USER GUIDE

Ruckus Wireless™ SmartCell Insight™ User Guide

Supporting SmartCell Insight™ 3.1.0

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About this Document

Overview

This *SmartCell Insight User Guide* provides instructions about how the Ruckus Wireless™ SmartCell Insight (SCI) application works, the reports that it generates, and what they are used for.

This guide is written for service operators and system administrators who are responsible for managing, configuring, and troubleshooting Wi-Fi networks. It 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-configap-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 *SmartZone™ (SZ) 100 and Virtual SmartZone Essentials (vSZ-E) Command Reference* 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.

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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

SmartCell Insight Introduction

SmartCell Insight (SCI) is a Big Data analytics and reporting engine that provides deep visibility into the performance and operational statistics of your Ruckus Wireless WiFi infrastructure.

SmartCell Insight (SCI) is designed to collect data from Ruckus network equipment, analyze that data, and then present it using a wide variety of standard and custom reports. SCI provides visibility, analytics and reports about network transmission statistics, equipment status and user traffic. It also provides details about the devices and applications that are used on the network, so that decision-makers can make better informed decisions about what types of devices and content their customers are using - and will be using more of - in the future.

To facilitate immediate value, SmartCell Insight ships with pre-built reports that solve the most common use cases faced by Engineering, Operations, and Planning organizations. These reports cover themes such as traffic usage, airtime utilization, client measurement, and application usage trends.

NOTE
All values in the reports, except AP counts, are approximates of the actual values, unless otherwise stated.

SmartCell Insight can collect data from the entire line of Ruckus Access Points (APs) along with ZoneDirector (ZD) and/or SmartZone (SZ) controllers. SCI uses scale-out architecture to collect data from up to 100,000 Access Points (AP). SCI can scale out horizontally, as required.

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 *Mgmt* or *Mgt* 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	
• Total Traffic = User Traffic + Management Traffic = Rx Total + Tx Total • Rx Total = Rx User + Rx Managemet • Tx Total = Tx User + Tx Managemet • User Traffic = Rx User + Tx User • Managemet Traffic = Rx Managemet + Tx Managemet	
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	A Wi-Fi client, uniquely identified by its MAC address. NOTE *All Radios* 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 *All Radios* unique count will consider this client as a single count.
Session	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. 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.

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

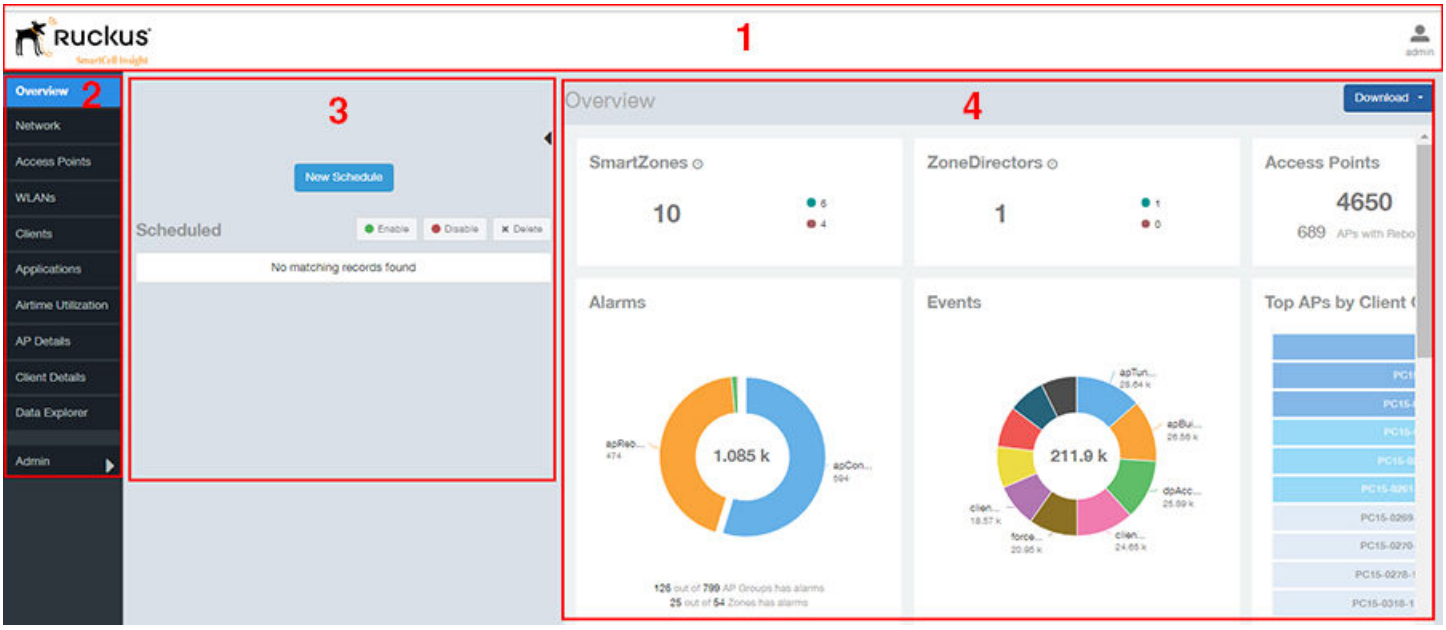


TABLE 4 SCI web interface elements

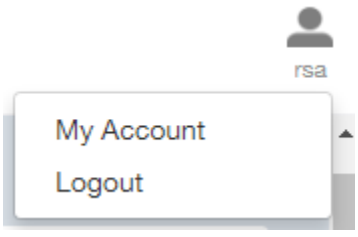
No.	Name	Description
1	Header Panel	Displays the currently logged in user profile. Click the user icon to update the profile or change the password as required.
2	Navigation Bar	Contains links that take you to the various dashboards and the Data Explorer cubes and Admin console.
3	Schedules Panel	Allows 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.

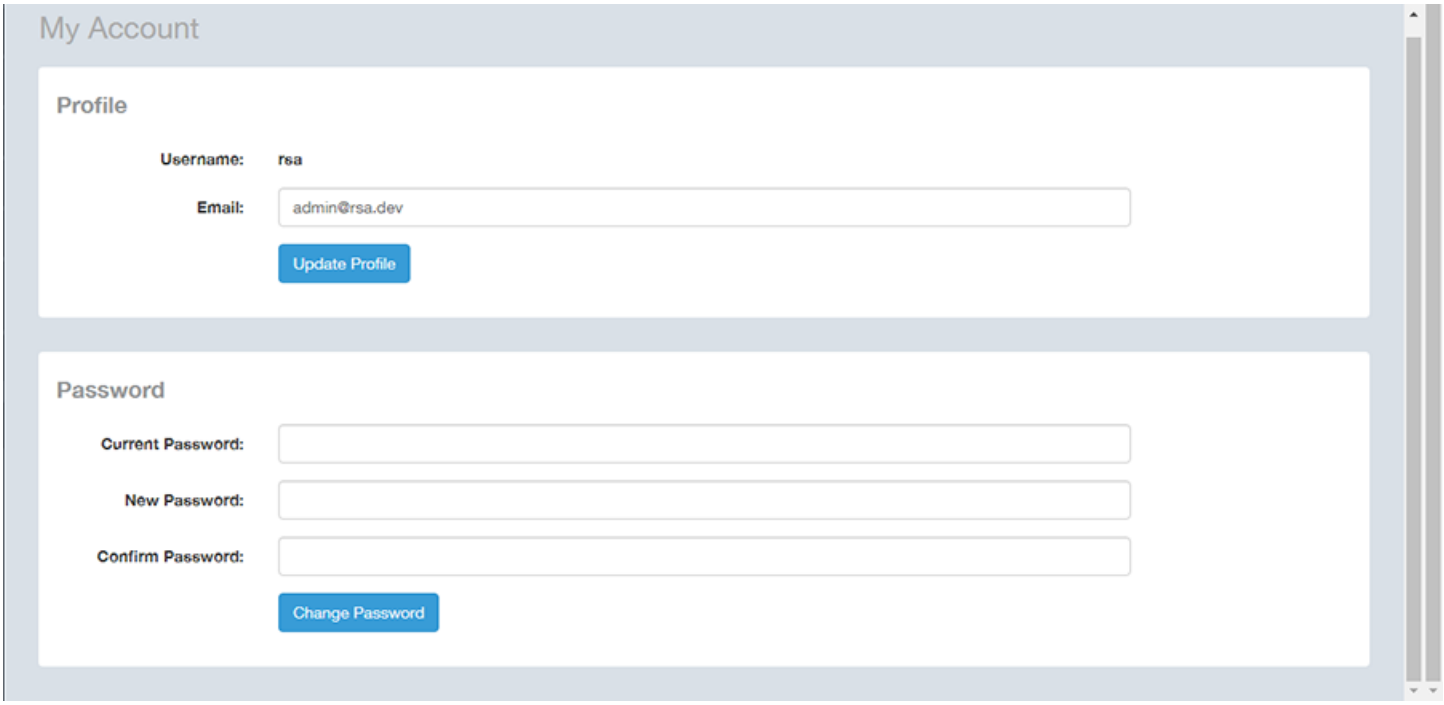
FIGURE 2 User Information pop-up



Click the:

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

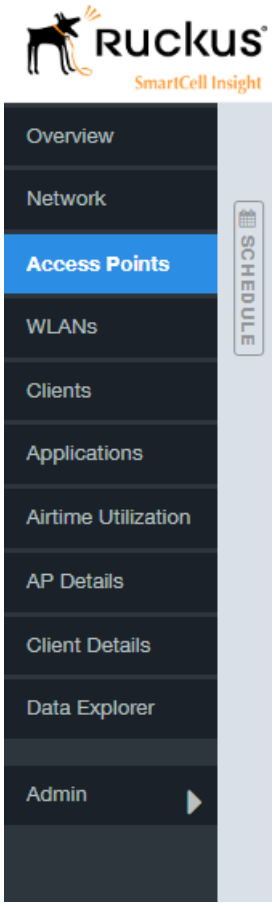
FIGURE 3 My Account



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

Using the navigation bar is how you 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 89 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 23
  - 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

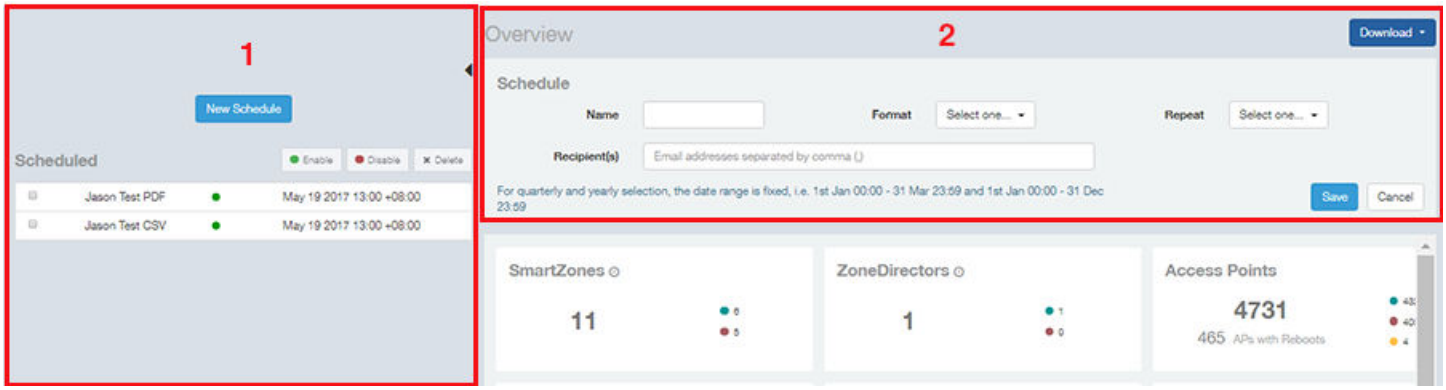
The Scheduler allows you to create schedules to generate reports to be sent out to recipients.

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.

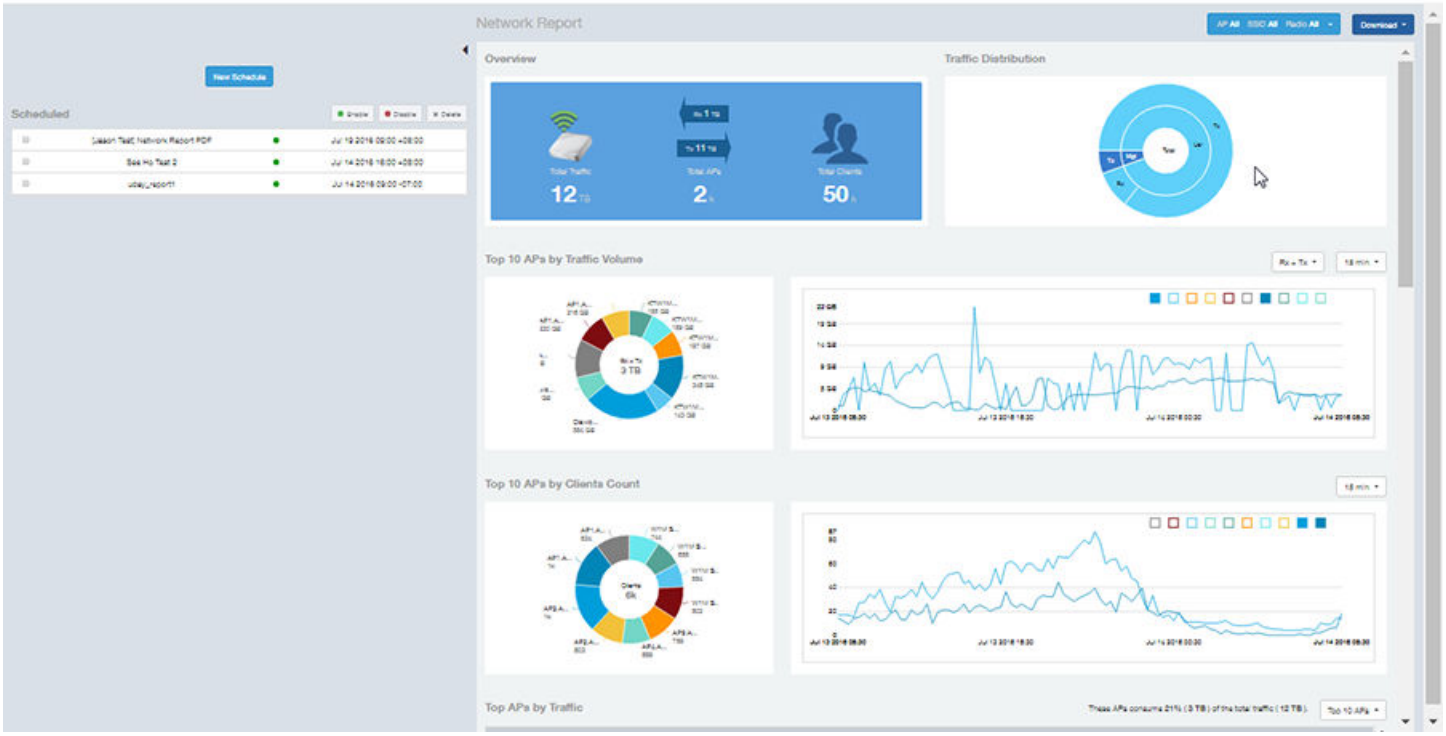
Click **Save** to save the schedule details. A new schedule is created and listed in the Schedule frame numbered 1 in the figure above.

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 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 Dashboard Containing Schedules



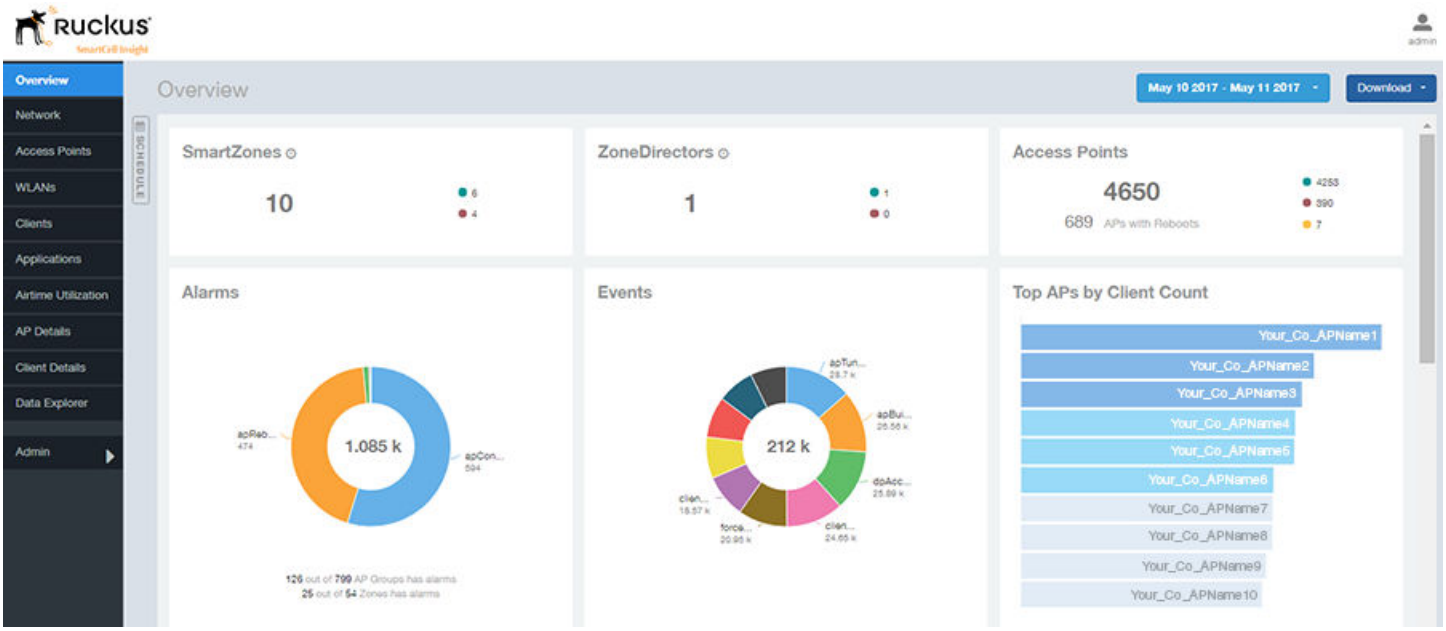
Overview Dashboard

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.

The purpose of this section is to describe the areas of the content panel of the Overview dashboard.

FIGURE 7 Overview Dashboard - Top Portion

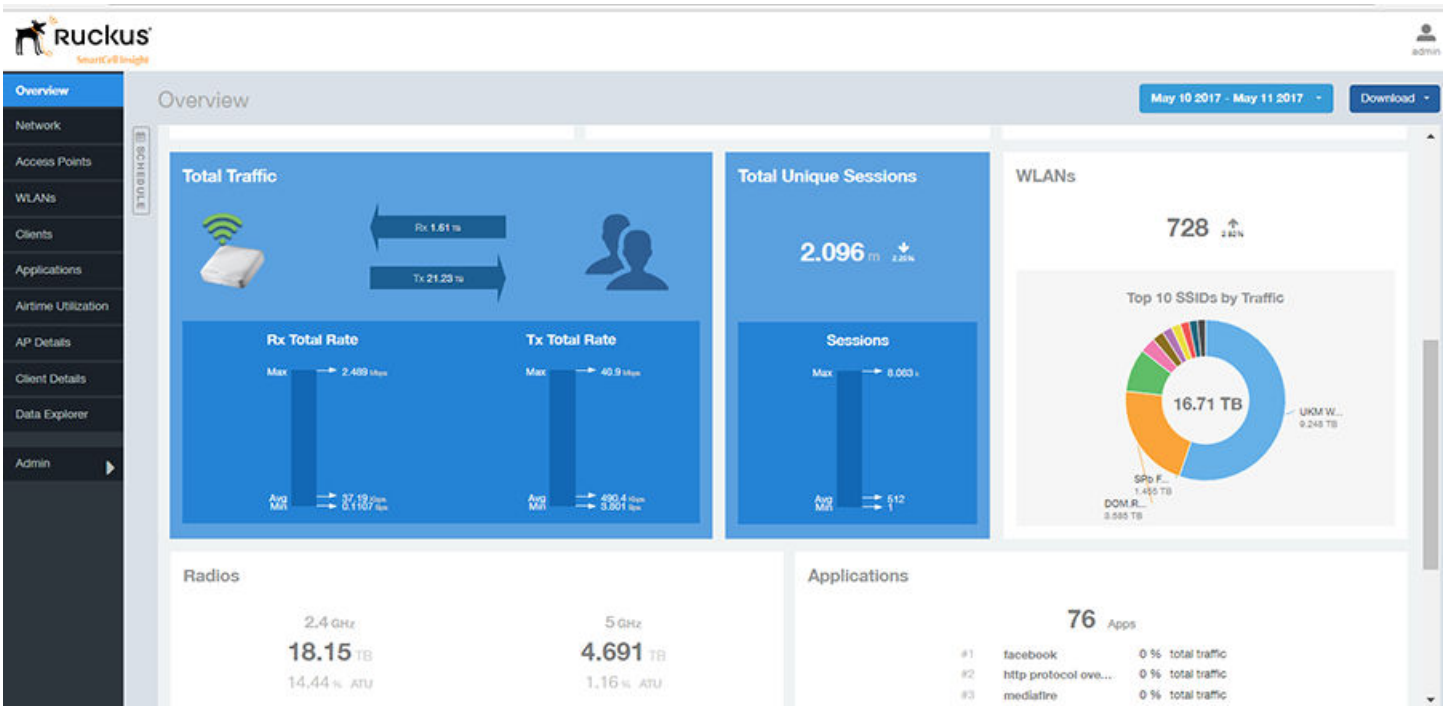


The areas shown in this portion of the Overview Dashboard are:

- SmartZones - Displays the number of SmartZone controllers being used in your WiFi network. The green and red dots depict how many of these controllers are active and inactive. For more information on the controllers that you have registered, go to the Admin Console > Settings portion of SCI.
- ZoneDirectors - Displays the number of ZoneDirector controllers being used in your WiFi network. The green and red dots depict how many of these controllers are active and inactive. For more information on the controllers that you have registered, go to the Admin Console > Settings portion of SCI.
- Access Points - Shows the number of APs in the network. Green and red status indicates if they are up or down, and yellow indicates other statuses, such as "Provisioned," "Discovery," and " Rebooting."
- Alarms - Displays the most frequently occurring alarms in the network. Hover over a color or name to display the full name of the alarm. Go to the Data Explorer dashboard for more information about events.

- Events - Displays the most frequently occurring events in the network. Hover 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 Network Dashboard.

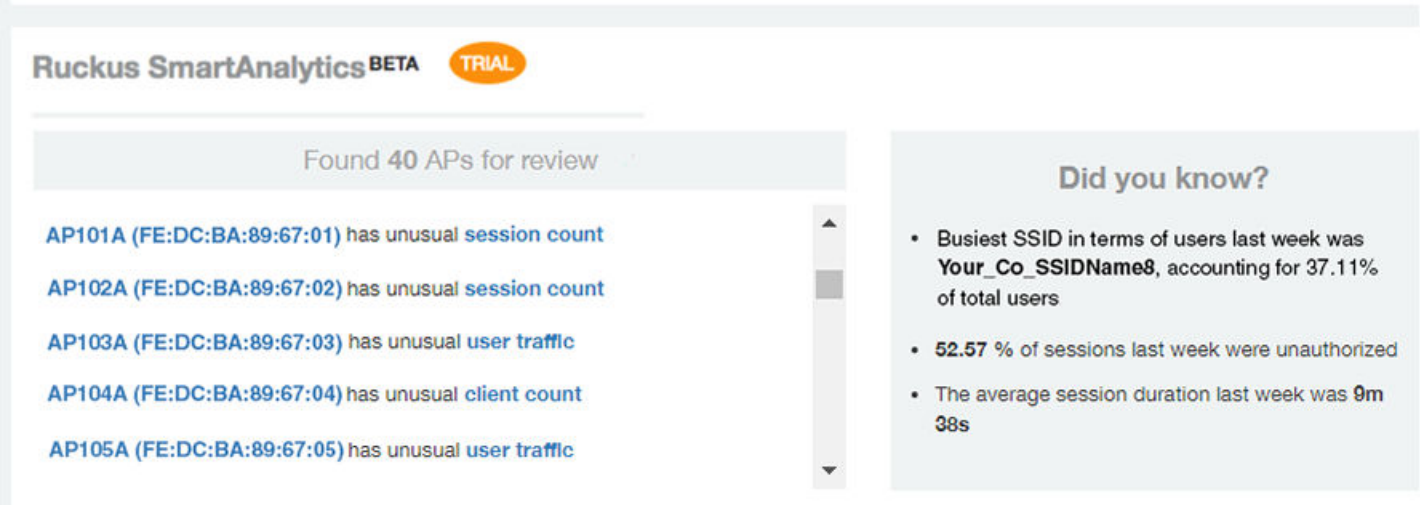
FIGURE 8 Overview Dashboard - Middle Portion



- The areas shown in this portion of the Overview Dashboard are:
- Total Traffic - Shows statistics about traffic received and transmitted by the access points, including the maximum and minimum rates of traffic. Go to the Network dashboard 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 dashboard. Hover over a portion of the pie 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 dashboard.
- Applications - Shows the applications being used more frequently by the clients in the network. For more information about applications usage, go to the Applications dashboard.

The lower portion of the Overview dashboard is the Smart Analytics portion, shown in the following figure:

FIGURE 9 Smart Analytics Portion of Overview Dashboard



For information about how to use Smart Analytics, refer to the Using Ruckus Smart Analytics on page 19

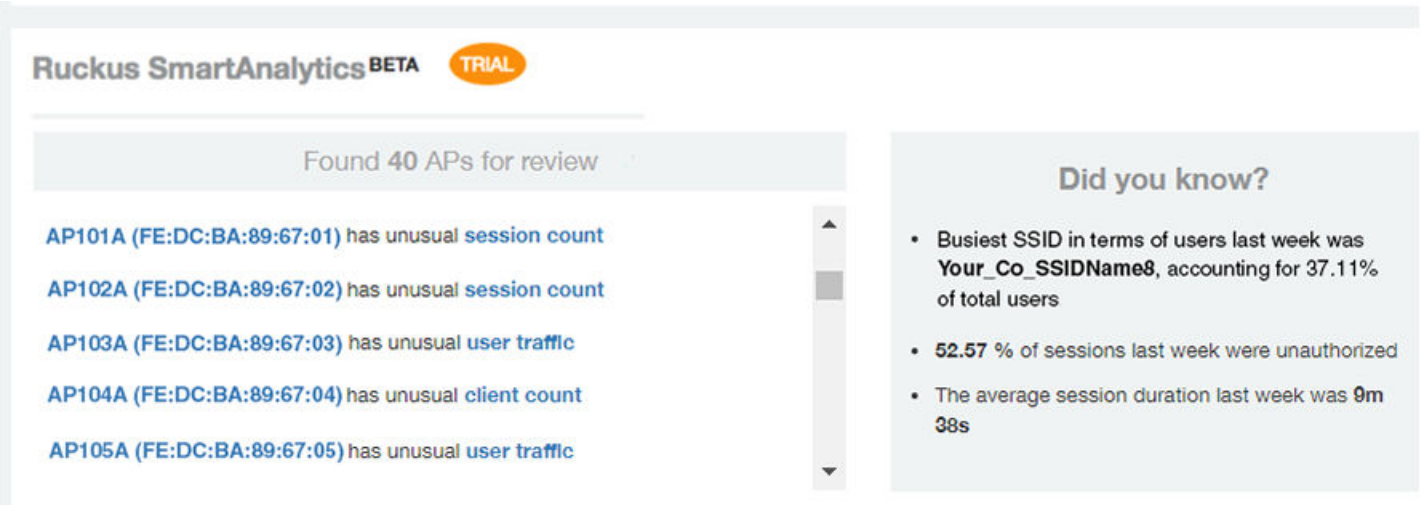
Using Ruckus Smart Analytics

Ruckus Smart Analytics uses advanced analytics techniques to identify APs that are exhibiting different-from-normal behavior, and flags them out 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 the system observed outside-of-normal behavior for that AP. The system learns the expected trends for the AP over a period of time, and flags an AP for review if any of the following look unusual:

- 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
- 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:



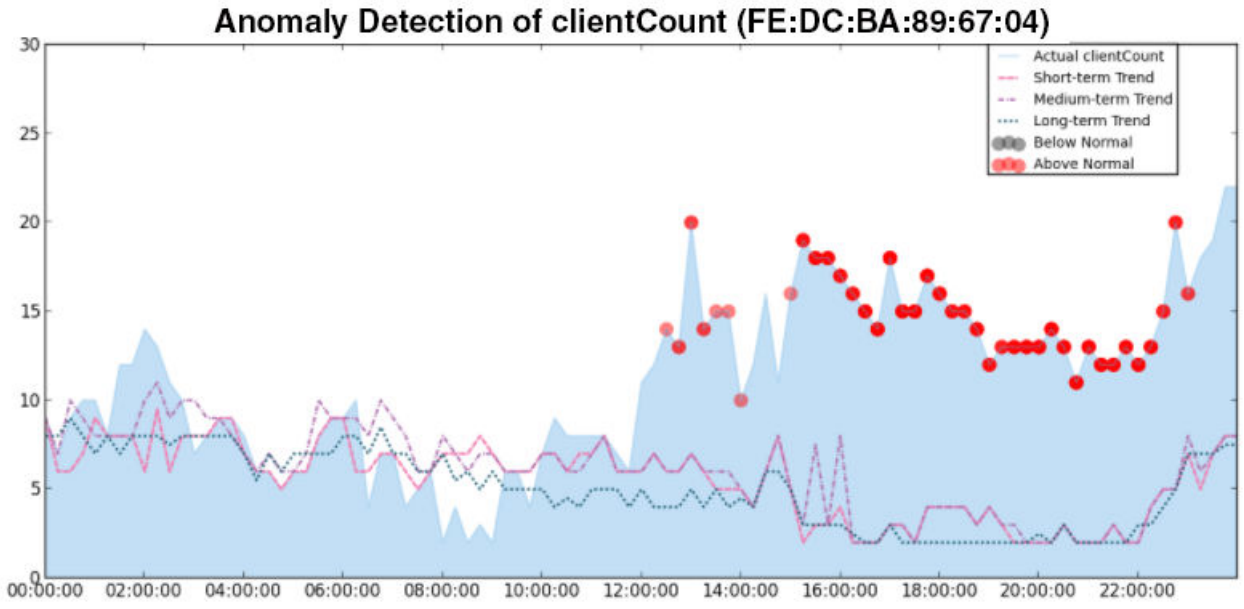
After the first few days, the system begins showing results, but the accuracy of the results improves over time, as the system learns more about the AP user traffic, client and session patterns. The results are usually accurate after one month, when the system completes learning and understands the short-term, 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.

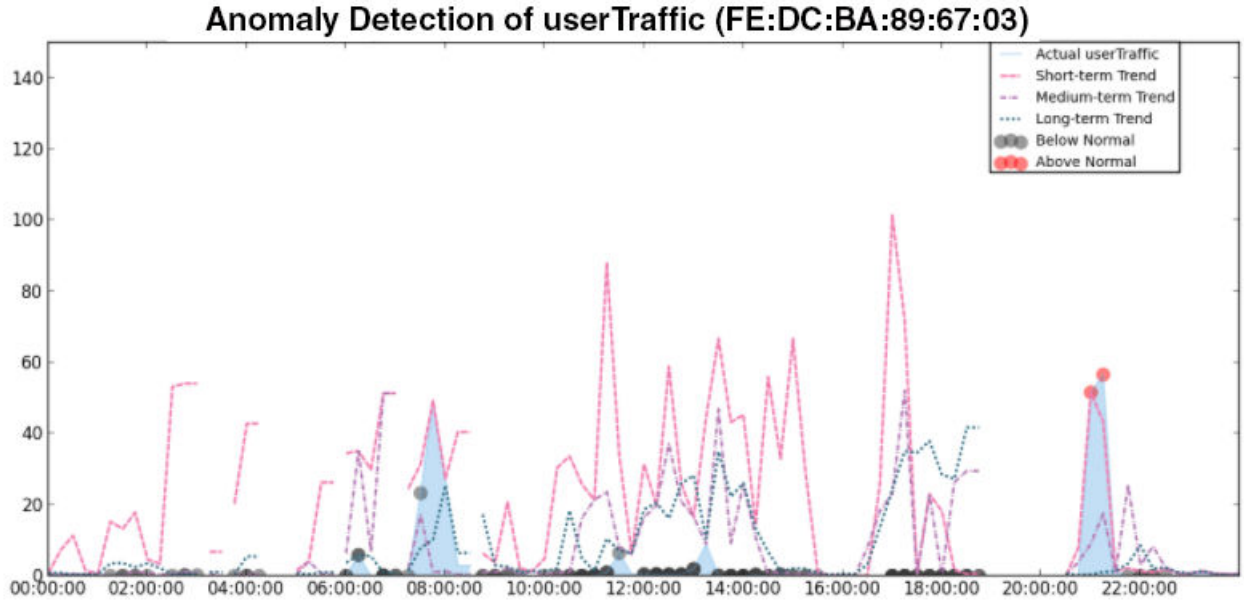
The "Did you know?" section of the display provides helpful information, and is updated every time you return to the Overview dashboard.

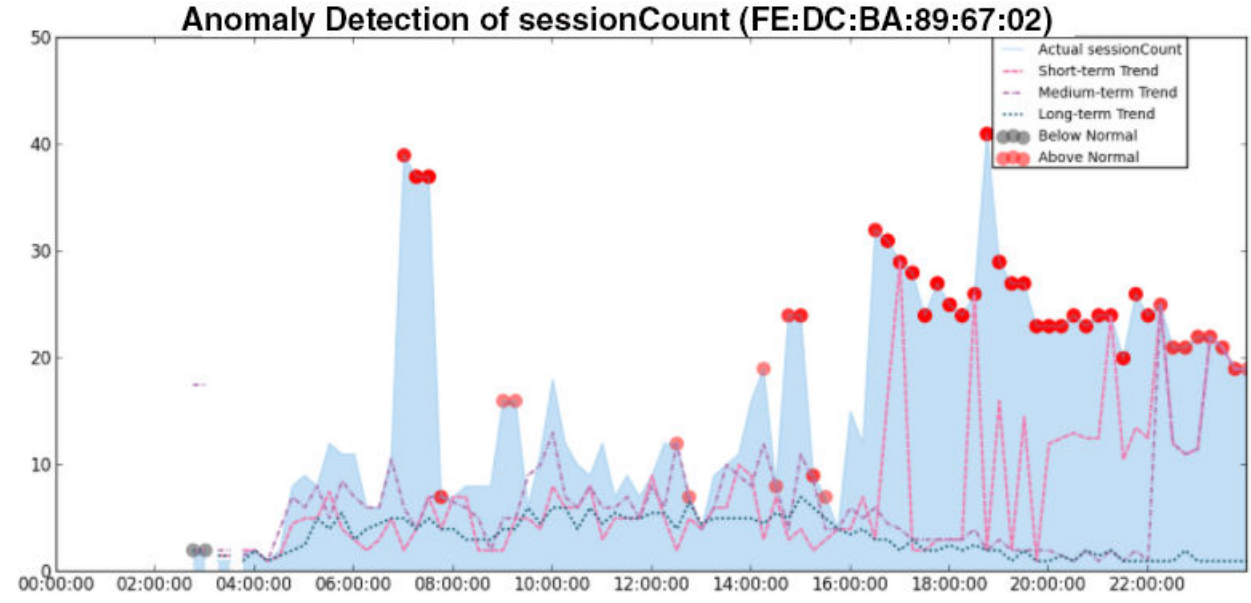
What You Can Do from the Ruckus Smart Analytics Display

From the Ruckus Smart Analytics output, you can do the following:

- Clicking on an AP/MAC Address link takes you to the AP Details Dashboard.
- Clicking on "client count," "user traffic" or "session count" links opens a graphical representation about the identified anomaly for the corresponding AP. The following figures show examples for each anomaly type.




Anomaly Detection of userTraffic (FE:DC:BA:89:67:03)
Actual userTraffic
Short-term Trend
Medium-term Trend
Long-term Trend
Below Normal
Above Normal
140
120
100
80
60
40
20
0
00:00:00
02:00:00
04:00:00
06:00:00
08:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00


Anomaly Detection of sessionCount (FE:DC:BA:89:67:02)
Actual sessionCount
Short-term Trend
Medium-term Trend
Long-term Trend
Below Normal
Above Normal
50
40
30
20
10
0
00:00:00
02:00:00
04:00:00
06:00:00
08:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00

Filters

Working With Filters

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

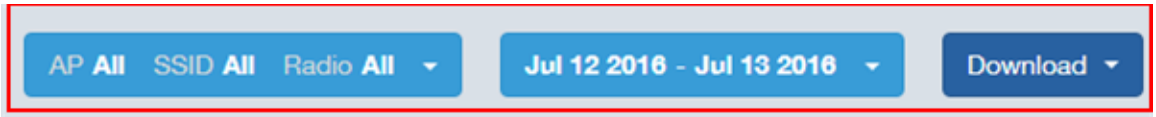
By selecting APs and setting a date range, you can examine specific subsets of data for any AP or group of APs for any time period in any of your wireless networks. For example, if you want to see just the total traffic and client counts for a certain AP on a certain day, you could use the Network Overview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

The same two filters are available on most dashboards:

- **AP/Radio Filter** (on some screens, **AP/SSID/Radio** filter)
- **Date Filter**

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

FIGURE 10 AP/Radio Filter, Date Filter and Download button

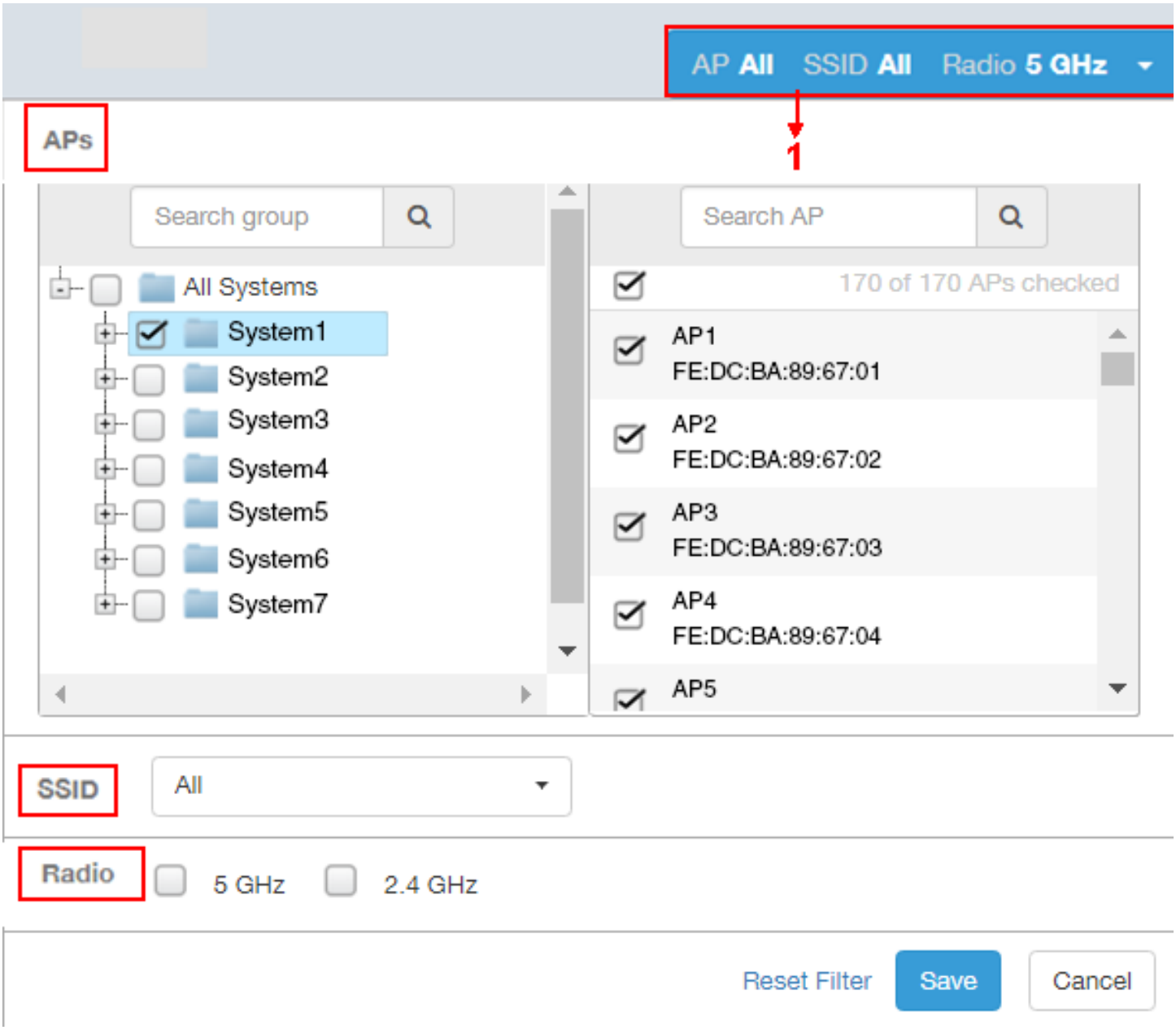


AP, SSID and Radio filter

Use these filters to generate SCI dashboards.

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

FIGURE 11 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.

NOTE
SSID option is seen on the nework, WLAN, client and application dashboards.

- Radio select 5 or 2.4 or both GHz.

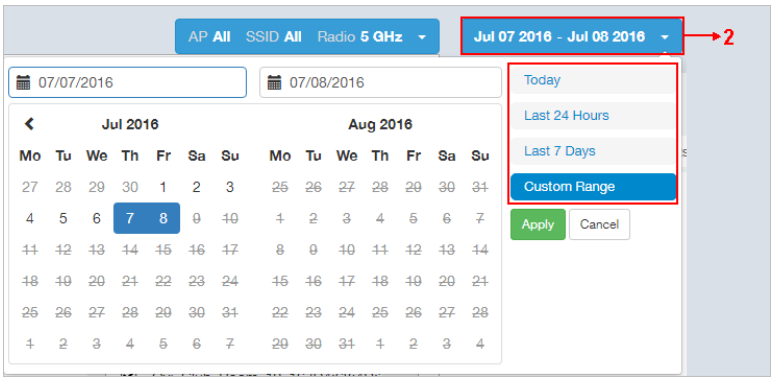
  Follow these steps to:

  1. Choose the AP, SSID and Radio filters
  2. Click the **Save** button to save your selections
  3. Use the **Reset Filter** button to clear the previous selections.

.

Date Filter

FIGURE 12 Custom Date Filter



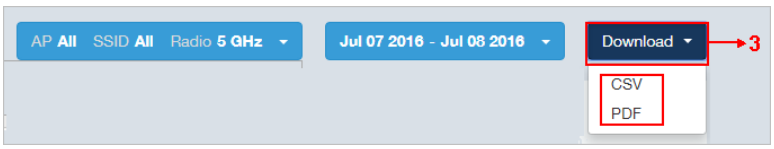
Custom Date Select a date range to update the dashboard. You can plot time for a certain period which could be today, last 24 hours, last 7 days, or a custom range (default value). This filter is numbered as **2** in the figure above.

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

Download

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

FIGURE 13 Download option



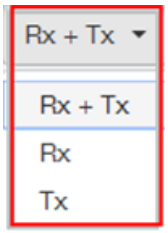
This filter (numbered **3** in the figure above) is available on most dashboards.

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 14 Rx+Tx filter



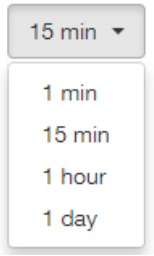
Select the Rx+Tx (default value), Rx, or Tx operating ranges. This filter can be used in the Network, WLAN and Application dashboards.

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 15 Time filter

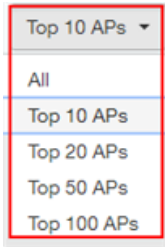


Specify the time frame of 1 minute, 15 minutes (default value), 1 hour or 1 day for applicable dashboards.

AP Filters

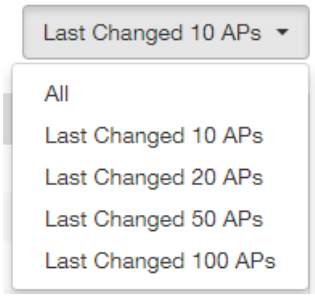
AP filters for various dashboards.

FIGURE 16 Top 100 APs



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

FIGURE 17 Last Changed 10 APs

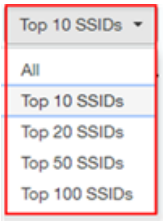


Specify the changed APs to display; the default is 10.

SSID Filter

SSID filter for WLAN dashboard.

FIGURE 18 SSID filter

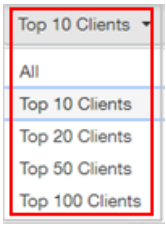


Specify the SSID filter of top 10 (default value), 20, 50, or 100 SSIDs for WLAN traffic and client sections.

Client Filter

Use the Client filter for determining client usage.

FIGURE 19 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:

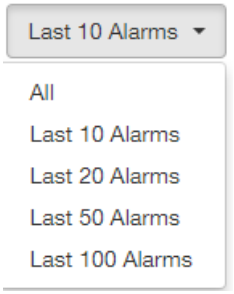
FIGURE 20 Application filter

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.

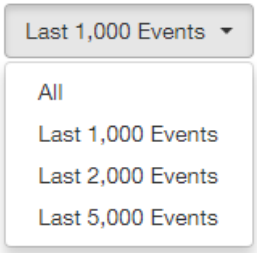
FIGURE 21 Alarms Filter



Events Filter

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

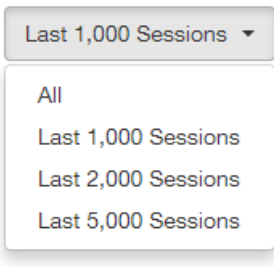
FIGURE 22 Events Filter



Sessions Filter

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

FIGURE 23 Sessions Filter



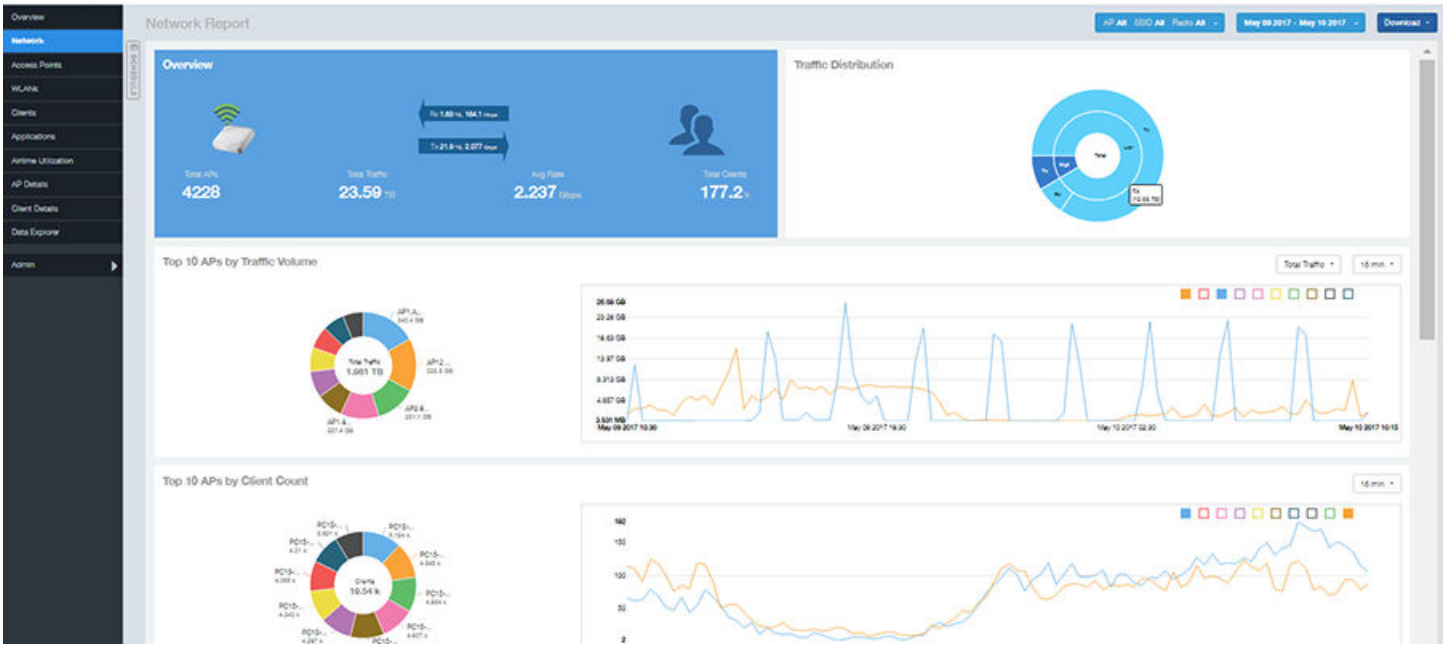
Network Report Dashboard

Network Report

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

The following figure shows only the upper portion of the Network report that appears when you click **Network** on the navigation bar.

FIGURE 24 Network Report (upper portion)



The Network report consists of eight sections, and they are described in the table below. Figures showing each of these sections appear later.

1	Overview	Contains the total traffic and the total clients on the network. It also contains the received and transmitted traffic between them.
2	Traffic Distribution	Contains the distribution of traffic in terms of size.

3	Top 10 APs by Traffic Volume	A pie chart and graph contain the top APs with the largest traffic volume in the network, along with the received and transmitted traffic volumes.
4	Top 10 APs by Client Count	A pie chart and graph contain the top APs by client count in the network, along with the received and transmitted traffic volumes.
5	Top APs by Traffic	A table contains the top APs with the largest traffic volume in the network.
6	Top APs by Client	A table contains the top APs by client count in the network.
7	Traffic Trend	A graph displays the traffic by usage and radio, and also the corresponding average traffic rate.
8	Traffic Over Time	A table tracks the traffic on the network based on time and other components.

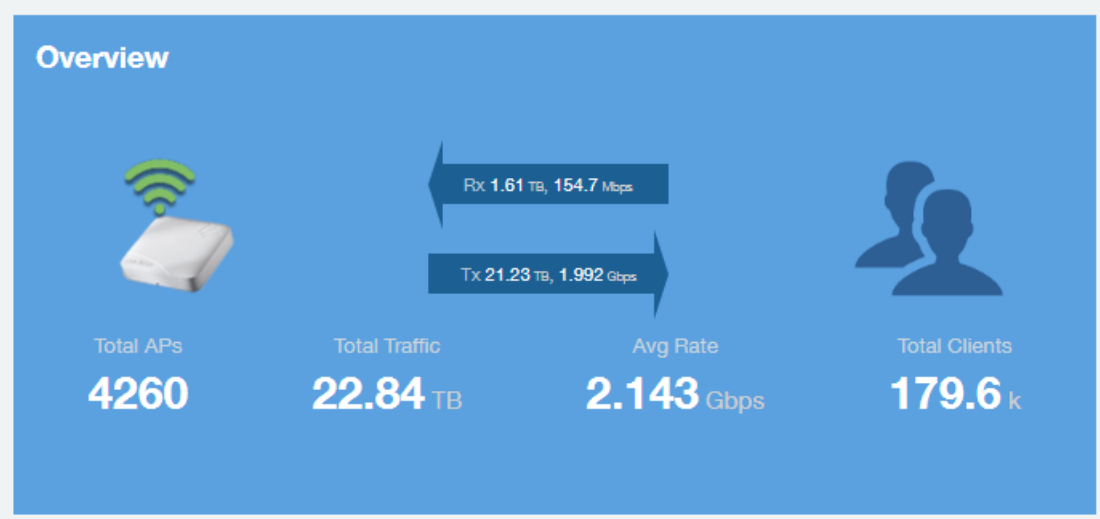
Network - Overview

The Network Overview section of the Network report provides a general overview of the entire network.

The Network Overview section displays the following, based on your selection of AP, SSID and Radio and Date Range filters:

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

FIGURE 25 Network - Overview



Network - Traffic Distribution

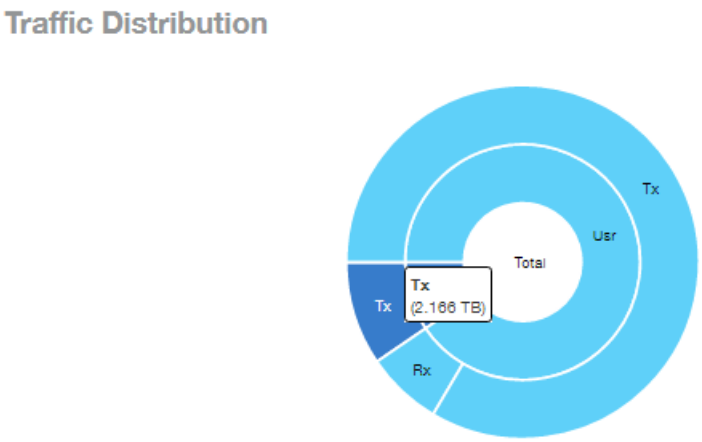
The Traffic Distribution pie chart of the Network report displays the distribution of traffic types.

Use this chart to display management traffic vs. 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 26 Network - Traffic Distribution



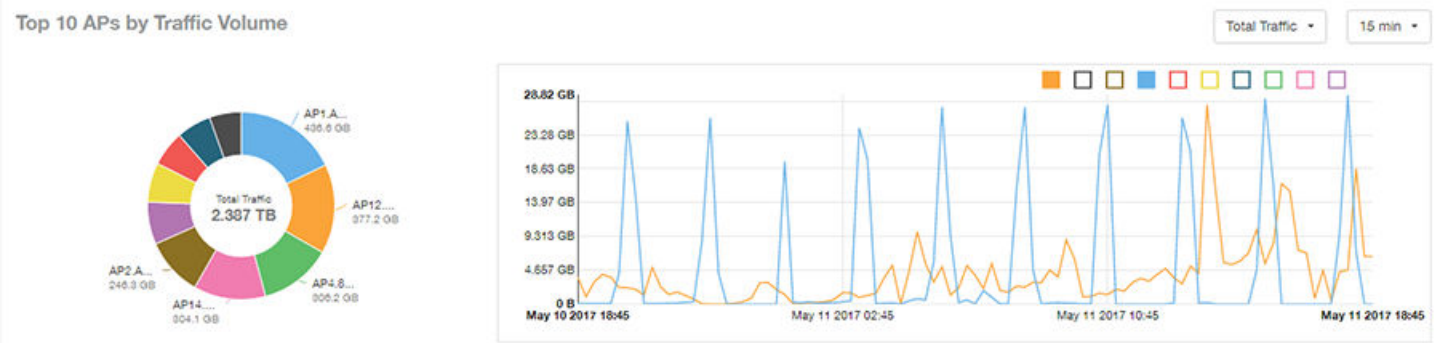
Network - Top 10 APs by Traffic Volume

The Top 10 APs by Traffic Volume chart and graph of the Network report display the highest-traffic APs.

Use the drop-down menus to specify the traffic type (Tx, Rx, or Tx+Rx) and the time granularity. Click any of the colored squares to toggle display of the AP in the line graph.

> NOTE
> The **Rx+Tx** drop-down menu applies to both the pie chart and the line graph, but the time granularity applies to the line graph only. This applies to all sections in all reports that appear in this format (pie chart + line graph with Rx/Tx + time granularity menus).

FIGURE 27 Network - Top 10 APs by Traffic Volume



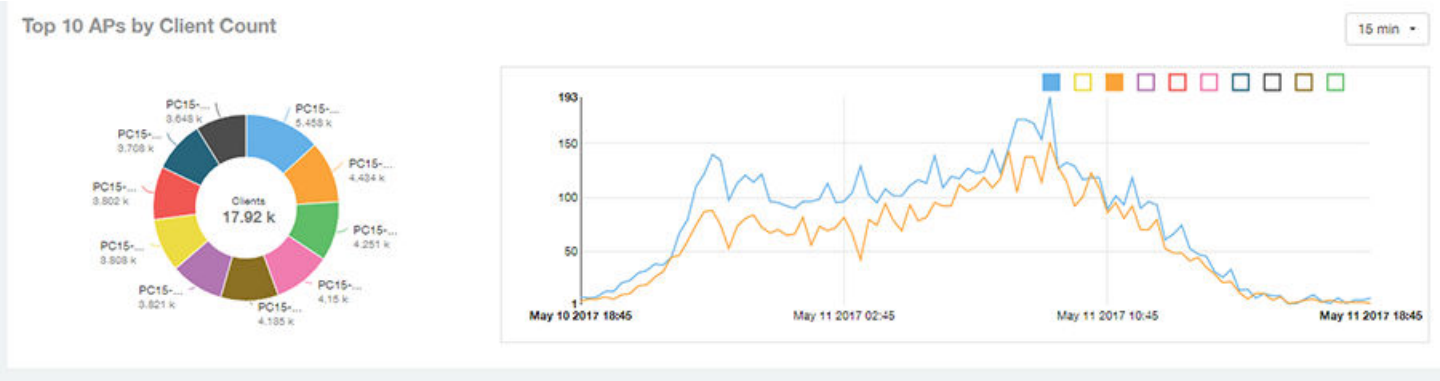
NOTE
If you hover over the line graph, a pop-up appears containing the selected AP details.

Network - Top 10 APs by Client Count

The Top 10 APs by Client Count pie chart and graph display the APs with the most clients on your network.

Use the drop-down menu to specify the time granularity of 15 minutes, 1 hour or 1 day. If you hover over the line graph a pop-up appears containing the details on the selected data points. Click any of the colored squares to toggle display of the AP in the line graph.

FIGURE 28 Network - Top 10 APs by Client Count



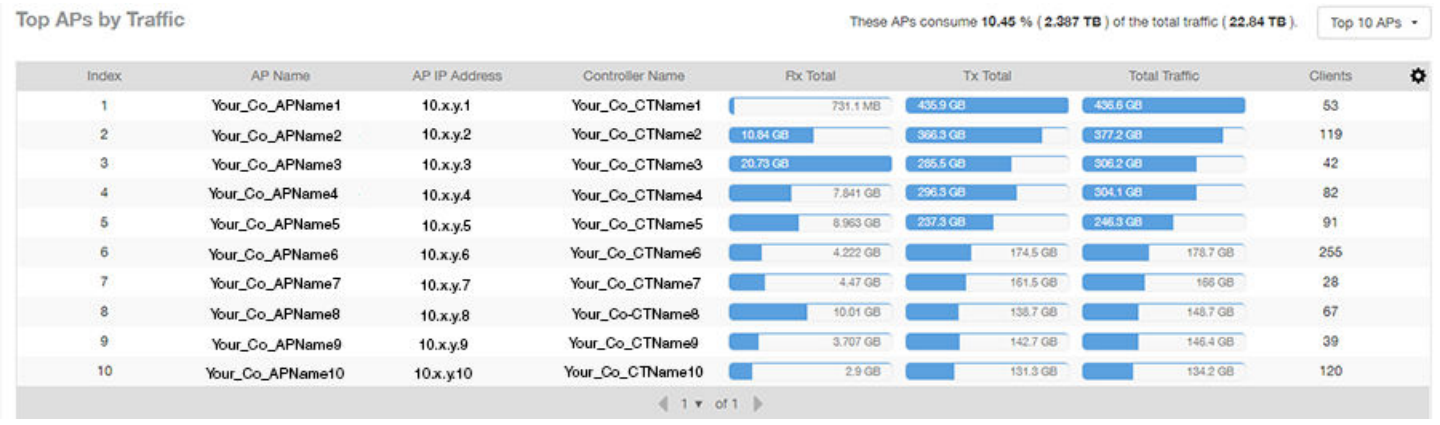
Network - Top APs by Traffic Volume (Table)

The Top APs by Traffic table lists the APs with the highest traffic volume in the network.

Use this table to view a list the top APs with the highest traffic volume, sorted according to the selected columns. Click the gear icon to select which columns to display, or click any column heading to sort by that column.

You can also select whether to display the top 10, 20, 50, or 100 APs by traffic volume from the Top APs filter. The number of rows per page can be defined using the **Rows per page** option in the table settings drop down list.

FIGURE 29 Network - Top APs by Traffic

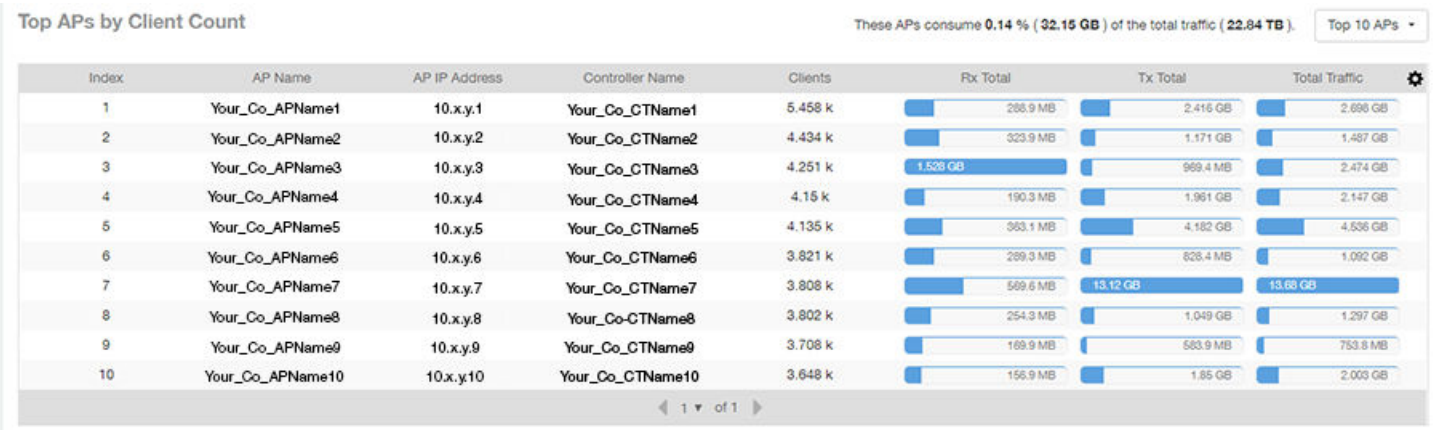


Network - Top APs by Client Count (table)

The Top APs by Client Count table of the Network report displays the APs with the most clients in the network.

Click the gear icon to view the list of table columns, or click any column heading to sort by that column. You can also select the top 10, 20, 50, or 100 APs by client count. The number of rows in a page is defined by the Rows per Page list in the table settings drop-down list.

FIGURE 30 Network - Top APs by Client



Network - Traffic Trend

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

If you hover over the line graph, a pop-up appears 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, - namely by user, total received traffic, total transmitted traffic, the total received and transmitted traffic, and the management traffic. You can also select a date range to view this date on the line graph. You can also specify the time granularity increment.

Traffic by Radio: You can select the traffic by radio details from the check boxes listed in the legend on top of the graph - namely by 5GHz, 2.4GHz, or/and view the total traffic by radio details. You can also select a date range to view this date on the line graph. This also applies to the corresponding average traffic rate graphs.

FIGURE 31 Network - Traffic Trend

Network - Traffic Over Time

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

Click the gear icon to select/deselect columns to display, or click any column heading to sort by that column.

FIGURE 32 Network - Traffic Over Time

Access Points Report Dashboard

Access Points Report

The Access Points report provides details on AP inventory, AP reboots, AP software version, AP models and AP Alarms.

The following figure shows only the upper portion of the Access Points dashboard that appears when you click **Access Points** on the navigation bar.

FIGURE 33 Access Points Dashboard (upper portion)

The Access Points report consists of 16 sections, which are listed in the table below. Figures showing each of these sections appear later.

NOTE

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

1	Overview	Contains an overview of the AP inventory – how many APs are connected, how many reboots, and so on.
2	Top 10 APs By Offline Duration (graph)	Contains the APs that have been disconnected over a specified duration.
3	AP Count Trend	A pie chart and graph show the number of available APs on the network based on the total number of APs and its online status.
4	AP Status Trends	A line chart shows the trend of various AP statuses such as online, offline, provisioned, discovery and so on.
5	Top 10 AP Models	A pie chart and graph contain the top APs models by count in the network, along with the trend of APs models over a specified time frame.
6	Top 10 AP Software Versions	A pie chart and graph contain the top APs software versions by AP count in the network, along with the trend of APs software versions over a specified time frame.
7	Top 10 AP Reboot Reasons	A pie chart and graph list the most common reasons why the APs in your network have restarted over a specified time frame.
8	Top 10 APs by Reboot Counts	A pie chart and graph contain the top APs that restarted, along with the APs based on the number of restart over a specified time frame.
9	Top 10 AP Alarm Types	A pie chart and graph contain the Top 10 Alarm types that have been generated, along with number of occurrences generated over a specified time frame.
10	Top AP Models	A table lists the distribution of AP models in the network.
11	Top AP Software Versions	A table lists the top AP software versions.
12	Top APs by Offline Duration (table)	A table lists the APs that are offline over a specified time.
13	Top APs by Reboot Count	A table lists the APs that have restarted over a specified time.
14	APs Configured in Multiple Systems	A table lists APs that have been associated with multiple controllers.

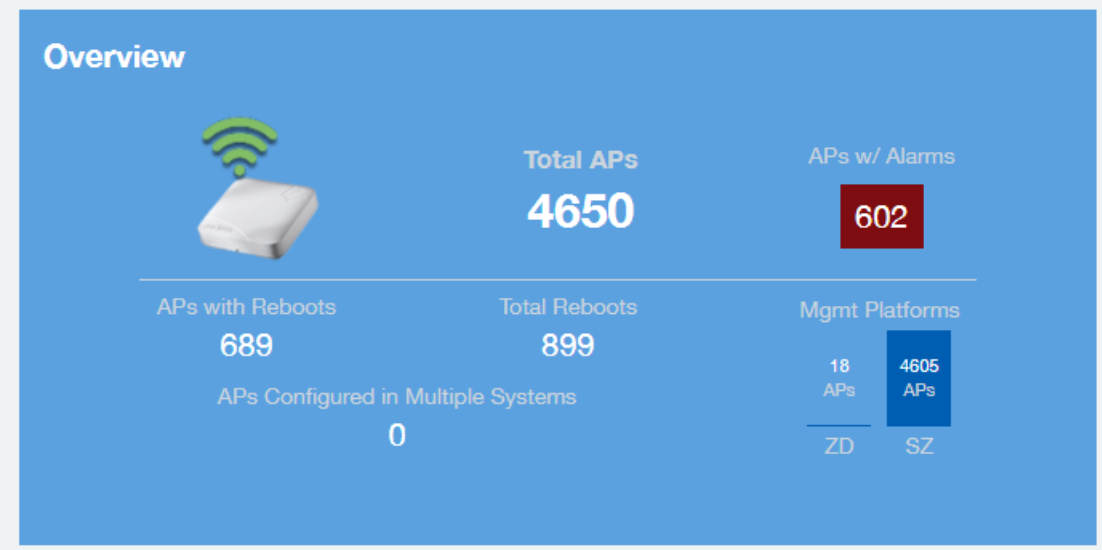
15	AP Details for Online/Offline Status	A table lists the APs on the network based on its online or offline status with AP name, IP address, location, model, controller and status.
16	AP Details for Other Statuses	A table lists the APs on the network based on AP name, IP address, location, model, controller and status

Access Points - Overview

The Access Points overview section provides a general overview of the APs on the network.

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

- Total APs
- APs with alarms
- APs with reboots
- Total reboots
- Management Platforms
- APs configured in multiple controllers

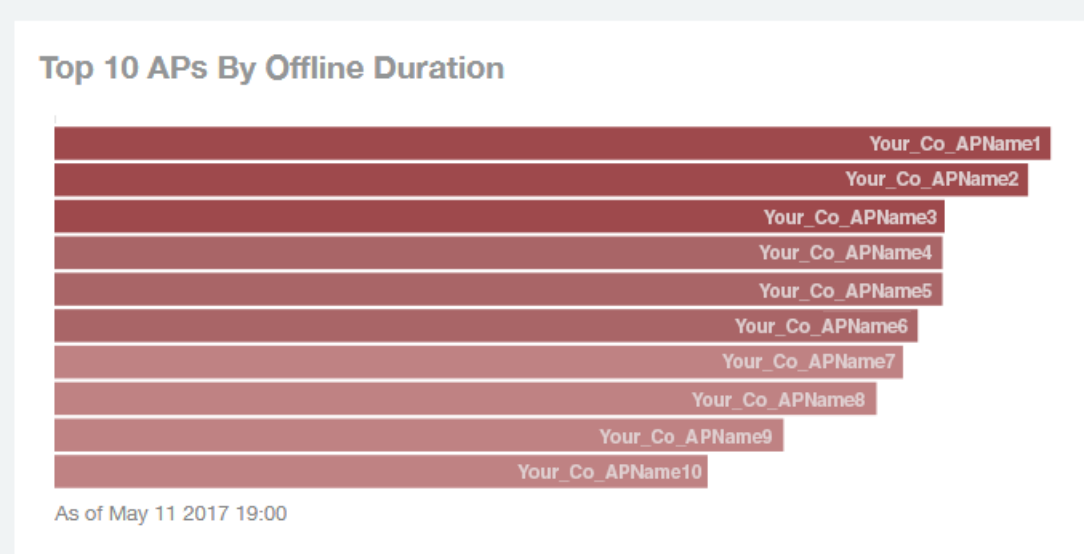


Access Points - Top 10 APs by Offline Duration

The Top 10 APs by Offline Duration chart of the Access Points report displays the top 10 APs in the network that have been disconnected for the longest duration.

Use the drop-down menu to specify the time granularity. If you hover over the line graph, a pop-up appears containing the details on the selected data points.

FIGURE 34 Access Points - Top 10 APs by Offline Duration



Access Points - Count Trend

The Count Trend graph of the Access Points report depicts how many access points in your network are being utilized over time.

To show access points being used over certain time periods, use the drop-down menu to specify the time granularity. If you hover over the line graph and pie chart, a pop-up appears containing the details on the selected data points. Click any of the colored squares to toggle the display of the AP in the line graph.

FIGURE 35 Access Points - Count Trend

Access Points - Status Trends

The Status Trends pie chart and graph of the Access Points report display the top APs by connection and uptime status, such as online, offline, provisioned, discovery and other classifications.

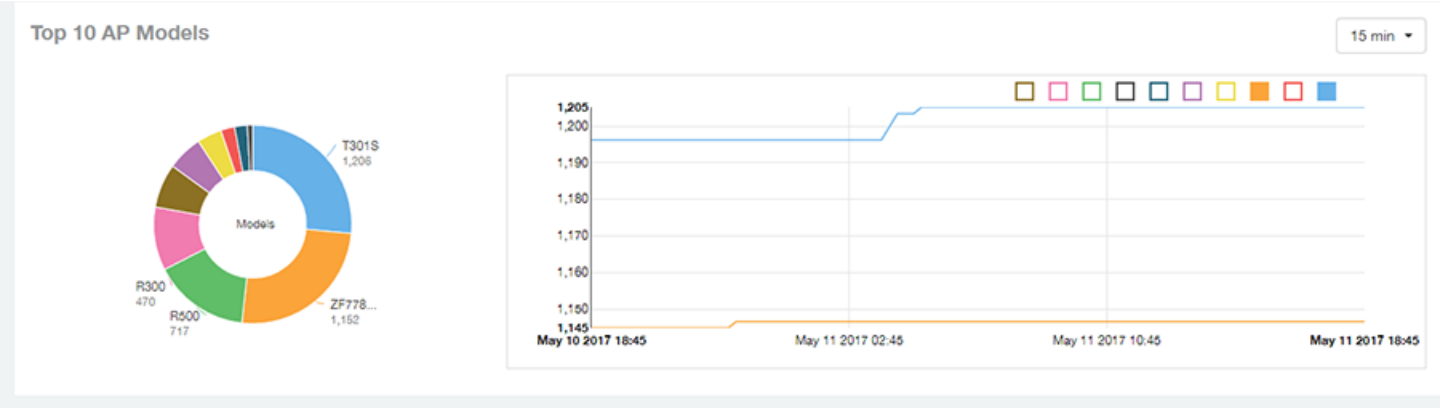
Use the drop-down menu to specify the time granularity. If you hover over the line graph and pie chart, a pop-up appears containing the details on the selected data points. Click any of the colored squares to toggle display of the AP in the line graph.

Access Points - Top 10 AP Models

The Top 10 AP Models pie chart and line graph display the model type being used most often in your network.

Use the drop-down menu to specify the time granularity. If you hover over the line graph and pie chart, a pop-up appears containing the details on the selected data points. Click any of the colored squares to toggle display of the AP in the line graph.

FIGURE 36 Access Points - Top 10 AP Models

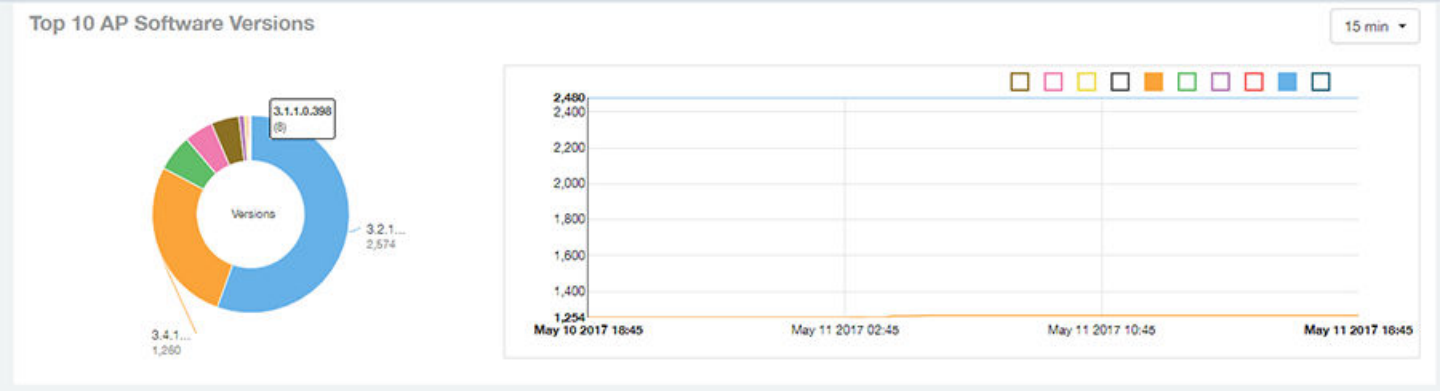


Access Points - Top 10 AP Software Versions

The Top 10 AP Software Versions pie chart and graph display the top 10 APs based on which software versions are being most frequently used in your network.

Use the drop-down menu to specify the time granularity. If you hover over the line graph or the pie chart, a pop-up appears containing the details on the selected data points. Click any of the colored squares to toggle display of the AP in the line graph.

FIGURE 37 Access Points - Top 10 AP Software Versions

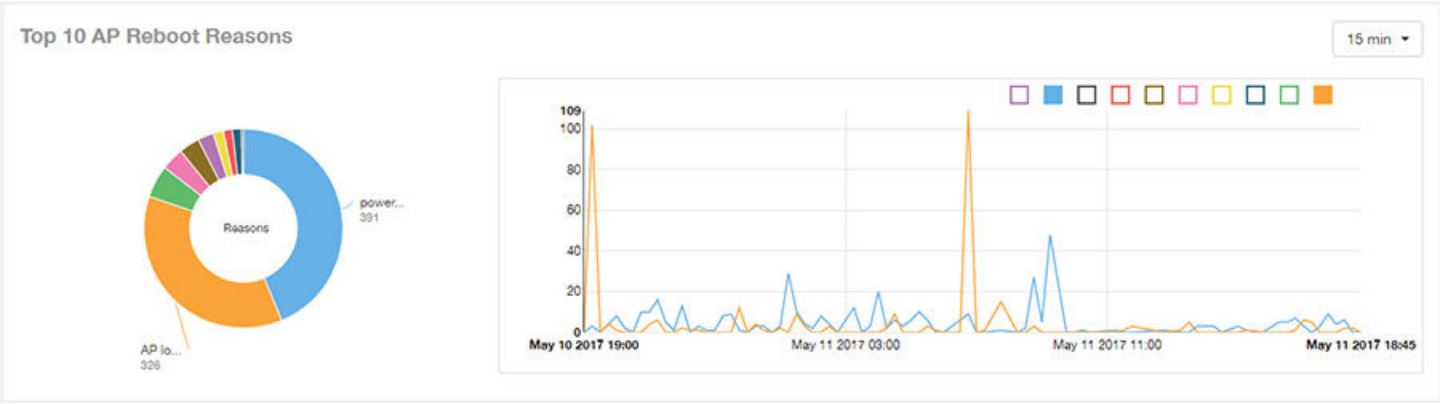


Access Points - Top 10 AP Reboot Reasons

The Top 10 AP Reboot Reasons pie chart and graph of the Access Points report display the 10 most common reasons why APs in your network that have rebooted.

Use the drop-down menu to specify the time granularity. If you hover over the line graph and pie chart, a pop-up appears containing the details on the selected data points. Click any of the colored squares to toggle display of the AP in the line graph.

FIGURE 38 Access Points - Top 10 AP Reboot Reasons

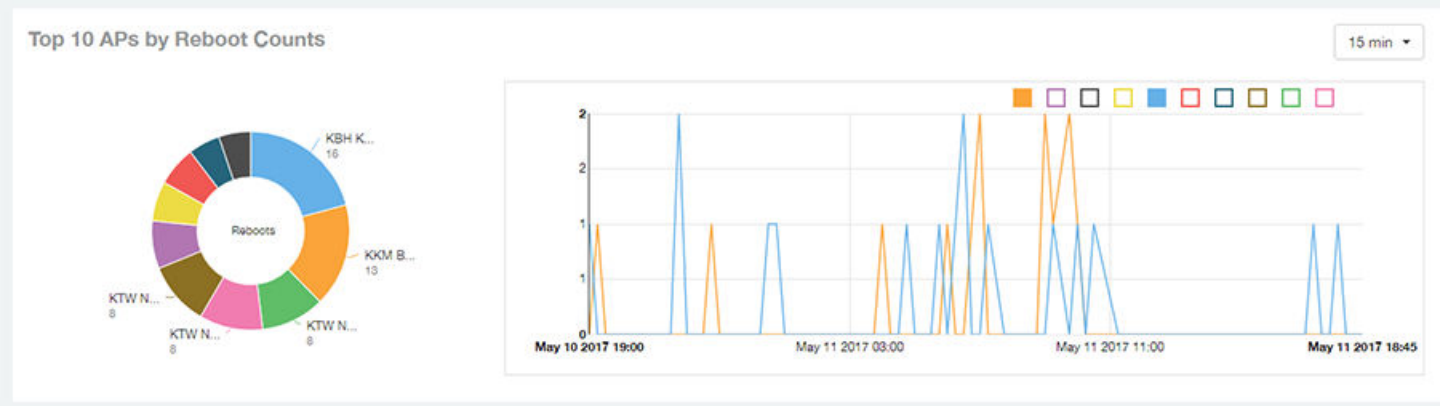


Access Points - Top 10 APs by Reboot Counts

The Top 10 APs by Reboot Counts pie chart and line graph of the Access Points report display the top 10 APs in your network that have rebooted most frequently.

Use the drop-down menu to specify the time granularity. If you hover over the line and pie graph, a pop-up appears containing the details on the selected data points. Click any of the colored squares to toggle display of the AP in the line graph.

FIGURE 39 Access Points - Top 10 APs by Reboot Counts

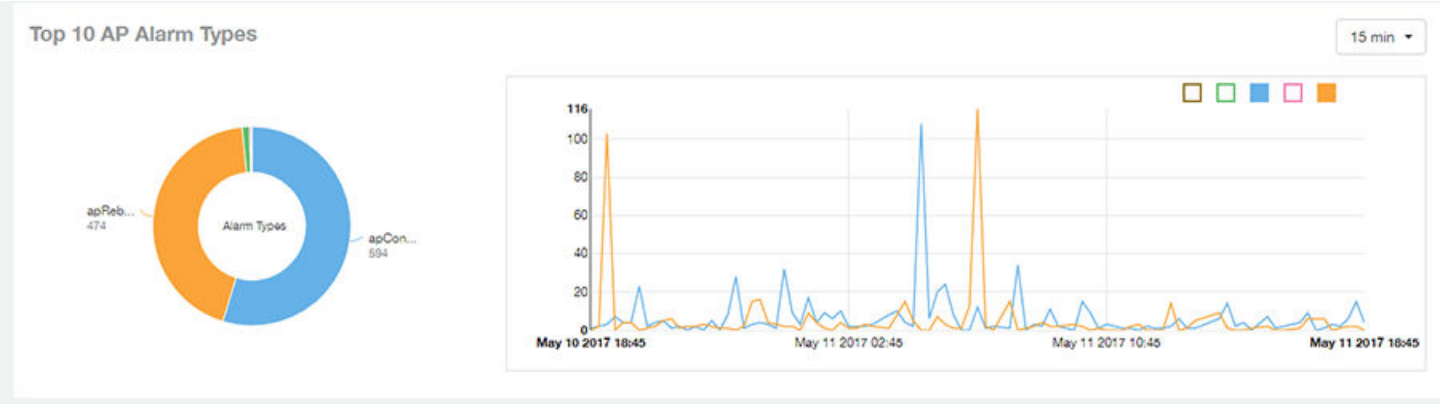


Access Points - Top 10 AP Alarm Types

The Top 10 AP Alarm Types pie chart and line graph of the Access Points report display the 10 alarm types most that have most frequently occurred to access points in your network.

Use the drop-down menu to specify the time granularity. If you hover over the line graph, a pop-up appears containing the details on the selected data points. Click any of the colored squares to toggle display of the AP in the line graph.

FIGURE 40 Access Points - Top 10 AP Alarm Types

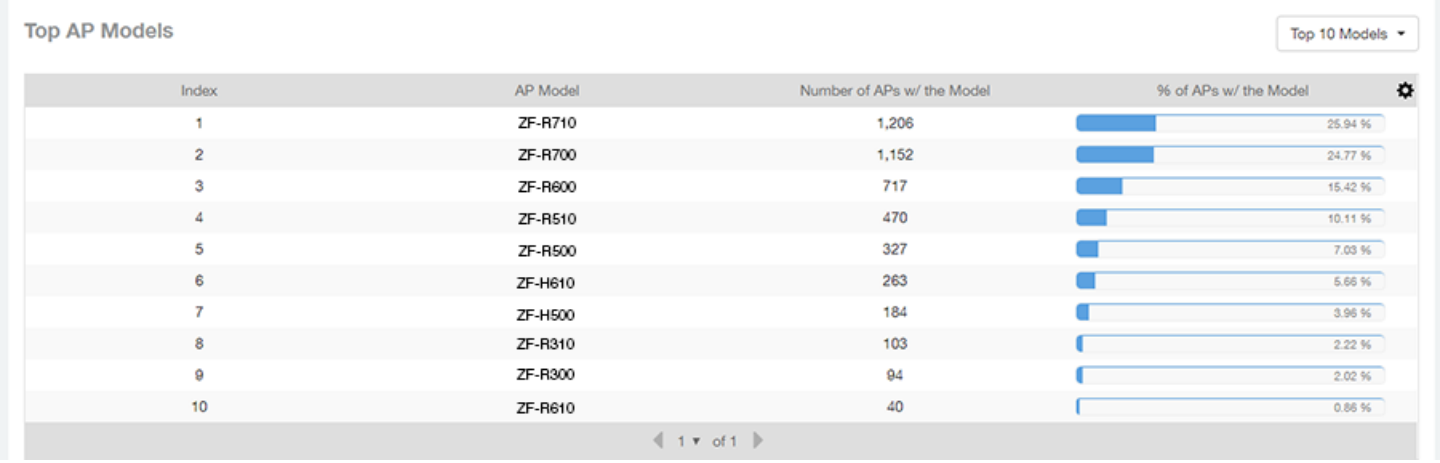


Access Points - Top AP Models (table)

The Top AP Models table of the Access Points report displays the model type being used most often by the APs in your network.

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

FIGURE 41 Access Points - Top AP Models

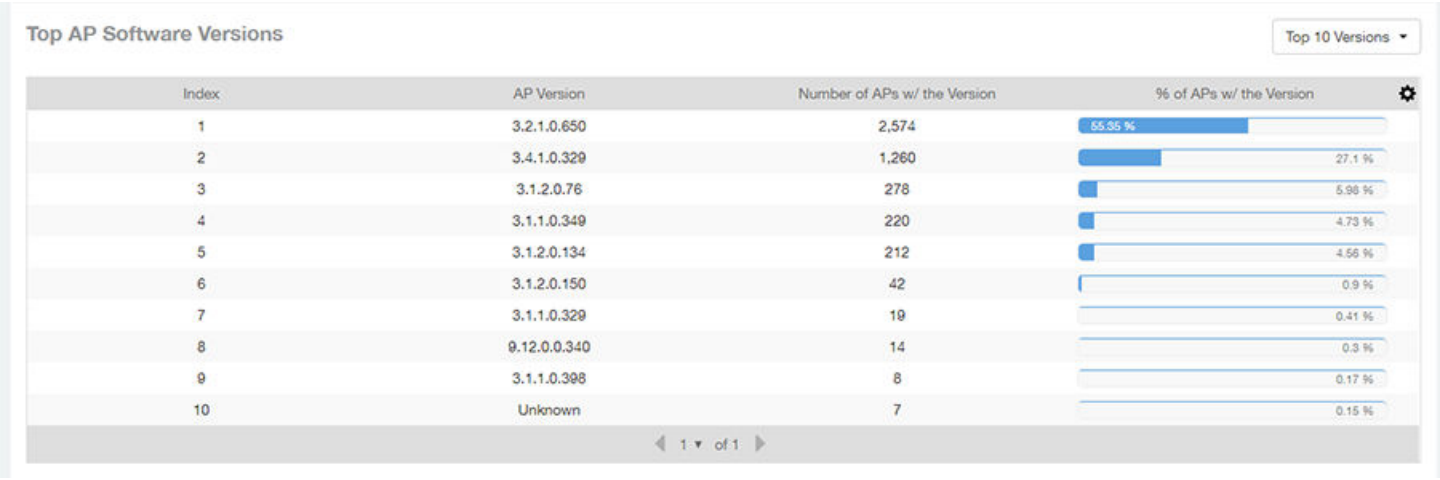


Access Points - Top AP Software Versions (table)

The Top AP Software Versions table of the Access Points report displays the AP software versions most frequently used in your network and the number of APs using each version.

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

FIGURE 42 Access Points - Top AP Software Versions



Top AP Software Versions — Top 10 Versions

Index	AP Version	Number of APs w/ the Version	% of APs w/ the Version
1	3.2.1.0.650	2,574	55.35 %
2	3.4.1.0.329	1,260	27.1 %
3	3.1.2.0.76	278	5.98 %
4	3.1.1.0.349	220	4.73 %
5	3.1.2.0.134	212	4.56 %
6	3.1.2.0.150	42	0.9 %
7	3.1.1.0.329	19	0.41 %
8	9.12.0.0.340	14	0.3 %
9	3.1.1.0.398	8	0.17 %
10	Unknown	7	0.15 %

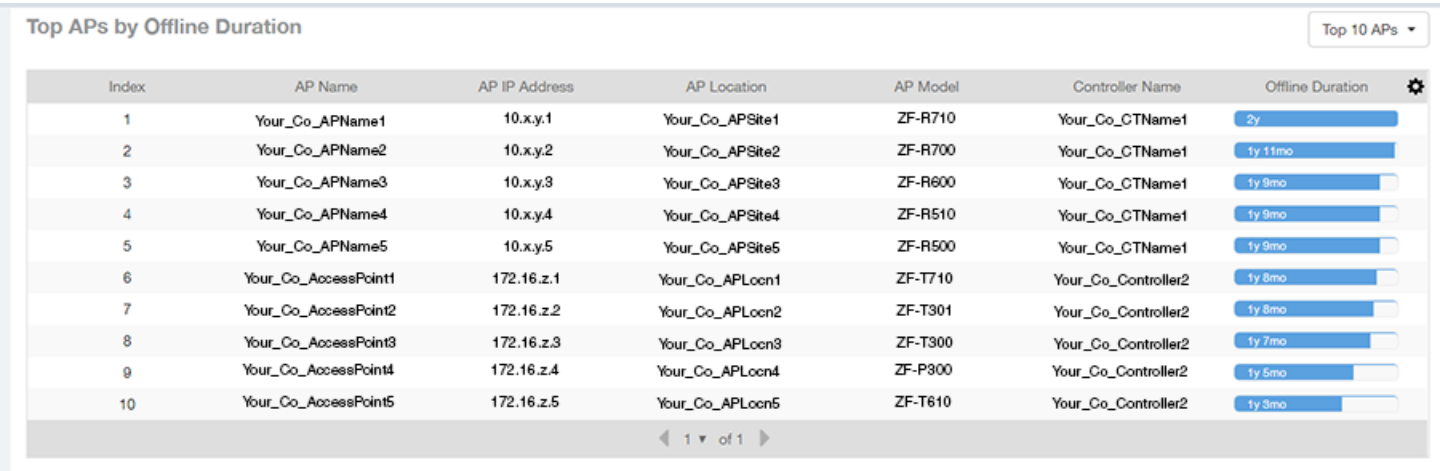
1 ▾ of 1

Access Points - Top APs by Offline Duration (table)

The Top APs by Offline Duration table of the Access Points report displays the top APs based on which ones have been offline for the longest duration, with details of AP name, IP address, location, model, controllers and duration in a tabular format.

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

FIGURE 43 Access Points - Top APs by Offline Duration



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

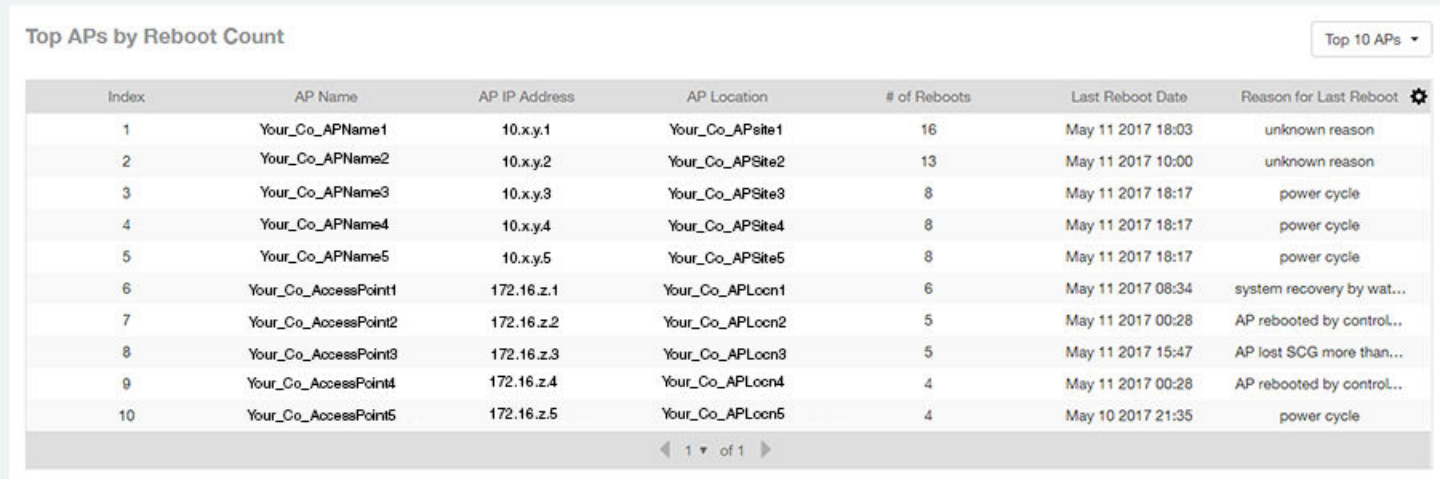
1 ▾ of 1

Access Points - Top APs by Reboot Count

The Top AP by Reboot Count table of the Access Points report displays the APs that have rebooted the most times, and includes AP name, IP address, location, number of reboots, last reboot date and reason.

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

FIGURE 44 Access Points - Top AP by Reboot Count



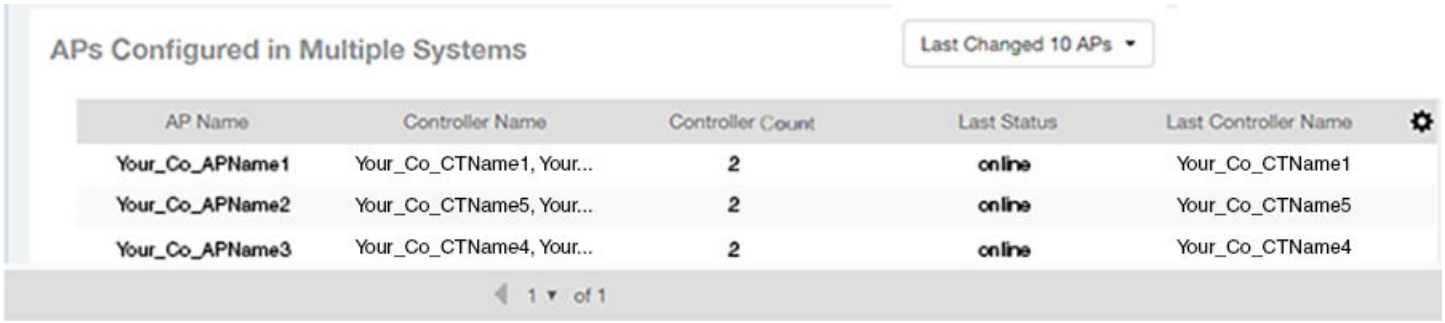
Access Points - APs Configured in Multiple Systems

The APs Configured in Multiple Systems table of the Access Points report shows you information about APs that have been associated with more than one controller.

In the Controller Name field, 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.

The table is sorted on the top AP model by default. Click any column heading to sort by that value. You can also select the top 10 (default value), 20, 50, or 100 clients to display, or display all AP models. 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 45 Access Points - APs Configured in Multiple Systems

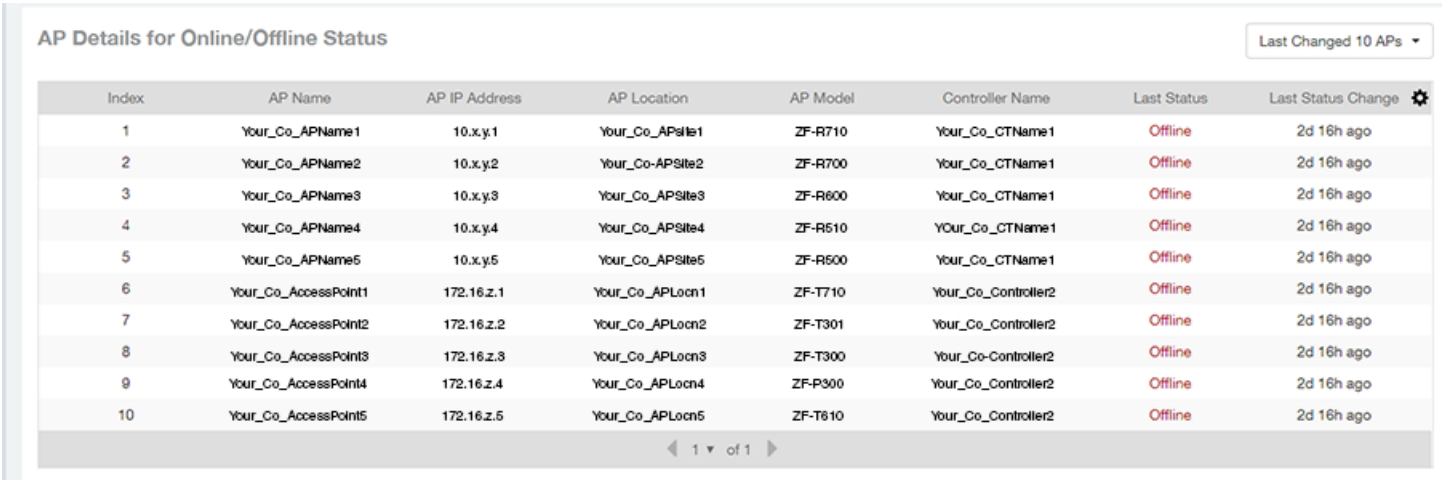


Access Points - AP Details for Online/Offline Status

The AP Details for Online/Offline Status table of the Access Points 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 list of columns to display. The table is sorted on the top AP model by default. Click any column heading to sort by that value. You can also select the top 10 (default value), 20, 50, or 100 clients to display, or display all AP models. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 46 Access Points - AP Details for Online/Offline Status

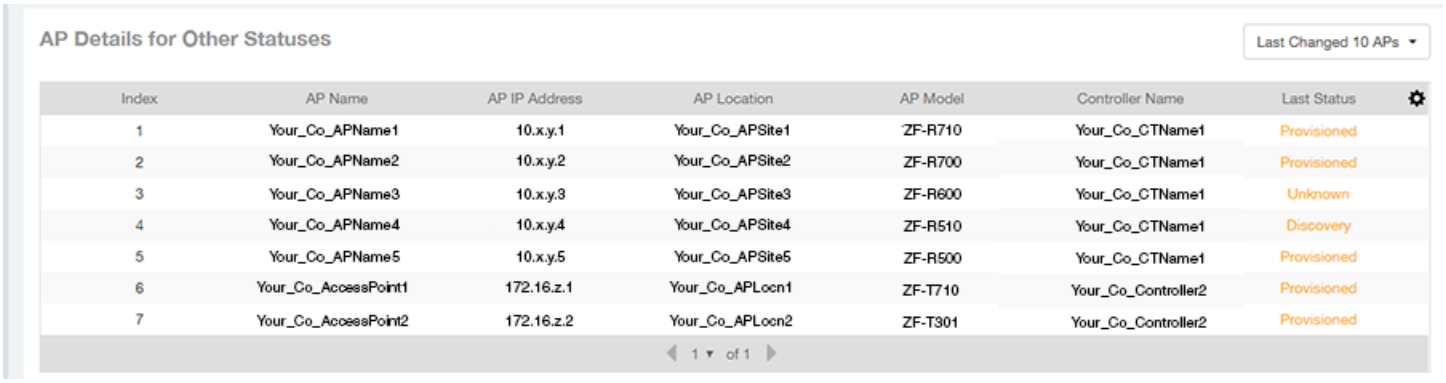


Access Points - AP Details for Other Statuses

The AP Details for Other Statuses table of the Access Points report displays the details for APs that are currently in a status other than online or offline.

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

FIGURE 47 Access Points - AP Details for Other Statuses



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

WLANs Report Dashboard

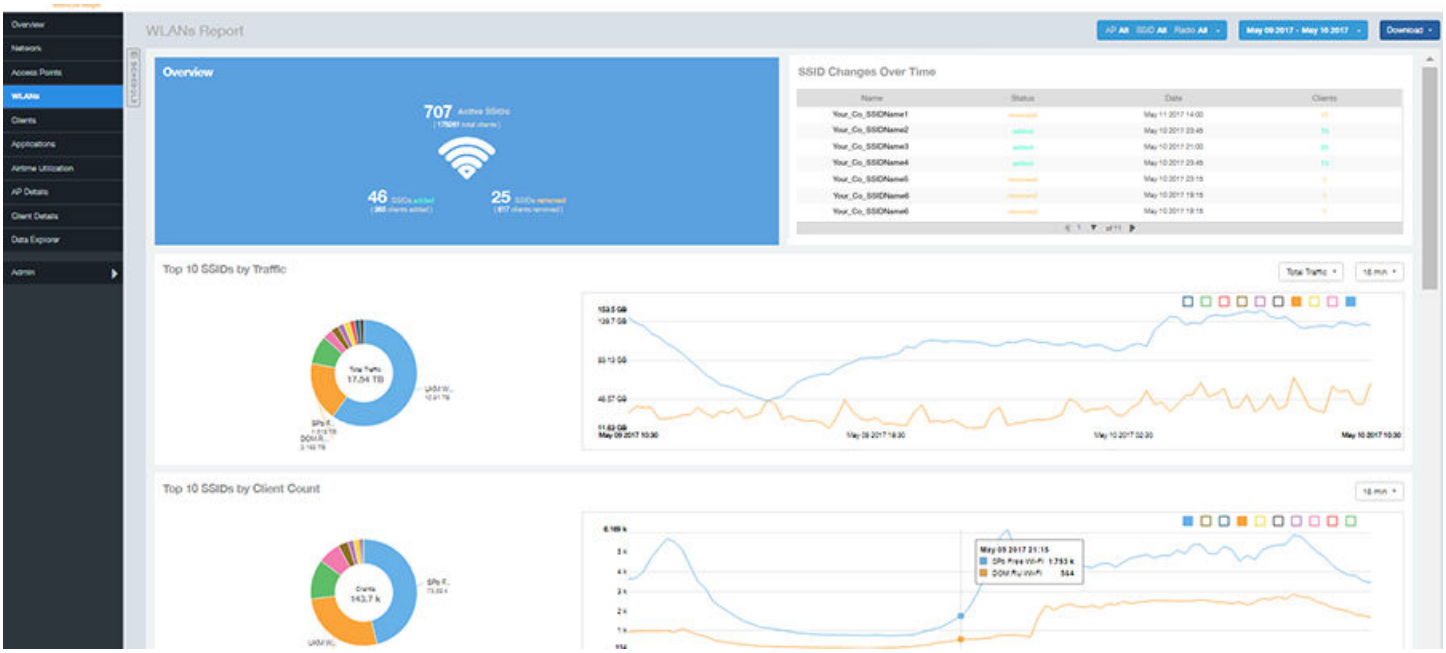
WLANs Report

The Wireless LANs report contains information about the SSIDs added as well as which are active or have been removed.

The report also includes details about SSID changes over time, SSIDs by received and transmitted traffic, client count over a time range and trend of the SSIDs based on traffic count and volume. The WLANs report allows you to filter the information based on APs, SSID and Radio, day and date and Rx+Tx filters. You can also customize the table reports be selecting the list of available components for each category.

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

FIGURE 48 WLANs Report (upper portion)



The WLANs report consists of seven sections, which are listed in the table below. Figures showing each of these sections appear later.

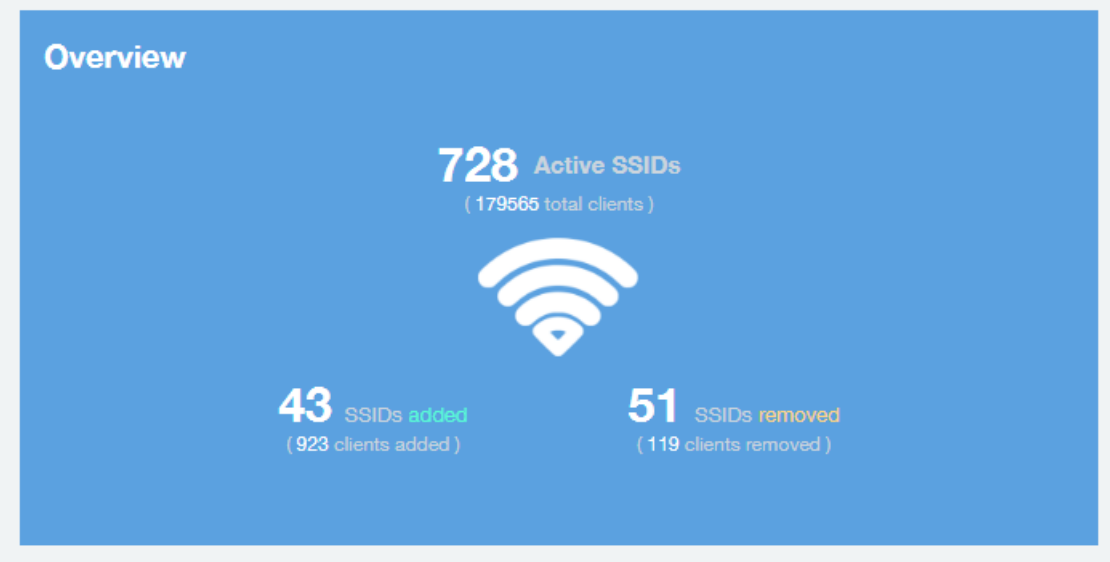
1	Overview	This report section contains the total number of active SSIDs, added and removed.
2	SSID Changes Over Time	A chart contains the SSID status, its last modified date and the number of clients associated to the SSID.

3	Top 10 SSIDs by Traffic	A pie chart and graph contain the top 10 SSIDs by traffic volume for received and transmitted traffic.
4	Top 10 SSID by Client Count	A pie chart and graph contain the top 10 SSIDs to show the most congested networks in terms of client count.
5	Active SSIDs Trends	The active SSID trend displays the traffic by SSID count and traffic volume.
6	Top SSIDs by Traffic (table)	This tabular report contains the top SSIDs with the largest traffic volume in the network as per the selected components.
7	Top SSIDs by Client (table)	The tabular report contains the top SSIDs by client count in the network as per the selected components.

WLANs - Overview

Thie Overview section of the WLANs report shows the total number of active SSIDs, and the number of added and removed SSIDs over the selected period.

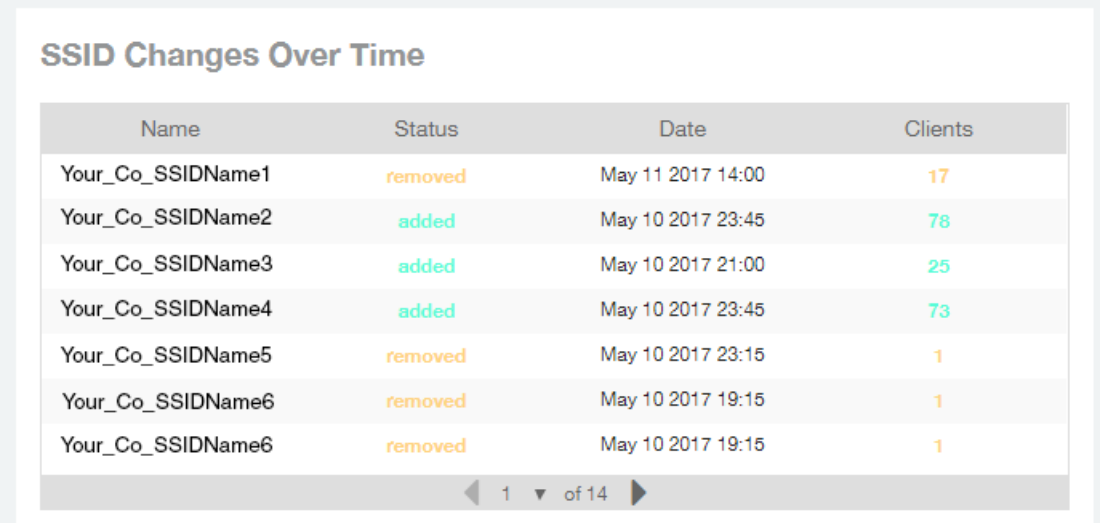
FIGURE 49 WLANs - Overview



WLANs - SSID Changes Over Time

The SSID Changes Over Time display of the WLANs report shows the most recent SSID changes.

FIGURE 50 WLANs - SSID Changes Over Time



WLANs -Top Ten SSIDs by Traffic

Use the Top 10 SSIDs by Traffic 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.

Click any of the colored squares to toggle display of the corresponding SSID. You can use the Total Traffic drop-down menu to choose whether to display transmitted data only, received data only, or total traffic.

FIGURE 51 WLANs - Top Ten SSIDs by Traffic

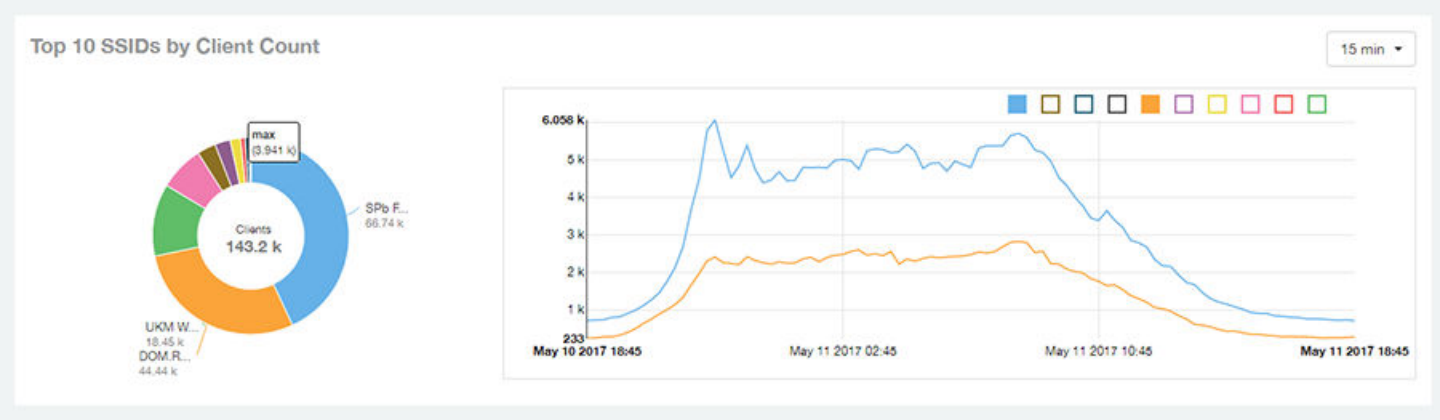
WLANs -Top Ten SSIDs by Client Count

Use the Top 10 SSIDs by Client Count pie chart and graph of the WLANs report to view which wireless networks are most congested in terms of client count, and to compare client counts over different time periods.

Click any of the colored squares to toggle the display of the corresponding SSID.

If you hover over the line graph a pop-up appears containing the selected SSID names and client counts at the chosen data point.

FIGURE 52 WLANs - Top Ten SSIDs by Client Count



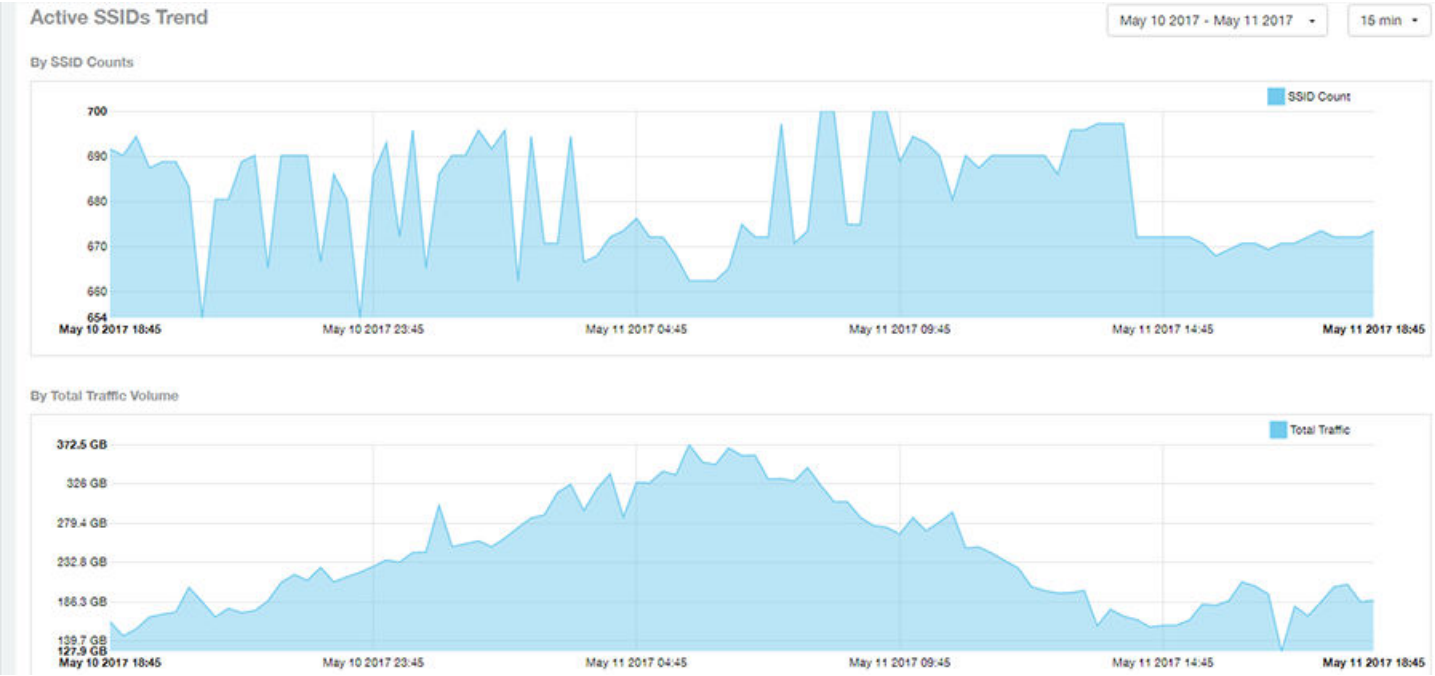
WLANs -Active SSIDs Trend

The Active SSIDs Trend graphs of the WLANs report contains two graphs: total number of SSIDs over time, and total traffic volume over time.

These graphs allow you to quickly view how many WLANs are active and what the total traffic volume is over time.

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

FIGURE 53 WLANs - Active SSIDs Trend Graphs



WLANs -Top SSIDs by Traffic (table)

The Top SSIDs by Traffic table of the WLANs report lists the top 10, 20, 50 or 100 SSIDs in the network by traffic volume.

You can sort the table by Total Traffic, Clients, AP count, or alphabetically by SSID name. Additionally, you can customize the table by clicking the gear icon and selecting from the list of columns. You can configure the number of rows per a page using the **Rows per Page** option in the table settings drop down menu.

You can also select whether to display only the top 10 (default value), 20, 50, or 100 SSIDs by traffic volume, or list all SSIDs.

FIGURE 54 WLANs - Top SSIDs by Traffic

Top SSIDs by Traffic

These SSIDs consume **73.15 %** (**16.71 TB**) of the total traffic (**22.84 TB**).

Top 10 SSIDs

Index	SSID Name	Rx Total	Tx Total	Total Traffic	Clients	APs
1	Your_Co_SSIDName1	584.3 GB	8.678 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	374.8 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

1 of 1

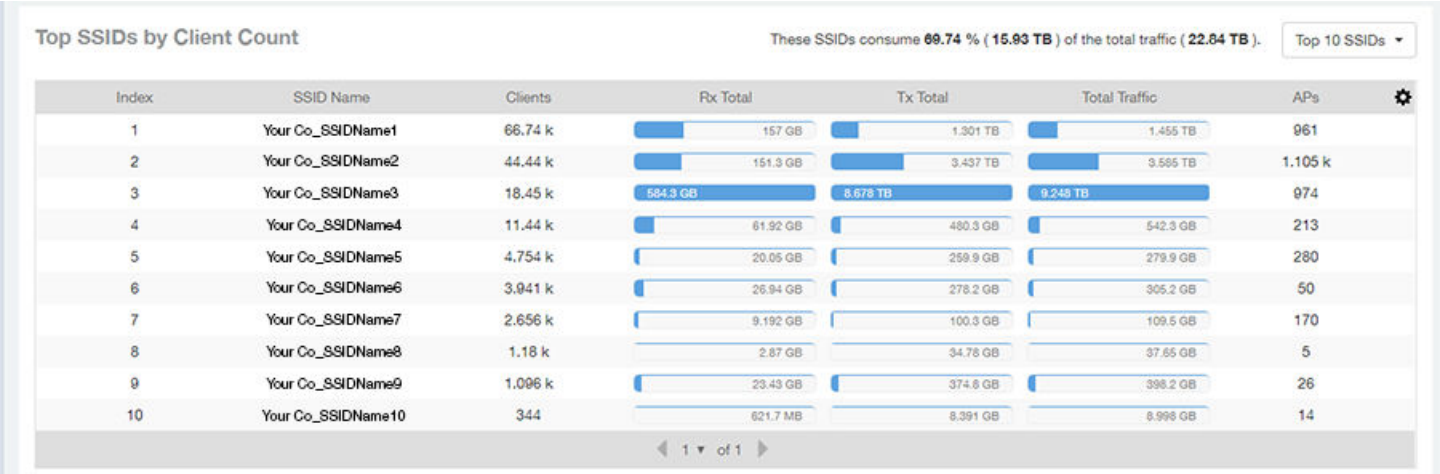
WLANs -Top SSIDs by Client Count (table)

The Top SSIDs by Client Count table of the WLANs report lists the top SSIDs by client count.

You can sort the table by Total Traffic, Clients, AP count, or alphabetically by SSID name. Additionally, you can customize the table by clicking the gear icon and selecting from the list of columns. You can configure the number of rows per a page using the **Rows per Page** option in the table settings drop down menu.

You can also select whether to display only the top 10 (default value), 20, 50, or 100 SSIDs by client count, or list all SSIDs.

FIGURE 55 WLANs - Top SSIDs by Client Count



Top SSIDs by Client Count

These SSIDs consume **69.74 %** (**15.93 TB**) of the total traffic (**22.84 TB**).

Top 10 SSIDs

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	3.585 TB	1.105 k
3	Your Co_SSIDName3	18.45 k	584.3 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	8.998 GB	14

1 of 1

Clients Report Dashboard

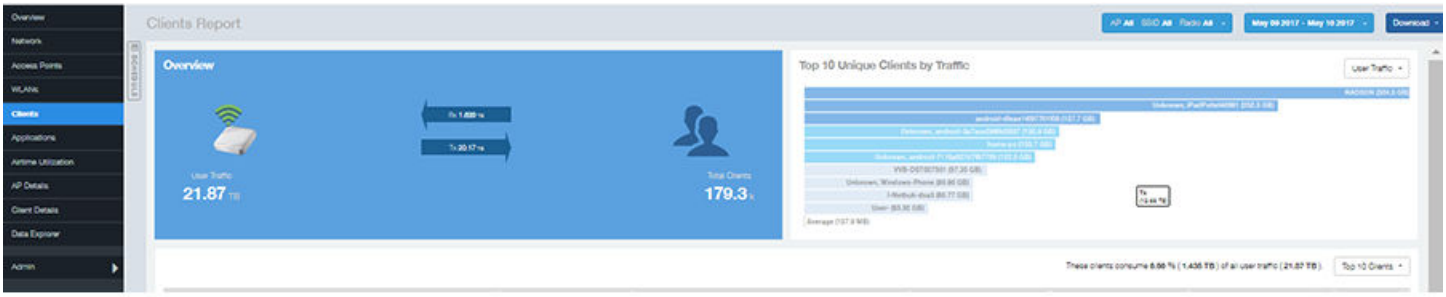
Clients Report

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.

The following figure shows only the upper portion of the Clients report that appears when you click **Clients** on the navigation bar.

FIGURE 56 Clients Report (upper portion)



The Clients report consists of five sections, which are listed in the table below. Figures showing each of these sections appear later.

1	Overview	Contains the total traffic and the total clients on the network. It also contains the received and transmitted traffic between them.
2	Top 10 Unique Clients by traffic	Contains the list of top 10 clients in terms of size of traffic.
3	Client details	Contains the client information and display the quantity of traffic consumed by the listed clients.
4	Unique Clients Trend over time (graph)	Displays the unique clients trend over time for client count and for traffic.
5	Unique Clients Trend over time (table)	Lists the unique clients trend over time.

Clients - Overview

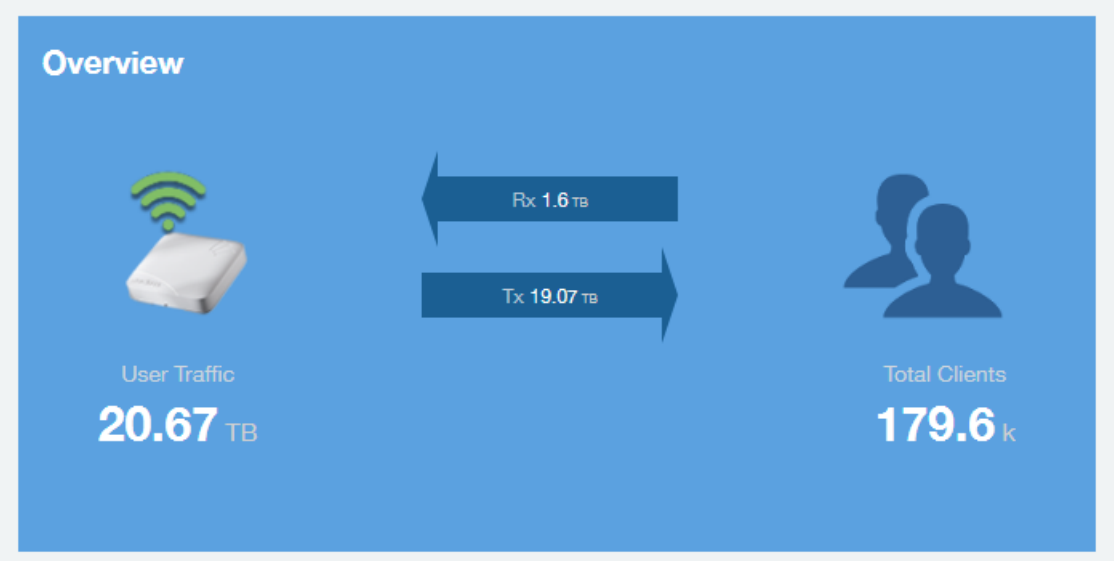
The Overview section of the Clients report provides information about the total traffic, both received and transmitted, and the total number of clients over the selected time period.

The Overview section contains the following:

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

This is based on your selection of AP/Radio and Date Range filters.

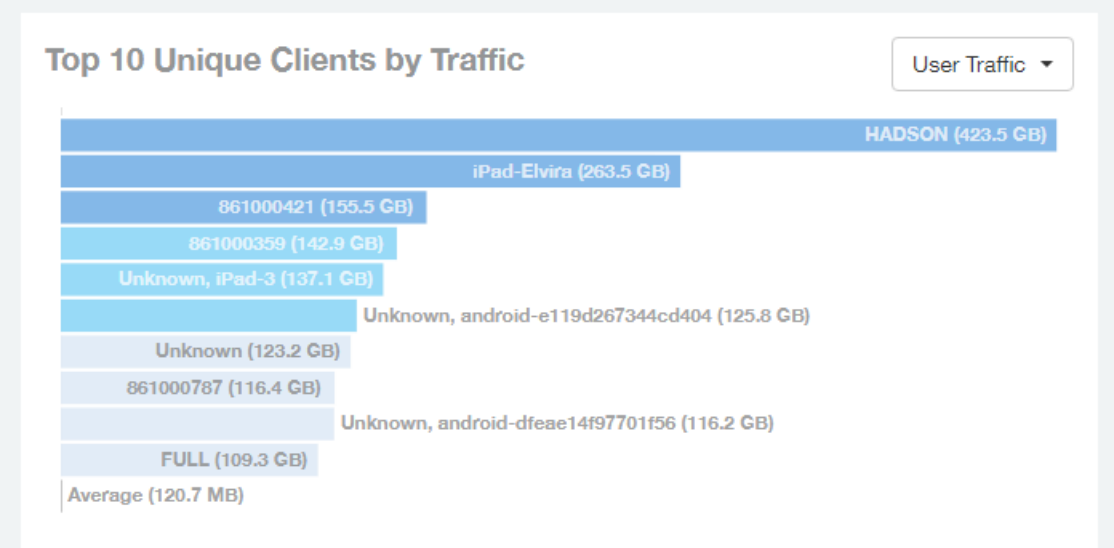
FIGURE 57 Overview



Clients - Top 10 Unique Clients by Traffic

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

FIGURE 58 Clients - Top 10 Unique Clients by Traffic

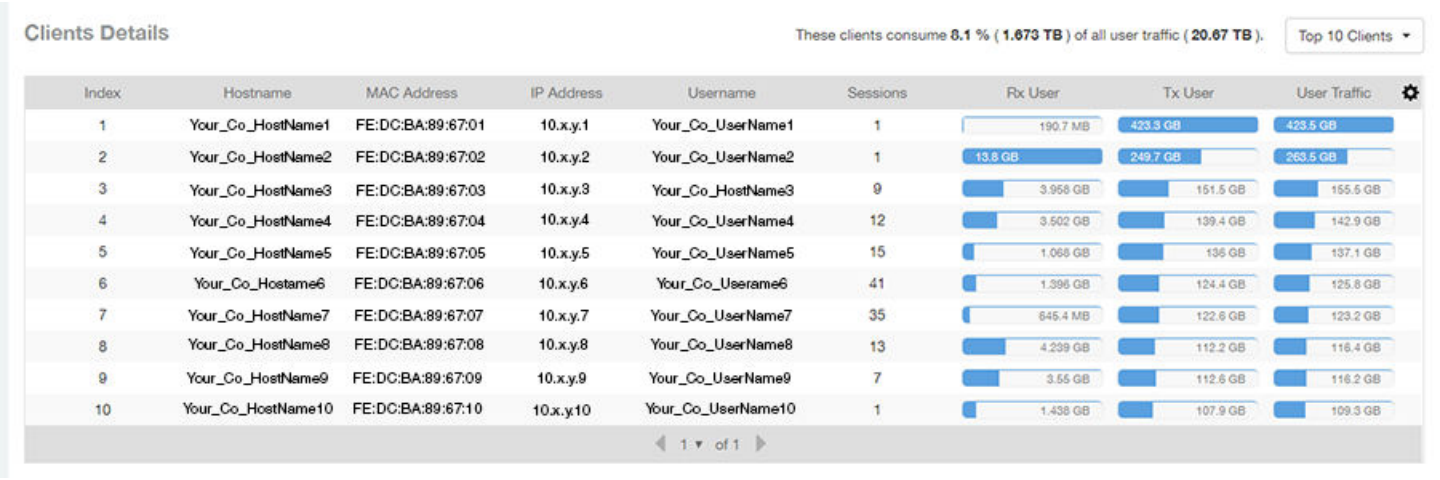


Clients - Clients Details

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 list of components from the table. By default, the table is sorted by total traffic (Rx + Tx). Click on a column heading to sort by that value. You can also 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.

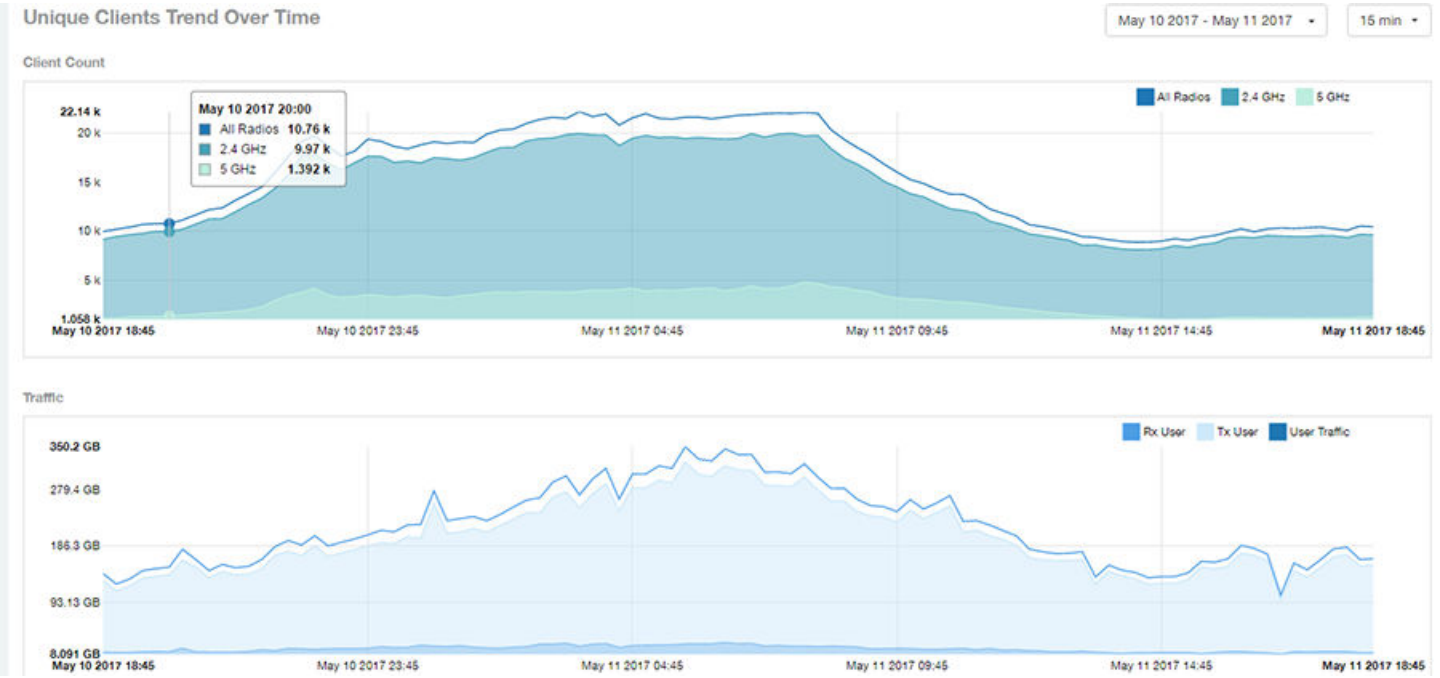
FIGURE 59 Clients - Clients details



Clients - Unique Clients Trends Over Time (graph)

Use the Unique Clients Trend graphs of the Clients report to view a breakdown of unique clients by radio type over time.

FIGURE 60 Clients - Unique Clients Trend Over Time Chart



Clients - Unique Clients Trend Over Time (Table)

The Unique Clients Trend Over Time table of the Clients report displays the total numbers of unique clients over the specified time intervals, as well as unique client count per radio, and client traffic (Tx, Rx, total) for a given time period.

The unique clients trend can be used to identify which time periods have the highest number of new clients connecting to the networks, or to compare transmit/receive traffic over different time periods throughout the day. Click the gear icon to select the list of columns to display. The table is sorted on the total traffic by default. Click any column heading to sort by that value. You can also select the top 10 (default value), 20, 50, or 100 clients to display, or display all clients. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 61 Clients - Unique Clients Trend Over Time Table

Applications Report Dashboard

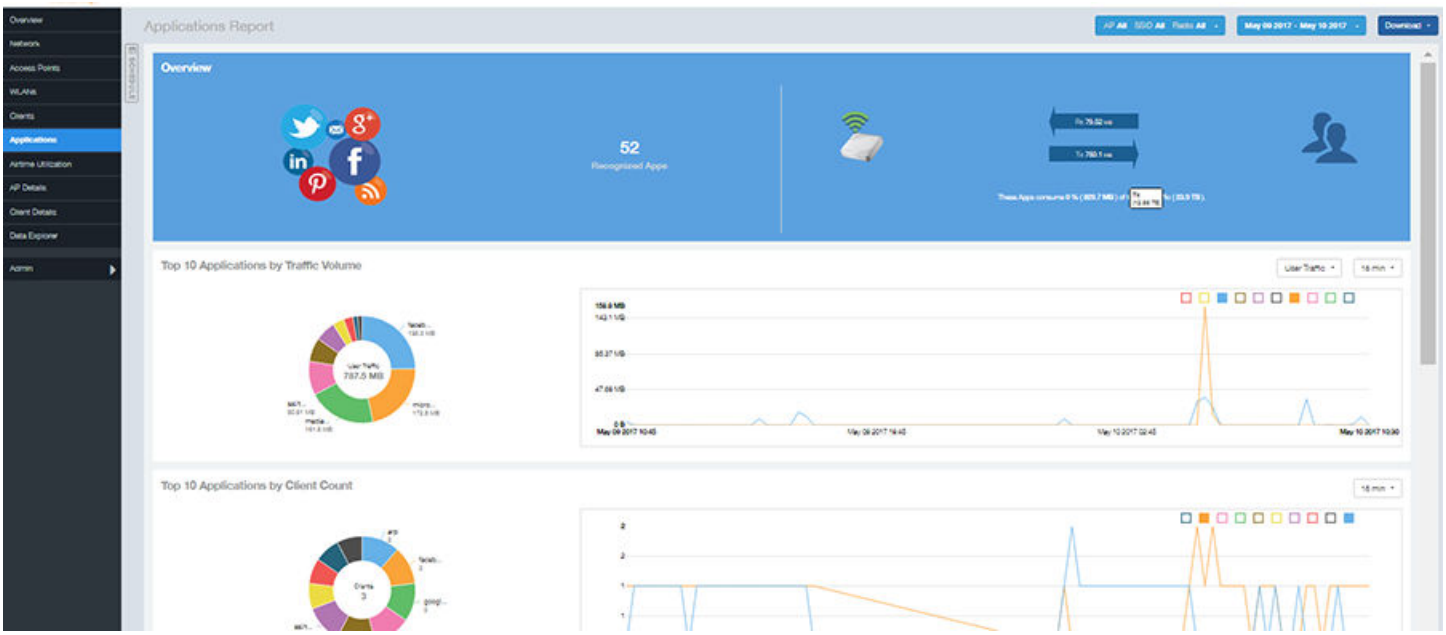
Applications Report

The Applications report provides the details of the applications accessed by the user.

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 10 applications by traffic volume received and transmitted over time, client count, traffic, and clients.

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

FIGURE 62 Applications Dashboard (upper portion)



The Applications report consists of five sections, which are listed in the table below. Figures showing each of these sections appear later.

1	Overview	Contains the list of applications that SCI recognizes, and displays the percentage of traffic consumed by these applications
2	Top 10 Applications by Traffic Volume	Contains the list of top 10 applications in terms of volume of traffic.

3	Top 10 Applications by Client Count	Contains the application information and displays the quantity of traffic consumed by the listed applications.
4	Top Applications by Traffic	Displays the top applications by traffic and the percentage consumed of the total traffic.
5	Top Applications by Client Count	Displays the top applications by clients and the percentage consumed of the total traffic by the applications.

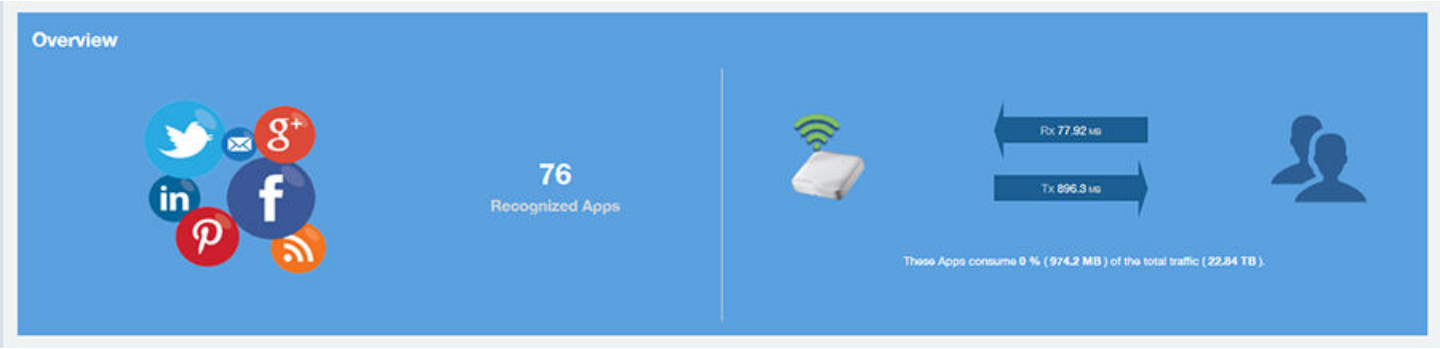
Applications - Overview

The Overview section of the Applications report provides an overview of all applications recognized by the application-recognition engine and the traffic volumes that these applications consume.

This Overview report contains the following:

- The number of recognized applications
- Total traffic
- Total number of APs, which also contains the received and transmitted traffic between them
- Total clients on the network

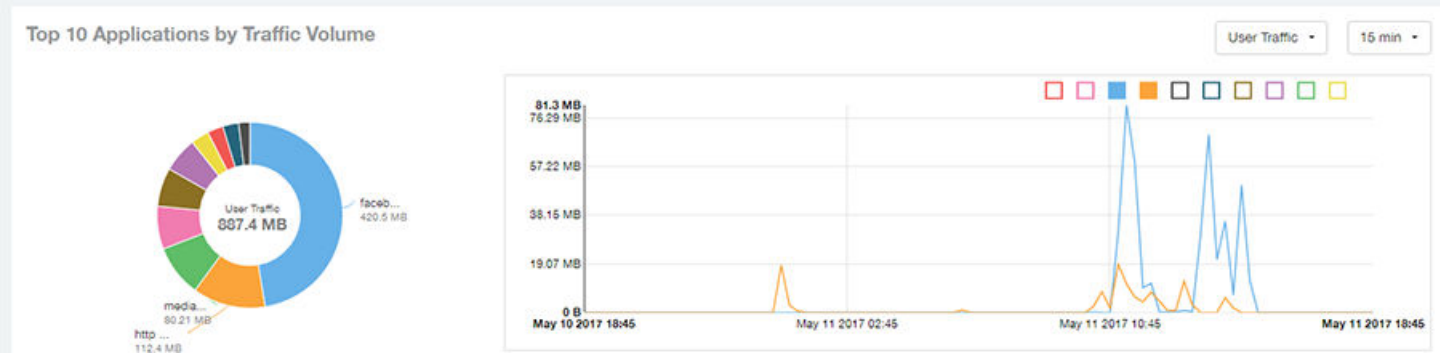
FIGURE 63 Applications - Overview



Applications - Top 10 by Traffic Volume

The Top 10 Applications by Traffic Volume pie chart and graph of the Applications report display the top applications with the largest traffic volume in the network, along with the received and transmitted traffic volumes.

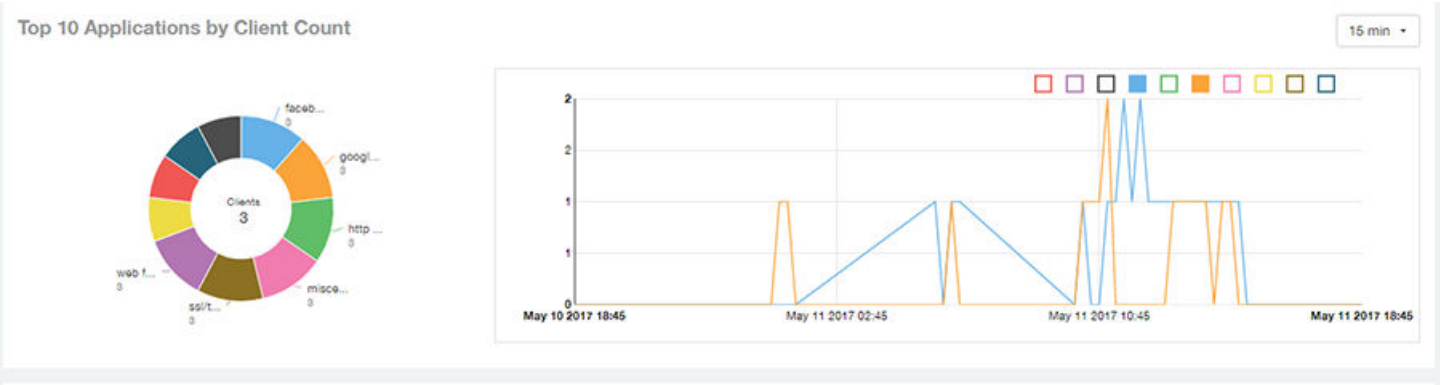
FIGURE 64 Applications - Top 10 Applications by Traffic Volume



The pie chart and graph contain the top applications with the largest traffic volume in the network, along with the received and transmitted traffic volumes. You can view the received and transmitted traffic volumes based on the Rx+Tx Filter on page 26. To view the top 10 applications, choose from the legend available on the top of the graph. Each applications will appear as a separate graph line. If you hover over the line graph a pop-up appears containing the selected details.

Applications - Top 10 by Client Count

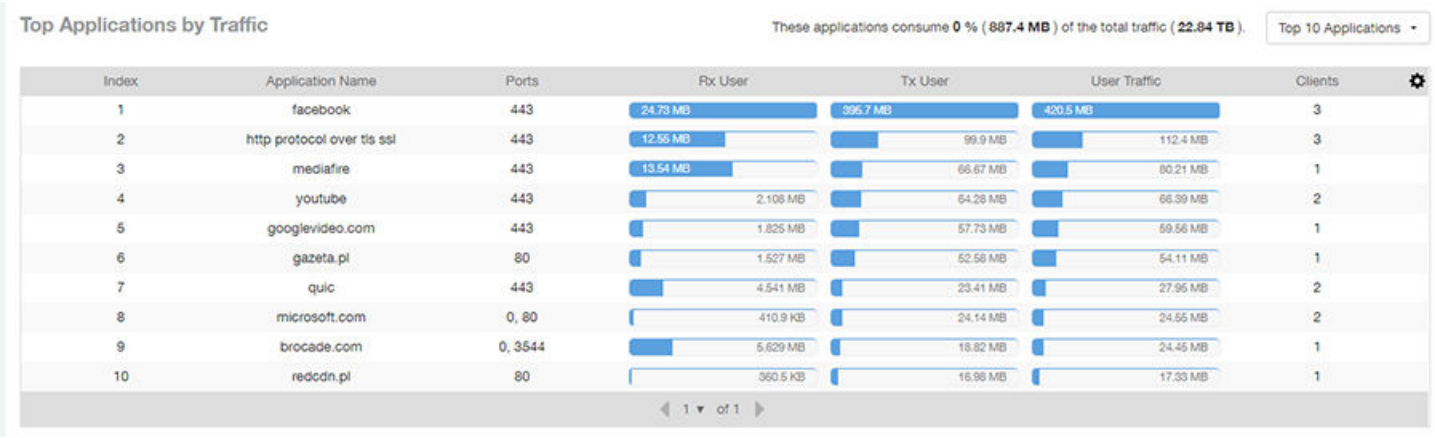
The Top 10 by Client Count pie chart and graph of the Applications report show the applications that are most frequently being used by the clients in the network over specified time intervals.



Applications - Top Applications by Traffic (table)

The Top Applications by Traffic table of the Applications report displays the top (10, 20 or 50) applications by the amount of traffic generated over the time period selected.

FIGURE 65 Applications - Top Applications by Traffic



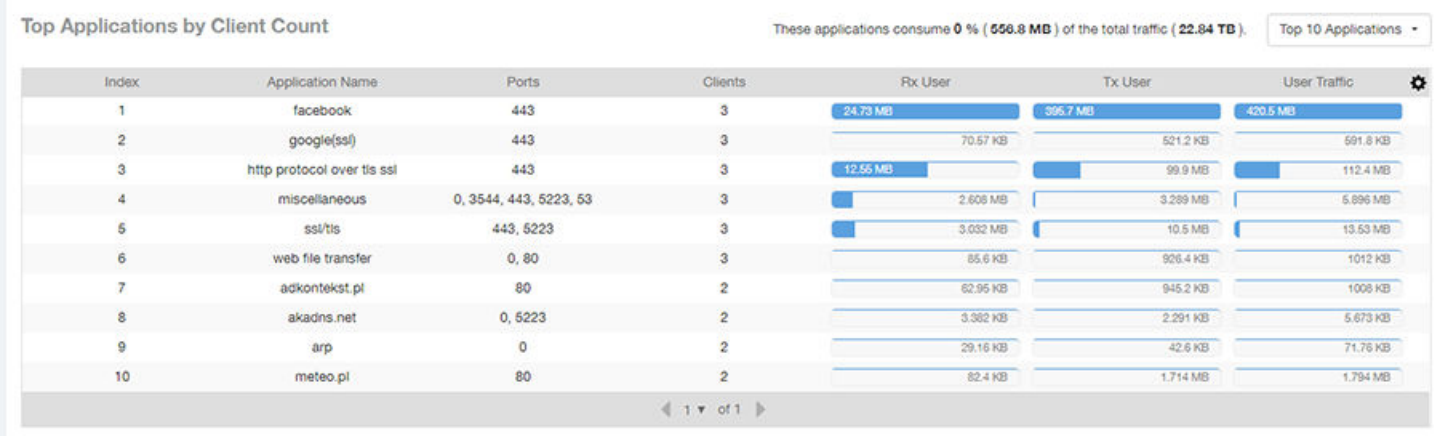
Applications - Top Applications by Client Count (table)

Use the Top Applications by Client Count table of the Applications report to view which applications are being used by the most clients on the network.

You can sort the table by any column by clicking on the column heading. Additionally, you can customize the table by clicking the gear icon ⚙ and selecting from the list of columns to display.

You can also select whether to display only the top 10 (default value), 20, 50, or 100 applications, or list all applications. Configure the number of rows per a page using the **Rows per Page** list in the table settings drop down menu.

FIGURE 66 Applications - Top Applications by Client Count



Airtime Utilization Report Dashboard

Airtime Utilization Report

The Airtime Utilization report provides an overview of airtime utilization.

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

The following figure shows the upper portion of the Airtime Utilization dashboard that appears when you click **Airtime Utilization** on the navigation bar.

FIGURE 67 Airtime Utilization Dashboard (upper portion)

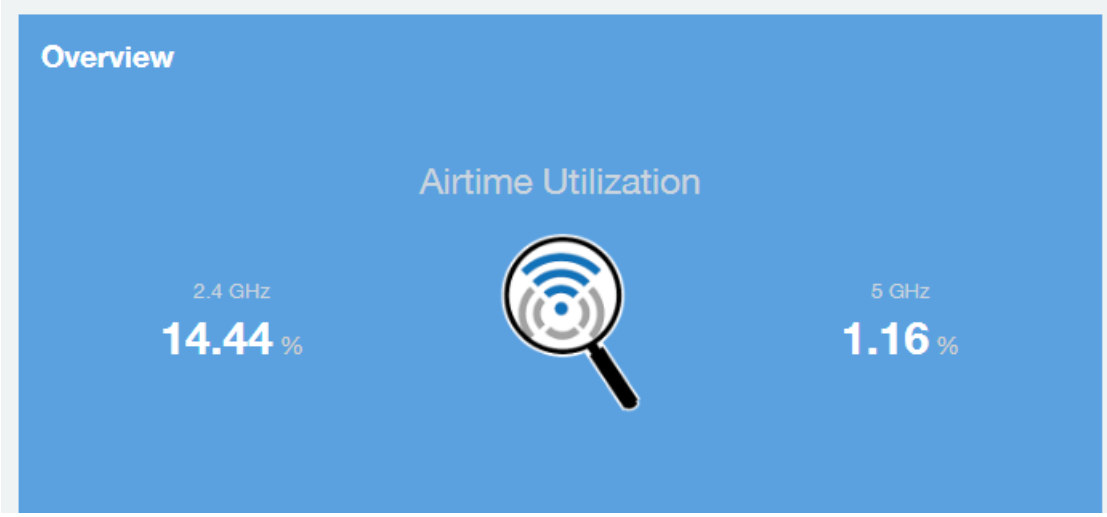
The Airtime Utilization report consists of the six sections listed in the table below.

1	Overview	The overview report section contains the total number of APs based on the radio category.
2	Top 10 APs by Airtime Utilization	This tabular report pertains to top ten APs airtime utilization, represented as percentage. This is based on your selection of APs, Radio and Date Range filters.
3	Top APs by Airtime Utilization for 2.4 GHz	This tabular report pertains to top APs airtime utilization based on the radio category of 2.4 GHz.
4	Top APs by Airtime Utilization for 5 GHz	This tabular report pertains to top APs airtime utilization based on the radio category of 5 GHz.
5	Airtime Utilization Trend	This graph pertains to the utilization trend of APs based on the radio category of 2.4 and 5 GHz.
6	Airtime Utilization Over Time	The tabular report contains the utilization trend of APs as per the selected components.

Airtime Utilization - Overview

The Overview section of the Airtime Utilization report displays the aggregate utilization rates for all of the 2.4 and 5 GHz radios on all APs for the selected time period.

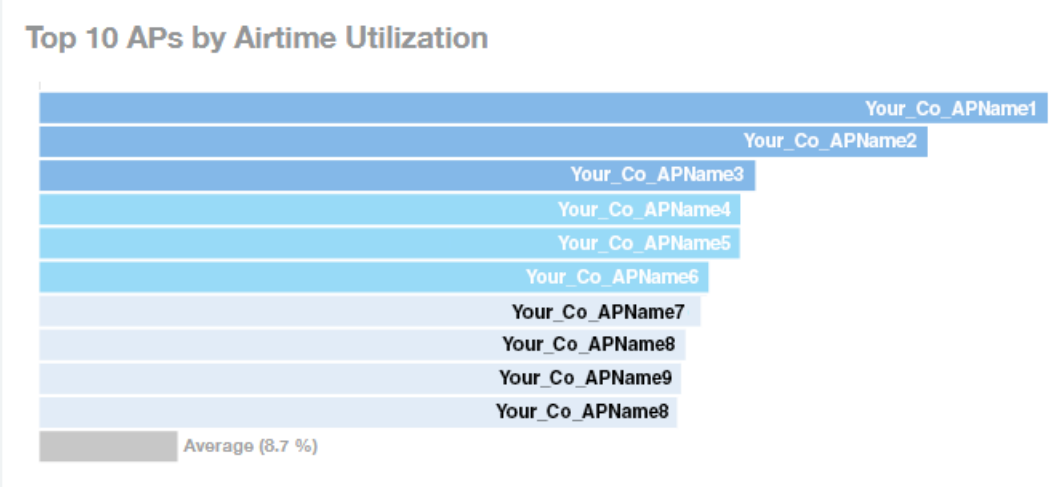
FIGURE 68 Airtime Utilization - Overview



Top 10 APs By Airtime Utilization

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

FIGURE 69 Top 10 APs by Airtime Utilization



Top APs by Airtime Utilization for 2.4 Ghz

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

Use this report to view a list the top APs with the highest airtime utilization sorted according to the selected columns. Click the gear icon to select which columns to display, or click any column heading to sort by that column.

You can also select whether to display the top 10, 20, 50, or 100 APs by airtime utlization from the Top APs filter. The number of rows per page can be defined using the **Rows per page** option in the table settings drop down list.

FIGURE 70 Top APs by Airtime Utilization for 2.4 GHz

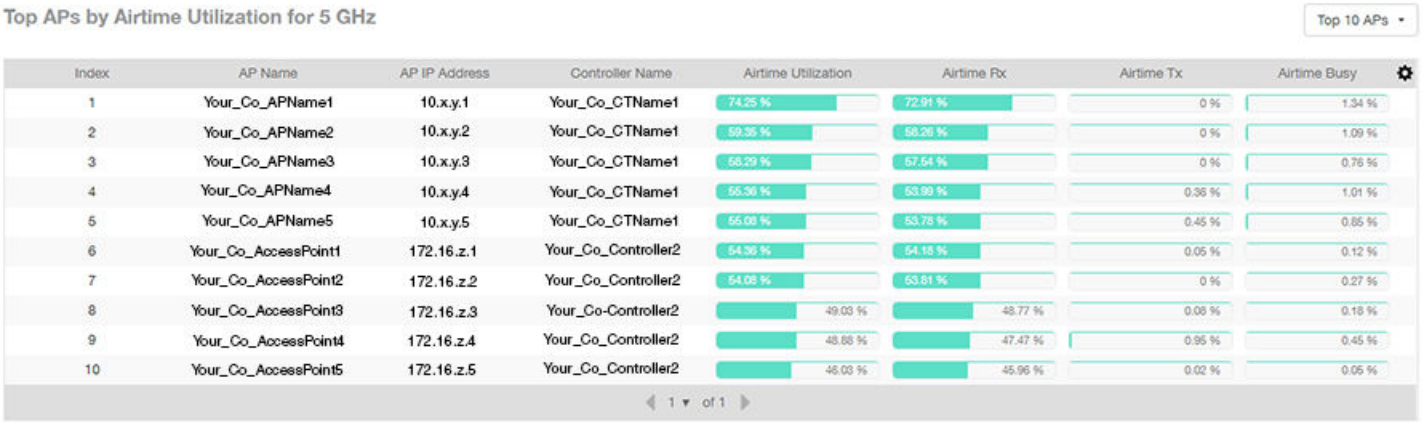
Airtime Utilization - Top APs by Airtime Utilization for 5 GHz

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 report to view a list the top APs with the highest airtime utilization sorted by the selected columns. Click the gear icon to select which columns to display, or click any column heading to sort by that column.

You can also select whether to display the top 10, 20, 50, or 100 APs by airtime utlization from the Top APs filter. The number of rows per page can be defined using the **Rows per page** option in the table settings drop down list.

FIGURE 71 Airtime Utilization - Top APs by Airtime Utilization for 5 GHz



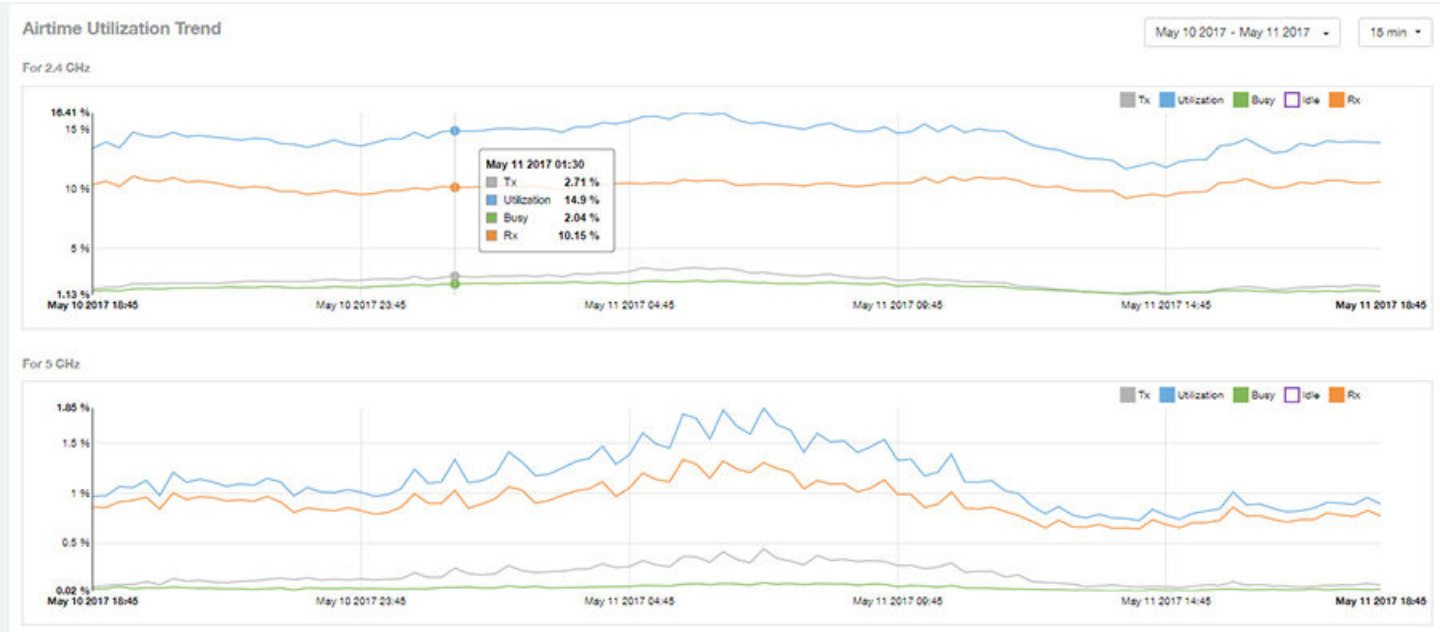
Index	AP Name	AP IP Address	Controller Name	Airtime Utilization	Airtime Rx	Airtime Tx	Airtime Busy
1	Your_Co_APName1	10.x.y.1	Your_Co_CTName1	74.25 %	72.91 %	0 %	1.34 %
2	Your_Co_APName2	10.x.y.2	Your_Co_CTName1	59.35 %	58.26 %	0 %	1.09 %
3	Your_Co_APName3	10.x.y.3	Your_Co_CTName1	58.29 %	57.54 %	0 %	0.76 %
4	Your_Co_APName4	10.x.y.4	Your_Co_CTName1	55.36 %	53.99 %	0.36 %	1.01 %
5	Your_Co_APName5	10.x.y.5	Your_Co_CTName1	55.08 %	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	54.08 %	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

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

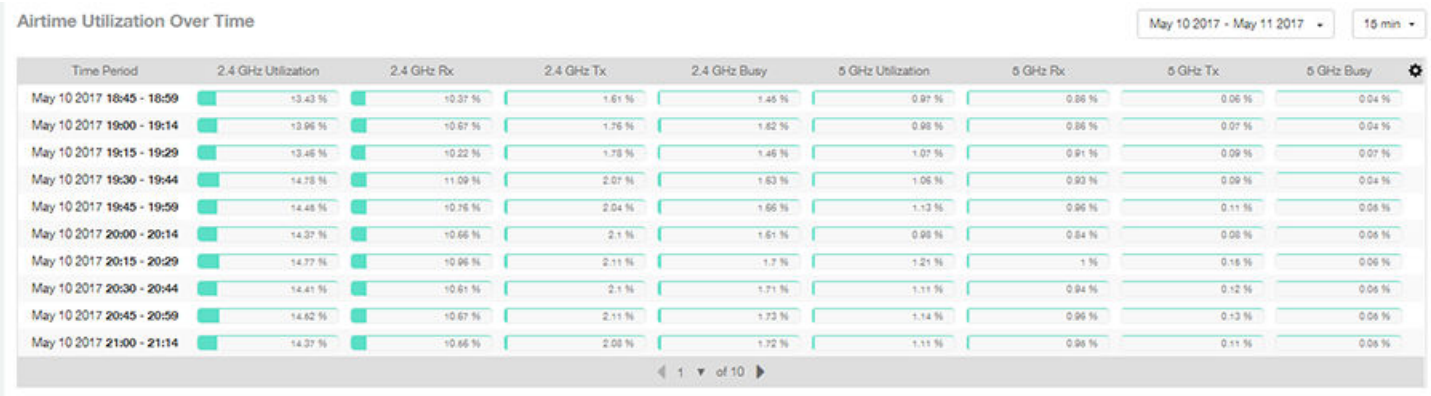
FIGURE 72 Airtime Utilization Trend



Airtime Utilization - Over Time

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

FIGURE 73 Airtime Utilization Over Time



AP Details Report Dashboard

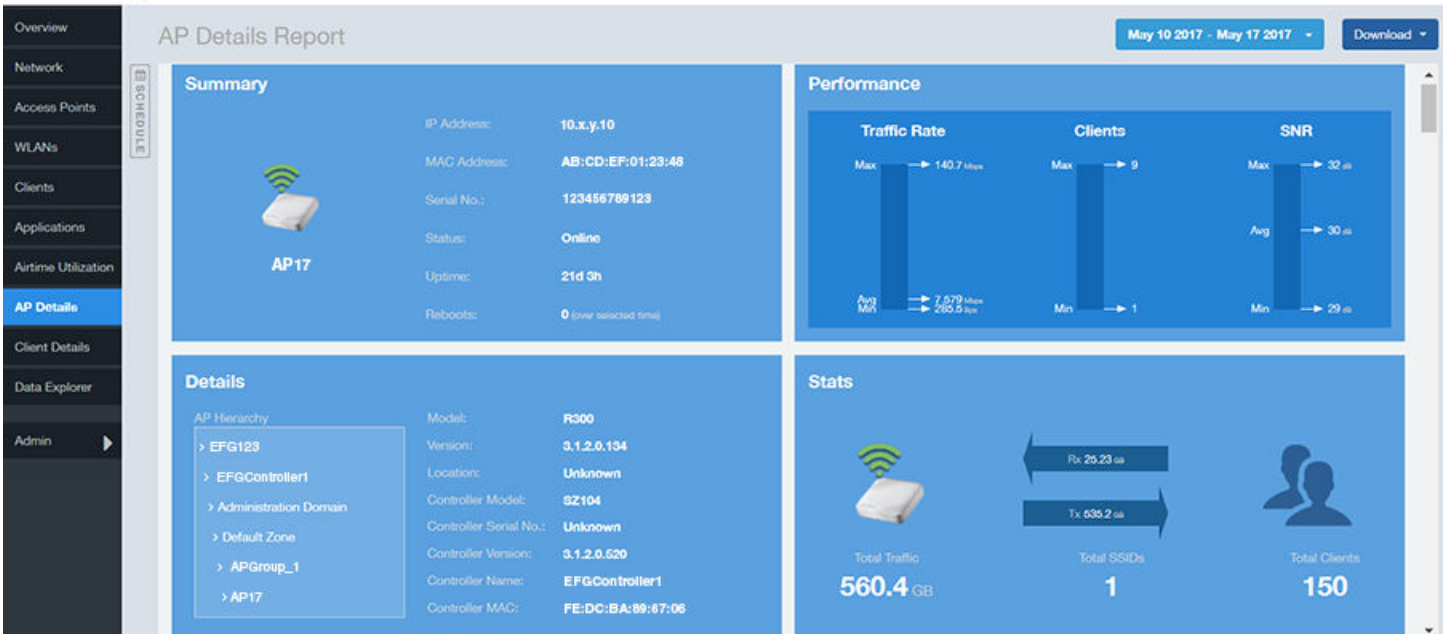
AP Details Report

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

You can reach this report by either clicking on a hyperlink of a client 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.

The following figure shows only the upper portion of the AP Details Report screen:

FIGURE 74 AP Details Report (upper portion)



The AP Details report consists of 17 sections and are described in the following table. Figures showing each of these sections appear later.

1	Summary	Contains basic information about the AP. The AP in this example figure above is AP17.
2	Performance	Contains performance data about the access point named AP17 in the example figure above.
3	Details	Contains some details about the example AP17 access point, including showing the nested hierarchy of how the administrator has set up the APs in the network.
4	Stats	Contains statistics specific to the example AP 17 access point.
5	Uptime History	A line graph shows when this AP has been up or down over different time periods.
6	Traffic Trend	Two type of line graphs depict traffic by usage, and two line graphs depict traffic by radio type for this AP.
7	Unique Clients Trend Over Time	Two line graphs depict unique clients associated with this AP. One graph shows the number of unique clients and the other shows the traffic generated by unique clients - both over specified time periods.
8	Top 10 Clients by Traffic Volume	A pie chart and line graph depict the clients that have generated the largest volume of traffic over this AP over a specified period of time.
9	Top 10 Applications by Traffic Volume	A pie chart and line graph depict the applications that have generated the largest volume of traffic over this AP over a specified time period.
10	Top SSIDs by Traffic	A table lists the SSIDs that have generated the most traffic associated with this AP over a specified time period. An SSID is a logical group of APs. An AP can belong to multiple SSIDs.
11	Sessions	A table provides details for whatever number of client sessions that you specify for this AP.
12	RSS Trend	A line graph depicts the received signal strength trends over time for this AP.
13	SNR Trend	A line graph depicts the signal-to-noise ratio trends over time for this AP.
14	Airtime Utilization Trend	Two line graphs depict the airtime utilization for this AP, by radio type, over a specified time period.
15	Clients Details	A table provides details for however many top clients for this AP that you specify.

16	Alarms	A table lists the alarms that have been generated for this AP for the time period that you specify.
17	Events	A table lists the events that have been generated for this AP for the time period that you specify.

AP Details - Summary

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

The AP shown in this example is named AP17.

FIGURE 75 AP Details - Summary

AP Details - Performance

The Performance section of the AP Details report displays data about the specified AP.

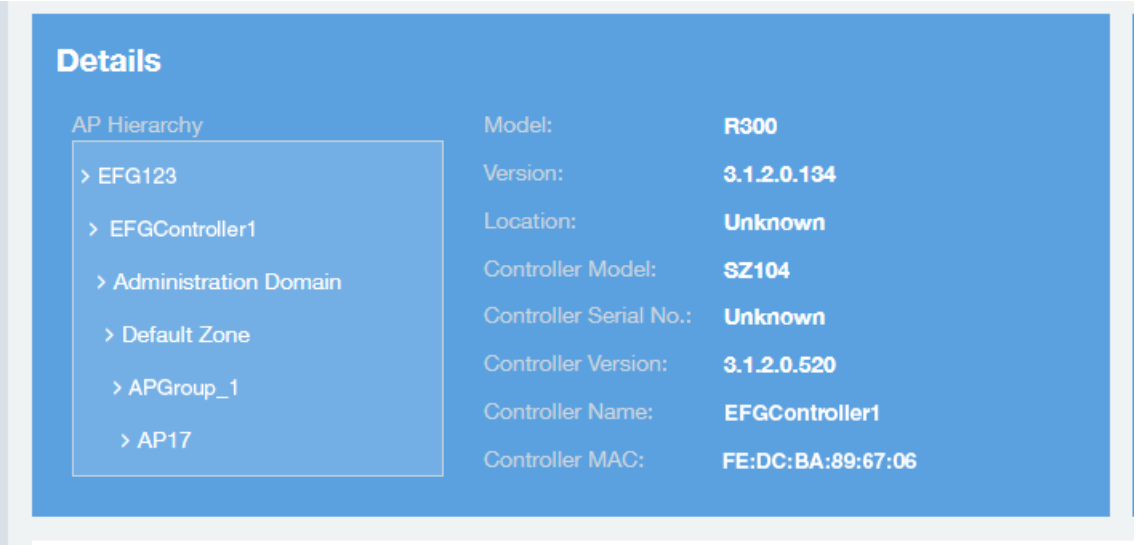
FIGURE 76 AP Details - Performance

AP Details - Details

The Details section 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 the administrator has named APGroup_1. EFGController1 in this example is one of the controllers being used on a wireless network named EFG123.

FIGURE 77 AP Details - Details



AP Details - Stats

The Stats section of the AP Details report displays some traffic statistics about the specified AP.

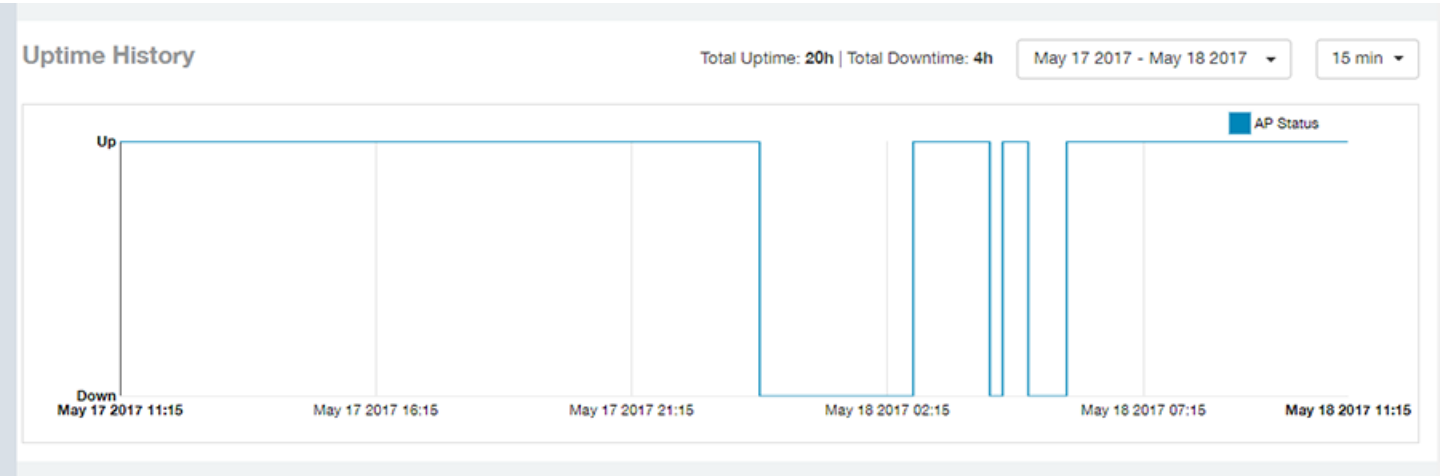
FIGURE 78 AP Details - Summary

AP Details - Uptime History

The Uptime History line 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 drop-down menus to specify the timeframe and the granularity of the graph.

FIGURE 79 AP Details - Uptime History



AP Details - Traffic Trend

The Traffic Trend section of the AP Details report contains 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 drop-down menus to specify the timeframe and the granularity of the graphs.

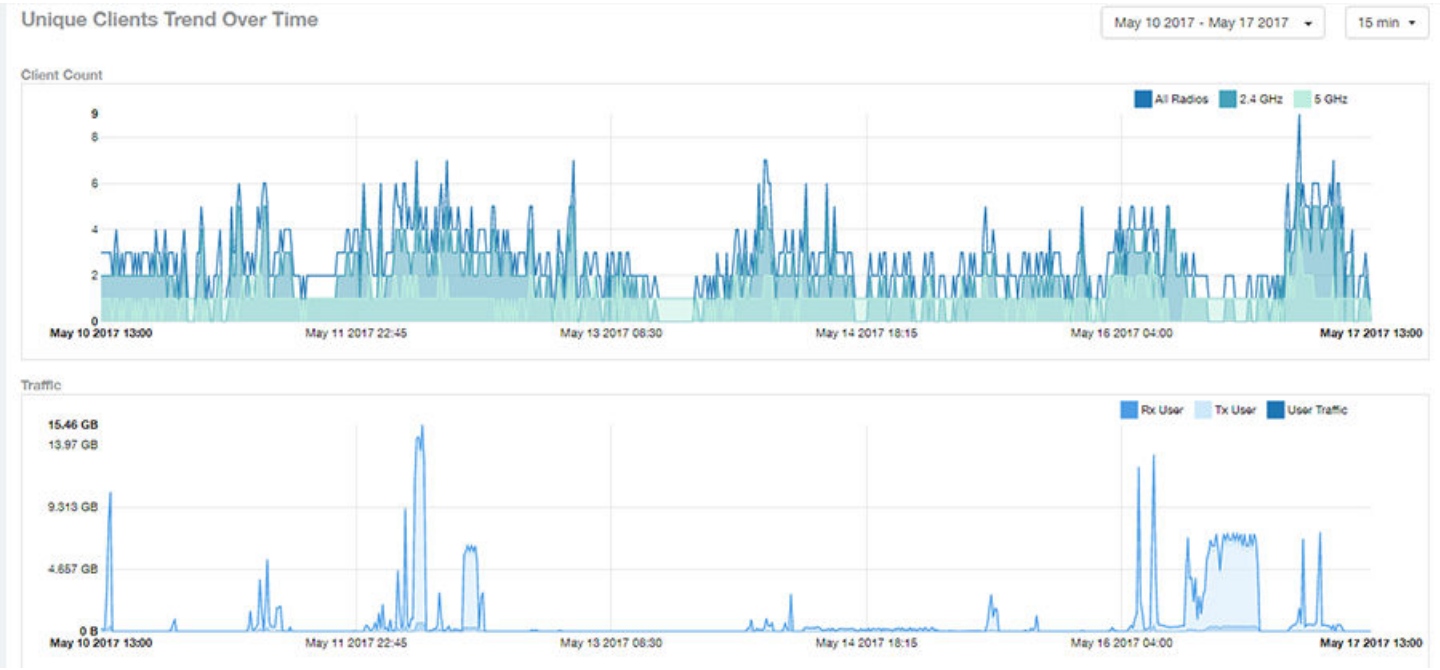
FIGURE 80 AP Details - Traffic Trend

AP Details - Unique Clients Trend Over Time

The Unique Clients Trend Over Time section of the AP Details report contains 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 drop-down menus to specify the timeframe and the granularity of the graphs.



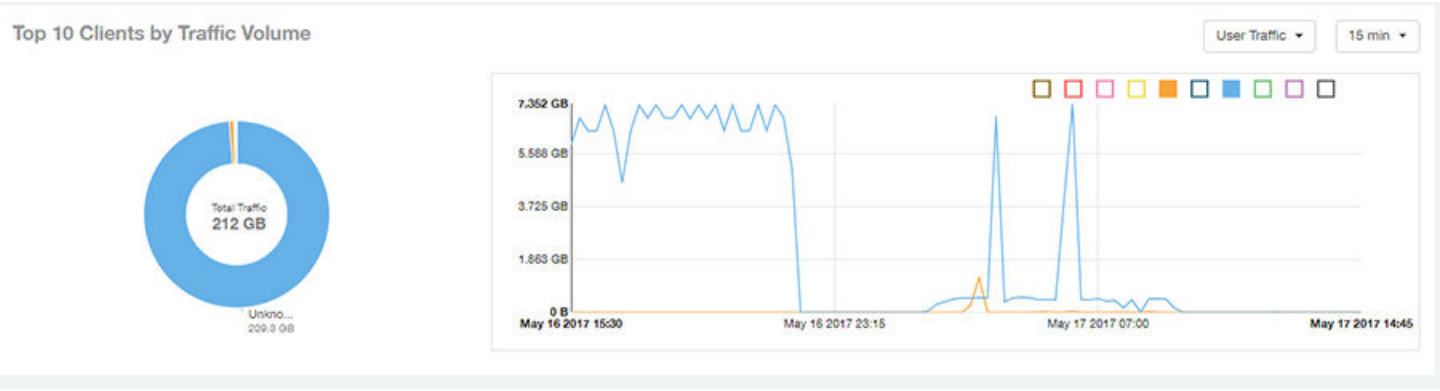
AP Details - Top 10 Clients by Traffic Volume

The Top 10 Clients by Traffic Volume pie 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 drop-down menus to specify the timeframe and the granularity of the graph. Click any of the colored squares to toggle display of the corresponding clients.

> NOTE
> If you click on one of the clients listed in the pie chart, you will be taken to the Client Details dashboard for that client.

FIGURE 81 AP Details - Top 10 Clients by Traffic Volume

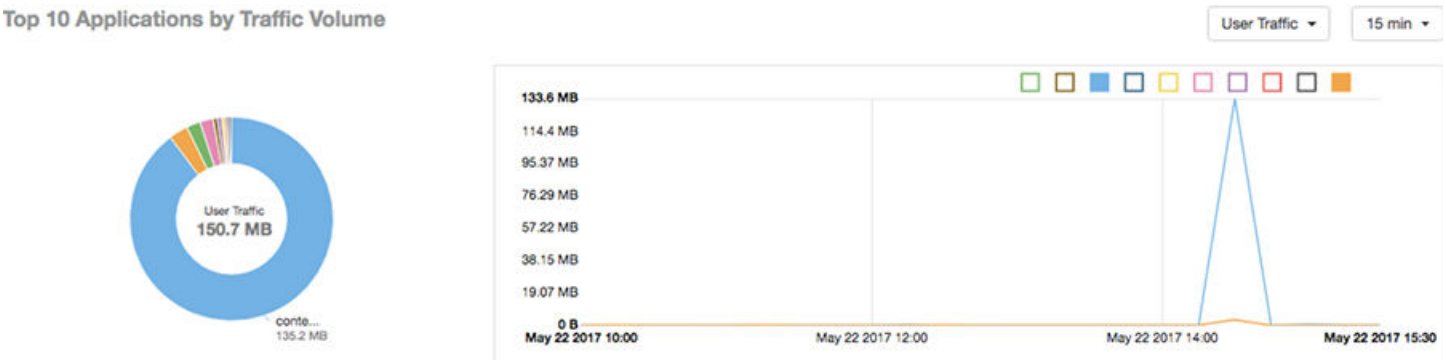


AP Details - Top 10 Applications by Traffic Volume

The Top 10 Applications by Traffic Volume pie 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 drop-down menus to specify the traffic type and the granularity of the graph. Click any of the colored squares to toggle display of the corresponding applications.

FIGURE 82 AP Details - Top 10 Applications by Traffic Volume



AP Details - Top SSIDs by Traffic

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

An SSID is a logical group of APs. An AP can belong to multiple SSIDs. Use the drop-down menu to specify the number of SSIDs to display.

FIGURE 83 AP Details - Top SSIDs by Traffic

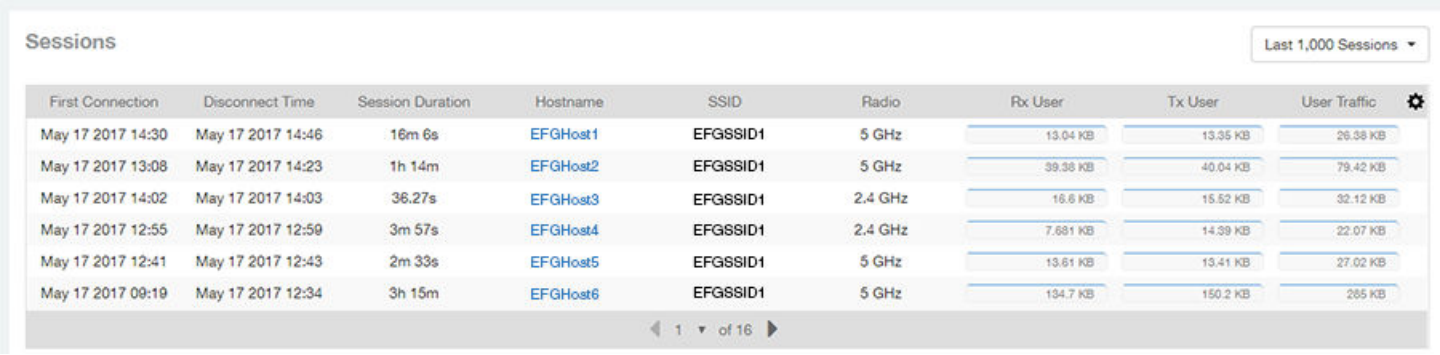
AP Details - Sessions

The Sessions table of the AP Details report provides details for however many client sessions that you specify for this AP.

Use the drop-down menu to specify how many sessions to display.

If you click on one of the client **hostname** links, you will be taken to the Client Details report for that client.

FIGURE 84 AP Details - Sessions



AP Details - RSS Trend

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

Use the drop-down menus to specify the timeframe and the granularity of the graph.

FIGURE 85 AP Details - RSS Trend

AP Details - SNR Trend

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

You can use the drop-down arrows to select the time frame and granularity for this graph.

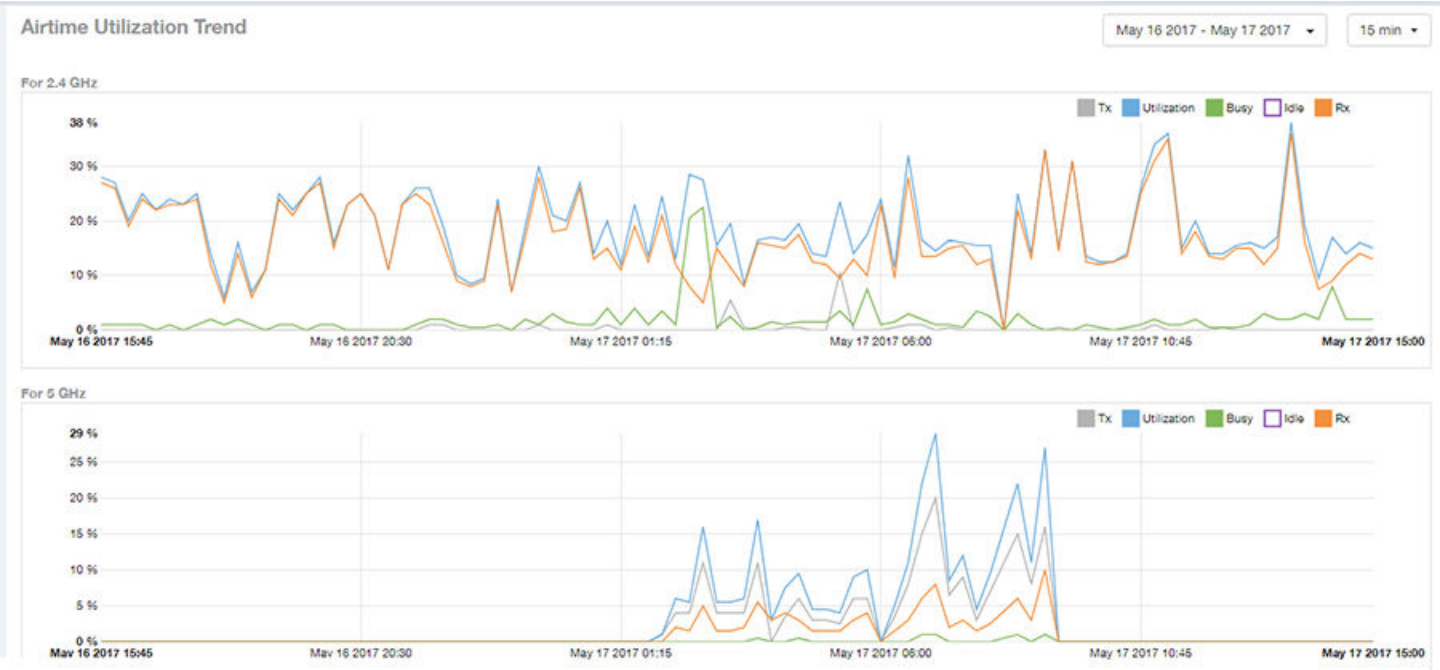
FIGURE 86 AP Details - SNR Trend

AP Details - Airtime Utilization Trend

The Airtime Utilization Trend line graphs of the AP Details report depict the airtime utilization for this AP, by radio type, over a specified time period.

You can use the drop-down arrows to select the time frame and granularity for this graph.

FIGURE 87 AP Details - Airtime Utilization Trend



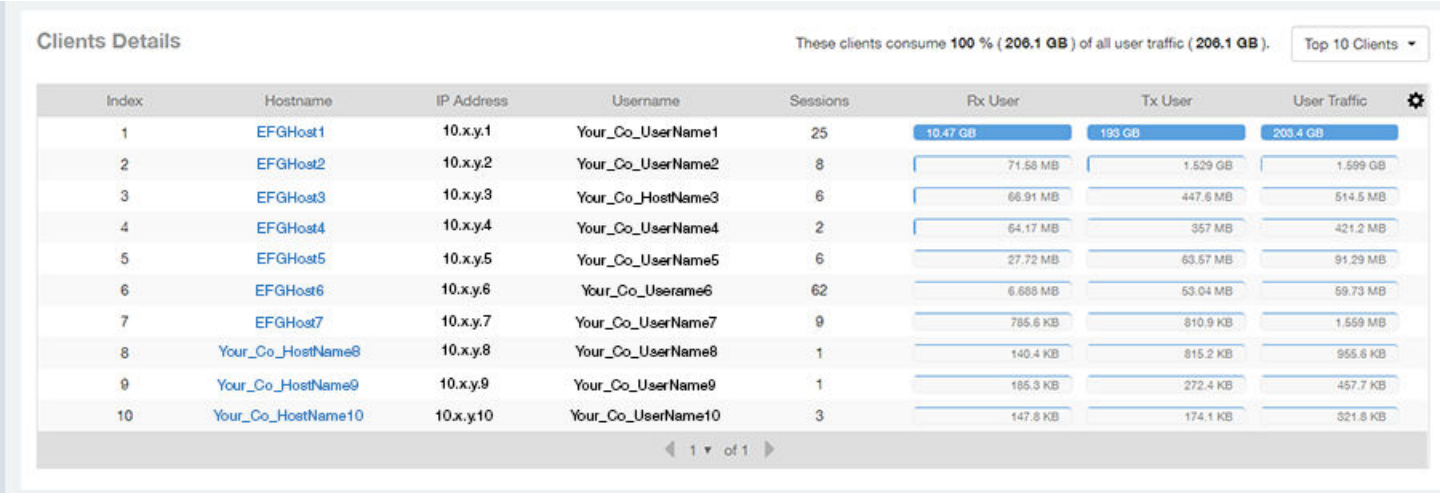
AP Details - Clients Details

The Clients Details table of the AP Details report provides details for however many top clients that you specify for this AP.

Use the drop-down menu to specify how many top clients to display.

If you click on one of the client **hostname** links, you will be taken to the Client Details report for that client.

FIGURE 88 AP Details - Clients Details



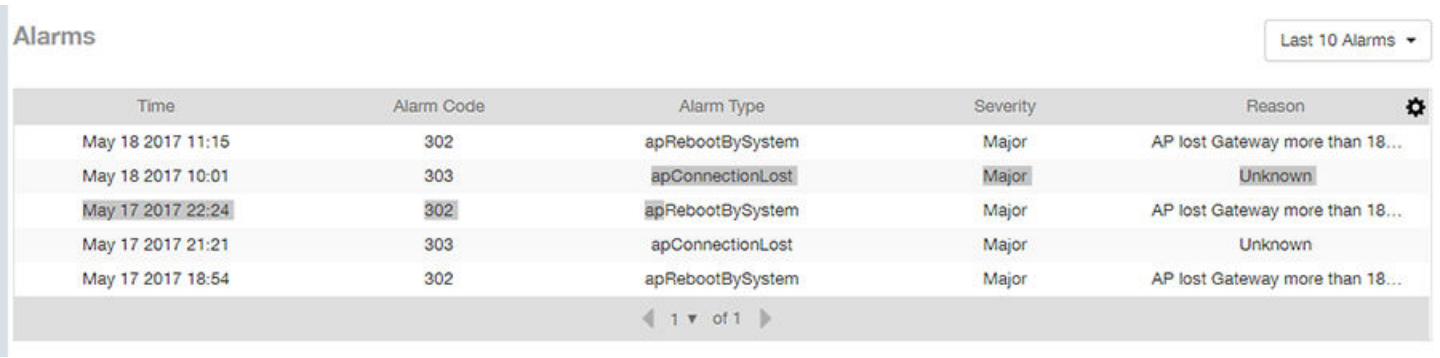
AP Details - Alarms

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

Use the drop-down menu to specify how many alarms to display.

You can use the gear icon to choose what columns of information you wish to display.

FIGURE 89 AP Details - Alarms



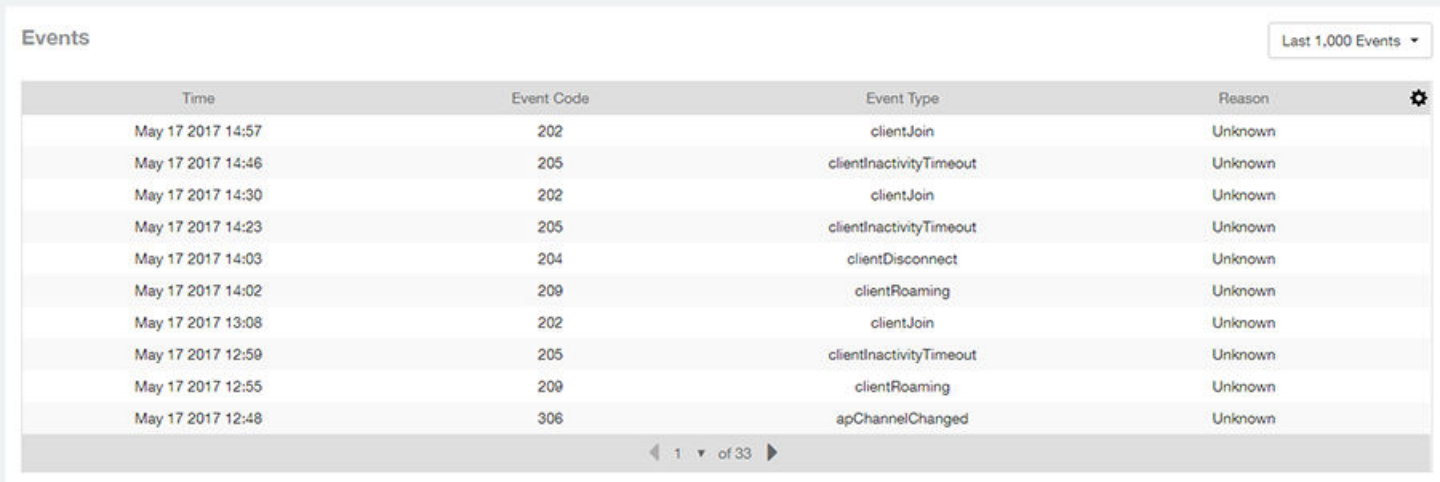
AP Details - Events

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

Use the drop-down menu to specify how many events to display.

You can use the gear icon to choose what columns of information you wish to display.

FIGURE 90 AP Details - Events



Client Details Report Dashboard

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.

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

FIGURE 91 Client Details Report (upper portion)

The Client Details report consists of seven sections and are described in the following table. Figures showing each of these sections appear later.

1	Summary	Contains basic information about the client. The hostname in this example figure above is XYZ123.
2	Stats	Contains basic statistics specific to this client.
3	Top 10 Applications by Traffic Volume	A pie chart and line graph contain the applications run by this client that have the largest traffic volume.
4	Traffic Trend	Two line graphs depict traffic by usage and traffic by radio type for this client.
5	RSS Trend	A line graph depicts the received signal strength trends over time for this client.
6	SNR Trend	A line graph depicts the signal-to-noise ratio trends over time for this client.
7	Sessions	A table provides details for sessions between this client and associated access points.

Client Details - Summary

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

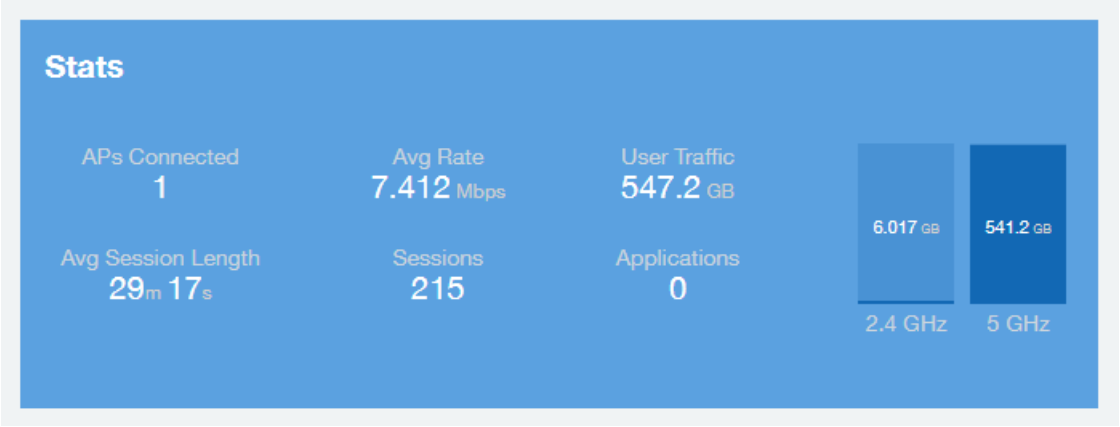
The hostname for the client shown in this example is XYZ123.

FIGURE 92 Client Details - Summary

Client Details - Stats

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

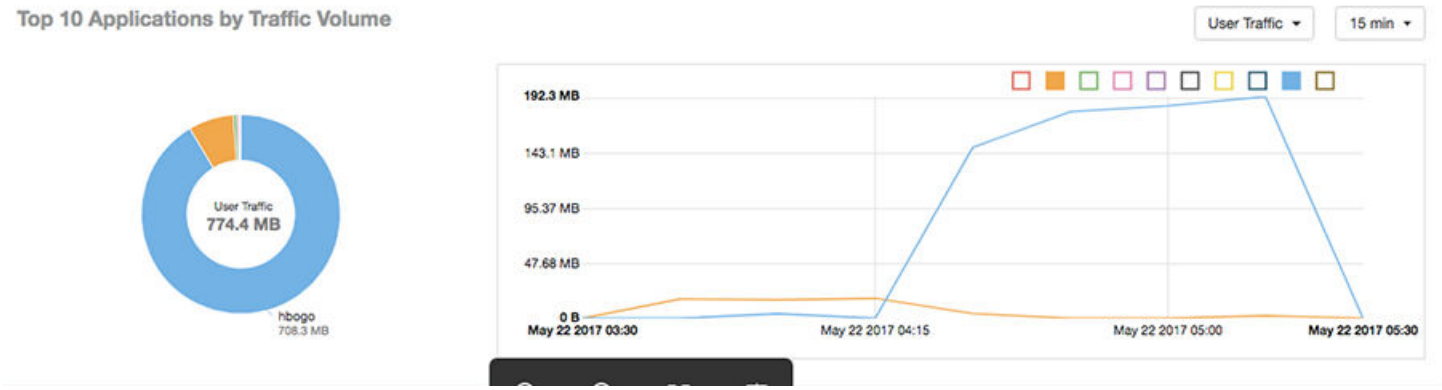
FIGURE 93 Client Details Stats



Client Details - Top 10 Applications by Traffic Volume

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 drop-down menus to specify the traffic type and the granularity of the graph. Click any of the colored squares to toggle display of the corresponding applications.

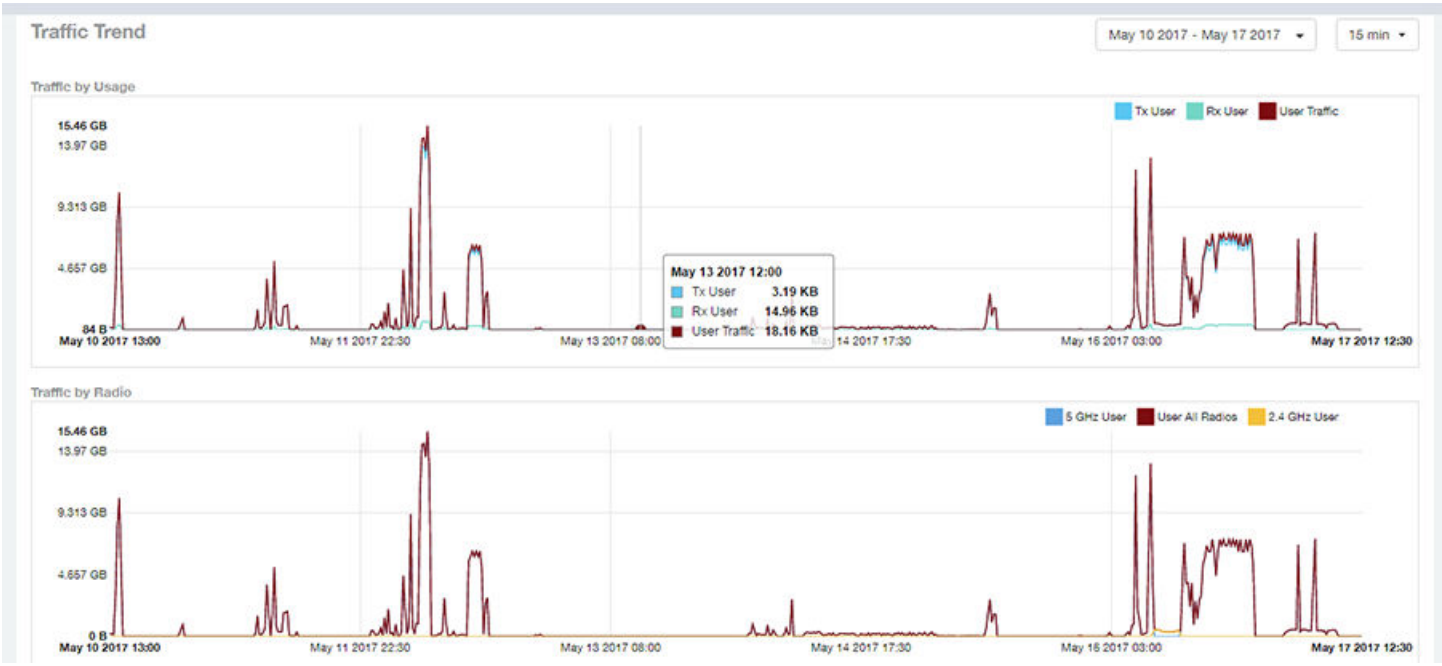


Client Details - Traffic Trend

The Traffic Trend graphs of the Client Details report depict traffic by usage and traffic by radio type for the client.

You can use the drop-down arrows to select the time frame and granularity for the graphs.

FIGURE 94 Client Details - Traffic Trend

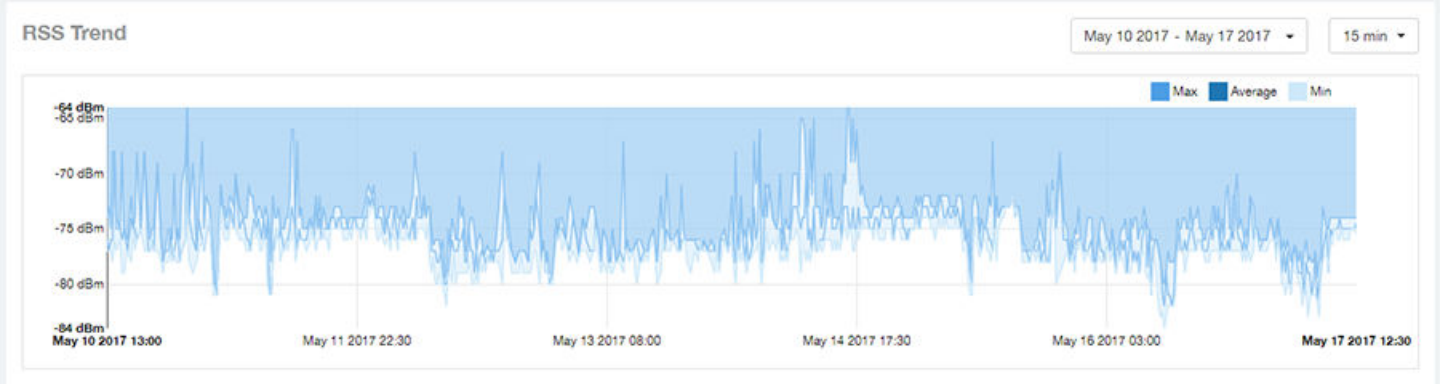


Client Details - RSS Trend

The RSS Trend graph of the Client Details report depicts the received signal strength trends over time for this client.

Use the drop-down menus to specify the timeframe and the granularity of the graph.

FIGURE 95 Client Details - RSS Trend

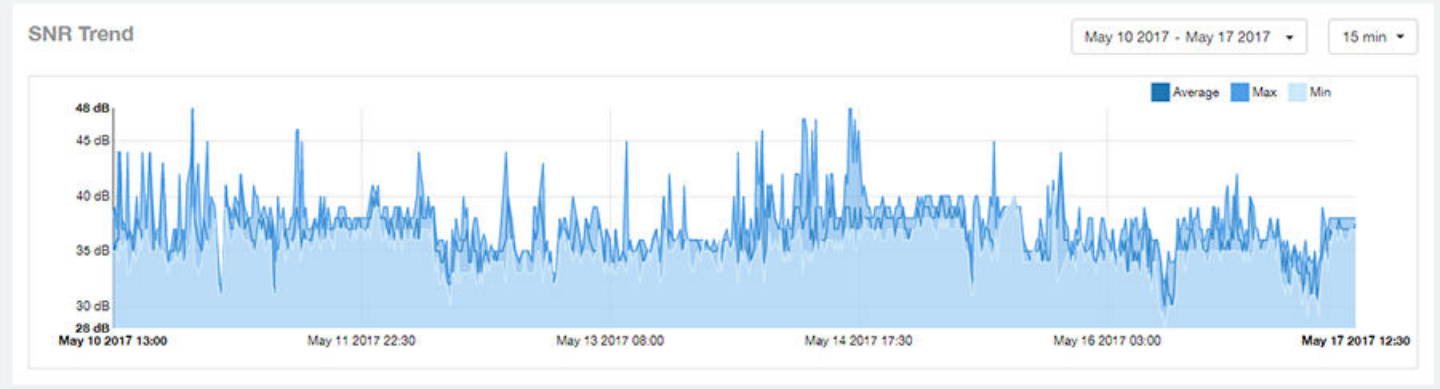


Client Details - SNR Trend

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

You can use the drop-down arrows to select the time frame and granularity for this graph.

FIGURE 96 Client Details - SNR Trend



Client Details - Sessions

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

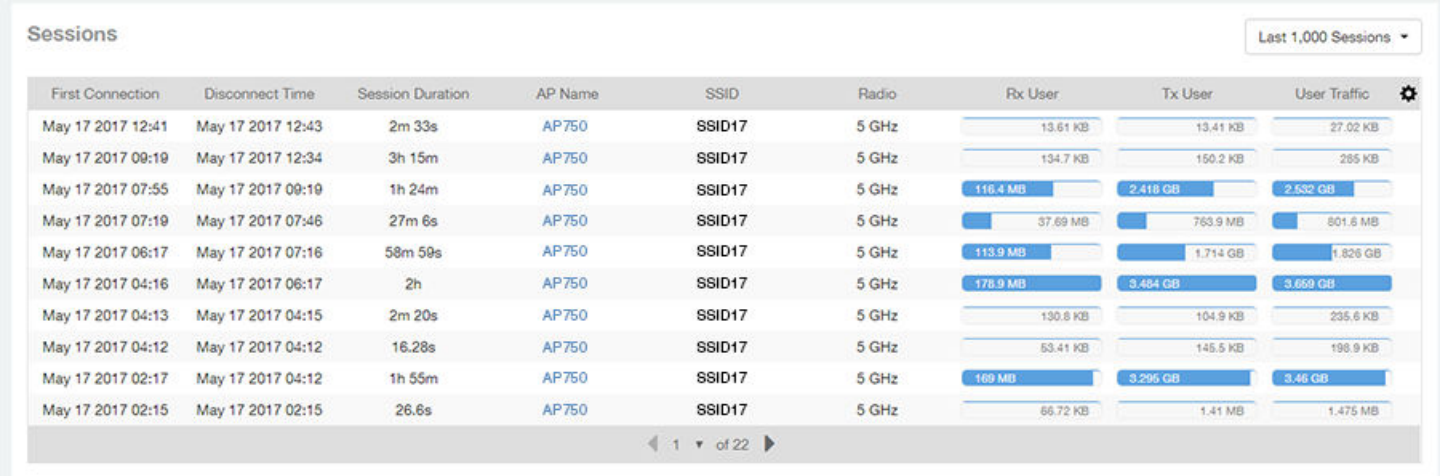
You can use the drop-down arrows to select the number of sessions you want to display.

You can use the gear icon ⚙ to choose what columns of information you wish to display.

NOTE

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

FIGURE 97 Client Details Sessions



Data Explorer Dashboard

Data Explorer and Data Cubes

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

Data Exploration

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

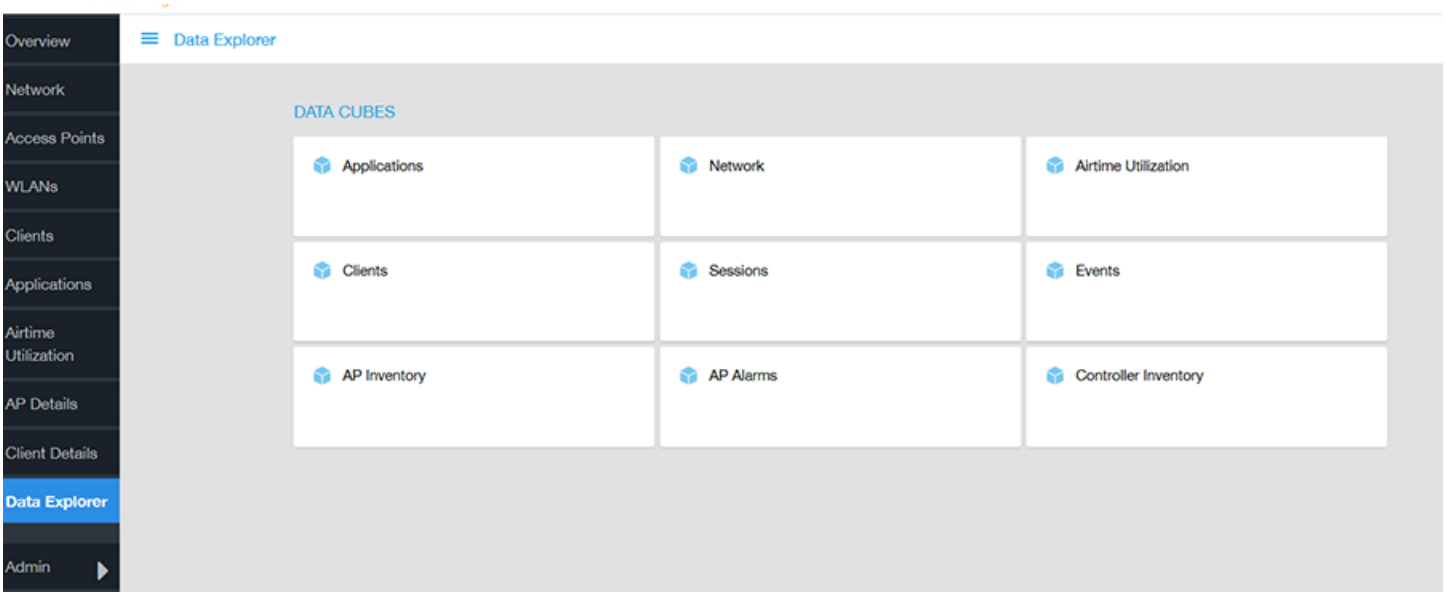
Consider your data to be a three-dimensional cube which you would like to explore, both inside out and outside in, so that you could glean more insights from your data. Of course, most real world data sets will have more than three dimensions, but the concepts from a 3D cube can be directly extended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

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 looking at all the data from Day 1, you slice the data to just the last 30 days.
2. Dice: Think of dicing a piece of cheese – you make multiple cuts and mash the cheese into much smaller pieces. A typical dice operation is after slicing the cube to just the last 30 days, you “cut” it further by filtering by the controller name and AP group. After the above slice and dice is a smaller piece of the original OLAP cube.
3. Drill Up/Down: In order to delve into the details, you drill down into a specific AP in the above AP Group, and further drilling down to a specific client hostname. Conversely, you could also search for client MAC in the beginning and drill up to see which AP and controller it belongs to.
4. Roll Up: This operation typically involves certain numbers, also known as measures which will be explained in detail below. In short, after doing your slice, dice and drill down, you would like to “roll up” the numbers to find out the total transmit traffic for the selected APs.
5. Pivot: Pivot is simply an operation that 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 APs and the controllers they belong to. Think of pivoting as changing the hierarchy between the dimensions.

Thus, as you use the custom reporting, refer to these five operations.

FIGURE 98 Data Explorer and Data Cubes



The SCI Data Explorer allows you to explore the data under various categories, using your own permutations and combinations, unlike the other canned reports available. The Data Explorer contains the following data cubes or data tables:

- Applications on page 91
- Network on page 92
- Airtime Utilization on page 93
- Clients on page 94
- Sessions on page 95
- Events on page 96
- AP Inventory on page 97
- AP Alarms on page 98
- Controller Inventory on page 99

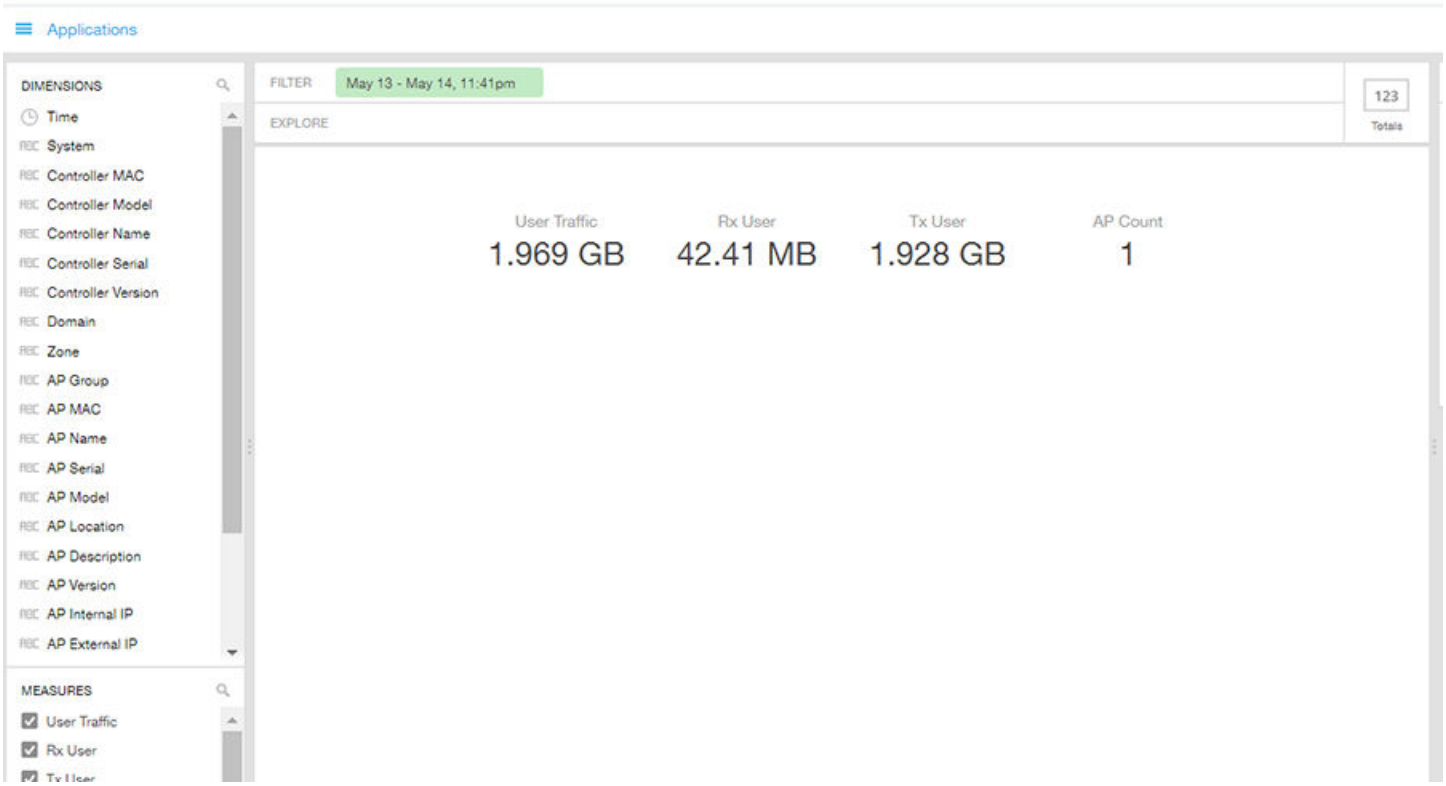
Using Filters

For information on how use data cube filters, which are common to all the data cubes, refer to Data Cube Filters on page 100

Applications

The Applications cube allows you to explore the application data in any method of your choice.

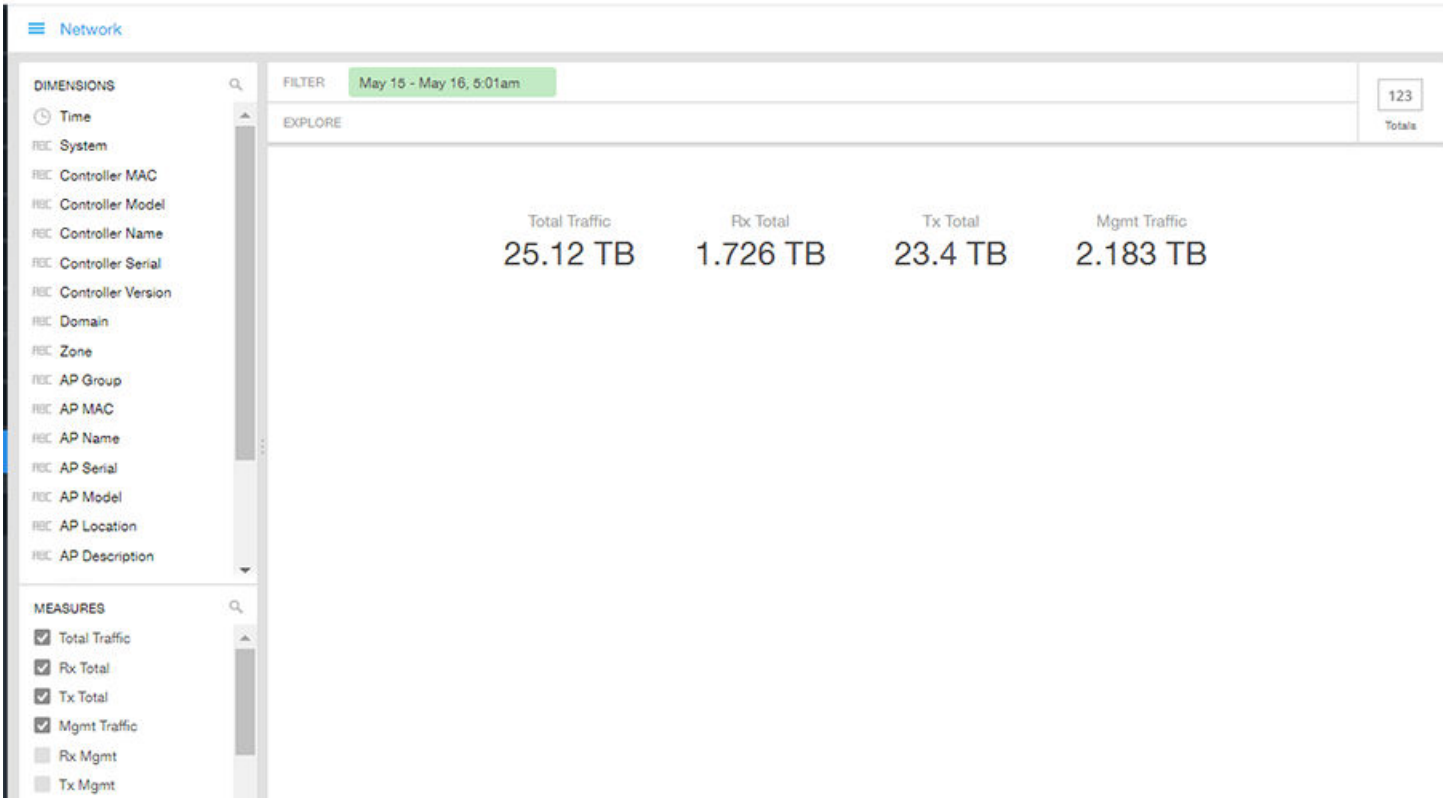
FIGURE 99 Data Explorer - Application



Network

Network cube allows you to explore the network traffic data and use or share the same for custom requirements.

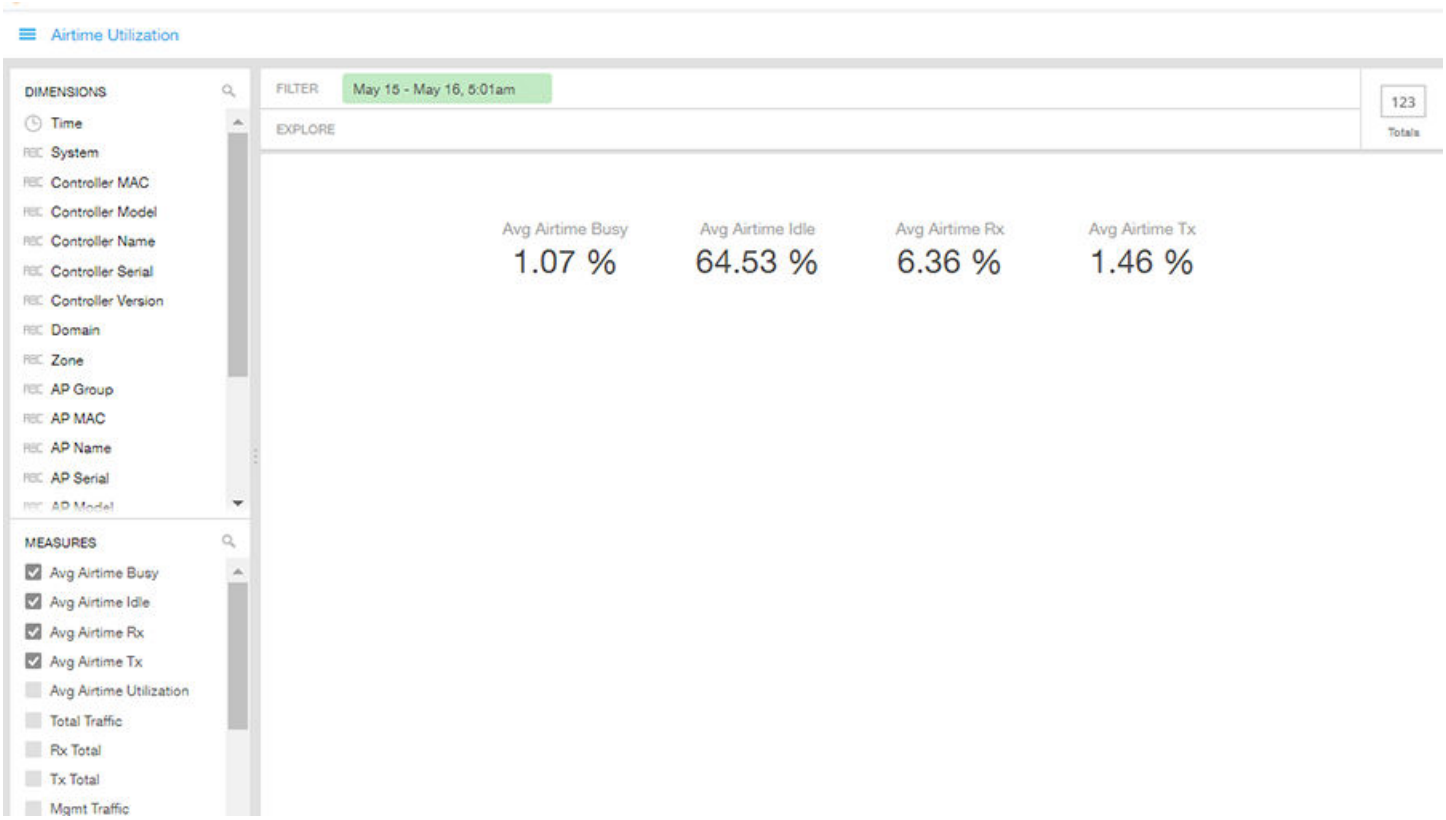
FIGURE 100 Data Explorer - Network



Airtime Utilization

Airtime Utilization cube allows you to explore the airtime utilization data in any method of your choice. It provides you with a platform to experiment with the data and use the same for custom requirements.

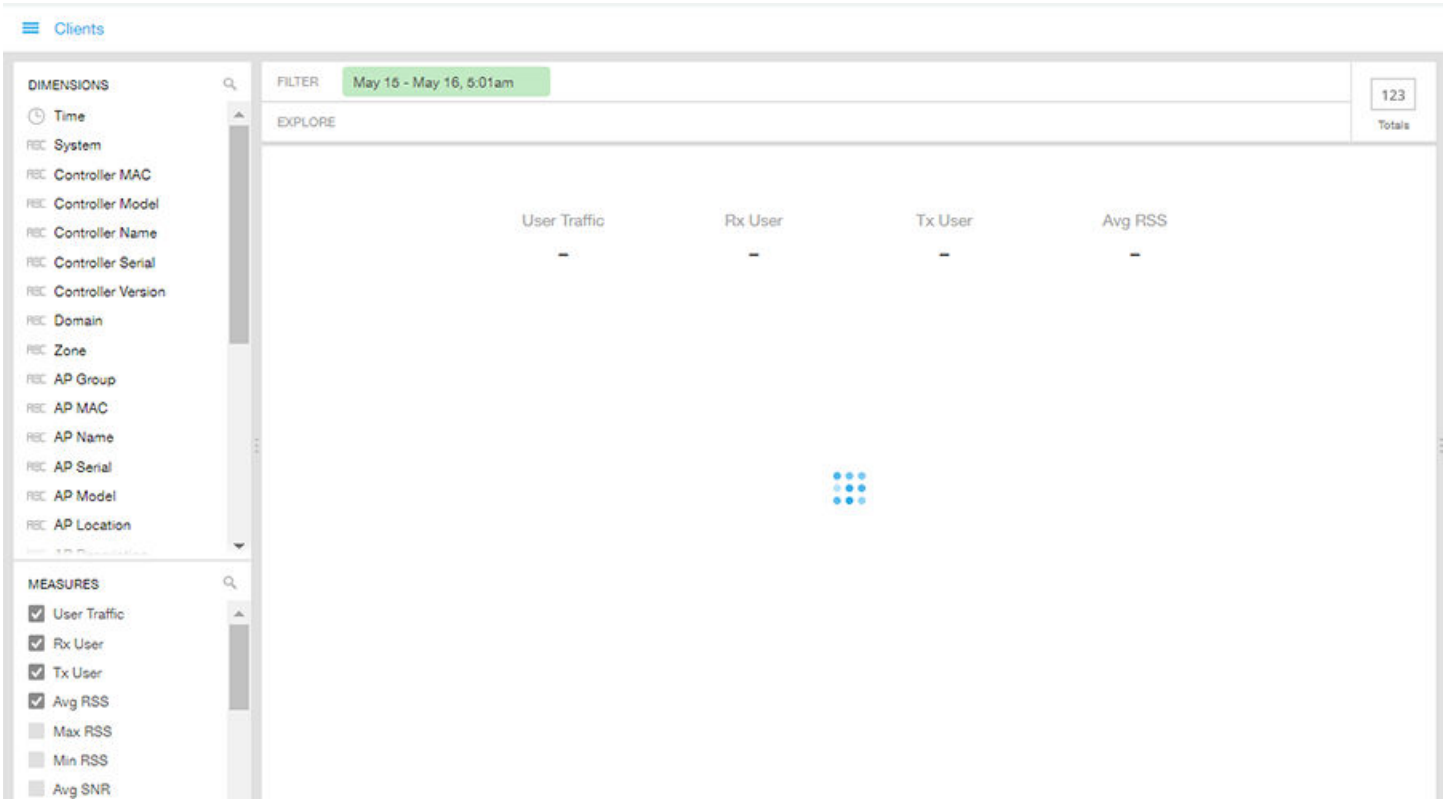
FIGURE 101 Data Explorer - Airtime Utilization



Clients

The Clients cube allows you to explore client data in any method of your choice.

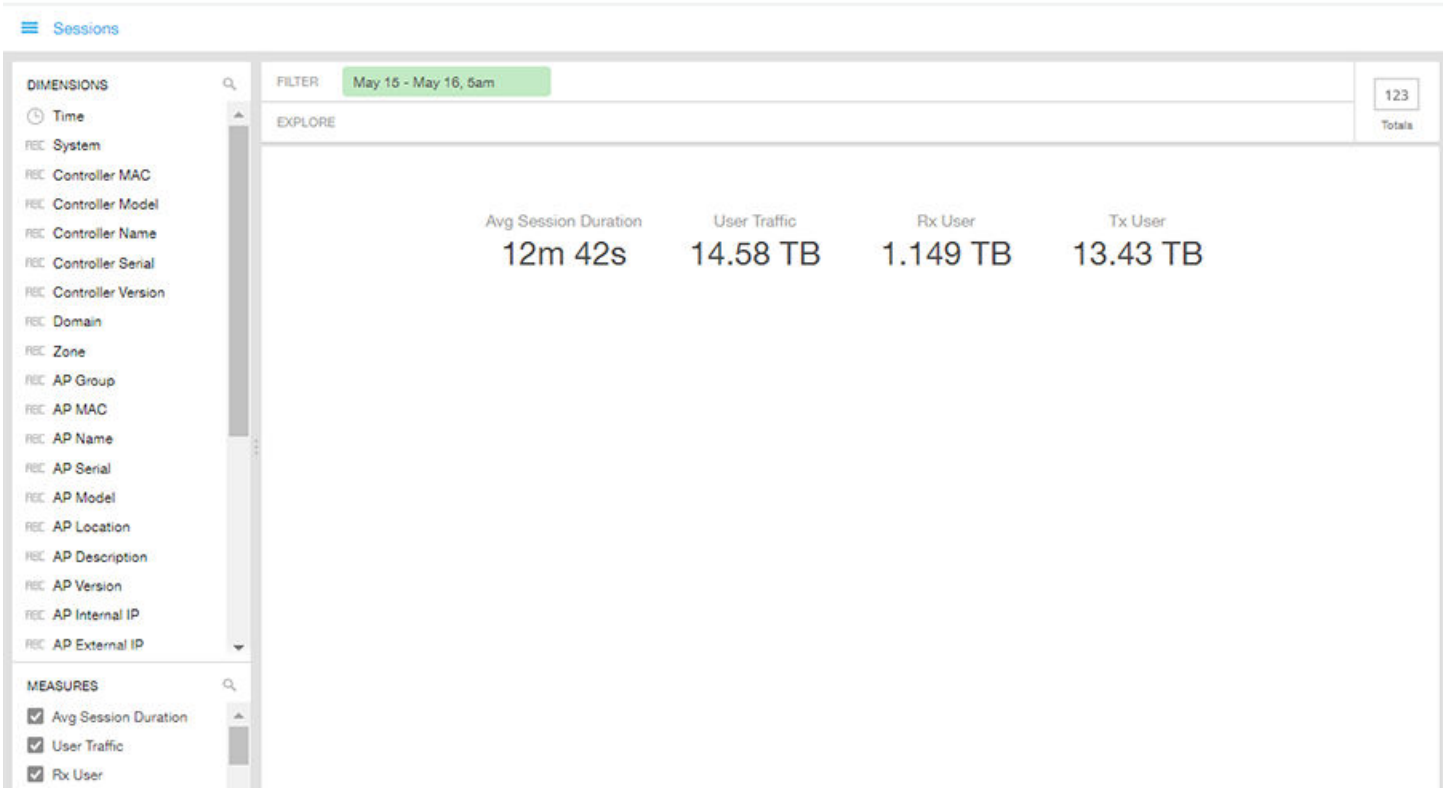
FIGURE 102 Data Explorer - Clients



Sessions

The Sessions cube allows you to explore the sessions summary in any method of your choice.

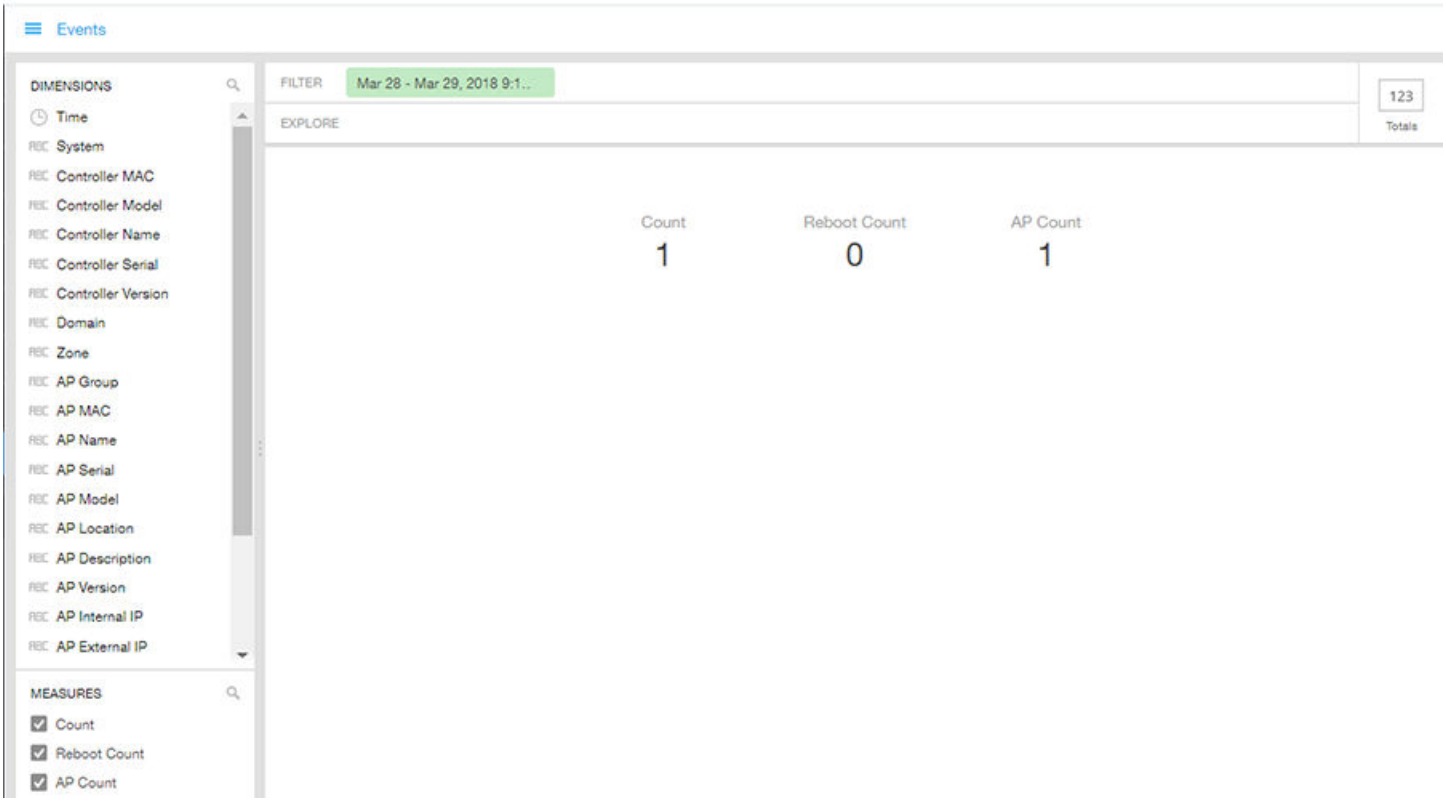
FIGURE 103 Data Explorer - Sessions



Events

Events cube allows you to explore the information on events and share the same as per custom requirements.

FIGURE 104 Data Explorer - Events



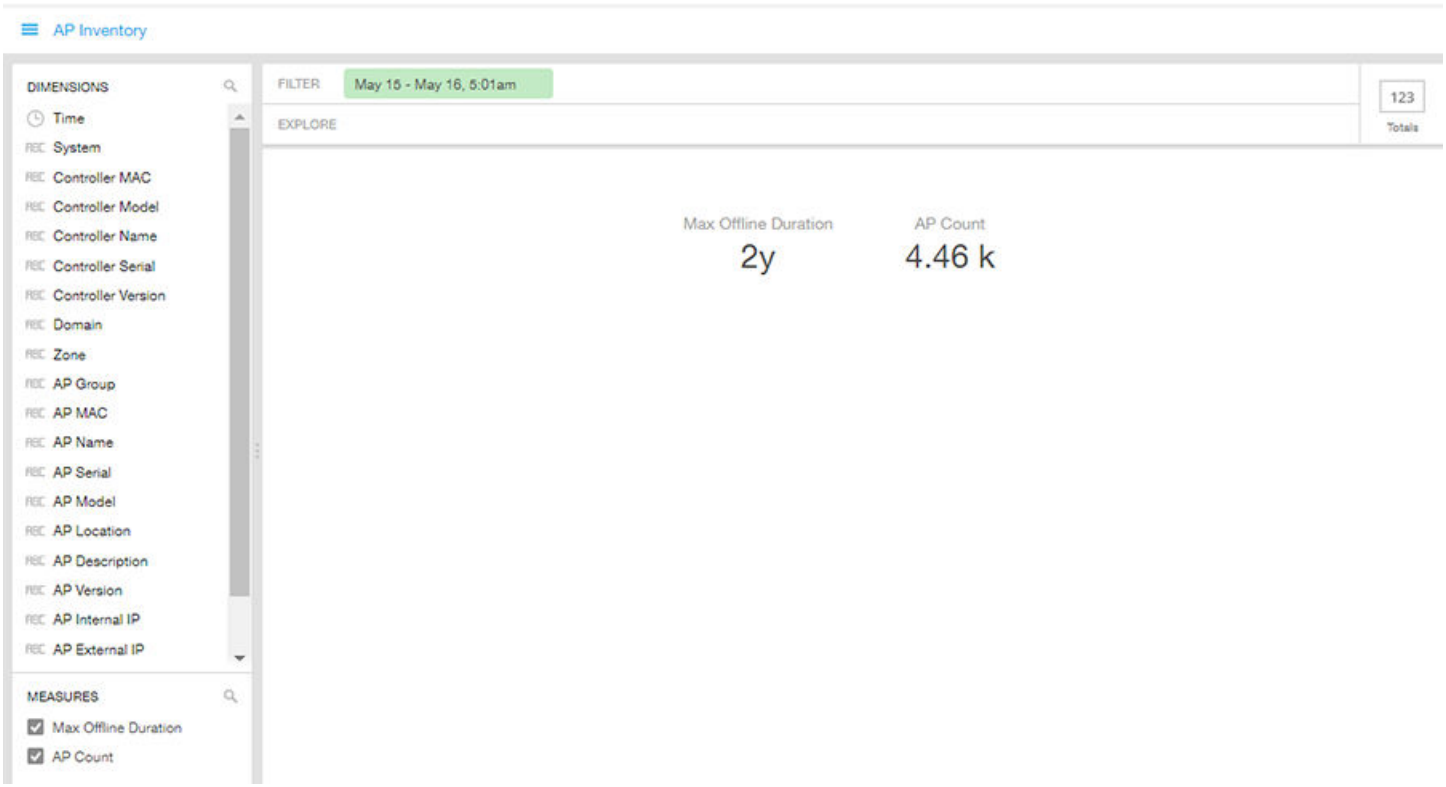
NOTE

Refer to the SmartZone *Alarm and Event Reference Guide* based on the controller platform (SCG200/SZ300 and vSZ-H) or (SZ100 and vSZ-E) for details on alarms and events.

AP Inventory

The AP inventory cube allows you to explore the information on AP models disconnected duration and share the same as per custom requirements.

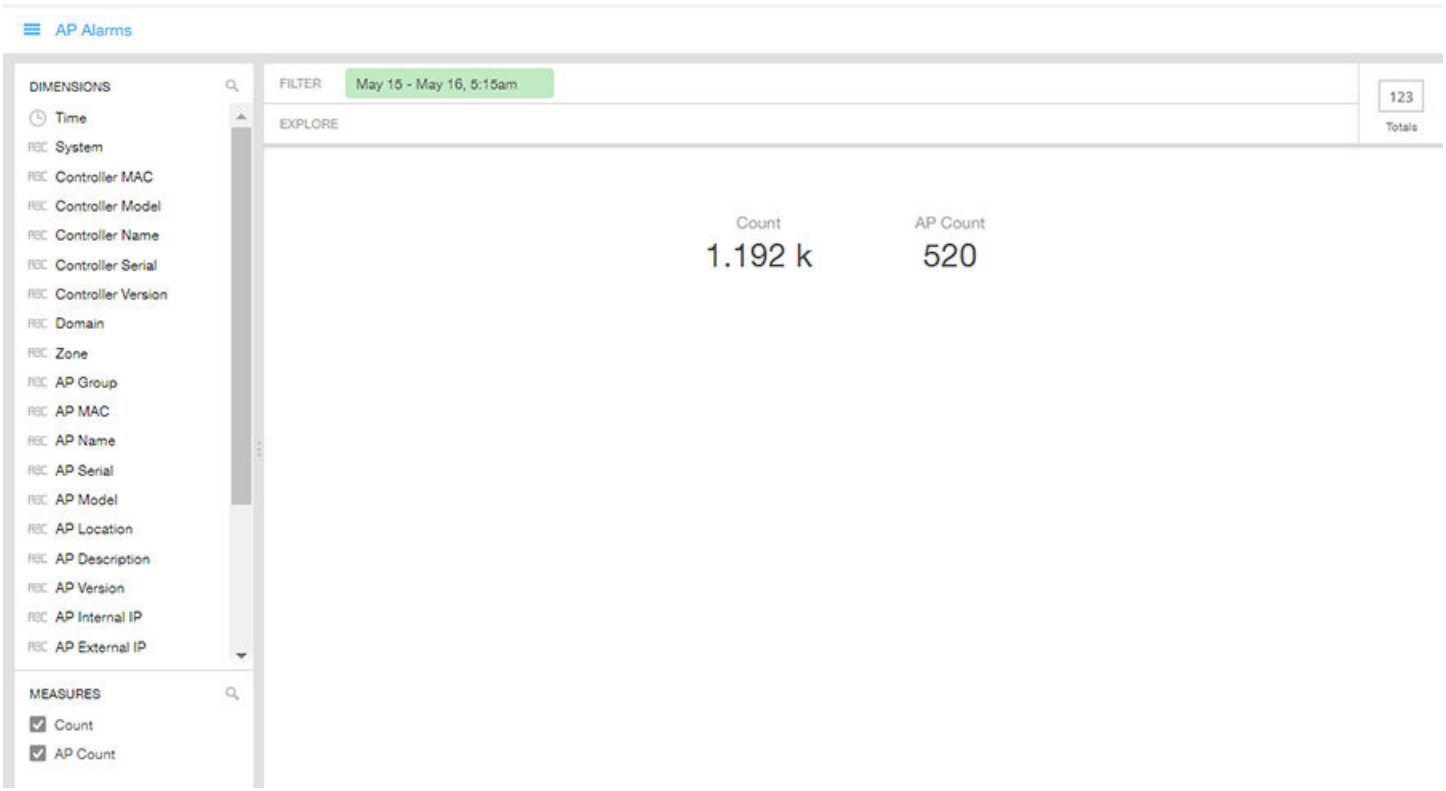
FIGURE 105 AP Inventory



AP Alarms

AP alarms cube allows you to explore the information on alarms based on the APs configured on different controllers and share the same as per custom requirements.

FIGURE 106 AP Alarms



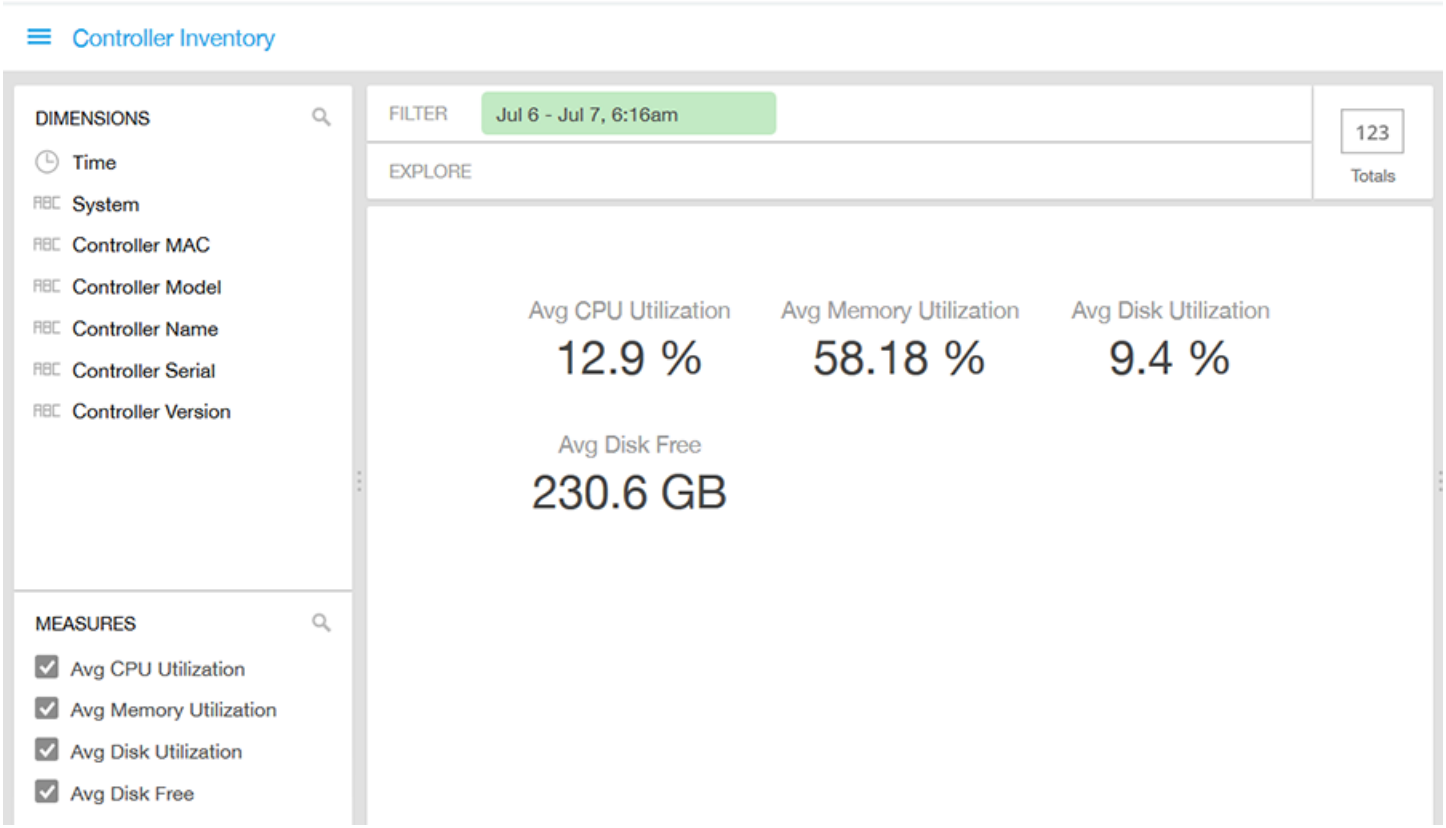
NOTE

Refer to the SmartZone *Alarm and Event Reference Guide* based on the controller platform (SCG200/SZ300 and vSZ-H) or (SZ100 and vSZ-E) for details on alarms and events.

Controller Inventory

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

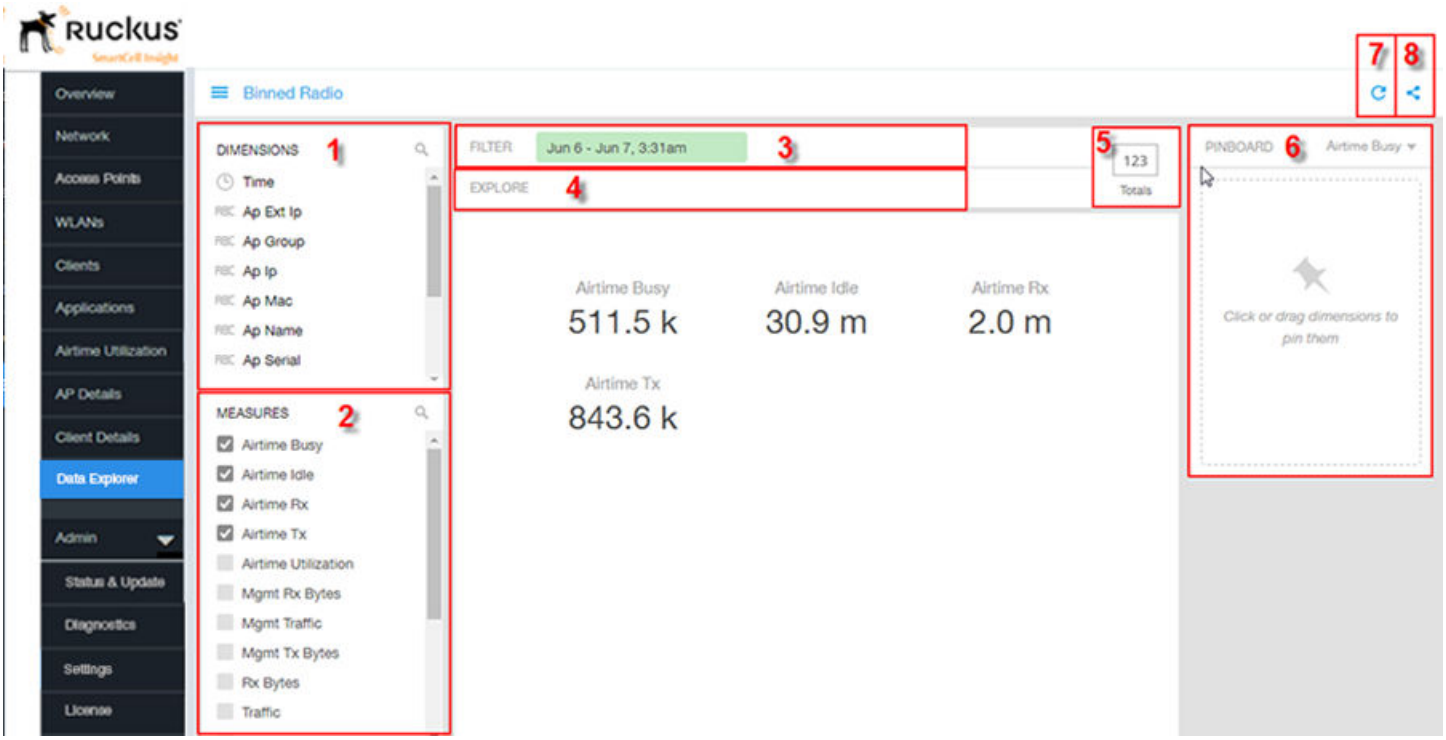
FIGURE 107 Controller Inventory



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.

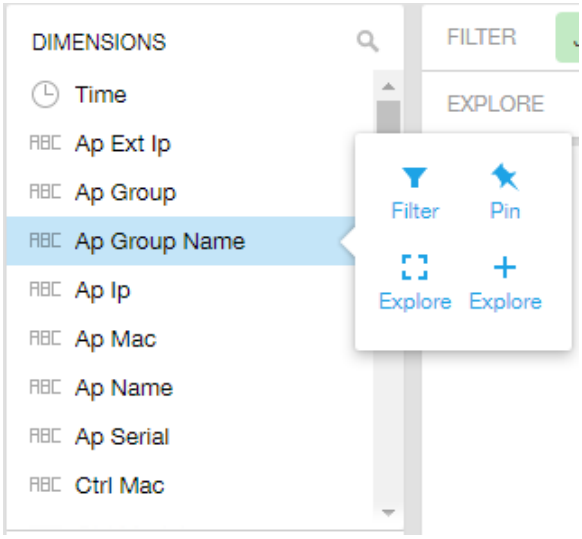
FIGURE 108 Data Cube Filters



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

Dimensions

FIGURE 109 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.

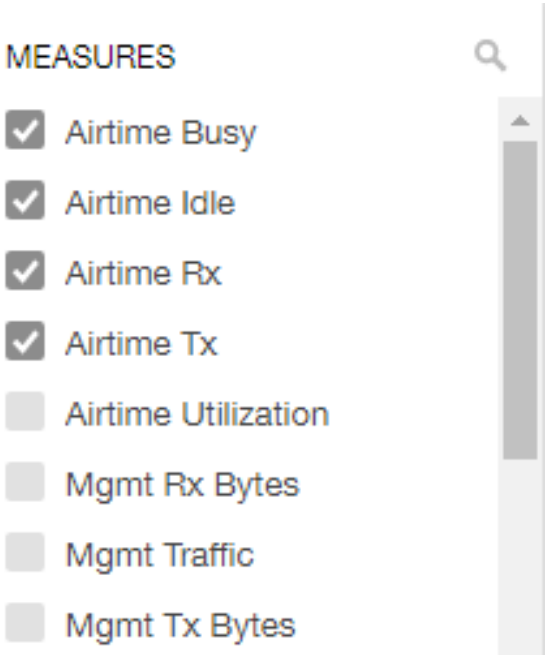
You can use the scroll bar on the screen for each data cube to view the supported dimensions for that cube. A complete list of dimensions supported on one or more data cubes in SCI follows:

- Time
- System
- Controller MAC
- Controller Model
- Controller Name
- Controller Serial
- Controller Version
- Domain
- Zone
- AP Group
- AP MAC
- AP Name
- AP Serial
- AP Model
- AP Location

- AP Description
- AP Version
- AP Internal IP
- AP External IP
- Connection Status
- Last Status Change
- Radio
- SSID
- Client MAC
- Client IP
- Username
- Hostname
- Manufacturer
- OS Type
- Session ID
- Session Type
- First Connection
- Disconnect Time
- Application Name
- Port
- Event Code
- Event Type
- Reason
- Alarm UUID
- Alarm Code
- Alarm Type
- Alarm State
- Severity
- Category

Measures

FIGURE 110 Measures



Number 2 in Data Cube Filters. Lists numbers such as Rx bytes, Traffic and Tx bytes. Select one or more measures by which you want to sort the selected dimension (in Explore). The first four measures in the list are the default measures.

Based on the selected cube, measures could vary. For example, **Events** displays the count, reboot count and AP count. Newly added measures are:

- Unique Client Count for Clients and Sessions data cubes
- Hostname Count for Clients and Sessions data cubes
- AP Count for all data cubes
- Username count for Clients and Sessions data cubes

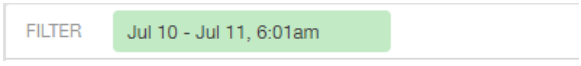
You can use the scroll bar on the screen for each data cube to view the supported measures for that cube. A complete list of measures supported on one or more data cubes in SCI follows:

- User Traffic
- Rx User
- Tx User
- AP Count
- Client MAC Count
- Total Traffic
- Rx Total
- Tx Total
- Mgmt Traffic
- Rx Mgmt

- Tx Mgmt
- User Traffic
- Rx User
- Tx User
- Avg Airtime Busy
- Avg Airtime Idle
- Avg Airtime Rx
- Avg Airtime Tx
- Avg Airtime Utilization
- Avg RSS
- Max RSS
- Min RSS
- Avg SNR
- Max SNR
- Min SNR
- Avg Noise Floor
- Avg Throughput Estimate
- Session Count
- AP Count
- Client Username
- Client Hostname
- Avg Session Duration
- Count
- Reboot Count
- Max Offline Duration
- Avg CPU Utilization
- Avg Memory Utilization
- Avg Disk Utilization
- Avg Disk Free

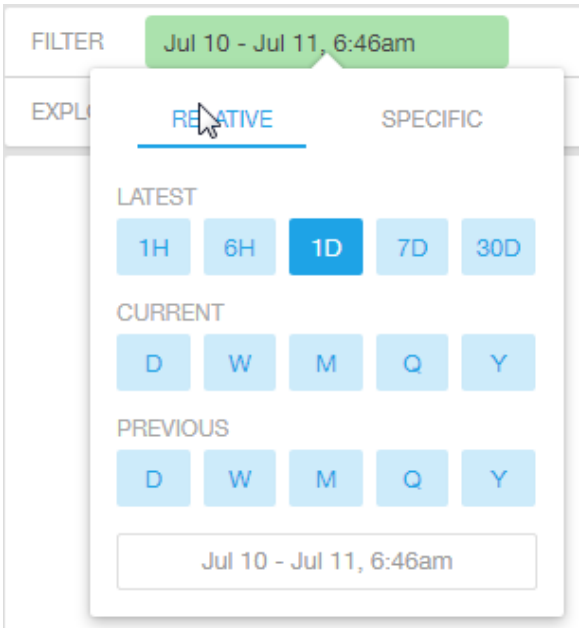
Filter

FIGURE 111 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.

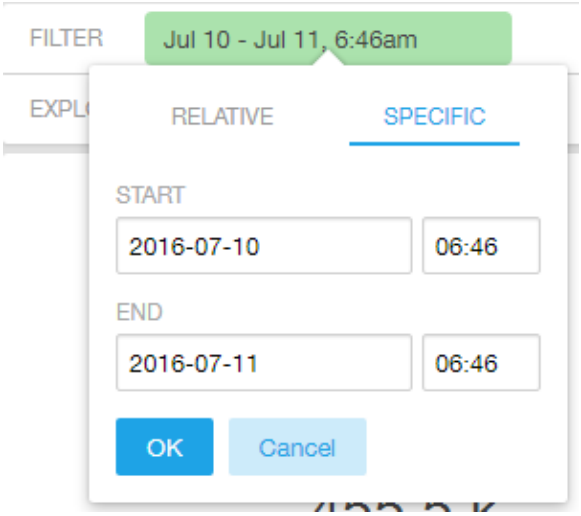
FIGURE 112 Time - Relative Settings



You can specify the following:

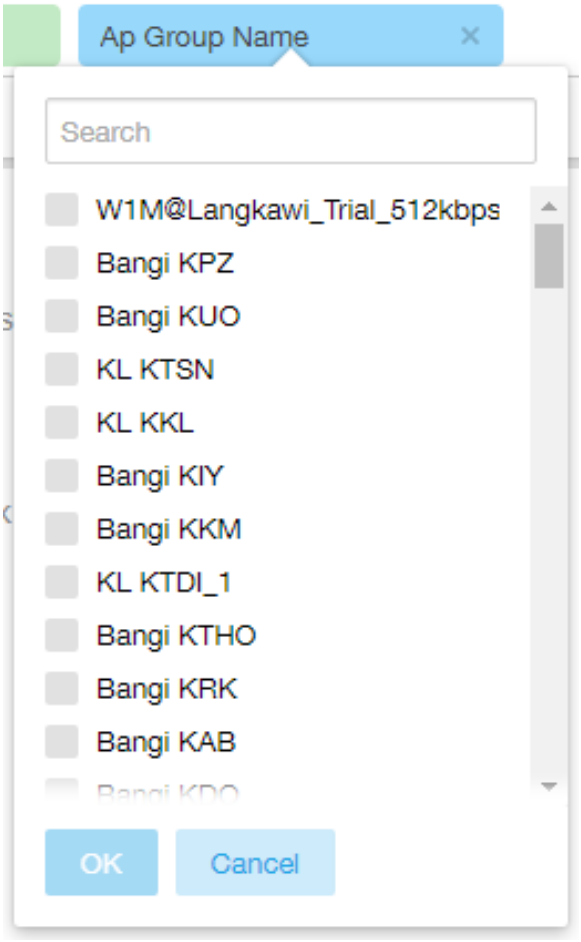
- Latest time of 1 hour, 6 hours, 1 day, 7 days, or 30 days.
- Current time of day, week, month, quarter, or year.
- Previous time of day, week, month, quarter, or year.

FIGURE 113 Time - Specific Settings



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

FIGURE 114 Dimension Options



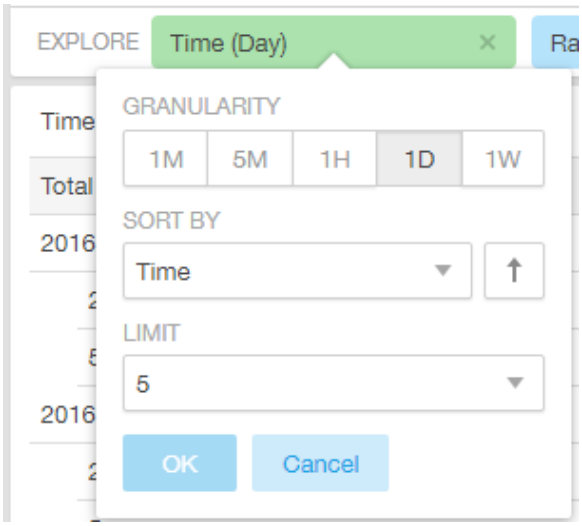
You can search the list of the dimension and choose specific entries. By default all the data that matches the dimension is listed.

Explore

FIGURE 115 Explore

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

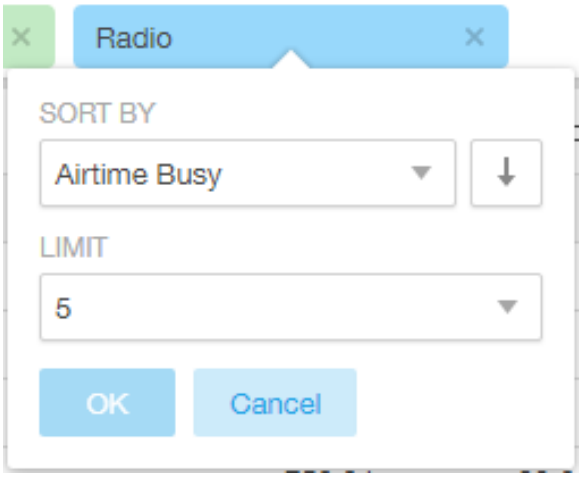
FIGURE 116 Explore Time



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 117 Sort Dimension by Measure



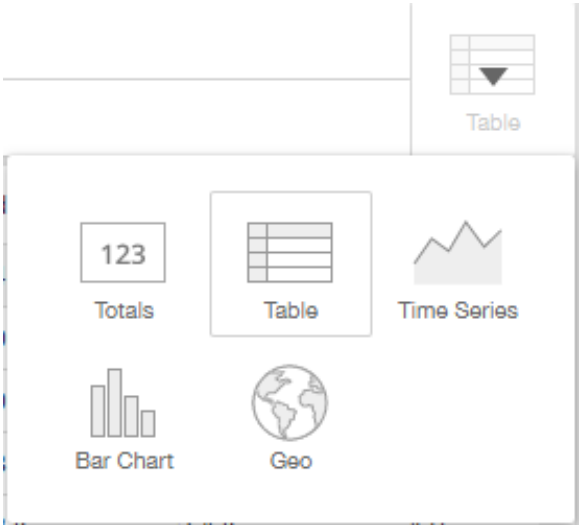
Use this filter to:

- 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 118 View Outputs



Number 5 in Data Cube Filters. Create outputs from visualization in the form of Totals, Tables, Bar chart, and Time Series. The default view is Totals. The Geo view is not supported in this release.

Number 5 in Data Cube Filters. Create outputs from visualization in the form of Totals, Tables, Bar chart, and Time Series. The default view is Totals. The Geo view is not supported in this release.

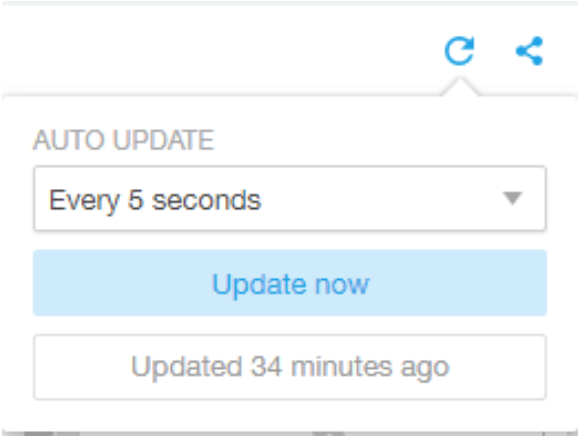
Pinboard

FIGURE 119 Pinboard

Number 6 in Data Cube Filters. Click or drag dimensions and pin them on the pinboard. Retain the dimensions for ready reference during visualization. You can sort the dimensions pinned on the pinboard by the drop down list of measures on the top right hand corner of the pinboard.

Refresh Options

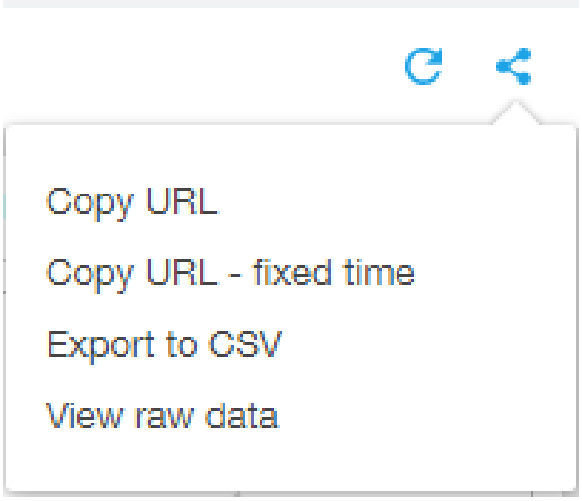
FIGURE 120 Refresh



Number 7 in Data Cube Filters. Refresh or auto update the screen at a selected time of 5 seconds, 15 seconds, every minute, 5 minutes, 10 minutes, 30 minutes, or not at all (off). The default option is **Update now**. It displays at the bottom of the pop-up, when the last update occurred.

Share Link

FIGURE 121 Share Link



Number 8 in Data Cube Filters. You can share the URL, Export to CSV, View raw data, or download the information.

Admin Dashboard

Admin Console

The Admin pages provide options for configuring SCI's administrative settings, performing diagnostics and performing system updates.

The Admin section is divided into the following pages:

- Status and Updates
- Diagnostics
- Settings
- License

NOTE
For information on SCI installation, refer to the SCI 2.0 Installation Guide, available from `support.ruckuswireless.com`

Status and Updates

The Status and Update page lists the active SCI nodes and displays the current firmware version.

Nodes

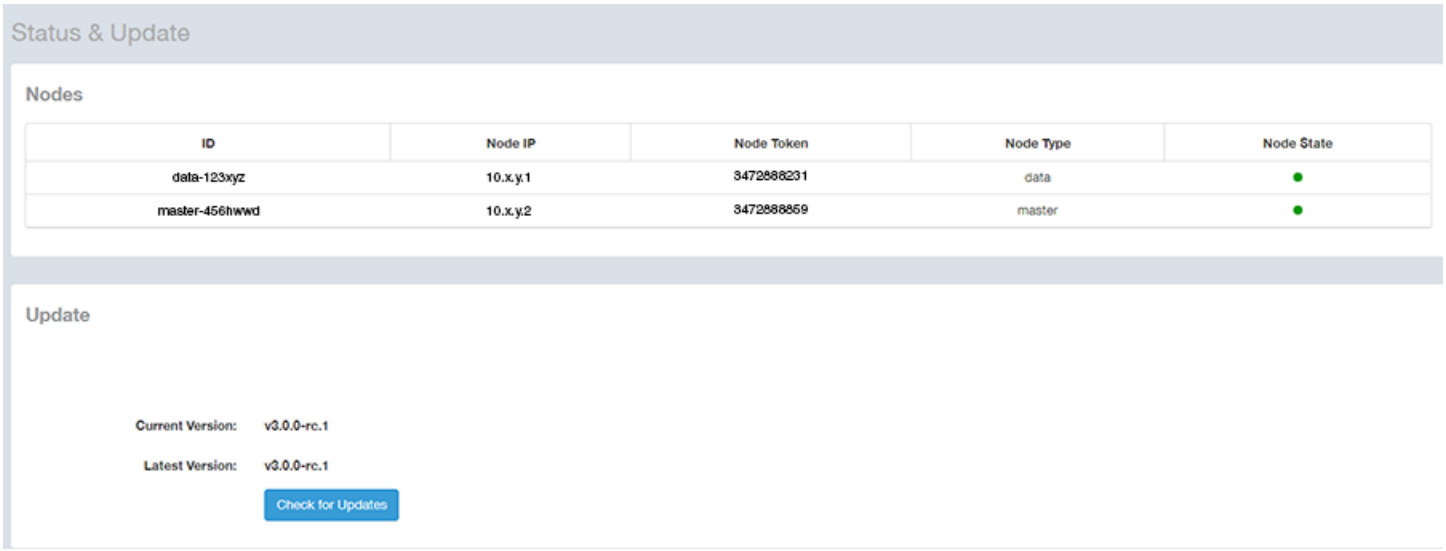
The Nodes section lists the active SCI nodes, and includes the following information on each node:

- **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.

Update

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).

FIGURE 122 Status and Update screen



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:

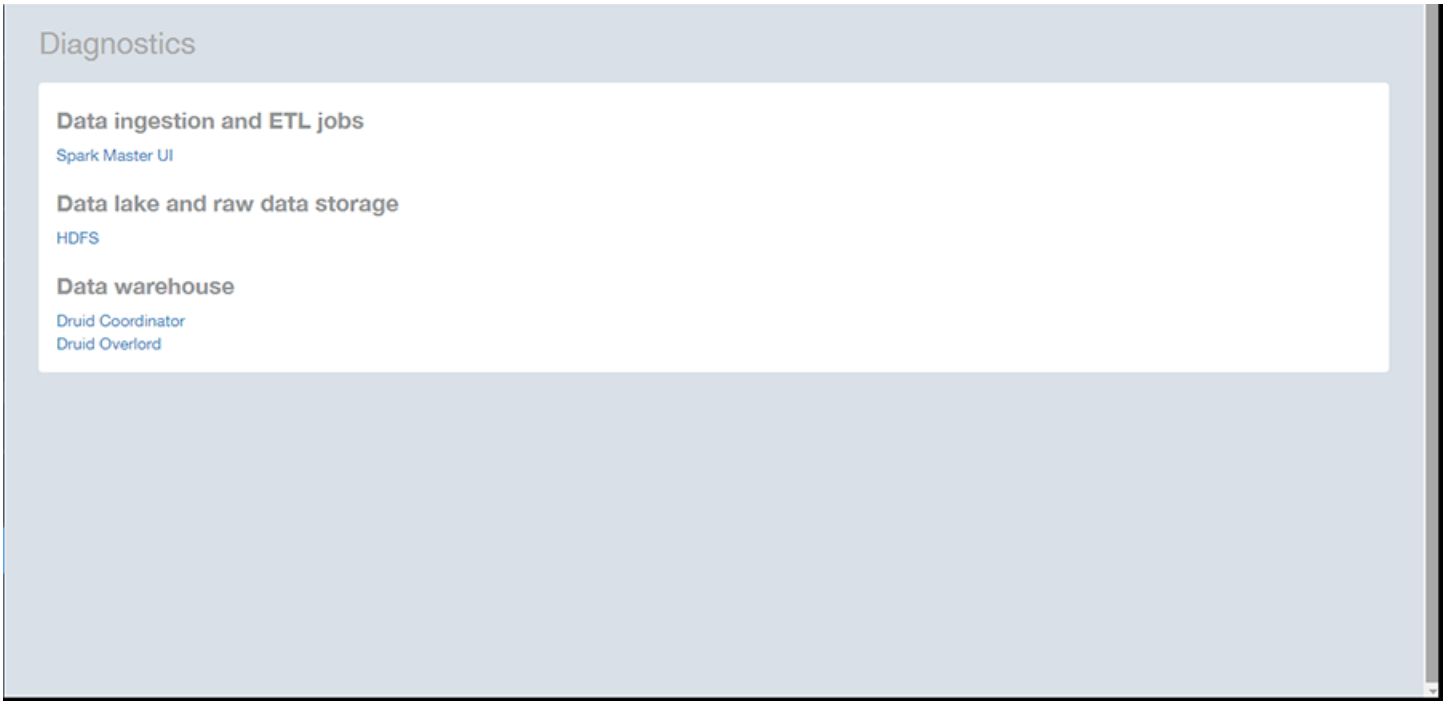
- **Data ingestion and ETL jobs:** The Spark Master UI provides details of workers, running applications, running drivers, completed applications and completed drivers.

  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 123 Diagnostics



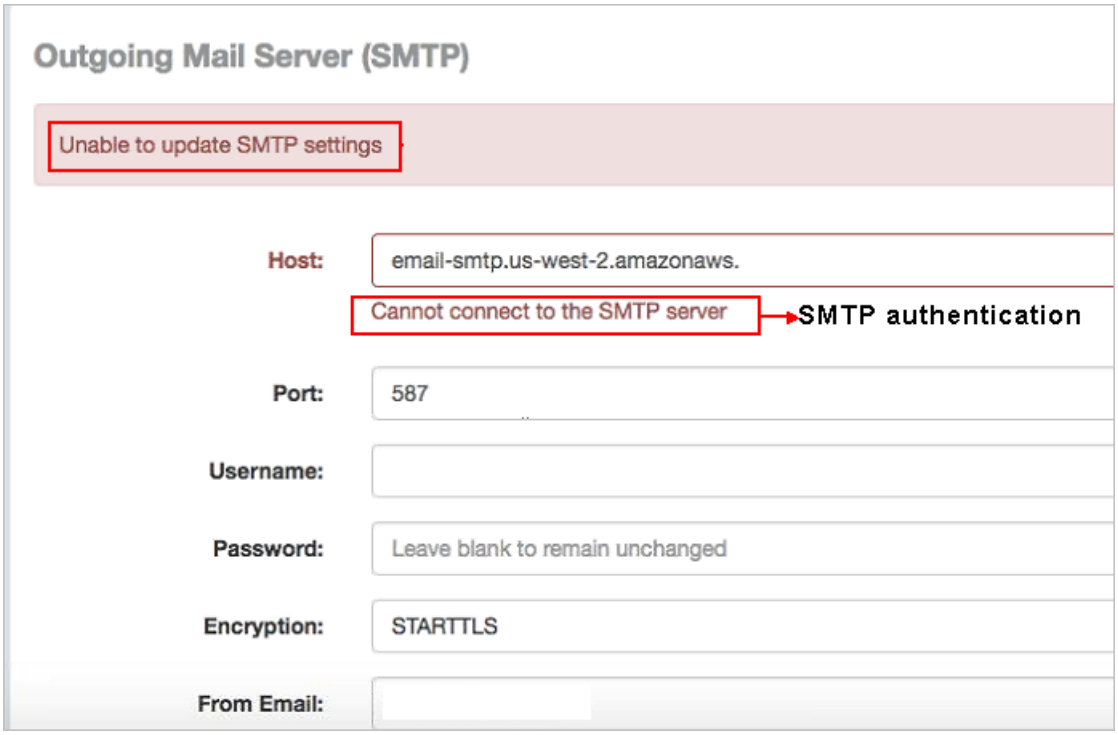
Settings

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

SMTP Settings

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

FIGURE 124 SMTP Settings

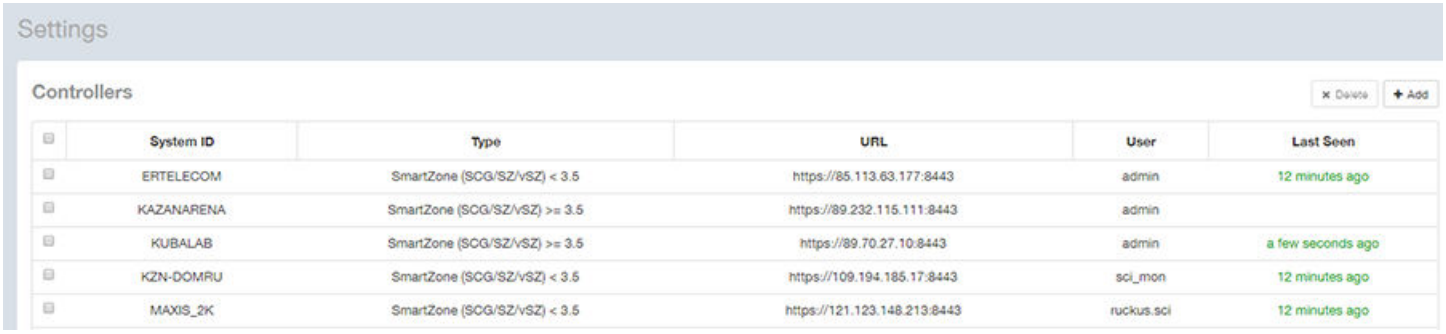


You can configure the SMTP mail server to send or receive e-mail messages to or from SCI. The SMTP settings section contains the configuration details:

- **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.

Controller Settings

FIGURE 125 Controller Settings

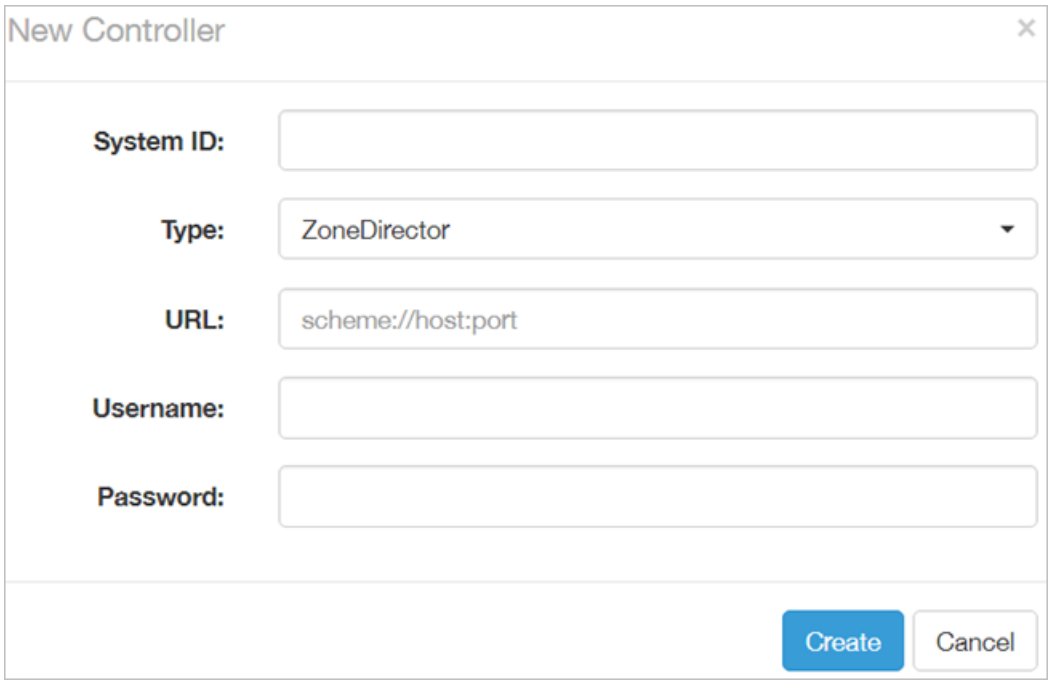


NOTE
The **Last Contacted** column in the above figure lists the last SCG controller connection and uptime status.

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

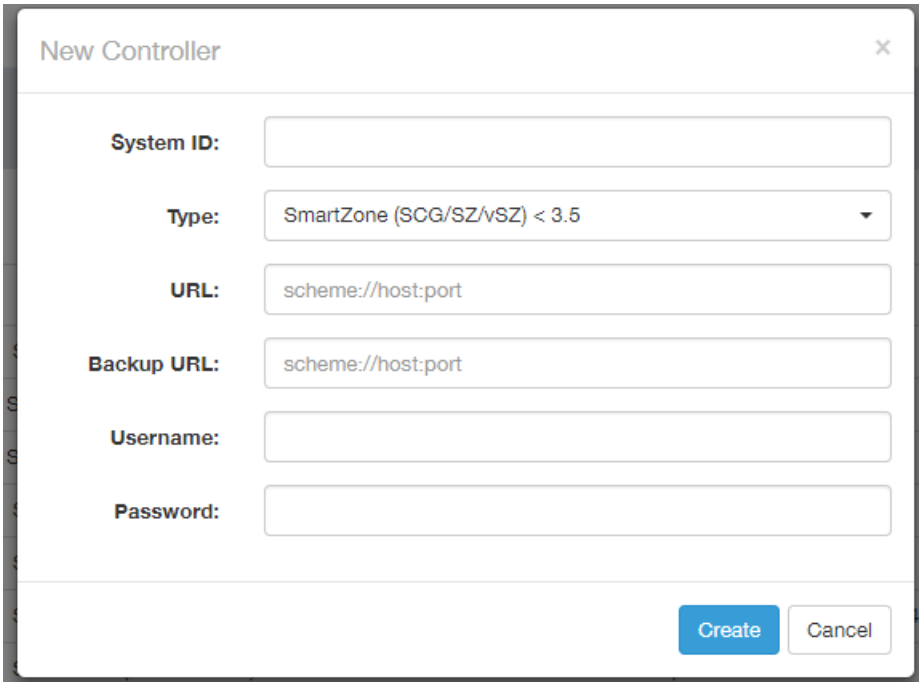
If you select ZoneDirector, the following screen appears:

FIGURE 126 Adding Controller Settings for ZoneDirector



If you select SmartZone <3.5 (the default), the following screen appears:

FIGURE 127 Adding Controller Settings for SmartZone < 3.5



If you have an SmartZone 3.4 (or below) cluster, you can provide a backup URL for SCI to connect to it if it is not able to connect to the default location.

You need to add these settings for every controller that you add to SCI.

- System ID: type the name of the controller you want to add to SCI

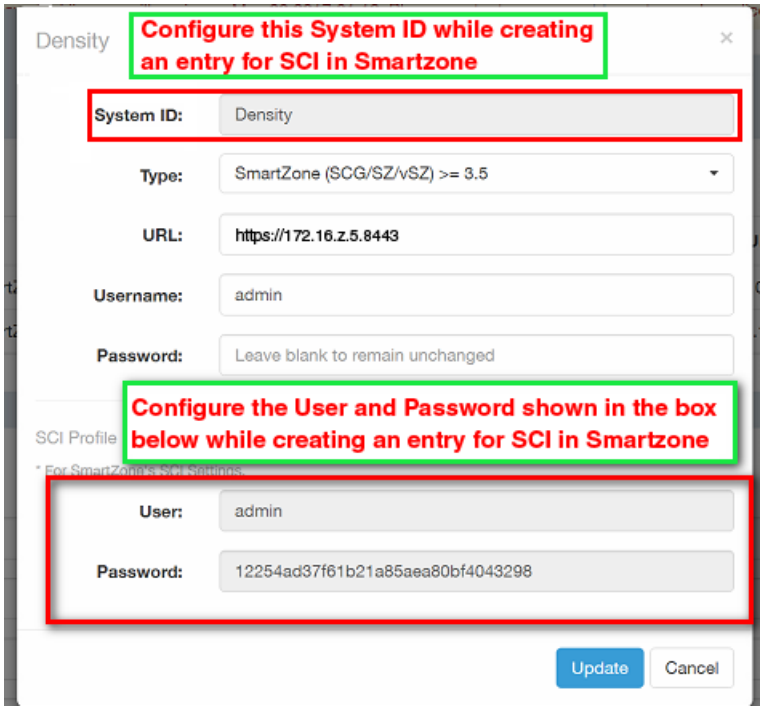
  NOTE
  The controller name should be unique and cannot be changed.

- Type: select the controller type from the drop-down menu
- URL: type the URL of the controller
- Backup URL: type the URL of the backup controller location
- Username: type the username to access the controller
- Password: type the password to access the controller

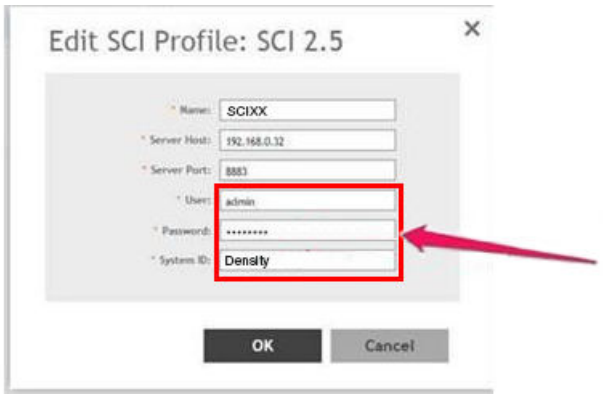
  NOTE
  The username and password must be created in the controller.

If you select SmartZone >=3.5, the following screen appears (red text containing important information has been added as well as example data):

FIGURE 128 New controller information - SmartZone 3.5 controller



The System ID field and the two fields under "SCI Profile" (User and Password) in the screen above must be identical to the fields of the same name in the Add (or Edit) Profile screen of the Controller Web UI **Systems > General Settings > SCI** area, as indicated in the figure below.



The complete list of fields that you need to configure in the SCI New Controller screen for adding a SmartZone >= 3.5 is shown below:

- **System ID**: This is the unique name of the controller that you want to add to SCI. As shown in the two figures above, this field must be identical between the SCI New Controller screen and the Add/Edit SCI Profile of the Controller Web UI.

  NOTE
  The system ID cannot be changed once it has been configured in the SCI Add Controller screen.

- **Type**: select the controller type from the drop-down menu
- **URL**: type the URL of the controller

- Username: Enter the administrator username to access the controller.

  NOTE
  The Username provided should be the same as the user name used to access the SmartZone UI.

- Password: Enter the administrator password to access the controller.
- **SCI Profile:** Enter the User and Password login credentials to access the SCI profile. These login credentials are different from the administrator credentials above. As shown in the two figures above, the two SCI Profile fields must be identical between the SCI New Controller screen and the Add/Edit SCI Profile of the Controller Web UI.

Click **Create** to save the controller settings. An entry appears in the Controller section with the controller details. You can delete a controller by selecting it from the Controller section, and then clicking **Delete**.

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 which is valid for 3 months. This license needs to be updated to the permanent license before the trial license expires. 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.
4. Upload this file to SCI on the License page.

You have successfully upgraded to the permanent license.