Ruckus Wireless™ SmartCell Insight (SCI™) Release 2.2

User Guide

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About This Guide

This *SmartCell Insight 2.0 User Guide* provides instructions about how the Ruckus Wireless™ SmartCell Insight (SCI) application works, the reports that it generates, and what they are used for.

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

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

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

Document Conventions

Table 1: Text conventions on page 6 and Table 2: Notice conventions on page 7 list the text and notice conventions that are used throughout this guide.

Table 1: Text conventions

Convention	Description	Example
`message phrase`	Represents messages displayed in response to a command or a status	`[Device Name] >`
`user input`	Represents information that you enter	`[Device Name] > set ipaddr 10.0.0.12`
user interface controls	Keyboard keys, software buttons, and field names	Click **Create New**
Start > **All Programs**	Represents a series of commands, or menus and submenus	Select **Start** > **All Programs**
ctrl+**V**	Represents keyboard keys pressed in combination	Press **ctrl**+**V** to paste the text from the clipboard.
screen or page names		Click **Advanced Settings**. The **Advanced Settings** page appears.
`command name`	Represents CLI commands	
parameter name	Represents a parameter in a CLI command or UI feature	

Convention	Description	Example
variable name	Represents variable data	*{ZoneDirectorID}*
`filepath`	Represents file names or URI strings	`http://ruckuswireless.com`

Table 2: Notice conventions

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

Related Documentation

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

Documentation Feedback

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

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

When contacting us, please include the following information:

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

SmartCell Insight Overview

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

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

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

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

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.

Elements of the SCI User Interface

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 admininstrator 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

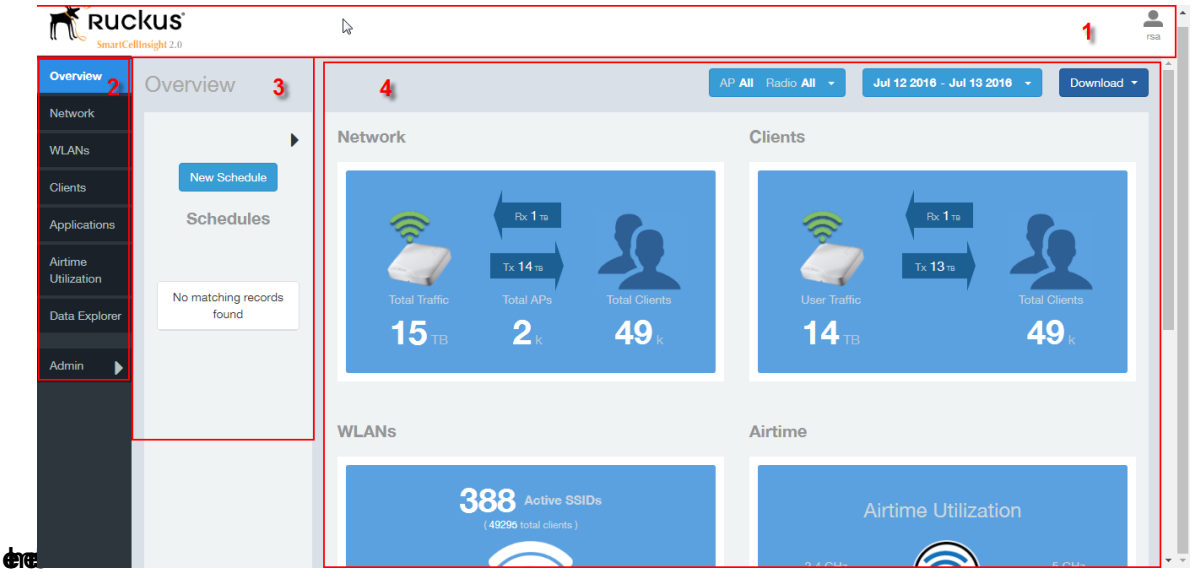


Table 3: SCI web interface elements

No.	Name	Description
1	Header Panel	Displays the currently logged in user profile. Click the user icon to update the profile or change the password as required.
2	Navigation Bar	Contains links that take you to the Overview, Network, WLANs, Clients, Applications, and Airtime Utilization dashboards. It also contains links to Data Explorer, and the 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.

User Information

Describes the My Account screen where the user information is stored.

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

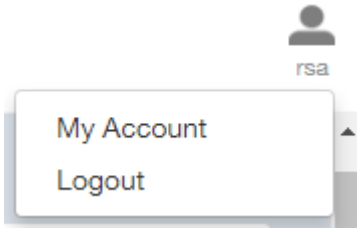


Figure 2: User Information pop-up

Click the:

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

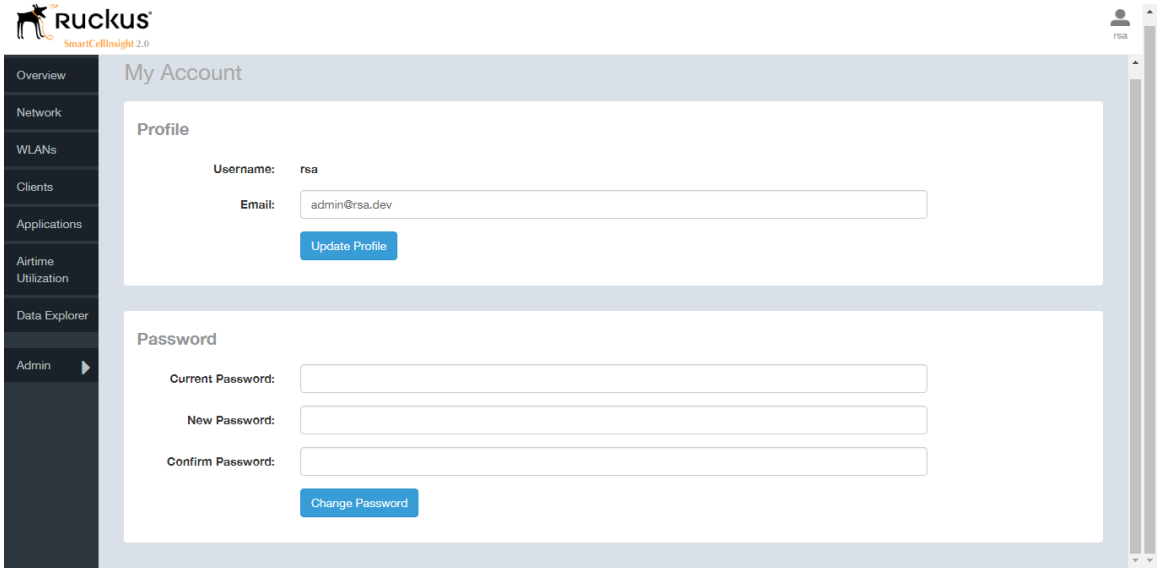


Figure 3: My Account

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

Using the Overview Page

2

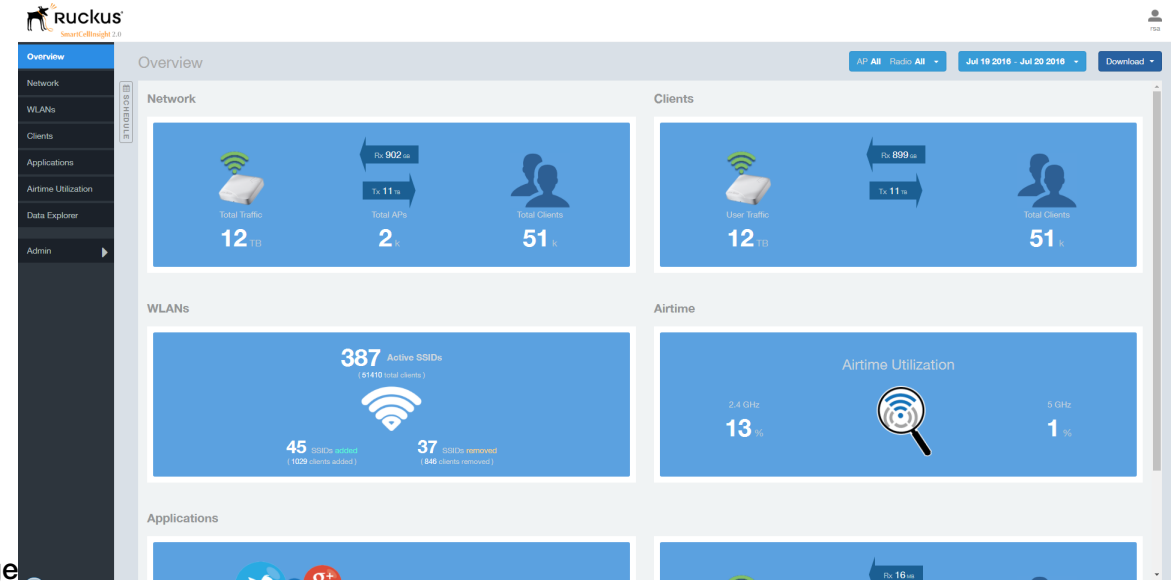
In this chapter:

- Overview - Network
- Overview - Clients
- Overview - WLAN
- Overview - Airtime
- Overview - Applications
- Filters to Generate Dashboard
- Overview - Data Explorer
- Overview - Admin

The Overview screen is the main dashboard that is displayed when you log into SCI. It provides a general overview of the key statistics of your WiFi network, such as total traffic, total clients, active WLANs, airtime utilization and applications identified.

To view more detailed information, click any of the other headings on the left navigation bar, or click the section in the content panel to redirect to the same page.

Figure 4: The Overview page



The Overview page contains the following reports:

- Overview - Network on page 12
- Overview - Clients on page 12
- Overview - WLAN on page 12
- Overview - Airtime on page 13
- Overview - Applications on page 13

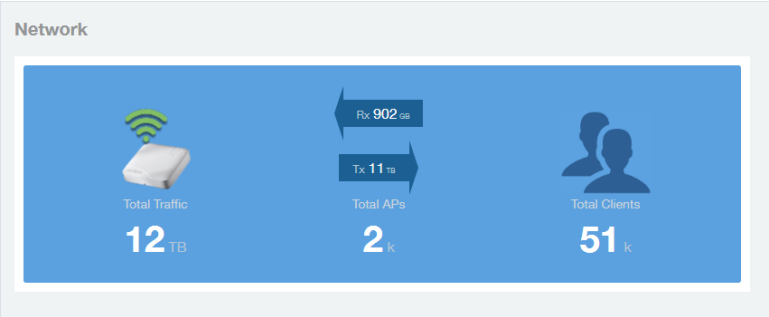
To filter the content displayed, click either the **AP - Radio** filter or the **Time Period** filter. For more information, see Working With Filters on page 19.

To download a copy of the content currently displayed on the screen, click **Download**, and select **CSV** or **PDF** as the file type.

Overview - Network

The Overview - Network report gives an overview of the data from the network perspective, and displays the total traffic, number of APs and clients.

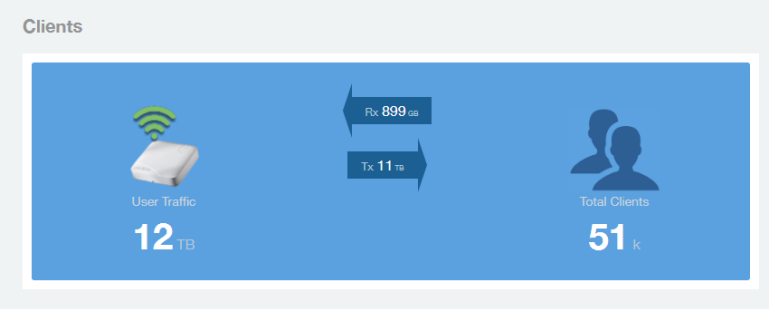
Figure 5: Network Overview report



Overview - Clients

The Overview - Clients report displays the total user traffic and total clients.

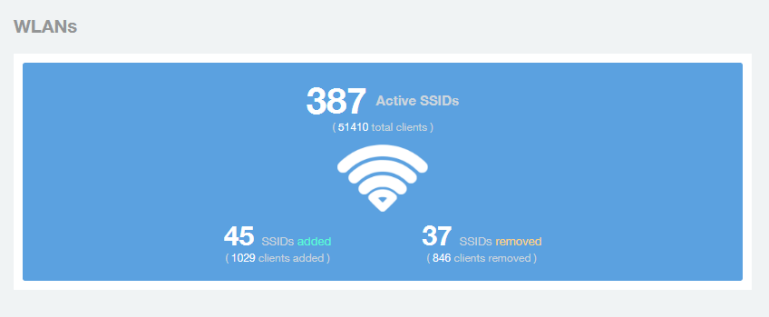
Figure 6: Clients



Overview - WLAN

The Overview - WLAN report displays an overview of the total number of SSIDs deployed, as well as the number of SSIDs added and removed over the selected period.

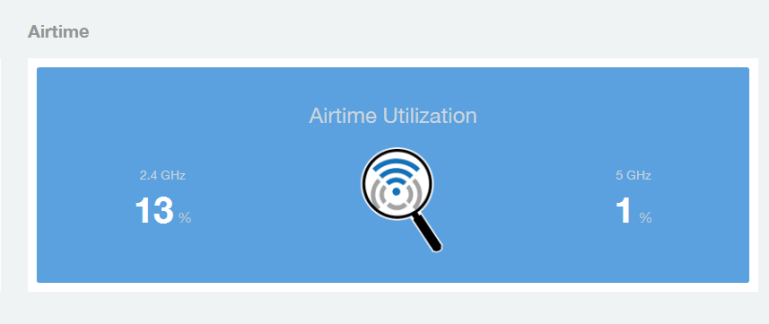
Figure 7: WLANs



Overview - Airtime

The Overview - Airtime repot provides an overview of the airtime utilization statistics on the 2.4 and 5 GHz AP radios.

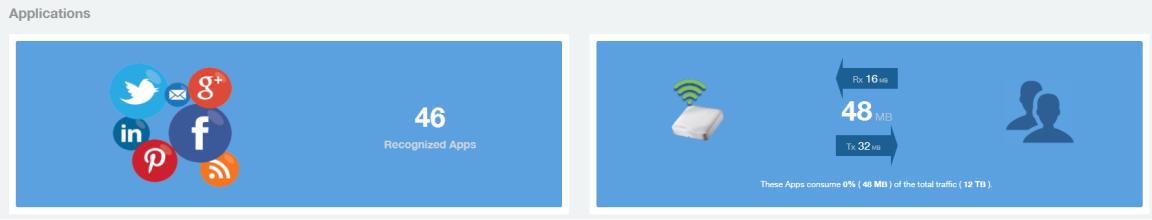
Figure 8: Airtime



Overview - Applications

The Overview - Applications report displays an overview of the applications identified by the application visibility engine.

Figure 9: Applications



Filters to Generate Dashboard

The dashboard can be updated based on the selection of filters.

Each of the dashboards can be updated based the selection of filters:

- **AP and or SSID and Radio**
- **Date**
- **Download option**

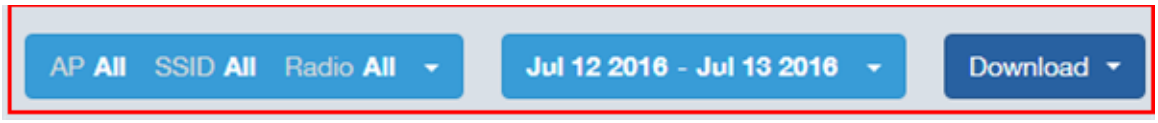


Figure 10: AP, Radio, Date and Download filter

NOTE: Refer to AP, SSID and Radio filter on page 19, Date Filter on page 20 and Download on page 21.

- **Rx+Tx filter**

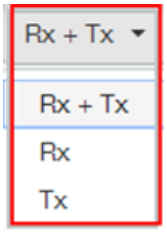


Figure 11: Rx+Tx filter

NOTE: Refer to Working With Filters on page 19.

- **Time filter**

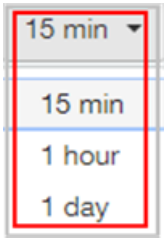


Figure 12: Time filter

NOTE: Refer to Time Filter on page 21.

- **Top APs filter**

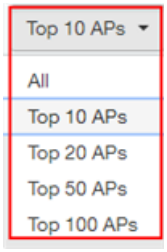


Figure 13: Top APs

NOTE: Refer to AP Filter on page 22

- **Top SSID filter**

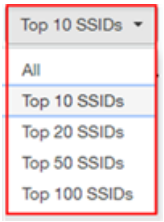


Figure 14: Top SSIDs

NOTE: Refer to SSID Filter on page 22

- **Top Client filter**

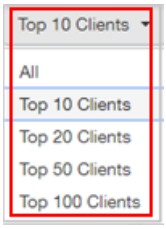


Figure 15: Top Clients

NOTE: Refer to Client Filter on page 22.

- **Top Application filter**

Figure 16: Top Applications

NOTE: Refer to Application Filter on page 23.

Overview - Data Explorer

Data Explorer provides a customizable way of extracting analytics using OLAP cubes.

Data Explorer This is a custom reporting tool that allows you to slice and dice an OLAP (Online Analytical Processing) cube. In addition to the default reports and analytics, SCI also provides OLAP (https://en.wikipedia.org/wiki/OLAP_cube) cubes to slice-and-dice the data, as per the needs of wide variety of users. Data in the OLAP cube can be accessed using the Data Explorer interface. Data Explorer provides a customizable way of extracting analytics using OLAP cubes and also provides rich data.

NOTE: Refer to Data Explorer on page 53 for details.

Overview - Admin

The Administration console helps you manage the functioning of SCI by providing status and updates and diagnostics.

Admin: The Administration (Admin) console helps you manage the functioning of SCI by providing status and updates and diagnostics. It provide visibility into the health of the system and check for updates. This also includes links to view the status of external sources that SCI uses, such as Hadoop, Spark, and Druid.

NOTE: Refer to Admin Console on page 65 for details.

Using the Scheduler

3

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

The Scheduler allows you to create reports at set dates and times. The second frame to the left side of the screen, adjacent to the Navigation Frame and numbered 1 in the figure above, 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 above the Overview dashboard, numbered 2 in the figure above.

On the Schedule screen:

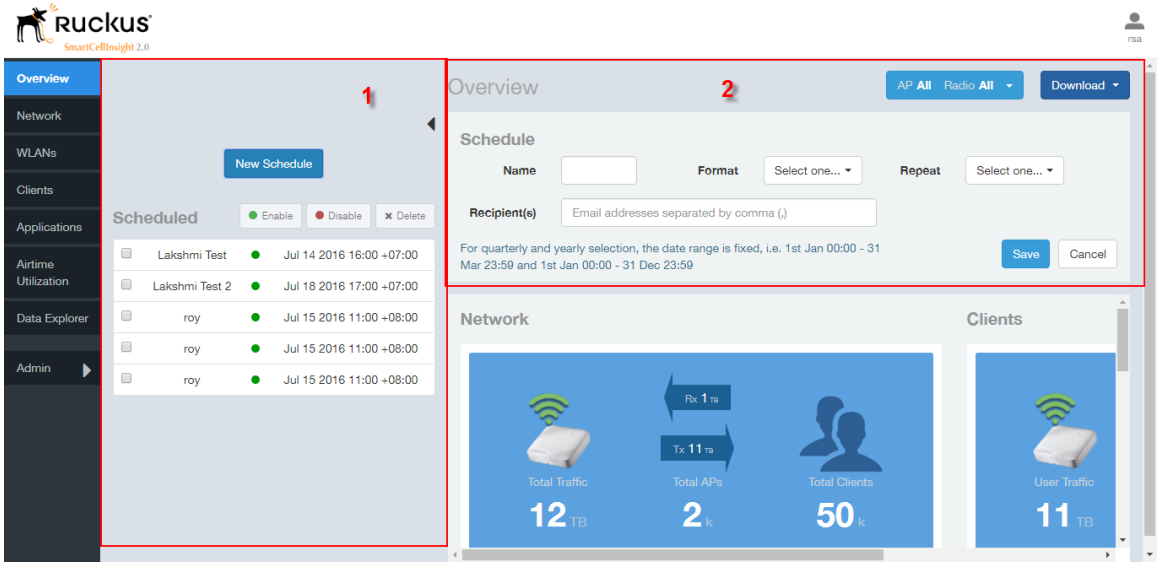


Figure 17: Scheduler on the Overview Dashboard

- **Name**: Enter the name of the schedule.
- **Format**: Select the format of the report from the drop down list, either PDF of 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 receipients. If you have more than one email address to enter, separate the email addresses with a comma.

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

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

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

Schedules can be created for all the dashboards, namely Network, WLANs, Clients, Airtime Utilization, and Applications. The schedule frame is integrated into every dashboard. All the filters and functionality of the dashboards can be used to create reports to be sent at specific dates and times to recepients. A sample Network dashboard is shown in the figure below. Refer to the specific dashboard for the description of how the dashboard and filters work.

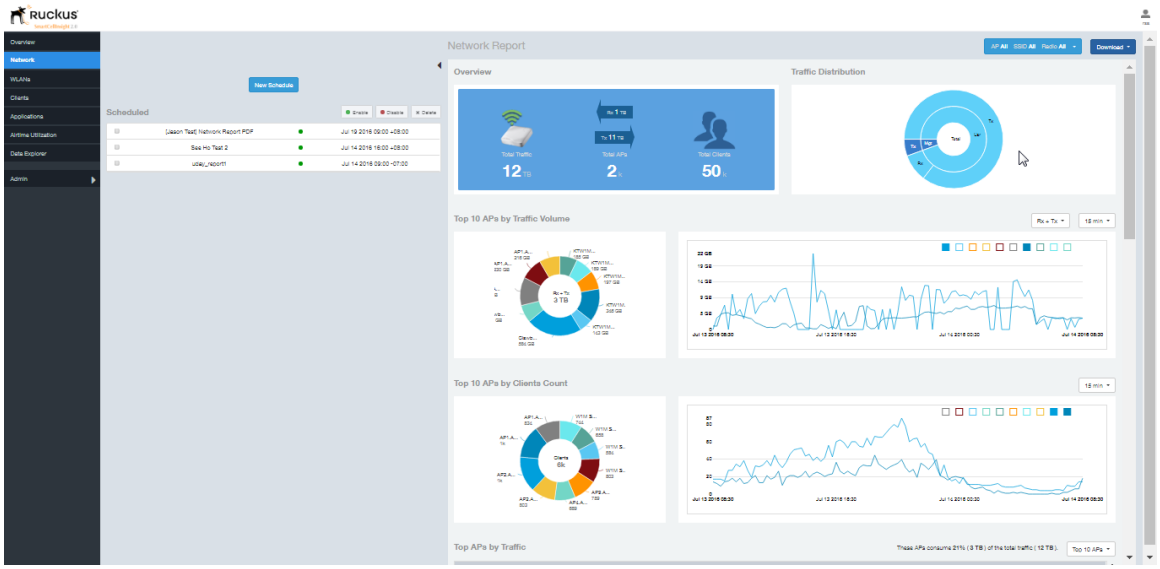


Figure 18: Network Dashboard Containing Schedules

Working With Filters

Filters are built into every dashboard and allow you to segregate and drill down into the data.

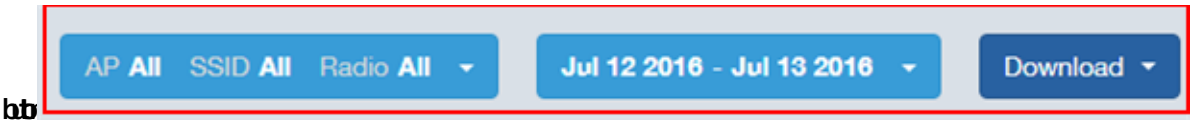
By selecting APs and setting a date range, you can examine specific subsets of data for any AP or group of APs for any time period in any of your wireless networks. For example, if you want to see just the total traffic and client counts for a certain AP on a certain day, you could use the Network Overview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

The same two filters are available on every dashboard:

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

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

Figure 19: AP/Radio Filter, Date Filter and Download



AP, SSID and Radio filter

Use these filters to generate SCI dashboards.

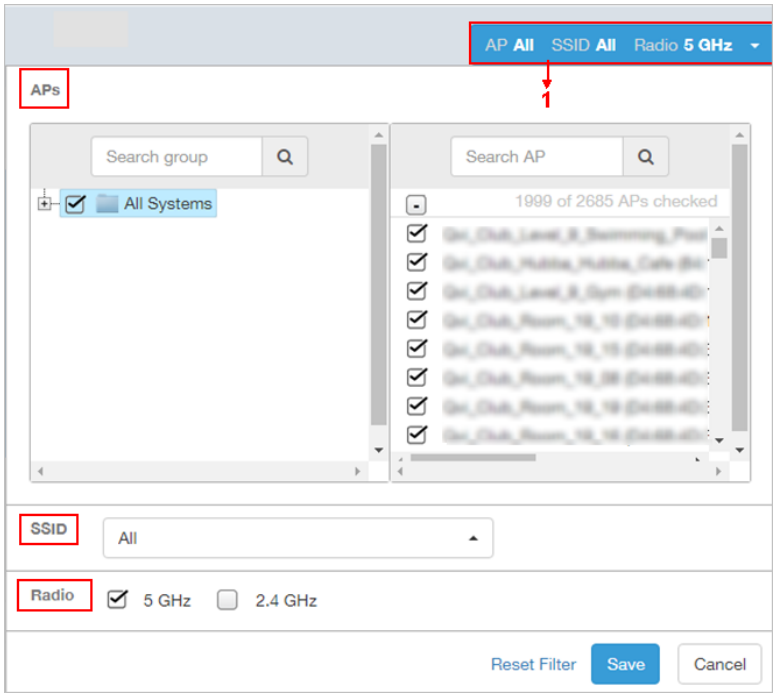


Figure 20: Custom AP and Radio Filter

Custom AP, SSID and Radio Filter: The user can select APs, SSID and Radio to view and analyze data.

- The AP dropdown lists contains a nested list of APs, the connected controller, and the related zones. 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 particualr SSID.

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

- Radio select 5 or 2.4 or both GHz.

  Follow these steps to:

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

.

Date Filter

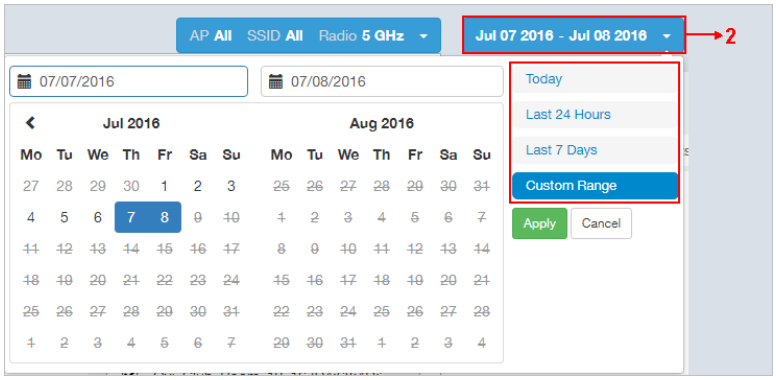


Figure 21: Custom Date Filter

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

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.

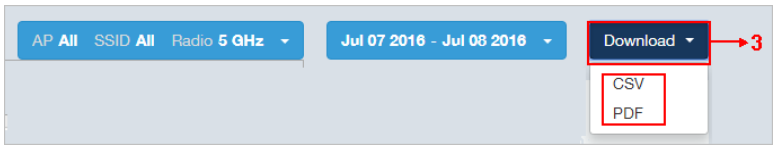


Figure 22: Download option

Download Option Use the download option to export the report in either CSV or PDF format. This filter is available on all dashboards expect Data explorer and Admin.

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

Rx+Tx Filter

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

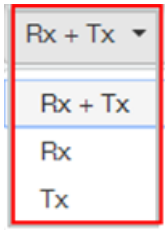


Figure 23: Rx+Tx filter

Rx+Tx : Select the Rx+Tx (default value) or Rx or Tx operating ranges. This filter can be used in network, WLAN and application dashboard.

Time Filter

Time filter for various dashboard.

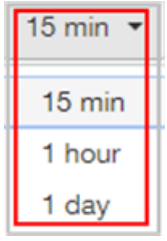


Figure 24: Time filter

Time: Specify the time frame of 15 minutes (default value), 1 hour or 1 day for network, client, application and airtime dashboards.

AP Filter

AP filter for Network dashboard.

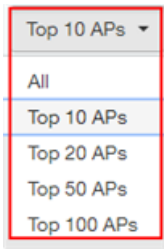


Figure 25: AP filter

Top APs Specify the APs filter of top 10 (default value), 20, 50, or 100 for Network dashboard of traffic and client sections.

SSID Filter

SSID filter for WLAN dashboard.

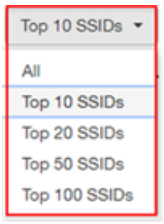


Figure 26: SSID filter

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

Client Filter

Client filter for determining client usage.

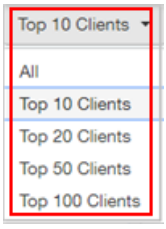


Figure 27: Client filter

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

Application Filter

Application filter for application dashboard.

Figure 28: Application filter

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

Network Report

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

The Network report gives you an overview of the network - the total traffic, the total APs received and transmitted, and the client details.

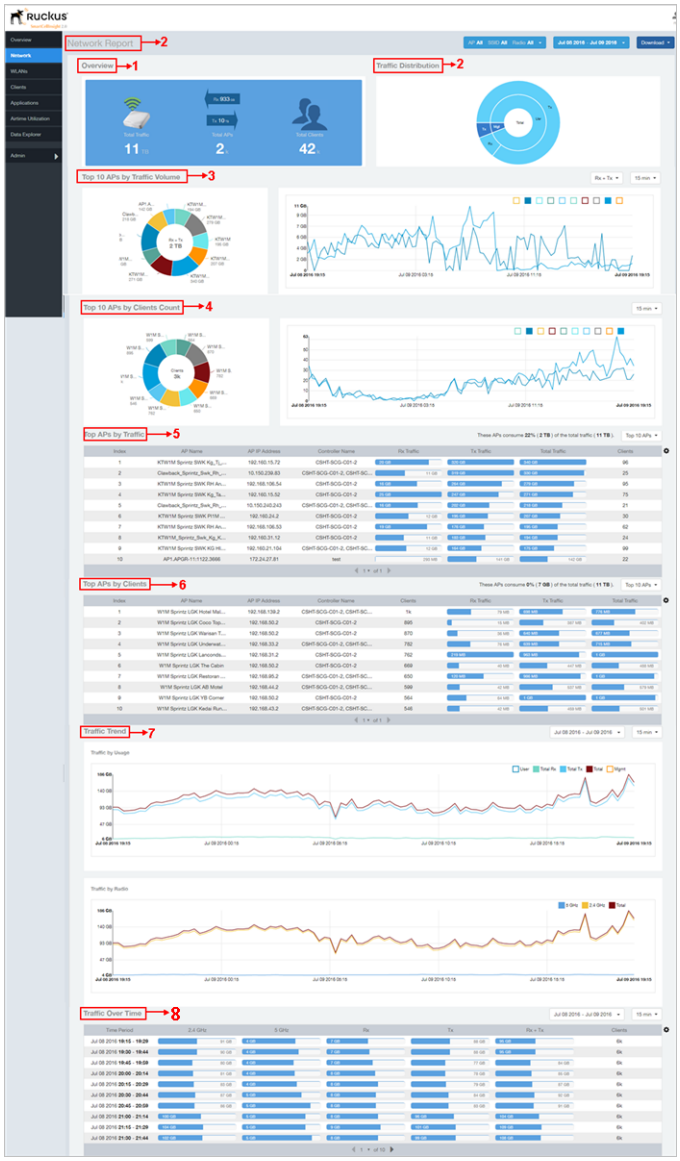


Figure 29: Network Report

The network report consists of several sections as per the table below. For ease of reading, each section has been numbered in the figure above, and corresponds to the table below.

1	Overview	Contains the total traffic and the total clients on the network. It also contains the received and transmitted traffic between them.
2	Traffic Distribution	Contains the distribution of traffic in terms of size.
3	Top 10 APs by Traffic Volume	The pie chart and graph contain the top APs with the largest traffic volume in the network, alongwith the received and transmitted traffic volumes.
4	Top 10 APs by Client Count	The pie chart and graph contain the top APs by client count in the network, alongwith the received and transmitted traffic volumes.
5	Top APs by Traffic	This table contains the top APs with the largest traffic volume in the network.
6	Top APs by Client	This table contains the top APs by client count in the network.
7	Traffic Trend	This graph displays the traffic by usage and radio.
8	Traffic Over Time	This table tracks the traffic on the network based on time and other components.

Network - Overview

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

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

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

Figure 30: Overview

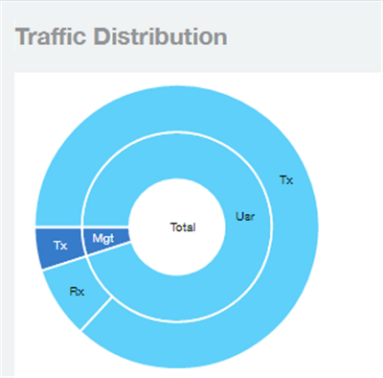
Network - Traffic Distribution

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

Use the **Traffic Distribution** report 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 31: Traffic Distribution



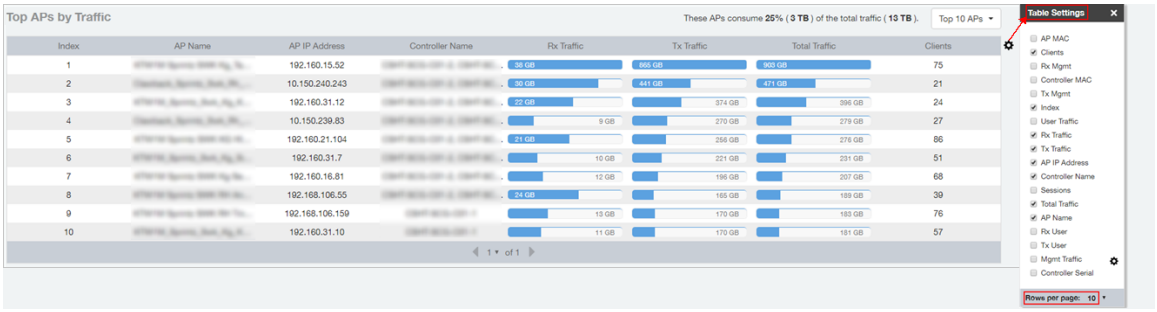
Network - Top APs by Traffic Volume Table

This table lists the APs with the highest traffic volume in the network.

Use this report 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 32: Top APs by Traffic

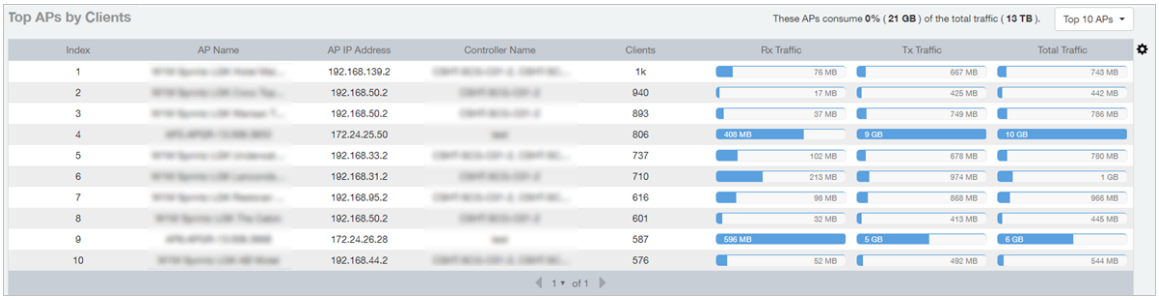


Network - Top APs by Client Count Table

This report displays the top APs by client count 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 table settings drop down list.

Figure 33: Top APs by Client



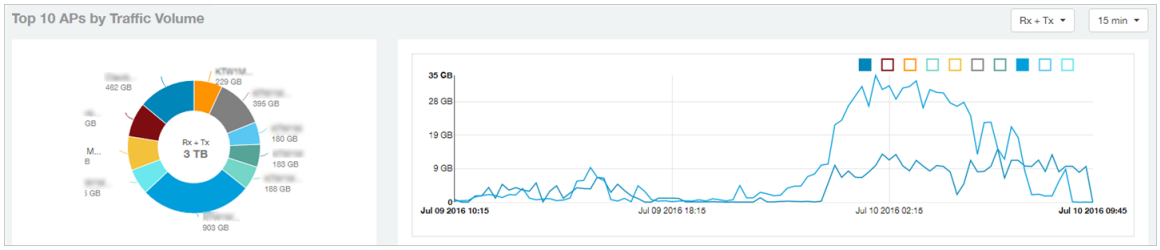
Network - Top 10 APs by Traffic Volume

The Top 10 APs by Traffic Volume report displays the list of highest traffic APs in pie chart and graph format.

Use the drop-down menus to specify the traffic type (Tx, Rx, or Tx+Rx), and the time granularity in increments of 15 minutes, 1 hour or 1 day. Click any of the colored squares to toggle display of the AP in the line graph.

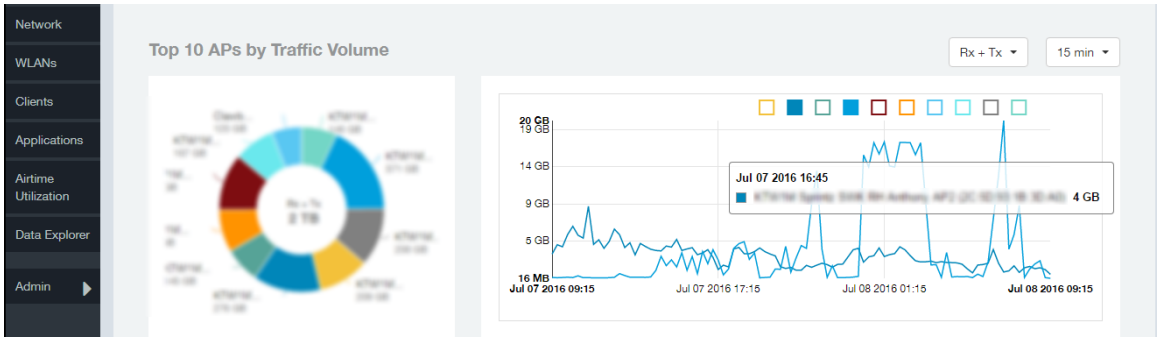
NOTE: The **Rx+Tx** drop-down menu applies to both the pie chart and the line graph, but the time granularity applies to the line graph only. This applies to all sections in all reports that appear in this format (pie chart + line graph with Rx/Tx + time granularity menus).

Figure 34: Top 10 APs by Traffic Volume



If you hover over the line graph a pop-up appears containing the selected AP details as shown in the figure below.

Figure 35: Top 10 APs by Traffic Volume - Hover Over Example

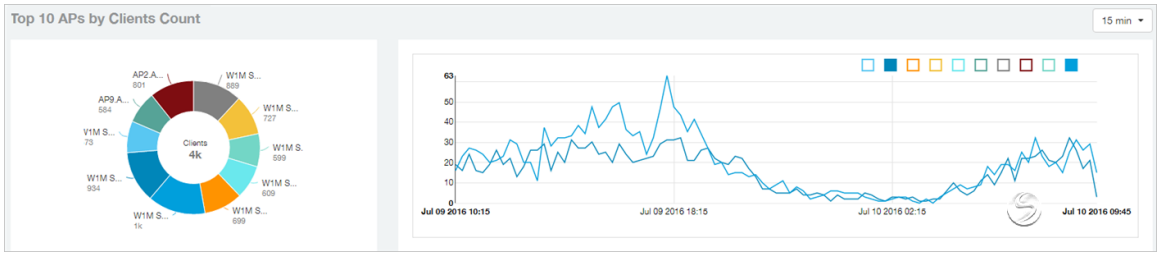


Network - Top 10 APs by Client Count

This report displays the top 10 APs by client count in pie chart and graph format.

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 36: Top 10 APs by Client Count



Network -Traffic Trend

The Traffic Trend report displays 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 in 15 minutes, 1 hour or 1 day increments.

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.

Figure 37: Traffic Trend

Network - Traffic Over Time

The Traffic Over Time report displays the traffic on the network over time.

This 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 38: Traffic Over Time

Traffic Over Time
Jul 08 2016 - Jul 09 2016
15 min
Table Settings
Time Period
2.4 GHz
5 GHz
Rx
Tx
Rx + Tx
Clients
Jul 08 2016 19:15 - 19:29
Jul 08 2016 19:30 - 19:44
Jul 08 2016 19:45 - 19:59
Jul 08 2016 20:00 - 20:14
Jul 08 2016 20:15 - 20:29
Jul 08 2016 20:30 - 20:44
Jul 08 2016 20:45 - 20:59
Jul 08 2016 21:00 - 21:14
Jul 08 2016 21:15 - 21:29
Jul 08 2016 21:30 - 21:44
6k
1 of 10
AP MAC
Clients
Rx Mgmt
Controller MAC
Tx Mgmt
Index
User Traffic
Rx Traffic
Tx Traffic
AP IP Address
Controller Name
Sessions
Total Traffic
AP Name
Rx User
Tx User
Mgmt Traffic
Controller Serial
Rows per page: 10

WLANs Report

The Wireless LANs report contains information on the SSIDs added, that which are active and removed. It also contains details of: 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.

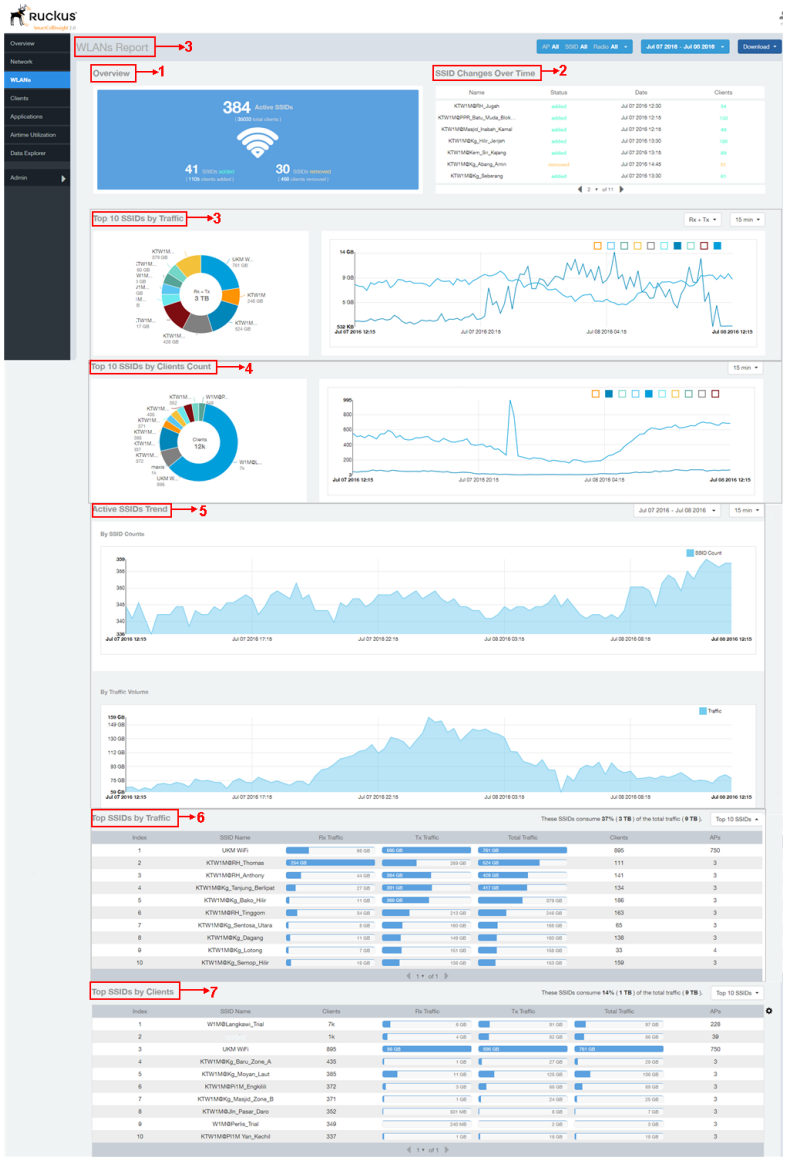


Figure 39: WLANs Report

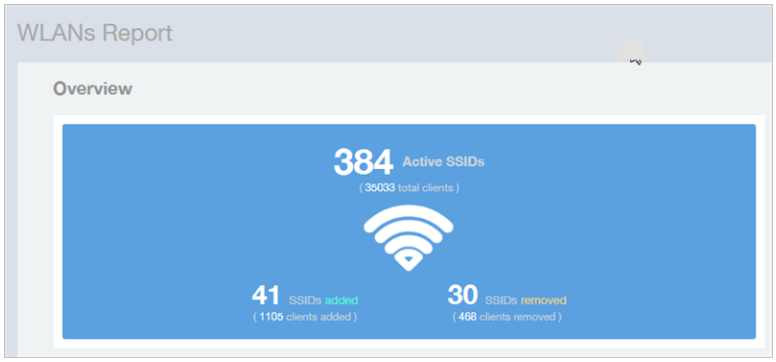
The following table lists the reports on the WLANs page.

1	Overview	This report section contains the total number of active SSIDs, added and removed.
2	SSID Changes Over Time	This tabular report pertains to the SSID status, its last modified date and number of clients associated to the SSID.
3	Top 10 SSIDs by Traffic	The pie chart and graph contain the top 10 SSIDs traffic volume of received and transmitted traffic volumes
4	Top 10 SSID by Client Count	The pie chart and graph contain the top 10 SSIDs client count of received and transmitted count
5	Active SSIDs Trends	The active SSID trend displays the traffic by SSID count and traffic volume
6	Top SSIDs by Traffic	This tabular report contains the top SSIDs with the largest traffic volume in the network as per the selected components
7	Top SSIDs by Client	The tabular report contains the top SSIDs by client count in the network as per the selected components.

WLANs Overview

The overview report provides a general overview of the total number of active SSIDs, and the number of added and removed SSIDs over the selected period.

Figure 40: WLANs Overview



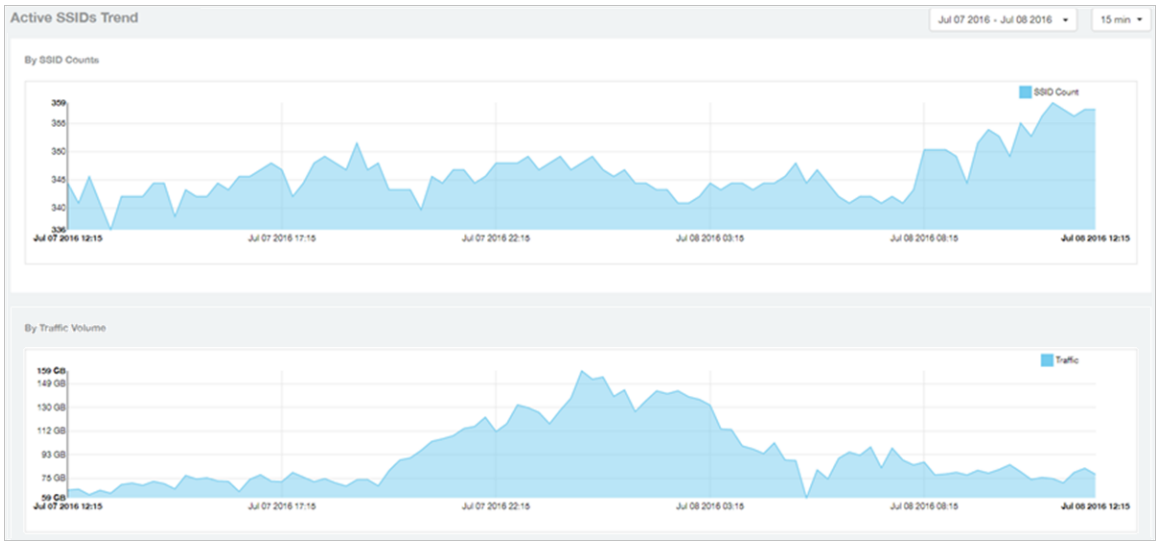
WLAN-Active SSID Trend

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

This report allows you to quickly see how many WLANs are active and the total traffic volume over time. Select a date range and the time increments by which to display the graph.

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

Figure 41: Active SSID Trend report

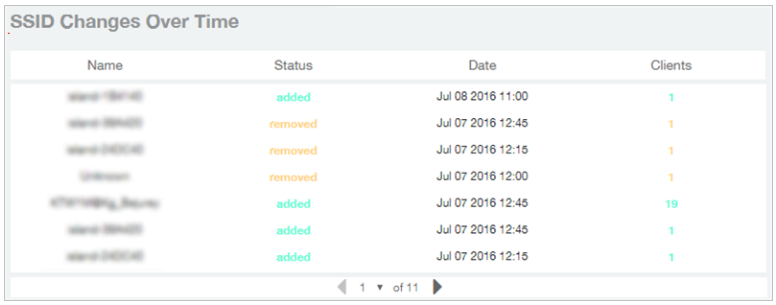


WLAN-SSID Changes Over Time

Use the SSID Changes Over Time report to quickly view the most recent SSID changes.

By default, this report displays the most recent changes up to the current time. To view changes for a previous time period, use the Time Period Filter.

Figure 42: SSID Changes Over Time



WLAN-Top SSIDs by Client

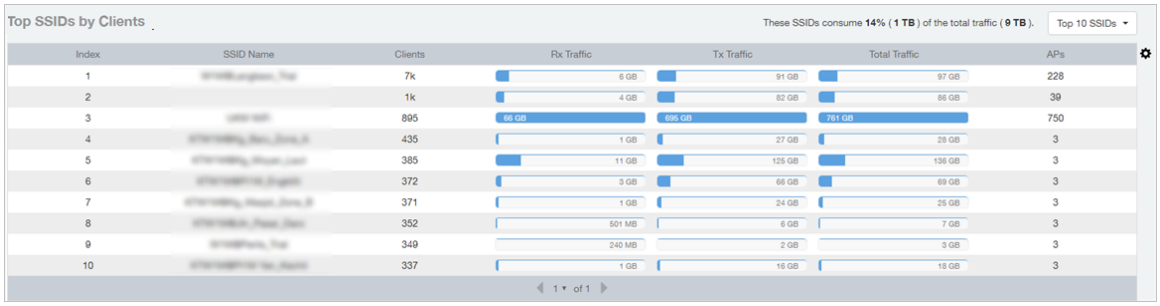
The Top SSIDs by Client report contains a table listing the top wireless networks by client count.

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

Figure 43: Top SSIDs by Clients



WLAN-Top SSIDs by Traffic

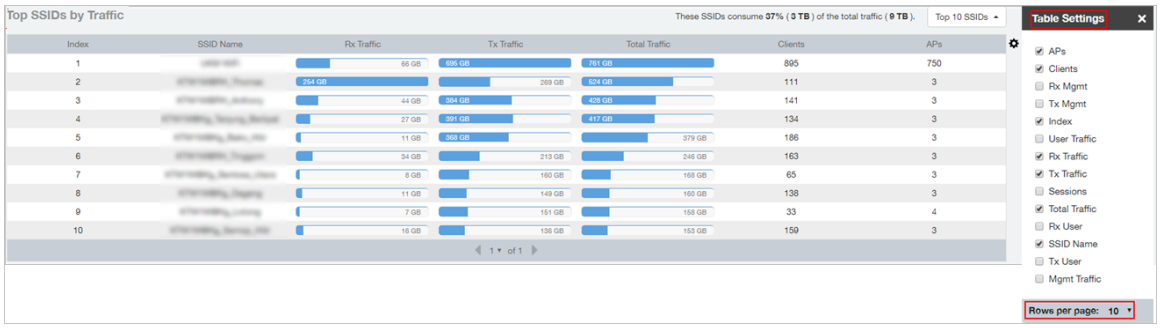
The Top SSIDs by Traffic table lists the top 10, 20, 50 or 100 SSIDs in the network by traffic volume.

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

Figure 44: Top SSIDs by Traffic



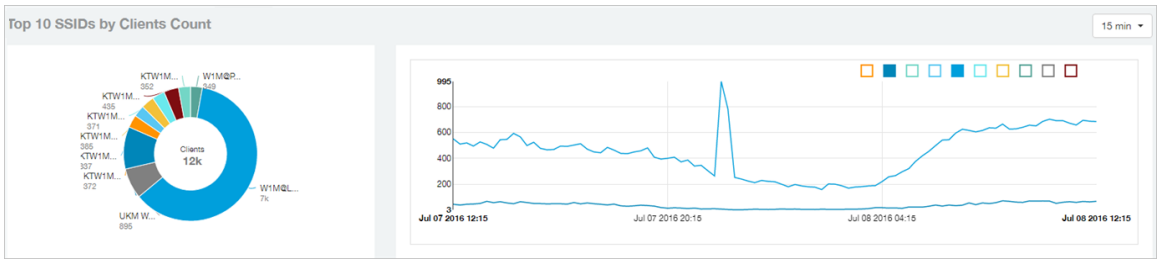
WLAN-Top Ten SSIDs by Client Count

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

Select a time increment to display (15 minutes, 1 hour or 1 day), and click any of the colored squares to toggle 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 45: Top Ten SSIDs by Client Count

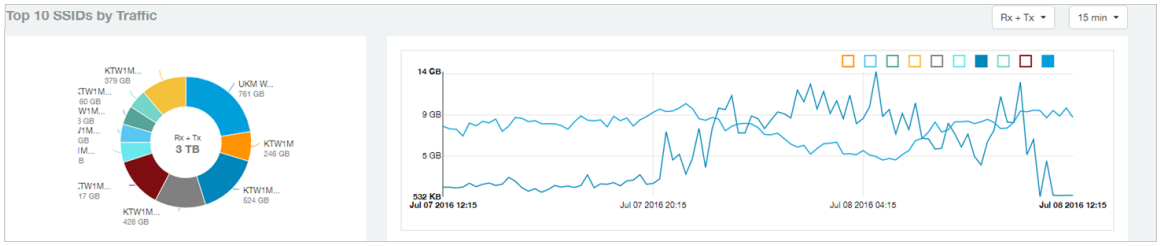


WLAN-Top Ten SSIDs by Traffic

Use the Top 10 SSIDs by Traffic reports to view which wireless networks are generating the most traffic, compare usage of the top WLANs over different time periods, and compare Tx and Rx statistics independently.

Click any of the colored squares to toggle display of the corresponding SSID. Select a time increment to display (15 minutes, 1 hour or 1 day), and choose whether to display transmit data only, receive data only, or total traffic.

Figure 46: Top Ten SSIDs by Traffic


Top 10 SSIDs by Traffic
Rx + Tx
15 min
KTW1M...
379 GB
UKM W...
761 GB
KTW1M
246 GB
KTW1M...
524 GB
KTW1M...
428 GB
Rx + Tx
3 TB
14 GB
9 GB
5 GB
532 KB
Jul 07 2016 12:15
Jul 07 2016 20:15
Jul 08 2016 04:15
Jul 08 2016 12:15

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.

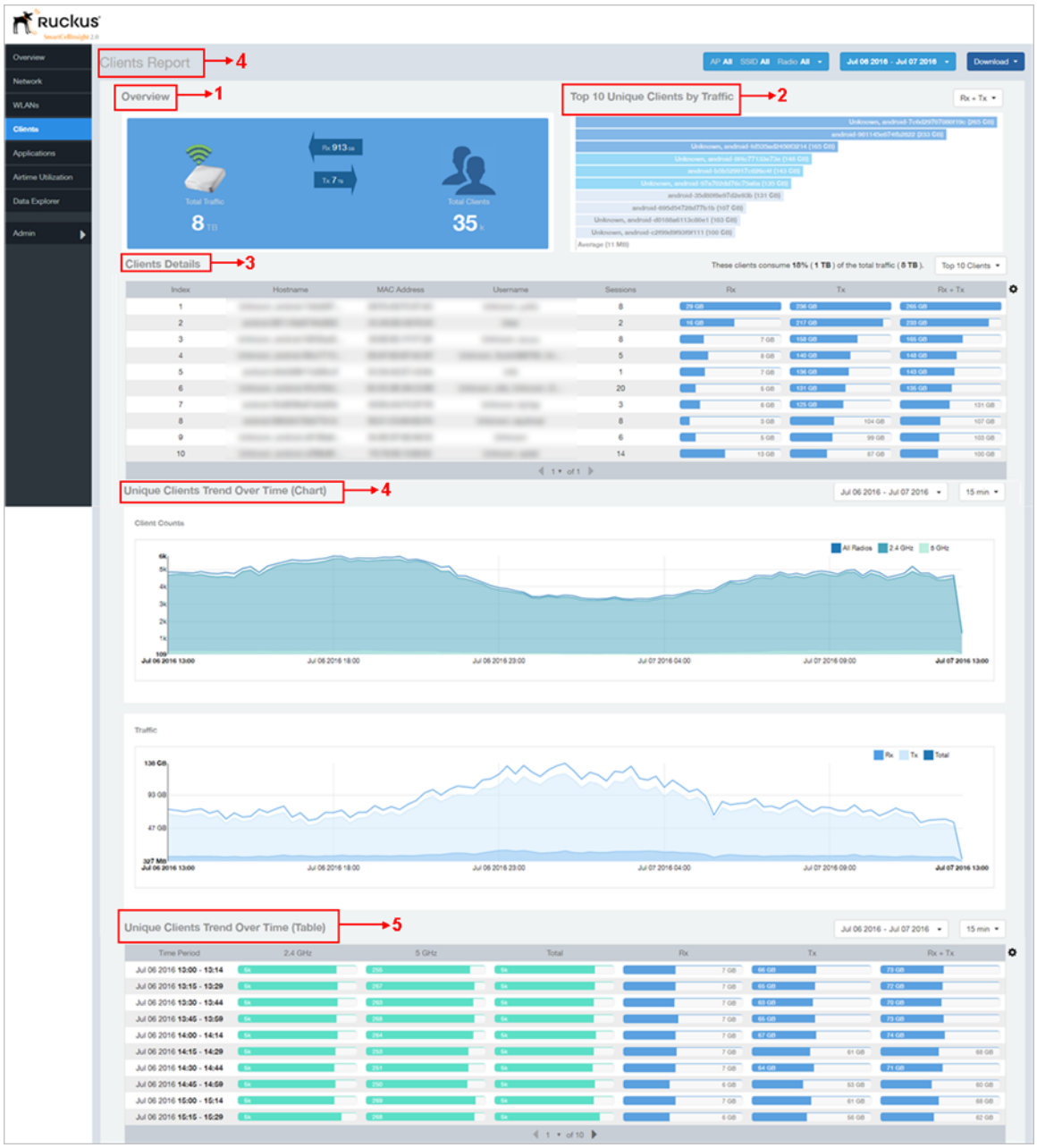


Figure 47: Clients Report

The clients report consists of several sections as per the table below. For ease of reading, each section has been numbered in the figure above, and corresponds to the table below.

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

Clients - Overview

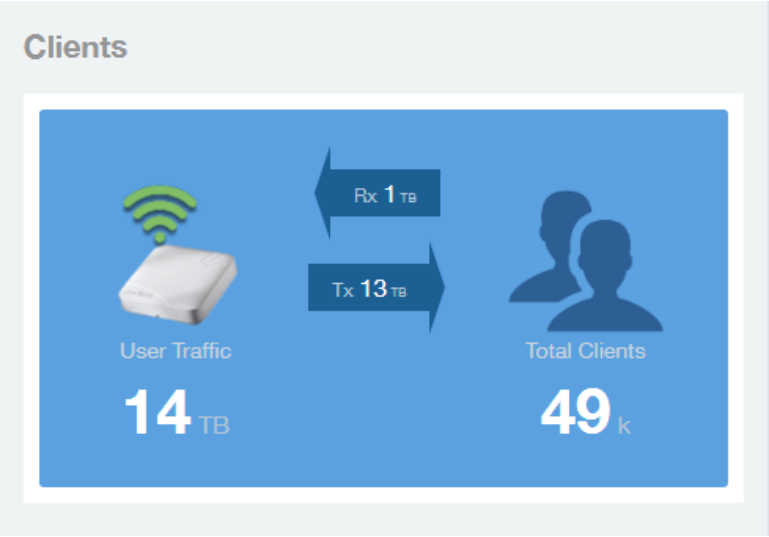
Provides an overview of the total traffic, both received and transmitted, and the total number of clients over the selected time period.

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 48: Overview



Clients - Top 10 Unique Clients by Traffic

This section provides you with the details of the top 10 unique clients by traffic, filtered on received traffic, transmitted traffic, and received and transmitted traffic.

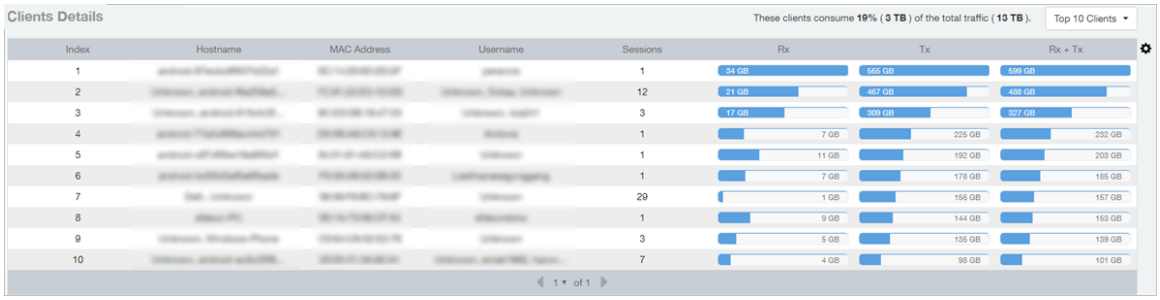
Figure 49: Top 10 Unique Clients by Traffic

Client Details

This table contains 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.

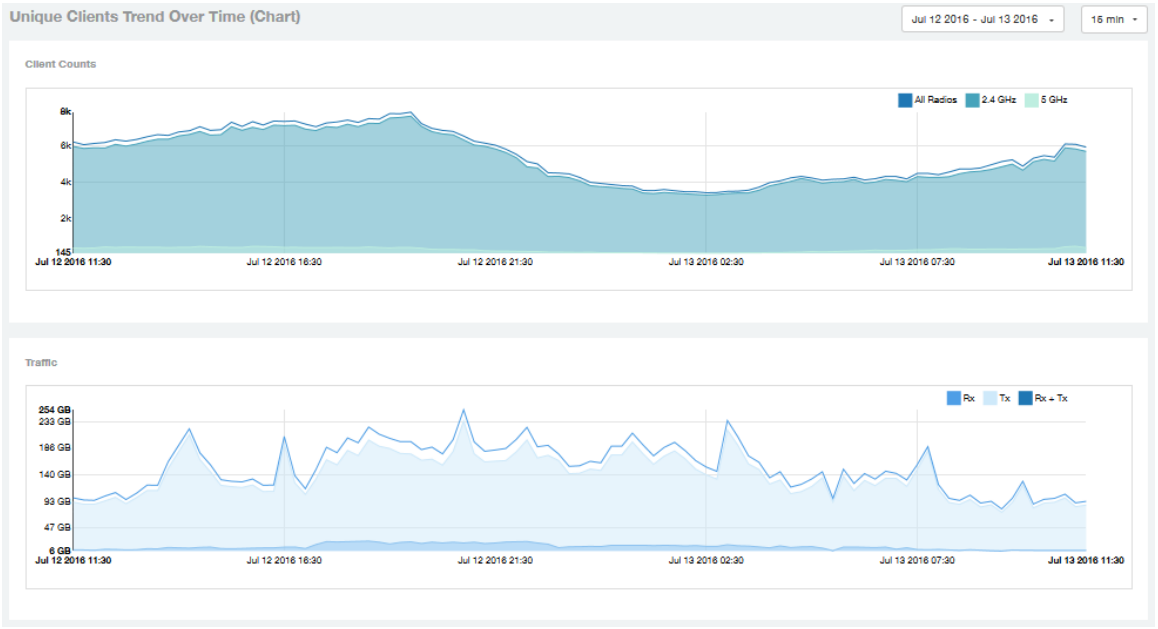
Figure 50: Client details



Clients - Unique Clients Trends Over Time (Chart)

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

Figure 51: Unique Clients Trend Over Time Chart



Clients Unique Clients Trend Over Time (Table)

This table displays the total numbers of unique clients over the specified time intervals, as well as unique client count per radio, and client traffic (Tx, Rx, total) for a given time period.

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

Figure 52: Unique Clients Trend Over Time Table

Unique Clients Trend Over Time (Table)
Jul 12 2016 - Jul 13 2016
15 min
Time Period
2.4 GHz
5 GHz
Total
Rx
Tx
Rx + Tx
Jul 12 2016 11:30 - 11:44 6k 430 6k 7 GB 92 GB 99 GB
Jul 12 2016 11:45 - 11:59 6k 411 6k 7 GB 88 GB 95 GB
Jul 12 2016 12:00 - 12:14 6k 429 6k 7 GB 88 GB 95 GB
Jul 12 2016 12:15 - 12:29 6k 484 6k 8 GB 94 GB 102 GB
Jul 12 2016 12:30 - 12:44 6k 459 6k 8 GB 100 GB 108 GB
Jul 12 2016 12:45 - 12:59 6k 478 6k 7 GB 89 GB 96 GB
Jul 12 2016 13:00 - 13:14 6k 470 6k 8 GB 99 GB 107 GB
Jul 12 2016 13:15 - 13:29 6k 468 6k 10 GB 112 GB 121 GB
Jul 12 2016 13:30 - 13:44 6k 469 7k 9 GB 112 GB 121 GB
Jul 12 2016 13:45 - 13:59 6k 448 7k 12 GB 151 GB 163 GB
1 of 10

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.

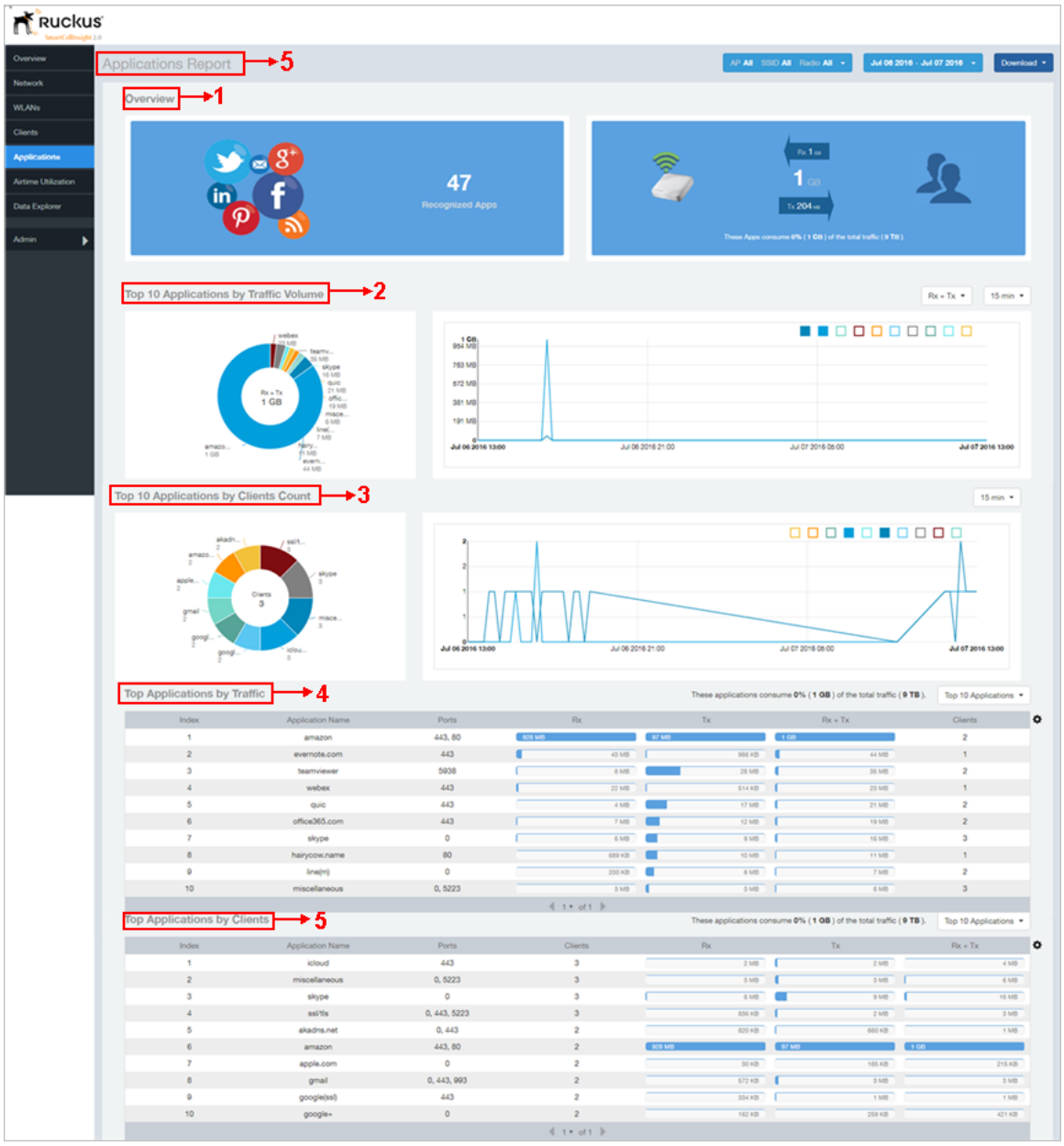


Figure 53: Applications Report

The Applications report consists of several sections as per the table below. For ease of reading, each section has been numbered in the figure above, and corresponds to the table below.

1	Overview	Contains the list of applications that SCI recognizes, and displays the percentage of traffic consumed by these applications
2	Top 10 Applications by traffic volume	Contains the list of top 10 applications in terms of volume of traffic.
3	Top 10 Applications by Client Count	Contains the application information and displays the quantity of traffic consumed by the listed applications.
4	Top Applications by Traffic	Displays the top applications by traffic and the percentage consumed of the total traffic.
5	Top Applications by Clients	Displays the top applications by clients and the percentage consumed of the total traffic by the applications.

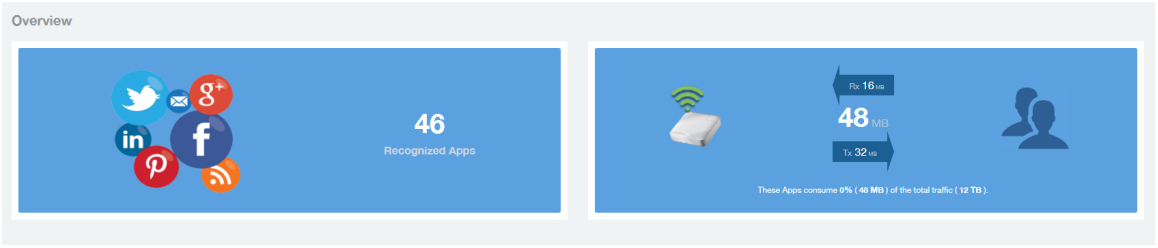
Applications - Overview

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

The Overview section 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 54: Applications Overview



Applications - Top 10 by Traffic Volume

Displays the top applications with the largest traffic volume in the network, alongwith the received and transmitted traffic volumes.

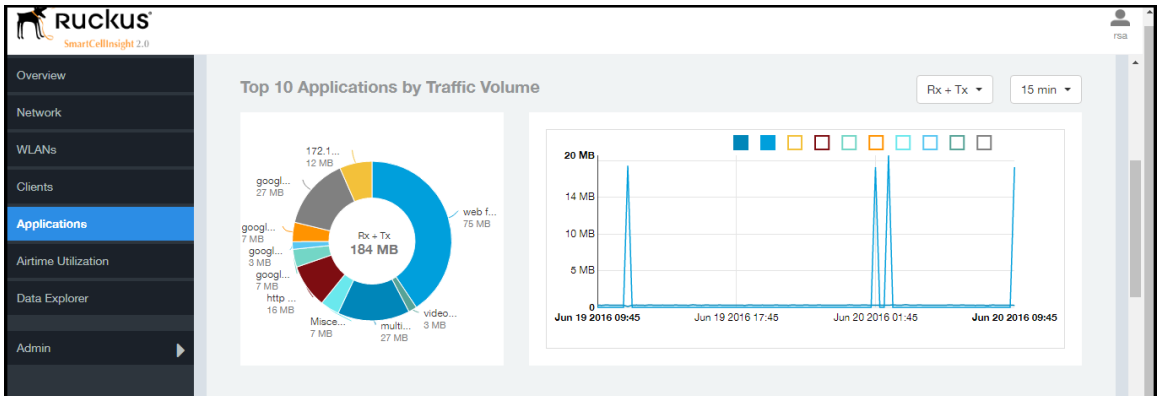


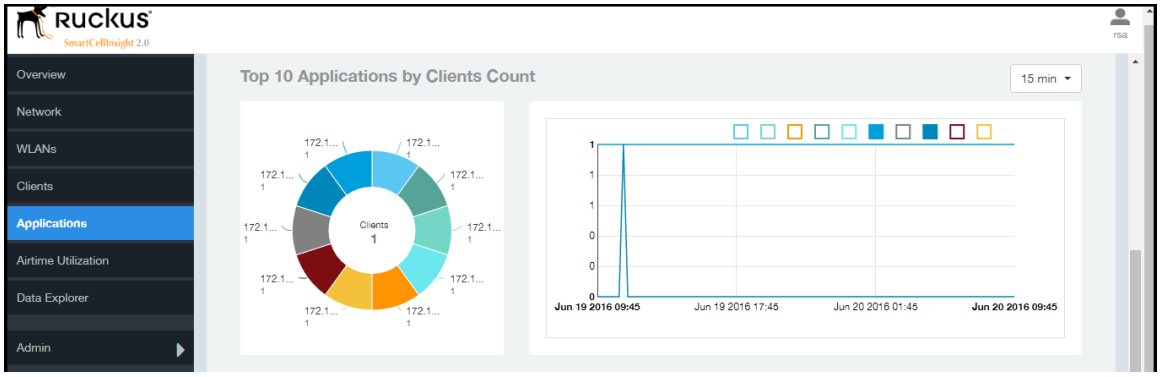
Figure 55: Top 10 Applications by Traffic Volume

The pie chart and graph contain the top applications with the largest traffic volume in the network, alongwith the received and transmitted traffic volumes. You can view the received and transmitted traffic volumes based on the Rx and Tx filter. You can also specify the time of 15 minutes, 1 hour or 1 day for data granularity purpose using the Time Filter on page 21. To view the top 10 APs choose from the legend available on the top of the graph. Each AP will appear as a separate graph line. If you hover over the line graph a pop-up appears containing the selected details.

Applications - Top 10 by Client Count

The Top 10 Applications by Client Count report consists of a pie chart and graph containing the top 10 applications by client count in the network.

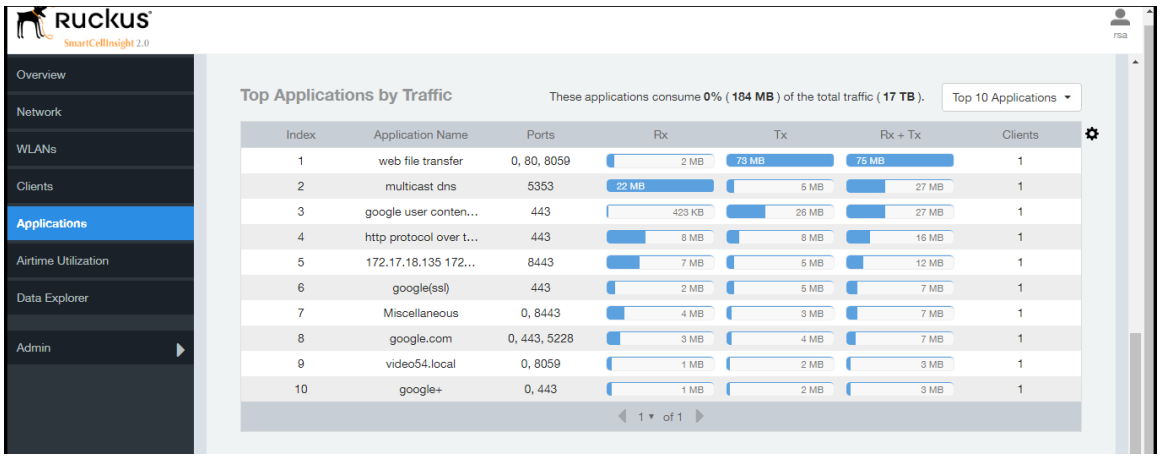
Figure 56: Top 10 Applications by Clients Count



Applications - Top Applications by Traffic

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

Figure 57: Top Applications by Traffic



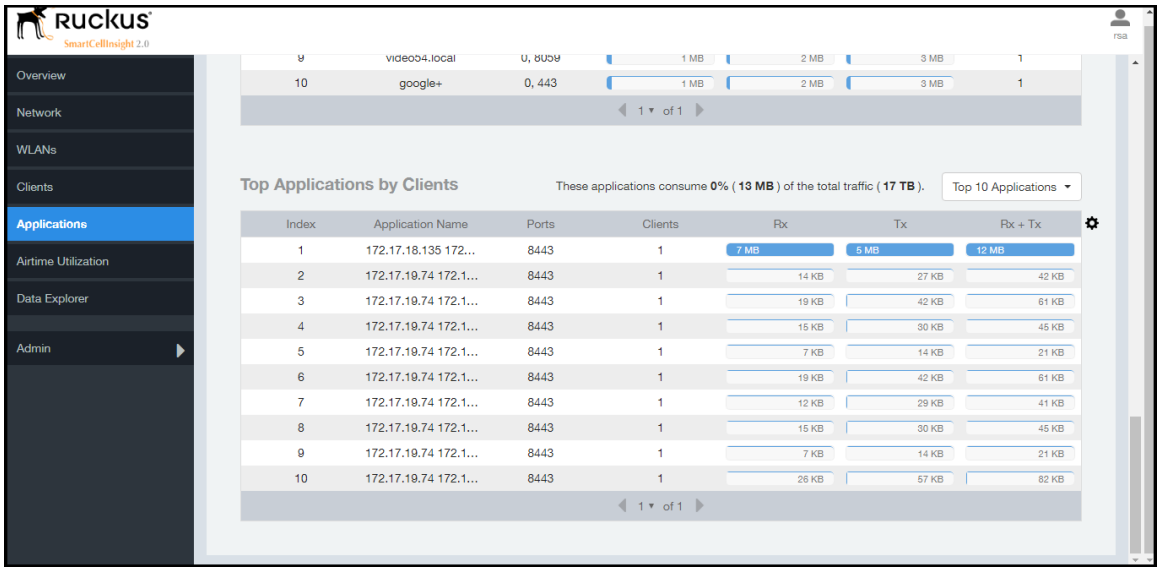
Applications - Top Applications by Clients

Use the Top Applications by Clients table 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 58: Top Applications by Clients


Ruckus
SmartCellInsight 2.0
rsa
Overview
Network
WLANs
Clients
Applications
Airtime Utilization
Data Explorer
Admin
9 videos4.local 0, 8059 1 MB 2 MB 3 MB 1
10 google+ 0, 443 1 MB 2 MB 3 MB 1
1 of 1
Top Applications by Clients
These applications consume 0% (13 MB) of the total traffic (17 TB).
Top 10 Applications
Index Application Name Ports Clients Rx Tx Rx + Tx
1 172.17.18.135 172... 8443 1 7 MB 5 MB 12 MB
2 172.17.19.74 172.1... 8443 1 14 KB 27 KB 42 KB
3 172.17.19.74 172.1... 8443 1 19 KB 42 KB 61 KB
4 172.17.19.74 172.1... 8443 1 15 KB 30 KB 45 KB
5 172.17.19.74 172.1... 8443 1 7 KB 14 KB 21 KB
6 172.17.19.74 172.1... 8443 1 19 KB 42 KB 61 KB
7 172.17.19.74 172.1... 8443 1 12 KB 29 KB 41 KB
8 172.17.19.74 172.1... 8443 1 15 KB 30 KB 45 KB
9 172.17.19.74 172.1... 8443 1 7 KB 14 KB 21 KB
10 172.17.19.74 172.1... 8443 1 26 KB 57 KB 82 KB
1 of 1

Airtime Utilization Report

The Airtime Utilization report provides the overview of airtime utilization for radios and APs.

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.

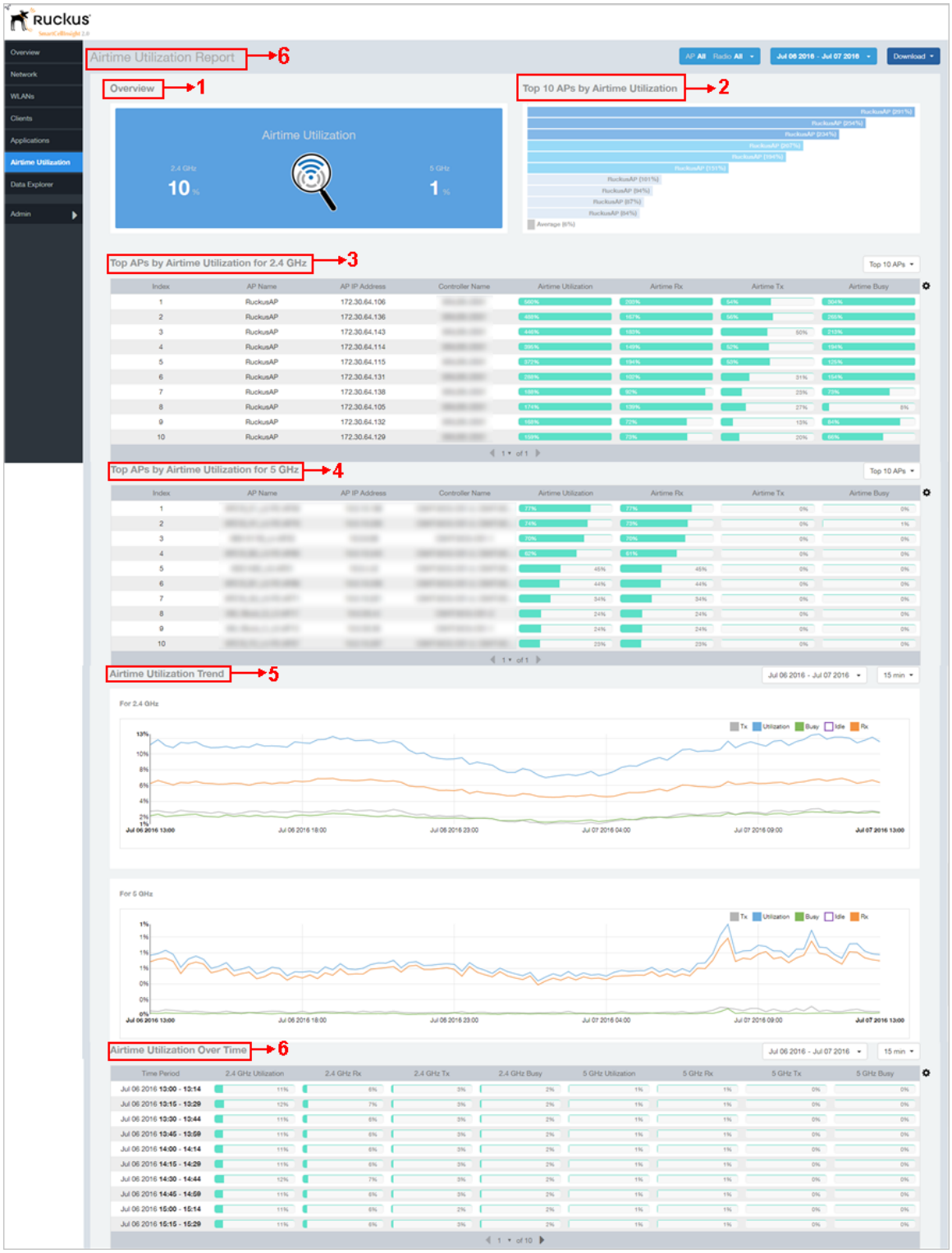


Figure 59: Airtime Utilization Report

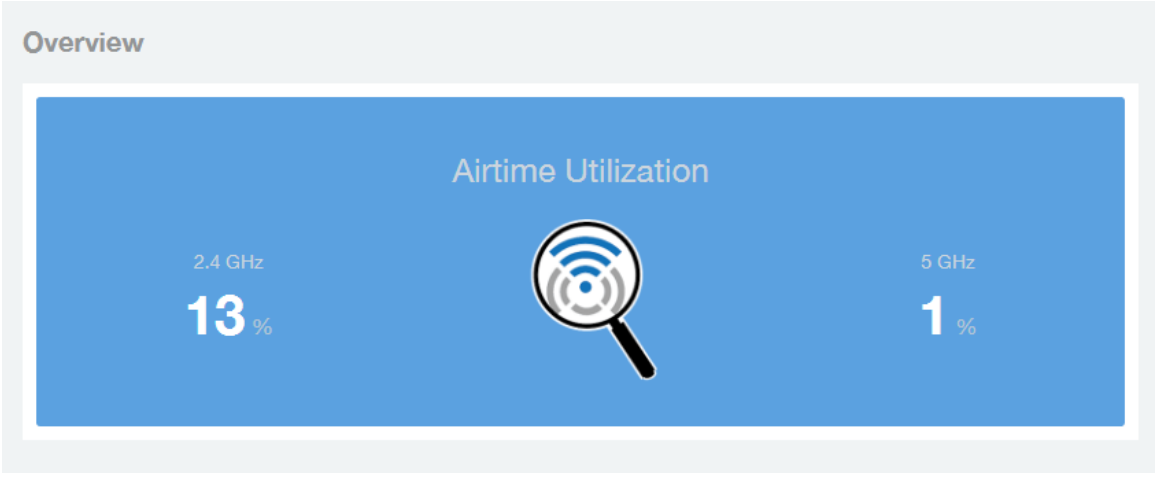
The Airtime utilization report consists of several sections as per the table below. For ease of reading, each section has been numbered in the figure above, and corresponds to the table below.

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

Airtime Utilization - Overview

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

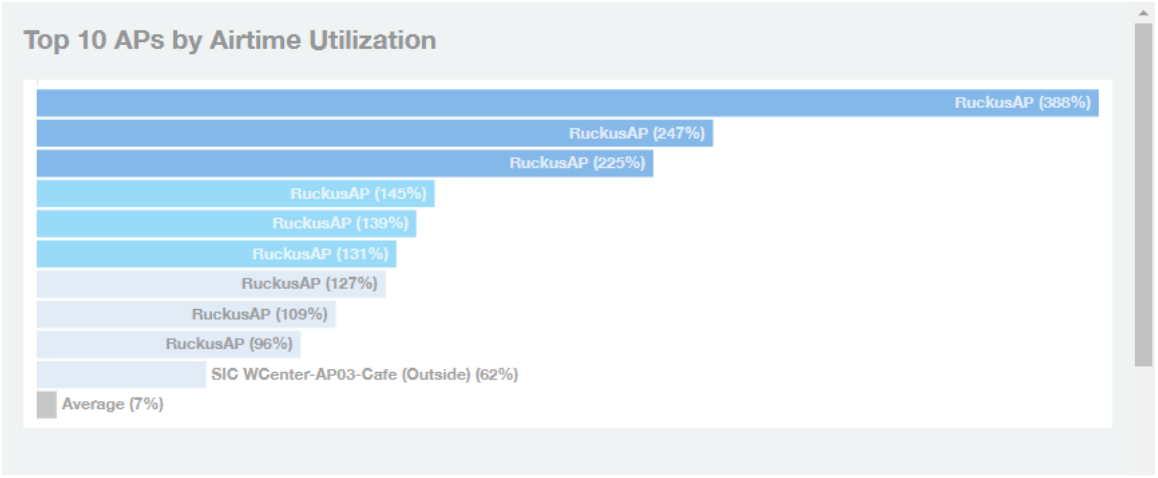
Figure 60: Airtime Utilization Overview



Top 10 APs By Airtime Utilization

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

Figure 61: Top 10 APs by Airtime Utilization



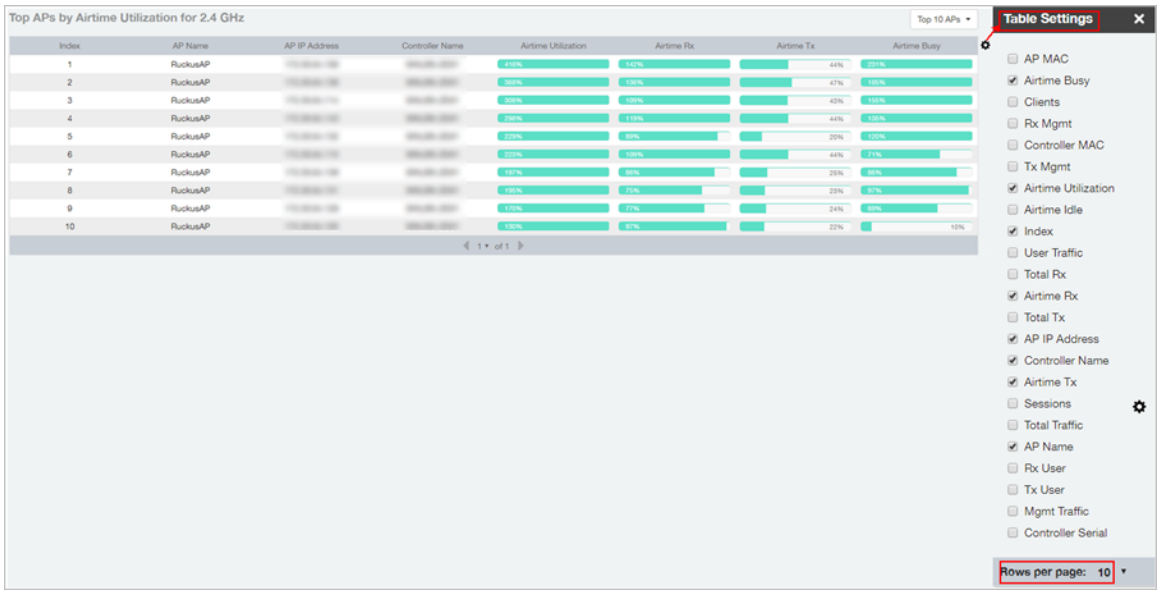
Top APs by Airtime Utilization for 2.4 Ghz

This report displays which APs have the highest utilization on the 2.4 GHz radio.

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

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

Figure 62: Top APs by Airtime Utilization for 2.4 GHz



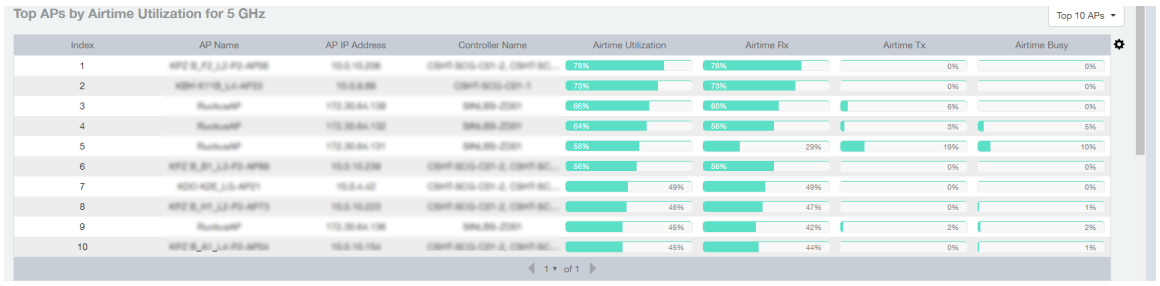
Top APs by Airtime Utilization for 5 GHz

This 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 according to the selected columns. Click the gear icon to select which columns to display, or click any column heading to sort by that column.

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

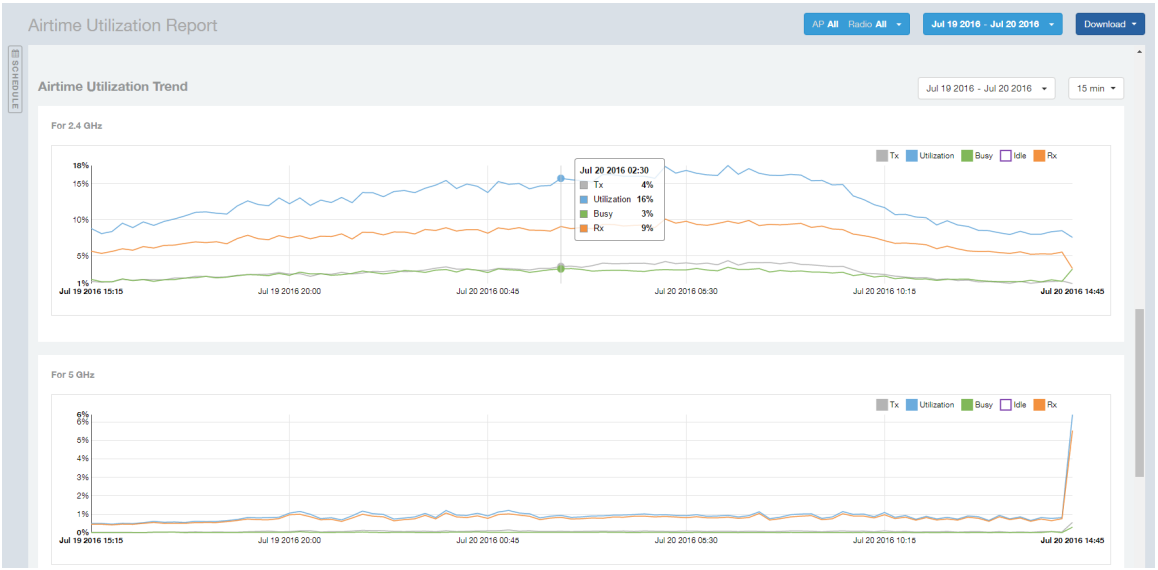
Figure 63: Top APs by Airtime Utilization for 5 GHz



Airtime Utilization Trend

This graph shows the airtime utilization trends for 2.4 and 5 GHz radios in percentages over time.

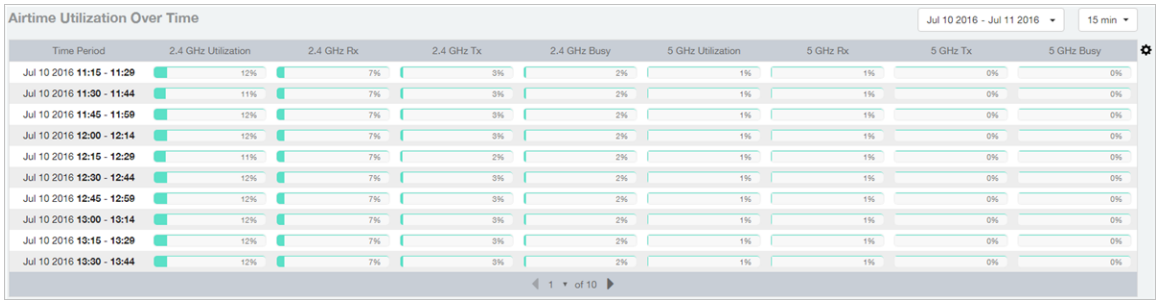
Figure 64: Airtime Utilization Trend



Airtime Utilization - Over Time

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

Figure 65: Airtime Utilization Over Time



Data Explorer

The Data Explorer allows you to view, filter, and manipulate data in virtually any way and from any perspective you can imagine.

Data Exploration

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

Consider your data to be a 3-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 datasets will have more than 3 dimensions, but the concepts from a 3D cube can be directly extended to a multi-dimensional hypercube.

With an OLAP cube, there are actually only 5 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. So what you have after the above slice and dice, is a smaller piece of the original OLAP cube.
3. **Drill Up/Down:** In order to get 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, always refer to these 5 simple operations and you will never be lost! A good reference on OLAP cubes can be found in Wikipedia `https://en.wikipedia.org/wiki/OLAP_cube`

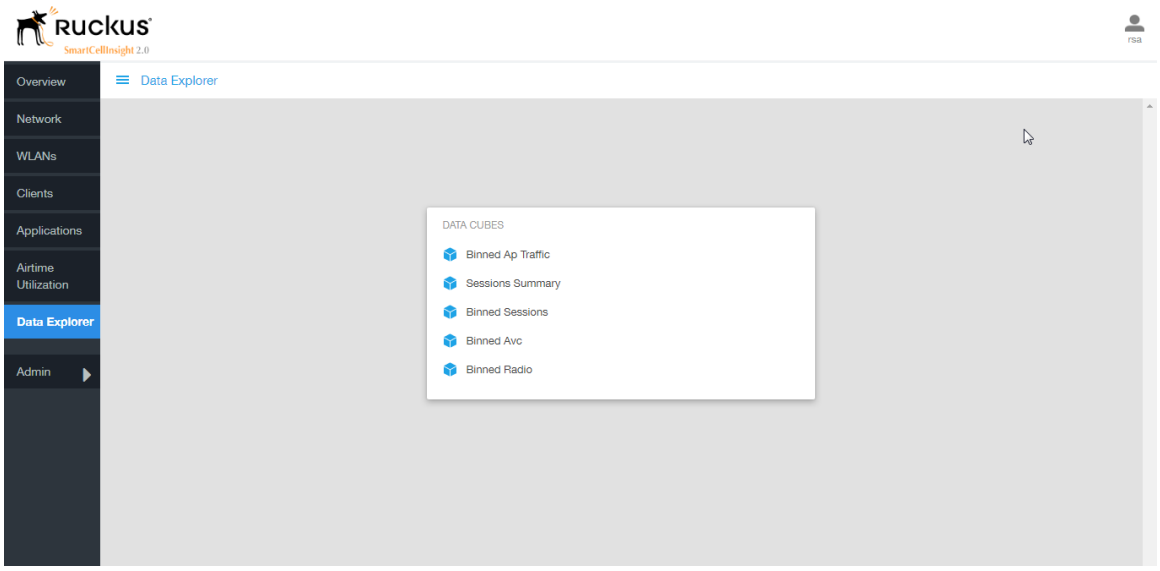


Figure 66: Data Explorer

The SCI Data Explorer allows you to explore the data for Radio, AP Traffic, Sessions, and AVC, using your own permutations and combinations, unlike the other canned reports available. The Data Explorer contains the following data cubes or data tables:

- Sessions Summary on page 55
- Binned Sessions on page 55
- Binned AVC on page 56
- Binned AP Traffic on page 56
- Binned Radio on page 57

Sessions Summary

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

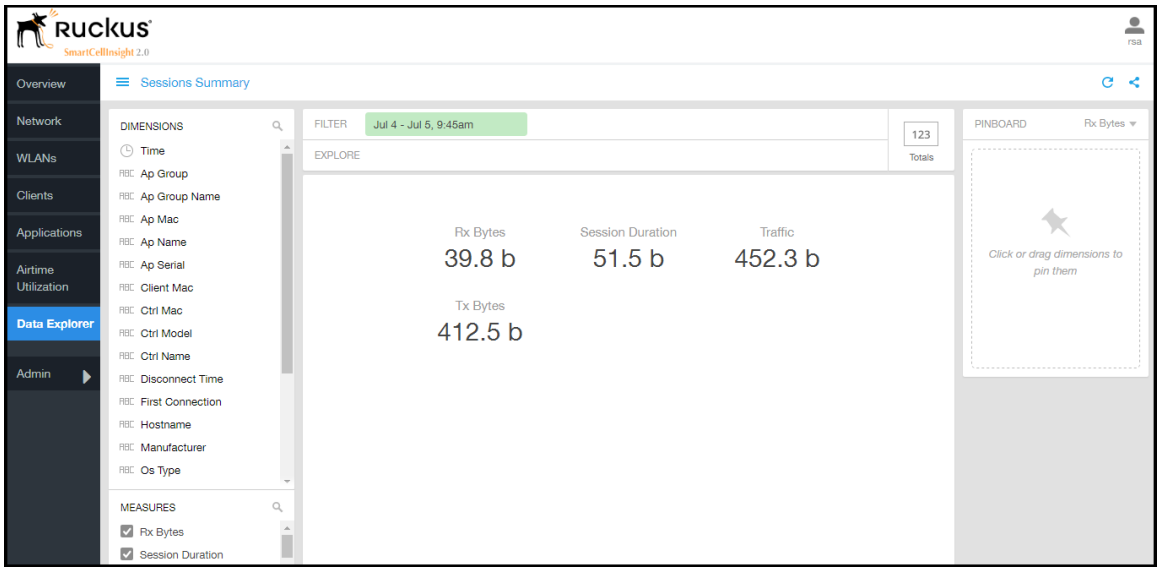


Figure 67: Sessions Summary

Binned Sessions

The Binned Sessions cube allows you to experiment with the sessions data.

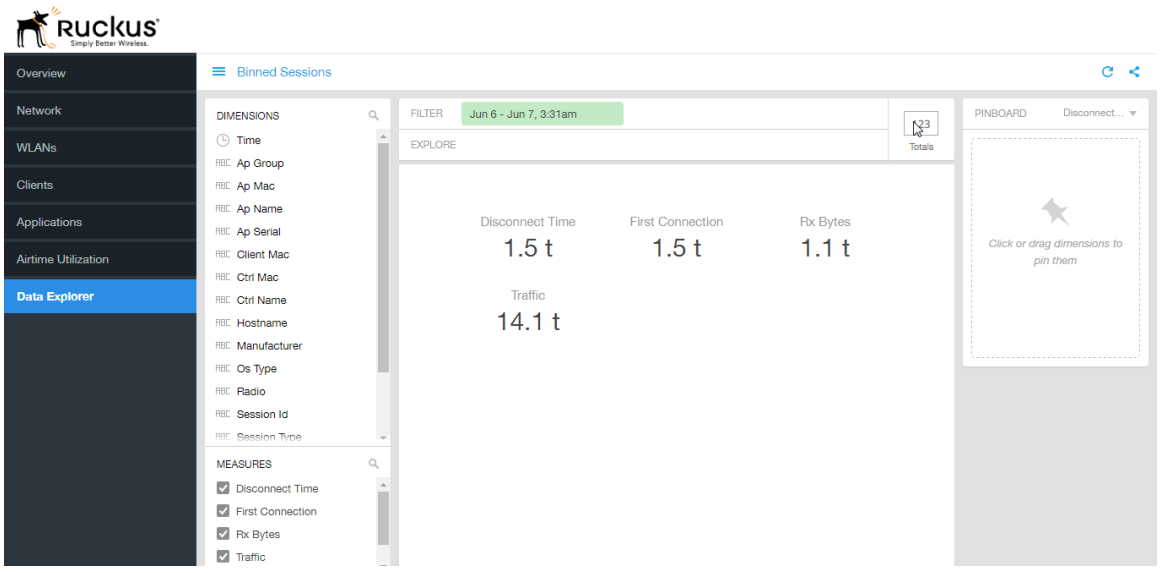


Figure 68: Binned Sessions

Binned AVC

The Binned AVC cube allows you to explore the AVC data in any method of your choice.

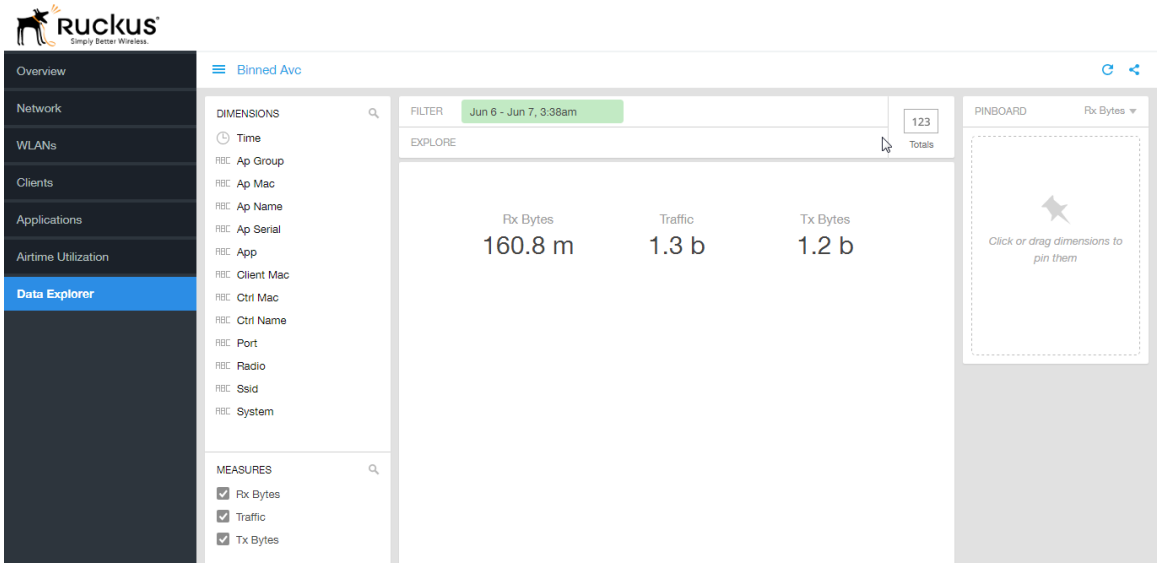


Figure 69: Binned AVC

Binned AP Traffic

The Binned AP Traffic cube allows you to explore the AP traffic data and use or share the same for custom requirements.

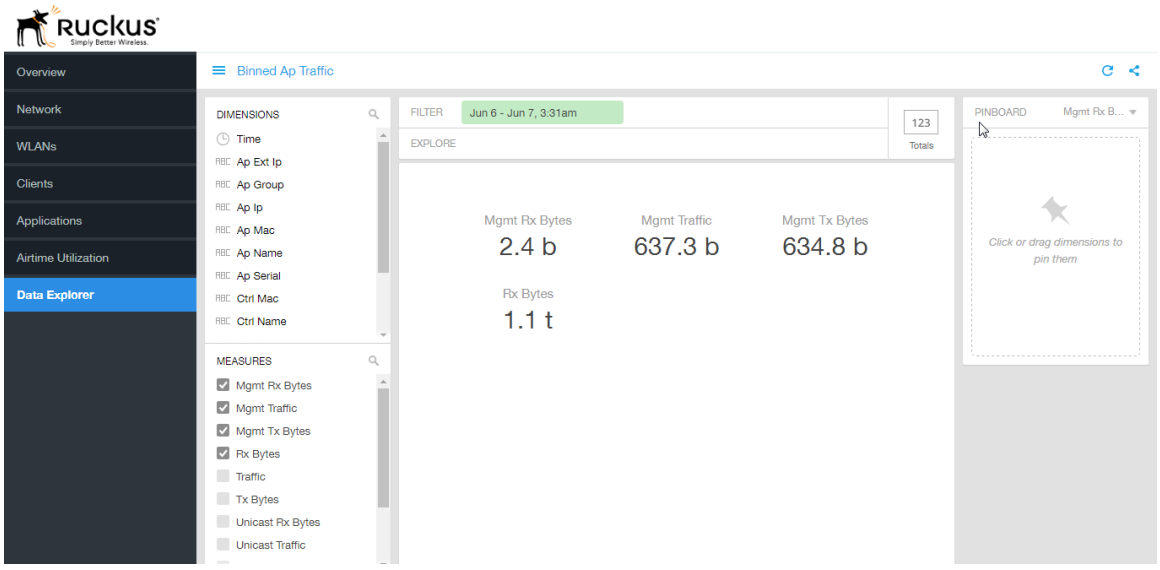


Figure 70: Binned AP Traffic

Binned Radio

The Binned Radio cube allows you to explore the Radio data in any method of your choice. It provides you a platform to experiment with the data and use the same for custom requirements.

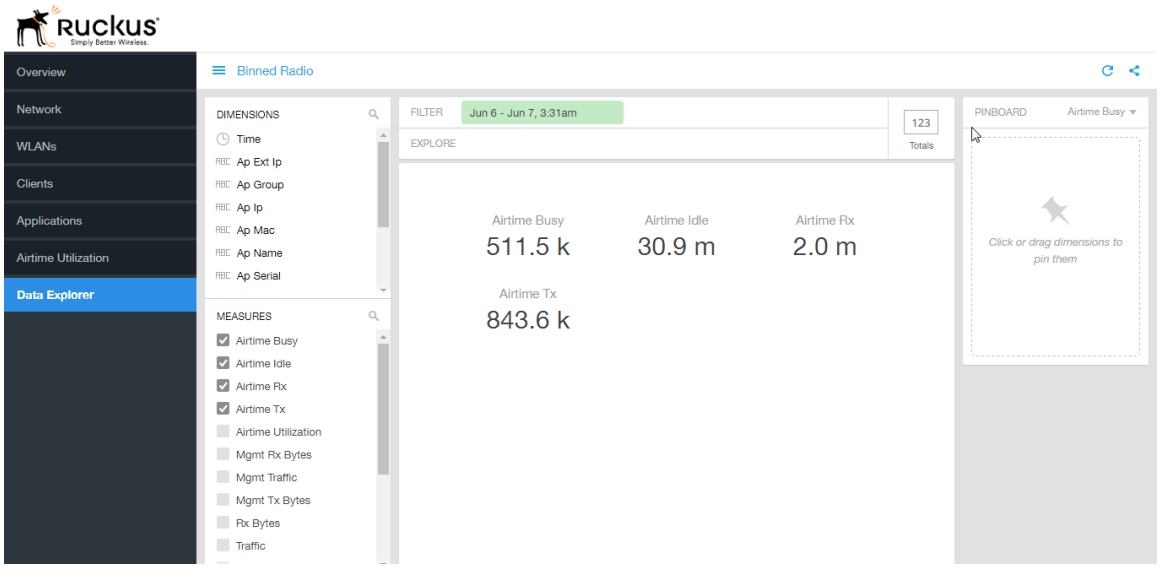


Figure 71: Binned Radio

Data Explorer - Data Cubes

Data Cubes contain groups of data sets, some of which exist in multiple cubes.

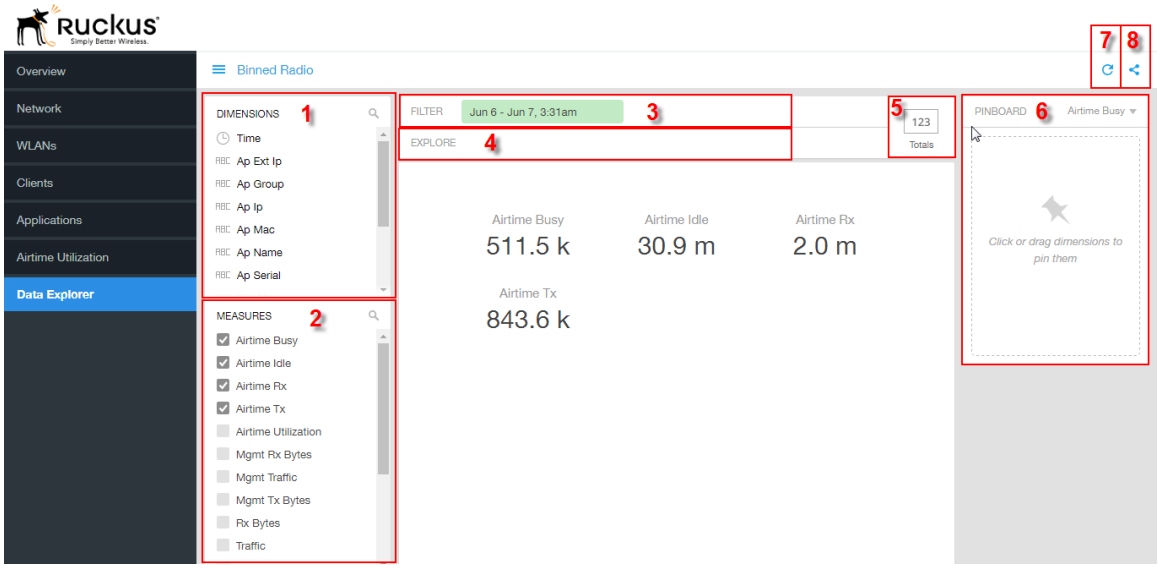


Figure 72: Data Cube Filters

The data cube filters are common to all the data cubes and are explained in detail in the sections below.

Dimensions

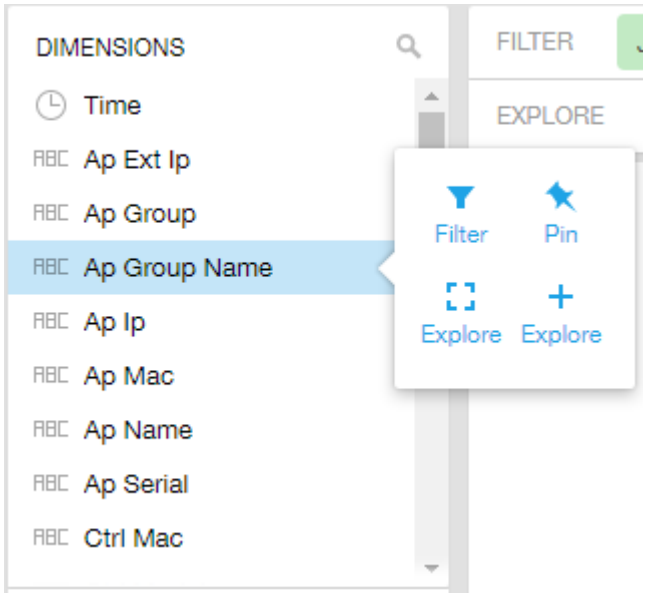


Figure 73: Dimensions

Number 1 in #unique_73/unique_73_Connect_42_fig_vzd_frl_fw. 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, or 100). You can also change the sorting order of the dimensions to be explored and pivot or change the hierarchy.
- Pin - one or more dimensionson on the Pinboard for easy reference.

Measures

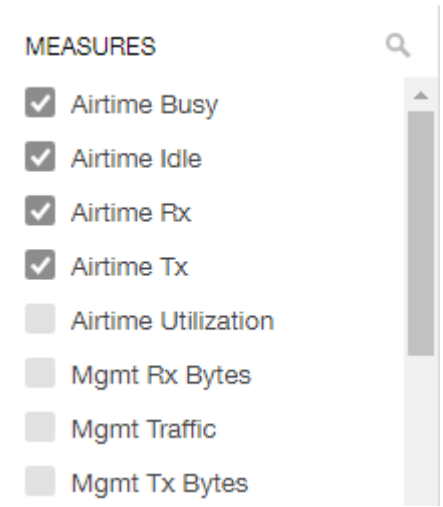


Figure 74: Measures

Number 2 in the #unique_73/unique_73_Connect_42_fig_vzd_frl_fw. Lists numbers such as Rx bytes, Traffic and Tx bytes. Select one or more measures by which you want to sort the selected dimension (in Explore). The first four measures in the list are the default measures.

Filter

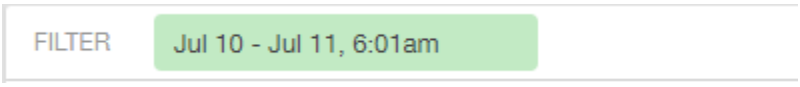


Figure 75: Filter

Number 3 in the #unique_73/unique_73_Connect_42_fig_vzd_frl_fw. 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.

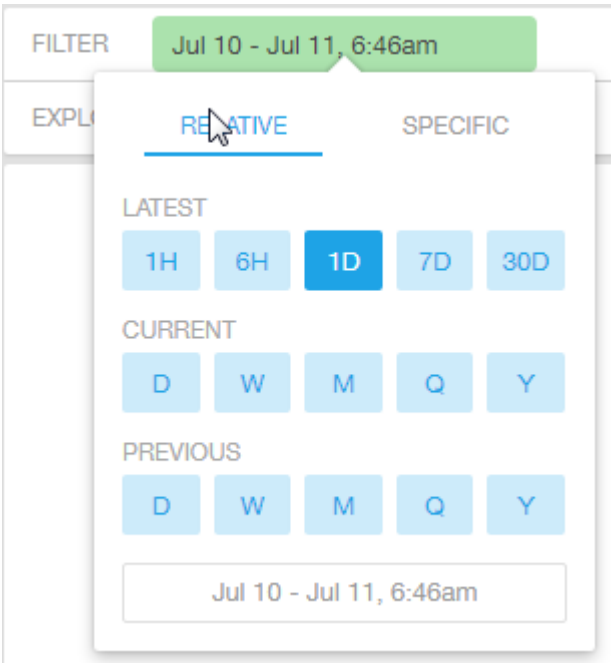


Figure 76: Time - Relative Settings

You can specify the:

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

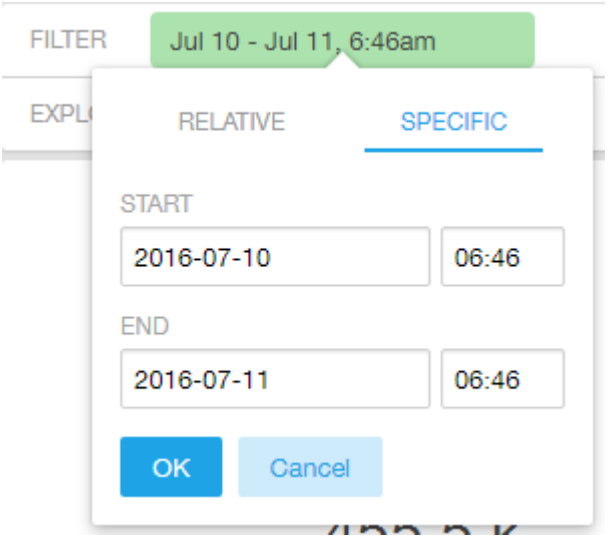


Figure 77: Time - Specific Settings

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

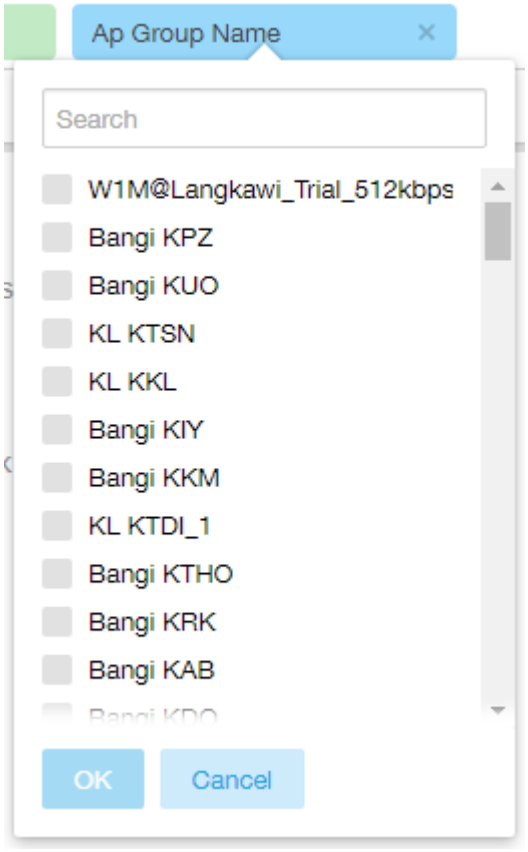


Figure 78: Dimension Options

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

Explore

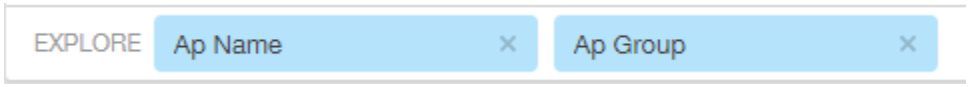


Figure 79: Explore

Number 4 in the #unique_73/unique_73_Connect_42_fig_vzd_frl_fw. Enables visualization based on dimensions and time (data granularity).

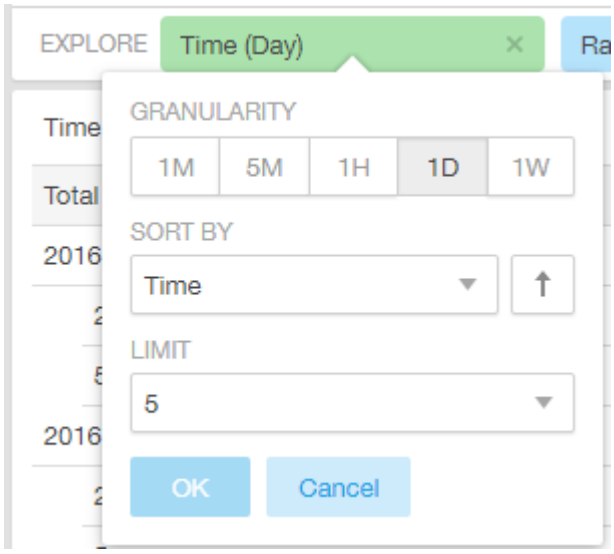


Figure 80: Explore Time

Use this filter to:

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

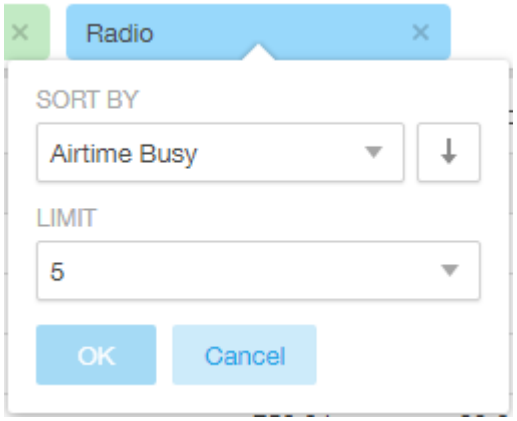


Figure 81: Sort Dimension by Measure

Use this filter to:

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

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

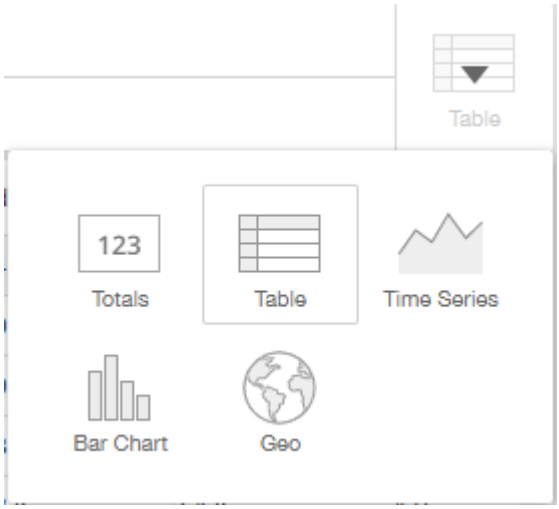


Figure 82: View Outputs

Number 5 in the #unique_73/unique_73_Connect_42_fig_vzd_frl_fw. Create outputs from visualization in the form of Totals, Tables, Bar chart, and Time Series. The default view is Totals. The Geo view is not supported in the SCI 2.0 release.

Pinboard

Figure 83: Pinboard

Number 6 in the #unique_73/unique_73_Connect_42_fig_vzd_frl_fw. Click or drag dimensions and pin them on the pinboard. Retain the dimensions for ready reference during visualization.

You can sort the dimensions pinned on the pinboard by the drop down list of measures on the top right hand corner of the pinboard.

Refresh Options

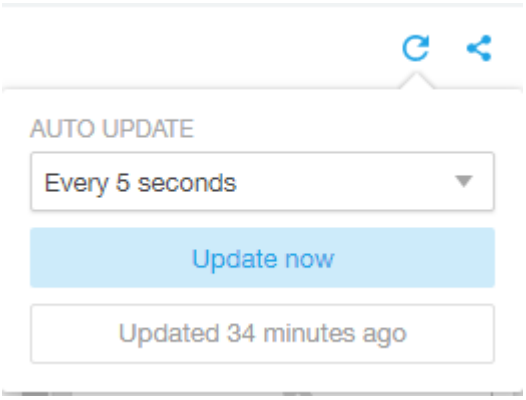


Figure 84: Refresh

Number 7 in the #unique_73/unique_73_Connect_42_fig_vzd_frl_fw. Refresh or auto update the screen at a selected time of 5 seconds, 15 seconds, every minute, 5 minutes, 10 minutes, 30 minutes, or not at all (off). The default option is **Update now**. It displays at the bottom of the pop-up, when the last update occurred.

Share Link

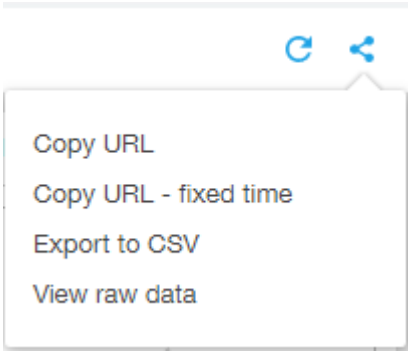


Figure 85: Share Link

Number 8 in the #unique_73/unique_73_Connect_42_fig_vzd_frl_fw. You can share the URL, Export to CSV, View raw data, or download the information.

Admin Console

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

The Admin section is divided into three pages:

- Status and Updates
- Diagnostics on page 65
- Settings Page
- License Page

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

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 86: Diagnostics

Ruckus
SmartCellInsight 2.0
rsa
Overview
Network
WLANs
Clients
Applications
Airtime Utilization
Data Explorer
Admin
Status & Update
Diagnostics
Diagnostics
Data ingestion and ETL jobs
Spark Master UI
Data lake and raw data storage
HDFS
Data warehouse
Druid Coordinator
Druid Overlord

SCI Settings

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

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

SMTP Settings

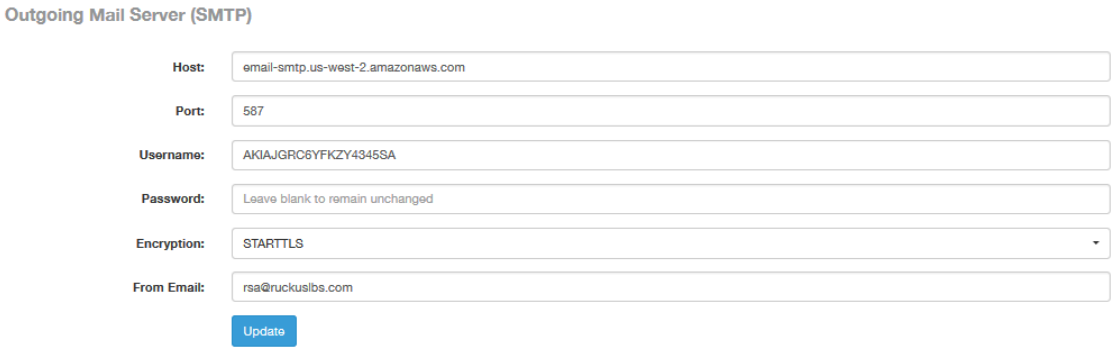


Figure 87: SMTP Settings

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

- **Host**: Enter the name of the host.
- **Port**: Enter the port number.
- **Username**: Enter the user name required to access the SMTP mail server.
- **Password**: Enter the password required to access the SMTP mail server.
- **Encryption**: Select the encryption method from the drop down list. You can also disable the encryption by selecting **Disabled** from the drop down list.
- **From email**: Enter the email ID that the messages are sent from.

Controller Settings

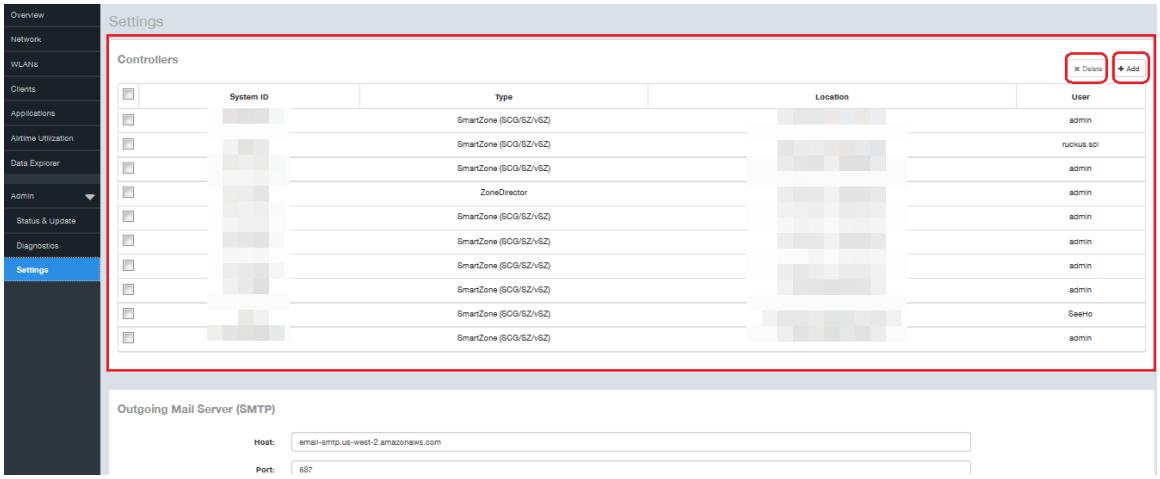


Figure 88: Controller Settings

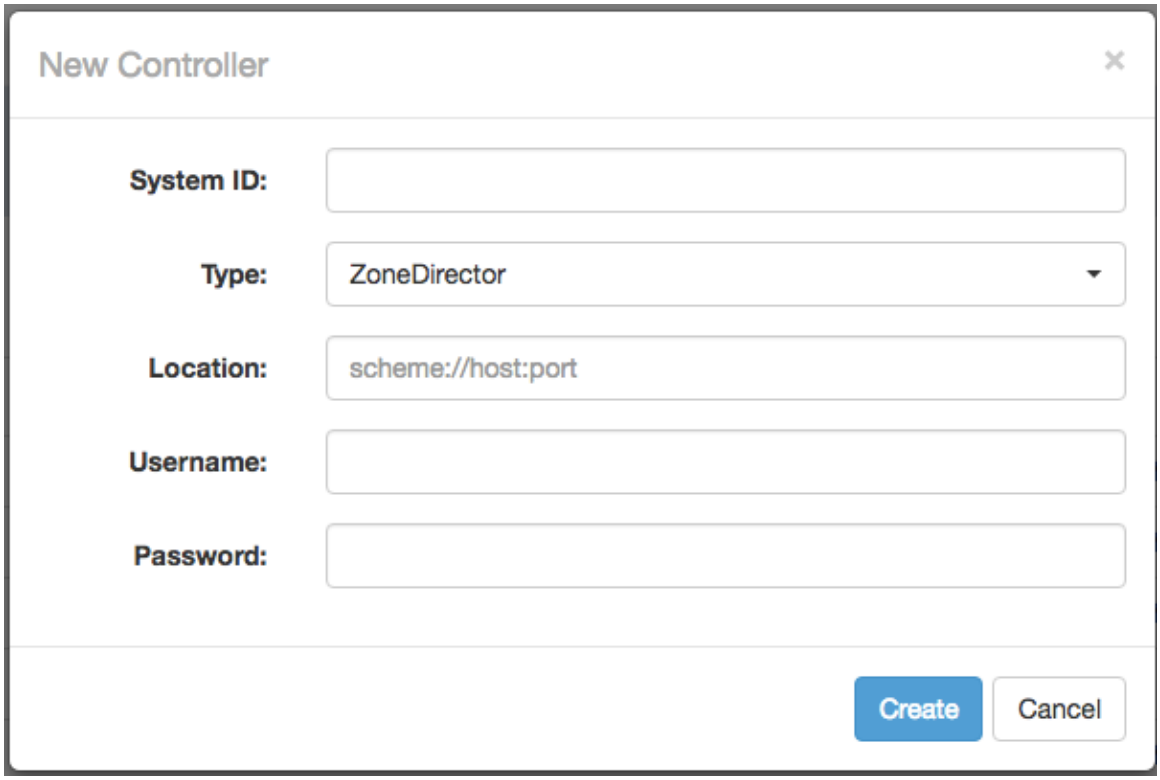


Figure 89: Adding Controller Settings for ZoneDirector

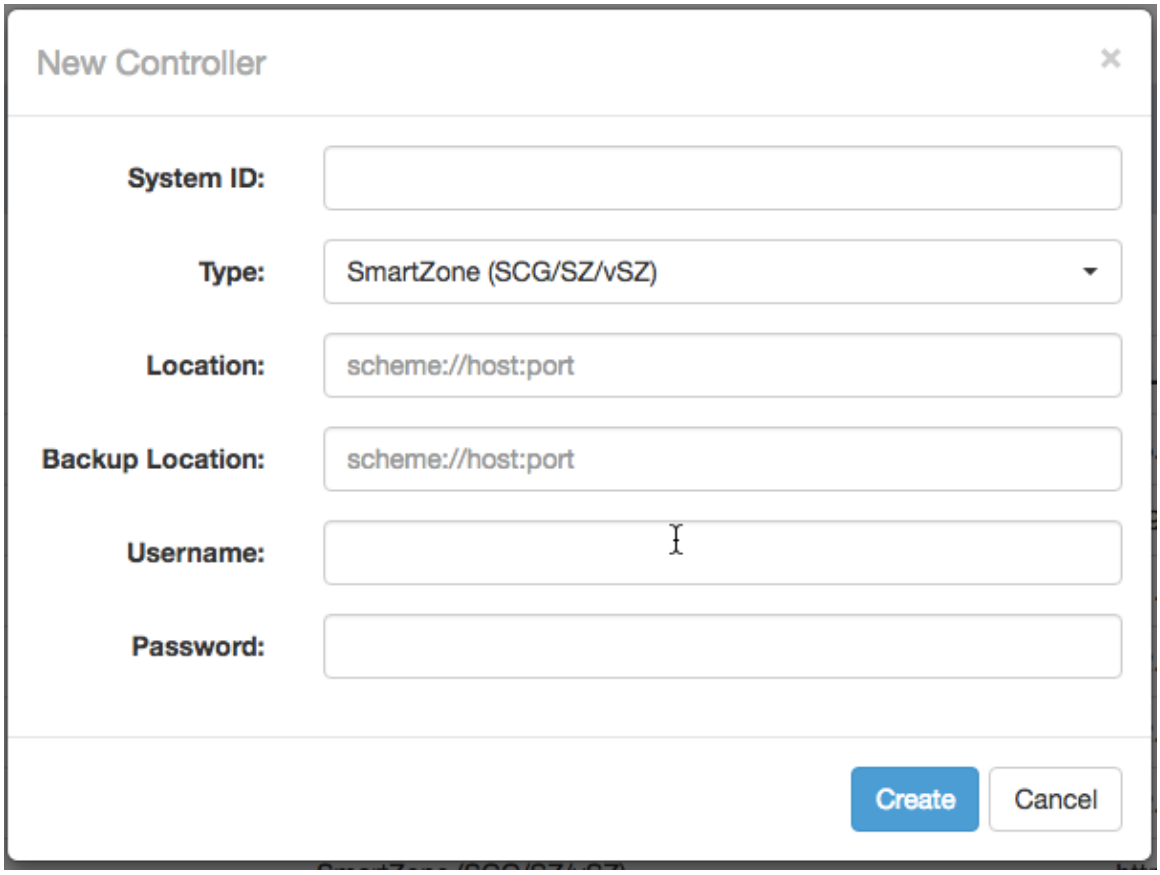


Figure 90: Adding Controller Settings for SmartZone Controllers

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

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

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

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

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

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

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

License

SCI 2.0 supports a trial license that you can use to try out the product before you purchase it. SCI 2.0 also supports a permanent SCI license.

SCI has a built in trial license which is valid for 3 months. This license needs to be updated to the permanent license before the trial license expires. Follow these steps to upgrade to the permanent license.

1. In the SCI 2.0 web UI, click **Admin > License**.
2. Generate a serial number for the SCI product.
3. Use the serial number to purchase and activate a license from the Ruckus support website. The Ruckus website provides a license file that you can download.
4. Upload this file to SCI on the License page.

You have successfully upgraded to the permanent license.

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