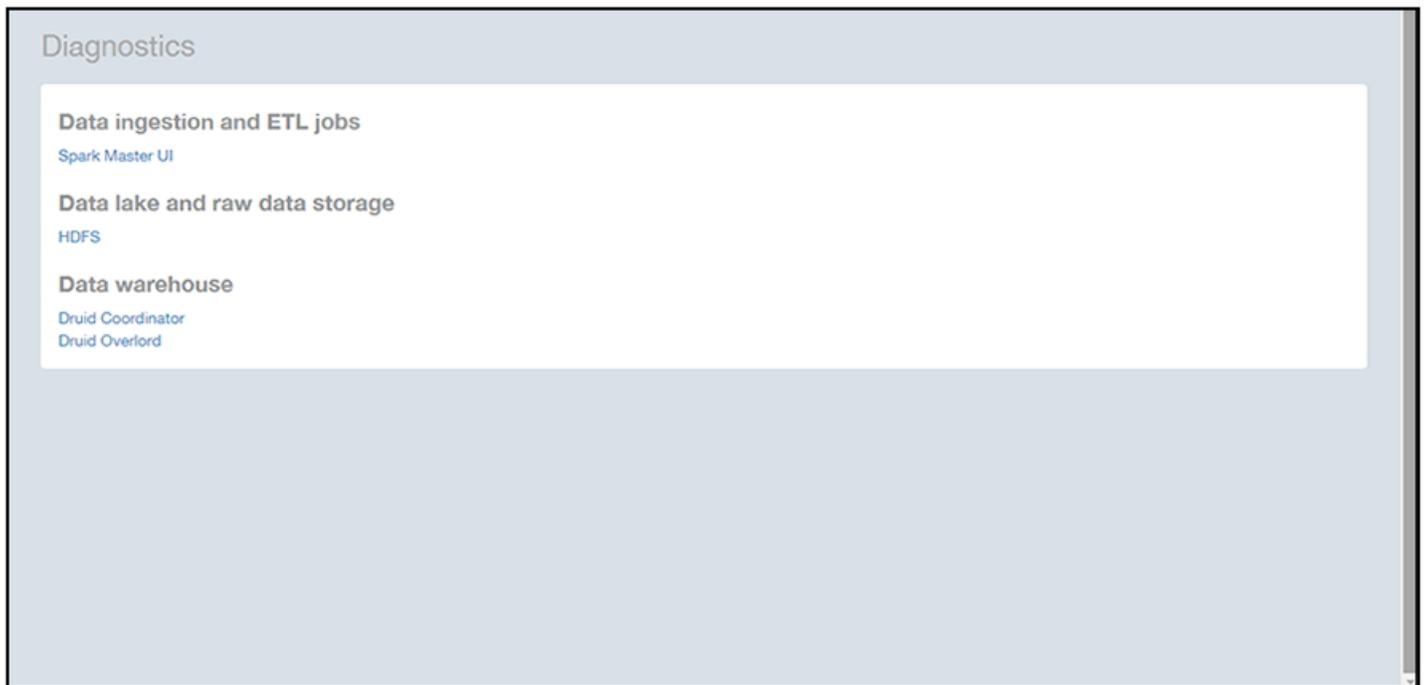
- **Data lake and raw data storage:**The HDFS or Hadoop system provides details of datanodes, datanode volume failures, snapshot summaries, startup progress, and utilities such as logs and browsing the file system.

For more details, see https://en.wikipedia.org/wiki/Apache_Hadoop

- **Data warehouse:**The Druid Coordinator or Console provides details of the data sources, cluster and indexing services.

For more details, see <http://druid.io/docs/latest/design/coordinator.html>

FIGURE 214 Diagnostics



Settings

The Settings area of the Admin Console is the location to store and update settings required for various features of SCI.

Controller Settings

FIGURE 215 Controller Settings

Settings					
Systems					
	System ID	Type	URL	User	Last Seen
<input type="checkbox"/>	SystemID1	SmartZone (SCG/SZ/vSZ < 3.5)	https://192.168.255.177:8443	admin	2 minutes ago
<input type="checkbox"/>	SystemID2	SmartZone (SCG/SZ/vSZ >= 3.5)	https://192.255.175.171:8443	admin	
<input type="checkbox"/>	SystemID3	SmartZone (SCG/SZ/vSZ >= 3.5)	https://192.16.27.19:8443	admin	3 months ago
<input type="checkbox"/>	SystemID4	SmartZone (SCG/SZ/vSZ < 3.5)	https://192.191.195.17:8443	sci_mon	2 minutes ago
<input type="checkbox"/>	SystemID5	SmartZone (SCG/SZ/vSZ < 3.5)	https://192.169.100.100:8443	ruckus.sci	2 minutes ago
<input type="checkbox"/>	SystemID6	SmartZone (SCG/SZ/vSZ < 3.5)	https://192.255.175.255:8443	rsa-agent	2 minutes ago
<input type="checkbox"/>	SystemID7	SmartZone (SCG/SZ/vSZ < 3.5)	https://192.171.176.255:8443	admin	2 minutes ago
<input type="checkbox"/>	SystemID8	ZoneDirector (Poll, all ZD versions)	https://192.171.176.255:8443	admin	3 minutes ago
<input type="checkbox"/>	SystemID9	ZoneDirector (Poll, all ZD versions)	https://192.171.176.255:8443	admin	3 minutes ago
<input type="checkbox"/>	SystemID10	SmartZone (SCG/SZ/vSZ >= 3.5)	https://192.171.176.255:8443	admin	4 minutes ago
<input type="checkbox"/>	SystemID11	SmartZone (SCG/SZ/vSZ < 3.5)	https://192.167.172.17:8443	admin	20 days ago
<input type="checkbox"/>	SystemID12	SmartZone (SCG/SZ/vSZ < 3.5)	https://192.255.175:8443	admin	5 months ago

To add a controller, click the **Add** button in the upper right of the Settings screen; a drop-down menu appears for you to select the controller type, as shown in the figure below.

FIGURE 216 Adding a New Controller Popup

The image shows a 'New System' popup window. It has a title bar with the text 'New System' and a close button (X). The form contains the following fields and options:

- System ID:** A text input field.
- Type:** A dropdown menu with the selected option 'SmartZone (SCG/SZ/vSZ < 3.5)'. The dropdown is open, showing the following options:
 - ZoneDirector (Poll, all ZD versions)
 - ZoneDirector (Push, ZD >= 9.13)
 - SmartZone (SCG/SZ/vSZ < 3.5)
 - SmartZone (SCG/SZ/vSZ >= 3.5)
- URL:** A text input field.
- Backup URL:** A text input field.
- Username:** A text input field.
- Password:** A text input field.

At the bottom right of the form, there are two buttons: 'Create' (a blue button) and 'Cancel' (a white button with a grey border).

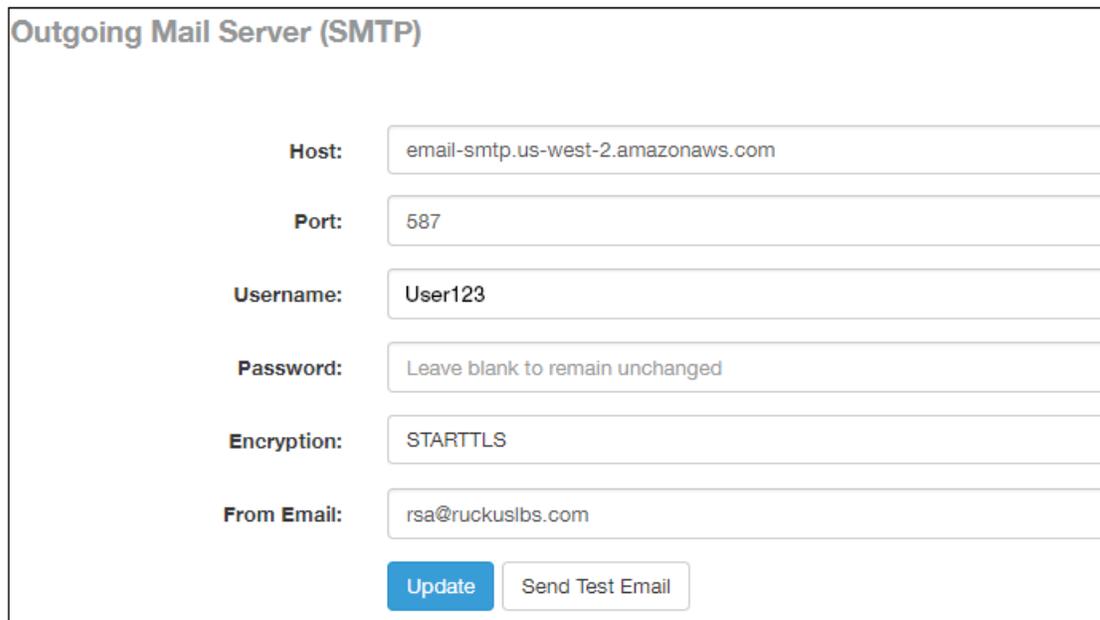
NOTE

For instructions on adding the different types of controllers as well as instructions on deleting or editing controllers, refer to the *SmartCell Insight Installation Guide*, "Configuring SCI" chapter, "Adding and Managing Controllers" section.

SMTP Settings

SCI requires certain settings to enable different areas of the functionality. These settings are listed in this section.

FIGURE 217 SMTP Settings



The screenshot shows a configuration form titled "Outgoing Mail Server (SMTP)". It contains several input fields and two buttons. The fields are: Host (email-smtp.us-west-2.amazonaws.com), Port (587), Username (User123), Password (Leave blank to remain unchanged), Encryption (STARTTLS), and From Email (rsa@ruckuslbs.com). The buttons are "Update" and "Send Test Email".

You can configure the SMTP mail server to send or receive e-mail messages to or from SCI. The SMTP settings section contains the configuration details:

- **Host:** Enter the name of the host. The system now checks the SMTP connectivity and displays an error if the authentication is not successful.
- **Port:** Enter the port number.
- **Username:** Enter the user name required to access the SMTP mail server.
- **Password:** Enter the password required to access the SMTP mail server.
- **Encryption:** Select the encryption method from the drop down list. You can also disable the encryption by selecting **Disabled** from the drop down list.
- **From email:** Enter the email ID that the messages are sent from.

To save your changes, click **Update**.

You can test your settings by sending a test email. Follow these steps:

1. After you have configured SMTP and saved your changes, click **Send Test Email**. The following popup should appear:

FIGURE 218 Send Test Email Popup



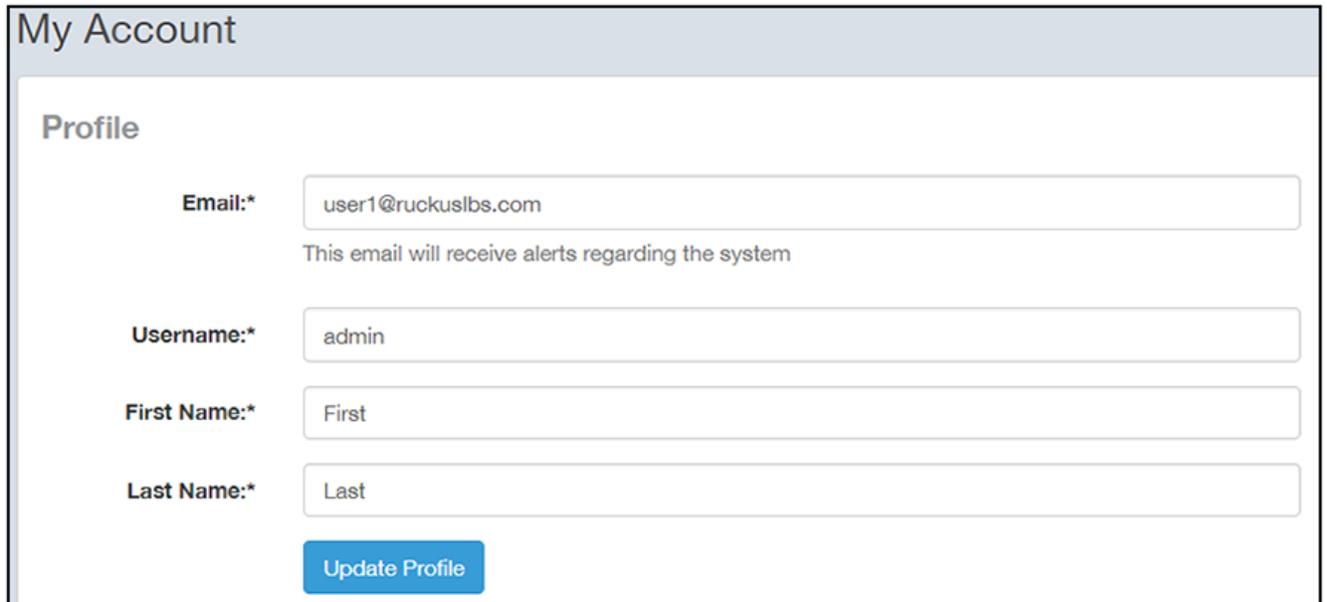
A screenshot of a 'Send Test Email' popup window. The window has a title bar with 'Send Test Email' and a close button (X). Below the title bar is a form with a label 'Email:' and a text input field containing 'ops@ruckuslbs.com'. At the bottom right of the form are two buttons: 'Send' (blue) and 'Cancel' (white).

2. Click **Send**.
3. Check that you receive an email to confirm that SMTP is working properly. The subject of the email that you receive should be: "Test email from your Ruckus SmartCell Insight." The body of the email should be: " Hi there, this is a test email."

NOTE

You should receive the email almost instantly. The email will be sent to the email address that is configured in the My Account screen > Profile section, which you open by clicking on the admin icon in the upper right of the SCI user interface, as shown in the following figure:

FIGURE 219 Email Address to Receive SMTP Test Email Reply from Ruckus



A screenshot of the 'My Account' profile section. The title 'My Account' is at the top. Below it is the 'Profile' section. It contains four form fields: 'Email:*' with the value 'user1@ruckuslbs.com' and a note 'This email will receive alerts regarding the system'; 'Username:*' with the value 'admin'; 'First Name:*' with the value 'First'; and 'Last Name:*' with the value 'Last'. At the bottom of the form is a blue 'Update Profile' button.

Data Retention

You can configure the time, in months, that you want SCI to retain all your raw and indexed data.

By default, this setting is 12 months, as shown in the screen below:

FIGURE 220 Data Retention section of Admin Dashboard



This means that SCI will delete any data older than 12 months. This action takes place on the 1st of each month.

If you want to change the data-retention time, follow example the steps below:

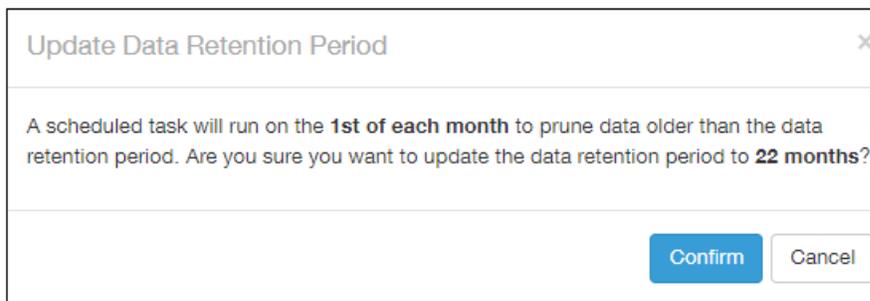
1. Slide the bar to the desired time in months (from 1 to 60) for which you want to retain data. For example, if you want to retain data for 22 months, slide the bar as follows:

FIGURE 221 Retaining Data for 22 Months



2. Click **Update**. A confirmation popup appears:

FIGURE 222 Data Retention Confirmation Popup window



3. Click **Confirm**. SCI will now flush data every 22 months, starting on the first of the upcoming month.

NOTE

Once data is deleted from SCI, the data cannot be recovered.

Instantly Pruning Old Data

If you need to purge data immediately instead of waiting until the first of the month, run the following script as root user:

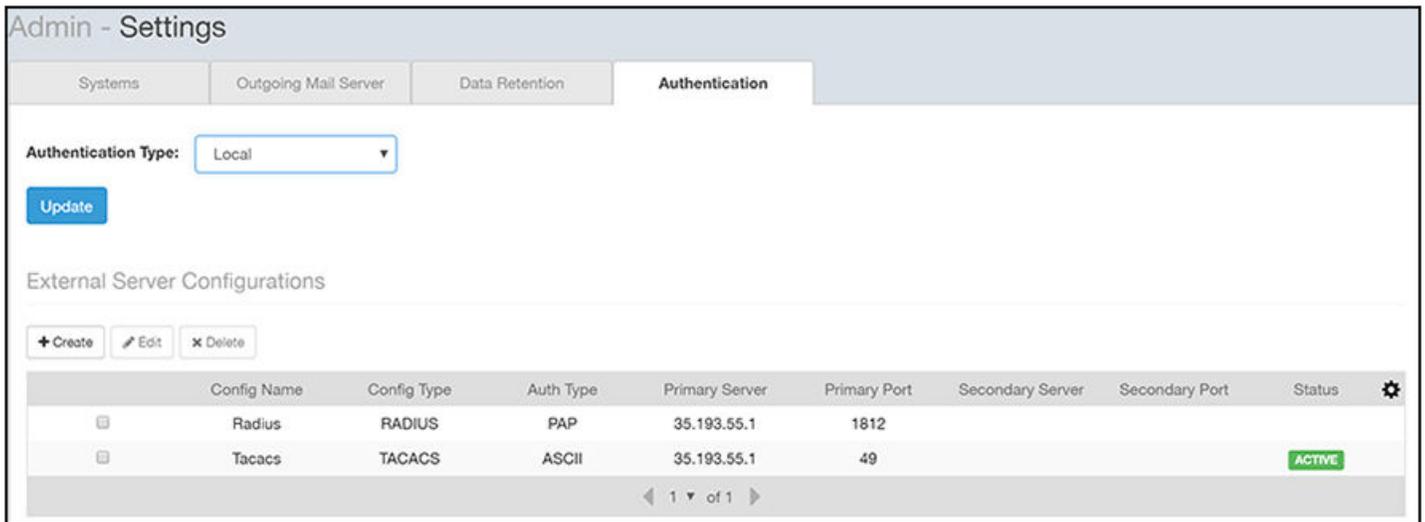
```
sudo /root/cronscripts/prune-data.sh
```

The length of time that the script runs depends of the amount of data to remove. Any data older than the data-retention period specified in **Admin > Settings** of the SCI user interface is immediately purged.

Authentication Tab on the SCI UI

The Authentication tab of the **Admin > Settings** screen lets you set whether you want local SCI users or external AAA server users to authenticate to SCI. You can also add new external servers from the Authentication tab. The following figure shows this tab if there are already some configured external servers (the IP addresses are just example values) :

FIGURE 223 Authentication Tab Main Page Example



By default, only users local to the SCI are authenticated.

Before you add external servers, there are certain steps you need to perform on the external server. Depending on whether the external server is RADIUS, TACACS+, or Cisco ACS, see the subsections below for how to add users, roles, and resource groups.

NOTE

If you add users and roles via external server configuration, this is indicated in the [Figure 254](#) on page 216.

Configuration to Perform on External AAA RADIUS Server:

1. Add the SCI server as a RADIUS client, specifying the AAA client name, IP address, shared secret, and other parameters.
2. If you are using the Ruckus dictionary file for vendor-specific attributes, install a new Ruckus dictionary file (or update the existing file) with the following attributes:
 - ATTRIBUTE, Ruckus-SCI-Role, 200, string
 - ATTRIBUTE, Ruckus-SCI-Resource-Group, 201, string
3. Configure an authentication policy with the following objectives:
 - Allow authentication from the SCI server.
 - Define the valid users and user groups.
 - Configure vendor-specific return attributes for the Ruckus-SCI-Role and Ruckus-SCI-Resource-Group, which maps the RADIUS user into SCI privilege sets.

NOTE

As with SCI, one user is associated with one resource group and one role only. There are three roles.

Sample Configuration Using FreeRADIUS for External AAA RADIUS Authentication:

1. Using SSH, log in to the FreeRADIUS server.
2. Enter CLI mode.
3. AAA admin should add two new attributes to dictionary.ruckus as shown below:

```
vi /usr/share/freeradius/dictionary.ruckus

ATTRIBUTE   Ruckus-SCI-Role           200   string
ATTRIBUTE   Ruckus-SCI-Resource-Group 201   string
```

4. Add all users, their roles and their resource groups:

```
vi /etc/freeradius/3.0/users

aaaadmin Cleartext-Password := "admin123"
        Reply-Message = "Hello Admin",
        Ruckus-SCI-Role = admin,
        Ruckus-SCI-Resource-Group = Default

aaagroupadmin Cleartext-Password := "admin123"
        Reply-Message = "Hello Group Admin",
        Ruckus-SCI-Role = groupadmin,
        Ruckus-SCI-Resource-Group = AAA_MLISA

aaaview Cleartext-Password := "admin123"
        Reply-Message = "Hello User",
        Ruckus-SCI-Role = view-only,
        Ruckus-SCI-Resource-Group = AAA_VIDEO54
```

5. Configure the SCI server IP that you wish to authenticate with the FreeRADIUS server:

```
vi /etc/freeradius/3.0/clients.conf

client all {
        ipaddr = 0.0.0.0/0
        secret = testing123
}
```

6. After adding the above configuration, restart FreeRADIUS by running the following command:

```
service freeradius restart
```

Configuration to Perform on External AAA TACACS+ Server:

1. Identify the TACACS administrators who need SCI administration privileges, and then create an admin group (or reuse an existing group).
2. Assign the SCI administrators to the SCI admin group on the TACACS server.
3. Within the TACACS SCI admin group, configure the SCI service (service = sci-resource-group) and map the Ruckus RBAC attributes (e.g. Ruckus-SCI-Role = admin; Ruckus-SCI-Resource-Group = Default).

Sample Configuration For External AAA TACACS+ Authentication:

1. Using SSH, log in to the TACACS+ server.
2. Enter CLI mode.
3. Open vi and type:

```
/etc/tacacs+/tac_plus.conf
```

4. Create a group:

```
group = admins {  
}
```

5. Add a service, role, and mgmt-devicegroups to the group you created above, as follows:

```
service = sci-resource-group {  
    Ruckus-SCI-Role = admin  
    Ruckus-SCI-Resource-Group = Default  
}
```

6. If needed, create additional groups and add a service, role, and mgmt-devicegroups to the group, as you did previously.

7. Create a user, associate the user with the correct group, and create a user password, as shown below:

```
user = aaaadmin {  
    member = admins  
    global = cleartext admin123  
}
```

8. The final configuration should now appear as follows:

```
vi /etc/tacacs+/tac_plus.conf  
  
group = admins {  
    service = sci-resource-group {  
        Ruckus-SCI-Role = admin  
        Ruckus-SCI-Resource-Group = Default  
    }  
}  
  
user = aaaadmin {  
    member = admins  
    global = cleartext admin123  
}  
  
group = groupadmins {  
    service = sci-resource-group {  
        Ruckus-SCI-Role = groupadmin  
        Ruckus-SCI-Resource-Group = AAA_MLISA  
    }  
}  
  
user = aaagroupadmin {  
    member = groupadmins  
    global = cleartext admin123  
}  
  
group = view-only {  
    service = sci-resource-group {  
        Ruckus-SCI-Role = view-only  
        Ruckus-SCI-Resource-Group = AAA_VIDEO54  
    }  
}  
  
user = aaaview {  
    member = view-only  
    global = cleartext admin123  
}
```

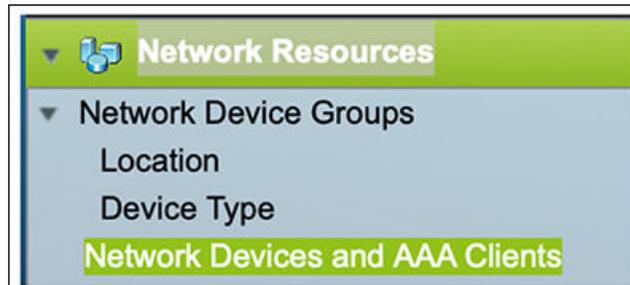
9. Restart the TACACS+ server by running the command:

```
service tacacs+ restart
```

Configuration to Perform on Cisco ACS Server:

1. To configure ACS to accept connections from SCI, click **Network Devices and AAA Clients** on the Cisco ACS configuration screen shown below:

FIGURE 224 Invoking Network Devices and AAA Clients Configuration



2. In the Network Devices and Clients screen (shown below):
 - a. Enter the name.
 - b. Enter the IP address of the SCI.
 - c. Select either RADIUS or TACACS+ from the drop-down list.
 - d. Click **Submit**.

FIGURE 225 Network Devices and Clients Configuration Screen

Network Resources > Network Devices and AAA Clients > Edit: "CISCO ACS Firewall"

Name: CISCO ACS Firewall
Description:

Network Device Groups
Location: All Locations Select
Device Type: All Device Types Select

IP Address
 Single IP Address IP Subnets IP Range(s)
IP: 10.137.11.45

Authentication Options

TACACS+
Shared Secret: testing123
Hide
 Single Connect Device
 Legacy TACACS+ Single Connect Support
 TACACS+ Draft
Compliant Single Connect Support

RADIUS
Shared Secret: testing123
Hide
CoA port: 1700
 Enable KeyWrap
Key Encryption Key:
Message Authenticator Code Key:
Key Input Format ASCII HEXADECIMAL

Submit Cancel

3. To create AAA users, click **Users** in the left pane of the Create Users screen (shown below), and do the following:
 - a. Enter the Name.
 - b. Enter the password.
 - c. Confirm the password.
 - d. Click **Submit**.
 - e. Repeat the preceding steps to add more users.

FIGURE 226 Creating Users Configuration Screen

Users and Identity Stores > Internal Identity Stores > Users > Create

General

Name: Status: Enabled

Description:

Identity Group: All Groups

Email Address:

Account Disable

Disable Account if Date Exceeds: 2019-Apr-02

Disable account after 3 successive failed attempts

Password Hash

Enable Password Hash

Applicable only for Internal Users to store password as hash. Authentication types CHAP/MSCHAP will not work if this option is enabled. While disabling the hash, ensure that password is reconfigured using change password option.

Password Lifetime

Password Never Expired/Disabled: Overwrites user account blocking in case password expired/disabled

Password Information

Password must:

- Contain 4 - 32 characters

Password Type: Internal Users

Password:

Confirm Password:

Change password on next login

Enable Password Information

Password must:

- Contain 4 - 128 characters

Enable Password:

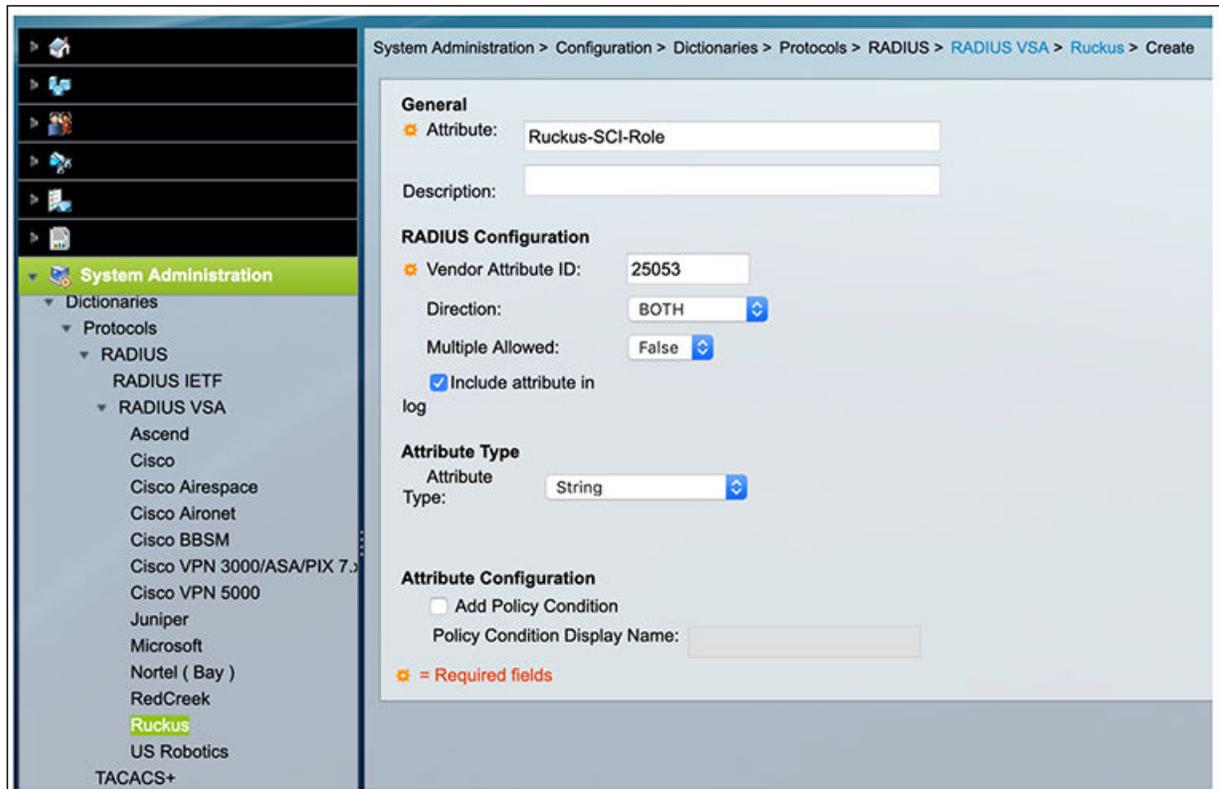
Confirm Password:

User Information

There are no additional identity attributes defined for user

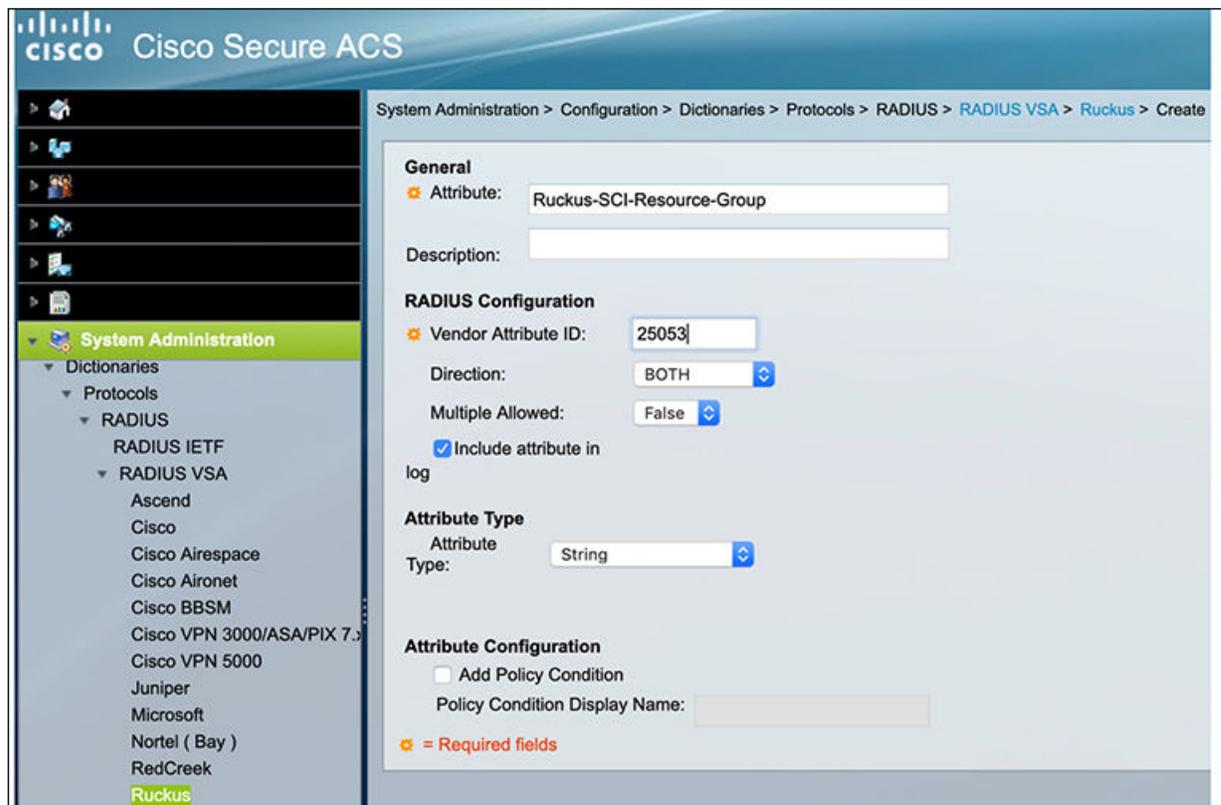
4. Install a new Ruckus dictionary file or update an existing dictionary with the following attributes to create the Ruckus-SCI-Role (see figure below):
 - a. Attribute: Ruckus-SCI-Role
 - b. Vendor Attribute ID: 25053
 - c. Attribute Type: String
 - d. Click **OK**.

FIGURE 227 Creating the Ruckus-SCI-Role



5. Install a new Ruckus dictionary file or update an existing dictionary with the following attributes to create the Ruckus-SCI-Resource-Group (see figure below):
 - a. Attribute: Ruckus-SCI-Resource-Group
 - b. Vendor Attribute ID: 25053
 - c. Attribute Type: String
 - d. Click **OK**.

FIGURE 228 Creating the Ruckus-SCI-Resource-Group



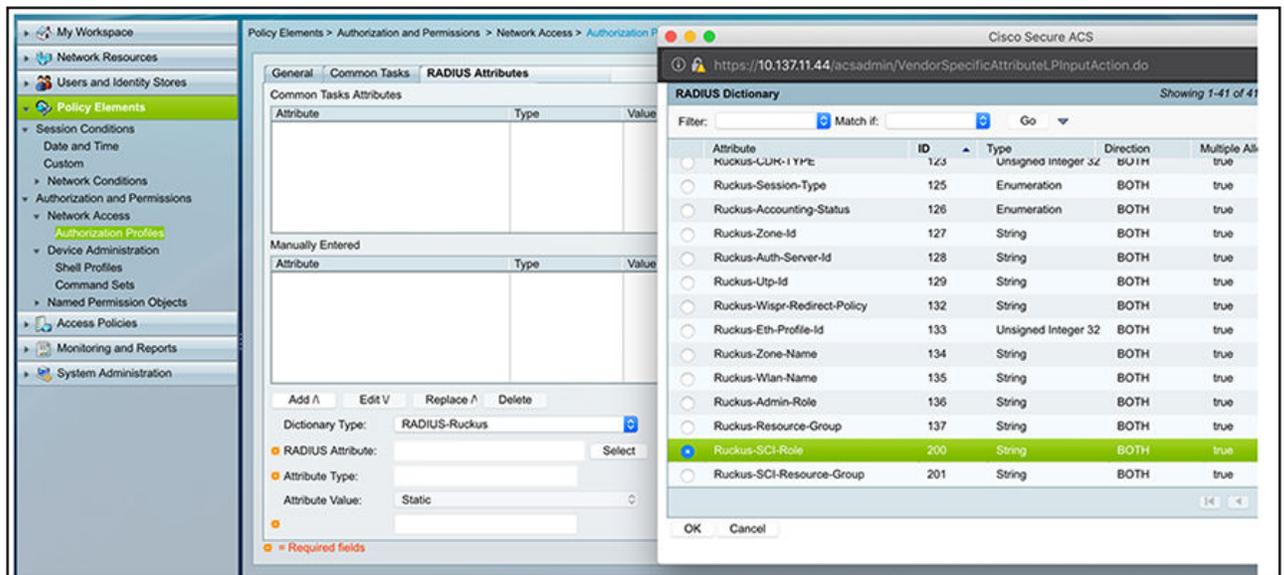
6. Go to the Create RADIUS Authorization Profiles screen (shown below).

FIGURE 229 Create RADIUS Authorization Profiles Screen



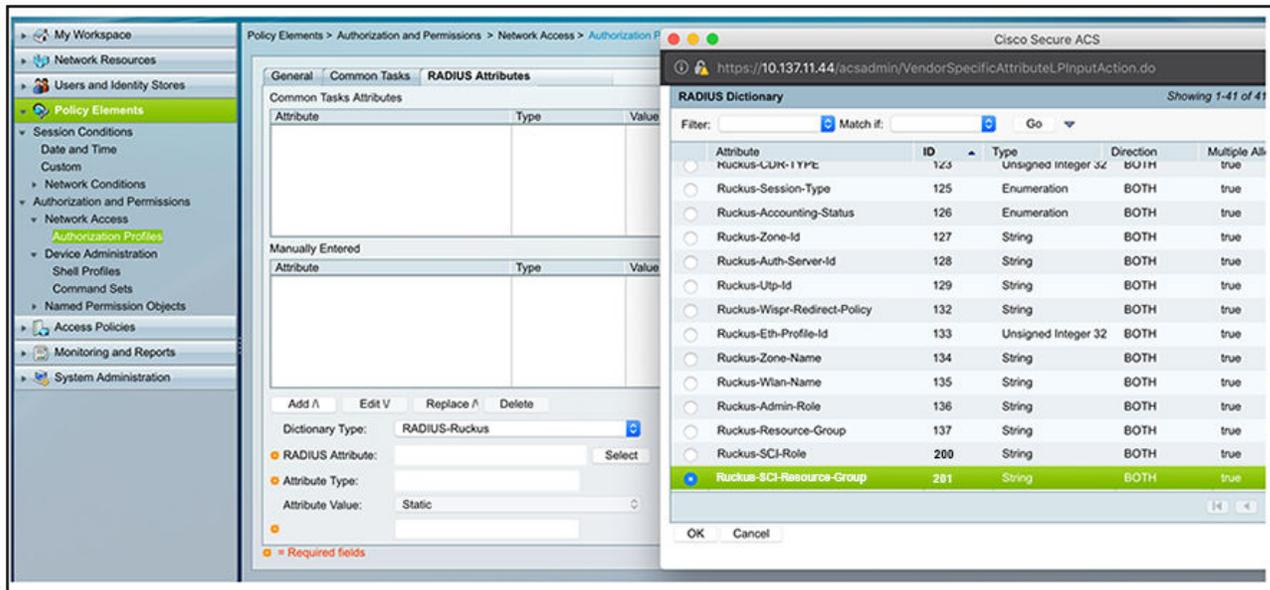
- Enter **RadiusAdmin** in the Name field.
- In the RADIUS Attributes tab, select RADIUS-RUCKUS from the Dictionary Type drop-down list, then, for the RADIUS Attribute, select Ruckus-SCI-Role (see screen below), and enter **admin** for the Attribute Value.

FIGURE 230 Selecting Ruckus-SCI-Role



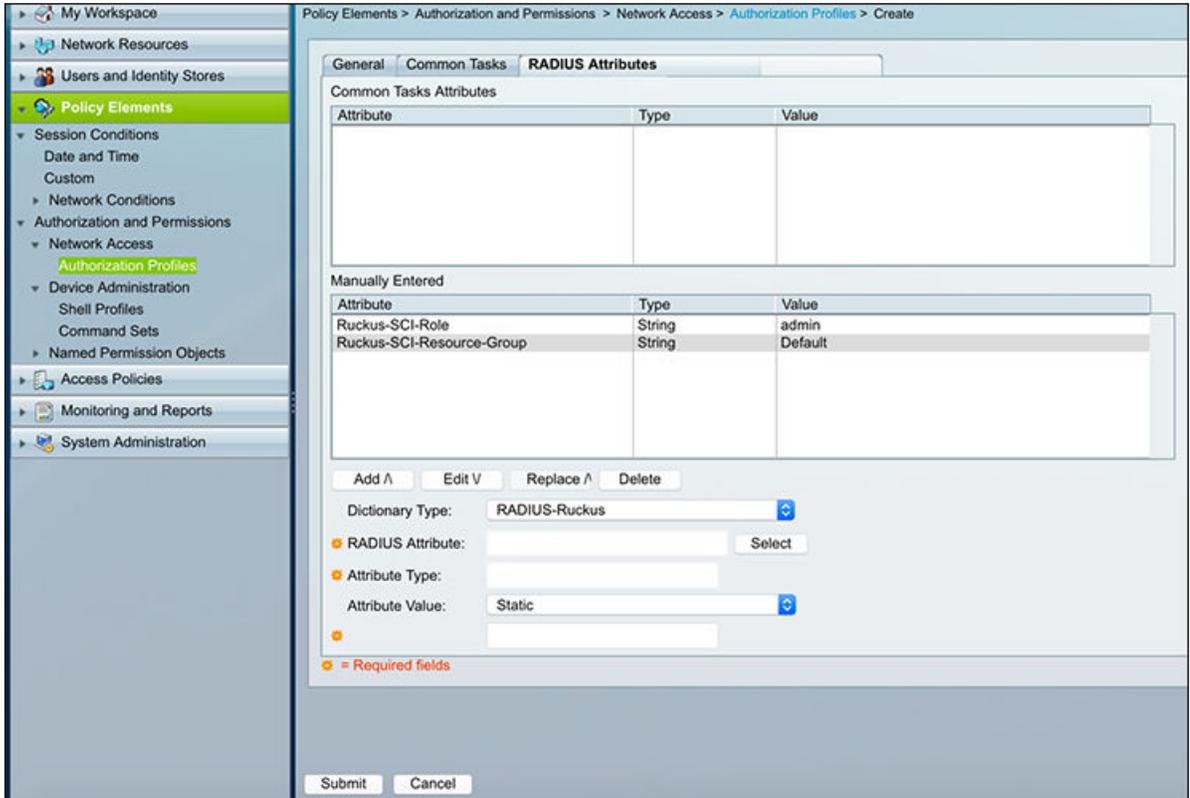
- c. Still in the RADIUS Attributes tab, for the RADIUS Attribute, select Ruckus-SCI-Resource-Group (see screen below), and enter **Default** for the Attribute Value.

FIGURE 231 Selecting Ruckus-SCI-Resource-Group



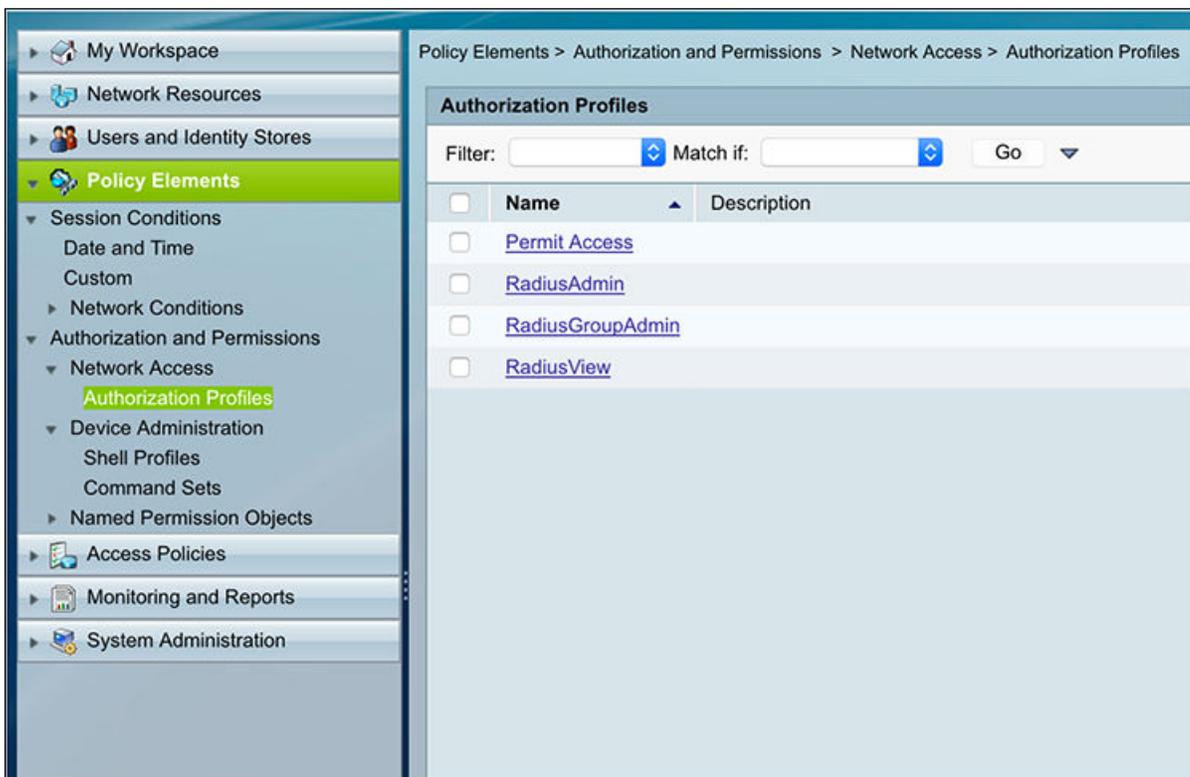
- d. Check that the Create RADIUS Authorization Profiles screen now shows the added attributes:

FIGURE 232 Added Attributes Now Appearing on Authorization Profiles Screen



- e. Click **Submit**.
- f. Repeat the steps you followed when you created the RadiusAdmin authorization profile to create profiles for RadiusGroupAdmin and RadiusView, listed on the screen below:

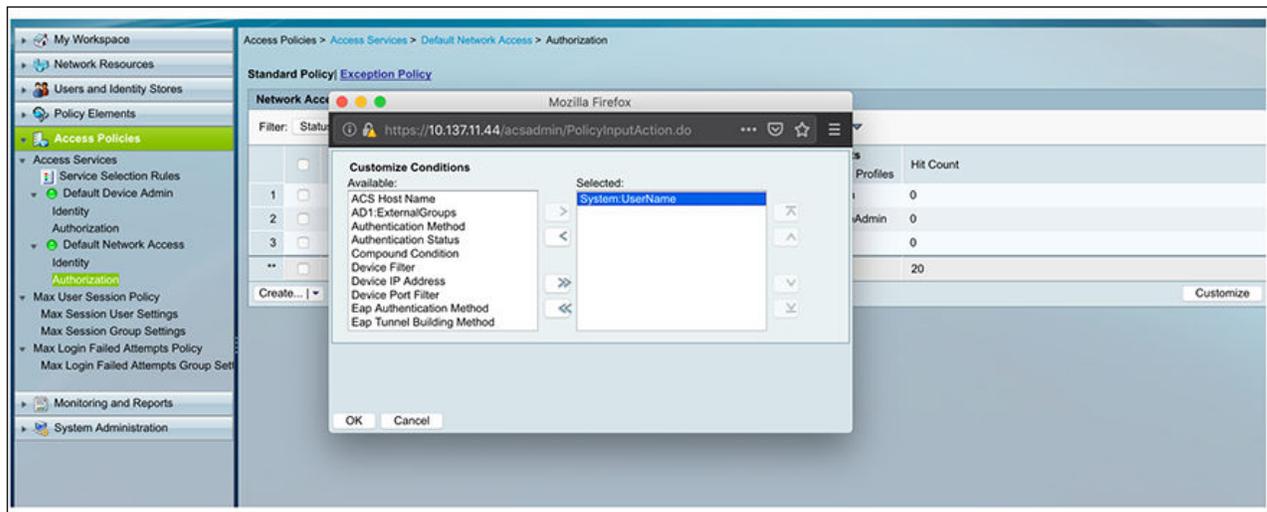
FIGURE 233 RadiusGroupAdmin and RadiusView Profiles Must Also Be Created



7. Create access policies for RADIUS:

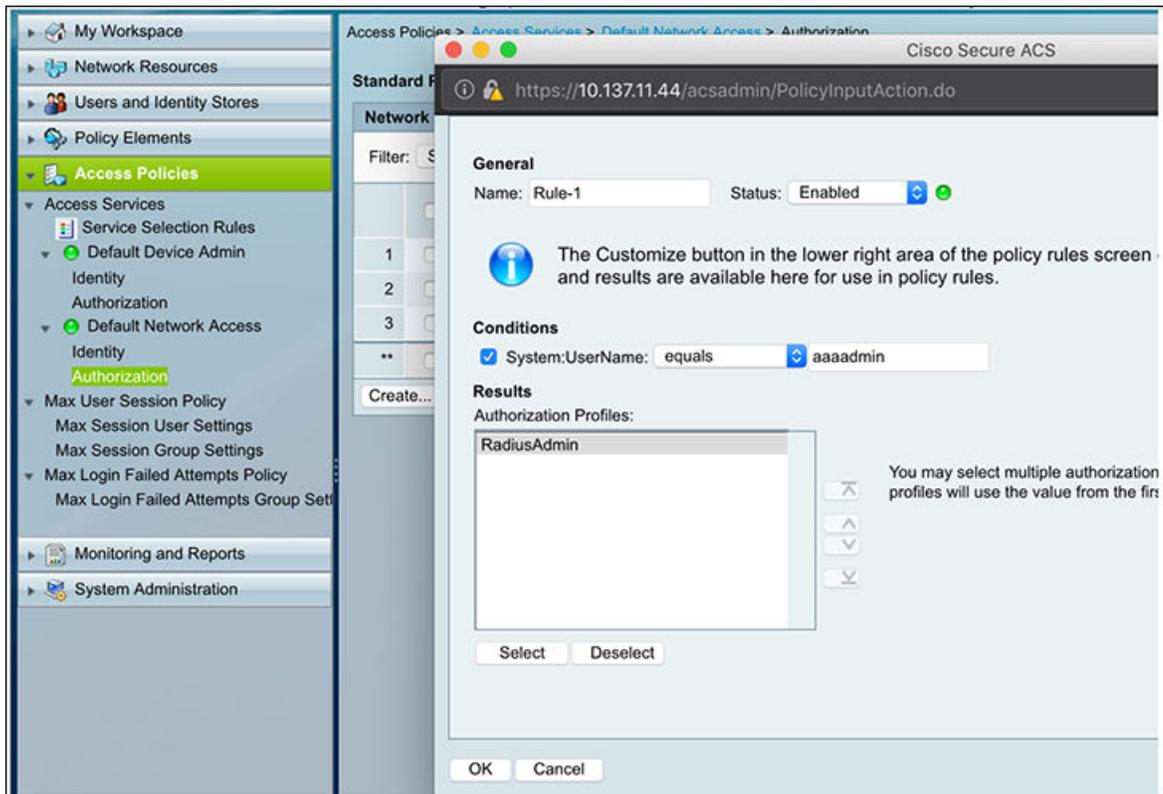
- a. Go to **Authorization**, click the Customize button on the far right, then select **System:Username**, and click **OK**:

FIGURE 234 Selecting System:Username Customization



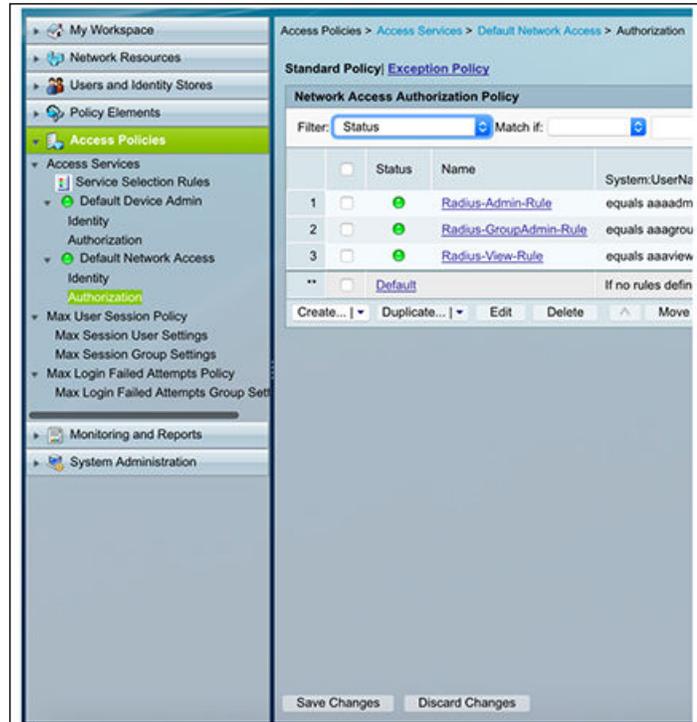
- b. Click the **Create** button (just to the left of the popup shown below), then configure the popup with the values shown ("Name" can be anything you want), then click **OK**:

FIGURE 235 Configuring a Rule



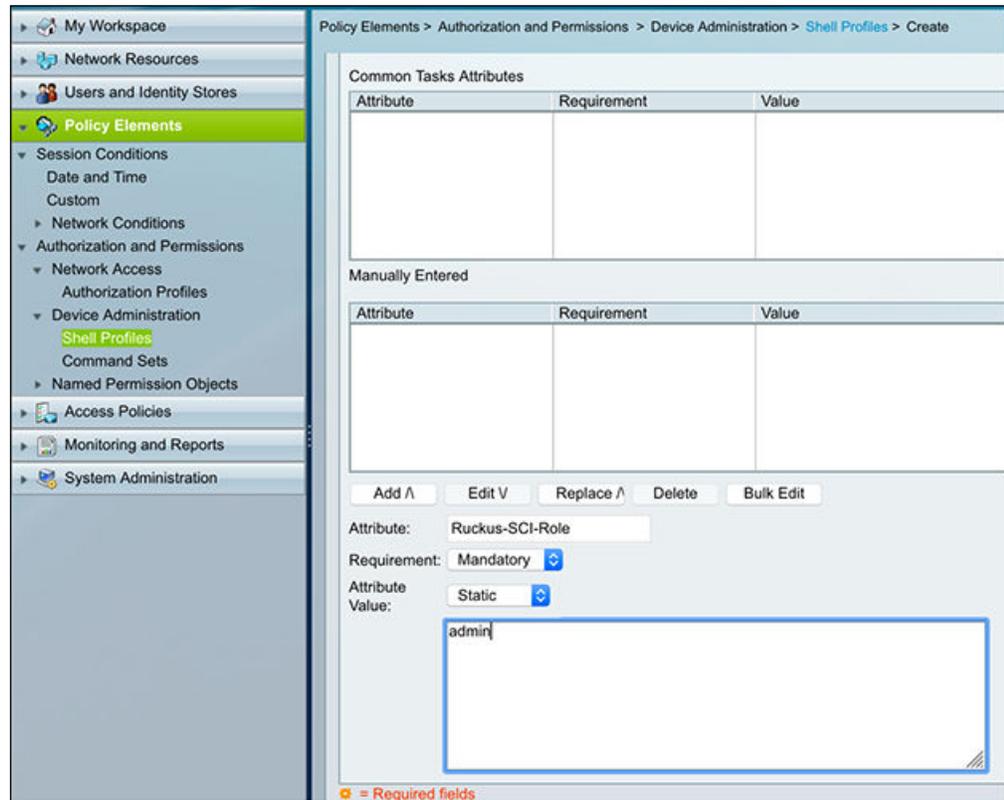
- c. Repeat the steps that you followed for creating **aaaadmin** to create policies for **aaagroupadmin** and **aaaview**, which are listed on the screen below:

FIGURE 236 Authorization Policy Screen



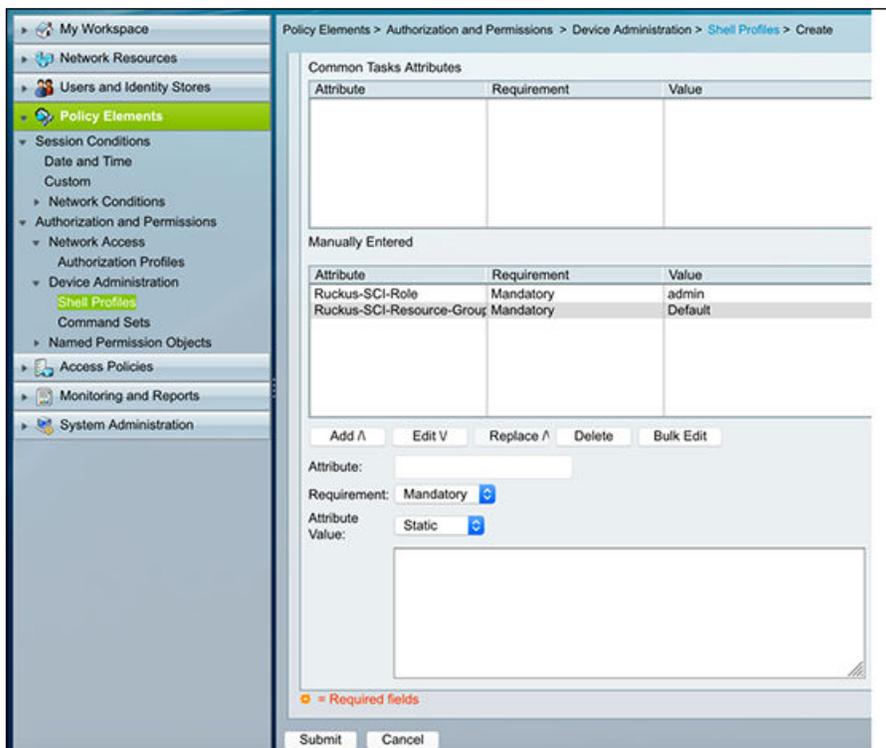
8. Create TACACS+ shell profiles:
 - a. Go to Shell Profiles (shown below):

FIGURE 237 Creating Shell Profiles



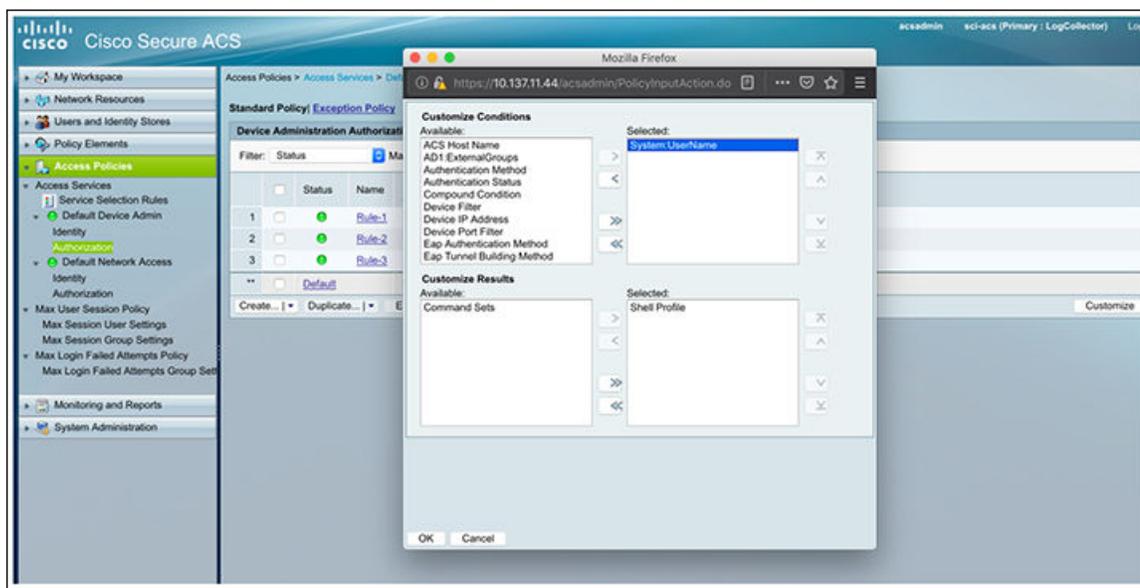
- b. In the Attribute field, enter **Ruckus-SCI-Role**.
- c. For the Attribute value, enter **admin**.
- d. Click **Add**.
- e. In the Attribute field, enter **Ruckus-SCI-Resource-Group**.
- f. For the Attribute value, enter **Default**.
- g. Click **Add**.
- h. Check that both shell profiles have been added to the Shell Profile Create screen, shown below, then click **Submit**.

FIGURE 238 Shell Profile Create Screen



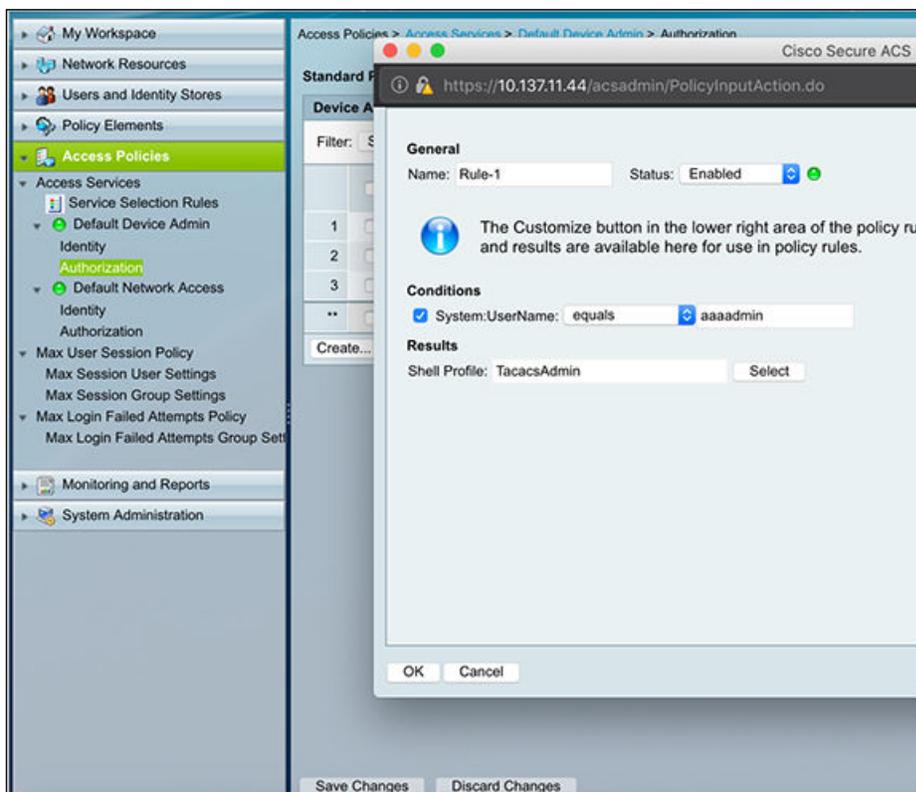
9. Configure access policies to enable TACACS+:
 - a. Go to **Default Device Admin > Authorization** (see the highlighted areas on the left pane of the screen below):

FIGURE 239 Configuring Access Policies



- b. Click the **Customize** button in the lower right of the screen to invoke the popup that is shown above, then select **System:Username**, then click **OK**.
10. Create an authorization rule:
 - a. Still in the Authorization area, click **Create** to invoke the popup shown below:

FIGURE 240 Creating an Authorization Rule



- b. Enter a descriptive name of your choice in the Name field, and configure the settings with the values shown above to create a rule for **aaaadmin**.
 - c. Click **OK**.
 - d. Create rules for **aaagroupadmin** and **aaaview** by repeating the steps you just performed for **aaaadmin**.
11. Enable the AAA server by performing the steps listed below the figure:

FIGURE 241 Enabling the AAA Server



- a. Click **Service Selection Rules** (highlighted above in the left pane).
- b. For Service, select either:
 - "Default Device Admin" to enable TACACS+
 - "Default Network Access" to enable RADIUS
- c. Click **Save Changes**.

Adding an External Server:

1. To add an external AAA server for user authentication, navigate to **Admin > Settings** in the SCI UI, and click the Authentication tab:

FIGURE 242 Authentication Tab



NOTE

Config Name (in the figure above) is not used by SCI, but is a descriptive name that the administrator of the external server configured to help identify the server.

2. Click **Create**.
3. Configure the external server information, an example of which is shown below:

FIGURE 243 Creating an External Server

The screenshot shows a 'Create External Server Configuration' dialog box with the following fields and values:

- Name:** us-server1
- Type:** TACACS
- Protocol:** ASCII
- Primary Server:**
 - Server:** 35.193.55.1
 - Port:** 49
 - Secret:** masked with dots
- Secondary Server:** (checked)
 - Server:** empty
 - Port:** 49
 - Secret:** empty
- Test Connection:**
 - Username:** Testuser1
 - Password:** masked with dots

At the bottom, there are radio buttons for 'Primary' and 'Secondary', a 'Test' button, and 'Update' and 'Cancel' buttons.

- **Name:** The name of the external AAA server that you can choose to activate.
- **Type:** RADIUS or TACACS+. Select the proper value for the external server.
- **Protocol:** For a RADIUS server, this value can be either PAP or CHAP. For a TACACS+ server, the only choice for protocol is ASCII. Make sure the value matches that of the external server.

NOTE

The protocol must be the same for the secondary server as for the primary server.

- **Server:** The IP address of the external server.
- **Port:** Must match the port being used for authentication on the external server. Default is 1812 for RADIUS and 49 for TACACS+.
- **Secret:** The secret key that has been configured on the server to allow communication between the server and SCI; *must match exactly* the secret that has been configured on the external server.

Test AAA Server Connection:

To test the AAA configuration, perform the following steps:

- Enter the username and password (used only for test-connection purpose) that are configured on the AAA server (RADIUS or TACACS+).
- Select "Primary" for validating the connection with primary-server details, then click **Test**.
- If secondary server details are provided, then select "Secondary" for validating the connection with secondary-server details, then click **Test**.

NOTE

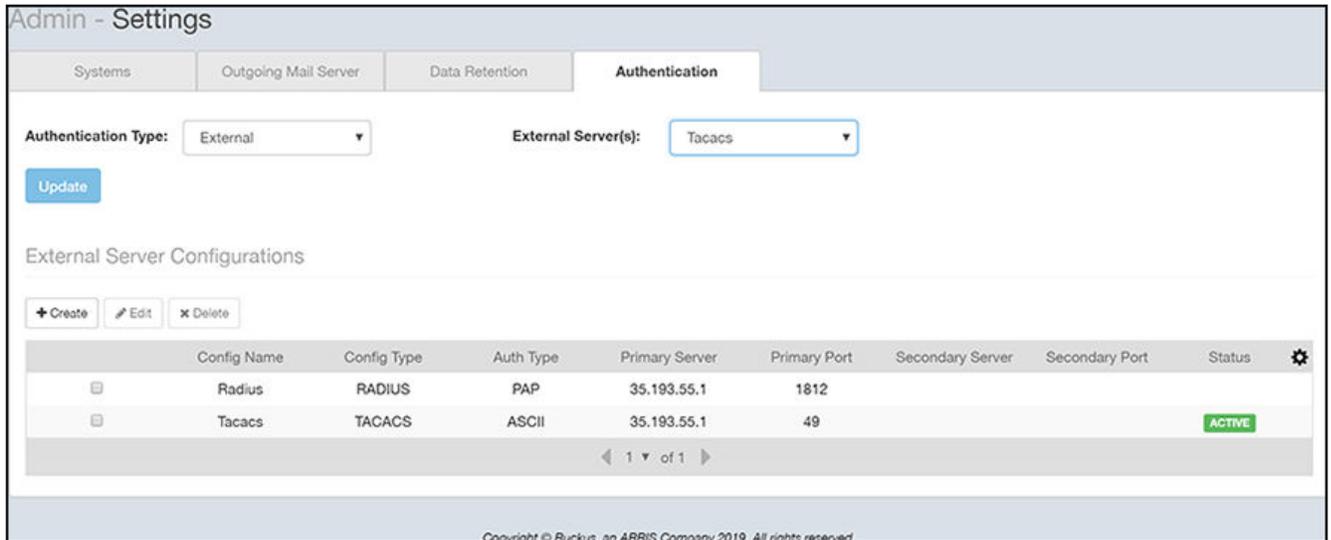
The secondary server is an optional standby server, which is tried only when the primary server is not reachable after 3 retries.

Selecting an External Server for User Authentication:

To select one specific external AAA server for SCI user authentication, follow these steps:

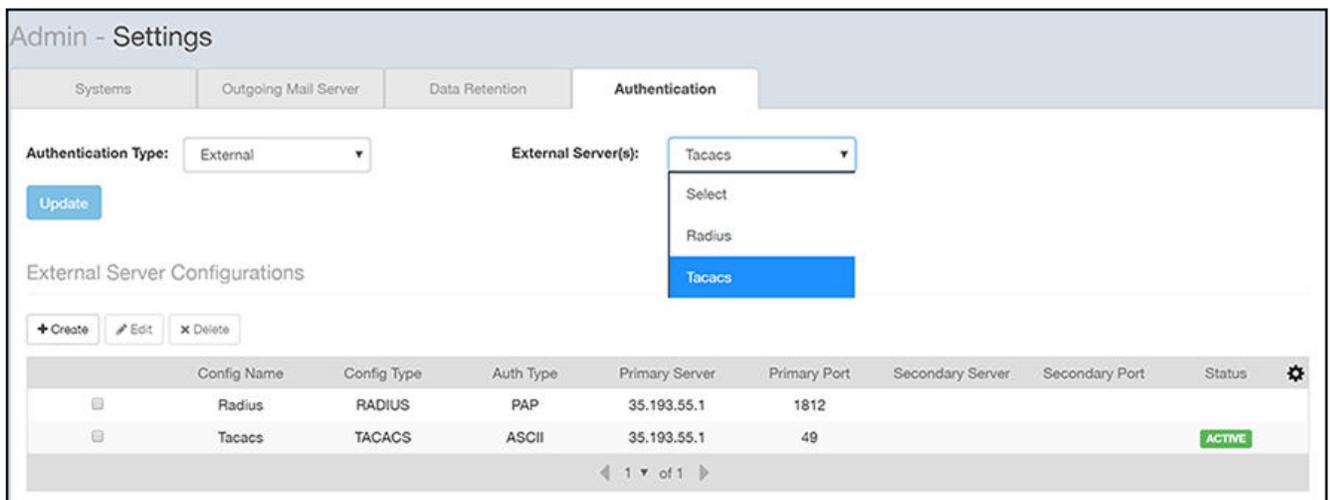
1. From the **Authentication Type** drop-down list, select **External**:

FIGURE 244 Selecting the External Authentication Type



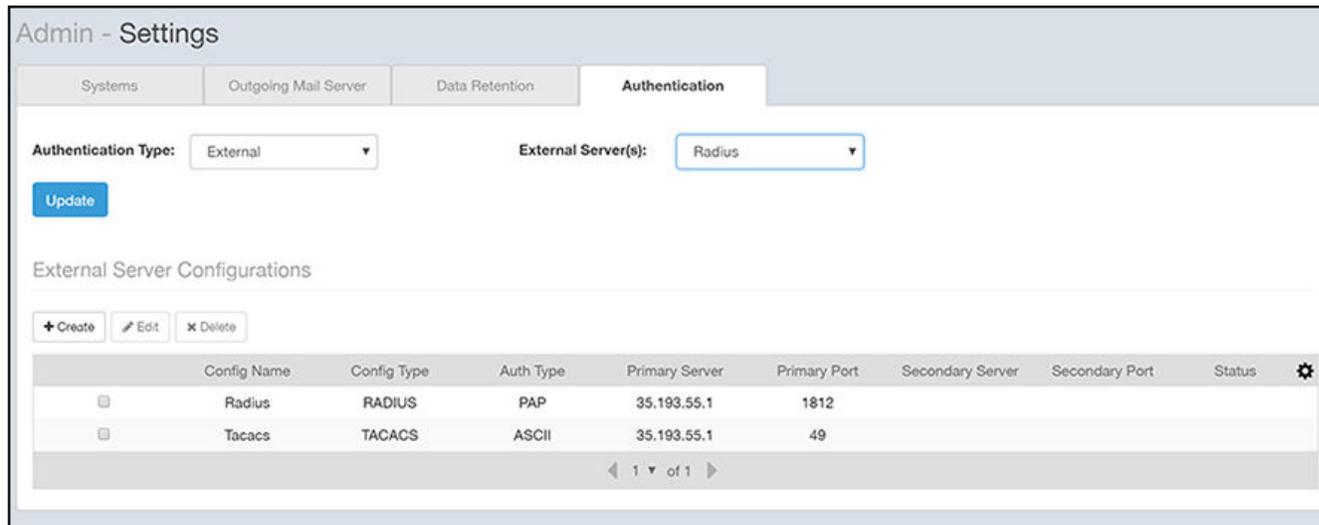
2. Click the External Server(s) drop-down list to view all configured external servers. The figure below shows such an example:

FIGURE 245 Configured External Servers in the Drop-Down List



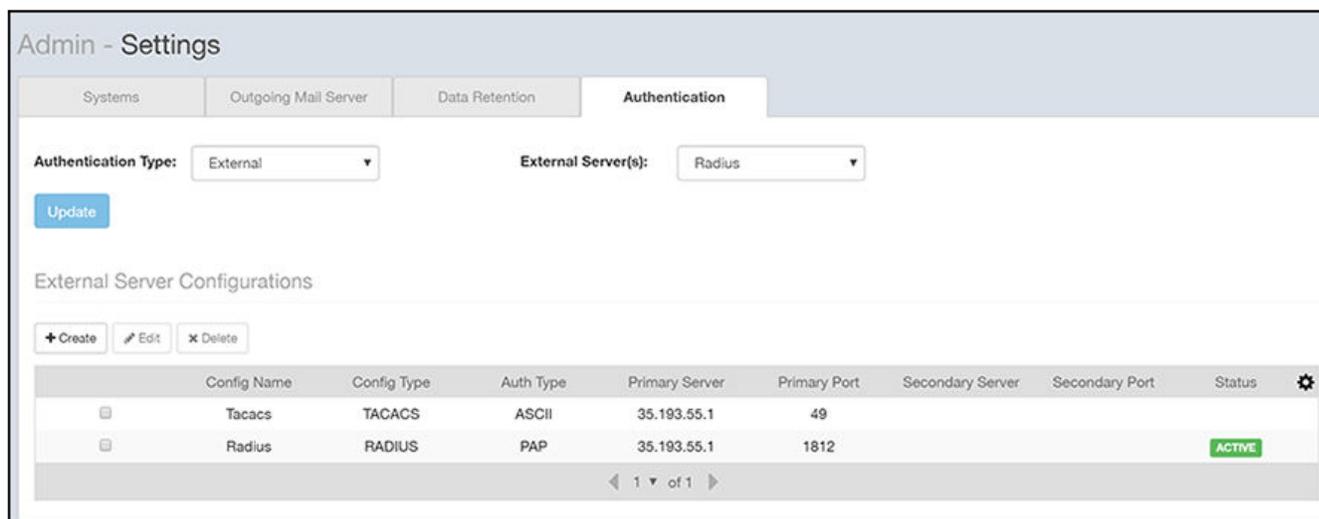
- From this drop-down list, select the external server from which users must be authenticated. You can select only one such server. If a user is not associated with that server, that user cannot be authenticated and will not be able to log in to SCI.

FIGURE 246 Selecting the External Server from the Drop-Down List



- Once you have selected the desired external server ("Radius" in the example above), click **Update**. You will need to confirm a pop-up message that you wish to continue because all active sessions will be invalidated. At next login, the status "ACTIVE" appears for the corresponding external server, as shown below:

FIGURE 247 "ACTIVE" Appears in Status Column for Selected External Server



- (Optional) To edit or delete an external server, check the box for the server, then use the **Edit** or **Delete** buttons as desired.

NOTE

If you want to revert to only local SCI users being authenticated, select "Local" from the Authentication Type drop-down list, then click **Update**. You will need to confirm a pop-up message that you wish to continue because all active sessions will be invalidated.

Notes about the "admin" user:

The "admin" user is always authenticated locally and is a fallback user if the external server is not reachable for the admin to log in and make changes. The "admin" user cannot be deleted or renamed.

License

SCI supports a trial license that you can use to try out the product before you purchase it. SCI also supports a permanent SCI license.

SCI has a built in trial license that is valid for three months. You must update this license to the permanent license before the trial license expires to prevent you from being locked out of SCI.

NOTE

When your license has expired, you cannot log in to SCI. Instead, you receive a message that your trial license has expired, along with a link to the License page to upload your permanent license.

NOTE

SCI provides a license leeway of upto 10% of the total active APs or 500 APs; whichever is lower within the network environment. Users will not be able to login to SCI and view data if this limit (10% of APs or 500 APs) is breached.

Follow these steps to upgrade to the permanent license:

1. In the SCI web UI, click **Admin > License**.
2. Generate a serial number for the SCI product.
3. Use the serial number to purchase and activate a license from the Ruckus support website. The Ruckus website provides a license file that you can download.

- Upload this file to SCI on the License page. The following illustration is example of how the License Page appears, providing status of your licenses:

FIGURE 248 Page to Upload Your License and Obtain Status of Licenses

Feature	Start	Expiration	Count	Notice
INSTANCE-SCI	Aug 16 2016 10:53	Perpetual License	1	SCI - Application Perpetual License
CAPACITY-SCI	Aug 16 2016 10:53	Perpetual License	1073741824	SCI WiFi analytics-1 AP lic. perpetual
SUP-SCI-EU	Aug 16 2016 10:53	Perpetual License	1	End User WatchDog Support for SCI, 1-year

Upload License

Serial Number: XXXXXXXXXXXX

File:

PCI Profiles

You can generate reports in SCI to determine if your WLANs are compliant with the Payment Card Industry (PCI) Data Security Standard v3.2. When you navigate to **Admin > PCI** in the left pane of the SCI user interface, the main PCI Profiles screen appears, as shown in the following example.

FIGURE 249 PCI Profiles Screen

Admin - PCI Profiles

	Name	SSIDs	Date	Compliance
<input checked="" type="checkbox"/>	pci test bed	QA-RaikiH-MSP1-101, QA-...	May 22 2018 04:57	FAIL
<input type="checkbox"/>	density	test-5g	May 17 2018 18:44	FAIL
<input type="checkbox"/>	both	DENSITY, QA-RaikiH-Web-...	May 17 2018 19:17	FAIL
<input type="checkbox"/>	1st density	bugbash, test-5g, qa-pre.k...	May 21 2018 04:00	FAIL
<input type="checkbox"/>	test2	testssid	May 22 2018 11:53	PASS

1 of 1

This screen lists the names of the various reports that have been run, the SSIDs on which each report has been run, the date of each report, and whether the overall report passed or failed the PCI compliance test. You can click on the red "Fail" or green "Pass" to observe the detailed report.

Creating a PCI Profile

You can create a PCI profile to run a report that indicates if a WLAN is in compliance with the PCI Data Security Standard v3.2.

Follow the steps below to create a PCI profile:

1. From **Admin > PCI** in the SCI user interface, click the **Create** button in the upper left of the screen.

The **Create Profile** screen is displayed.

FIGURE 250 Creating a PCI Profile

Index	Question	
1.1.2	Do you maintain a network diagram documenting wireless connections to the CDE?	<input checked="" type="checkbox"/>
1.2.3	Do you have a firewall in place that permits only authorized traffic between the wireless network and CDE?	<input checked="" type="checkbox"/>
2.1.1	Do you change all known encryption keys or passwords when anyone with knowledge about them leaves or changes roles?	<input checked="" type="checkbox"/>
2.4	Do you maintain a system inventory of hardware and software in scope for PCI? (Hint: SZ allows you to export a CSV list of devices)	<input checked="" type="checkbox"/>
6.1	Do you utilize a reputable third-party source to identify and rank security vulnerabilities?	<input checked="" type="checkbox"/>
6.2	Do you monitor and install vendor-supplied security patches in a timely manner?	<input checked="" type="checkbox"/>
7.2	Do you prevent all unnecessary administrative access across systems with a default 'deny-all' policy?	<input checked="" type="checkbox"/>

2. Complete the screen configuration as follows:

- Name: Enter any descriptive name for your PCI profile.
- SSIDs to report: Use the Search area and the + buttons to locate all the SSIDs you want to include in the report, then click the box next to each desired SSID.

NOTE

When an SSID is selected for the PCI report, this SSID is identified as part of the cardholder data environment (CDE). Unselected SSIDs in the same zone are considered non-CDE SSIDs. The system will compare the security settings of CDE and non-CDE SSIDs to ensure that the network complies with PCI requirements. Only the zone(s) of selected SSIDs are evaluated for each PCI report.

- Index/Question: Checkmark the compliance questions that you want included in your report. SCI will pull data directly from the controller to check the compliance of each question against the PCI Data Security Standard.

NOTE

Not all questions are shown in the screen example above.

3. Click **Create** at the bottom right of the screen.

The result of the report (Pass or Fail) appears in the list of PCI profiles on the main PCI Profiles screen, an example of which is shown in [Figure 249](#) on page 211.

Opening and Downloading a PCI Profile Report

The PCI Profile report gives you an overall status (Pass or Fail) as well as a breakdown of all categories you requested when you created the PCI profile.

Follow the steps below to view and download a copy of your PCI report.

1. From the main PCI Profile screen, an example of which is shown in [Figure 249](#) on page 211, click on either the green "Pass" or red "Fail" button, depending on the report you wish to view.

The report is displayed, as shown in the following example, where both the overall status is provided (in the upper right) as well as the compliancy of each individual item you chose when you created the PCI profile.

FIGURE 251 PCI Report Example

PCI ID	Description	Compliant	Details
1.1.2	Current network diagram that identifies all connections between the cardholder data environment and other networks, including any wireless networks	PASS	
1.2.3	Install perimeter firewalls between all wireless networks and the cardholder data environment, and configure these firewalls to deny or, if traffic is necessary for business purposes, permit only authorized traffic between the wireless environment and the cardholder data environment.	PASS	
2.1.1	For wireless environments connected to the cardholder data environment or transmitting cardholder data, change ALL wireless vendor defaults at installation, including but not limited to default wireless encryption keys, passwords, and SNMP community strings.	PASS	
2.3	Encrypt all non-console administrative access using strong cryptography.	PASS	
2.4	Maintain an inventory of system components that are in scope for PCI DSS.	PASS	
4.1.1	Ensure wireless networks transmitting cardholder data or connected to the cardholder data environment, use industry best practices to implement strong encryption for authentication and transmission.	PASS	
6.1	Establish a process to identify security vulnerabilities, using reputable outside sources for security vulnerability information, and assign a risk ranking (for example, as "high," "medium," or "low") to newly discovered security vulnerabilities.	PASS	
6.2	Ensure that all system components and software are protected from known vulnerabilities by installing applicable vendor-supplied security patches. Install critical security patches within one month of release.	PASS	
7.2	Establish an access control system(s) for systems components that restricts access based on a user's need to know, and is set to "deny all" unless specifically allowed.	PASS	
8.1.1	Assign all users a unique ID before allowing them to access system components or cardholder data.	PASS	
8.1.2	Control addition, deletion, and modification of user IDs, credentials, and other identifier objects.	PASS	
8.1.3	Immediately revoke access for any terminated users.	PASS	
8.1.4	Remove/disable inactive user accounts within 90 days.	FAIL	

Overall Status: **FAIL**

TDC-PCI-TESTBED

Download Cancel

2. Click the **Download** button (lower right) to obtain a PDF copy of the report.

Editing or Deleting a PCI Profile

You can edit or delete any PCI profile, as desired.

To edit or delete a profile, check the box or boxes next to the PCI profile, then click the applicable button - either **Edit** or **Delete** - to perform the desired actions.

NOTE

You can select and delete multiple profiles simultaneously if desired.

FIGURE 252 Edit or Delete PCI Profiles

	Name	SSIDs	Date	Compliance	
<input checked="" type="checkbox"/>	pci test bed	QA-RaikiH-MSP1-101, QA-...	May 22 2018 04:57	FAIL	⚙️
<input type="checkbox"/>	density	test-5g	May 17 2018 18:44	FAIL	
<input type="checkbox"/>	both	DENSITY, QA-RaikiH-Web-...	May 17 2018 19:17	FAIL	
<input type="checkbox"/>	1st density	bugbash, test-5g, qa-pre.k...	May 21 2018 04:00	FAIL	
<input type="checkbox"/>	test2	testssid	May 22 2018 11:53	PASS	

Users and Roles

The Users and Roles page of the Admin dashboard allows you to define who can control the various wifi resources in your system.

At its most basic level, you perform the following steps to define who has control over these resources:

1. Create resource groups. For each group that you create, you select the Access Points, SSIDs, and other assets that you want to belong to that group. This procedure is described in [Creating Resource Groups](#) on page 217.
2. Create users, then give the user a role, then assign the user to an resource group. The Super Admin role automatically is assigned to all resource groups. This procedure is described in [Creating Users and Roles](#) on page 219.

Resource Groups

The following screen shows an example of several configured resource groups:

FIGURE 253 Resource Groups Screen

	Group Name	Description	Associated Users	Created By	Last Edit Time
	Default	Full access to all resource groups	2		Mar 09 2018 10:59
<input type="checkbox"/>	Dev Group	For RSC dev team	1		
<input type="checkbox"/>	Group 1		2	admin	Mar 09 2018 11:44
<input type="checkbox"/>	Group 2		2	admin	Mar 08 2018 09:29
<input type="checkbox"/>	Controller 1		2	admin	Mar 08 2018 09:33
<input type="checkbox"/>	Domain 1	Filter by domain	1	admin	Mar 08 2018 09:43
<input type="checkbox"/>	Zone 2		1	admin	Mar 08 2018 15:49
<input type="checkbox"/>	All Zones		3	admin	Mar 08 2018 09:48
<input type="checkbox"/>	Controller 2		1	admin	Mar 08 2018 10:08
<input type="checkbox"/>	Controller 3		2	admin	Mar 09 2018 10:54

A resource group is made up of your selection of a subset of the wifi assets available in SCI. The filters provided during resource-group selection allow you to select any systems, controllers, domains, zones, AP groups, SSIDs, or individual APs. A resource group allows the Super Admin to confine access for a group of users to a restricted set of wifi assets. Therefore, a resource group is equivalent to a tenant.

SCI contains a **Default** resource group. This group corresponds to the entire set of wifi assets. The **Default** resource group cannot be edited or deleted.

NOTE

SCI can support up to 2,000 resource groups.

Users and Their Roles

The following screen shows an example of several configured users and their roles, including those belonging to external AAA authentication servers:

FIGURE 254 Users and Roles Screen

	Email	Username	First Name	Last Name	Role	Resource Group	Created By	User Type	Last Login TI...
<input type="checkbox"/>	nodata@test.com	nodata	no	data	View Only	dummy	admin	Local	Jan 11 2019...
<input type="checkbox"/>	scilocaladmin@...	scilocaladmin	SCI	Local Admin	Super Admin	Default		Local	Jan 19 2019...
<input type="checkbox"/>	aaaadmin@exa...	aaaadmin	FIRST	LAST	Super Admin	Default		External	Jan 18 2019...
<input type="checkbox"/>	aaaview@exam...	aaaview	FIRST	LAST	View Only	AAA_VIDEO54		External	Jan 14 2019...
<input type="checkbox"/>	aaagroupadmin...	aaagroupadmin	FIRST	LAST	Admin	AAA_MLUSA		External	Jan 14 2019...

Users are uniquely defined by their email address and their username, and each user must be assigned to only one of three possible roles: Super Admin, Admin, and View Only. The following figure shows the access rights of each role.

FIGURE 255 Access Rights for Each User Role

	View Data	Manage Saved Filters	Manage Schedules	Manage Users	Manage Resource Groups	Manage Cluster
Super Admin	✓	✓	✓	✓	✓	✓
Admin	✓	✓	✓	✓	✗	✗
View Only	✓	✗	✗	✗	✗	✗

Note the following information about the Super Admin and Admin roles:

- Super Admin: This role can be assigned *only* to the **Default** resource group. The Super Admin has full access rights to all functionality in SCI. The Super Admin is the only role that can exist within the default resource group.
- Admin: This role exists within a resource group. However, a resource group *can* exist without anyone assigned to the role of Admin.

Creating Resource Groups

You can create resource groups and then assign user roles who can manage various wifi resources in your system.

It is recommended that you first create a resource group, and then create users and roles to assign to the resource group. The reason is that, during user creation, you are required to assign a user to a resource group.

Creating a New Resource Group

Follow these steps to create a new resource group:

1. In SCI, navigate to **Admin > Users & Roles**.

2. On the **Users & Roles** screen, click the **Resource Groups** tab.

A screen such as the following appears, assuming that some resource groups have already been configured.

FIGURE 256 Resource Groups Screen Example

	Group Name	Description	Associated Users	Created By	Last Edit Time	
	Default	Full access to all resource groups	2		Mar 09 2018 10:59	
<input type="checkbox"/>	Dev Group	For RSC dev team	1			
<input type="checkbox"/>	Group 1		2	admin	Mar 09 2018 11:44	
<input type="checkbox"/>	Group 2		2	admin	Mar 08 2018 09:29	
<input type="checkbox"/>	Controller 1		2	admin	Mar 08 2018 09:33	
<input type="checkbox"/>	Domain 1	Filter by domain	1	admin	Mar 08 2018 09:43	
<input type="checkbox"/>	Zone 2		1	admin	Mar 08 2018 15:49	
<input type="checkbox"/>	All Zones		3	admin	Mar 08 2018 09:48	
<input type="checkbox"/>	Controller 2		1	admin	Mar 08 2018 10:08	
<input type="checkbox"/>	Controller 3		2	admin	Mar 09 2018 10:54	

3. Click **Create**.

A popup appears, such as in the example below:

FIGURE 257 Create Resource Group Popup

Create Resource Group

Name:*

Description:

APs

Search group:

Search AP:

0 of 0 APs checked

- All Systems
 - System 1
 - System 2
 - System 3
 - System 4
 - System 5
 - System 6

SSID:

4. In the **Create Resource Group** popup, do the following:
 - a) In the **Name** field, enter a universally unique name for the resource group.
 - b) In the **Description** field, enter a useful description of the group for your own information.
 - c) In the **APs** section, use the filters to select the desired wifi assets.
 - d) Once you select one or more APs, the SSID dropdown is activated, and you can select desired SSIDs.
 - e) To complete the configuration of the new resource group, click **Create**.

The newly configured resource group should now appear in the list of resource groups on the **Users & Roles** screen under the **Resource Groups** tab.

Editing a Resource Group

To edit a resource group, do the following:

1. Click the box to the left of the group you want to edit.
2. Click **Edit**.
3. In the popup, make the desired changes, then click **Update**.

Deleting One or More Resource Groups

To delete resource groups, do the following:

1. Click the box to the left of the group for each group that you want to delete.
2. Click **Delete**.

NOTE

All users associated with these groups are also deleted.

Creating Users and Roles

Once you create resource groups, you can create users, assign roles to these users, and assign users to manage one or all resource groups.

It is recommended that you first create a resource group, and then create users and roles to assign to the resource group. The reason is that, during user creation, you are required to assign a user to a resource group.

Creating a New User

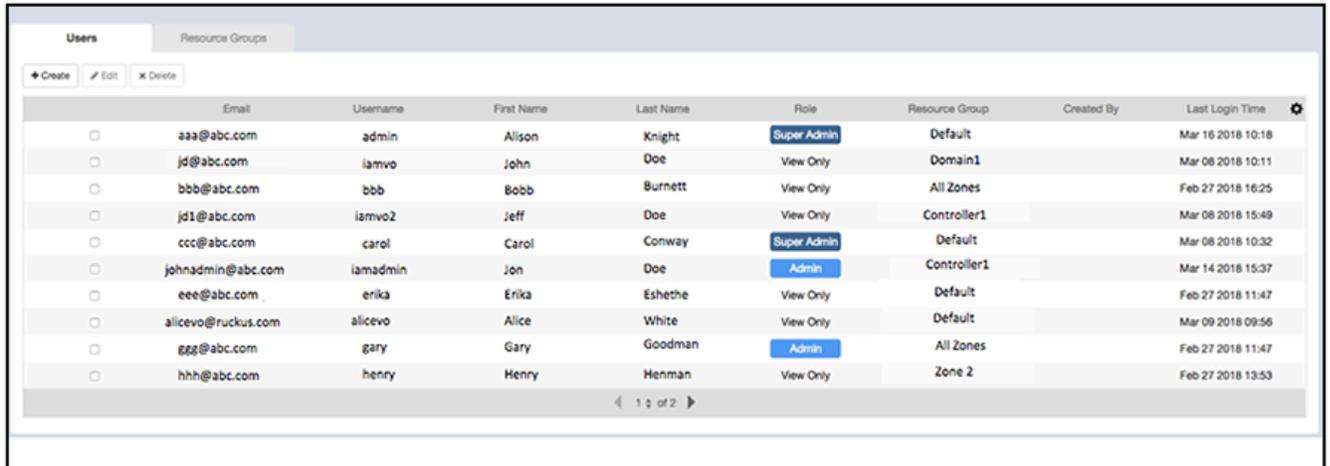
Follow these steps to create a new user:

1. In SCI, navigate to **Admin > Users & Roles**.

2. On the **Users & Roles** screen, click the **Users** tab.

A screen such as the following appears, assuming there are already configured users and resource groups:

FIGURE 258 Users Screen Example



	Email	Username	First Name	Last Name	Role	Resource Group	Created By	Last Login Time
<input type="checkbox"/>	aaa@abc.com	admin	Alison	Knight	Super Admin	Default		Mar 16 2018 10:18
<input type="checkbox"/>	jd@abc.com	iamvo	John	Doe	View Only	Domain1		Mar 08 2018 10:11
<input type="checkbox"/>	bbb@abc.com	bbb	Bobb	Burnett	View Only	All Zones		Feb 27 2018 16:25
<input type="checkbox"/>	jd1@abc.com	iamvo2	Jeff	Doe	View Only	Controller1		Mar 08 2018 15:49
<input type="checkbox"/>	ccc@abc.com	carol	Carol	Conway	Super Admin	Default		Mar 08 2018 10:32
<input type="checkbox"/>	johnadmin@abc.com	iamadmin	Jon	Doe	Admin	Controller1		Mar 14 2018 15:37
<input type="checkbox"/>	eee@abc.com	erika	Erika	Eshethe	View Only	Default		Feb 27 2018 11:47
<input type="checkbox"/>	alicevo@ruckus.com	alicevo	Alice	White	View Only	Default		Mar 09 2018 09:56
<input type="checkbox"/>	ggg@abc.com	gary	Gary	Goodman	Admin	All Zones		Feb 27 2018 11:47
<input type="checkbox"/>	hhh@abc.com	henry	Henry	Henman	View Only	Zone 2		Feb 27 2018 13:53

3. Click **Create**.

The **Create Users** popup appears:

FIGURE 259 Create User Popup

The screenshot shows a 'Create User' popup window with the following fields and values:

- Email:***: Empty text input field.
- Username:***: Empty text input field.
- Password:***: Text input field containing 'Minimum 8 characters'.
- Confirm Password:***: Text input field containing 'Minimum 8 characters'.
- First Name:***: Empty text input field.
- Last Name:***: Empty text input field.
- Role:***: Dropdown menu with 'Super Admin' selected and an information icon to the right.
- Resource Group:***: Dropdown menu with '(Full access to all resource groups)' selected.

At the bottom right, there are two buttons: a blue 'Create' button and a white 'Cancel' button.

4. In the **Create Users** popup, fill out all the information, taking into account the following:
 - All fields are mandatory.
 - Users are uniquely defined by their email address and their username. Therefore, no two users can share the same email address and/or username.
 - The **Role** field has three possible roles: **Super Admin**, **Admin**, and **View Only**. If you select **Super Admin**, then this user automatically has full access to all resource groups, as shown in the popup above. Therefore, a Super Admin is assigned to the **Default** resource group because that group contains the entire set of wifi assets in the system. However, if you select either the **Admin** or **View Only** role for the user, you then need to select only one group from the **Resource Group** dropdown.
5. Click **Create**.

The newly configured user should now appear in the list of users on the **Users & Roles** screen under the **Users** tab.

Editing a User

To edit a user, do the following:

1. Click the box to the left of the user whose configuration you wish to edit.
2. Click **Edit**.
3. In the popup, make the desired changes, then click **Update**.

Deleting One or More Users

To delete users, do the following:

1. Click the box to the left of the user for all users that you want to delete.
2. Click **Delete**.

NOTE

Only a Super Admin can delete another Super Admin. However, a Super Admin cannot be demoted to Admin or View Only roles. The only way to demote a Super Admin is to delete the Super Admin user, then recreate the user with the desired role.



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