USER GUIDE



Ruckus SmartCell Insight[™] User Guide, 5.3.0

Supporting SmartCell Insight[™] 5.3.0

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Overview

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

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

NOTE

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

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

Document Conventions

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

Convention	Description	Example
monospace	Represents information as it appears on screen	[Device name]>
monospace bold	Represents information that you enter	<pre>[Device name]> set ipaddr 10.0.0.12 ruckus# show running-configap-heartbeat</pre>
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 TM (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

TABLE 2 Notice conventions (continued)

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

Related Documentation

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

Documentation Feedback

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

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

When contacting us, please include the following information:

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

SmartCell Insight Overview

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SmartCell Insight Introduction

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

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

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

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

SCI supports Ruckus SmartZone and Ruckus ZoneDirector controllers.

NOTE

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

Definition of Terms

The following are terms used in SCI.

TABLE 3 Definition of Terms

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

TABLE 3 Definition of Terms (continued)

Term	Definition					
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 betwee	n various traffic metrics					
• Total Traffic =	- User Traffic + Management Traffic = Rx Total + Tx Total					
• Rx Total = Rx	User + Rx Managemet					
• Tx Total = Tx	ser + 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 <i>All Radios</i> unique count will not be larger than the sum of the <i>2.4GHz</i> and <i>5GHz</i> radios. This is because a Wi- Fi client could connect to both radios within the selected time granularity, and <i>All Radios</i> unique count will consider this client as a single count.					
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.					
	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

RUCKUS	ş			1			edmin
Overview 2 ^		3	Overview		4		Download +
Network >		•	Controller		Access Points		Switches
WLANS		iew Schedule				9.96	
Clients	Scheduled	Enable Disable X Drieta		9 🔸		444	
Applications	0 21	 Jan 01 2020 00:00 +05:30 				Total	
Artime Utilization	CK test PDF weekly	 Jun 24 2019 10:00 +05:30 	5	4	92	153	9
AP Details	delete	 Jun 23 2019 01:00 +05:30 	SmanZones		APs with Reboots	APs With Alarms	Switches Online
Client Details	itendra_report	 Jun 28 2019 10:00 +05:30 	Network Usage (Quantiau			
Switch Details	Lakshmi Test Overview	 Jun 22 2019 12:00 +08:00 Jul 01 2019 00:00 +08:00 	Network Usage	Jverview			
	B Overview1	 Jan 01 2020 00:00 +08:00 	1000				
Data Explorer	0 P3	 Jan 01 2020 00:00 +08:00 	250				<u> </u>
Admin 🔸	PR675_mnthly	 Jul 22 2019 01:00 +08:00 	st clears			۰ 🔴	
	test CSV	 Jun 22 2019 13:00 +05:30 	No. o			•	
			250		200	9-2-0	

TABLE 4 SCI web interface elements

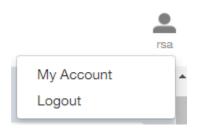
No.	Name	Description
1	Header Panel	Displays the currently logged in user profile. Click the user icon \bigcirc to update the profile or change the password as required.
2	Navigation Bar	Contains links that take you to the various dashboards and the Data Explorer cubes and Admin console.
3	Schedules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

My Account	
Profile	
Email:*	ops@ruckuslbs.com
	This email will receive alerts regarding the system
Username:*	admin
First Name:*	First
Last Name:*	Last
	Update Profile
Password	
Current Password:	
New Password:	Minimum 8 characters
Confirm Password:	Minimum 8 characters
	Change Password

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

Using the Navigation Bar

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



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

- Using the **Admin** console. The Admin console is where you add controllers to your network. The admin console also shows the health of the system and checks for updates. Links to view the status of external sources that SCI uses, such as Hadoop, Spark and Druid, are also provided.
- Using **Data Explorer**. Data Explorer is a custom reporting tool that allows you to manipulate an OLAP (Online Analytical Processing) cube to address the needs of a wide variety of users. Refer to Data Explorer and Data Cubes on page 127 for details.
- Generating reports. The remaining dashboards in SCI can be used to generate reports.
 - To filter the content displayed, click either the **AP SSID Radio** filter or the **Time Period** filter. For more information about using filters to generate specific reports, refer to the Working With Filters on page 27
 - To download a copy of the content currently displayed on the screen, click **Download**, and select **CSV** or **PDF** as the file type.

Using the Scheduler

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

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

FIGURE 4 Schedule frame to click to invoke Scheduler



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

FIGURE 5 Scheduler on the Overview Dashboard

		1	Overview			2			Downlo	ed *
			Schedule Name		Format	Select one •	Repeat	Selectore •		
Schedule	ed	finative Positive X Deleter	Recipient(s)	Errol addresses separated by	orrena ()					
D 21		 Jan 01 2020 00:00 +05:30 	For quarterly and yearly selection	, the date range is fixed, i.e. Jan 0	1 00:00 - Mar 31 23:59 and Jan 0	01 00:00 - Dec 31 23:59			Seve Can	iver
D des	iute	 Jun 29 2019 01:00 +05:30 								-
D jter	ndra_report	 Jun 28 2019 10:00 +05:30 	Controller		Access Points		Switches		1	-
D Lok	kahmi Tost	 Jun 28 2019 12:00 +08:00 					(1999) (1999) (1999)			
0 Ov	erview	Jul 01 2019 00:00 +08:00		9 👬		2964 🚨		9		
0 Qve	reciper1	 Jan 01 2020 00:00 +08:00 		1 M		100 -		144	••	
O PO		 Jan 01 2020-00:00 +08:00 								
D PA	1675 jawataly	 Jul 22 2019 01:00 +08:00 	6 Smarthman	3 ZonaConstan	7 Athe with Proposite	33 Alte Will Alasem	9 Sectores Colos	(Seekate		

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

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

NOTE

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

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

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

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





Overview Dashboard

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Using the Overview Dashboard - Content Panel

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

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:

- Controller- Displays the number of controllers being used in your WiFi network. The green and red dots depict how many of these controllers are active and inactive.
- 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."
- Switches Shows the number of switches 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."
- Network Usage overview This is a plot showing the relationship between the number of clients and the total traffic in the network. It contains bubbles of different colors that indicate different dimensions of the network including Applications, Domain, OS Types, System, AP Group, Switch, and SSID. Hover over any of the bubbles to display the

number of connected clients and traffic information. Bubble sizes vary, depending on their value (except for APs and Switches).

FIGURE 8 Overview Dashboard - Ruckus SmartAnalytics

erview	٥v	/erview						May 01 2019 - Ma	y 02 2019 🔸 Downlo
ntory		Ruckus SmartAna	lytics						
tory > OHEDULE					Found 43 APs 1	for review ^{whars this?}			
54		User Traffic 🖉	3	Client Count 🕕	Session	Count 13	Short Session Ratio	P	eboot Count 🔘
cations		AP Name	Anomalies (Yesterday)	Anomalies (30 Days)	User Traffic Score	Client Count Score	Session Count Score 5	Short Session Ratio S	Reboot Count Score
10		AP4.8610-0590	3	15	6.0	8.3	8.5	-	
stion		AP1.8610-0737	з	5	8.2	7.4	7.3	-	-
etails		KKL B_E_L1-AP21	3	5	7.8	7.6	82	-	
		AP1.8610-0333	3	7	8.5	72	7.3	-	-
Details		LUCT_Concourse_AP4	з	в	7.1	7.5	8.0	-	
Explorer		MAXIS_LVL11_Amdoc	3	5	8.3	هه 💫	83	-	
Capitoria		W04-56K-R710.11	2	4	-	8.0	8.1	-	
		AP1.8610-0974	2	8	-	6.5	6.9	-	
		AP2.8610-0042	2	3		6.5	6.7	-	
		AP1.8610-0347	2	1		7.9	7.9	-	
					- 1× i	of 5 🕨			

For information about how to use Ruckus SmartAnalytics, refer to Using Ruckus Smart Analytics on page 21

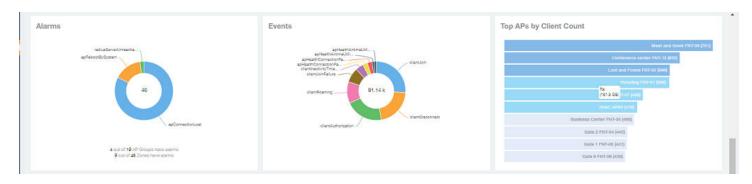


FIGURE 9 Overview Dashboard - Middle Portion

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

- 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.

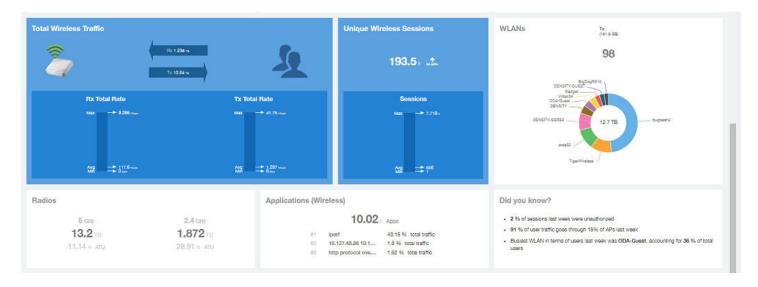


FIGURE 10 Overview Dashboard - Lower Portion

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.
- "Did you know?" Provides a short, bulleted list about your system, such as the average duration of a session for a week, or the busiest SSID. The "Did you know?" section is updated every time you return to the Overview dashboard.

Using Ruckus Smart Analytics

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

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

- User Traffic: An AP is flagged for review when the User Traffic is unusually high or low compared to the expected trends
- Client Count: An AP is flagged for review when the Client Count is unusually high or low compared to the expected trends
- Session Count: An AP is flagged for review when the Session Count is unusually high or low compared to the expected trends

- Short Session Ratio: An AP is flagged for review when the ratio of short sessions per total sessions becomes unusually high.
- Reboot Count: An AP is flagged for review when the number of times the AP has been rebooted is unusually high.

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

FIGURE 11 Default Display Example of Ruckus SmartAnalytics

			Found 51 APs f	or review What's this?			
User Traff	c 10	Client Count 12	Session	Count 10	Short Session Ratio	14) Ret	poot Count 📵
AP Name	Anomalies (Yesterday)	Anomalies (30 Days)	User Traffic Score	Client Count Score	Session Count Score	Short Session Ratio	Reboot Count S
AP1	3	0	7.4	7.1	7.3		
AP2	2	20	8.5	-	-	8.1	-
AP3	2	1	-	6.8	7.9		-
AP4	2	0	-	8.6	8.7		-
AP5	2	0	-	6.8	7.0		-
AP6	2	1	-	7.0	7.1		-
AP7	2	11	-	7.7	7.8		
AP8	2	7	-	8.2	7.4	-	-
AP9	2	0	-	7.4	7.4	-	-
AP10	1	0			6.9		

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

NOTE

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

Actions You Can Perform on the Smart Analytics Display

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

- To interpret the color coding and associated scores, note that the closest the score is to 10, the more likely there is to be an issue with the AP for the corresponding anomaly type:
 - Deep red = a score in the range of 9 to 10
 - Orange red = a score in the range of 8 to 9
 - Amber = a score in the range of 7 to 8
 - Deep yellow = a score in the range of 6 to 7
 - Bright yellow = a score in the range of 5 to 6

- Click on any AP to go to the AP Details dashboard for that AP, where you can then view anomaly charts for details, as shown in How to View Details from the Ruckus Smart Analytics Display.
- Use the gear icon on the upper right of the SmartAnalytics display to customize the output.
- Click on any of the Anomaly tabs to display the output for only the tabs you select. For example, if you want to view only the access points that have a possible anomaly with reboot count, highlight the Reboot Count tab only. The following figure shows a sample display for this scenario (note that the Reboot Count tab has been selected and appears in gray below):

FIGURE 12 Ruckus SmartAnalytics Output When Filtering on Reboot Count Only

			Found 51 APs f	or review What's this?			
User Traff	ic 16	Client Count 12	Session	Count 10	Short Session Ratio	14 Rel	boot Count 🕐
AP Name	Anomalies (Yesterday)	Anomalies (30 Days)	User Traffic Score	Client Count Score	Session Count Score	Short Session Ratio	Reboot Count S
AP11	1	30	-	-	-	-	8.6
AP12	1	0	-				7.1
AP13	1	3		-	-	-	6.6
AP14	1	2	-				6.6
AP15	1	2	-	-	-	-	6.4
AP16	1	2	-				6.4
AP17	1	0	-	-	-	-	6.4
AP18	1	4	-				6.2
AP19	1	2					6.2

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

			Found 51 APs	for review What's this?			
User Traff	c 16	Client Count 12	Session	Count 10	Short Session Ratio	IS Ret	poot Count 🗐
AP Name	Anomalies (Yesterday)	Anomalies (30 Days)	User Traffic Score	Client Count Score V	Session Count Score	Short Session Ratio	Reboot Count S
AP1	2	0		8.6	8.7		
AP2	2	7	-	8.2	7.4	-	-
AP3	2	11	-	7.7	7.8	-	-
AP4	1	4	-	7.8		-	-
AP5	2	0	-	7.4	7.4	-	-
AP6	3	0	7.4	7.1	7.3	-	-
AP7	2	1	-	7.0	7.1	-	-
AP8	1	0		6.9		-	
AP9	2	1	-	6.8	7.9	-	
AP10	2	0		6.8	7.0		

How to View Details from the Ruckus Smart Analytics Display

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

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

FIGURE 13 Client Count



FIGURE 14 User Traffic

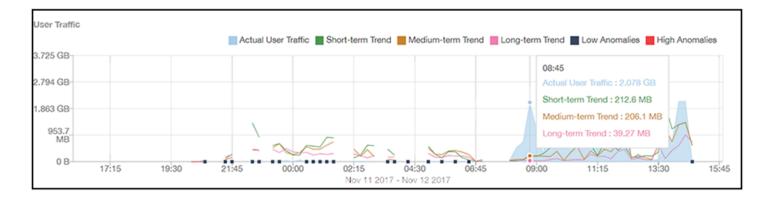


FIGURE 15 Session Count

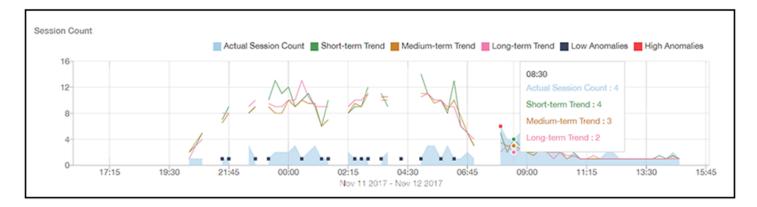


FIGURE 16 Short Session Ratio

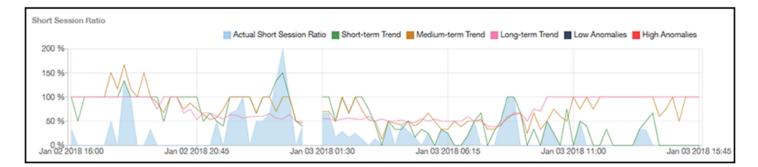
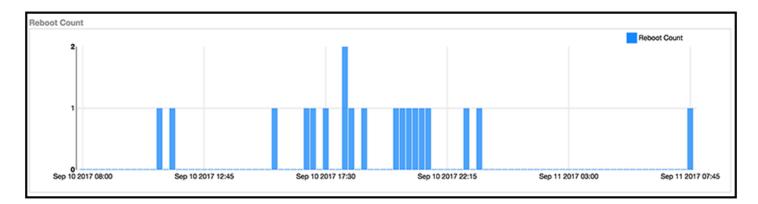


FIGURE 17 Reboot Count



Filters

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Working With Filters

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

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

The same filters are available on most dashboards:

- AP/Radio Filter (on some screens, AP/SSID/Radio filter)
- Date Filter
- Saved Filters. For information on how to use Saved Filters, refer to Using Saved Filters on page 33.

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

FIGURE 18 AP/Radio Filter, Date Filter, Saved Filters, 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 19 Custom AP and Radio Filter

	AP AII SSID AII Radio 5 C	3Hz +
APs	1	
Search group Q	Search AP Q	
🗄 🔲 🚞 All Systems	170 of 170 APs che	ecked
System1	AP1 FE:DC:BA:89:67:01	^
	AP2 FE:DC:BA:89:67:02	
	AP3 FE:DC:BA:89:67:03	
t-	▼ AP4 FE:DC:BA:89:67:04	
4 >	AP5	-
SSID All -		
Radio 5 GHz 2.4 GHz		
	Reset Filter Save	Cancel

- 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.

Filters Download

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 20 Custom Date Filter

11 07/07/2016 11 07/08/2016									Today						
<	 Jul 2016 					Aug 2016						Last 24 Hours			
Мо	Ти	We	Th	Fr	Sa	Su	Мо	Ти	We	Th	Fr	Sa	Su	Last 7 Days	s
27	28	29	30	1	2	3	25	26	27	28	20	30	31	Custom Range	
4	5	6	7	8	9	10	4	2	3	4	5	6	7	Apply Cancel	
11	12	13	44	15	16	17	8	9	10	44	12	13	44		
18	10	20	21	22	23	24	15	16	17	18	10	20	21		
25	26	27	28	20	30	31	22	23	24	25	26	27	28		
4	2	3	4	5	6	7	20	30	31	4	2	3	4		

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 21 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.

Filters Rx+Tx Filter

Rx+Tx Filter

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

FIGURE 22 Rx+Tx filter

Rx + Tx ▼
Rx + Tx
Rx
Tx

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 23 Time filter

15 min 🔻
1 min
15 min
1 hour
1 day

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 24 Top 100 APs

Top 10 APs 🔻
All
Top 10 APs
Top 20 APs
Top 50 APs
Top 100 APs

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

FIGURE 25 Last Changed 10 APs

Last Changed 10 APs 🝷
All
Last Changed 10 APs
Last Changed 20 APs
Last Changed 50 APs
Last Changed 100 APs

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

SSID Filter

SSID filter for WLAN dashboard.

FIGURE 26 SSID filter

Top 10 SSIDs 🔻
All
Top 10 SSIDs
Top 20 SSIDs
Top 50 SSIDs
Top 100 SSIDs

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

Filters Client Filter

Client Filter

Use the Client filter for determining client usage.

FIGURE 27 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 28 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 29 Alarms Filter

Last 10 Alarms 💌
All
Last 10 Alarms
Last 20 Alarms
Last 50 Alarms
Last 100 Alarms

Events Filter

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

FIGURE 30 Events Filter

Last 1,000 Events 💌					
All					
Last 1,000 Events					
Last 2,000 Events					
Last 5,000 Events					

Sessions Filter

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

FIGURE 31 Sessions Filter

Using Saved Filters

SCI allows you to create custom filters and then save them for future use on a per-report basis.

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

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

FIGURE 32 Radio, Date and Saved Filters and Download bar



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

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



FIGURE 33 Network Dashboard Example of Creating a Saved Filter - Before Changes

2. Make the desired selections to any filter. In the example figure below, no changes are made to the Radio or Date filters, but in the Top 10 APs by Traffic Volume filters, the Traffic and time-increment drop-downs have been changed to Rx Total and 1 day, respectively.

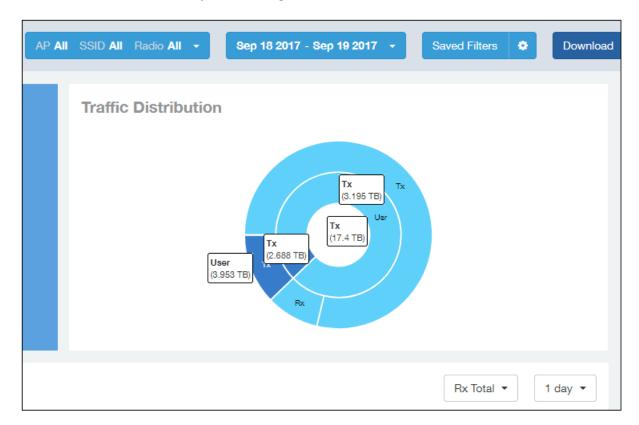
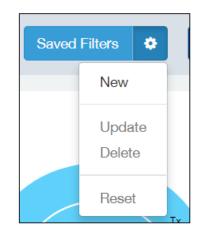


FIGURE 34 Network Dashboard Example of Creating a Saved Filter - After Desired Filter Selections

3. To save these settings so that they can be used again at a later time, click the wheel icon as shown below, and you are presented with a popup.

FIGURE 35 Popup Window to Take Actions on Filters



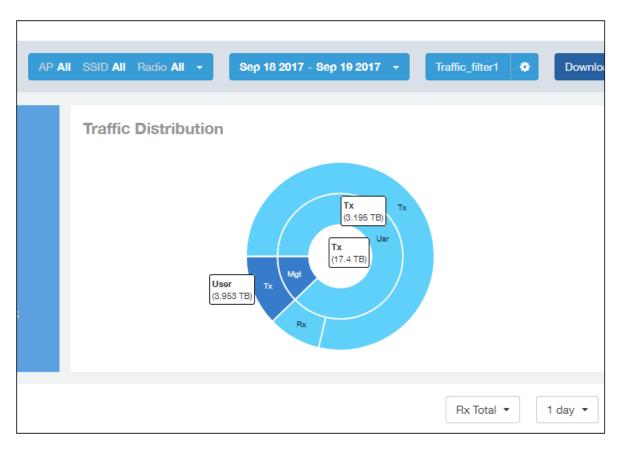
4. Select New. A popup appears. Enter a name for the filter, as shown in the example below, and click **Create**.

FIGURE 36 Entering a Name for the New Saved Filter

Create Saved Filte	r	×
Name:	Traffic_filter1	
		Create

5. Check that the newly created saved filter is now in effect on this dashboard. For the example shown, the Network Dashboard should now appear as follows, with the selections of Rx Total and 1 day in effect, and the name of the saved filter shown next to the wheel icon:

FIGURE 37 Network Dashboard Example of Creating a Saved Filter - After Saving the Filter



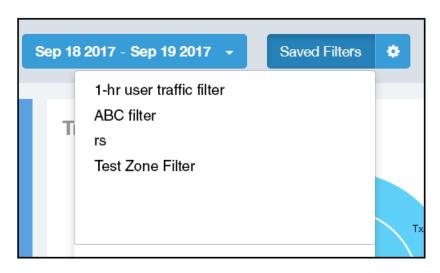
NOTE

A saved filters apply only to the dashboard on which it was created. You cannot import a saved filter on another dashboard.

Actions You Can Take on a Saved Filter

Whenever you go to a dashboard that supports filters, you can click on **Saved Filters** in the Radio, Date and Saved Filters and Download bar. If there are any saved filters, they will display, as shown in the following example figure:

FIGURE 38 Example List of Saved Filters



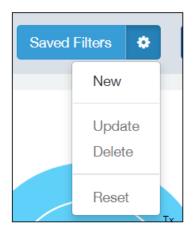
You can click on any of the saved filters and generate a report.

NOTE

The "Saved Filters" text will be replaced by the name of any filter that you open. But you can still click in the same area, and the list of saved filters is displayed.

If you click on the wheel icon, the following possible actions are allowed on a filter:

FIGURE 39 Actions You can Take on Filters



Descriptions of each action are:

• New: Allows you to create a new saved filter, as shown in the example earlier in this section.

- Update: Allows you to make changes to an existing saved filter, including changing the filter name if desired. Make any changes you wish to the filter selections, then select Update. A popup appears next, where you click **Update** again to save your changes.
- Delete: Deletes an existing saved filter.
- Reset: Displays default settings for all filters. To return to a saved filter, simply click on **Saved Filters** again in the Radio, Date and Saved Filters and Download bar.

Network Report Dashboard

•	Network - Wireless Report	. 39
•	Network - Wired Report	.49

Network - Wireless Report

The Network - Wireless 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 - Wireless Report update.

FIGURE 40 Network - Wireless Report (upper portion)



The Network - Wireless Report consists of the following sections.

Overview

The **Overview** section provides a general overview of the entire network. It 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 41 Network - Wireless Report: Overview

Overview			
		1 тв, 154.7 Мерс 3 тв, 1.992 Серс	5
Total APs		Avg Rate	Total Clients
4260	22.84 тв	2.143 Gbps	179.6 k

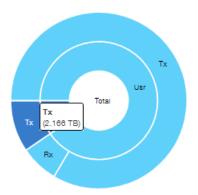
Traffic Distribution

The **Traffic Distribution** pie chart of the **Network -Wireless 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 42 Network -Wireless Report: Traffic Distribution

Traffic Distribution



Top APs by Traffic

The Top 10 APs by Traffic are represented as a chart and table. The chart/table along with the Network - Wireless Report

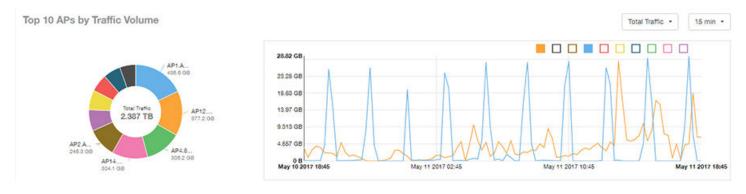
graph displays the APs with the highest traffic volume in the network. You can use these icons to toggle between the chart and table views.

In the chart, 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 43 Network -Wireless Report: Top 10 APs by Traffic (Chart)



NOTE

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

In the table, view a list the top APs with the highest traffic volume, sorted according to the selected columns. Click the gear icon

 $oldsymbol{\Phi}$ 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 44 Network - Wireless Report: Top APs by Traffic (Table)

Index	AP Name	AP IP Address	Controller Name	Rx	Total	Tx	Total	Total	Traffic	Clients	*
1	Your_Co_APName1	10.x.y.1	Your_Co_CTName1	(731.1 MB	435.9 GB		435.6 GB		53	
2	Your_Co_APName2	10.x.y.2	Your_Co_CTName2	10.84 GB		366.3 GB		377.2 GB		119	
3	Your_Co_APName3	10.x.y.3	Your_Co_CTName3	20.73 G8)	285.5 GB		306.2 GB		42	
4	Your_Co_APName4	10.x.y.4	Your_Co_CTName4		7.841 GB	296.5 GB		304.1 GB		82	
5	Your_Co_APName5	10.x.y.5	Your_Co_CTName5		8.963 GB	237.3 GB		246.3 GB		91	
6	Your_Co_APName6	10.x.y.6	Your_Co_CTName6		4.222 GB		174,5 GB		178.7 GB	255	
7	Your_Co_APName7	10.x.y.7	Your_Co_CTName7	0.0	4,47 GB		161.5 GB		166 GB	28	
8	Your_Co_APName8	10.x.y.8	Your_Co-CTName8	0	10.01 GB		138.7 G8		148.7 GB	67	
9	Your_Co_APName9	10.x.y.9	Your_Co_CTName9		3.707 GB		142.7 GB		146.4 GB	39	
10	Your_Co_APName10	10.x.y.10	Your_Co_CTName10		2.9 GB		131.3 GB		134.2 GB	120	

Top APs by Client Count

The Top 10 APs by Client Count are represented as a chart and table. The chart/table along with the Network - Wireless

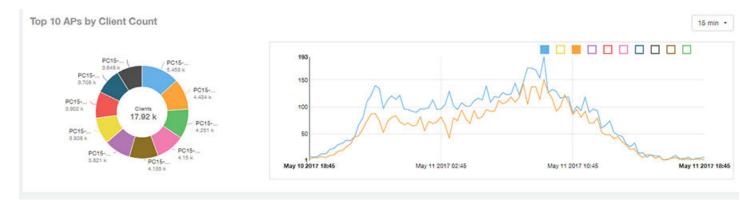
Report graph display the APs with the most clients on the network. You can use these icons chart and table views.

to toggle between the

:=

In the chart, 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 45 Network - Wireless Report: Top 10 APs by Client Count (Chart)



In the table, 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 46 Network - Wireless Report : Top APs by Client (Table)

Index	AP Name	AP IP Address	Controller Name	Clients	Rx Total	Tx Total	Total Traffic	
1	Your_Co_APName1	10.x.y.1	Your_Co_CTName1	5.458 k	288.9 MB	2.416 GB	2.696 G	8
2	Your_Co_APName2	10.x.y.2	Your_Co_CTName2	4.434 k	323.9 MB	1.171 GB	1,487 0	8
3	Your_Co_APName3	10.x.y.3	Your_Co_CTName3	4.251 k	1.528 GB	969.4 MB	2.474 G	8
4	Your_Co_APName4	10.x.y.4	Your_Co_CTName4	4.15 k	190.3 MB	1.961 GB	2.147 0	8
5	Your_Co_APName5	10.x.y.5	Your_Co_CTName5	4.135 k	363.1 MB	4,182 GB	4.536 G	8
6	Your_Co_APName6	10.x.y.6	Your_Co_CTName6	3.821 k	289,3 MB	828,4 MB	1,092 0	8
7	Your_Co_APName7	10.x.y.7	Your_Co_CTName7	3.808 k	569.6 MB	13.12 G8	13.68 GB	
8	Your_Co_APName8	10.x.y.8	Your_Co-CTName8	3.802 k	254.3 MB	1,049 G8	1.297 0	8
9	Your_Co_APName9	10.x.y.9	Your_Co_CTName9	3.708 k	169.9 MB	583.9 MB	753.8 N	8
10	Your_Co_APName10	10.x.y.10	Your_Co_CTName10	3.648 k	156.9 MB	1,85 G8	2.003 0	8

Traffic Trend

The Traffic Trend graphs of the Network - Wireless 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.

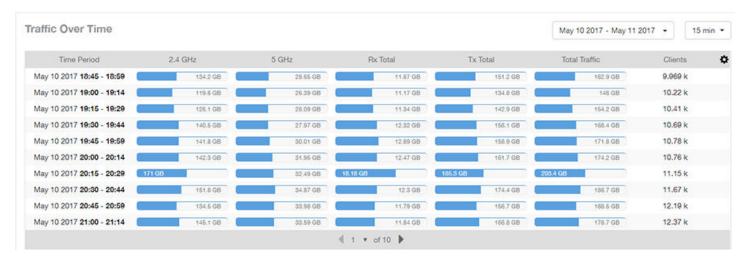


FIGURE 47 Network - Wireless Report: Traffic Trend

Traffic Over Time

The **Traffic Over Time** table of the Network - Wireless 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 48 Network - Wireless Report: Traffic Over Time



Network - Wireless Report Overview

The Network - Wireless Report Overview section provides a general overview of the entire network.

The 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 49 Network - Wireless Report : Overview

Overview			
		ТВ, 154.7 Мара 3 тв, 1.992 Glaps	2
Total APs		Avg Rate	Total Clients
4260	22.84 тв	2.143 Gbps	179.6 k

Network - Wireless Report Traffic Distribution

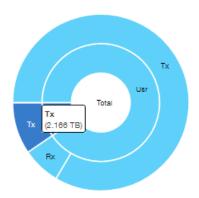
The Traffic Distribution pie chart of the Network -Wireless Report displays the distribution of traffic types.

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 50 Network -Wireless Report: Traffic Distribution

Traffic Distribution



Network - Wireless Report Top APs by Traffic

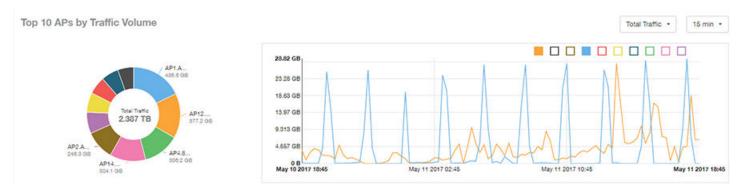
The Top 10 APs by Traffic Volume chart and graph of the Network - Wireless Report display the highest-traffic APs.

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 51 Network -Wireless Report : Top 10 APs by Traffic



NOTE

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

Network - Wireless Report Top APs by Traffic (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 52 Network - Wireless Report: Top APs by Traffic

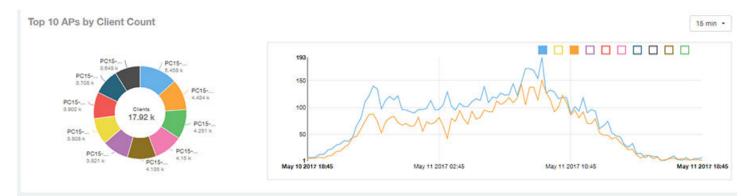
Index	AP Name	AP IP Address	Controller Name	Rx Total	Tx Total	Total Traffic	Clients
1	Your_Co_APName1	10.x.y.1	Your_Co_CTName1	(731.1 MB	435.9 G8	436.6 GB	53
2	Your_Co_APName2	10.x.y.2	Your_Co_CTName2	10.84 GB	366.3 GB	377.2 G8	119
3	Your_Co_APName3	10.x.y.3	Your_Co_CTName3	20.73 G8	285.5 GB	306.2 GB	42
4	Your_Co_APName4	10.x.y.4	Your_Co_CTName4	7.841 GB	2963 GB	304.1 G8	82
5	Your_Co_APName5	10.x.y.5	Your_Co_CTName5	8.963 GB	237.3 GB	246.3 GB	91
6	Your_Co_APName6	10.x.y.6	Your_Co_CTName6	4.222 GB	174.5 GB	178.7 GB	255
7	Your_Co_APName7	10.x.y.7	Your_Co_CTName7	4.47 G8	161.5 GB	168 GB	28
8	Your_Co_APName8	10.x.y.8	Your_Co-CTName8	10.01 GB	138.7 G8	148.7 GB	67
9	Your_Co_APName9	10.x.y.9	Your_Co_CTName9	3.707 GB	142.7 08	146.4 GB	39
10	Your_Co_APName10	10.x.y.10	Your_Co_CTName10	2.9 GB	131.3 GB	134.2 GB	120

Network - Wireless Report Top 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 53 Network - Wireless Report: Top 10 APs by Client Count



Network - Wireless Report Top APs by Client Count (table)

The Top APs by Client Count table of the Network - Wireless 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 54 Network - Wireless Report : Top APs by Client

Index	AP Name	AP IP Address	Controller Name	Clients	Rx Total	Tx Total	Total Traffic
1	Your_Co_APName1	10.x.y.1	Your_Co_CTName1	5.458 k	288.9 MB	2.416 GB	2.698 GB
2	Your_Co_APName2	10.x.y.2	Your_Co_CTName2	4.434 k	323.9 MB	1.171 GB	1.487 GB
3	Your_Co_APName3	10.x.y.3	Your_Co_CTName3	4.251 k	1.528 GB	969.4 MB	2.474 GB
4	Your_Co_APName4	10.x.y.4	Your_Co_CTName4	4.15 k	190.3 MB	1.961 G8	2.147 G8
5	Your_Co_APName5	10.x.y.5	Your_Co_CTName5	4.135 k	363.1 MB	4,182 GB	4.536 GB
6	Your_Co_APName6	10.x.y.6	Your_Co_CTName6	3.821 k	289.3 MB	828,4 MB	1.092 GB
7	Your_Co_APName7	10.x.y.7	Your_Co_CTName7	3.808 k	569.6 MB	13.12 G8	13.68 G8
8	Your_Co_APName8	10.x.y.8	Your_Co-CTName8	3.802 k	254.3 MB	1.049 GB	1.297 G8
9	Your_Co_APName9	10.x.y.9	Your_Co_CTName9	3.708 k	169.9 MB	583.9 MB	753.8 MB
10	Your_Co_APName10	10.x.y.10	Your_Co_CTName10	3.648 k	156.9 MB	1,85 G8	2.003 G8

Network - Wireless Report Traffic Trend

The Traffic Trend graphs of the Network - Wireless 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 55 Network - Wireless Report: Traffic Trend

Network - Wireless Report Traffic Over Time

The Traffic Over Time table of the Network - Wireless 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 56 Network - Wireless Report: Traffic Over Time

Network - Wired Report

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

The following figure shows the upper portion of the Network - Wired Report that appears when you click **Wired** on the navigation bar.

FIGURE 57 Network - Wired Report (upper portion)



The Network - Wired Report consists of the following sections. 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 by Switch Model and Port Speed	Contains the distribution of traffic by port speed for each switch model in use.
3	Top Switches by Traffic	A pie chart and graph display the switches with the most traffic. You can toggle to a table view of this information by clicking on the Table icon.
4	Top Switches by PoE Usage	A pie chart and graph display the switches with the highest power over Ethernet (PoE) utilization. You can toggle to a table view of this information by clicking on the Table icon.
5	Traffic Trend	A graph displays the traffic by usage, and also shows the corresponding average traffic rate.

Network - Wired Report Overview

The Network - Wired Report Overview section provides a general overview of the entire network.

The 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 58 Network - Wired Report: Overview

Overview			
2	A	іта, 141.7 маря іта, 1.179 акря	2
Total APs 2270	Total Traffic 14.04 TB	Avg Rate 1.317 Gbps	Total Clients 33.27 k

Network - Wired Report Traffic Distribution by Switch Model and Port Speed

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

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

Traffic Distribution by Switch Model and Port Speed 100 Gbps 40 Gbps ICX7450-32ZP 858.8 25 Gbps 16 Gbps 14 Gbps 10 Gbps 5 Gbps 2.5 Gbps ICX7650-48ZP 23.1 TB 1 Gbps 155 Mbps 1/2 0 B 181.9 TB 363.8 TB 545.7 TB 727.6 TB 909.5 TB

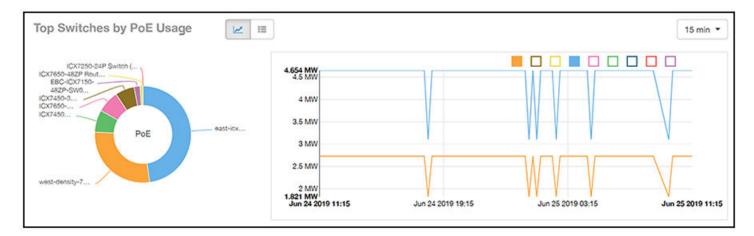
FIGURE 59 Network - Wired Report: Traffic Distribution by Switch Model and Port Speed

Network - Wired Report Top Switches by PoE Usage

Use the Top Switches by PoE Usage pie chart and graph of the Network - Wired report to view which wired switches are utilizing the most power over internet.

On the pie chart, you can hover over any area to view more details, or click on one of the areas of the pie chart to go to the Switch Details dashboard for the corresponding switch. In the line graph, you can hover to view switch utilization at different times; you can toggle the boxes on and off to display or not display the switches they represent.

FIGURE 60 Network - Wired Report Top Switches by PoE Usage



Network - Wired Report Top Switches by PoE Usage (Table)

Use the Top Switches by PoE Usage table of the Network - Wired report to view which wired switches are utilizing the most power over internet.

You can click various headings to sort the table as desired. You can also use the drop-down menu to select the number of switches shown, and use the gear icon to include or exclude any columns.

FIGURE 61 Network - Wired Report Top Switches by PoE Usage (table)

Index	Switch Name	PoE Utilization	PoE Total	% of PoE Utilized	
1	east-icxstack-density	4.654 MW	8.88 MW	52.41 %	
2	west-density-7650-stack	2.731 MW	4.488 MW	60.85 %	
3	ICX7450-32ZP Router	727.1 KW	2.244 MW	02.4.%	
4	ICX7650-48ZP Router	720 KW	4.488 MW	16.04 %	
5	ICX7450-32ZP Switch	625.8 KW	4.488 MW	13.94 %	
6	EBC-ICX7150-48ZP-SW01	195.9 KW	740 KW	26.48 %	
7	ICX7650-48ZP Router	92.4 KW	4.488 MW	2.06 %	
8	ICX7250-24P Switch	0 mW	370 KW	0.96	
9	density-main-switch	0 mW	2.22 MW	0 %	

Network - Wired Report Top Switches By Traffic

Use the Top Switches By Traffic pie chart and graph of the Network - Wired report to view which wired switches have the most traffic. You can use the Traffic drop-down to show total traffic, transmitted traffic only, or received traffic only.

On the pie chart, you can hover over any area to view more details, or click on one of the areas of the pie chart to go to the Switch Details dashboard for the corresponding switch. In the line graph, you can hover to view traffic for switches at different times; you can toggle the boxes on and off to display or not display the switches they represent.

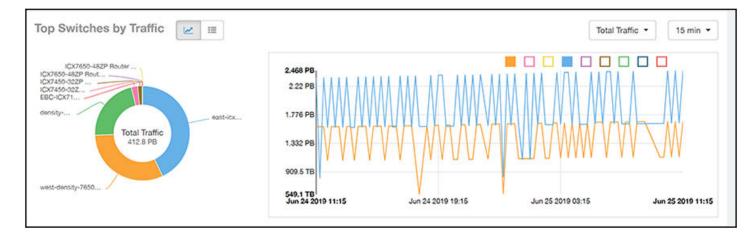


FIGURE 62 Network - Wired Report Top Switches By Traffic

Network - Wired Report Top Switches by Traffic (table)

Use the Top Switches by Switches table of the Network - Wired report to view which wired switches have the most traffic.

You can click various headings to sort the table as desired. You can also use the drop-down menu to select the number of switches shown, and use the gear icon to include or exclude any columns.

FIGURE 63 Network - Wired Report Top Switches by Traffic (table)

Index	Switch Name	Rx		1	Гх	Total	Traffic
1	east-icxstack-density	87.61 P8	2	89.89 PB		177.5 P8	
2	west-density-7650-stack	64.17 PB		65.22 P8		129.4 PB	
3	density-main-switch	45.06 PB	3		45.33 PB	90.4 PB	
4	ICX7450-32ZP Switch	(4,316 PB	•	4.499 PB		8.815 PB
5	ICX7450-32ZP Router	ſ	3.224 PB	ſ	3.25 PB	(6.474 PB
6	ICX7650-48ZP Router		91.87 TB		91.94 TB		183.8 TB
7	ICX7650-48ZP Router		4.813 TB		2.964 TB	-	7.776 TB
8	EBC-ICX7150-48ZP-SW01		3.12 TB	1	3,499 TB	1	6.619 TB
9	ICX7250-24P Switch		83.22 G8		120.2 GB	1	203.4 GB

Network - Wired Report Traffic Trend

The Traffic Trend section of the Network - Wired report contains two line graphs that provide traffic information about the wired switches in the network.

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

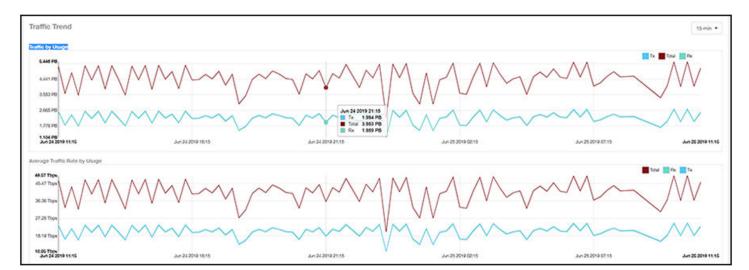


FIGURE 64 Network - Wired Traffic Trend

Inventory Dashboard

•	Inventory - APs Report	.55
•	Inventory - Controllers Report	
•	Inventory - Switches Report	. 68

Inventory - APs Report

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

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

FIGURE 65 Inventory - APs Dashboard (upper portion)

Overview	In	ventory - APs Report			AP AL -	May 06 2019 - May 07 2019 👻	Saved Filters •	Download •
Network >								
Inventory +	E SCHEDULE	Overview						
APs	DULE			2565	110	205	20°	
Controllers	1990							
Switches			18				Total Reboots	
WLANs								
Clients			_					
Applications		Top APs by Offline Duration	1					
Airtime				20:05:0	3.00.7C:10	PKUS-MH	RuckusAP (3) AP02-Do not move (3y 9mo)	11mo)
Utilization							01-Do not move (3y 8mo)	
AP Dotails						COS-TES	RuckusAP (Jy 7mo) IT (Jy 5mo)	
Client Details						KIY RP_LO-AP45 (by 3m		
Data Explorer						KKL Block, D_LG-AP14 (3y) KKL Block, D_L1-AP15 (3y)		
Conta Colpición					PKKTI B_MESYUAPAT	LG-APOS (2y 9mo)		
Admin 🔸		As of May 07 2019 13:45			KTDI_18_81_L0-/	AP13 (Dy 8mo)		

The Inventory - APs Report consists of the 12 sections that 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 APs By Offline Duration (graph)	Contains the APs that have been disconnected over a specified duration. The APs are ordered from longest offline duration to shortest offline duration. You can click the Table View icon to toggle to a table view of this information.
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 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. You can click the Table View icon to toggle to a table that shows the distribution of AP models in the network.
6	Top 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. You can click the Table View icon to toggle to a table that shows the software versions that are being used the most.
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 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. You can click the Table View icon to toggle to a table that shows the APs that have restarted over a specified time.
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	APs Configured in Multiple Systems	A table lists APs that have been associated with multiple controllers.
11	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.
12	AP Details for Other Statuses	A table lists the APs on the network based on AP name, IP address, location, model, controller and status

TABLE 5 Sections of the Inventory - APs Report Dashboard (continued)

Inventory - APs Report Overview

The Inventory - APs Report 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

FIGURE 66 Inventory - APs Report Overview

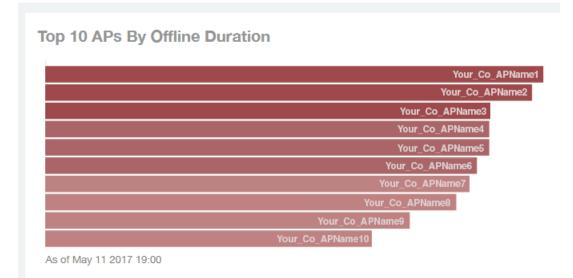


Inventory - APs Report: Top APs by Offline Duration

The Top APs by Offline Duration chart of the Inventory - APs 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 that allows you to obtain details on the selected data points.

FIGURE 67 Inventory - APs Report: Top APs by Offline Duration



Inventory - APs Report: Top APs by Offline Duration (table)

The Top APs by Offline Duration table of the Inventory - APs 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 68 Inventory - APs Report: Top APs by Offline Duration

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	ty 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

Inventory - APs Report: AP Count Trend

The Count Trend graph of the Inventory - APs 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.



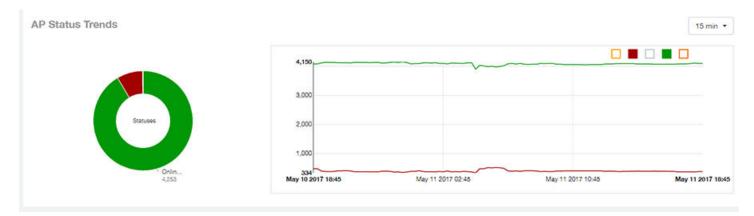
FIGURE 69 Inventory - APs Report: AP Count Trend

Inventory - APs Report: AP Status Trends

The AP Status Trends pie chart and graph of the Inventory - APs 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.

FIGURE 70 Inventory - APs Report: AP Status Trends



Inventory - APs Report: Top AP Models

The Top AP Models pie chart and line graph of the Inventory - APs Report display the model type that is most often used 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 71 Inventory - APs Report: Top AP Models



Inventory - APs Report: Top AP Models (table)

The Top AP Models table of the Inventory - APs 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 models 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 72 Inventory - APs Report: Top AP Models (table)

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

Inventory - APs Report: Top AP Software Versions

The Top AP Software Versions pie chart and graph of the Inventory - APs Report display the most-used software versions in your network, and show how many APs are using each version.

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.

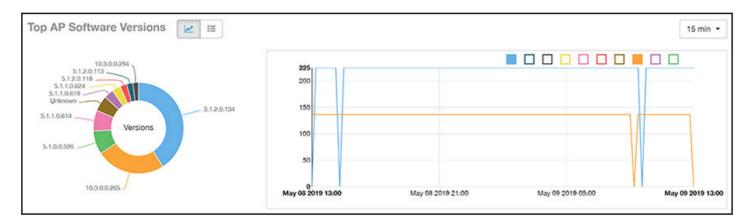


FIGURE 73 Inventory - APs Report: Top AP Software Versions

Inventory - APs Report: Top AP Software Versions (table)

The Top AP Software Versions table of the Inventory - APs 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.

P Software Versions				Top 10 Versions
Index	AP Version	Number of APs w/ the Version	96 of	APs w/ the Version
1	3.2.1.0.650	2,574	65.35 %	
2	3.4.1.0.329	1,260	6	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 %

FIGURE 74 Inventory - APs Report: Top AP Software Versions (table)

Inventory - APs Report: Top 10 AP Reboot Reasons

The Top 10 AP Reboot Reasons pie chart and graph of the APs & Controllers report display the 10 most common reasons why APs in your network 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.

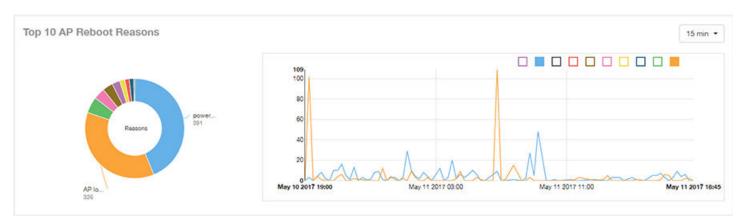


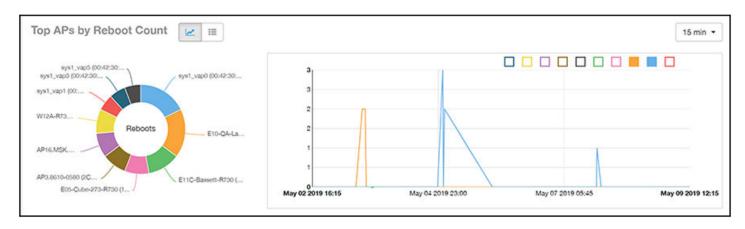
FIGURE 75 Inventory - APs Report: Top 10 AP Reboot Reasons

Inventory - APs Report: Top APs by Reboot Count

The Top APs by Reboot Count pie chart and line graph of the Inventory - APs 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 76 Inventory - APs Report: Top APs by Reboot Count



Inventory - APs Report: Top APs by Reboot Count (table)

The Top AP by Reboot Count table of the Inventory - APs 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.

Ps by Rebo						Top 10 APs
Index	AP Name	AP IP Address	AP Location	# of Reboots	Last Reboot Date	Reason for Last Reboot
1	Your_Co_APName1	10.x.y.1	Your_Co_APsite1	16	May 11 2017 18:03	unknown reason
2	Your_Co_APName2	10.x.y.2	Your_Co_APSite2	13	May 11 2017 10:00	unknown reason
3	Your_Co_APName3	10.x.y.3	Your_Co_APSite3	8	May 11 2017 18:17	power cycle
4	Your_Co_APName4	10.x.y.4	Your_Co_APSite4	8	May 11 2017 18:17	power cycle
5	Your_Co_APName5	10.x.y.5	Your_Co_APSite5	8	May 11 2017 18:17	power cycle
6	Your_Co_AccessPoint1	172.16.z.1	Your_Co_APLocn1	6	May 11 2017 08:34	system recovery by wat.
7	Your_Co_AccessPoint2	172.16.z.2	Your_Co_APLocn2	5	May 11 2017 00:28	AP rebooted by control.
8	Your_Co_AccessPoint3	172.16.z.3	Your_Co_APLocn3	5	May 11 2017 15:47	AP lost SCG more than
9	Your_Co_AccessPoint4	172.16.z.4	Your_Co_APLocn4	4	May 11 2017 00:28	AP rebooted by control.
10	Your_Co_AccessPoint5	172.16.z.5	Your_Co_APLocn5	4	May 10 2017 21:35	power cycle

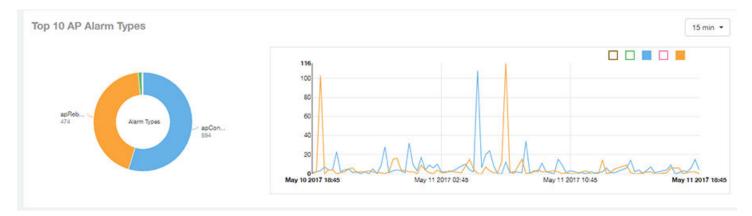
FIGURE 77 Inventory - APs Report: Top APs by Reboot Count (table)

Inventory - APs Report: Top 10 AP Alarm Types

The Top 10 AP Alarm Types pie chart and line graph of the Inventory - APs 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 78 Inventory - APs Report: Top 10 AP Alarm Types



Inventory - APs Report: APs Configured in Multiple Systems

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

In the Controller Name 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.

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

FIGURE 79 Inventory - APs Report: APs Configured in Multiple Systems

Configured in M	lultiple Systems		Last Changed 10 APs ·		
AP Name	Controller Name	Controller Count	Last Status	Last Controller Name	4
Your_Co_APName1	Your_Co_CTName1, Your	2	online	Your_Co_CTName1	
/our_Co_APName2	Your_Co_CTName5, Your	2	online	Your_Co_CTName5	
Your_Co_APName3	Your_Co_CTName4, Your	2	online	Your_Co_CTName4	

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

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

Click the gear icon to select the 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 80 Inventory - APs Report: AP Details for Online/Offline Status

Details for O	nline/Offline Status						Last Changed 10 APs
Index	AP Name	AP IP Address	AP Location	AP Model	Controller Name	Last Status	Last Status Change
1	Your_Co_APName1	10.x.y.1	Your_Co_APsile1	ZF-R710	Your_Co_CTName1	Offline	2d 16h ago
2	Your_Co_APName2	10.x.y.2	Your_Co-APSite2	ZF-R700	Your_Co_CTName1	Offline	2d 16h ago
3	Your_Co_APName3	10.x.y.3	Your_Co_APSite3	ZF-R600	Your_Co_CTName1	Offline	2d 16h ago
4	Your_Co_APName4	10.x.y.4	Your_Co_APSite4	ZF-R510	YOur_Co_CTName1	Offline	2d 16h ago
5	Your_Co_APName5	10.x.y.5	Your_Co_APSite5	ZF-R500	Your_Co_CTName1	Offline	2d 16h ago
6	Your_Co_AccessPoint1	172.16.z.1	Your_Co_APLocn1	ZF-T710	Your_Co_Controller2	Offline	2d 16h ago
7	Your_Co_AccessPoint2	172.16.z.2	Your_Co_APLocn2	ZF-T301	Your_Co_Controller2	Offline	2d 16h ago
8	Your_Co_AccessPoint3	172.16.z.3	Your_Co_APLocn3	ZF-T300	Your_Co-Controller2	Offline	2d 16h ago
9	Your_Co_AccessPoint4	172.16.z.4	Your_Co_APLocn4	ZF-P300	Your_Co_Controller2	Offline	2d 16h ago
10	Your_Co_AccessPoint5	172.16.z.5	Your_Co_APLocn5	ZF-T610	Your_Co_Controller2	Offline	2d 16h ago

Inventory - APs Report: AP Details for Other Statuses

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

Click the gear icon to select the 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 81 Inventory - APs Report: AP Details for Other Statuses

Details for Ot	her Statuses					Last Changed 10
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

Inventory - Controllers Report

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

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

FIGURE 82 Inventory - Controllers Dashboard (upper portion)

New	1	nventory - Controllers	Report	AP	II - May 06 2019 - May 07	2019 - Saved Filters	o Downi
vork 🕨		intentery controller	rioport				
ntory 👻	ESCHEDULE	Overview					
9.).	DULE			6=	F	í a	
ntrollers		Rimpily Batta			5		
itches		Ruckus				ZoneDirectors	
is i							
30							
5		Resource Utilization					
ts cations 10		Resource Utilization	Controller Serial	CPU Utilization	Memory Utilization	Disk Utilizativ	on 🌣
s ations e			Controller Serial 471336000025	CPU Utilization		Disk Utilizati	on 🌣
s ations o tion		Controller Name			N (550%	Disk Utilizati	
s ations e tion stalls		Controller Name CSHT-SCG-C01-2	471336000025	7.47	N 56476 N	Disk Utilizati	18,14 %
s ations e tion stalls		Controller Name CSHT-SCG-C01-2 EBC-SIN-01	471336000025 381838000470	1 7.47	N 5550 %	_	18.14 % 7.19 %
s eations o tion tails Dotails		Controller Name CSHT-SCG-C01-2 EBC-SIN-01 SZ1-KZN	471336000025 381838000470 961526000117	7.47 7.60 12.64	N (50.10 N) N (51.16 N) N (4	7.43 %	18,14 % 7.19 % 11,11 %
Ns cations ne ation etails t Details Explorer		Controller Name CSHT-SCG-C01-2 EBC-SIN-01 SZ1-KZN SZ2-KZN	471336000025 381838000470 961526000117 191526005153	7,47 7,43 12,64 12,94	N (50.00 N)	(7.43 % C	18,14 % 7,19 % 11,11 % 10.35 %

The Inventory - Controllers Report consists of four sections, which are listed in the table below. Figures showing each of these sections appear later.

NOTE

All counts shown are exact counts.

1	Overview	Contains an overview of the controller inventory, such as which controllers are being used, and their online/offline status.
2	Resource Utilization	A table shows the CPU, memory and disk utilization percentages for each controller in your system.
3	License Utilization	A table shows the licenses available and consumed for the APs for each system.
4	KRACK Assessment	A table shows the KRACK vulnerability status of all Access Points that are filtered to be displayed.

Inventory - Controllers Report Overview

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

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

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

FIGURE 83 Inventory - Controllers Report Overview

Overview			
Ruckus	6 Total Controllers € Online © Offline	5 SmartZones	1 ZoneDirectors

Inventory - Controllers Report: Resource Utilization

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

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

FIGURE 84 Inventory - Controllers Report: Resource Utilization

Resource Utilization				
Controller Name	Controller Serial	CPU Utilization	Memory Utilization	Disk Utilization
SCI-PUSH-XML	511408000113	2.36 %	5.9 %	15.58 %
SINLBS-VSZ01	983VF4KRN6UFN00JLL2SV75G	5.5 %	65.18 %	11.68 %
sci-push-xml-2	501408000926	0.29 %	3.35 %	15.53 %
vSPoT-ZD-CI-RKSGP	481408000086	1.03 %	22.63 %	12.4 %
		4 1 ▼ of 1		

Inventory - Controllers Report: License Utilization

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

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

FIGURE 85 Inventory - Controllers Report: License Utilization

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

Inventory - Controllers Report: KRACK Assessment

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

The following is an example of the Krack Assessment section.

FIGURE 86 Inventory - Controllers Report: KRACK Assessment

KRACK Assessment	0.19 % (8/4249) of APs in all syst	ems are patched.		
System Name	Zone	APs Patched	APs Patched (%)	Recomm
SYSTEM 1	Zone 1	0/218	0 %	Patch your APs
SYSTEM 2	Zone A	8/8	100 %	Turn on unpatch
SYSTEM 3	Default Zone	0/214	0 %	Patch your APs
SYSTEM 4	Zone A	0/1	0 %	Patch your APs
SYSTEM 5	Default Zone	0/1	0 %	Patch your APs
SYSTEM 6	Zone 1	0/1	0 %	Patch your APs
SYSTEM 7	Default Zone	0/10	0 %	Patch your APs
SYSTEM 8	California Zone	0/1	0 %	Patch your APs
SYSTEM 9	Default Zone	0/3	0 %	Patch your APs
SYSTEM 10	Zone 10	0/1	0 %	Patch your APs
		🖣 1 \$ of 5 🕨		

You can follow the recommendations displayed to patch your Access points. Refer to the following site for information and instructions: https://support.ruckuswireless.com/krack-ruckus-wireless-support-resource-center

Inventory - Switches Report

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

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



FIGURE 87 Inventory - Switches Dashboard (upper portion)

The Inventory - Switches Report consists of four 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 switch inventory, such as the total number of switches and ports that are currently in use.
2	Switch Count Trend	A line chart shows the trend of total switches, total switch units, online status, and offline status over specified time intervals.
3	Top Switch Software Versions	A pie chart and graph contain the most-used switch software versions and the number of switches using each version, along with the trend of software versions over a specified time frame. You can click the Table View icon to toggle to a table that shows the software versions that are being used the most.
4	Top Switch Models	A pie chart and graph contain the top switch models by count in the network, along with the trend of switch models over a specified time frame. You can click the Table View icon to toggle to a table that shows the distribution of switch models in the network.

Inventory - Switches Report Overview

The Inventory - Switches Report overview section provides a general overview of the switches in the network.

This overview section displays the following, based on your selection of filters:

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

FIGURE 88 Inventory - Switches Report Overview

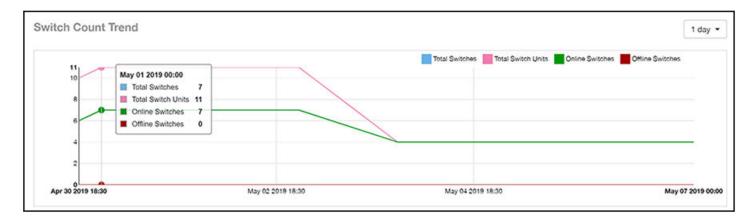


Inventory - Switches Report: Switch Count Trend

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

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 the display of the switches in the line graph.

FIGURE 89 Inventory - Switches Report: Switch Count Trend

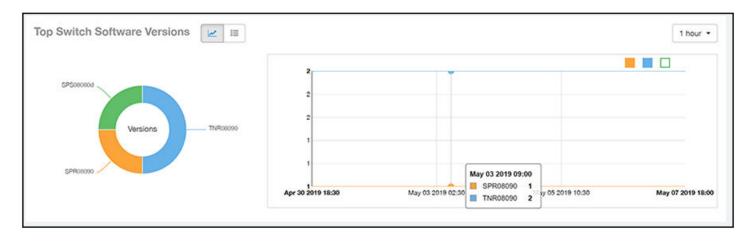


Inventory - Switches Report: Top Switch Software Versions

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

Use the 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 switch in the line graph.

FIGURE 90 Inventory - Switches Report: Top Switch Software Versions



Inventory - Switches Report: Top Switch Software Versions (table)

The Top Switch Software Versions table of the Inventory - Switches Report displays the switch software versions most frequently used in your network and the number of switches using each version.

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

FIGURE 91 Inventory - Switches Report: Top Switch Software Versions (table)

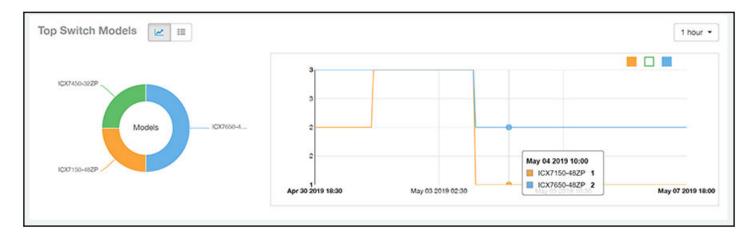
Top Switch Software Versions			Top 10 Versions 👻
Index	Switch Version	Number of Switches w/ the Version	% of Switches w/ the Version
1	SPS08090b	3	60 %
2	SPS08090a	1	20 %
3	TNS08090b	1	20 %
	∉ 1	▼ of 1 🕨	

Inventory - Switches Report: Top Switch Models

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

FIGURE 92 Inventory - Switches Report: Top Switch Models



Inventory - Switches Report: Top Switch Models (table)

The Top Switch Models table of the Inventory - Switches Report displays the model type being used most often by the switches in your network.

Click the gear icon to select the list of columns to display. The table is sorted on the top switch 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 models to display, or display all switch models. The number of rows per page is defined by the **Rows per Page** option in the table settings menu.

FIGURE 93 Inventory - Switches Report: Top Switch Models (table)

Top Switch Models 🗾 😐	J		Top 10 Models *
Index	Switch Model	Number of Switches w/ the Model	% of switches w/ the Model
1	ICX7150-48ZP	3	60 %
2	ICX7450-32ZP	1	20 %
3	ICX7650-48ZP	1	20 %

WLANs Report Dashboard

•	WLANs Report	73
	WLANs - Overview	
•	WLANs - SSID Changes Over Time	78
	WLANs -Top SSIDs by Traffic	
	WLANs -Top SSIDs by Traffic (table)	
	WLANs -Top SSIDs by Client Count	
	WLANs -Top SSIDs by Client Count (table)	
	WLANs -Active SSIDs Trend	

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 94 WLANs Report (upper portion)



The WLANs report consists of the following sections:

Overview

The **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 95 WLANs - Overview



SSID Changes Over Time

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

FIGURE 96 WLANs - SSID Changes Over Time

SSID Changes Ove	r Time		
Name	Status	Date	Clients
Your_Co_SSIDName1	removed	May 11 2017 14:00	17
Your_Co_SSIDName2	added	May 10 2017 23:45	78
Your_Co_SSIDName3	added	May 10 2017 21:00	25
Your_Co_SSIDName4	added	May 10 2017 23:45	73
Your_Co_SSIDName5	removed	May 10 2017 23:15	1
Your_Co_SSIDName6	removed	May 10 2017 19:15	1
Your_Co_SSIDName6	removed	May 10 2017 19:15	1
	1	🔻 of 14 🕨	

Top 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.

The **Top SSIDs by Traffic** are represented as a chart and table. You can use these icons to toggle between the chart and table views.

In the chart, 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.





In the table view, 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.

SIDs by Traffic					These	SSIDs consume	73.15 % (16.71 TI	B) of the total traffic (22.84 TB).	Top 10 SSI	Ds ·
Index	SSID Name	Rx 1	Total	Tx	Total	Total 1	raffic	Clients	APs	્
1	Your_Co_SSIDName1	584.3 GB		8.678 TB		9.248 TB	6	18.45 k	974	
2	Your_Co_SSIDName2		151.3 GB	0	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		642.3 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	1	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	

FIGURE 98 WLANs - Top SSIDs by Traffic (table)

Top SSIDs by Client Count

Use the **Top 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.

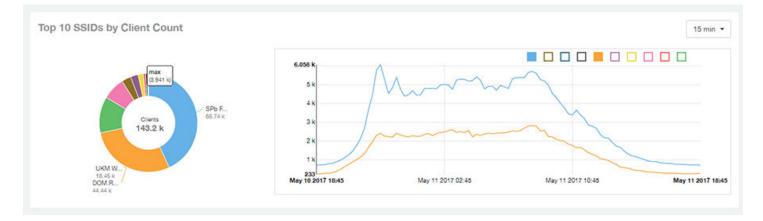
The **Top SSIDs by Client Count** are represented as a chart and table. You can use these icons chart and table views.

to toggle between the

In the chart, 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 99 WLANs - Top Ten SSIDs by Client Count (chart)



In the table view, 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 100 WLANs - Top SSIDs by Client Count (table)

SSIDs by Clie	ant Count			These S	SIDs consume	69.74 % (15.	93 TB) of the to	otal traffic (22.84 TB).	Top 10 SS	Ds •
Index	SSID Name	Clients	Rx Total		Tx	Total	Total	Traffic	APs	4
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	6	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	0	259.9 GB		279.9 GB	280	
6	Your Co_SSIDName6	3.941 k	1	26.94 GB	(278.2 GB		305.2 GB	50	
7	Your Co_SSIDName7	2.656 k		9.192 GB	ſ	100.3 GB	1	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	-	374.6 GB	(398.2 GB	26	
10	Your Co_SSIDName10	344		621.7 MB	-	8.391 GB	-	8.998 GB	14	

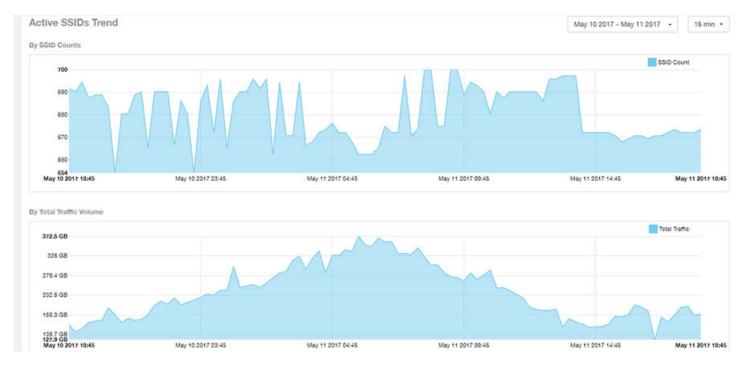
Active SSIDs Trend

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.





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 102 WLANs - Overview

Overview	
	Active SSIDs 65 total clients)
43 SSIDs added (923 clients added)	51 SSIDs removed (119 clients removed)

WLANs - SSID Changes Over Time

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

FIGURE 103 WLANs - SSID Changes Over Time

SSID Changes Ove	r Time		
Name	Status	Date	Clients
Your_Co_SSIDName1	removed	May 11 2017 14:00	17
Your_Co_SSIDName2	added	May 10 2017 23:45	78
Your_Co_SSIDName3	added	May 10 2017 21:00	25
Your_Co_SSIDName4	added	May 10 2017 23:45	73
Your_Co_SSIDName5	removed	May 10 2017 23:15	1
Your_Co_SSIDName6	removed	May 10 2017 19:15	1
Your_Co_SSIDName6	removed	May 10 2017 19:15	1
	- 1	🔻 of 14 🕨	

WLANs -Top 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 104 WLANs - Top Ten SSIDs by Traffic



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 105 WLANs - Top SSIDs by Traffic

SSIDs by Traffic				These S	SIDs consume	73.15 % (16.71 T	B) of the total traffic (22.84 TB).	Top 10 SS	IDs
Index	SSID Name	Rx Total	T	x Total	Total	Traffic	Clients	APs	
1	Your_Co_SSIDName1	584.3 GB	8.678 TB		9.248 TB	3	18.45 k	974	
2	Your_Co_SSIDName2	151.3 0	8	3.437 TB		3.585 TB	44,44 k	1.105 k	
3	Your_Co_SSIDName3	157 0	iB C	1.301 TB		1.455 TB	66.74 k	961	
4	Your_Co_SSIDName4	61.92 0	IB	480.3 GB		542.3 GB	11.44 k	213	
5	Your_Co_SSIDName5	23.43 0	IB (374.8 GB	(398.2 GB	1.096 k	26	
6	Your_Co_SSIDName6	11.38 M	IB	337.6 GB	1	337.6 GB	1	959	
7	Your_Co_SSIDName7	25.13 0	18	299.3 GB	(324.6 GB	101	6	
8	Your_Co_SSIDName8	26.94 0	18	278.2 GB	(305.2 GB	3.941 k	50	
9	Your_Co_SSIDName9	12.63 0	18	278 GB	(290.7 GB	288	20	
10	Your_Co_SSIDName10	20.05 0	18	259.9 GB		279.9 GB	4.754 k	280	

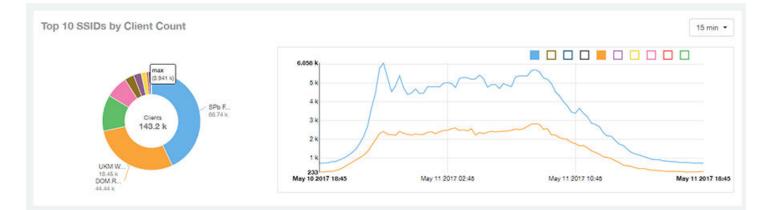
WLANs -Top SSIDs by Client Count

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 106 WLANs - Top Ten SSIDs by Client Count



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 107 WLANs - Top SSIDs by Client Count

SSIDs by Clie	ant Count			These	SSIDs consume	69.74 % (15.	93 TB) of the to	otal traffic (22.84 TB).	Top 10 SS	ilDs •
Index	SSID Name	Clients	Rx	Total	Tx	Total	Total	Traffic	APs	4
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	1	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	C	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	C	100.3 GB	1	109.5 GB	170	
8	Your Co_SSIDName8	1.18 k	1	2.87 GB		34.78 GB		37.65 GB	5	
9	Your Co_SSIDName9	1.096 k	•	23.43 GB	-	374.6 GB	-	398.2 GB	26	
10	Your Co_SSIDName10	344		621.7 MB	-	8.391 GB	-	8.998 GB	14	

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.

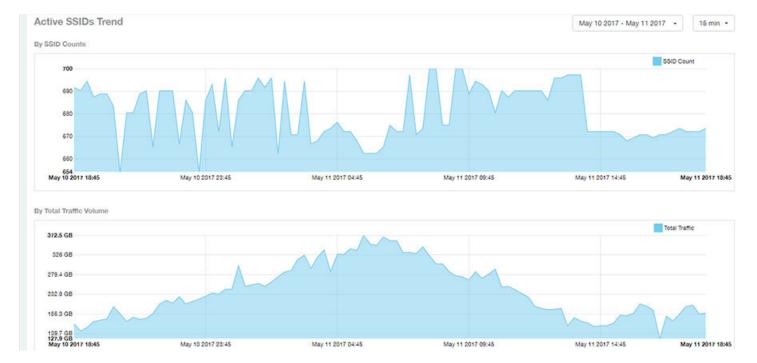


FIGURE 108 WLANs - Active SSIDs Trend Graphs

Clients Report Dashboard

•	Clients Report	83
	Clients - Overview	
	Clients - Top 10 Unique Clients by Traffic	
	Clients - Top 10 OS by Client Count	
	Clients - Top 10 Manufacturers by Client Count	
	Clients - Top 10 Authentication Methods by Client Count	
	Clients - Clients Details.	
	Clients - Unique Clients Trends Over Time (graph)	
	Clients - Unique Clients Trend Over Time (Table)	

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 109 Clients Report (upper portion)

Overview	Clients Report	The and its of and it from an it. Many the party is been at
Network +	Overview	Top 10 Unique Clients by Traffic user tare +
Inventory +		Addition (2012) 100 Sedanang, Padridensipility (2013) 100 Andread Phane (2012) 1011 (1117) 1011
WLANs	Salar Salar	Advances in waters in a functional sector of the Teleson Manuary and the Conference of the Teleson Manuary and the Teleson and the Teleson and the Teleson Balances, and and Teleson and the Teleson and the Teleson
Clients	verben terben 21.97 m 179.3v	VV&-bitrartian (pr.an.da)
Applications	21.0/10 1/0.3	Among (112 AM)
Airtime Utilization		These clients consume 656 % (1.455 TB) of all user traffic (21.87 TB) Tag 10 Clients +
AP Details		
Client Details		
Switch Details		
Data Explorer		
Admin 🔸		

The Clients report consists of the following sections.

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.

Clients Report Dashboard

Clients Report

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 110 Overview

Overview		
	Rx 1.6 тв Тx 19.07 тв	5
User Traffic 20.67 TB	,	Total Clients 179.6 k

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 111 Clients - Top 10 Unique Clients by Traffic

p 10 Unique Clients by Traffic	User Traffic
	HADSON (423.5 GB
iPad-Elvira (263.5 GB)	
861000421 (155.5 GB)	
861000359 (142.9 GB)	
Unknown, iPad-3 (137.1 GB)	
Unknown, android-e119d267344cd404 (125.8 GB)	
Unknown (123.2 GB)	
861000787 (116.4 GB)	
Unknown, android-dfeae14f97701f56 (116.2 GB)	
FULL (109.3 GB)	
Average (120.7 MB)	

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.

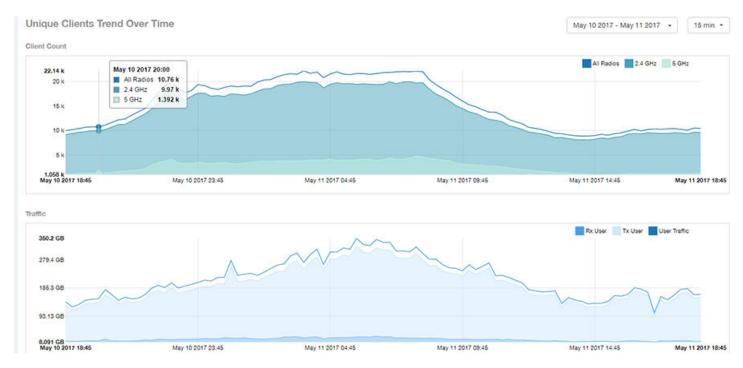
FIGURE 112 Clients - Clients details

ts Detail	S			The	ese clients consum	e 8.1 % (1.673 TB) of al	l user traffic (20.67 TB).	Top 10 Clients
Index	Hostname	MAC Address	IP Address	Username	Sessions	Rx User	Tx User	User Traffic
1	Your_Co_HostName1	FE:DC:BA:89:67:01	10.x.y.1	Your_Co_UserName1	1	190.7 MB	423.3 GB	423.5 GB
2	Your_Co_HostName2	FE:DC:BA:89:67:02	10.x.y.2	Your_Co_UserName2	1	13.8 GB	249.7 G8	263.5 GB
3	Your_Co_HostName3	FE:DC:BA:89:67:03	10.x.y.3	Your_Co_HostName3	9	3.958 GB	151.5 GB	165.6 GB
4	Your_Co_HostName4	FE:DC:BA:89:67:04	10.x.y.4	Your_Co_UserName4	12	3.502 GB	139.4 GB	142.9 G8
5	Your_Co_HostName5	FE:DC:BA:89:67:05	10.x.y.5	Your_Co_UserName5	15	1.068 GB	136 GB	137.1 GB
6	Your_Co_Hostame6	FE:DC:BA:89:67:06	10.x.y.6	Your_Co_Userame6	41	1.396 G8	124.4 GB	125.8 GB
7	Your_Co_HostName7	FE:DC:BA:89:67:07	10.x.y.7	Your_Co_UserName7	35	845.4 MB	122.6 GB	123.2 GB
8	Your_Co_HostName8	FE:DC:BA:89:67:08	10.x.y.8	Your_Co_UserName8	13	4.239 GB	112.2 GB	116.4 GB
9	Your_Co_HostName9	FE:DC:BA:89:67:09	10.x.y.9	Your_Co_UserName9	7	3.55 GB	112.6 GB	116.2 GB
10	Your_Co_HostName10	FE:DC:BA:89:67:10	10.x.y.10	Your_Co_UserName10	1	1.438 GB	107.9 GB	109.3 GB

Unique Clients Trend

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

FIGURE 113 Clients - Unique Clients Trend Over Time Chart



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 114 Overview

Overview		
	Пх 1.6 тв Тх 19.07 тв	5
User Traffic 20.67 TB		Total Clients 179.6 k

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.

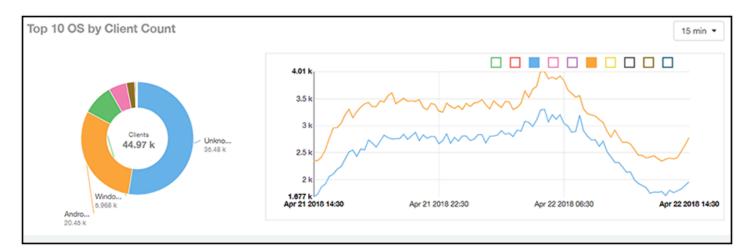
FIGURE 115 Clients - Top 10 Unique Clients by Traffic



Clients - Top 10 OS by Client Count

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

FIGURE 116 Clients - Top 10 OS by Client Count



Clients - Top 10 Manufacturers by Client Count

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

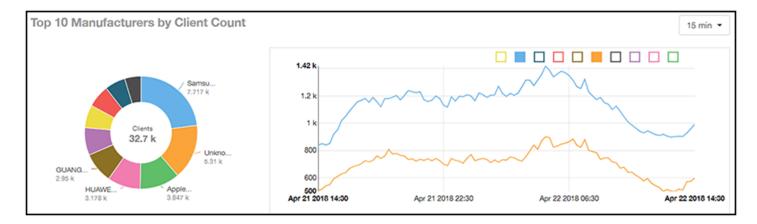
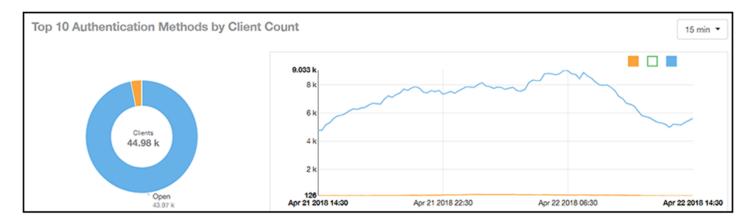


FIGURE 117 Clients - Top 10 Manufacturers by Client Count

Clients - Top 10 Authentication Methods by Client Count

The Top 10 Authentication Methods chart and graph of the Clients report provides you with information about the top 10 methods most commonly used in your system to authenticate users.

FIGURE 118 Clients - Top 10 Authentication Methods



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 119 Clients - Clients details

nts Detai	S			The	se clients consum	ne 8.1 % (1.673 1	B) of all	user traffic (20.67 TB). Top 10 Clien	its
Index	Hostname	MAC Address	IP Address	Username	Sessions	Rx Us	er	Tx User	User Traffic	
1	Your_Co_HostName1	FE:DC:BA:89:67:01	10.x.y.1	Your_Co_UserName1	1	11	0.7 MB	423.3 GB	423.5 GB	
2	Your_Co_HostName2	FE:DC:BA:89:67:02	10.x.y.2	Your_Co_UserName2	1	13.8 GB		249.7 G8	263.5 GB	-
3	Your_Co_HostName3	FE:DC:BA:89:67:03	10.x.y.3	Your_Co_HostName3	9	3	958 GB	151.5 GB	165.6 GB	8
4	Your_Co_HostName4	FE:DC:BA:89:67:04	10.x.y.4	Your_Co_UserName4	12	3	502 GB	139.4 GB	142.9 G8	8
5	Your_Co_HostName5	FE:DC:BA:89:67:05	10.x.y.5	Your_Co_UserName5	15	1	068 GB	136 GB	137.1 GB	8
6	Your_Co_Hostame6	FE:DC:BA:89:67:06	10.x.y.6	Your_Co_Userame6	41	1	396 G8	124.4 GB	125.8 GB	8
7	Your_Co_HostName7	FE:DC:BA:89:67:07	10.x.y.7	Your_Co_UserName7	35	6	15.4 MB	122.6 GB	123.2 G8	8
8	Your_Co_HostName8	FE:DC:BA:89:67:08	10.x.y.8	Your_Co_UserName8	13	4	239 GB	112.2 GB	116.4 GB	8
9	Your_Co_HostName9	FE:DC:BA:89:67:09	10.x.y.9	Your_Co_UserName9	7		3.55 GB	112.6 GB	116.2 GB	ß
10	Your_Co_HostName10	FE:DC:BA:89:67:10	10.x.y.10	Your_Co_UserName10	1		438 GB	107.9 GB	109.3 GB	в

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.

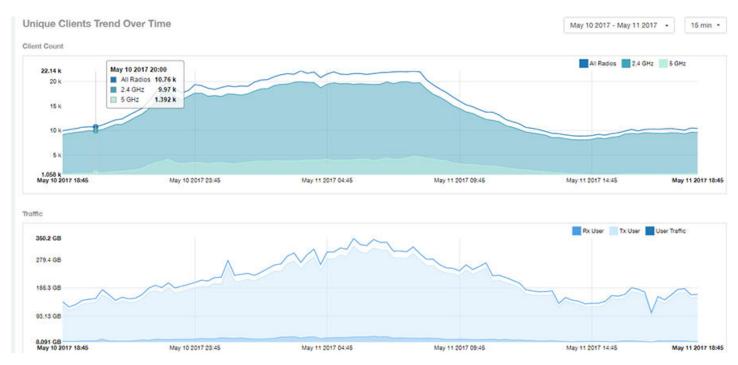


FIGURE 120 Clients - Unique Clients Trend Over Time Chart

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 **P** 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.

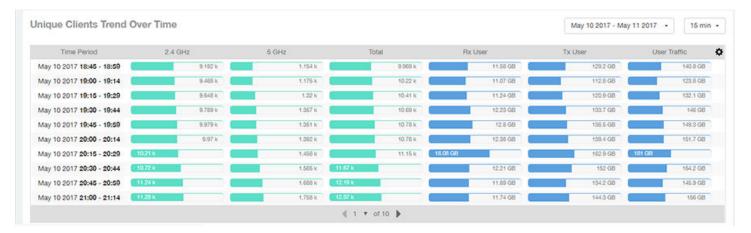


FIGURE 121 Clients - Unique Clients Trend Over Time Table

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Applications Report Dashboard

•	Applications Report	93
•	Applications - Overview	
•	Applications - Top 10 by Traffic Volume	
	Applications - Top Applications by Traffic (table)	
	Applications - Top Applications by Client Count	
•	Applications - Top Applications by Client Count (table)	

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 122 Applications Dashboard (upper portion)

Overview	Applications Report			AD AM SOO AM THEIR AM -	May 00-2017 - May 10-2017 - Download -
Network +	Overview				Î
Inventory >	S -8			1.78.0	8
WLANs	m f	52 Hamperical Appr	2	To 780 Feet	22
Clients	10			Train Ages concerned 74 (483,7448) of 10 (101,748) for (40,870)	
Applications					
Airtime Utilization	Top Applications by Traffic 🛛 😥 🖩				
AP Details		10110			
Client Details	100 Tarls 787.5 MD	363° MB			
Switch Details	MA. Normal Parks Traine	0.0000 May 04207 1048	~ ^ Ne(042011448	Ner02073248	Mar 10.20/7 10.30
Data Explorer					
Admin 🕨	Top Applications by Client Count	; 			

The Applications report consists of three 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 Applications by Traffic	Contains the list of top 10 applications in terms of volume of traffic. To view a table with this information, click the Table icon.
3 Top Applications by Client Count	Contains the application information and displays the quantity of traffic consumed by the listed applications. To view a table with this information, click the Table icon.

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 123 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 124 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 30. To view the top 10 applications, choose from the legend available on the top of the graph. Each application will appear as a separate graph line. If you hover over the line graph a pop-up appears containing the selected details.

Applications - Top Applications by Traffic (table)

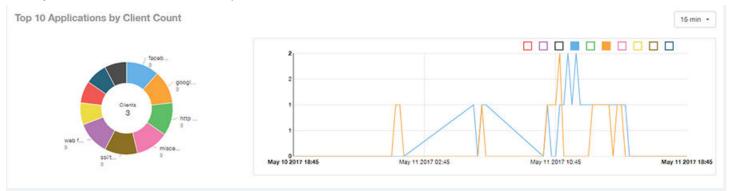
The Top Applications by Traffic table of the Applications report displays the top (10, 20 or 50) applications by the amount of traffic generated over the time period selected.

Index	Application Name	Ports	Rx U	lser	Tx	User	User	Traffic	Clients	1
1	facebook	443	24.73 MB		395.7 MB)	420.5 MB		3	
2	http protocol over tis ssl	443	12.55 MB	0		99.9 MB		112.4 MB	3	
3	mediafire	443	13.54 MB			66.67 MB		80.21 MB	1	
4	youtube	443		2.108 MB		64.28 MB		66.39 MB	2	
5	googlevideo.com	443		1.825 MB		57.73 MB		69.56 MB	1	
6	gazeta.pl	80	•	1.527 MB		52.58 MB		54.11 MB	1	
7	quic	443		4.541 MB		23.41 MB		27.95 MB	2	
8	microsoft.com	0, 80	(410.9 KB		24.14 MB		24.55 MB	2	
9	brocade.com	0, 3544	0	5.629 MB		18.82 MB	•	24.45 MB	1	
10	redcdn.pl	80	0	360.5 KB	(16.98 MB		17.33 MB	1	

FIGURE 125 Applications - Top Applications by Traffic

Applications - Top Applications 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 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 126 Applications - Top Applications by Client Count

Index	Application Name	Ports	Clients	Rx User	Tx User	User Traffic
1	facebook	443	3	24.73 MB	395.7 MB	420.5 MB
2	google(ssl)	443	з	70.57 KB	521.2 KB	591.8 KB
3	http protocol over tis ssl	443	3	12.55 MB	99.9 MB	112.4 MB
4	miscellaneous	0, 3544, 443, 5223, 53	3	2.608 MB	3.289 MB	5.896 MB
5	ssl/tis	443, 5223	з	3.032 MB	10.5 MB	13.53 MB
6	web file transfer	0, 80	3	85.6 KB	926.4 KB	1012 KB
7	adkontekst.pl	80	2	62.95 KB	945.2 KB	1008 KB
8	akadns.net	0, 5223	2	3.362 KB	2.291 KB	5.673 KB
9	arp	0	2	29.16 KB	42.6 KB	71.76 KB
10	meteo.pl	80	2	82.4 KB	1.714 MB	1.794 MB

Airtime Utilization Report Dashboard

•	Airtime Utilization Report	97
	Airtime Utilization - Overview	
	Top 10 APs By Airtime Utilization	
	Top APs by Airtime Utilization for 2.4 Ghz	
	Airtime Utilization - Top APs by Airtime Utilization for 5 GHz	
	Airtime Utilization Trend	
	Airtime Utilization - Over Time	101

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 127 Airtime Utilization Dashboard (upper portion)

Overview	Airtime Utilizat	ion Report				AT AR Flock AR - May 10 2017 - May 10 2017	Downad -
Network +	Overview				Top 10 APs by Airtime Utilization		Ê
Inventory +	8					AC Without APR Can David RC Without APR Can P RC With Cont APR	100
WLANs			6			HERE ALL PREAMERS AND A LEVEL APPENDENT AND A LEVEL AND A LEVEL APPENDENT AND A PERMEMBER AND A	
Clients		15.03 %	X	1.52 -		$\begin{array}{c} XY(T, A, r, L) = YY(AP(0, D(T, N), D(T, N$	- 1
Applications					Bernard RJ No	Constant and an and an an an	
Airtime Utilization							
AP Details							
Client Details							
Switch Details							
Data Explorer							
Admin 🕨							

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 Utilizatio for 5 GHz	n 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	e 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.

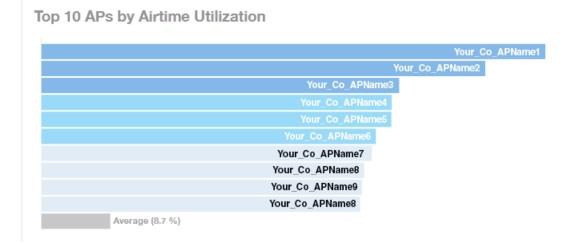
FIGURE 128 Airtime Utilization - Overview



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 129 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 utilization 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 130 Top APs by Airtime Utilization for 2.4 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	69.07 %	17.04 %	0 %	62.03 %
2	Your_Co_APName2	10.x.y.2	Your_Co_CTName2	63.56 W	30.74 %	0 %	32.82 %
3	Your_Co_APName3	10.x.y.3	Your_Co_CTName3	62.14.%	48.92 %	6.86 %	6.37 %
4	Your_Co_APName4	10.x.y.4	Your_Co_CTName4	60.02 %	47,19.96	4.08 %	7.75 9
5	Your_Co_APName5	10.x.y.5	Your_Co_CTName5	66.97.96	40.54 %	11.92 %	4.52 %
6	Your_Co_APName6	10.x.y.6	Your_Co_CTName6	56.00 %	23.04 %	0.03 %	33.32 9
7	Your_Co_APName7	10.x.y.7	Your_Co_CTName7	56.02 %	26.77 %	0.%	29.25 9
8	Your_Co_APName8	10.x.y.8	Your_Co-CTName8	55.36.%	42.26 %	3.86 %	7.24 9
9	Your_Co_APName9	10.x.y.9	Your_Co_CTName9	62.73.96	43.24 %	4.36 %	5.13 9
10	Your_Co_APName10	10.x.y.10	Your_Co_CTName10	52.64 %	45.71 %	2.45 %	4.48 9

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 so 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 utilization 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.

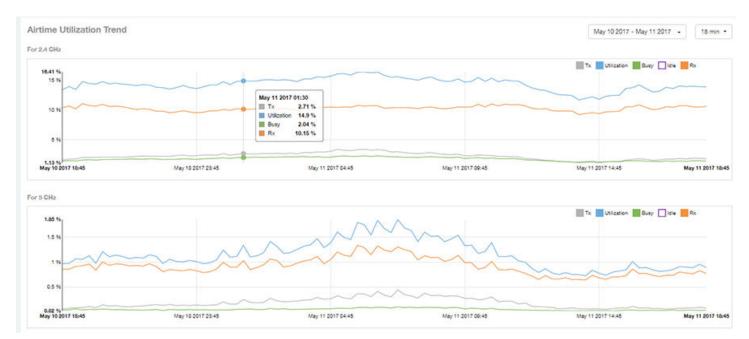
FIGURE 131 Airtime Utilization - Top APs by Airtime Utilization for 5 GHz

Top APs by Airtime Utilization for 5 GHz Top 10 APs . AP Name AP IP Address Controller Name Airtime Utilization Airtime Rx Airtime Tx Airtime Busy ø Index 1 Your_Co_APName1 10.x.y.1 Your_Co_CTName1 0.96 1.34 % 2 Your_Co_APName2 10.x.y.2 Your_Co_CTName1 0 % 1.09 % 3 Your_Co_APName3 10.x.y.3 Your_Co_CTName1 0.96 0.76 % 4 Your_Co_APName4 10.x.y.4 Your_Co_CTName1 0.35 % 1.01 % 5 Your_Co_APName5 10.x.y.5 Your_Co_CTName1 0.45 % 0.85 % 6 Your_Co_AccessPoint1 172.16.z.1 Your_Co_Controller2 0.05 % 0.12.96 7 Your_Co_AccessPoint2 172.16.z.2 Your_Co_Controller2 0.96 0.27 % 8 Your_Co_AccessPoint3 172.16.z.3 Your_Co-Controller2 49.03 % 48.77 % 0.08 % 0.18 % 0.45.96 9 Your Co AccessPoint4 172.16.7.4 Your Co Controller2 48.88 % 47.47.96 0.95 % 10 Your_Co_Controller2 45.96 % 0.02.96 0.05 % Your_Co_AccessPoint5 172.16.z.5 46.03 % 4 1 v 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 132 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 133 Airtime Utilization Over Time

Time Period	2.4 GHz Utilization	2.4 GHz Rx	2.4 GHz Tx	2.4 GHz Busy	5 GHz Utilization	5 GHz Rx	5 GHz Tx	5 GHz Busy
Aay 10 2017 18:45 - 18:59	13.43 %	10.37 %	1.61 %	1.45 %	0.97 %	0.86 %	0.06 %	0.04.96
May 10 2017 19:00 - 19:14	12.96.96	10.67 %	1.76.%	1.82 %	0.98.%	0.86 %	0.07 %	0.04 %
Aay 10 2017 19:15 - 19:29	13.46 %	10.22 %	1.78 %	1.46 %	1.07.%	0.91.96	0.09.95	0.07.96
Aay 10 2017 19:30 - 19:44	14.78 %	11.09 %	2.07 %	1.63 %	1.05.96	0.93 %	0.09.%	0.0+%
Aay 10 2017 19:45 - 19:59	14.45%	10.76 %	2.04 %	1.66.95	1.13.95	0.96 %	0.11.96	0.06 %
Aay 10 2017 20:00 - 20:14	14.37 %	10.66 %	2.1 %	1.61.%	0.90 %	0.84 %	0.08 %	0.06 %
Aay 10 2017 20:15 - 20:29	14.77 %	10.06.%	2.11.%	1.7 %	1.21 %	1 %	0.15.96	0.06 %
May 10 2017 20:30 - 20:44	54.41.55	10.61 %	2.1.94	3,71,56	1.11%	0.94 %	0.12.56	0.06 %
Aay 10 2017 20:45 - 20:59	14.62.95	10.67 %	2.11.%	1.73.%	1.14.%	0.96 %	0.13 %	0.06 %
Aay 10 2017 21:00 - 21:14	14.07 %	10.66 %	2.00 %	1.72 %	1.11.96	0.96 %	0.11.96	0.05 %

AP Details Report Dashboard

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AP Details Report

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

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

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

FIGURE 134 AP Details Report (upper portion)

Overview	A	P Details Report				May 10 2017	- May 17 2017 + Downloa
Network +	(11)	Summary			Performance		
Inventory +	BSCHEDULE	Summary			Performance		
WLANs	DULE			10.x.y.10	Traffic Rate	Clients	SNR
Clients	-	*		AB:CD:EF:01:23:48	Max + 140.7 shan	Max> 9	Max -+ 32.4
Applications				123456789123			
Airtime Utilization		AP 17		Online 21d Sh			Aug -+ 30 m
AP Details					\$22 == \$423 tor	Ma	Mn 29 n
Client Details		Description			City in		
Switch Details		Details AP Henerohy		R300	Stats		
Data Explorer		> EFG123		0.1.2.0.104	~	Rx 25 23 ca	P
Admin 🕨		EFGController1 Administration Domain Dufault Zone APGroup_1 AP17	Location: Controller Modeb Controller Serial No.2 Controller Venion: Controller Name: Controller MAC:	Unknown 82104 Unknown 3.1.2.0.620 EFGController1 FE:DC:BA:89:67:06	Total Turtho 560.4 GB	Tx 688.2 ss Total SSIDs 1	Stat Clients 150

The AP Details report consists of the sections 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 types 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 Applications by Traffic	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. You can click the Table icon to toggle to a table of this same information.
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.
18	Anomalies	Charts provide information about any behavior that might be out of the normal range for this AP.
19	Anomalies for the Past 30 Days	Provides the same information as the Anomalies section for the past 30 days.

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 135 AP Details - Summary



AP Details - Performance

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

FIGURE 136 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 137 AP Details - Details

P Hierarchy	Model:	R300
EFG123	Version:	3.1.2.0.134
> EFGController1	Location:	Unknown
> Administration Domain	Controller Model:	SZ104
> Default Zone	Controller Serial No.:	Unknown
> APGroup_1	Controller Version:	3.1.2.0.520
	Controller Name:	EFGController1
> AP17	Controller MAC:	FE:DC:BA:89:67:06

AP Details - Stats

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

FIGURE 138 AP Details - Summary

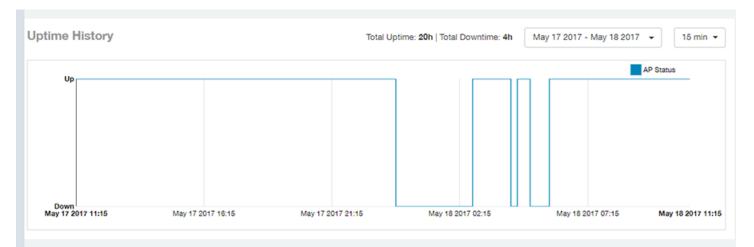


AP Details - Uptime History

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 139 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 140 AP Details - Traffic Trend



AP Details - Unique Clients Trend Over Time

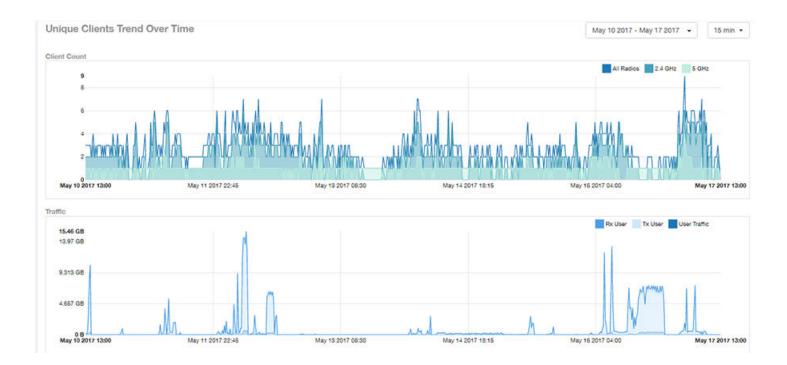
The Unique Clients Trend Over Time section of the AP Details report contains two line graphs that provide information about unique clients associated with the specified AP over a certain time period.

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 Report Dashboard

AP Details - Top 10 Clients by Traffic Volume



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 141 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.

NOTE

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

FIGURE 142 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 143 AP Details - Top SSIDs by Traffic

Index	SSID Name	Rx Total	Tx Total	Total Traffic	Clients	APs	4
1	Your_Co_SSID_Name1	11.02 G8	201.3 GB	212.3 GB	32	1	

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 144 AP Details - Sessions

essions							L	ast 1,000 Session
First Connection	Disconnect Time	Session Duration	Hostname	SSID	Radio	Rx User	Tx User	User Traffic
May 17 2017 14:30	May 17 2017 14:46	16m 6s	EFGHost1	EFGSSID1	5 GHz	13.04 KB	13.35 KB	26.38 KB
May 17 2017 13:08	May 17 2017 14:23	1h 14m	EFGHost2	EFGSSID1	5 GHz	39.38 KB	40.04 KB	79.42 KB
May 17 2017 14:02	May 17 2017 14:03	36.27s	EFGHost3	EFGSSID1	2.4 GHz	16.6 KB	15.52 KB	32.12 KB
May 17 2017 12:55	May 17 2017 12:59	3m 57s	EFGHost4	EFGSSID1	2.4 GHz	7.681 KB	14.39 KB	22.07 KB
May 17 2017 12:41	May 17 2017 12:43	2m 33s	EFGHost5	EFGSSID1	5 GHz	13.61 KB	13.41 KB	27.02 KB
May 17 2017 09:19	May 17 2017 12:34	3h 15m	EFGHost6	EFGSSID1	5 GHz	134.7 KB	150.2 KB	285 KB

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 145 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 146 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.

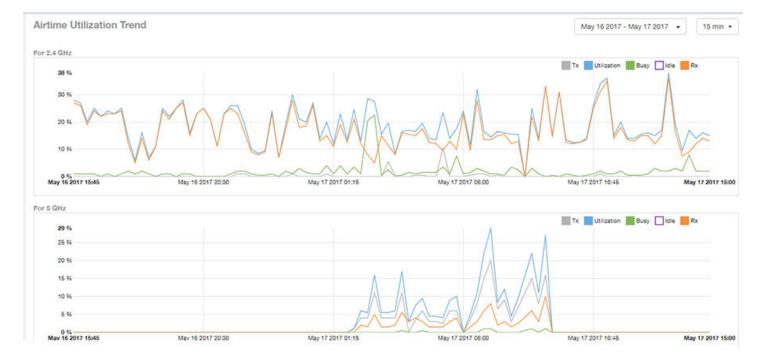


FIGURE 147 AP Details - Airtime Utilization Trend

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 148 AP Details - Clients Details

ents Details				These clients	consume 100 % (206.1 GB)) of all user traffic (206.1 GB)	Top 10 Client
Index	Hostname	IP Address	Username	Sessions	Rx User	Tx User	User Traffic
1	EFGHost1	10.x.y.1	Your_Co_UserName1	25	10.47 68	195 GB	203.4 GB
2	EFGHost2	10.x.y.2	Your_Co_UserName2	8	71.58 MB	1.529 GB	1.599 GB
3	EFGHost3	10.x.y.3	Your_Co_HostName3	6	66.91 MB	447.6 MB	514.5 MB
4	EFGHost4	10.x.y.4	Your_Co_UserName4	2	64.17 MB	357 MB	421.2 MB
5	EFGHost5	10.x.y.5	Your_Co_UserName5	6	27.72 MB	63.57 MB	91.29 MB
6	EFGHost6	10.x.y.6	Your_Co_Userame6	62	6.688 MB	53.04 MB	59.73 MB
7	EFGHost7	10.x.y.7	Your_Co_UserName7	9	785.6 KB	810.9 KB	1,559 MB
8	Your_Co_HostName8	10.x.y.8	Your_Co_UserName8	1	140.4 KB	815.2 KB	955.6 KB
9	Your_Co_HostName9	10.x.y.9	Your_Co_UserName9	1	185.3 KB	272.4 KB	457.7 KB
10	Your_Co_HostName10	10.x.y.10	Your_Co_UserName10	3	147.8 KB	174.1 KB	321.8 KB

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 149 AP Details - Alarms

arms				Last 10 Alarms •
Time	Alarm Code	Alarm Type	Severity	Reason
May 18 2017 11:15	302	apRebootBySystem	Major	AP lost Gateway more than 18
May 18 2017 10:01	303	apConnectionLost	Major	Unknown
May 17 2017 22:24	302	apRebootBySystem	Major	AP lost Gateway more than 18
May 17 2017 21:21	303	apConnectionLost	Major	Unknown
May 17 2017 18:54	302	apRebootBySystem	Major	AP lost Gateway more than 18
		4 1 v of 1 🕨		

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 150 AP Details - Events

rents			Last 1,000 Events *
Time	Event Code	Event Type	Reason
May 17 2017 14:57	202	clientJoin	Unknown
May 17 2017 14:46	205	clientInactivityTimeout	Unknown
May 17 2017 14:30	202	clientJoin	Unknown
May 17 2017 14:23	205	clientInactivityTimeout	Unknown
May 17 2017 14:03	204	clientDisconnect	Unknown
May 17 2017 14:02	209	clientRoaming	Unknown
May 17 2017 13:08	202	clientJoin	Unknown
May 17 2017 12:59	205	clientInactivityTimeout	Unknown
May 17 2017 12:55	209	clientRoaming	Unknown
May 17 2017 12:48	306	apChannelChanged	Unknown

AP Details - Anomalies

The anomalies charts provide information about any behavior that might be out of the normal range for this AP, such as high reboot count, unusually high or low user traffic, unusually high or low client count, or unusually high or low session count.

For more information about anomalies, as well as screen shots of each type, refer to the Using Ruckus Smart Analytics on page 21.

Client Details Report Dashboard

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	Client Details - Stats	
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•	Client Details - RSS Trend	. 118
•	Client Details - SNR Trend	119
•	Client Details - Sessions	119

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 151 Client Details Report (upper portion)

Overview	Client Details Repo	rt				May 10 2017 - Ma	y 17 2017 -	Download
Network								
nventory >	Summary			Stats				
WLANs ULE	~		10.x.y.12	APs Connected	Avg Rate	User Traffic		
Clients	- E		FE:DC:BA:89:67:01 Mac 05 X	1	7.423 Million	547.2 os		541.2 ca
Applications			Apple, Inc.	Avg Session Length 29.n 17s	215	Applications 0		
irtime Itilization	XYZ123		Disconnected AP750					5 GHz
P Details	Top 10 Applications	by Traffic Volume				User	Traffic •	15 min •
ient Details								
witch Details								
ata Explorer								
imin 🔸								

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

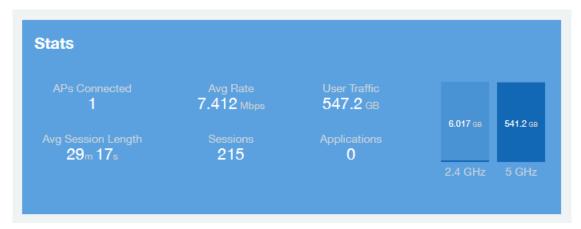
FIGURE 152 Client Details - Summary

	IP Address:	10.x.y.12
	MAC Address:	FE:DC:BA:89:67:01
	OS:	Mac OS X
	Manufacturer:	Apple, Inc.
XYZ123	Last Known Status:	Disconnected
	Current/Last AP:	AP750

Client Details - Stats

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

FIGURE 153 Client Details Stats



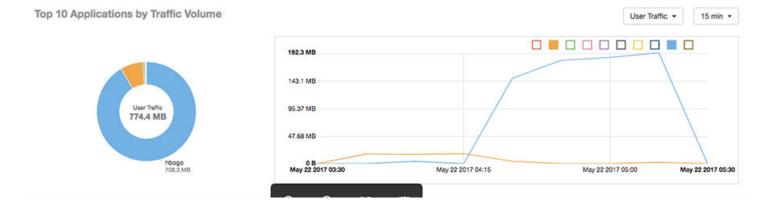
Client Details - Top 10 Applications by Traffic Volume

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.

NOTE

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

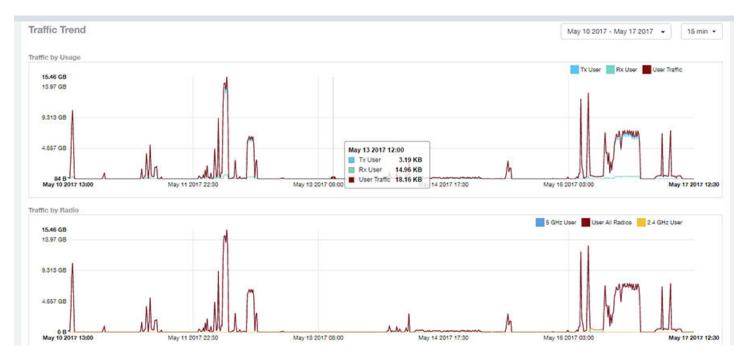


Client Details - Traffic Trend

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 154 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.

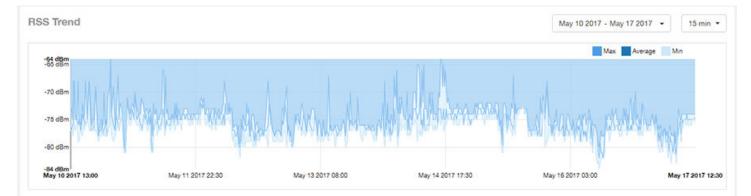


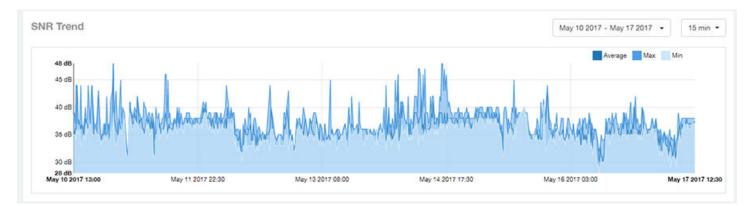
FIGURE 155 Client Details - RSS Trend

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 156 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 157 Client Details Sessions

essions								Last 1,000 Sessions	s •
First Connection	Disconnect Time	Session Duration	AP Name	SSID	Radio	Rx User	Tx User	User Traffic	ł
May 17 2017 12:41	May 17 2017 12:43	2m 33s	AP750	SSID17	5 GHz	13.61 KB	13,41 KB	27.02 KB	
May 17 2017 09:19	May 17 2017 12:34	3h 15m	AP750	SSID17	5 GHz	134.7 KB	150.2 KB	285 KB	1
May 17 2017 07:55	May 17 2017 09:19	1h 24m	AP750	SSID17	5 GHz	116.4 MB	2.418 GB	2.532 GB	1
May 17 2017 07:19	May 17 2017 07:46	27m 6s	AP750	SSID17	5 GHz	37,69 MB	763.9 MB	801.6 M8	
May 17 2017 06:17	May 17 2017 07:16	58m 59s	AP750	SSID17	5 GHz	113.9 MB	1.714 GB	1.826 GB	3
May 17 2017 04:16	May 17 2017 06:17	2h	AP750	SSID17	5 GHz	178.9 MB	3.484 GB	3.659 GB	
May 17 2017 04:13	May 17 2017 04:15	2m 20s	AP750	SSID17	5 GHz	130.8 KB	104.9 KB	235.6 KB	
May 17 2017 04:12	May 17 2017 04:12	16.28s	AP750	SSID17	5 GHz	53.41 KB	145.5 KB	198.9 KB	1
May 17 2017 02:17	May 17 2017 04:12	1h 55m	AP750	SSID17	5 GHz	(169 MB	3.295 GB	3.46 GB	n
May 17 2017 02:15	May 17 2017 02:15	26.6s	AP750	SSID17	5 GHz	66.72 KB	1.41 MB	1.475 MB	

Switch Details Report Dashboard

•	Switch Details Report	121
	Switch Details - Summary	
	Switch Details - Details	
	Switch Details - Resource Utilization	
	Switch Details - Top Ports By Traffic	124
	Switch Details - Traffic Trend	
	Switch Details - LLDP Neighbor List	
	Switch Details - Uptime History	

Switch Details Report

The Switch Details report provides details about one specific switch.

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

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

FIGURE 158 Switch Details Report (upper portion)

· • •	Switch Details Report			Jun 14 2019 - Jun 21 2019 - Dow
	Summary		Details	
DULE		Unknown	Switch Hierarchy	ICX7650-48ZP
			DENSITY	TN/R08090
ins		D4.C1.9E:14:C3.99		No 1
		EZC3307P01H	> Administration Domain	1 vszo50
	ICX7650-48ZP Router	ONLINE		vSCGe
•			> WESTBLOOK	5.1.2.0.152
ala		1mo 6d		98H03WJ3QT25HW3UJN5FD7P476XA
etails	December 1997 and a			
	Resource Utilization			15 min •
orer				CPU 🧮 Memory 🛄 PoE
•	31 %			
	25.55			
	20 %			
	15.96			

The Switch 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 switch.
2	Details	Contains basic statistics specific to this switch.
3	Resource Utilization	A graph shows the CPU, memory and power over Ethernet (PoE) utilization percentages for each switch in your system.

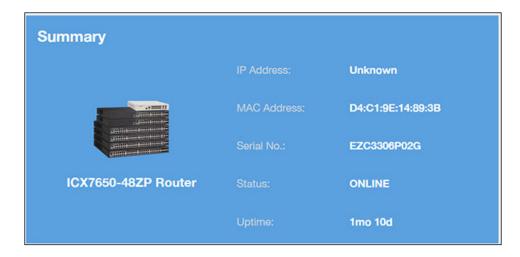
4	Top Ports By Traffic	A pie chart and line graph show the ports that are handling the most traffic. You can toggle to a table view of this information by clicking the Table icon.
5	Traffic Trend	Two line graphs depict traffic by usage and average traffic rate for this switch.
6	LLDP Neighbor List	A table that provides information about all the LLDP neighbors for this switch.
7	Uptime History	A line graph shows when this switch has been up or down over different time periods.

Switch Details - Summary

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

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

FIGURE 159 Switch Details - Summary



Switch Details - Details

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

FIGURE 160 Switch Details - Details

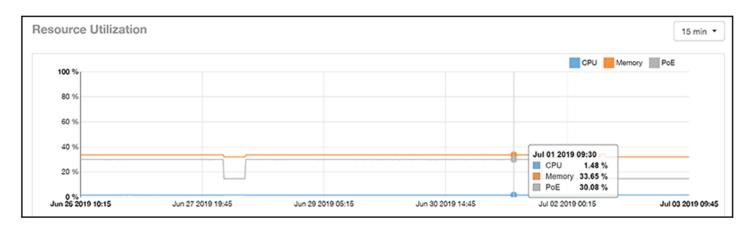
Details								
Switch Hierarchy	Model:	ICX7650-48ZP						
	Version:	TNR08090						
> DENSITY	Stack:	No						
	No. of Switch Units:	1						
> Administration Domain	Controller Name:	vsze50						
	Controller Model:	vSCGe						
> EASTBLOCK	Controller Version:	5.1.2.0.152						
	Controller Serial No.:	98H03WJ3GT25HW3UJ						

Switch Details - Resource Utilization

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

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

FIGURE 161 Switch Details - Resource Utilization



Switch Details - Top Ports By Traffic

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

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

Top Ports by Traffic 2 := 15 min * GigabitEthernet1/1/20 GigabitEthernet1/1/11 256.1 TB GigabitEthernet. 227.4 TB GinabitEthern SHIFTING GigabitEt ... 181.9 TB 136.4 TE 10Giga.. Ports 90.95 TB 10Gigabi 45.47 TE <u>ד חדשה הידר הירך הידרך המתחר הדדשה הדדשות הידר השר ד</u> 0 B¹ Jun 26 2019 10:15 Jun 28 2019 18:15 Jul 01 2019 02:15 Jul 03 2019 09:45

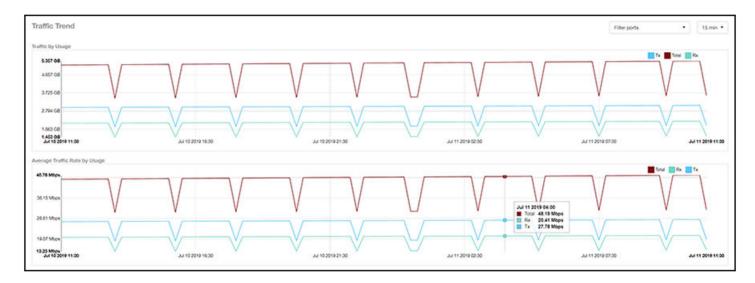
FIGURE 162 Switch Details - Top Ports By Traffic

Switch Details - Traffic Trend

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

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

FIGURE 163 Switch Details - Traffic Trend



Switch Details - LLDP Neighbor List

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

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

FIGURE 164 Switch Details - LLDP Neighbor List

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

Switch Details - Uptime History

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

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

FIGURE 165 Switch Details - Uptime History

Uptime History				Total Uptime: 6d 20h Total Do	wntime: 0 15 min 👻
Up					Switch Status
Down Jun 18 2019 14:30	Jun 20 2019 00:00	Jun 21 2019 09:30	Jun 22 2019 19:00	Jun 24 2019 04:30	Jun 25 2019 14:00

Data Explorer Dashboard

•	Data Explorer and Data Cubes	127
•	Airtime Utilization	130
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•	AP Inventory	132
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•	Exporting Raw Data Using the SCI Virtual Machine Command Line Interface	

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.

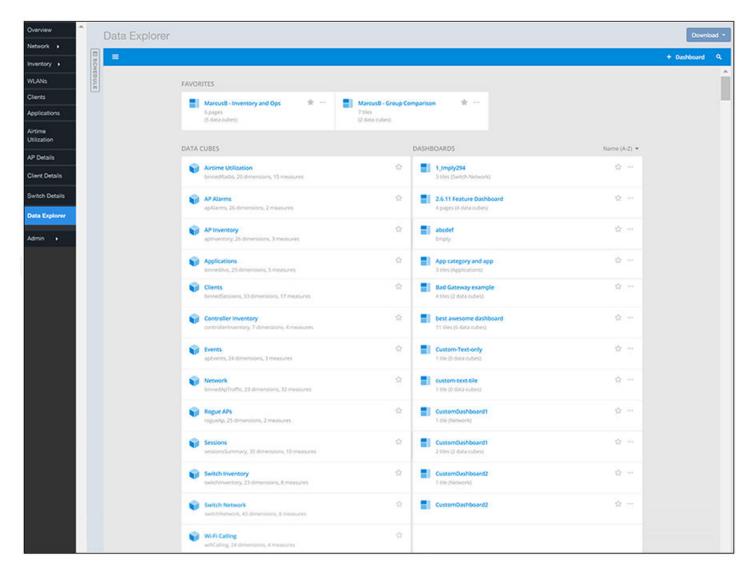
With an OLAP cube, there are five operations that you can perform:

- 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 166 Data Explorer and Data Cubes



The 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:

- Airtime Utilization on page 130
- AP Alarms on page 131
- AP Inventory on page 132
- Applications on page 133
- Clients on page 134
- Controller Inventory on page 135

- Events on page 135
- Network on page 136
- Rogue APs on page 137
- Sessions on page 138
- Switch Inventory on page 139
- Switch Network on page 140
- WiFi-Calling on page 141

NOTE

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

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 142

Dashboards

You can create and save dashboards, which allow you to customize reports by using data from any or all of the data cubes. Refer to the following sections for information on these dashboards:

- Creating a Data Explorer Dashboard on page 168
- Actions You Can Perform on an Existing Dashboard on page 173

Airtime Utilization

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

FIGURE 167 Data Explorer - Airtime Utilization

■ Airtime Utilization						в <	8
DIMENSIONS	٩,	FILTER	🕒 Latest day	+	123	MEASURES	
() Time	Î	EXPLORE	+		Total	Avg Airtime Busy	Ψ
A System	- 11					Search	
△ Controller MAC	- 11					Avg Airtime Busy	
A Controller Model	- 11					Avg Airtime Idle	
A Controller Serial	- 11					Avg Airtime Rx	
A Controller Version	- 11					Avg Airtime Tx	
A Domain	- 11			Avg Airtimo Busy		Avg Airtime Utilization	
∧ Zone	- 11			Avg Airtime Busy		Total Traffic	
A AP Group	- 11			0.88 %		Rx Total	
A AP MAC	- 11			0100 /0		Tx Total	
A AP Name	- 11					Mgmt Traffic	
A AP Serial	- 11					Rx Mgmt	
A AP Model	- 11					Tx Mgmt	÷
A AP Location							-
A AP Description						Multi-selection	

AP Alarms

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

FIGURE 168 AP Alarms

■ AP Alarms						# < #
DIMENSIONS Time	Q,	FILTER EXPLORE	🕒 Latest day +	+	123 Total	MEASURES Count
System Controller MAC Controller Model Controller Name Controller Serial						Search Count AP Count
Controller Version Domain Zone AP Group AP MAC AP Name				Count 466		Multi-selection
A AP Serial A AP Model A AP Location	÷					

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.

Data Explorer Dashboard AP Inventory

AP Inventory

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

FIGURE 169 AP Inventory

■ AP Inventory						8 × 8
AP Inventory DIMENSIONS Time System Controller MAC Controller Model Controller Name Controller Serial Controller Version Domain Zone AP Group AP Group AP MAC AP Name AP Serial	ď	FILTER EXPLORE	C Latest day +	+ Max Offline Duration 2y 11mo	123 Total	MEASURES Max Offline Duration Search Max Offline Duration AP Count Multi-selection to pin them
A AP Model A AP Location	Ţ					

Applications

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

FIGURE 170 Data Explorer - Applications

						≈ < ≈
DIMENSIONS	٩	FILTER	🕒 Latest day	+	123	MEASURES
() Time	- î	EXPLORE	+		Total	User Traffic V
A System	- 1					Search
A Controller Model	- 1					User Traffic
A Controller Name	- 1					Rx User
A Controller Serial	- 1					Tx User
A Controller Version	- 1					Client MAC Count
A Domain	- 1			User Traffic		AP Count
A Zone	- 1					
A AP Group	- 1			58.79 MB		Multi-selection
A AP MAC	- 1					
A AP Name						
A AP Serial						
A AP Model						
A AP Location						
A AP Description						
A AP Version						

Data Explorer Dashboard Clients

Clients

The Clients cube allows you to explore client data for your system.

FIGURE 171 Data Explorer - Clients

≡ Clients						8 < 8
DIMENSIONS	٩	FILTER	🕒 Latest day	+	123	MEASURES
() Time	^	EXPLORE	+		Total	User Traffic 🛛 🔍
A System	- 1					Search
A Controller MAC	- 1					
A Controller Model	- 1					User Traffic
A Controller Name	- 1					Rx User
A Controller Serial	- 1					Tx User
A Controller Version	- 1					Session Count
A Domain	- 1			User Traffic		Roaming Session Count
A Zone						Client Username Count
A AP Group				14.68 TB		Client Hostname Count
A AP MAC						Avg RSS
A AP Name						Max RSS
A AP Serial						Min RSS
A AP Model						Avg SNR 👻
A AP Location						
A AP Description						Multi-selection
A AP Version					_	

Controller Inventory

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

FIGURE 172 Controller Inventory

Controller Inventory				a < a
DIMENSIONS Q. © Time A System	FILTER C Latest day EXPLORE +	+	10001	URES CPU Utilization
Controller MAC Controller Model Controller Name Controller Serial Controller Version		Avg CPU Utilization	Avg Avg	g CPU Utilization g Memory Utilization g Disk Utilization g Disk Free
		15.03 %		Multi-selection

Events

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

FIGURE 173 Data Explorer - Events

≡ Events						a < ≈
DIMENSIONS	٩ ،	FILTER	() Latest day	+	123	MEASURES
A System		EXPLORE	+		Total	Search
Controller Model A Controller Name						Count Reboot Count
A Controller Serial				_		AP Count
A Controller Version A Domain				Count 9		Multi-selection
A Zone A AP Group				9		
A AP MAC A AP Name						
A AP Serial A AP Model						
A AP Location	÷					

Data Explorer Dashboard Network

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.

NOTE

Also, refer to the ZoneDirector Syslog Events Reference Guide.

Network

The Network cube allows you to explore network traffic data and its usage.

FIGURE 174 Data Explorer - Network

■ Network						1	a < a
DIMENSIONS	٩	FILTER	() Latest day	+	123	MEASURES	
() Time	^	EXPLORE	+		Total	Total Traffic	v
A System	- 1					Search	H
A Controller MAC	- 1					Search	
A Controller Model	- 1					Total Traffic	^
A Controller Name	- 1					Rx Total	
A Controller Serial	- 1					Tx Total	
A Controller Version	- 1					Mgmt Traffic	
A Domain	- 1			Total Traffic		Rx Mgmt	
A Zone	- 1					Tx Mgmt	
A AP Group	- 1			15.48 TB		User Traffic	
A AP MAC	- 1					Rx User	
A AP Name	- 1					Tx User	
A AP Serial						Rx Failures	
A AP Model						Tx Failures	-
A AP Location							
A AP Description						Multi-selection	on
A AP Version							

Rogue APs

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

FIGURE 175 Rogue APs

						# < #
DIMENSIONS © Time	٩ ،	FILTER	③ Latest day	+	123 Total	MEASURES Rogue AP Count
A System Controller MAC Controller Model						Search Rogue AP Count
A Controller Name A Controller Serial						Max Rogue RSSI
A Controller Version A Domain				Rogue AP Count 359		Multi-selection
A Zone A AP Group A AP MAC	1			228		
A AP Name A AP Serial						
 AP Model AP Location 						

Data Explorer Dashboard Sessions

Sessions

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

FIGURE 176 Data Explorer - Sessions

≡ Sessions				H < H
DIMENSIONS Q	FILTER ③ Latest day EXPLORE +	+	123 Total	MEASURES User Traffic V
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		User Traffic 10.2 TB		Search User Traffic Rx User Tx User Avg Session Duration Session Count Roaming Session Count Client Username Count Client Hostname Count Client MAC Count AP Count

Switch Inventory

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

FIGURE 177 Switch Inventory

Switch Inventory						8 ± 8
DIMENSIONS Time A System	Q FILT	ER 🕑 Latest day	+		123 Overall	MEASURE ····
Controller MAC Controller Model Controller Name Controller Serial Controller Version Domain Switch Group Name Switch Subgroup Name Switch Subgroup Name Switch Name	l		Switch Coun	t		Jearch Switch Count Offline Duration PoE Ublization (%) PoE Usage (mW) PoE Free (mW) PoE Total (mW) CPU (%) Memory (%)
Switch Name Switch Serial Switch Version Switch Version Switch IP Switch Status Switch Firmware Switch Uptime	÷					I≣ Multi-selection

Switch Network

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

FIGURE 178 Switch Network

Data Explorer								De	wnioa	d •
Switch Network									±	8
DIMENSIONS DIMENSIONS Time A System Controller MAC Controller Madel Controller Name Controller Serial Controller Version Domain Switch Group Name Switch Group Name Switch Subgroup Name Switch Status Switch IP Switch IP Switch IP Switch Iptime	, p	PILTER EXPLORE	() Latest day +	*	Switch Unit Count	123 Overall	MEASURE Switch Unit Count jearch Switch Unit Count Port Count Rx Traffic Tx Traffic Total Traffic Port POE Utilization (%) Packet in Packet Out III Multi-selection ★ Compare			

WiFi-Calling

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

FIGURE 179 WiFi-Calling

≡ Wi-Fi Calling					# ± #
DIMENSIONS Time A System	Q FILT	ER 🕑 Latest day	+	123 Overall	MEASURE
Controller MAC Controller Model Controller Name Controller Serial Controller Serial Controller Version Domain	L		Total Wi-Fi Calling bytes		Bearch Total Wi-Fi Calling bytes Downlink Wi-Fi Calling byt Uplink Wi-Fi Calling bytes Call Duration
 Zone AP Group AP MAC AP Name AP Serial AP Model AP Location AP Description 	l		1.1 m		E Multi-selection

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.

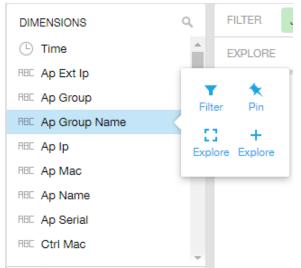
FIGURE 180 Data Cube Filters

RUCKU	JS [™]				0 adr	
Nerview *	Data Explorer				Download *	
ventory •	E Sessions				678 #<	
entory • Entory • Entory • Entory • Entory • Entorements entore		ALTER O Latest day EXPLORE +	+ 3	123 Total	MEASURES 2 User Traffic *	
time Isation Details	System Controller MAC Controller Model				9	
nt Details	Controller Name Controller Serial Controller Version		User Traffic		Click or drag dimensions to pin them	
Explorer	 △ Domain △ Zone △ AP Group 		9.85 TB			
	A AD Model					

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

Dimensions

FIGURE 181 Dimensions



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

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

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

TABLE 6 Dimensions

Dimension name	Description	Supported Data Cubes
Alarm Code	Unique string assigned by the controller to an alarm.	AP Alarms
Alarm State	Indicates if the alarm is outstanding.	AP Alarms
Alarm Type	Description for access point and controller alarms.	AP Alarms
Alarm UUID	Unique string assigned by the controller to an alarm.	AP Alarms
AP Description	Description string of the access point that is configured in the controller.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP

TABLE 6 Dimensions (continued)

Dimension name	Description	Supported Data Cubes
		Wifi-Calling
AP External IP	External IP address of the access point.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP Wifi-Calling
AP Group	AP Groups configured in the controller.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP Wifi-Calling
AP Internal IP	Internal IP address of the access point.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP Wifi-Calling
AP Latitude	Latitude of GPS coordinates	AP Inventory
AP Longitude	Longitude of GPS coordinates	AP Inventory
AP Location	Location string of the access point that is configured in the controller.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP Wifi-Calling
AP MAC	Base MAC address of the access point.	 Applications Network

Dimension name	Description	Supported Data Cubes
		 Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP Wifi-Calling
AP Model	Description of the access point model type.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP Wifi-Calling
AP Name	Name of the access point configured in the controller.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP Wifi-Calling
AP Serial	Serial number of the access point.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP Wifi-Calling
AP Version	Firmware version number of the access point.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory

Dimension name	Description	Supported Data Cubes
		AP Alarms
		Rogue AP
		Wifi-Calling
Application Category	Amount of user traffic by category	Applications
Application Name	Name of the application accessed by the WiFi client.	Applications
Authentication Method	The WiFi encryption and authentication method adopted.	ClientsSessions
BSSID	Basic service set identifier	Network
Cable modem firmware	Firmware version of the cable modem.	AP Inventory
Cable modem IP	IP address of the cable modem.	AP Inventory
Cable modem MAC	MAC address of the cable modem.	AP Inventory
Category	Category for access point and controller alarms or events.	EventsAP Alarms
Channel	The WiFi channel number used.	NetworkClientsSessions
Client IP	Internal IP address of the WiFi client.	Clients Sessions
Client MAC	MAC address of the WiFi client.	 Applications Clients Sessions Wifi-Calling
Client Radio Mode	Possible values are: ac, n, a, g, b, or "unknown" (if SmartZone version is prior to 3.6).	ClientsSessions
Connection Status	Connection status of the access point: Online, Offline, Discovery, Provisioned.	AP Inventory
Controller MAC	MAC address of the controller.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Controller Inventory Rogue AP Switch Inventory Switch Network Wifi-Calling
Controller Model	Description of the model of the controller.	 Applications Network Airtime Utilization Clients

Dimension name	Description	Supported Data Cubes
		 Sessions Events AP Inventory AP Alarms Controller Inventory Rogue AP Switch Inventory Switch Network Wifi-Calling
Controller Name	Name of the configured controller.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Controller Inventory Rogue AP Switch Inventory Switch Network Wifi-Calling
Controller Serial	Serial number of the controller.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Controller Inventory Rogue AP Switch Inventory Switch Network Wifi-Calling
Controller Version	Firmware version number of the controller.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Controller Inventory Rogue AP

Dimension name	Description	Supported Data Cubes
		Switch InventorySwitch NetworkWifi-Calling
Disconnect Time	Disconnect time of a session.	Sessions
Domain	Domains configured in the controller.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP Switch Inventory Switch Network Wifi-Calling
Event Code	Code number for access point and controller events.	Events
Event Type	Description for access point and controller events.	Events
First Connection	First connection time of a session.	Sessions
FQDN of ePDG	Fully qualified domain name of Evolved Packet Data Gateway.	Wifi-Calling
Hostname	Hostname configured in the WiFi client.	Clients Sessions
Is Ruckus AP	Indicates if the connected device on this port is a Ruckus AP.	Switch Network
Lag Name	Link aggregation name of the port.	Switch Network
Last Status Change	Date and time of the last change in Connection Status of the access point.	AP Inventory
Manufacturer	Manufacturer information for the WiFi client.	ClientsSessions
Number of Ports	The number of ports on the switch.	Switch InventorySwitch Network
Operators	WiFi operators.	Wifi-Calling
Number of Switch Units	The number of individual hardware switches (which may or may not be stacked).	Switch InventorySwitch Network
Optics	The optics, by Gbits per second, being used in the switch network.	Switch Network
OS Type	OS information for the WiFi client.	Clients Sessions
Port	Port of the application accessed by the WiFi client.	Applications
Port Mac	The MAC addresses of individual ports on a switch.	Switch Network

Dimension name	Description	Supported Data Cubes
Port Name	All the port names being used in the switch network.	Switch Network
Port Number	All the port numbers being used in the switch network.	Switch Network
Port Status	The up/down operating status of the port.	Switch Network
Port Link Status	The up/down status of all port links in the switch network.	Switch Network
Port Admin Status	The admin-configured port status (up/down).	Switch Network
Port Speed	All the port speeds in use in the switch network.	Switch Network
Port VLans	All the port VLans in use in the switch network.	Switch Network
Radio	Indicates the radio frequency band: 2.4GHz or 5GHz.	 Applications Network Airtime Utilization Clients Sessions Wifi-Calling
Reason	Additional description for access point and controller alarms or events, if available.	Events AP Alarms
Remote Device Name	The name of the device connected to the switch/port, as learned from LLDP.	Switch Network
Remote Port Mac	The MAC address of the device connected to the switch/port.	Switch Network
Remote Port Type	The functionality of the device connected to the switch/port, as learned from LLDP.	Switch Network
Remote Port Description	The description of the device connected to the switch/port, as learned from LLDP.	Switch Network
Remote Port	The port used by the remote device to connect to this switch/port, as learned from LLDP.	Switch Network
Roaming Session ID	A unique session ID that is created when a client roams to multiple APs within a short- enough time span that the client is connected to these APs simultaneously.	ClientsSessions
Rogue AP MAC	MAC Address of the detected Rogue AP.	Rogue AP
Rogue Channel	The WiFi channel that the rogue AP was operating on.	Rogue AP
Rogue Encryption	The WiFi encryption and authentication method adopted by the rogue AP.	Rogue AP
Rogue Radio	The radio band (2.4GHz or 5GHz) that the rogue AP was operating on.	Rogue AP
Rogue SSID	SSID of the detected Rogue AP.	Rogue AP
Rogue Type	Possible types are: ignore, known, rogue, and malicious	Rogue AP
Router ID	The router IDs being used in the network.	Switch InventorySwitch Network

Dimension name	Description	Supported Data Cubes
Session ID	ID string assigned to a session.	ClientsSessions
Session Type	Indicates whether the session is authorized or unauthorized.	ClientsSessions
Severity	Severity level for access point and controller alarms or events.	EventsAP Alarms
SSID	Service set identifier (SSID) configured in the controller.	 Applications Network Clients Sessions Wifi-Calling
Switch Firmware	Firmware versions being used by the switches in the network.	Switch InventorySwitch Network
Switch Group Name	Names of all the switch groups in the network.	Switch InventorySwitch Network
Switch MAC	MAC addresses of the switches in the network.	Switch InventorySwitch Network
Switch Model	Model numbers of the switches in the network.	Switch InventorySwitch Network
Switch Name	Names of the switches in the network.	Switch InventorySwitch Network
Switch Serial	Serial numbers of the switches in the network.	Switch InventorySwitch Network
Switch Status	Online/offline/flagged status of the switches in the network.	Switch InventorySwitch Network
Switch Subgroup Name	Names of the switch subgroups in the network.	Switch InventorySwitch Network
System	System ID of the controller or the SmartZone Cluster.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Controller Inventory Rogue AP Switch Inventory Switch Network Wifi-Calling
Time	Allows the data to be viewed in terms of data points with timestamps. Time granularity of 1 minute, 15 minutes, 1 hour, 1 day and 1 week can be chosen.	 Applications Network Airtime Utilization

Dimension name	Description	Supported Data Cubes
		 Clients Sessions Events AP Inventory AP Alarms Controller Inventory Rogue AP Switch Inventory Switch Network Wifi-Calling
Username	Username of the user account associated with the WiFi client.	ClientsSessions
Zone	Zones configured in the controller.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms Rogue AP Wifi-Calling

Measures

FIGURE 182 Measures

MEASURES
User Traffic 🔹 🔻
Search
User Traffic
Rx User
Tx User
Avg Session Duration
Session Count
Roaming Session Count
Client Username Count
Client Hostname Count
Client MAC Count
AP Count
Multi-selection

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

Based on the selected cube, measures can vary.

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

NOTE

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

TABLE 7 Measures

Measure name	Description	Supported Data Cubes
AP Count	Unique number of access points.	 Applications Network Airtime Utilization Clients Sessions Events AP Inventory AP Alarms

TABLE 7 Measures (continued)

Measure name	Description	Supported Data Cubes
AP Uptime	Uptime percentage for an access point.	AP Inventory
AP-to-SZ Ping Latency	Average time, in milliseconds, for the AP to transmit a packet to the SZ controller, and receive the packet back.	Network
Avg Airtime Busy	Average of the airtime busy metric.	Airtime Utilization
Avg Airtime Idle	Average of the airtime idle metric.	Airtime Utilization
Avg Airtime Rx	Average of the airtime receive metric.	Airtime Utilization
Avg Airtime Tx	Average of the airtime transmit metric.	Airtime Utilization
Avg Airtime Utilization	Average of the total airtime utilization.	Airtime Utilization
Avg CPU Utilization	Average CPU utilization for the controller.	Controller Inventory
Avg Disk Free	Average free disk space for the controller.	Controller Inventory
Avg Disk Utilization	Average disk utilization for the controller.	Controller Inventory
Avg Memory Utilization	Average memory utilization for the controller.	Controller Inventory
Avg Noise Floor	Average noise floor power in dBm.	Clients
Avg RSS	Average received signal strength of the access point in dBm.	Clients
Avg Session Duration	Average time duration for a session.	Sessions
Avg SNR	Average signal to noise ratio at the access point in dB.	Clients
Avg Throughput Estimate	Average throughput estimate for the WiFi client.	• Clients
Call Duration	Length of call to the nearest second.	WiFi Calling
Client Hostname		Clients Sessions
Client MAC Count	Unique number of WiFi clients.	 Applications Clients Sessions
Client Username		ClientsSessions
Count		EventsAP Alarms
CPU (%)	Percentage of CPU currently in use.	Switch Inventory
Downlink Wifi-Calling Bytes	Number of bytes being used only in the downlink communications of the wifi calling.	WiFi-Calling
Failed Associations	Number of failed associations.	Network
Failed Authentications	Number of failed open authentications	Network
Mgmt Traffic	Traffic volume, which is transmitted and received in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.	NetworkAirtime Utilization
Max Offline Duration	The maximum offline duration within the selected time range.	AP Inventory
Max Rogue SNR	The maximum detected SNR of the rogue AP.	Rogue AP
Max RSS	Maximum received signal strength of the access point in dBm.	Clients

TABLE 7 Measures (continued)

Measure name	Description	Supported Data Cubes
Max SNR	Maximum signal to noise ratio at the access point in dB.	Clients
Memory (%)	Percentage of memory currently in use.	Switch Inventory
Min RSS	Minimum received signal strength of the access point in dBm.	Clients
Min SNR	Minimum signal to noise ratio at the access point in dB.	Clients
Offline Duration	Duration given in milliseconds.	Switch Inventory
PoE Utilization (%)	Percentage of available power over Ethernet wattage being utilized.	Switch Inventory
PoE Usage (mW)	Power over Ethernet usage.	Switch Inventory
PoE Free (mW)	Available power over Ethernet not currently being used.	Switch Inventory
PoE Total (mW)	PoE usage plus PoE free.	Switch Inventory
Port Count	Number of ports for a given switch that are part of the corresponding dimension.	Switch Network
Port PoE Utilization (%)	Percentage of PoE used by a specific port out of the total of PoE being used by the switch at the specified time.	Switch Network
Reboot Count		Events
Roaming Session Count	The number of roaming sessions for a specific client. A roaming session occurs when a client roams quickly enough to remain connected to multiple APs simultaneously. If you find a client that has a large number of roaming sessions, you can use various dimensions in Data Explorer to obtain details about the APs.	ClientsSessions
Rogue AP Count	The number of Rogue APs detected by all the APs in your network.	Rogue AP
Rx Failures	Receive packets which failed to be processed due to insufficient buffer in AP.	Network
Rx Management	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.	NetworkAirtime Utilization
Rx Traffic	Traffic received for each dimension measure.	Switch Network
Rx Total	Sum of the Rx user and management traffic.	NetworkAirtime Utilization
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.	 Applications Network Airtime Utilization Clients Sessions
Session Count	Number of unique sessions.	Clients Sessions
Successful Associations	Number of successful associations.	Network
Successful Authentications	Number of successful open authentications	Network

TABLE 7 Measures (continued)

Measure name	Description	Supported Data Cubes
Successful Authentication Ratio	Ratio of number of successful open authentications over total number of open authentications.	Network
Switch Count	Number of switches for each corresponding dimension.	Switch Inventory
Switch Unit Count	Number of switch units for each corresponding dimension.	Switch Network
Total Data Frames Ratio	Percentage of all Tx and Rx packets that are data.	Network
Total Management Frames Ratio	Percentage of all Tx and Rx packets that are management.	Network
Total Traffic	Sum of the user and management traffic.	NetworkAirtime UtilizationSwitch Network
Total Wifi-Calling Bytes	Total number of downlink WiFi calling bytes plus uplink WiFi calling bytes.	WiFi-Calling
TxBroadcastFrames	Number of broadcast packets transmitted by the network.	Network
Tx Client MCS Rate	Client transmission data rate.	Clients
TxDropDataFrames	Tx data frames that are dropped by the message queue.	Network
Tx Failures	Transmit packets which failed to be processed due to insufficient buffer in AP.	Network
Tx Management	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.	NetworkAirtime Utilization
TxMulticastFrames	Number of multicast packets transmitted by the network.	Network
Tx Total	Sum of the Tx user and management traffic.	NetworkAirtime Utilization
Tx Traffic	Traffic transmitted for each corresponding dimension.	Switch Network
TxUnicastFrames	The number of data packets transmitted by the network that are not broadcast or multicast packets.	Network
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.	 Applications Network Airtime Utilization Clients Sessions
Uplink Wifi-Calling Bytes	Number of bytes being used only in the uplink communications of the wifi calling.	WiFi-Calling
User Traffic	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	 Applications Network Airtime Utilization Clients Sessions

Filter

FIGURE 183 Filter

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 184 Time - Relative Settings

FILTER	Jul	10 - Jul	11, 6:4	6am	
EXPL	REXATIVE		_	SPECIF	FIC
L	ATEST				
	1H	6H	1D	7D	30D
C	URRE	T			
	D	w	м	Q	Y
P	REVIO	US			
	D	w	м	Q	Y
	Jul 10 - Jul 11, 6:46am				

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.

FILTER Jul 10 - Jul 11, 6:46am EXPL RELATIVE SPECIFIC START 2016-07-10 06:46 END 2016-07-11 06:46 OK Cancel

FIGURE 185 Time - Specific Settings

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

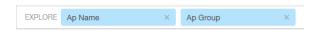
FIGURE 186 Dimension Options

	Ap Group Name ×			
	Search			
L	W1M@Langkawi_Trial_512kbps	*		
L	Bangi KPZ			
s	Bangi KUO			
L	KL KTSN			
L	KL KKL			
L	Bangi KIY			
C	Bangi KKM			
L	KL KTDI_1			
L	Bangi KTHO			
L	Bangi KRK			
L	Bangi KAB			
	Bandi KDO	Ŧ		
	OK Cancel			

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 187 Explore



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

FIGURE 188 Explore Time

EXPLO	RE 1	lime (I	Day)			×	Ra
Time	GRAN	NULAF	RITY				-1
Total	1N	1 8	δM	1H	1D	1W	
2016	SORT	Г <mark>В</mark> Ү					
2010	Tim	е				1	
F	LIMIT	-					
2016	5						
2010	C	K	C	ancel			
-							-

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 189 Sort Dimension by Measure

×	Radio			×
S	ORT BY			
	Airtime Bu	isy	•	+
LI	MIT			
ł	5			-
	ок	Cancel		

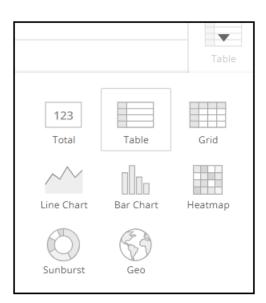
Use this filter to:

- 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 190 View Outputs



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

Add to Dashboard

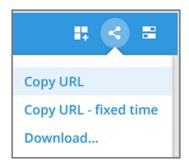
FIGURE 191 Add to Dashboard

-

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

Share Link

FIGURE 192 Share Link



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

FIGURE 193 Selecting the Amount of Data to Download and the Desired Format

Download data	×
AMOUNT OF DATA TO DOWNLOAD	
100k rows	Ψ.
FORMAT	
CSV (Comma-separated values)	v
CSV (Comma-separated values)	
TSV (Tab-separated values)	
XLSX (Excel spreadsheet)	
JSON (Newline delimited JSON)	

Options

FIGURE 194 Options

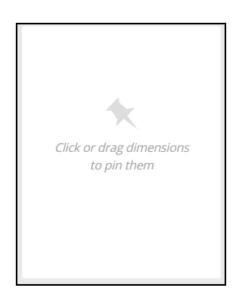
# <			
TIMEZONE			
Etc/UTC	•		
AUTO UPDATE			
Every 5 minutes 🔍	G		
Updated 1 hour ago			
View raw data			
Monitor queries			
Enable cache			

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

Data Explorer Dashboard Data Cube Filters

Pinboard

FIGURE 195 Pinboard



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

Time Compares

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

FIGURE 196 Time Compares

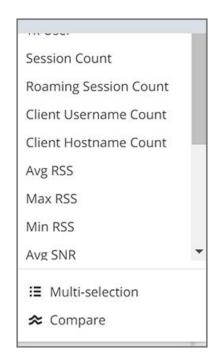
FILTER 🕒 Latest 7 da	ys +		MEASURE	
EXPLORE A Controller	Version × +	Table	User Traffic	v
Controller Version	User Traffic ↓	Change	COMPARE	×
Overall	745.58 GB	▼ 347177.26 GB (99.8%)	1 month back	v
3.6.1.0.227	386.92 GB	▼ 23.27 GB (5.7%)		
5.0.0.0.672	356.88 GB	▼ 388.68 GB (52.1%)		
5.1.0.0.424	1.78 GB	▲ 1.78 GB (new)		

Creating a Data Comparison

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

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

FIGURE 197 Selecting Compare from the Measure Drop-Down List



5. If you have already invoked the Compare feature, the previous time period you selected is automatically used, and a display such as the one in Figure 196 appears. However, if you have not yet used Compare, or if you want to change the current time-period, invoke the **Compare** drop-down list:

FIGURE 198 Using the Compare Drop-Down

MEASURE	
User Traffic	~
COMPARE	×
1 month back	W
Previous period	
1 month back	
1 year back	
Custom	
Aug 24 - Sep 1, 4:55	am

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

FIGURE 199 Custom Comparison Pop-Up Window

Custom comparison	×
Relative	Absolute
1	day back 🔍
	Cancel OK

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

Custom o	comparison			×	-
	Relative	Ab	osolute		35.
1			day back	•	14
		Canc	second back minute back		30. 984
124	47.44 GB		hour back		1396
.340	22.91 GB		day back		263.6
.17	3.6 GB		week back month back year back		208.5

FIGURE 200 List of Choices from the Relative Drop-Down List

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

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

FIGURE 201 Custom Comparison - Absolute Tab

Custom comparison	×
Relative	Absolute
START TIME	
2018-09-26	17:46
🗹 Auto adjust end date	
END TIME	
2018-09-27	17:46
	Cancel OK

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

Removing the Compare Feature

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

FIGURE 202 Removing the Compare Measure

IEASURE	•••
User Traffic	٣
Şearch	
User Traffic	*
Rx User	
Tx User	
Session Count	
Roaming Session Count	t
Client Username Count	
Client Hostname Count	
Avg RSS	
Max RSS	
Min RSS	
Avg SNR	•
∷ Multi-selection	
🕿 Remove compare n	ne

Creating a Data Explorer Dashboard

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

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

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

The New dashboard screen is displayed:

FIGURE 203 New Dashboard screen

12	Data Explorer	Download *						
SCHEDULE	New dashboard		Cancel Save					
HEDU	Common filter	Click and drag to add a tile						
m								

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

FIGURE 204 Naming the New Dashboard

	la se la construcción de la constru		E DemoD8
		Click and drag to add a tile	Common filter

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

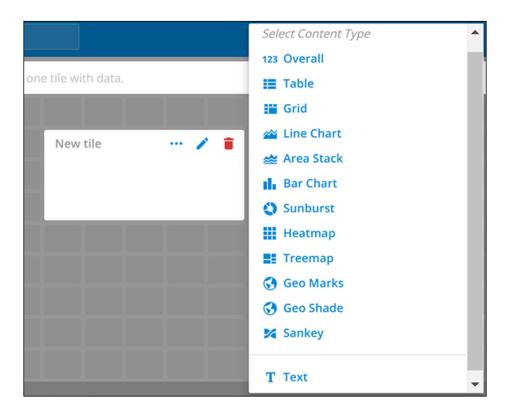


FIGURE 205 Adding a Tile to Your Dashboard by Using the Popup

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

The following popup appears:

FIGURE 206 New-Tile Popup After Selecting Content Type of 123 Total

	TITLE
	New tile
New tile 🛛 🔐 🎓 💼	CONTENT
	123 Total
	DATA CUBE
	Applications
3.7 MB	FILTER
J./ IVID	🕒 Latest day
	+
	SHOW
	+
	MEASURES
	User Traffic
	VISUALIZATION OPTIONS >
	TILE OPTIONS >
	😭 Edit in Data Cube

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

FIGURE 207 New-Tile Popup After Doing Some Customization

		TITLE	
		Network tile	
		CONTENT	
		III Table	∇
Vetwork tile		• DATA CUBE	
AP Version	Total Traffic	Network	W
		FILTER	
3.2.1.0.650	8277.2 GB	🕒 Latest day	
3.1.2.0.76	95.15 GB	A AP Description (2)	×
3.1.2.0.134	5.42 GB	+	
10.0.1.0.17	1.4 GB	SHOW	
		A AP Version	×
		+	
•		MEASURES	
		Total Traffic	W
		VISUALIZATION OPTIONS >	
		TILE OPTIONS >	
		😭 Edit in Data Cub	e

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

Network tile					Cancel	Save	
DIMENSIONS	Q	FILTER 🕒 Latest day	∧ AP Description (2) × +		MEASURES		
① Time	-	EXPLORE A AP Version	× +	Table	Total Traffic		
A System	- 8						
A Controller MAC	- 1	AP Version	Total Traffic	***			
A Controller Model		Total	8281.41 GB				
A Controller Name		3.2.1.0.650	8180.24 GB		- A		
A Controller Serial		3.1.2.0.76	94.31 GB		X		
A Controller Version		3.1.2.0.134	5.41 GB		Click or drag d		
A Domain		10.0.1.0.17	1.45 GB		to pin th	12/22	
A Zone		10.0.10.17	1.45 55				
A AP Group							
A AP MAC							
△ AP Name							
A AP Serial							
AP Model							
A AP Location							
A AP Description							
A ADMANIAN	_						

FIGURE 208 Editing New Tile in the Data Cube

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

FIGURE 209 Sunburst Representation of Tile in Data Cube



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

Actions You Can Perform on an Existing Dashboard

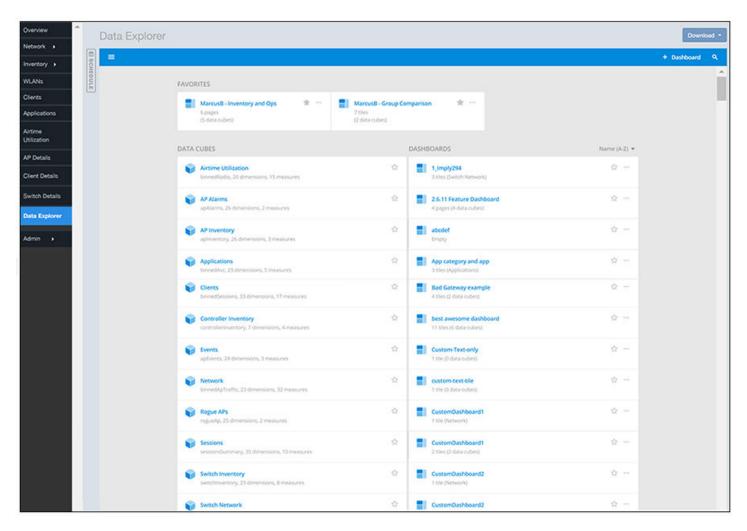
You can perform many actions on an existing dashboard, such as adding or removing tiles, editing existing tiles, deleting tiles and deleting the entire dashboard.

Opening a Dashboard

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

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





Editing a Dashboard

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

FIGURE 211 Dashboard example with three tiles

Data Explorer							Download •
DemoDB							8 Z
FILTER +							
AP Location, AP Version by Total Traffic	Domain, AP Serial, AP Location Domain, AP Serial, AP Location 11 (Ldministration Domain 1214000480 Unknown	u ⁿ - 1907.35 MB - 1430.51 MB - 953.67 MB - 476.84 MB - 476.84 MB 0 0 0 0 0	Controller Version, Time by Session	Count Count Count AP Count 1 1	129M	6fM	

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

FIGURE 212 Dashboard-Editing buttons



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

TABLE 8 Icons for Editing a Dashboard

lcon	Name of Icon	Actions You Can Perform
=	Dashboard options	Clicking this icon allows you to change the following settings: • Time zone • Auto-update interval • Enabling/disabling cache
	Edit this dashboard	 Clicking this icon allows you to do the following: Rearrange or resize the tiles by using your cursor. Make changes to specific tiles within the dashboard by using the icons

Actions You Can Perform on an Existing Dashboard

TABLE 8 Icons for Editing a Dashboard (continued)

lcon	Name of Icon	Actions You Can Perform
		that appear for each tile:
		🗡 🧵
		 Use the three dots to duplicate the tile. Use the Pencil icon to add or remove dimensions and measures for the tile as well as to change the representation of the data for the tile. Use the garbage-can icon to delete the tile from the dashboard.
		 Click on the Options tab in the upper-right portion of the screen: This invokes another screen containing general information about the dashboard. From there, there are two tabs - one called "General" and one called "Sharing." In the General tab, you can do the following:
		 Rename the dashboard Add or modify a description of the dashboard Change the color theme Decide whether to enforce the time filter Delete the dashboard.
		In the Sharing tab, you can set who you want to view and edit the dashboard.
		NOTE Remember to click Save to save your changes.

Using the Explain Feature

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

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

FIGURE 213 Explain Feature Invoked

[Data Explorer							Download *
1 SO	≡ AP Alarms							# ± #
SCHEDULE	DIMENSIONS C	FILTER 🕒 Latest day		A AP Model: R510 ×	+		MEASURE	
m	A AP Name	EXPLORE A AP Model		R510		Table	AP Count	*
	A AP Serial A AP Model	AP Model	Cancel	17 Select + ····			+ Explain	×
	 AP Location AP Description 	R510	17	~~~~~			Breakdown 🔻	
	A AP Version A AP Internal IP	R300 R720	5				Controller MAC F0:B0:52:04:0F:00	
	A AP External IP A Reason	H510 R320	1				Controller Serial	Υ Τ.
	A Severity A Category	R710	1				13150800002	T T
	A Alarm UUID A Alarm Code	T610	1				AP Name	

The Explain feature includes three different algorithms:

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

Applying Filters At the Dashboard Level

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

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

Exporting Raw Data Using the SCI Virtual Machine Command Line Interface

FIGURE 214 Applying Filters to a Dashboard



Exporting Raw Data Using the SCI Virtual Machine Command Line Interface

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

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

NOTE

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

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

/storage/ rsa-api/ export /configs

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

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

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

NOTE

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

/storage/rsa-api/ export /keys

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

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

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

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

- Template File for Exporting Raw Data on page 179
- Raw Data Output for Dimensions and Measures on page 180

Template File for Exporting Raw Data

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

```
# This is an example configuration file in YAML format. Lines starting with '#' are comments.
# Refer to http://www.yaml.org for detailed specification. Please change values accordingly.
# All attributes are required unless specified as 'Optional'.
# Version: 1.0
          17 Oct 2017
# Date:
source:
  # The data source name (case-sensitive). Refer to detailed API reference guide regarding how to
  # retrieve the actual value of data source name. Alternatively you may get it from URL
  # while accessing a particular Data cube via Data Explorer.
  # Example: access Data cube 'Clients' by accessing URL (replace {HOST} with your SCI master node
  # IP address, authentication may be required):
     https://{HOST}/report/dataExplorer#/d/binnedSessions/Clients
  # The 'dataSource' of 'Clients' is 'binnedSessions' in this example
  dataSource: 'foo'
  # ISO 8601 timestamp (e.g, yyyy-MM-ddTHH:mmZ)
  # Examples:
    (1) '1970-01-01T00:00Z' for UTC
  #
    (2) '2017-01-01T00:00+0300' for UTC +3
     (3) '2017-01-01T00:00-0800' for UTC -8
  #
     (4) '2017-01-01T00:00+0530' for UTC +5:30
 # Make sure that 'startTime' is before 'endTime'.
startTime: '2017-01-01T00:00:00Z'
endTime: '2017-02-01T00:00:00Z'
  # Optional (comment out if it does not apply)
  # In the format of '<key>': [a list of values], e.g., 'system': ['foo', 'bar']
  # The key name refers to the actual case-sensitive value (not display name) of a particular
  # dimension of a data cube. Refer to detailed API reference guide regarding how to retrieve the values of
  # dimensions. Alternatively, you may export a few rows (i.e., 1 minute) without filter and check
  # out the title of the CSV file for all filter dimension names
  # For a particular filter, results match any of the values specified in the list for that specific
  # key would be returned. If multiple filters specified, only results match all of them would be
  # returned.
  # Example:
  # (1) Get all rows for 'system' equals to 'foo' or 'bar'
  # filters:
      'system': ['foo', 'bar']
  #
```

Data Explorer Dashboard

Exporting Raw Data Using the SCI Virtual Machine Command Line Interface

```
#
    (2) Get all rows for 'system' equals to 'foo', AND 'ctrlMac' equals '99:F6:66:2A:B2:80'
  #
  #
  # filters:
      'system': ['foo']
  #
     'ctrlMac': ['99:F6:66:2A:B2:80']
  #
  #
  # Uncomment and change the following lines to apply filters
  # filters:
  # '<key1>': ['value1', 'value2']
# '<key2>': ['value1', 'value2']
destination:
  # 'ftp' or 'sftp' only (case-sensitive)
  protocol: 'ftp'
  # The hostname or IP address of the FTP server
 host: 'localhost'
  # FTP login username
  # For 'sftp', it refers to the SSH login username
  user: 'ftp-username'
  # Required by 'ftp' protocol only
  # FTP server login password
  password: 'ftp-password'
  # Required by 'sftp' protocol only
# File name only of the SSH public key. The file must exist in directory
  # '/storage/rsa-api/export/keys' on 'SCI' master host
  #
  # privateKey: 'changeme.pem'
  # Apply to 'sftp' protocol only
# Passphrase for 'privateKey' if any, leave it with empty value '' or remove it otherwise
  # passphrase: 'changeme'
  # The prefix for exported file names. If it contains path of sub-directories (e.g.,
  # 'path/to/dir/example'), those directories (i.e., 'path/to/dir') must exist on FTP server
  # beforehand
  prefix: 'example'
```

Raw Data Output for Dimensions and Measures

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

Refer to the following tables:

- Table 9
- Table 10

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

TABLE 9 Dimensions

Dimension name	Description	Supported Data Sources
alarmCode	Unique string assigned by the controller to an alarm.	AP Alarms
alarmState	Indicates if the alarm is outstanding.	AP Alarms
alarmType	Description for access point and controller alarms.	AP Alarms
alarmUUID	Unique string assigned by the controller to an alarm.	AP Alarms

Dimension name	Description Supported Data Sources			
apDescription	Description string of the access point that is configured in the controller.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms 		
apExtlp	External IP address of the access point.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms 		
apFwVersion	Firmware version number of the access point.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms 		
apGroupName	AP Groups configured in the controller.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms 		
aplp	Internal IP address of the access point.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms 		
apLocation	Location string of the access point that is configured in the controller.	 Applications Network traffic Airtime Utilization Clients Sessions 		

Exporting Raw Data Using the SCI Virtual Machine Command Line Interface

Dimension name	Description	Supported Data Sources	
		 AP Events AP Inventory AP Alarms	
арМас	Base MAC address of the access point.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms 	
apModel	Description of the access point model type.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms 	
apName	Name of the access point configured in the controller.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms 	
арр	Name of the application accessed by the WiFi client.	Applications	
apSerial	Serial number of the access point.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms 	
AuthMethod	The WiFi encryption and authentication method adopted.	ClientsSessions	
category	Category for access point and controller alarms or events.	AP EventsAP Alarms	
channel	The WiFi channel number used.	 Network Clients Sessions 	

Exporting Raw Data Using the SCI Virtual Machine Command Line Interface

Dimension name	Description	Supported Data Sources		
clientlp	Internal IP address of the WiFi client.	ClientsSessions		
clientMac	MAC address of the WiFi client.	 Applications Clients Sessions 		
connectionstatus	Connection status of the access point: Online, Offline, Discovery, Provisioned.	AP Inventory		
ctrlFwVersion	Firmware version number of the controller.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms Controller Inventory Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Events Airtime Utilization Clients Sessions AP Events AP Inventory AP Events AP Events AP Inventory AP Alarms Controller Inventory 		
ctrlMac	MAC address of the controller.			
ctrlModel	Description of the model of the controller.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms Controller Inventory 		
ctrlName	Name of the configured controller.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms Controller Inventory 		
ctrlSerial	Serial number of the controller.	 Applications Network traffic		

Exporting Raw Data Using the SCI Virtual Machine Command Line Interface

Dimension name	Description	Supported Data Sources
		 Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms Controller Inventory
disconnectTime	Disconnect time of a session.	Sessions
domains	Domains configured in the controller.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms
eventCode	Code number for access point and controller events.	AP Events
eventType	Description for access point and controller events.	AP Events
firstConnection	First connection time of a session.	Sessions
hostname	Hostname configured in the WiFi client.	ClientsSessions
lastStatusChangeTime	Date and time of the last change in Connection Status of the access point.	AP Inventory
manufacturer	Manufacturer information for the WiFi client.	ClientsSessions
memoryUtilization	Percentage of memory being used by the controller.	Controller Inventory
osType	OS information for the WiFi client.	ClientsSessions
port	Port of the application accessed by the WiFi client.	Applications
radio	Indicates the radio frequency band: 2.4GHz or 5GHz.	 Applications Network traffic Airtime Utilization Clients Sessions
radioMode	Possible values are: ac, n, a, g, b, or "unknown" (if SmartZone version is prior to 3.6).	ClientsSessions
reason	Additional description for access point and controller alarms or events, if available.	AP Events AP Alarms
roamingSessionId	A unique session ID that is created when a	Clients

TABLE 9 Dimensions (continued)

Dimension name	Description	Supported Data Sources		
	enough time span that the client is connected to these APs simultaneously.			
sessionId	ID string assigned to a session.	ClientsSessions		
sessionType	Indicates whether the session is authorized or unauthorized.	ClientsSessions		
severity	Severity level for access point and controller alarms or events.	AP Events AP Alarms		
ssid	Service set identifier (SSID) configured in the controller.	in the • Applications • Network traffic • Clients • Sessions		
system	System ID of the controller or the SmartZone Cluster.			
timestamp	Timestamps are represented in UTC timezone format.	 Airtime Utilization Network traffic Applications AP Events AP Alarms AP Inventory Clients Controller Inventory Sessions 		
username	Username of the user account associated with the WiFi client.	ClientsSessions		
zoneName	Zones configured in the controller.	 Applications Network traffic Airtime Utilization Clients Sessions AP Events AP Inventory AP Alarms 		

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

Exporting Raw Data Using the SCI Virtual Machine Command Line Interface

TABLE 10 Measures

Measure name	Description	Supported Data Sources		
airtimeBusy	Average of the airtime busy metric in percentage form.	Airtime Utilization		
airtimeldle	Average of the airtime idle metric in percentage form.	Airtime Utilization		
airtimeRx	Average of the airtime receive metric in percentage form.	Airtime Utilization		
airtimeTx	Average of the airtime transmit metric in percentage form.	Airtime Utilization		
airtimeUtilization	Average of the total airtime utilization in percentage form.	Airtime Utilization		
Avg 2.4 GHz Capacity	Average 2.4 GHz capacity over a specified period of time, measured in Mbps.	Network		
Avg 5 GHz Capacity	Average 5 GHz capacity over a specified period of time, measured in Mbps.	Network		
Avg Capacity Per Ap	Average capacity per access point over a specified period of time, measured in Mbps.	Network		
count	A count for each event and alarm type.	AP Events AP Alarms		
cpuUtilization	Average CPU utilization for the controller in percentage form.	Controller Inventory		
disconnectDuration	Indicated how many milliseconds an AP has been disconnected.	AP Inventory		
diskFree	Average free disk space, in bytes, for the controller.	Controller Inventory		
diskUtilization	Average disk utilization, in percentage, for the controller.	Controller Inventory		
failedAssoc	Number of failed associations.	Network		
diskTotal	Total amount of disk space, in bytes, on the controller.	Controller Inventory		
firstRss	First received signal strength of the access point in dBm.	• Clients		
firstSnr	First signal to noise ratio at the access point in dB.	• Clients		
lastRss	Last received signal strength of the access point in dBm.	• Clients		
lastSnr	Last signal to noise ratio at the access point in dB.	• Clients		
licenseCount	Total number of licenses available on the controller?	Controller Inventory		
licenseUtilization	Percentage of available licenses currently being used on the controller.	Controller Inventory		
maxRss	Maximum received signal strength of the access point in dBm.	• Clients		
maxSnr	Maximum signal to noise ratio at the access point in dB.	• Clients		
memoryUtilization	Average memory utilization for the controller, given in percentage form.	Controller Inventory		

Data Explorer Dashboard Exporting Raw Data Using the SCI Virtual Machine Command Line Interface

TABLE 10 Measures (continued)

Measure name	e Description Supported Data Sources			
mgmtRxBytes	Traffic volume, which is received from AP (Access Point) in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.	Network trafficAirtime Utilization		
mgmtTraffic	Traffic volume, which is transmitted and received in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.	Network trafficAirtime Utilization		
mgmtTxBytes	Traffic volume, which is transmitted by AP (Access Point) in IEEE 802.11 control and management frames. This includes all unicast, multicast and broadcast traffic.	Network trafficAirtime Utilization		
minRss	Minimum received signal strength of the access point in dBm.	Clients		
minSnr	Minimum signal to noise ratio at the access point in dB.	• Clients		
noiseFloor	Average noise floor power in dBm.	Clients		
newAssoc	Number of successful associations.	Network		
rxFail_r	Receive packets which failed to be processed due to insufficient buffer in AP.	Network		
rxBytes	Sum of userRxBytes and mgmtRxBytes.	 Network traffic Airtime Utilization Applications Clients Sessions 		
Session Count	Number of unique sessions.	ClientsSessions		
sessionDuration	The length of a session, given in milliseconds.	Sessions		
throughputEstimate	Average throughput estimate for the WiFi client.	• Clients		
traffic	Sum of the user and management traffic.	 Network traffic Airtime Utilization Applications Clients Session 		
txBcastFrames_r	Number of broadcast packets transmitted by the network.	Network		
txDropDataFrames_r	Tx data frames that are dropped by the message queue.	Network		
txFail_r	Transmit packets which failed to be processed due to insufficient buffer in AP.	Network		
txBytes	Sum of userTxBytes and mgmtTxBytes.	rtes. Network traffic Airtime Utilization Applications Clients Sessions		

Exporting Raw Data Using the SCI Virtual Machine Command Line Interface

TABLE 10 Measures (continued)

Measure name	Description	Supported Data Sources	
txMcastFrames_r	Number of multicast packets transmitted by the network.	Network	
txUcastFrames_r	The number of data packets transmitted by the network that are not broadcast or multicast packets.	Network	
userRxBytes	Traffic volume, which is received by AP (Access Point) in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic.	 Applications Network traffic Airtime Utilization Clients Sessions 	
userTraffic	Traffic volume, which is transmitted and received in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic. User Traffic = Rx User + Tx User	 Applications Network traffic Airtime Utilization Clients Sessions 	
userTxBytes	Traffic volume, which is transmitted by AP (Access Point) in IEEE 802.11 MAC Service Data Unit (MSDU) data frames. This includes all unicast, multicast and broadcast traffic.	 Applications Network traffic Airtime Utilization Clients Sessions 	

PII Hashing

•	Hashing Data-Source Attributes	.18	89
•	Template File for PII Hashing	. 18	89

Hashing Data-Source Attributes

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

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

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

/storage/rsa-api/hashing/configs

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

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

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

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

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

Template File for PII Hashing

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

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

#

#

#

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

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

Admin Dashboard

•	Admin Console	. 191
	Status and Update	
	Diagnostics	
	Settings	
	License	
	PCI Profiles	
	Users and Roles	

Admin Console

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

The Admin section is divided into the following pages:

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

NOTE

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

Status and Update

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

Nodes

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

FIGURE 215 Status and Update Screen with Node Tab selected

- Status	& Update				
Nodes	Notifications	Update			
10	>	Node IP	Node Token	Node Type	Node State
data-3b62d48d		10.0.0.168	6805196779	data	•
data-96a3c9fc		10.0.240	4499070968	data	•
master-e7d3ce7a		10.0.2.162	3843798771	master	•

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

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

Notifications

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

FIGURE 216 Status and Update Screen with Notifications Tab selected

dmin -	Status	& Update	е			
Nod	les	Notifica	tions	Update		
Level	Source	Туре		Mess	age	Details
Critical	Node	Disk Usage	Y	our data node (IP: 10.0.0.168)	has reached 82% disk usage	Please refer to the Notifications Section in the User guide
Critical	Node	Disk Usage	You	ur master node (IP: 10.0.2.162) has reached 85% disk usage	Please refer to the Notifications Section in the User guide



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

NOTE

The only current "level" of notification at this time is *critical*, as shown in the screen above.

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

FIGURE 217 Email Address to Receive Notifications

			0 🚊
My Account			My Account Logout
Profile			
	Username:	admin	
	Email:	user1@ruckuslbs.com	
		This email will receive alerts regarding the system	
		Update Profile	

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

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

Notification	Description	Action(s) to Try
Your master node (IP: 10.x.y.1) has reached 83 percent disk usage.	This notification appears whenever one of the SCI nodes has a disk usage of 80% or more. This notification indicates that you could potentially run out of disk space on SCI.	 Reduce the data retention period by going to the Admin > Settings screen, "Data Retention" section. For more information, refer to the Settings on page 196 section, "Data Retention" portion. Copy your data to a new SCI with more disk space. If you need assistance, contact Ruckus support. Add new data nodes. Because the Hadoop Distributed File System (HDFS) replication factor is two, you
Your Spark cluster (Spark master IP: 10.x.y.2)	This notification appears when an ETL Spark	need at least two data nodes in your SCI cluster. Go to Admin > Diagnostics > Spark Master.
was unable to accept a job submission.	job is taking a long time, and SCI is unable to submit the next job. This could mean that SCI is unable to ingest data from the controllers and that SCI is unable to continue to collect data.	Search for "Running Applications." If this section shows more than one job running, check again in a half hour. If there is still more than one job shown running in the "Running Application" section, contact Ruckus customer support to ensure that you are not losing data.

TABLE 11 Notifications and Possible Corrective Actions

Update

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

FIGURE 218 Status and Update Screen with Update Tab selected

Admin - Stat	tus & I	Update	
Nodes		Notifications	Update
Current	Version:	v5.0.0-rc.2	
Latest	Version:	v5.0.0-rc.2	
		Check for Updates	

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

Diagnostics

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

The following links to diagnostic tools are provided:

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

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 219 Diagnostics

Diagnostics

Data ingestion and ETL jobs Spark Master UI

Data lake and raw data storage HDFS

Data warehouse Druid Coordinator Druid Overlord Admin Dashboard Settings

Settings

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

Controller Settings

FIGURE 220 Controller Settings

ystems	5				× Delete + Ad
0	System ID	Туре	URL	User	Last Seen
	SystemID1	SmartZone (SCG/SZ/vSZ < 3.5)	149pe-180.115-80.177.8x40	admin	2 minutes ago
	SystemID2	SmartZone (SCG/SZ/vSZ >= 3.5)	100pt-100.000.110.111.011.010	admin	
	SystemID3	SmartZone (SCG/SZ/vSZ >= 3.5)	19px/98.70.27.10.8443	admin	3 months ago
8	SystemID4	SmartZone (SCG/SZ/vSZ < 3.5)	100pe-1108-104-105-110440	sci_mon	2 minutes ago
a)	SystemID5	SmartZone (SCG/SZ/vSZ < 3.5)	Manufacture straights (which show one water	ruckus.sci	2 minutes ago
3	SystemID6	SmartZone (SCG/SZ/vSZ < 3.5)	100pts (100.00) 170.00 (0x10)	rsa-agent	2 minutes ago
9	SystemID7	SmartZone (SCG/SZ/vSZ < 3.5)	145pan-152, 11, 116, 252, 2821	admin	2 minutes ago
3	SystemID8	ZoneDirector (Poll, all ZD versions)	100pm/52.11.116.202.0000	admin	3 minutes ago
0	SystemID9	ZoneDirector (Poll, all ZD versions)	14(par./52.11.198.000)	admin	3 minutes ago
9	SystemID10	SmartZone (SCG/SZ/vSZ >= 3.5)	August (12), 11, 116, 202, 5052	admin	4 minutes ago
9	SystemID11	SmartZone (SCG/SZ/vSZ < 3.5)	Magaza (1988, 1987, 112, 128-128-12	admin	20 days ago
	SystemID12	SmartZone (SCG/SZ/vSZ < 3.5)	100pper/102.001.000.1000.00000	admin	5 months ago

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

FIGURE 221 Adding a New Controller Popup

New System	×
System ID:	
Туре:	SmartZone (SCG/SZ/vSZ < 3.5)
URL:	ZoneDirector (Poll, all ZD versions) ZoneDirector (Push, ZD >= 9.13)
Backup URL:	SmartZone (SCG/SZ/vSZ < 3.5) SmartZone (SCG/SZ/vSZ >= 3.5)
Username:	
Password:	
	Create

NOTE

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

SMTP Settings

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

FIGURE 222 SMTP Settings

Outgoing Mail Server (SM	TP)
Host:	email-smtp.us-west-2.amazonaws.com
Port:	587
Username:	User123
Password:	Leave blank to remain unchanged
Encryption:	STARTTLS
From Email:	rsa@ruckuslbs.com
	Update Send Test Email

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

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

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

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

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

FIGURE 223 Send Test Email Popup

Send Test Email	×
Email:	ops@ruckuslbs.com
	Send Cancel

2. Click Send.

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

NOTE

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

FIGURE 224 Email Address to Receive SMTP Test Email Reply from Ruckus

My Account	
Profile	
Email:*	user1@ruckuslbs.com
	This email will receive alerts regarding the system
Username:*	admin
First Name:*	First
Last Name:*	Last
	Update Profile

Data Retention

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

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

FIGURE 225 Data Retention section of Admin Dashboard

Data Retention			
Period (months):	0 1 Update	12	 60

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

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

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

FIGURE 226 Retaining Data for 22 Months

Data Retention			
Period (months):	0	22	
	Update		

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

FIGURE 227 Data Retention Confirmation Popup window

Update Data Retention Period	×
A scheduled task will run on the 1st of each retention period. Are you sure you want to u	month to prune data older than the data odder the data retention period to 22 months ?
	Confirm Cancel

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

NOTE

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

Instantly Pruning Old Data

If you need to purge data immediately instead of waiting until the first of the month, run the following script as root user: **sudo /root/cronscripts/prune-data.sh**

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

Authentication Tab on the SCI UI

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

FIGURE 228 Authentication Tab Main Page Example

Systems	Outgoing Mail	Server I	Data Retention	Authentication					
thentication Type	Local	•							
Jpdate									
	r Configurations								
ternal Server	r Configurations								
ternal Server		Config Type	Auth Type	Primary Server	Primary Port	Secondary Server	Secondary Port	Status	
ternal Server	× Delete	Config Type RADIUS	Auth Type PAP	Primary Server 35.193.55.1	Primary Port 1812	Secondary Server	Secondary Port	Status	

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

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

NOTE

If you add users and roles via external server configuration, this is indicated in the Figure 259 on page 229.

Configuration to Perform on External AAA RADIUS Server:

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

NOTE

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

Sample Configuration Using FreeRADIUS for External AAA RADIUS Authentication:

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

vi /usr/share/freeradius/dictionary.ruckus

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

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

```
vi /etc/freeradius/3.0/users
aaaadmin Cleartext-Password := "admin123"
    Reply-Message = "Hello Admin",
    Ruckus-SCI-Role = admin,
    Ruckus-SCI-Resource-Group = Default
aaagroupadmin Cleartext-Password := "admin123"
    Reply-Message = "Hello Group Admin",
    Ruckus-SCI-Role = groupadmin,
    Ruckus-SCI-Role = groupadmin,
    Ruckus-SCI-Resource-Group = AAA_MLISA
aaaview Cleartext-Password := "admin123"
    Reply-Message = "Hello User",
    Ruckus-SCI-Role = view-only,
    Ruckus-SCI-Resource-Group = AAA_VIDE054
```

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

```
vi /etc/freeradius/3.0/clients.conf
client all {
    ipaddr = 0.0.0.0/0
    secret = testing123
}
```

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

service freeradius restart

Configuration to Perform on External AAA TACACS+ Server:

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

Sample Configuration For External AAA TACACS+ Authentication:

- 1. Using SSH, log in to the TACACS+ server.
- 2. Enter CLI mode.

```
3. Open vi and type:
```

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

4. Create a group:

```
group = admins {
}
```

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

- 6. If needed, create additional groups and add a service, role, and mgmt-devicegroups to the group, as you did previously.
- 7. Create a user, associate the user with the correct group, and create a user password, as shown below:

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

8. The final configuration should now appear as follows:

```
vi /etc/tacacs+/tac plus.conf
group = admins {
        service = sci-resource-group {
            Ruckus-SCI-Role = admin
            Ruckus-SCI-Resource-Group = Default
        }
}
user = aaaadmin {
      member = admins
       global = cleartext admin123
}
group = groupadmins {
        service = sci-resource-group {
            Ruckus-SCI-Role = groupadmin
            Ruckus-SCI-Resource-Group = AAA MLISA
        }
}
user = aaagroupadmin {
       member = groupadmins
       global = cleartext admin123
}
group = view-only {
        service = sci-resource-group {
            Ruckus-SCI-Role = view-only
          Ruckus-SCI-Resource-Group = AAA VIDE054
        }
}
user = aaaview {
   member = view-only
    global = cleartext admin123
}
```

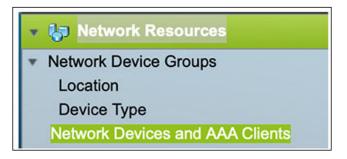
9. Restart the TACACS+ server by running the command:

service tacacs+ restart

Configuration to Perform on Cisco ACS Server:

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

FIGURE 229 Invoking Network Devices and AAA Clients Configuration



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

Name: CIS	CO ACS Firewall			
Description:				
Network Device Gro	NUDS			
Location	All Locations	Select		
Device Type	All Device Types	Select		
P Address		Authentication Options		
Single IP Add	Iress IP Subnets IP Range(s)	*	TACACS+ 🖸	
O Uligio Il' AUC	O i conten O i contentato)	Shared Secret:		
o IP: 10.137.11.4	5	testing123		
		Hide		
		Single Connect Device		
		 Legacy TACACS+ Single Connect Support 		
		TACACS+ Draft Compliant Single Connect Support		
		*	RADIUS 💋	
		Shared Secret:		
		o testing123		
		Hide		
		CoA port: 1700		
		Enable KeyWrap		
		Key Encryption Key:		
		Message Authenticator Code Key:		
		Key Input Format ASCI		

FIGURE 230 Network Devices and Clients Configuration Screen

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

FIGURE 231 Creating Users Configuration Screen

କ -	Users and Identity Stores > 1					
6	General					
S Users and Identity Stores	O Name: 88	admin	Status: Enabled	1 🖸 \Theta		
lentity Groups	Description:					
ternal Identity Stores	o Identity Group: All	0		Colum		
User: Hosts		Groups		Select		
ternal Identity Stores	Email Address:					
DAP						
Active Directory	Account Disable					
RSA SecuriD Token Servers	Disable Account if	Date Exceeds: 20	19-Apr-02 🔚 (уууу-М	mm-dd)		
RADIUS Identity Servers ertificate Authorities						
ertificate Authentication Profile	Disable account af	er 3 succes	ssive failed attempts			
lentity Store Sequences						
*	Password Hash					
			Applicable only for Int	ernal Users to store par	ssword as hash.	
	Enable Password H	lash			work if this option is enabled. rd is reconfigured using change password option.	
	Password Lifetime					
	Password Never E	pired/Disabled:	Overwrites user acco	unt blocking in case pa	ssword expired/disabled	
	Password Informatio	n			Enable Password Information	
	Password must: • Contain 4 - 32	characters			Password must: • Contain 4 - 128 characters	
	• Contain 4 - 32	characters			Contain 4 - 128 characters	
	Password Type:	Internal Users	Sel	ect	Enable Password:	
	o Password:				Confirm	
					Password:	
	 Confirm Password: 		t~			
	Change passw	ord on next login				
	User Information					
	There are no addition	anal identity attribut	les defined for user			

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

FIGURE 232 Creating the Ruckus-SCI-Role

1		
>∰	ystem Administration > Configurati	ion > Dictionaries > Protocols > RADIUS > RADIUS VSA > Ruckus > Create
> ija	General	
> 28	Attribute: Ruckus-SCI-F	Role
> \$ x		
> 🛼	Description:	
>	RADIUS Configuration	
🔹 👯 System Administration	O Vendor Attribute ID:	25053
 Dictionaries 	Direction:	вотн
 Protocols RADIUS 	Multiple Allowed:	False
RADIUS IETF	Include attribute in	
* RADIUS VSA	log	
Ascend	Attribute Type	
Cisco Cisco Airespace	Attribute String	
Cisco Aironet	Type:	
Cisco BBSM		
Cisco VPN 3000/ASA/PIX 7.)	Attribute Configuration	
Cisco VPN 5000 Juniper	Add Policy Condition	
Microsoft	Policy Condition Display N	Name:
Nortel (Bay)	e = Required fields	
RedCreek		
Ruckus US Robotics		
TACACS+		

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

FIGURE 233 Creating the Ruckus-SCI-Resource-Group

> đ i	System Administration > Configuration > Dictionaries > Protocols > RADIUS > RADIUS VSA > Ruckus > Creat
> 🕼 > 🎉 > 🎭	General Attribute: Ruckus-SCI-Resource-Group
> 🍢 > 💼	RADIUS Configuration
System Administration Dictionaries Protocols RADIUS RADIUS IETF RADIUS VSA Ascend Cisco Cisco Airespace Cisco Aironet Cisco BBSM	 Vendor Attribute ID: 25053 Direction: BOTH © Multiple Allowed: False © Include attribute in log Attribute Type Attribute String ©
Cisco VPN 3000/ASA/PI Cisco VPN 5000 Juniper Microsoft Nortel (Bay) RedCreek Ruckus	Attribute Configuration Add Policy Condition Policy Condition Display Name: C = Required fields

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

FIGURE 234 Create RADIUS Authorization Profiles Screen

Stores and Identity Stores	General	Common Tasks	RADIUS Attributes	
Policy Elements	🔷 Name:	RadiusAdmin	1	
Session Conditions Date and Time Custom	Descrip = Requir	ption: red fields		
 Network Conditions Authorization and Permissions Network Access Authorization Profiles 				
 Device Administration Shell Profiles Command Sets 				
Named Permission Objects	-			
 Named Permission Objects Access Policies 				

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

A My Workspace	Policy Elements > Authorizat	on and Permissions > Network	k Access > Authorization P				Cisco Secure ACS			
b Network Resources	General Common T	sks RADIUS Attributes		🛈 🔒 https://10.137.11.44/acsadmin/VendorSpecificAttributeLPInputAction.do						
3 Users and Identity Stores	Common Tasks Attribu			RADI	IS Dictionary				Showing 1-41 of 4	
So Policy Elements	Attribute	Тур	e Value	-		Charle C				
Session Conditions				Filter:	S Matc	hift	Go 🕶			
Date and Time Custom				0	Attribute Nuckus-CDK-TYPE	ID 123	Type Unsigned Integer 32	Direction BUTH	Multiple A true	
 Network Conditions 				0	Ruckus-Session-Type	125	Enumeration	BOTH	true	
Authorization and Permissions • Network Access				0	Ruckus-Accounting-Status	126	Enumeration	BOTH	true	
Authorization Profiles				0	Ruckus-Zone-Id	127	String	BOTH	true	
 Device Administration 	Manually Entered Attribute	Тур	e Value	0	Ruckus-Auth-Server-Id	128	String	BOTH	true	
Shell Profiles Command Sets	Aanoute	typ	e value	0	Ruckus-Utp-Id	129	String	BOTH	true	
 Named Permission Objects 				ŏ	Ruckus-Wispr-Redirect-Polic		String	BOTH	true	
C Access Policies				õ	Ruckus-Eth-Profile-Id	133	Unsigned Integer 32	BOTH	true	
Monitoring and Reports				õ	Ruckus-Zone-Name	134	String	BOTH	true	
System Administration				0	Ruckus-Wlan-Name	135	String	BOTH	true	
	Add A Edit V	Replace A Delete		0	Ruckus-Admin-Role	136	String	BOTH	true	
	Dictionary Type:	RADIUS-Ruckus	0	0	Ruckus-Resource-Group	137	String	BOTH	true	
	O RADIUS Attribute:		Select	•	Ruckus-SCI-Role	200	String	BOTH	true	
	Attribute Type:			0	Ruckus-SCI-Resource-Group	201	String	BOTH	true	
	Attribute Value:	Static	0						10.00	
	0			OK	Cancel					
	a = Required fields									

FIGURE 235 Selecting Ruckus-SCI-Role

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

My Workspace	Policy Elements > Authorization	n and Permissions >	Network Access >	Autorization P				Cisco Secure ACS			
Network Resources	General Common Ta		ibutes	1	🛈 🗛 https://10.137.11.44/acsadmin/VendorSpecificAttributeLPInputAction.do						
Week and Identity Stores Stores	Common Tasks Attribut	and a second second second			RADI	JS Dictionary				Showing 1-41 of 4	
Policy Elements	Attribute		Туре	Value	Filter:			Go 🔻			
Session Conditions					Filter:						
Date and Time Custom					0	Attribute Ruckus-CDR-TYPE	1D 123	 Type Unsigned Integer 3. 	Direction BOTH	Multiple A true	
Network Conditions					0	Ruckus-Session-Type	125	Enumeration	BOTH	true	
 Authorization and Permissions Network Access 					0	Ruckus-Accounting-Status	126	Enumeration	BOTH	true	
Authorization Profiles	Manually Entered				0	Ruckus-Zone-Id	127	String	BOTH	true	
 Device Administration Shell Profiles 	Attribute		Туре	Value	0	Ruckus-Auth-Server-Id	128	String	BOTH	true	
Command Sets					0	Ruckus-Utp-Id	129	String	BOTH	true	
 Named Permission Objects 					Õ	Ruckus-Wispr-Redirect-Policy	132	String	BOTH	true	
Access Policies					0	Ruckus-Eth-Profile-Id	133	Unsigned Integer 32	BOTH	true	
Monitoring and Reports					0	Ruckus-Zone-Name	134	String	BOTH	true	
System Administration					0	Ruckus-Wlan-Name	135	String	BOTH	true	
	Add A Edit V	Replace /	Delete		0	Ruckus-Admin-Role	136	String	BOTH	true	
	Dictionary Type:	RADIUS-Ruckus		0	0	Ruckus-Resource-Group	137	String	BOTH	true	
	o RADIUS Attribute:			Select	0	Ruckus-SCI-Role	200	String	BOTH	true	
	Attribute Type:					Ruckus-SCI-Resource-Group	201	String	BOTH	true	
	Attribute Value:	Static		0						10.00	
	0				OK	Cancel					
	o = Required fields										

FIGURE 236 Selecting Ruckus-SCI-Resource-Group

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

My Workspace	Policy Elements > Authorization and Permise	IONS - NEWYORK ACCESS -	Additionization Promos > Create	
UN Network Resources	General Common Tasks RADI	JS Attributes		
3 Users and Identity Stores	Common Tasks Attributes			
So Policy Elements	Attribute	Туре	Value	
Session Conditions Date and Time Custom Network Conditions Authorization and Permissions Network Access				
Authorization Profiles Device Administration	Manually Entered			
Shell Profiles	Attribute	Туре	Value	
Command Sets	Ruckus-SCI-Role Ruckus-SCI-Resource-Group	String String	admin Default	
 Named Permission Objects 	Ruckus-Sci-Resource-Group	oung	Delaur	
🛴 Access Policies				
Monitoring and Reports				
System Administration				
	Add A Edit V Replac	e A Delete		
	Dictionary Type: RADIUS-R	uckus		
	RADIUS Attribute:		Select	
			a construction of the second s	
	Attribute Type:			
	Attribute Value: Static			
	e = Required fields			
	No.			
	Submit Cancel			

FIGURE 237 Added Attributes Now Appearing on Authorization Profiles Screen

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

FIGURE 238 RadiusGroupAdmin and RadiusView Profiles Must Also Be Created

My Workspace	Policy Elements > Authorization	and Permissions > Network Acce	ess > Authorization Profiles						
▶ ∛ Network Resources	Authorization Profiles								
Users and Identity Stores	Filter:	Match if:	Go 🗢						
🔹 🎭 Policy Elements									
 Session Conditions Date and Time Custom Network Conditions Authorization and Permissions Network Access Authorization Profiles Device Administration Shell Profiles Command Sets Named Permission Objects Monitoring and Reports System Administration 	Name Permit Access RadiusAdmin RadiusGroupAdmir RadiusView	Description							

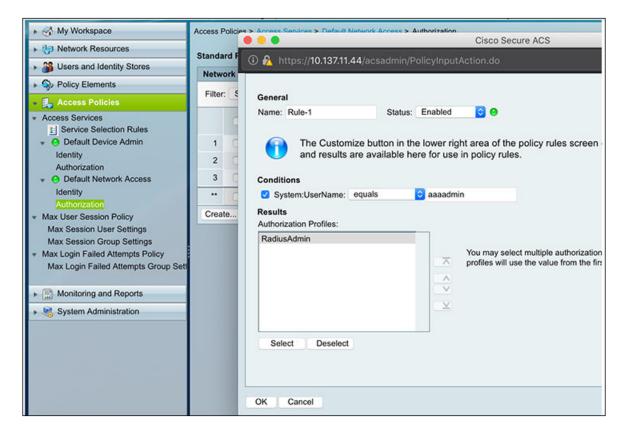
- 7. Create access policies for RADIUS:
 - a. Go to **Authorization**, click the Customize button on the far right, then select **System:Username**, and click **OK**:

FIGURE 239 Selecting System:Username Customization

My Workspace Network Resources	Access Po	dicies > A	ccess Services > Default Network Accer	ss > Authorization				
	Standar	d Policy	Exception Policy					
S Users and Identity Stores	Netwo	rk Acci		Mozilla Firefox		12		
Policy Elements	Eiter	Statu	0.0			L.		
5 Access Policies	rindr.	Utatu.	(i) A https://10.137.11.44/acs	admin/PolicyInputAction.do	… ⊠ ☆ ≡			
Access Services I Service Selection Rules		•	Customize Conditions Available:	Selected:		Profiles	Hit Count	
* O Default Device Admin	1		ACS Host Name	System:UserName		1	0	
Identity	2		AD1:ExternalGroups Authentication Method	>	~	Admin	0	
Authorization O Default Network Access	3		Authentication Status	<	A		0	
Identity Authorization		DI	Compound Condition Device Filter				20	
Max User Session Policy	Create		Device IP Address Device Port Filter Eap Authentication Method	*	×	2		Customize
Max Session User Settings Max Session Group Settings			Eap Tunnel Building Method					
Max Login Failed Attempts Policy								
Max Login Failed Attempts Group Sett								
Monitoring and Reports								
3 System Administration			OK Cancel					

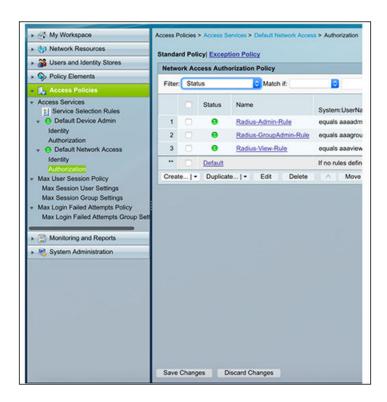
b. Click the **Create** button (just to the left of the popup shown below), then configure the popup with the values shown ("Name" can be anything you want), then click **OK**:

FIGURE 240 Configuring a Rule



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

FIGURE 241 Authorization Policy Screen



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

FIGURE 242 Creating Shell Profiles

▶ 🛃 My Workspace	Policy Elements > A	Authorization an	d Permissions	> Device Adr	ninistration > Shell Profile	> Create
Image: Imag						
	Common Task	s Attributes				
Users and Identity Stores	Attribute		Requiremen	nt	Value	
Policy Elements						
Session Conditions Date and Time Custom Network Conditions Authorization and Permissions Network Access	Manually Ente	ared				
Authorization Profiles	Attribute		Requiremen	nt	Value	
Access Policies						
Monitoring and Reports						
System Administration	Add A	Edit V	Replace /	Delete	Bulk Edit	
	Attribute:	Ruckus-SCI-F	Role			
	Requirement:	Mandatory	0			
	Attribute	Static	7			
	Value:					
		admin				<i>li</i> .
	a = Required f	leios				

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

FIGURE 243 Shell Profile Create Screen

My Workspace			Administration > Shell Profiles > Create					
Network Resources	Common Tasks Attributes							
Stores and Identity Stores	Attribute	Requirement	Value					
Policy Elements								
Session Conditions Date and Time Custom Network Conditions Authorization and Permissions								
* Network Access	Manually Entered							
Authorization Profiles	Attribute	Requirement	Value					
Device Administration Shell Profiles Command Sets Named Permission Objects	Ruckus-SCI-Role Ruckus-SCI-Resource-Ge	Mandatory	admin Default					
Access Policies								
Monitoring and Reports								
System Administration	Add A Edit V Attribute: Requirement: Mandatory Attribute Value: Static	Replace A Delete	Bulk Edit					
	• = Required fields							

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

FIGURE 244 Configuring Access Policies

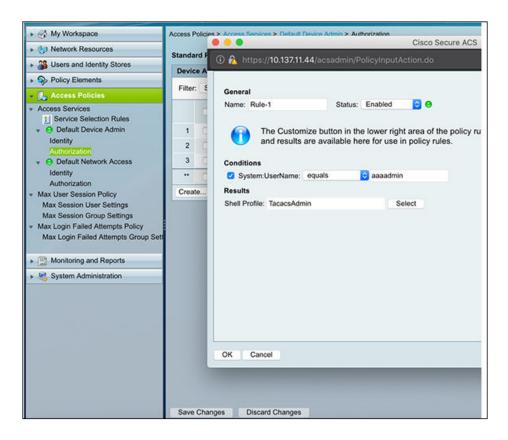
🔆 My Workspace	Construction of the second s				• • • •		lla Firefox	🖂 🔶 =	
1 Network Resources	Standar	rd Poli	cyl Excep	tion Policy	Customize Conditions	- provincing -		- H O	
Users and Identity Stores	Device Administration Authorizati				Available:		Selected:		
Policy Elements Access Policies	Filter	Stat	us	🖸 Ma	ACS Host Name AD1 ExternalGroups Authentication Method	->	System UserName	x	
Access Services			Status	Name	Authentication Status Compound Condition Device Filter	<			
Default Device Admin Identity	1		•	Bule-1	Device Filter Device IP Address Device Port Filter	>>		~	
Autocaston	2		•	Bule-2	Eap Authentication Method Eap Tunnel Building Method	~		×	
Default Network Access Identity	3 9 Bule-3				Customize Results				
Authorization lax User Session Policy Max Session User Settings Max Session Group Settings lax Login Failed Attempts Policy Max Login Failed Attempts Group Sett	Creat	• . •		10_ • E	Available: Command Sets		Selected: Shell Profile	*	Custo
Monitoring and Reports						44		×	
System Administration									
					OK Cancel				

b. Click the **Customize** button in the lower right of the screen to invoke the popup that is shown above, then select **System:Username**, then click **OK**.

10. Create an authorization rule:

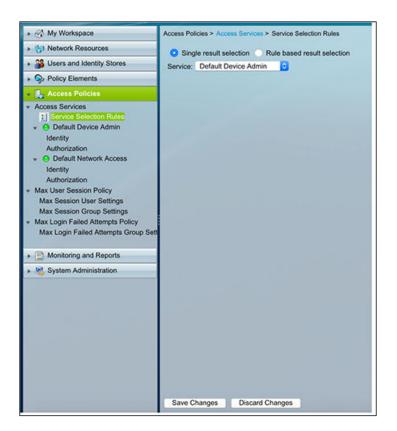
a. Still in the Authorization area, click **Create** to invoke the popup shown below:

FIGURE 245 Creating an Authorization Rule



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

FIGURE 246 Enabling the AAA Server



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

Adding an External Server:

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

FIGURE 247 Authentication Tab

Systems	Outgoing Mail	Server Data	a Retention	Authentication					
uthentication Type	Local	•							
Update									
Update									
	Configurations								
	Configurations								
xternal Server		Config Type	Auth Type	Primary Server	Primary Port	Secondary Server	Secondary Port	Status	
xternal Server	× Delete	Config Type RADIUS	Auth Type PAP	Primary Server 35.193.55.1	Primary Port 1812	Secondary Server	Secondary Port	Status	

NOTE

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

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

FIGURE 248 Creating an External Server

		O Primar	/ 💿 Secondary	Test
Jsername:*	Testuser1	Password:*		
lest Connec	tion			
Port:*	49	Secret:*		
Server:*				
Secondary S	lonvor n			
Port:"	49	Secret:*		
Server:*	35.193.55.1			
Primary Serv	rer			
Type:*	TACACS	\$ Protocol:*	ASCII	1
Name:*	us-server1			

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

NOTE

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

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

Test AAA Server Connection:

To test the AAA configuration, perform the following steps:

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

NOTE

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

Selecting an External Server for User Authentication:

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

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

FIGURE 249 Selecting the External Authentication Type

Systems	Outgoing Mail	l Server Da	ta Retention	Authentication					
thentication Type:	External	•	External S	erver(s): Tacacs	*				
Jpdate									
dernal Server (Configurations								
	Configurations × Delete								
		Config Type	Auth Type	Primary Server	Primary Port	Secondary Server	Secondary Port	Status	
	× Delete	Config Type RADIUS	Auth Type PAP	Primary Server 35.193.55.1	Primary Port 1812	Secondary Server	Secondary Port	Status	
Create	× Delete Config Name					Secondary Server	Secondary Port	Status	

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

FIGURE 250 Configured External Servers in the Drop-Down List

Systems	Outgoing Mail	Server	Data Retention	Authen	tication					
thentication Type:	External	•	External	Server(s):	Tacacs	•				
					10000000					
pdate					Select					
Jpdate					Select Radius					
opdate sternal Server C	Configurations									
ternal Server C	Configurations				Radius					
ternal Server C		Config Type	e Auth Type	Primar	Radius	Primary Port	Secondary Server	Secondary Port	Status	
ternal Server C	× Delete	Config Type RADIUS	e Auth Type PAP		Radius Tacacs	Primary Port 1812	Secondary Server	Secondary Port	Status	

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

Systems	Outgoing Mail	Server	Data Retention	Authen	tication					
thentication Type:	External	•	External	Server(s):	Radius	•				
Jpdate										
Jpdate kternal Server C	Configurations									
kternal Server C	Configurations									
kternal Server C		Config Typ	be Auth Type	Priman	y Server	Primary Port	Secondary Server	Secondary Port	Status	
tternal Server C	× Delete	Config Typ RADIUS			y Server 33.55.1	Primary Port 1812	Secondary Server	Secondary Port	Status	

FIGURE 251 Selecting the External Server from the Drop-Down List

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

FIGURE 252 "ACTIVE" Appears in Status Column for Selected External Server

Systems	Outgoing Mai	l Server D	ata Retention	Authentication					
Authentication Type:	External	¥	External Se	erver(s): Radius	×				
Update									
Update									
Update External Server (Configurations								
External Server (Configurations * Delete								
External Server (Config Type	Auth Type	Primary Server	Primary Port	Secondary Server	Secondary Port	Status	,
External Server (× Delete	Config Type TACACS	Auth Type ASCII	Primary Server 35.193.55.1	Primary Port 49	Secondary Server	Secondary Port	Status	

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

NOTE

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

Notes about the "admin" user:

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

License

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

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

NOTE

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

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. The following illustration is example of how the License Page appears, providing status of your licenses:

FIGURE 253 Page to Upload Your License and Obtain Status of Licenses

License				
Feature	Start	Expiration	Count	Notice
INSTANCE-SCI	Aug 16 2016 10:53	Perpetual License	1	SCI - Application Perpetual License
CAPACITY-SCI	Aug 16 2016 10:53	Perpetual License	1073741824	SCI WiFi analytics-1 AP lic. perpetual
SUP-SCI-EU	Aug 16 2016 10:53	Perpetual License	1	End User WatchDog Support for SCI, 1-year
Upload License				
Serial Number	XXXXXXXXXX			
File	Click here to select a file			
	Upload			

PCI Profiles

You can generate reports in SCI to determine if your WLANs are compliant with the Payment Card Industry (PCI) Data Security Standard v3.2.

When you navigate to **Admin > PCI** in the left pane of the SCI user interface, the main PCI Profiles screen appears, as shown in the following example.

FIGURE 254 PCI Profiles Screen

+ Create / Edit X Delete					
	Name	SSIDs	Date	Compliance	3
2	pci test bed	QA-RaikiH-MSP1-101, QA	May 22 2018 04:57	FAIL	
	density	test-5g	May 17 2018 18:44	FAIL	
	both	DENSITY, QA-RaikiH-Web	May 17 2018 19:17	FAIL	
	1st density	bugbash, test-5g, qa-pre.k	May 21 2018 04:00	FAIL	
	test2	testssid	May 22 2018 11:53	PASS	

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

Creating a PCI Profile

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

Follow the steps below to create a PCI profile:

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

The **Create Profile** screen is displayed.

FIGURE 255 Creating a PCI Profile

10210	Profile		
	Name	Test report 15	
SSIDs	to Report	Search SSID Q	
Index	Question Do you main	tain a network diagram documenting wireless connections to the CDE?	8
1.2.3	Do you have	a firewall in place that permits only authorized traffic between the wireless network and CDE?	6
2.1.1	Do you chan roles?	ge all known encryption keys or passwords when anyone with knowledge about them leaves or changes	8
	Do you main		
2.4	devices)	tain a system inventory of hardware and software in scope for PCI? (Hint: SZ allows you to export a CSV list o	f
2.4 3.1	devices)	tain a system inventory of hardware and software in scope for PCI? (Hint: SZ allows you to export a CSV list o e a reputable third-party source to identify and rank security vulnerabilities?	f
	devices) Do you utiliz		

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

NOTE

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

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

NOTE

Not all questions are shown in the screen example above.

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

The result of the report (Pass or Fail) appears in the list of PCI profiles on the main PCI Profiles screen, an example of which is shown in Figure 254 on page 224.

Opening and Downloading a PCI Profile Report

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

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

1. From the main PCI Profile screen, an example of which is shown in Figure 254 on page 224, click on either the green "Pass" or red "Fail" button, depending on the report you wish to view.

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

FIGURE 256 PCI Report Example

pci test b	mpliance Report		
May 22 201			Overall Status: TAL
PCIID	Description	Compliant	Details
1.1.2	Current network diagram that identifies all connections between the cardholder data environment and other networks, including any wireless networks	PASS	
1.2.3	Install perimeter firewalls between all wireless networks and the cardholder data environment, and configure these frewalls to deny or, if traffic is necessary for business purposes, permit only authorized traffic between the wireless environment and the cardholder data environment.	PASS	
2.1.1	For wireless environments connected to the cardholder data environment or transmitting cardholder data, change ALL wireless vendor defaults at installation, including but not limited to default wireless encryption keys, passwords, and SNMP community strings.	PASS	
2.3	Encrypt all non-console administrative access using strong cryptography.	MASS	
2.4	Maintain an inventory of system components that are in scope for PCI DSS.	PASS	
4.1.1	Ensure wireless networks transmitting cardholder data or connected to the cardholder data environment, use industry best practices to implement strong encryption for authentication and transmission.	PASS	
6.1	Establish a process to identify security vulnerabilities, using reputable outside sources for security vulnerability information, and assign a risk ranking (for example, as "high," "medium," or "low") to newly discovered security vulnerabilities.	MSS	
6.2	Ensure that all system components and software are protected from known vulnerabilities by installing applicable vendor- supplied security patches. Install critical security patches within one month of release.	PASS	
7.2	Establish an access control system(a) for systems components that restricts access based on a user's need to know, and is set to "deny all" unless specifically allowed.	PASS	
8.1.1	Assign all users a unique ID before allowing them to access system components or cardholder data.	MASS	
8.1.2	Control addition, deletion, and modification of user IDs, credentials, and other identifier objects.	INSS	
8.1.3	Immediately revoke access for any terminated users.	PASS	
8.1.4	Remove/disable inactive user accounts within 90 days.	FAIL	TDC-PCI-TESTBED

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

Editing or Deleting a PCI Profile

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

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

NOTE

You can select and delete multiple profiles simultaneously if desired.

FIGURE 257 Edit or Delete PCI Profiles

+ Create / Edit X Delete					
	Name	SSIDs	Date	Compliance	ł
2	pci test bed	QA-RaikiH-MSP1-101, QA	May 22 2018 04:57	FAIL	
	density	test-5g	May 17 2018 18:44	FAIL	
	both	DENSITY, QA-RaikiH-Web	May 17 2018 19:17	FAIL	
0	1st density	bugbash, test-5g, qa-pre.k	May 21 2018 04:00	FAIL	
	test2	testssid	May 22 2018 11:53	PASS	

Users and Roles

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

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

- 1. Create resource groups. For each group that you create, you select the Access Points, SSIDs, and other assets that you want to belong to that group. This procedure is described in Creating Resource Groups on page 230.
- 2. Create users, then give the user a role, then assign the user to an resource group. The Super Admin role automatically is assigned to all resource groups. This procedure is described in Creating Users and Roles on page 232.

Resource Groups

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

FIGURE 258 Resource Groups Screen

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

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

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

NOTE

SCI can support up to 2,000 resource groups.

Users and Their Roles

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

FIGURE 259 Users and Roles Screen

Users	Resourc	e Groups							
Create 🖋	Edit X Delete								
	Email	Username	First Name	Last Name	Role	Resource Group	Created By	User Type	Last Login Ti 🕻
	nodata@test.com	nodata	no	data	View Only	dummy	admin	Local	Jan 11 2019
	scilocaladmin@	scilocaladmin	SCI	Local Admin	Super Admin	Default		Local	Jan 19 2019
	aaaadmin@exa	aaaadmin	FIRST	LAST	Super Admin	Default		External	Jan 18 2019
	aaaview@exam	aaaview	FIRST	LAST	View Only	AAA_VIDEO54		External	Jan 14 2019
	aaagroupadmin	aaagroupadmin	FIRST	LAST	Admin	AAA_MLISA		External	Jan 14 2019

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

FIGURE 260 Access Rights for Each User Role

	View Data	Manage Saved Filters	Manage Schedules	Manage Users	Manage Resource Groups	Manage Cluster
Super Admin	~	~	~	~	~	~
Admin	~	~	~	~	×	ж
View Only	~	ж	ж	×	×	×

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

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

Creating Resource Groups

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

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

Creating a New Resource Group

Follow these steps to create a new resource group:

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

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

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

FIGURE 261 Resource Groups Screen Example

Users Resource Groups						
+ Create / Edit x Delete						
	Group Name	Description	Associated Users	Created By	Last Edit Time	٥
	Default	Full access to all resource groups	2		Mar 09 2018 10:59	
0	Dev Group	For RSC dev team	1			
0	Group 1		2	admin	Mar 09 2018 11:44	
0	Group 2		2	admin	Mar 08 2018 09:29	
0	Controller 1		2	admin	Mar 08 2018 09:33	
0	Domain 1	Filter by domain	1	admin	Mar 08 2018 09:43	
0	Zone 2		1	admin	Mar 08 2018 15:49	
0	All Zones		3	admin	Mar 08 2018 09:48	
0	Controller 2		1	admin	Mar 08 2018 10:08	
0	Controller 3		2	admin	Mar 09 2018 10:54	
		4 1 t of 2	•			

3. Click Create.

A popup appears, such as in the example below:

FIGURE 262 Create Resource Group Popup

Name:*		
Description:		
s Search group Q	Search AP	Q
All Systems All System 1 System 2 System 3 System 4 System 5 System 6		0 of 0 APs checke

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

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

Editing a Resource Group

To edit a resource group, do the following:

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

Deleting One or More Resource Groups

To delete resource groups, do the following:

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

NOTE

All users associated with these groups are also deleted.

Creating Users and Roles

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

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

Creating a New User

Follow these steps to create a new user:

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

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

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

FIGURE 263 Users Screen Example

Users	Resource Groups							
Preate / Edit	× Delete							
	Email	Username	First Name	Last Name	Role	Resource Group	Created By	Last Login Time
0	aaa@abc.com	admin	Alison	Knight	Super Admin	Default		Mar 16 2018 10:18
0	jd@abc.com	iamvo	John	Doe	View Only	Domain1		Mar 08 2018 10:11
0	bbb@abc.com	bbb	Bobb	8urnett	View Only	All Zones		Feb 27 2018 16:25
0	jd1@abc.com	iamvo2	Jeff	Doe	View Only	Controller1		Mar 08 2018 15:49
0	ccc@abc.com	carol	Carol	Conway	Super Admin	Default		Mar 08 2018 10:32
0	johnadmin@abc.com	iamadmin	Jon	Doe	Admin	Controller1		Mar 14 2018 15:37
0	eee@abc.com	erika	Erika	Eshethe	View Only	Default		Feb 27 2018 11:47
0	alicevo@ruckus.com	alicevo	Alice	White	View Only	Default		Mar 09 2018 09:56
0	ggg@abc.com	gary	Gary	Goodman	Admin	All Zones		Feb 27 2018 11:47
0	hhh@abc.com	henry	Henry	Henman	View Only	Zone 2		Feb 27 2018 13:53
				-1 0 of 2 🕨				

3. Click **Create**.

The Create Users popup appears:

FIGURE 264 Create User Popup

Create User		×
Email:*]
Username:*]
Password:*	Minimum 8 characters]
Confirm Password:*	Minimum 8 characters]
First Name:*]
Last Name:*]
Role:*	Super Admin	0
Resource Group:*	(Full access to all resource groups)]
	Create	Cancel

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

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

Editing a User

To edit a user, do the following:

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

Deleting One or More Users

To delete users, do the following:

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

NOTE

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



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