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Ruckus Wireless™ SmartZone™ 100/ Virtual SmartZone™ Essentials

Administrator Guide for SmartZone 3.1.2

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2 Working with User Accounts, Guest Passes, and User Roles

3 Configuring the Wireless Network

4 Configuring System Settings

5 Managing Administrators, Administrator Roles, and Administrator Authentication

7 Working with Reports

8 Performing Administrative Tasks

About This Guide

This *Administrator Guide* describes how to configure the Ruckus Wireless™ SmartZone™ 100 (SZ-100)/Virtual SmartZone™ Essentials (vSZ-E) and how to use the web interface to manage access points that are reporting to the SZ-100/vSZ-E (collectively referred to as "the controller" throughout this guide). This guide is written for those responsible for installing and managing network equipment. Consequently, it assumes that the reader has basic working knowledge of local area networking, wireless networking, and wireless devices.

NOTE: If release notes are shipped with your product and the information there differs from the information in this guide, follow the instructions in the release notes.

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

Document Conventions

Table 1 and Table 2 list the text and notice conventions that are used throughout this guide.

Table 1. Text conventions

Convention	Description	Example
`monospace`	Represents information as it appears on screen	`[Device name]>`
`monospace bold`	Represents information that you enter	`[Device name]>` **`set ipaddr 10.0.0.12`**
default font bold	Keyboard keys, software buttons, and field names	On the **Start** menu, click **All Programs**.
italics	Screen or page names	Click **Advanced Settings**. The *Advanced Settings* page appears.

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

In addition to this *Administrator Guide*, each SZ-100/vSZ-E documentation set includes the following:

- *Getting Started Guide/Quick Setup Guide*: Provides step-by-step instructions on how to set up and configure the controller out of the box.
- *Online Help*: Provides instructions for performing tasks using the controller's web interface. The online help is accessible from the web interface and is searchable.
- *Release Notes*: Provide information about the current software release, including new features, enhancements, and known issues.

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When contacting us, please include the following information:

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

For example:

- SZ-100/vSZ-E Administrator Guide for SmartZone 3.1.2
- Part number: 800-71106-001
- Page 88

Navigating the Web Interface 1

In this chapter:

NOTE: Before continuing, make sure that you have already set up the controller as described in the *Getting Started Guide* or *Quick Setup Guide* for your controller platform.

Setting Up the Controller for the First Time

For information on how to set up the controller for the first time, including instructions for running and completing the controller's Setup Wizard, see the *Getting Started Guide* or *Quick Setup Guide* for your controller platform.

Logging On to the Web Interface

Before you can log on to the controller web interface, you must have the IP address that you assigned to the Management (Web) interface when you set up the controller on the network using the Setup Wizard. Once you have this IP address, you can access the web interface on any computer that can reach the Management (Web) interface on the IP network.

Follow these steps to log on to the controller web interface.

1. On a computer that is on the same subnet as the Management (Web) interface, start a web browser. Supported web browsers include:
   - Google Chrome 30 and later (recommended)
   - Safari 6 and later (Mac OS)
   - Safari 5.1.7 and later (Windows)

- Mozilla Firefox 28 and later
- Internet Explorer 10 and later

2 In the address bar, type the IP address that you assigned to the Management (Web) interface, and then append a colon and **`8443`** (the controller’s management port number) at the end of the address.

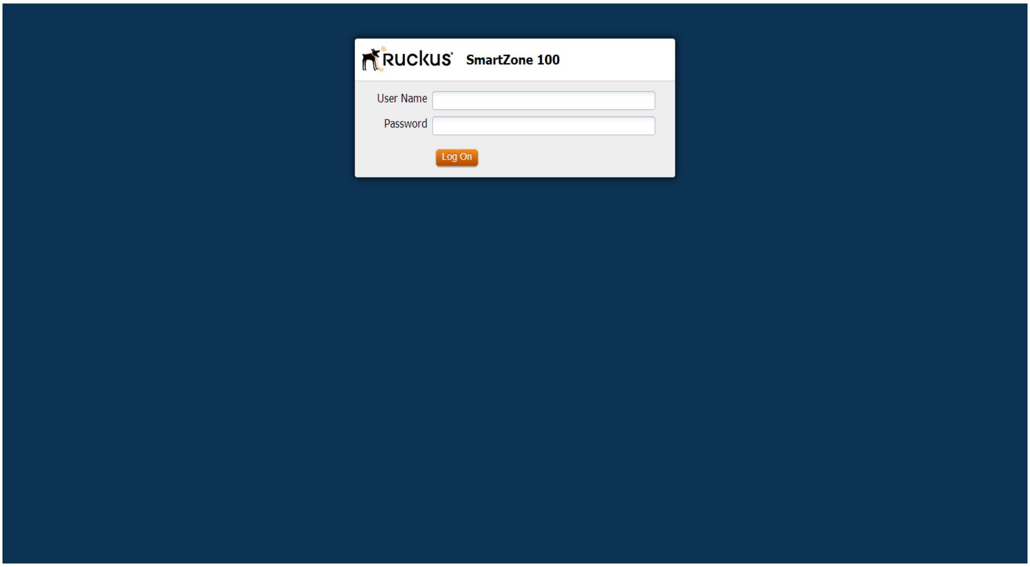
For example, if the IP address that you assigned to the Management (Web) interface is 10.10.101.1, then you should enter:

```
https://10.10.101.1:8443
```

NOTE: The controller web interface requires an HTTPS connection. You must append `https` (not `http`) to the Management interface IP address to connect to the web interface. If a browser security warning appears, this is because the default SSL certificate (or security certificate) that the controller is using for HTTPS communication is signed by Ruckus Wireless and is not recognized by most web browsers.

The controller web interface logon page appears.

Figure 1. The controller logon page



3 Log on to the controller web interface using the following logon details:

- *User Name*: admin

- *Password*: {the password that you set when you ran the Setup Wizard}

4 Click **Log On**.

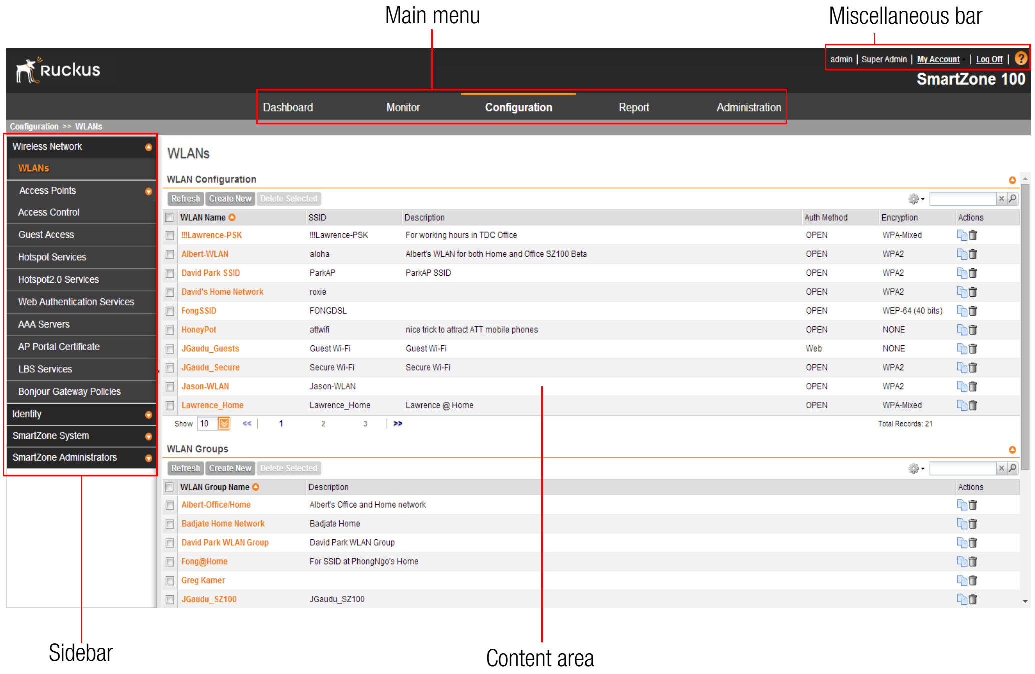
The web interface refreshes, and then displays the Dashboard, which indicates that you have logged on successfully.

Web Interface Features

The web interface (shown in Figure 2) is the primary interface that you will use to:

- Manage access points and WLANs
- Create and manage users and roles
- Monitor wireless clients, managed devices, and rogue access points
- View alarms, events, and administrator activity
- Generate reports
- Perform administrative tasks, including backing up and restoring system configuration, upgrading the cluster upgrade, downloading support, performing system diagnostic tests, viewing the statuses of controller processes, and uploading additional licenses (among others)

Figure 2. The controller web interface features



WLANs

WLAN Configuration

WLAN Name	SSID	Description	Auth Method	Encryption	Actions
!!!Lawrence-PSK	!!!Lawrence-PSK	For working hours in TDC Office	OPEN	WPA-Mixed	
Albert-WLAN	aloha	Albert's WLAN for both Home and Office SZ100 Beta	OPEN	WPA2	
David Park SSID	ParkAP	ParkAP SSID	OPEN	WPA2	
David's Home Network	roxie		OPEN	WPA2	
FongSSID	FONGDSL		OPEN	WEP-64 (40 bits)	
HoneyPot	attwifi	nice trick to attract ATT mobile phones	OPEN	NONE	
JGaudu_Guests	Guest Wi-Fi	Guest Wi-Fi	Web	NONE	
JGaudu_Secure	Secure Wi-Fi	Secure Wi-Fi	OPEN	WPA2	
Jason-WLAN	Jason-WLAN		OPEN	WPA2	
Lawrence_Home	Lawrence_Home	Lawrence @ Home	OPEN	WPA-Mixed	

Show 10 << | 1 2 3 | >> Total Records: 21

WLAN Groups

WLAN Group Name	Description	Actions
Albert-Office/Home	Albert's Office and Home network	
Badjate Home Network	Badjate Home	
David Park WLAN Group	David Park WLAN Group	
Fong@Home	For SSID at PhongNgo's Home	
Greg Kamer		
JGaudu_SZ100	JGaudu_SZ100	

The following sections describe the web interface features that are called out in Figure 2:

- Main Menu
- Sidebar
- Content Area
- Miscellaneous Bar

Main Menu

This is the primary navigation menu. The main menu contains the following items:

- **Dashboard**: The page that loads after you log on, it provides graphical summary of what is happening on the controller and its managed access points. The Dashboard uses widgets to display graphical summaries of system statuses, access point statuses, client count, etc. For more information on the Dashboard widgets, see Using Widgets on the Dashboard.
- **Monitor**: Contains options for viewing information about WLANs, access points, wireless clients, system information, alarms, events, and administrator activity.

  For more information, see Monitoring the Wireless Network.
- **Configuration**: Contains options for managing WLANs, access points, and system settings. For more information, see Configuring the Wireless Network.
- **Report**: Contains options for generating various types of reports, including network tunnel statistics and historical client statistics. For more information, see Working with Reports.
- **Administration**: Contains options for performing administrative tasks, such as backing up and restoring the database, upgrading the system, downloading log files, performing diagnostic tests, and managing administrator accounts. For more information, see Performing Administrative Tasks.

Sidebar

The sidebar, located on the left side of the Content Area, provides additional options related to the submenu that you clicked. For example, sidebar items under *Configuration > Access Points* include common AP settings and AP tunnel settings.

On some pages, the sidebar also includes a tree that you can use to filter the information you want to show in the Content Area.

Content Area

This large area displays tables, forms, and information that are relevant to submenu and sidebar items that you clicked.

Miscellaneous Bar

This shows the following information (from left to right):

- *System date and time:* Displays the current system date and time. This is obtained by the controller from the NTP time server that has been configured.
- *Administrator user name*: Displays the user name of the administrator that is currently logged on.
- *Administrator role*: Displays the administrator role (for example, Super Admin) of the user that is currently logged on.
- *My Account* link*:* Clicking this link displays the following links:
  - *Change Password*: Click this link to change your administrator password. For more information, see Changing the Administrator Password.
  - *Preference*: Click this link to configure the session timeout settings. In *Session Timeout Settings*, type the number of minutes (1 to 1440 minutes) of inactivity after which the administrator will be logged off of the web interface automatically.
- *Log Off*: Click this to log off the controller web interface. For more information, see Logging Off the Web Interface.
- ?: Click this icon to launch the Online Help, which provides information on how to perform management tasks using the web interface.

Using Widgets on the Dashboard

The dashboard provides a quick summary of what is happening on the controller and its managed access points. It uses widgets to display at-a-glance information about managed access points, associated clients, and system summary, among others.

This section describes the widgets that you can display and how to add, move, and delete widgets from the dashboard.

NOTE: To refresh the information on each widget, click ⟳ (refresh button) on the upper-right corner of the widget.

Widgets That You Can Display

The controller supports the following dashboard widgets:

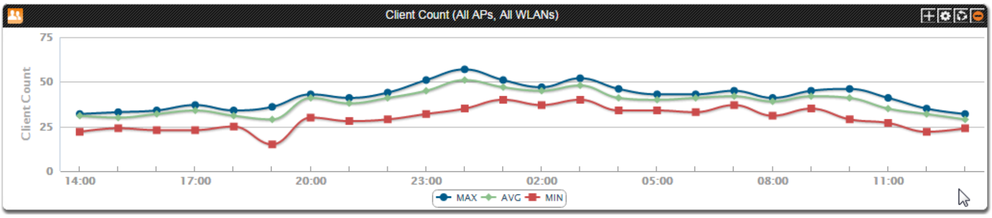
- Client Count Summary Widget
- AP Summary Widget
- System Summary Widget
- Traffic Summary Widget
- Client Type Summary Widget
- Wireless Network Summary Widget
- Top 10 APs by Client Count
- Top 10 Clients by Traffic

Client Count Summary Widget

The client count (all APs, all WLANs) widget displays a graph of the number of wireless clients that are associated with access points that the controller is managing. You can display client count by AP or WLAN.

The client count summary widget requires two widget slots.

Figure 3. The client count summary widget

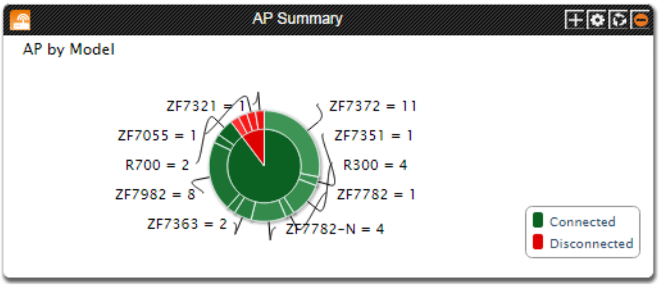


AP Summary Widget

The AP summary widget includes a pie chart that shows the connection status of managed APs. You can configure the pie chart to show access point data based on their connection status, model, and mesh role.

This widget requires one widget slot.

Figure 4. The AP summary widget

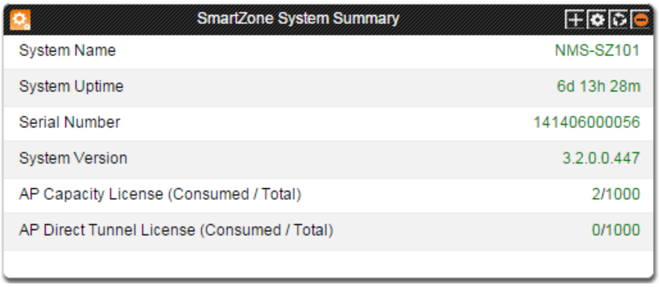


System Summary Widget

The system summary widget displays information about the controller system, including the system name, system uptime, serial number, system version number, AP capacity license (consumed versus total) and AP direct tunnel license (consumed versus total).

This widget requires one widget slot.

Figure 5. The system summary widget

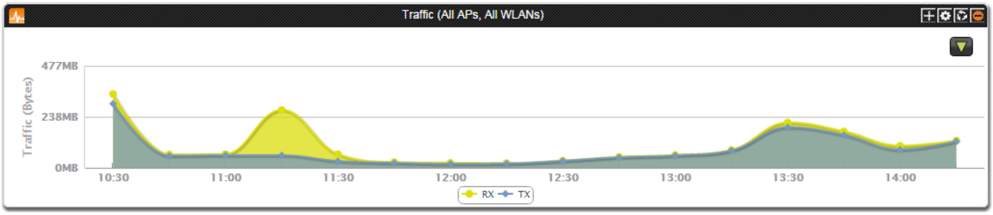


System Name	NMS-SZ101
System Uptime	6d 13h 28m
Serial Number	141406000056
System Version	3.2.0.0.447
AP Capacity License (Consumed / Total)	2/1000
AP Direct Tunnel License (Consumed / Total)	0/1000

Traffic Summary Widget

The traffic summary widget displays a graph of TX and RX throughputs (in bytes). This widget requires two widget slots.

Figure 6. The traffic summary widget



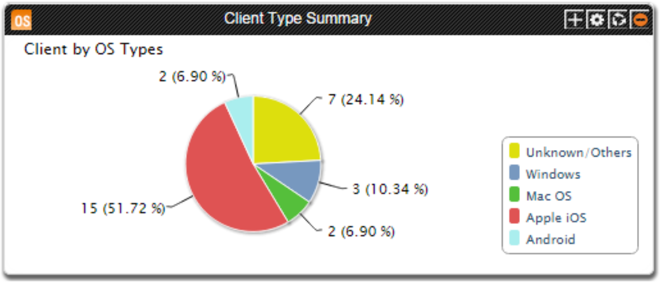
Client Type Summary Widget

The client type summary widget displays a pie chart that shows the types of OS that associated wireless clients are using.

This widget requires one widget slot.

NOTE: The default refresh interval for the client type summary widget is 15 minutes. When you add the widget, you can configure this refresh interval to any value between 1 and 30 minutes.

Figure 7. The client type summary widget

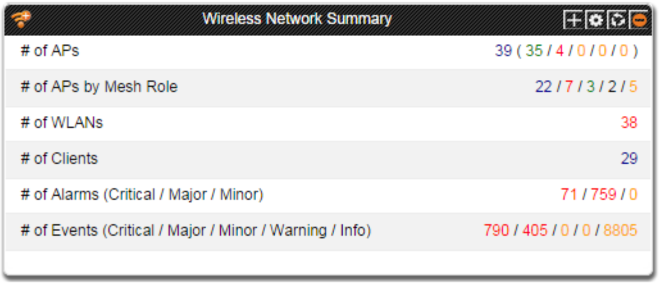


Wireless Network Summary Widget

The wireless network summary widget displays details about the APs, WLANs, and clients that the controller is managing. It also displays the number of alarms and events that the controller has generated.

This widget requires one widget slot.

Figure 8. The wireless network summary widget



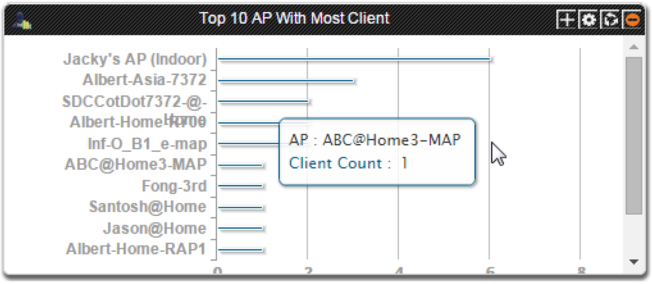
Wireless Network Summary

# of APs	39 (35 / 4 / 0 / 0 / 0)
# of APs by Mesh Role	22 / 7 / 3 / 2 / 5
# of WLANs	38
# of Clients	29
# of Alarms (Critical / Major / Minor)	71 / 759 / 0
# of Events (Critical / Major / Minor / Warning / Info)	790 / 405 / 0 / 0 / 8805

Top 10 APs by Client Count

The top 10 APs by client count widget displays the ten APs with the most number of clients associated with them. This widget requires one widget slot.

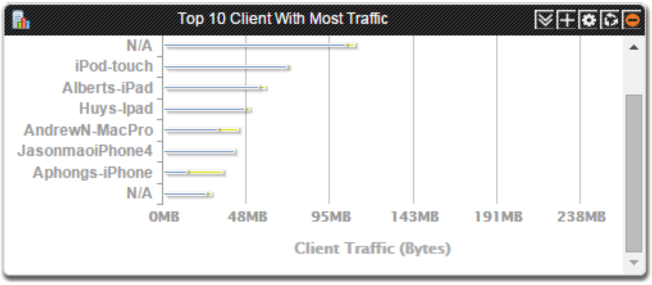
Figure 9. The top 10 APs by client count widget



Top 10 Clients by Traffic

The top 10 clients by traffic widget displays the ten clients with the highest traffic volume. This widget requires one widget slot.

Figure 10. The top 10 clients by traffic widget



Widget Slots

The controller provides nine slots on the dashboard for placing widgets. Note that some widgets are wider (for example, the client count summary and traffic widgets) and require two widget slots. Make sure that there are enough empty slots on the dashboard before you add or move a widget.

Adding a Widget

Follow these steps to add a widget to the dashboard.

1 Click the » icon in the upper-left corner of the page (below the Ruckus Wireless icon). The icons for adding widgets appear (see Table 1).

Table 1. Icons for adding widgets

Icon	Widget Name
👥	Client count summary widget
📶	AP summary widget
⚙	System summary widget
📈	Traffic summary widget
OS	Client type summary widget

Table 1. Icons for adding widgets

Icon	Widget Name
📶	Wireless network summary widget
👤📊	Top 10 APs by Client Count
📄📊	Top 10 Clients by Traffic Count

2 Click the icon for the widget that you want to add. A configuration form, which contains widget settings that you can configure, appears.

3 Configure the widget settings.

4 Click **OK**. The page refreshes, and then the widget that you added appears on the dashboard.

You have completed adding a widget. To add another widget, repeat the same procedure.

Adding a Widget to a Widget Slot

A single widget slot can contain multiple widgets of the same size (one-slot widgets versus two-slot widgets). For example, you can add the client count summary widget and traffic summary widget (both are two-slot widgets) to the same widget slot.

Follow these steps to add a widget to a widget slot.

1 Locate an existing widget slot to which you want to add a widget.

2 Click the ⊞ icon that is on the upper-right hand corner of the widget slot. A submenu appears and displays the widgets that you can add to the widget slot.

3 Click the name of the widget that you want to add to the widget slot. The widget configuration window appears.

NOTE: You can only add a widget once. If a widget already exists in a different widget slot, you will be unable to add it to another widget slot.

4 Configure the information that you want the widget to display and the interval at which to refresh the information on the widget.

NOTE: The refresh intervals for the client count summary and traffic summary widgets are non-configurable.

5 Click **OK**. The widget slot refreshes, and then the widget that you added appears.

You have completed adding a widget to a widget slot.

Displaying a Widget in a Widget Slot

A widget slot that contains multiple widgets automatically cycles through the different widgets that have been added to it at one-minute intervals. If you want to view a specific widget in a widget slot, you can manually display it.

Follow these steps to display a widget that belongs to a widget slot manually.

1 Locate the widget slot that contains the widget that you want to display.

2 Click the ︾ icon that is on the upper-right hand corner of the widget slot. A submenu appears and displays the widgets that have been added to the widget slot.

3 Click the name of the widget that you want to display. The widget slot refreshes, and the widget that you clicked appears.

You have completed displaying a widget in a widget slot.

Moving a Widget

Follow these steps to move a widget from one widget slot to another.

1 Make sure that there are sufficient slots for the widget that you want to move.

2 Hover your mouse pointer on the title bar of the widget. The pointer changes into a four-way arrow.

3 Click-and-hold the widget, and then drag it to the empty slot to which you want to move it.

4 Release the widget.

You have completed moving a widget to another slot.

Deleting a Widget

Follow these steps to delete a widget.

1. Locate the widget that you want to delete.
2. Click the ⊖ icon that is in the upper-right hand corner of the widget. A confirmation message appears.
3. Click **Yes** to confirm.

The dashboard refreshes, and then the widget that you deleted disappears from the page.

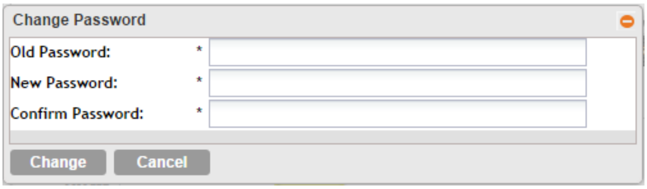
Changing the Administrator Password

Follow these steps to change the administrator password.

1. On the *Miscellaneous Bar*, click **Change Password**. The *Change Password* form appears.
2. In *Old Password*, type your current password.
3. In *New Password*, type the new password that you want to use.
4. In *Confirm Password*, retype the new password above.
5. Click **Change**.

You have completed changing your administrator password. The next time you log on to the controller, remember to use your new administrator password.

Figure 11. The Change Password form



Logging Off the Web Interface

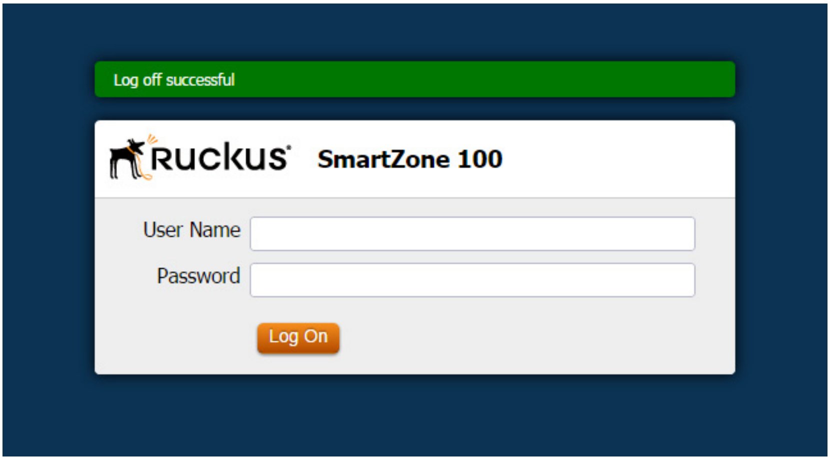
Follow these steps to log off the web interface.

1. On the *Miscellaneous Bar*, click **Log Off**. A confirmation message appears.
2. Click **Yes**. The controller logs you off the web interface. The logon page appears with the following message above the Ruckus Wireless logo:

   ```
   Log off successful
   ```

You have completed logging off the web interface.

Figure 12. The message “Log off successful” indicates that you have successfully logged off the web interface



Log off successful

Working with User Accounts, Guest Passes, and User Roles

2

In this chapter:

- Working with User Accounts
- Working with Guest Passes
- Working with User Roles

Working with User Accounts

A user is a registered user account that may be given access to the controller hotspot. A user account contains a user's personal information, logon information, and the subscription package that he or she has been assigned.

This section describes the following tasks:

- Creating a User Account
- Editing a User Account

Creating a User Account

Follow these steps to create a user account.

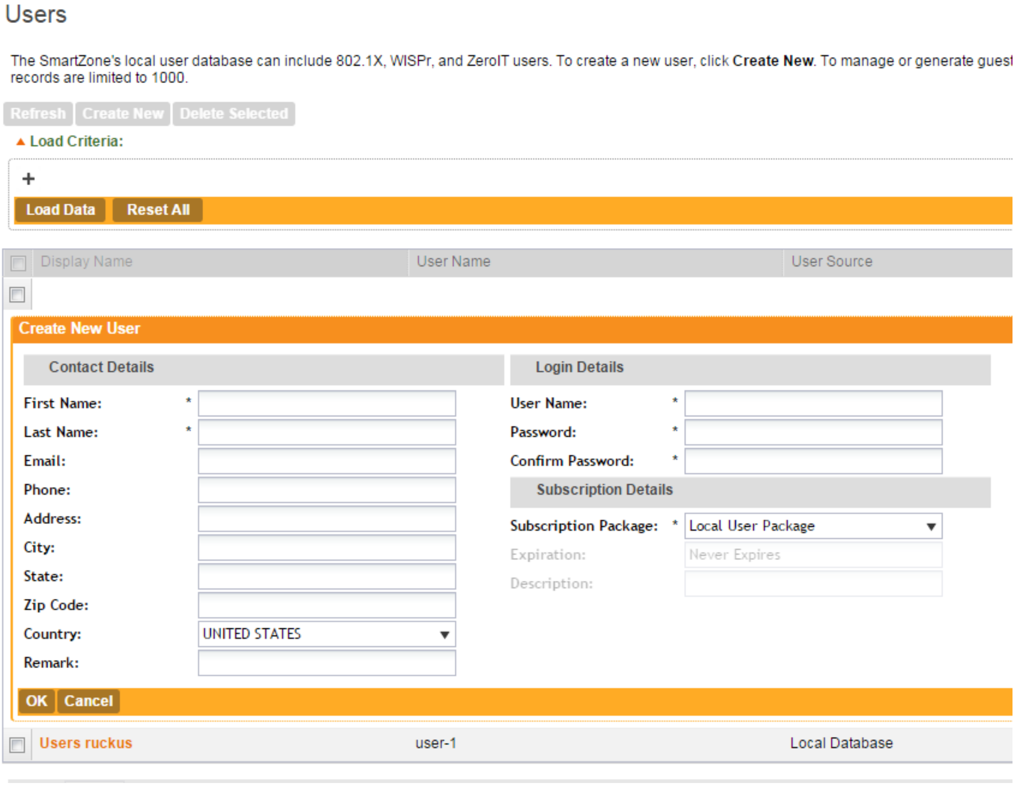
1. Go to *Configuration* > *Identity* > *Users*.
2. Click **Create New**.
3. In the *Contact Details* section, fill out the following boxes:
   - First Name
   - Last Name
   - Email
   - Phone
   - Country
   - City
   - Street
   - Zip Code

- State: Select **Enabled** to enable this user profile or select **Disabled**.
- Remark

4. In the *Login Details* section, fill out the following boxes to create the logon credentials of this user:
   - *User Name*: Type a name for this user. The user name is not case-sensitive and will always be displayed in lowercase characters.
   - *Password*: Type a password for this user. The password must be at least eight characters in length.
   - *Confirm Password*: Retype the password above.
5. In the *Subscription Details* section, configure the following settings:
   - *Subscription Package*: Select the subscription package that you want to assign to the user.
   - *Expiration*: This field is automatically populated with the expiration value of the subscription package that you selected above.
   - *Description*: This field is automatically populated with the description of the subscription package that you selected above.
6. Click **OK**.

You have completed creating a user account.

Figure 13. Creating a user account



Users

The SmartZone's local user database can include 802.1X, WISPr, and ZeroIT users. To create a new user, click **Create New**. To manage or generate guest
records are limited to 1000.

□	Display Name	User Name	User Source
□			
□	Users ruckus	user-1	Local Database

Create New User

Contact Details

First Name:	*	
Last Name:	*	
Email:		
Phone:		
Address:		
City:		
State:		
Zip Code:		
Country:		UNITED STATES ▼
Remark:		

Login Details

User Name:	*	
Password:	*	
Confirm Password:	*	

Subscription Details

Subscription Package:	*	Local User Package ▼
Expiration:		Never Expires
Description:		

Editing a User Account

Follow these steps to edit an existing user account.

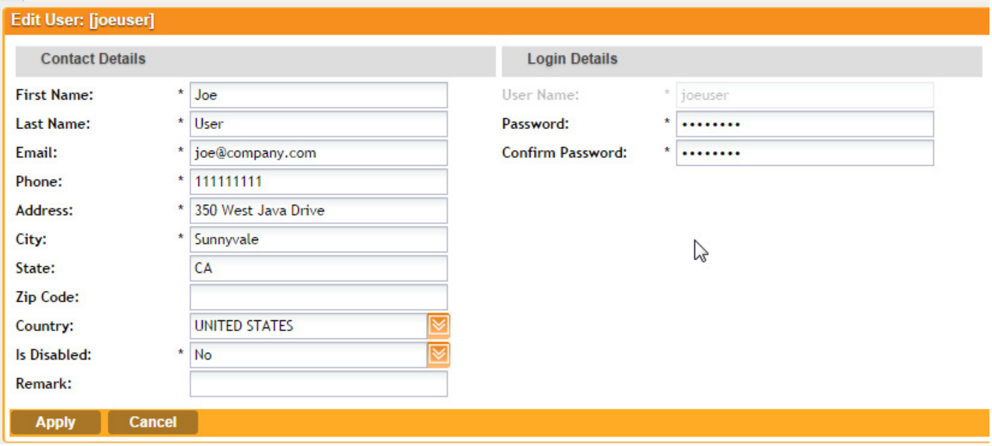
1 Go to *Configuration* > *Identity* > *Users*.

2 Locate the user account that you want to edit, and then click the user name. The *Edit User: [{User Name}]* form appears.

3 Edit the user account by updating the fields in the *Contact Details* and *Login Details* sections.

4 Click **OK**.

Figure 14. Editing a user account



Edit User: [joeuser]

Contact Details

First Name: * Joe
Last Name: * User
Email: * joe@company.com
Phone: * 111111111
Address: * 350 West Java Drive
City: * Sunnyvale
State: CA
Zip Code:
Country: UNITED STATES
Is Disabled: * No
Remark:

Login Details

User Name: * joeuser
Password: * ••••••••
Confirm Password: * ••••••••

Working with Guest Passes

Similar to user accounts, guest passes in the controller allow users to gain access to the controller hotspots. However, unlike user accounts, guest pass users are not required to provide personal information to access the controller hotspots and can therefore remain anonymous.

Guest passes are generated for specific WLANs only – guest pass users will only be able to gain access to the WLANs for which the guest pass was generated.

Generating Guest Passes

Generating guest passes involves four steps:

Step 1: Create a Guest Access Portal

Step 2: Create a Guest Access WLAN

Step 3: Generate a Guest Pass

Step 4: Send Guest Passes to Guest Users

Step 1: Create a Guest Access Portal

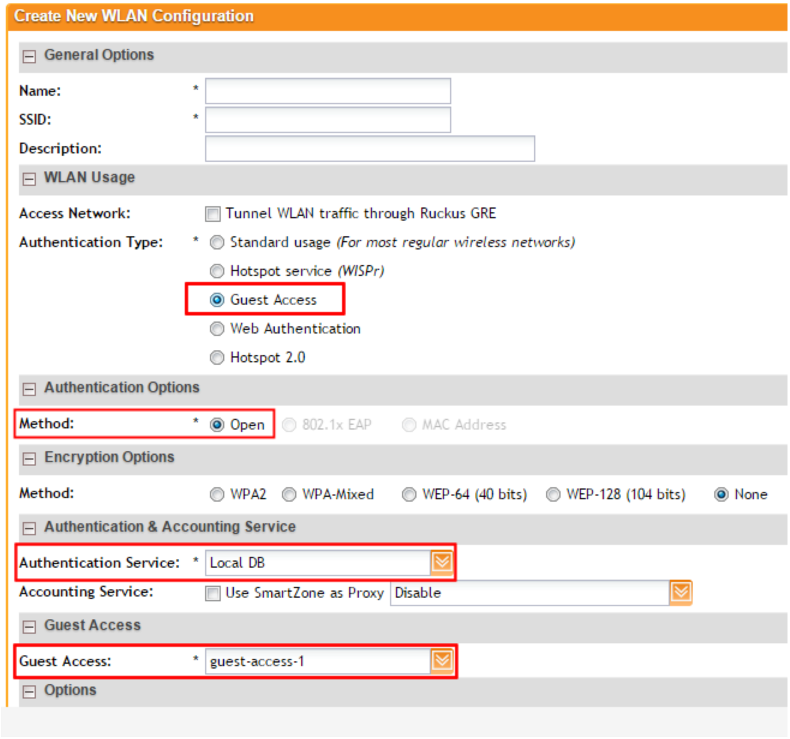
Follow the instructions in Creating a Guest Access Portal to create at least one guest access portal. When you finish creating a guest access portal, continue to Step 2: Create a Guest Access WLAN

Step 2: Create a Guest Access WLAN

Follow these steps to create a WLAN that will be used for guest access only.

1. Go to *Configuration* > *Wireless Network* > *WLANs*.
2. In the *WLAN Configuration* section, click **Create New**.
3. In *General Options*, configure the following:
   - Name
   - SSID
   - Description
4. In *WLAN Usage*, configure the following:
   - In *Access Network*, select the **Tunnel WLAN traffic through Ruckus GRE** check box if you want to tunnel the traffic from this WLAN back to the controller.
   - In *Authentication Type*, click **Guest Access**.
5. Configure the rest of the WLAN settings. For details on each setting, see Creating a WLAN.
6. When you finish creating a guest access WLAN, continue to Step 3: Generate a Guest Pass.

Figure 15. Creating a WLAN for guest access only



Create New WLAN Configuration

⊟ General Options

Name: *

SSID: *

Description:

⊟ WLAN Usage

Access Network: □ Tunnel WLAN traffic through Ruckus GRE

Authentication Type: * ○ Standard usage *(For most regular wireless networks)*
○ Hotspot service *(WISPr)*
● Guest Access
○ Web Authentication
○ Hotspot 2.0

⊟ Authentication Options

Method: * ● Open ○ 802.1x EAP ○ MAC Address

⊟ Encryption Options

Method: ○ WPA2 ○ WPA-Mixed ○ WEP-64 (40 bits) ○ WEP-128 (104 bits) ● None

⊟ Authentication & Accounting Service

Authentication Service: * Local DB

Accounting Service: □ Use SmartZone as Proxy Disable

⊟ Guest Access

Guest Access: * guest-access-1

⊟ Options

Step 3: Generate a Guest Pass

Follow these steps to generate a guest pass.

1. Click *Configuration* > *Identity* > *Guests* > *Guest Passes.* The *Guest Passes* page appears.
2. Click *Generate Guest Pass*. The *Generate Guest Pass* screen appears.
3. Configure the following options:
    - *Guest Name*: Type a name that you want to assign to the guest user.
    - *Guest WLAN*: Select the guest WLAN that you created in Step 2: Create a Guest Access WLAN.
    - *Number of Passes*: Type the number of guest passes that you want to generate.

- *Pass Valid For*: Set the validity period for the guest pass by filling in the two boxes. For example, if you want the guest pass to be valid for seven days, type **7** in the first box, and then select **Days** in the second box.

4 Configure the advanced options:

- *Pass Generation*: Select the **Auto Generate** check box if you want the controller to generate the guest pass key automatically. If you want to generate the guest pass manually, clear the **Auto Generate** check box.

NOTE: If you are generating more than one guest pass, the Auto Generate check box is selected automatically and is not configurable.

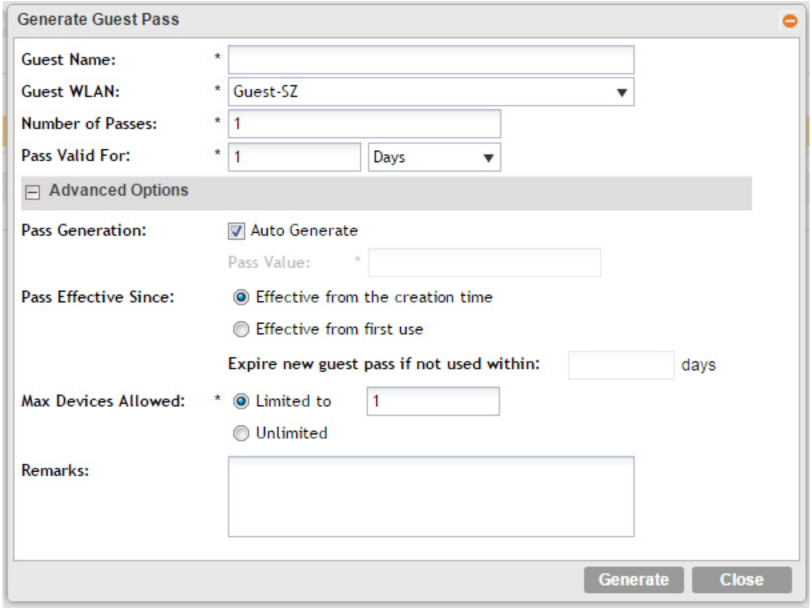
- *Pass Effective Since*: Set the guest pass validity period by selecting one of the following options:
  - **Effective from the creation time**: This type of guest pass is valid from the time it is first created to the specified expiration time, even if it is not being used by any end user.
  - **Effective from first use**: This type of guest pass is valid from the time the user uses it to authenticate with the controller until the specified expiration time. An additional parameter (Guest Pass will expire in X days) can be configured to specify when an unused guest pass will expire regardless of use. The default is 7 days.
  - **Expire guest pass if not used within [ ] days**: If you want this guest pass to expire if it is unused after you generated it, type the number of days in the box (maximum value is 365 days).
- *Max Devices Allowed*: Set the number of users that can share this guest pass.
  - **Limited to [ ]**: If you want a limited number of users to share this guest pass, click this option, and then type the number in the box.
  - **Unlimited**: If you want an unlimited number of users to share this guest pass, click this option.
  - *Session Duration*: If you clicked **Unlimited**, this option appears. If you want require users to log on again after their sessions expire, select the **Require guest re-login after [ ]** check box, and then select a time increment. If this feature is disabled, connected users will not be required to re-log in until the guest pass expires.
- In *Remarks* (optional), type your notes about this guest pass, if any.

5 Click **Generate**. The page refreshes, and then the guest pass you generated appears in a table, along with other guest passes that exist on the controller.

6 Click **OK** to close the pop-up message.

You have completed generating a guest pass. You are now ready to send the guest pass to guest users. See Step 4: Send Guest Passes to Guest Users for information.

Figure 16. Generating a guest pass



Generate Guest Pass

Guest Name: *

Guest WLAN: * Guest-SZ

Number of Passes: * 1

Pass Valid For: * 1 Days

⊟ Advanced Options

Pass Generation: ☑ Auto Generate

Pass Value: *

Pass Effective Since: ● Effective from the creation time

○ Effective from first use

Expire new guest pass if not used within: days

Max Devices Allowed: * ● Limited to 1

○ Unlimited

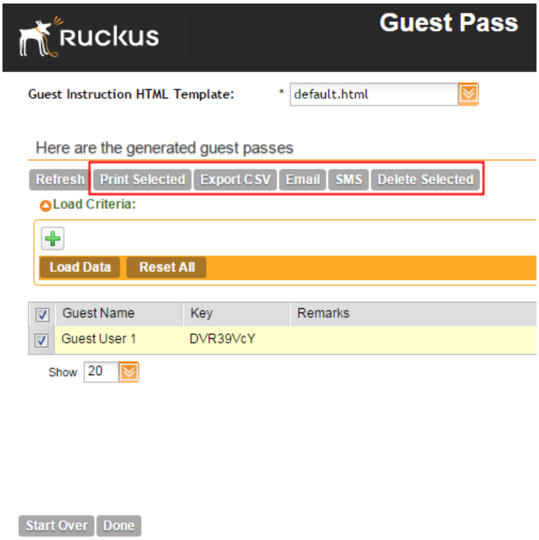
Remarks:

Step 4: Send Guest Passes to Guest Users

On the page that appears after you generate a guest pass are options for delivering the guest pass to guest users (see Figure 17). These delivery options include:

- Print Selected: See Printing the Guest Pass.
- Export CSV: See Exporting the Guest Pass to CSV.
- Email: See Sending the Guest Pass via Email.
- SMS: See Sending the Guest Pass via SMS.

Figure 17. Options for delivering guest passes to guest users



Guest Instruction HTML Template: * default.html

Here are the generated guest passes

☑	Guest Name	Key	Remarks
☑	Guest User 1	DVR39VcY	

Show 20

Printing the Guest Pass

NOTE: If your browser is blocking pop-ups, make you temporarily disable the pop-up blocker so you can view and print the guest pass.

After you generate the guest pass, you can print the guest pass information, which contains the guest user information and instructions on how to connect to the hotspot, and give it to the guest user.

Follow these steps to print a guest pass.

1. Select the guest passes that you want to print by selecting the check boxes before them.

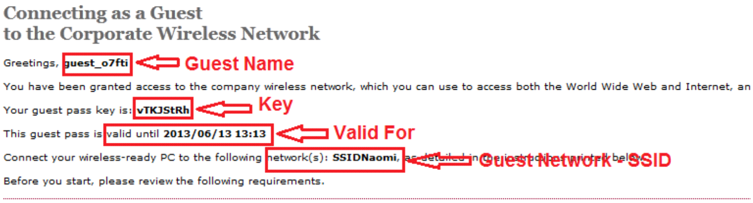
2 In *Guest Instruction HTML Template*, select a printout template to use. The default printout template (`default.html`) is selected by default. If you created custom printout templates (see Creating a Guest Pass Printout Template), they will appear in the drop-down menu.

3 Click **Print Selected**. A new browser page appears, which displays the guest pass and available printing options.

4 Configure your printer settings, and then print the guest passes.

You have completed printing the guest passes.

Figure 18. What a guest pass printout looks like



Connecting as a Guest
to the Corporate Wireless Network

Greetings, **guest_o7fti**

You have been granted access to the company wireless network, which you can use to access both the World Wide Web and Internet, an

Your guest pass key is: **vTKJStRh**

This guest pass is valid until **2013/06/13 13:13**

Connect your wireless-ready PC to the following network(s): **SSIDNaomi**, as detailed in the instructions printed below.

Before you start, please review the following requirements.

Exporting the Guest Pass to CSV

Follow these steps to export the last generated guest passes to a comma-separated value (CSV) file.

1 Select the guest passes that you want to export to CSV by selecting the check boxes before them.

2 Click **Export CSV**. Your web browser downloads the CSV file to its default download location.

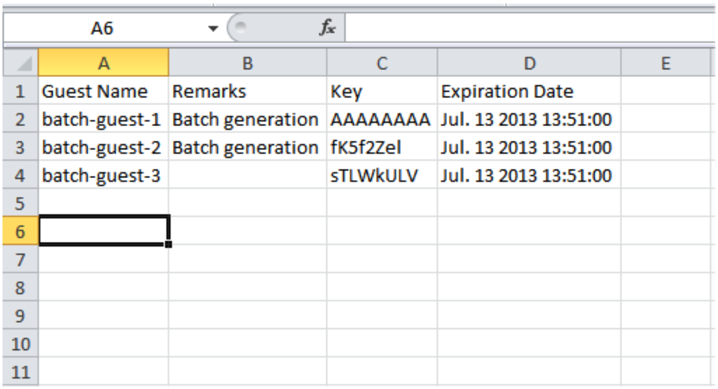
3 Go to your web browser's default download location and look for a file named `guestpass[number].csv`.

4 Using Microsoft Excel or a similar application, open the CSV file. The CSV file displays the details of the guest passes, including:

- Guest Name
- Remarks
- Key
- Expiration Date

You have completed exporting the last generated guest passes to CSV.

Figure 19. A sample CSV of generated guest passes when opened in Excel



	A	B	C	D	E
1	Guest Name	Remarks	Key	Expiration Date	
2	batch-guest-1	Batch generation	AAAAAAAA	Jul. 13 2013 13:51:00	
3	batch-guest-2	Batch generation	fK5f2Zel	Jul. 13 2013 13:51:00	
4	batch-guest-3		sTLWkULV	Jul. 13 2013 13:51:00	
5					
6					
7					
8					
9					
10					
11					

Sending the Guest Pass via Email

NOTE: To send guest passes via email, you must have added an external email server to the controller. See Configuring an External Email Server for more information.

Follow these steps to send the guest pass via email.

1 Select the guest passes that you want to send via email by selecting the check boxes before them.

2 Click **Email**. The Recipient Email form appears on the right side of the page (see Figure 20).

3 Click **Add New**.

4 In the box that appears below, type the email address to which you want to send the guest passes.

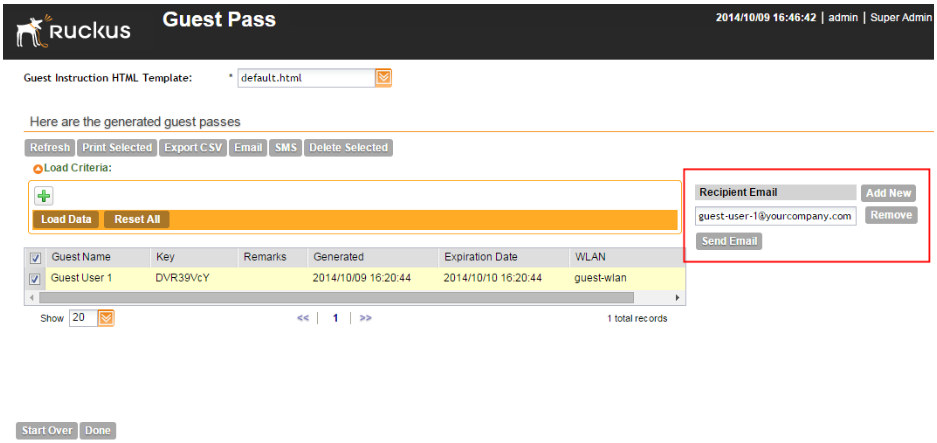
5 To add another recipient, click **Add New** again, and then type another email address.

6 When you have finished adding all the email recipients, click **Send Email**. A dialog box appears and informs you that the emails have been sent to the message queue successfully

7 Click **OK** to close the dialog box.

You have completed sending guest passes via email.

Figure 20. Use the Recipient Email form to specify who will receive the guest passes via email



Guest Instruction HTML Template: * default.html

Here are the generated guest passes

☑	Guest Name	Key	Remarks	Generated	Expiration Date	WLAN
☑	Guest User 1	DVR39VcY		2014/10/09 16:20:44	2014/10/10 16:20:44	guest-wlan

Show 20

1 total records

Recipient Email

guest-user-1@yourcompany.com

Sending the Guest Pass via SMS

NOTE: To send guest passes via email, you must have added an external SMS gateway to the controller. See Configuring the External SMS Gateway for more information.

Follow these steps to send the guest pass via email.

1 Select the guest passes that you want to send via SMS by selecting the check boxes before them.

2 Click **SMS**. SMS options appears on the right side of the page (see Figure 21).

3 In Guest Instruction SMS Template, select the SMS template that you want to use.

4 Click **Add New**.

5 In the box that appears below, type the phone number to which you want to send the guest passes via SMS.

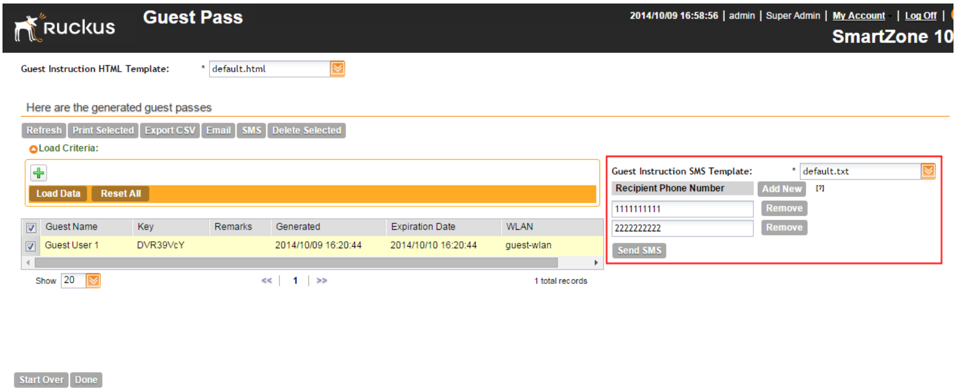
6 To add another SMS recipient, click **Add New** again, and then type another phone number.

7 When you have finished adding all the SMS recipients, click **Send SMS**. A dialog box appears and informs you that the SMS messages have been sent to the message queue successfully

8 Click **OK** to close the dialog box.

You have completed sending guest passes via SMS.

Figure 21. Options for sending guest passes via SMS



Guest Instruction HTML Template: * default.html

Here are the generated guest passes

☑	Guest Name	Key	Remarks	Generated	Expiration Date	WLAN
☑	Guest User 1	DVR39VcY		2014/10/09 16:20:44	2014/10/10 16:20:44	guest-wlan

Show 20 << | 1 | >> 1 total records

Guest Instruction SMS Template: * default.txt

Recipient Phone Number
1111111111
2222222222

Generating Guest Passes from an Imported CSV

You can also manually define the guest passes that you want to generate in a comma-separated value (CSV) file (a sample of which is available for download from the *Guest Pass* page).

Follow these steps to generate guest passes from an imported CSV file.

1 Click *Configuration* > *Identity* > *Users*.

2 Click *Guest Pass* > *Guest Pass Service*. The *Guest Pass* page appears.

3 Click **Import Guest Pass**, and then click **Next**.

4 Look for the following text under **Browse**:

```
To download a sample guest pass, click here.
```

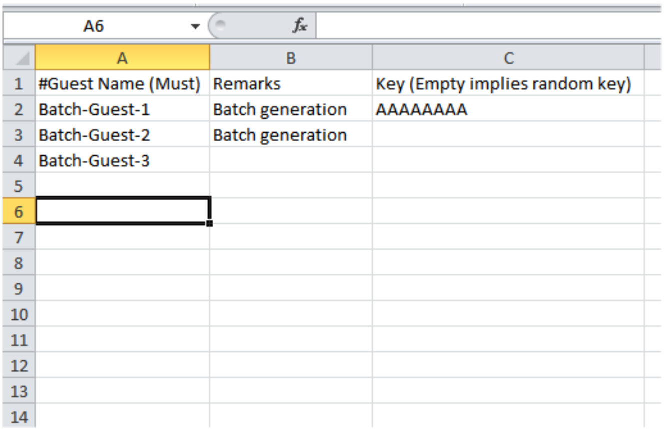
5 Click the `here` link to download the sample CSV file.

6 Using Microsoft Excel or a similar application, open the CSV file.

7 In the CSV file, fill out the following columns:

- *#Guest Name (Must)*: Assign a user name to the guest pass user.
- Remarks (Optional): Add some notes or comments about this guest pass.
- *Key*: Enter a guest pass key or leave it blank so the controller can generate the key automatically.

Figure 22. The sample CSV file when opened in Excel



A6 *fx*

	A	B	C
1	#Guest Name (Must)	Remarks	Key (Empty implies random key)
2	Batch-Guest-1	Batch generation	AAAAAAAA
3	Batch-Guest-2	Batch generation	
4	Batch-Guest-3		
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

8 Save the CSV file.

9 Go back to the Guest Pass page, and then configure the following settings on the Common Guest Pass Settings:

- *Guest WLAN*: Select the guest WLAN that you created in Step 2: Create a Guest Access WLAN.
- *Pass Valid For*: Set the validity period for the guest pass by filling in the two boxes. For example, if you want the guest pass to be valid for seven days, type **7** in the first box, and then select **Days** in the second box.

10 Configure the advanced options:

- *Pass Effective Since*: Set the guest pass validity period by selecting one of the following options:
  - **Effective from the creation time**: This type of guest pass is valid from the time it is first created to the specified expiration time, even if it is not being used by any end user.
  - **Effective from first use**: This type of guest pass is valid from the time the user uses it to authenticate with the controller until the specified expiration time. An additional parameter (Guest Pass will expire in X days) can be configured to specify when an unused guest pass will expire regardless of use. The default is 7 days.
  - **Expire guest pass if not used within [ ] days**: If you want this guest pass to expire if it is unused after you generated it, type the number of days in the box (maximum value is 365 days).

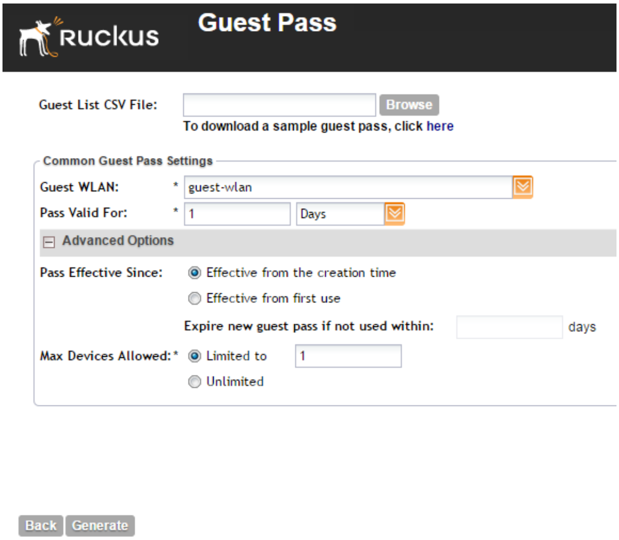
- *Max Devices Allowed*: Set the number of users that can share this guest pass.
  - **Limited to [ ]**: If you want a limited number of users to share this guest pass, click this option, and then type the number in the box.
  - **Unlimited**: If you want an unlimited number of users to share this guest pass, click this option.
  - *Session Duration*: If you clicked **Unlimited**, this option appears. If you want require users to log on again after their sessions expire, select the **Require guest re-login after [ ]** check box, and then select a time increment. If this feature is disabled, connected users will not be required to re-log in until the guest pass expires.

11 In *Guest List CSV File* (at the top of the page), click **Browse**, and then select the CSV file you edited earlier. The page refreshes, and the number of guest passes that the controller has identified in the CSV file appears below the Browse button.

12 Click **Generate**. The page refreshes, and then the guest pass you generated appears in a table, along with other guest passes that exist on the controller.

You have completed generating a guest pass. You are now ready to send the guest pass to guest users. See Step 4: Send Guest Passes to Guest Users for information.

Figure 23. The Guest Pass page for importing a CSV file



Guest Pass

Guest List CSV File:

To download a sample guest pass, click here

Common Guest Pass Settings

Guest WLAN: * guest-wlan

Pass Valid For: * 1 Days

Advanced Options

Pass Effective Since: ● Effective from the creation time ○ Effective from first use

Expire new guest pass if not used within: days

Max Devices Allowed:* ● Limited to 1 ○ Unlimited

Viewing the List of Guest Users

Follow these steps to view guest users that currently exist on the controller.

1 Click *Configuration* > *Identity* > *Users*.

2 Click the *User Type* column to sort all existing user accounts by user type.

All users of the user type “Guest” are guest users.

You have completed view the list of guest users.

Deleting Guest Users

Follow these steps to delete guest users.

1 Click *Configuration* > *Identity* > *Users*.

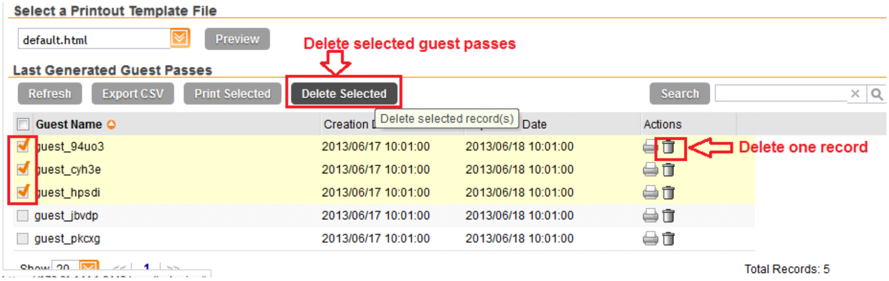
2 Select the check boxes before the guest user accounts that you want to delete. Click **Delete Selected**. A confirmation message appears.

3 Click **Yes** to confirm. The page refreshes, and the guest user accounts that you deleted disappears from the list.

NOTE: To delete a single guest pass, click the 🗑 (delete) icon that is in the same row as the guest pass name.

You have completed deleting a guest pass or guest passes.

Figure 24. Deleting a single guest pass or multiple guest passes


Select a Printout Template File
default.html
Preview
Delete selected guest passes
Last Generated Guest Passes
Refresh
Export CSV
Print Selected
Delete Selected
Delete selected record(s)
Search
Delete one record
Show 20
1

□ Guest Name	Creation D	Date	Actions
☑ guest_94uo3	2013/06/17 10:01:00	2013/06/18 10:01:00	🖶 🗑
☑ guest_cyh3e	2013/06/17 10:01:00	2013/06/18 10:01:00	🖶 🗑
☑ guest_hpsdi	2013/06/17 10:01:00	2013/06/18 10:01:00	🖶 🗑
□ guest_jbvdp	2013/06/17 10:01:00	2013/06/18 10:01:00	🖶 🗑
□ guest_pkcxg	2013/06/17 10:01:00	2013/06/18 10:01:00	🖶 🗑

Total Records: 5

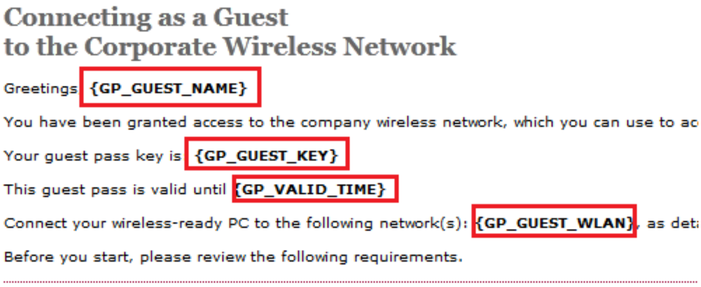
Creating a Guest Pass Printout Template

A guest pass printout template contains variables for the information that guest users need to connect to the controller hotspots (for example, guest name, key, and WLAN name), as well as the actual instructions for connecting to the WLAN.

A default printout template exists in the controller. If you want to create your own printout template, follow these steps.

1. Go to *Configuration* > *Identity* > *Users*.
2. Click *Guest Pass* > *Manage Templates*. The *Manage Guest Instruction Templates* page appears.
3. Using an HTML editor, create a new HTML or text file.
4. Add content to the file. Typically, a printout template contains instructions for connecting to the controller hotspot. See Figure 25 for the content of the default printout template.

Figure 25. Content of the default printout template



Connecting as a Guest
to the Corporate Wireless Network

Greetings {GP_GUEST_NAME}

You have been granted access to the company wireless network, which you can use to ac

Your guest pass key is {GP_GUEST_KEY}

This guest pass is valid until {GP_VALID_TIME}

Connect your wireless-ready PC to the following network(s): {GP_GUEST_WLAN}, as det

Before you start, please review the following requirements.

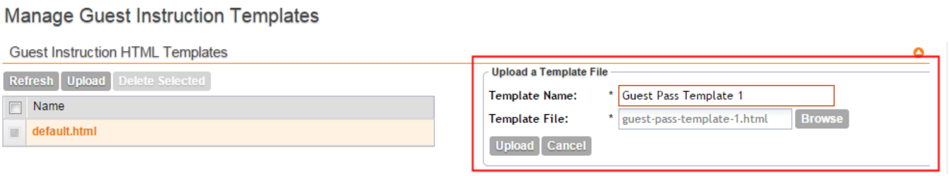
5. Insert the following variables into the content of your template:
   - {GP_GUEST_NAME}: This is the guest pass user name.
   - {GP_GUEST_KEY}: This is the guest pass key.
   - {GP_VALID_TIME}: This is the expiration date and time of the guest pass.
   - {GP_GUEST_WLAN}: This is the WLAN with which the guest user can associate using the guest name and guest key.
6. Save the file.
7. On the *Manage Guest Instruction Templates* page, click the appropriate Upload button for the template that you are creating. The Upload a Template File form appears on the right side of the page.
8. Configure the Upload a Template File options:

- Template Name: Type a name for the template that you are uploading.
- Template File: Click Browse, and select the template file you created.

9 Click Upload. An information message box appears and informs you that the template file has been uploaded successfully.

10 Click OK. The template file you uploaded now appears in the list of templates.

Figure 26. The Upload a Template File form



Manage Guest Instruction Templates

Guest Instruction HTML Templates

	Name
□	default.html

Upload a Template File

Template Name: * Guest Pass Template 1

Template File: * guest-pass-template-1.html

Working with User Roles

The controller provides a default role (named "Default) that is automatically applied to all new user accounts. This role links all users to the internal WLAN and permits access to all WLANs by default. As an alternative, you can create additional roles that you can assign to selected wireless network users, to limit their access to certain WLANs, to allow them to log on with non-standard client devices, or to grant permission to generate guest passes. (You can then edit the "default" role to disable the guest pass generation option.)

Creating a User Role

Follow these steps to create a user role.

1 Go to *Configuration* > *Identity* > *Roles*.

2 Click **Create New**. The Create User Role form appears.

3 Configure the options in the Create User Role form.

- Name: Type a name for this user role.
- Description: Type a description for this user role.
- Default Group Attribute Value: (Fill in this field only if you are creating a user role based on group attributes extracted from an Active Directory or LDAP server.) Enter the User Group name here. Active Directory/LDAP users with the same group attributes are automatically mapped to this user role.
- WLANS: Specify whether this role will have access to all WLAN or to specific WLANs only.

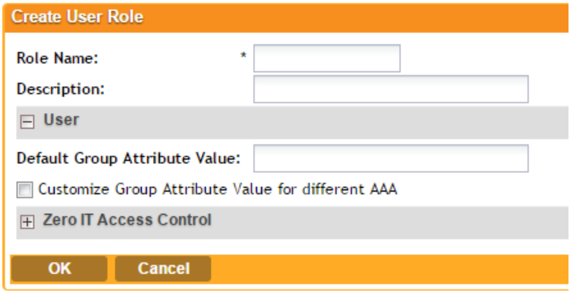
- Allow Zero IT Access to All WLANs: Click this to allow this user role access to all WLANs.
- Allow Zero IT Access to Selected WLANs Only. Click to allow this user role access to specific WLANs only. You must select the WLAN to which this user role will have access.

- Max Devices Allowed: Set the number of users that can share this role.
  - Limited to [ ]: If you want a limited number of users to share this role pass, click this option, and then type the number in the box.
  - Unlimited: If you want an unlimited number of users to share this role, click this option.

4 Click OK.

You have completed creating a user role.

Figure 27. Creating a user role



Create User Role

Role Name: *

Description:

⊟ User

Default Group Attribute Value:

□ Customize Group Attribute Value for different AAA

⊞ Zero IT Access Control

Configuring the Wireless Network 3

In this chapter:

Configuring WLANs

- Creating a WLAN
- Viewing Existing WLANs
- Deleting WLANs

Creating a WLAN

Follow these steps to create a WLAN.

1. Go to *Configuration* > *Wireless Network* > *WLANs*.
2. In the *WLAN Configuration* section, click **Create New**.
3. In *General Options*, configure the following:
   - *Name*: Type a name for this WLAN.
   - *SSID*: Type a short name for the WLAN. The SSID is the WLAN name that is broadcast on the wireless network.
   - *HESSID*: Type the homogeneous extended service set identifier (HESSID). The HESSID is a 6-octet MAC address that identifies the homogeneous ESS. The HESSID value must be identical to one of the BSSIDs in the homogeneous ESS.
   - *Description*: Type a brief description of the qualifications/purpose for this WLAN (for example, Engineering or Voice).
4. In *WLAN Usage*, configure the following:
   - In *Access Network*, select the **Tunnel WLAN traffic through Ruckus GRE** check box if you want to tunnel the traffic from this WLAN back to the controller. Tunnel mode enables wireless clients to roam across different APs on different subnets. If the WLAN has clients that require uninterrupted wireless connection (for example, VoIP devices), Ruckus Wireless recommends enabling tunnel mode. When you enable this option, you need to select core network for tunneling WLAN traffic back to the controller.
   - In *Authentication Type*, click one of the following options.
     - **Standard usage (For most regular wireless networks)**: This is a regular WLAN suitable for most wireless networks.
     - **Hotspot (WISPr)**: Click this option if want to use a hotspot portal that you previously created.

  - **Guest Access and Hotspot 2.0 Onboarding**: Click this option if you want guest users to use this WLAN and offer Hotspot 2.0 service to guest users. After you complete creating this WLAN for guest access, you can start generating guest passes (see Working with Guest Passes).

NOTE: For more information about Hotspot 2.0 online signup, see the *Hotspot 2.0 Reference Guide for this release*.

  - **Web Authentication**: Click this option if you want to require all WLAN users to complete a web-based logon to this network every time they attempt to connect (see Working with Web Authentication Services).
  - **Hotspot 2.0**: Click this option if you want a Hotspot 2.0 operator profile that you previously created to use this WLAN. See the *Hotspot 2.0 Reference Guide* for this release.
  - **Hotspot 2.0 Secure Online Signup (OSEN)**: Click this option if you want to use this WLAN for Hotspot 2.0 OSEN. See the *Hotspot 2.0 Reference Guide* for this release for more information.

5 in *Authentication Options*, click the authentication method by which users will be authenticated prior to gaining access to the WLAN. The level of security should be determined by the purpose of the WLAN you are creating.

- **Open (Default)**: No authentication mechanism is applied to connections. If WPA or WPA2 encryption is used, this implies WPA-PSK authentication.

NOTE: If you clicked **Web Authentication** in *Authentication Type*, Open is the only available authentication option.

- **802.1x EAP**: A very secure authentication/encryption method that requires a back-end authentication server, such as a RADIUS server. Your choice mostly depends on the types of authentication the client devices support and your local network authentication environment.
- **MAC Address**: Authenticate clients by MAC address. MAC address authentication requires a RADIUS server and uses the MAC address as the user logon name and password. You have two options for the MAC address format to use for authenticating clients:
  - Use user defined text as authentication password (default is device MAC address)
  - Set device MAC address in 802.1x format 00-10-A4-23-19-C0. (The default is 0010a42319c0).

6 In *Encryption Options*, select an encryption method to use. WPA and WPA2 are both encryption methods certified by the Wi-Fi Alliance and are the recommended encryption methods. The Wi-Fi Alliance will be mandating the removal of WEP due to its security vulnerabilities, and Ruckus Wireless recommends against using WEP if possible.

- **WPA2**: Enhanced WPA encryption using stronger TKIP or AES encryption algorithm.
- **WPA-Mixed**: Allows mixed networks of WPA and WPA2 compliant devices. Use this setting if your network has a mixture of older clients that only support WPA and TKIP, and newer client devices that support WPA2 and AES.
- **WEP-64 (40 bits)**: Provides a lower level of encryption, and is less secure, using 40-bit WEP encryption.
- **WEP-128 (104 bits)**: Provides a higher level of encryption than WEP-64, using a 104-bit key for WEP encryption. However, WEP is inherently less secure than WPA.
- **None**: No encryption; traffic is sent in clear text.

CAUTION! If you set the encryption method to WEP-64 (40 bit) or WEP-128 (104 bit) and you are using an 802.11n or 802.11ac AP for the WLAN, the AP will operate in 802.11g mode.

7 In *Hotspot Portal*, configure the following options.

NOTE: This section only appears if you clicked **Hotspot (WISPr)** in *WLAN Usage > Authentication Type*.

- *Hotspot (WISPr) Portal*: Select the hotspot that you want this WLAN to use. This option appears only when **Hotspot (WISPr)** is selected as the WLAN usage type. This hotspot portal may be the hotspot that you created in Creating a Hotspot (WISPr) Portal.
- *Bypass CNA*: Select the **Enable** check box if you want to bypass the Apple CNA feature on iOS and OS X devices that connect to this WLAN. See Bypassing Apple CNA for more information.
- *Authentication Service*: Select the authentication server that you want to use for this WLAN. Options include **Local DB**, **Always Accept**, and any AAA servers that you previously added (see Working with AAA Servers). Additionally, if you want the controller to proxy authentication messages to the AAA server, select the **Use Controller as Proxy** check box.

- *Accounting Service*: Select the RADIUS Accounting server that you want to use for this WLAN. You must have added a RADIUS Accounting server previously (see Working with AAA Servers). Additionally, if you want the controller to proxy accounting messages to the AAA server, select the **Use Controller as Proxy** check box.

8 In *Guest Access Portal*, configure the following options:

NOTE: This section only appears if you clicked **Guest Access + Hotspot 2.0 Online Signup** in *WLAN Usage > Authentication Type*.

- *Guest Portal Service*: Select the guest access portal that you created earlier for this onboarding WLAN.
- *Bypass CNA*: Select the **Enable** check box if you want to bypass the Apple CNA feature on iOS and OS X devices that connect to this WLAN. See Bypassing Apple CNA for more information.
- *Guest Authentication*: Select **Guest** to require users to enter their guest credentials, or select **Always Accept** to allow users without guest credentials to authentication.
- *Guest Accounting*: Select the RADIUS Accounting server that you want to use for this WLAN. You must have added a RADIUS Accounting server previously (see Working with AAA Servers). Additionally, if you want the controller to proxy accounting messages to the AAA server, select the **Use SCG as Proxy** check box.

9 In the *Online Signup/Onboarding Service* section, configure the following options:

NOTE: This section only appears if you clicked **Guest Access + Hotspot 2.0 Online Signup** in *WLAN Usage > Authentication Type*.

- *Hotspot 2.0 Signup*: Select the **Hotspot 2.0 devices** check box to enable support for Hotspot 2.0 devices. See the *Hotspot 2.0 Reference Guide* for this release for more information.
- *Zero-IT Onboarding*: Select the **Non-Hotspot 2.0 devices (i.e., legacy devices) and Hotspot Rel 1 devices** check box.
- *Onboarding Portal*: Select the portal signup profile that you want this guest WLAN to use.
- *Authentication Services*: Select the authentication server that you previously added to the controller.

10 In the Authentication & Accounting Service section, configure the following options:

- *Web Authentication Portal*: Select the web authentication portal that you created previously. See Working with Web Authentication Services for more information.
- *Bypass CNA*: Select the **Enable** check box if you want to bypass the Apple CNA feature on iOS and OS X devices that connect to this WLAN. See Bypassing Apple CNA for more information.
- *Authentication Service*: Select the authentication server that you want to use for this WLAN. Options include **Local DB**, **Always Accept**, and any AAA servers that you previously added (see Working with AAA Servers). Additionally, if you want the controller to proxy authentication messages to the AAA server, select the **Use SCG as Proxy** check box.
- *Accounting Service*: Select the RADIUS Accounting server that you want to use for this WLAN. You must have added a RADIUS Accounting server previously (see Working with AAA Servers). Additionally, if you want the controller to proxy accounting messages to the AAA server, select the **Use SCG as Proxy** check box.

11 In *Options*, configure the following options:

- *Wireless Client Isolation*: Wireless client isolation enables subnet restrictions for connected clients. Click **Enable** if you want to prevent wireless clients associated with the same AP from communicating with each other locally. The default value is **Disable**.
- *Priority*: Set the priority of this WLAN to Low if you would prefer that other WLAN traffic takes priority. For example, if you want to prioritize internal traffic over guest WLAN traffic, you can set the priority in the guest WLAN configuration settings to "Low." By default, all WLANs are set to high priority.

12 In *RADIUS Options*, click + (plus sign) to display the options, and then configure the following:

- *NAS ID*: Select how to the RADIUS server will identify the AP. Options include:
  - WLAN BSSID
  - AP MAC
  - User-defined
- *NAS Request Timeout*: Type the timeout period (in seconds) after, which an expected RADIUS response message is considered to have failed.

- *NAS Max Number of Retries*: Type the number of failed connection attempts after which the controller will fail over to the backup RADIUS server.
- *NAS Reconnect Primary*: If the controller fails over to the backup RADIUS server, this is the interval (in minutes) at which the controller will recheck the primary RADIUS server if it is available. The default interval is 5 minutes.
- *Call STA ID*: Use either WLAN BSSID or AP MAC as the station calling ID. Select one.

13 In *Advanced Options*, configure the following options:

- *User Traffic Profile:* If you want this WLAN to use a user traffic profile that you previously created, select it from the drop-down menu. Otherwise, select **System Default**. For more information, see Creating a User Traffic Profile.
- *L2 Access Control*: If you want this WLAN to use an L2 access control policy that you previously created, select it from the drop-down menu. Otherwise, select **Disable**. For more information, see Creating an L2 Access Policy.
- *Device Policy*: If you want this WLAN to use a device policy that you previously created, select it from the drop-down menu. Otherwise, select **Disable**. For more information, see Controlling Device Access.
- *Access VLAN*: By default, all wireless clients associated with APs that the controller is managing are segmented into a single VLAN (with VLAN ID 1). If you want to tag this WLAN traffic with a different VLAN ID, enter a valid VLAN ID (2-4094) in the box.
- *Hide SSID*: Select this check box if you do not want the ID of this WLAN advertised at any time. This will not affect performance or force the WLAN user to perform any unnecessary tasks.
- *Client Load Balancing*: To disable client load balancing on this WLAN, select the **Do not perform client load balancing for this WLAN service check** box. For more information, see Client Load Balancing.
- *Proxy ARP*: Select this check box to enable proxy ARP. When proxy ARP is enabled on a WLAN, the AP provides proxy service for stations when receiving neighbor discovery packets (for example, ARP request and ICMPv6 Neighbor Solicit messages), and acts on behalf of the station in delivering ARP replies. When the AP receives a broadcast ARP/Neighbor Solicit request for a known host, the AP replies on behalf of the host. If the AP receives a request for an unknown host, it forwards the request at the rate limit specified.

- *Max Clients*: This option limits the number of clients that can associate with this WLAN per AP (default is 100). You can also limit the total number of clients that a specific AP (or radio, on dual radio APs) will manage.
- *802.11d*: Select this check box to enable this standard on this WLAN. 802.11d provides specifications for compliance with additional regulatory domains (countries or regions) that were not defined in the original 802.11 standard. Click this option if you are operating in one of these additional regulatory domains.
- *Force DHCP*: Enable this option to force clients to obtain a valid IP address from DHCP within the specified number of seconds. This prevents clients configured with a static IP address from connecting to the WLAN. Additionally, if a client performs Layer 3 roaming between different subnets, in some cases the client sticks to the former IP address. This mechanism optimizes the roaming experience by forcing clients to request a new IP address.
- *DHCP Option 82*: Select the **Enable DHCP Option 82** check box to enable this feature. When this feature is enabled and an AP receives a DHCP request from a wireless client, the AP will encapsulate additional information (such as VLAN ID, AP name, SSID and MAC address) into the DHCP request packets before forwarding them to the DHCP server. The DHCP server can then use this information to allocate an IP address to the client from a particular DHCP pool based on these parameters.
- *Client TX/RX Statistics*: Select the **Ignore statistics from unauthorized clients** check box if you do not want the controller to monitor traffic statistics for unauthorized clients.
- *Inactivity Timeout*: Select this check box and enter a value in seconds (60 to 600) after which idle clients will be disconnected.
- *Client Fingerprinting:* By selecting this check box, the controller will attempt to identify client devices by their operating system, device type and host name, if available. This makes identifying client devices easier on the Dashboard, Monitor and Client Details pages.
- *OFDM Only*: Select the check box to force clients associated with this WLAN to use only Orthogonal Frequency Division Multiplexing (OFDM) to transmit data. OFDM-only allows the client to increase management frame transmission speed from CCK rates to OFDM rates. This feature is implemented per WLAN and only affects the 2.4GHz radio.

- *BSS Min Rate*: Select this check box to set the BSS rates of management frames from default rates (CCK rates for 2.4G or OFDM rate – 6Mbps for 5G] to the desired rates. By default, BSS Min Rate is disabled.

NOTE: OFDM-only takes higher priority than BSS-minrate. However, OFDM-only relies on BSS-minrate to adjust its rate for management frames.

- *Mgmt Tx Rate*: To set the maximum transmit rate for management frame, select a value (in Mbps) from the drop-down list.
- *Service Schedule*: Use the Service Schedule tool to control which hours of the day, or days of the week to enable/disable WLAN service. Options include:
  - **Always On**: Click this enable this WLAN at all times.
  - **Always Off**: Click this option to disable the WLAN service at all times.
  - **Specific**: Click this to set specific hours during which this WLAN will be enabled. For example, a WLAN for student use at a school can be configured to provide wireless access only during school hours. Click on a day of the week to enable/disable this WLAN for the entire day. Colored cells indicate WLAN enabled. Click and drag to select specific times of day. You can also disable a WLAN temporarily for testing purposes, for example.

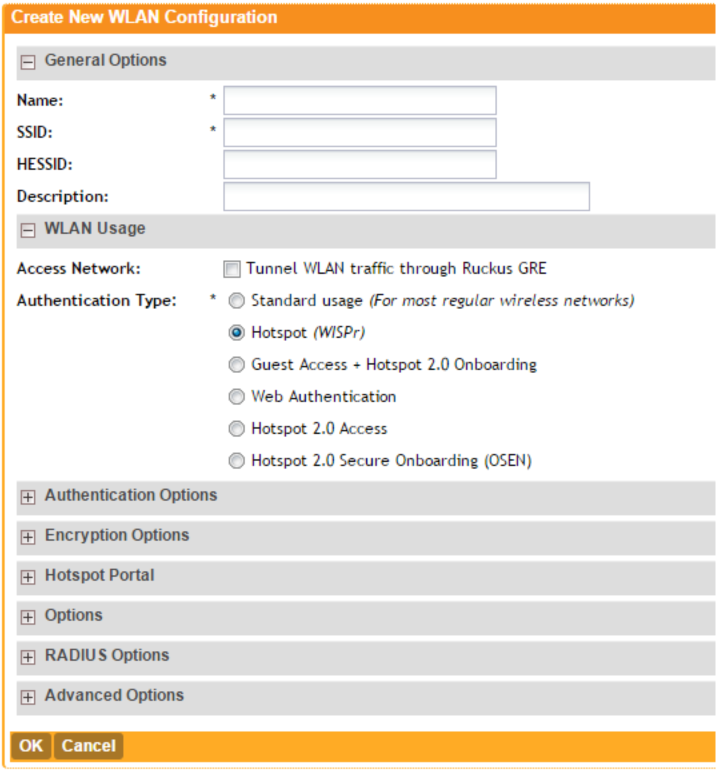
NOTE: The service schedule feature will not work properly if the controller does not have the correct time. To ensure that the controller always maintains the correct time, point the controller to an NTP server's IP address, as described in Configuring the System Time.

- *Band Balancing*: Client band balancing between the 2.4GHz and 5GHz radio bands is disabled by default on all WLANs. To disable band balancing for this WLAN only (when enabled globally), select the **Do not perform band balancing for this WLAN service** check box. For more information, see Band Balancing.

14 Click **OK** at the bottom of the form.

You have completed creating and configuring a WLAN service of the AP zone.

Figure 28. The Create New WLAN Configuration form



Create New WLAN Configuration

⊟ General Options

Name: *

SSID: *

HESSID:

Description:

⊟ WLAN Usage

Access Network: □ Tunnel WLAN traffic through Ruckus GRE

Authentication Type: *
- ○ Standard usage *(For most regular wireless networks)*
- ● Hotspot *(WISPr)*
- ○ Guest Access + Hotspot 2.0 Onboarding
- ○ Web Authentication
- ○ Hotspot 2.0 Access
- ○ Hotspot 2.0 Secure Onboarding (OSEN)

⊞ Authentication Options

⊞ Encryption Options

⊞ Hotspot Portal

⊞ Options

⊞ RADIUS Options

⊞ Advanced Options

Client Load Balancing

Enabling load balancing can improve WLAN performance by helping to spread the wireless client load between nearby access points, so that one AP does not get overloaded while another sits idle. The load balancing feature can be controlled from within the controller web interface to balance the number of clients per radio on adjacent APs.

“Adjacent APs” are determined by the controller at startup by measuring the RSSI during channel scans. After startup, the controller uses subsequent scans to update the list of adjacent radios periodically and when a new AP sends its first scan report. When an AP leaves, the controller immediately updates the list of adjacent radios and refreshes the client limits at each affected AP.

Once the controller is aware of which APs are adjacent to each other, it begins managing the client load by sending the configured client limits to the APs. These limits are “soft values” that can be exceeded in several scenarios, including:

1. When a client’s signal is so weak that it may not be able to support a link with another AP
2. When a client’s signal is so strong that it really belongs on this AP.

The APs maintain these configured client limits and enforce them once they reach the limits by withholding probe responses and authentication responses on any radio that has reached its limit.

Key Points About Client Load Balancing

Before you enable load balancing, keep the following considerations in mind:

- The load balancing rules apply only to client devices; the AP always responds to another AP that is attempting to set up or maintain a mesh network.
- Load balancing does not disassociate clients already connected.
- Load balancing takes action before a client association request, reducing the chance of client misbehavior.
- The process does not require any time-critical interaction between APs and the controller.
- Provides control of adjacent AP distance with safeguards against abandoning clients.
- Can be disabled on a per-WLAN basis. For instance, on a voice WLAN, load balancing may not be desired due to voice roaming considerations.
- Background scanning must be enabled on the WLAN for load balancing to work.

Band Balancing

Band balancing balances the client load on radios by distributing clients between the 2.4 GHz and 5 GHz radios. This feature is enabled by default and set to a target of 25% of clients connecting to the 2.4 GHz band. To balance the load on a radio, the AP encourages dual-band clients to connect to the 5 GHz band when the configured percentage threshold is reached.

ChannelFly and Background Scanning

SmartZone controllers offer the ChannelFly and Background Scanning automatic channel selection methods for spectrum utilization and performance optimization. While Background Scanning must be enabled for rogue AP detection, AP location detection and radio power adjustment, either can be used for automatic channel optimization.

The main difference between ChannelFly and Background Scanning is that ChannelFly determines the optimal channel based on real-time statistical analysis of actual throughput measurements, while Background Scanning uses channel measurement and other techniques to estimate the impact of interference on Wi-Fi capacity based on progressive scans of all available channels.

NOTE: If you enable ChannelFly, Background Scanning can still be used for adjusting radio power and rogue detection while ChannelFly manages the channel assignment. Both cannot be used at the same time for channel management.

Benefits of ChannelFly

With ChannelFly, the AP intelligently samples different channels while using them for service. ChannelFly assesses channel capacity every 15 seconds and changes channel when, based on historical data, a different channel is likely to offer higher capacity than the current channel. Each AP makes channel decisions based on this historical data and maintains an internal log of channel performance individually.

When ChannelFly changes channels, it utilizes 802.11h channel change announcements to seamlessly change channels with no packet loss and minimal impact to performance. The 802.11h channel change announcements affect both wireless clients and Ruckus mesh nodes in the 2.4 GHz and/or 5 GHz bands.

Initially (in the first 30-60 minutes) there will be more frequent channel changes as ChannelFly learns the environment. However, once an AP has learned about the environment and which channels are most likely to offer the best throughput potential, channel changes will occur less frequently unless a large measured drop in throughput occurs.

ChannelFly can react to large measured drops in throughput capacity in as little as 15 seconds, while smaller drops in capacity may take longer to react to.

Disadvantages of ChannelFly

Compared to Background Scanning, ChannelFly takes considerably longer for the network to settle down. If you will be adding and removing APs to your network frequently, Background Scanning may be preferable. Additionally, if you have clients that do not support the 802.11h standard, ChannelFly may cause significant connectivity issues during the initial capacity assessment stage.

You can enable/disable ChannelFly per band. If you have 2.4 GHz clients that do not support 802.11h, Ruckus recommends disabling ChannelFly for 2.4 GHz but leaving it enabled for the 5 GHz band.

Background Scanning

Using Background Scanning, SmartZone controllers regularly samples the activity in all Access Points to assess RF usage, to detect rogue APs and to determine which APs are near each other for mesh optimization. These scans sample one channel at a time in each AP so as not to interfere with network use. This information is then applied in AP Monitoring and other controller monitoring features. You can, if you prefer, customize the automatic scanning of RF activity, deactivate it if you feel it's not helpful, or adjust the frequency, if you want scans at greater or fewer intervals.

NOTE: Background Scanning must be enabled for SmartZone controllers to detect rogue APs on the network.

Client Admission Control

Client admission control allows APs to adaptively allow or deny the association of clients based on the potential throughput of the currently associated clients. This helps prevent APs from becoming overloaded with clients and improves user experience for wireless users.

As an administrator, you can help maintain a positive user experience for wireless users on the network by configuring the following client admission control settings:

- Minimum client count
- Maximum radio load
- Minimum client throughput

Client admission control is implemented on a per radio basis and is currently only supported on 802.11n APs.

Bypassing Apple CNA

Some Apple iOS and OS X clients include a feature called Captive Network Assistant (CNA), which allows clients to connect to an open captive portal WLAN without displaying the logon page.

When a client connects to a wireless network, the CNA feature launches a pre-browser login utility and it sends a request to a success page on the Apple website. If the success page is returned, the device assumes it has network connectivity and no action is taken. However, this login utility is not a fully functional browser, and does not support HTML, HTML5, PHP or other embedded video. In some situations, the ability to skip the login page for open WLANs is a benefit. However, for other guest or public access designs, the lack of ability to control the entire web authentication process is not desirable.

The controller provides an option to work around the Apple CNA feature if it is not desirable for your specific deployment. With CNA bypass enabled, captive portal (web-based authentication) logon must be performed by opening a browser to any unauthenticated page (HTTP) to get redirected to the logon page.

Viewing Existing WLANs

Follow these steps to view a list of existing WLANs.

1. Click *Configuration* > *Wireless Network* > *WLAN*. The WLANs page appears.
2. Look for the WLAN Configuration section. All existing WLANs are listed in the section and their basic settings, including the:
   - WLAN name
   - SSID
   - Description
   - Auth Method (authentication method)
   - Encryptions
   - Actions (that you can perform)

You have completed viewing a list of existing WLANs.

Deleting WLANs

Follow these steps to delete WLANs.

1. Go to *Configuration* > *WLAN*. The WLANs page appears.
2. Look for the *WLAN Configuration* section.

3. Locate the WLAN or WLANs that you want to delete.
4. Select the check boxes (first column) for the WLANs that you want to delete.
5. Click **Delete Selected**.

The WLANs that you selected disappear from the list. You have completed deleting WLANs.

NOTE: If you are deleting a single WLAN, you can also click the 🗑 icon (under the *Actions* column) that is in the same row as the WLAN that you want to delete.

Configuring WLAN Groups

A WLAN group is a way of specifying which APs or AP groups provide which WLAN services. If your wireless network covers a large physical environment (for example, multi-floor or multi-building office) and you want to provide different WLAN services to different areas of your environment, you can use WLAN groups to do this.

For example, if your wireless network covers three building floors (1st floor to 3rd floor) and you need to provide wireless access to visitors on the 1st floor, you can do the following:

1. Create a WLAN service (for example, “Guest Only Service”) that provides guest-level access only.
2. Create a WLAN group (for example, “Guest Only Group”), and then assign “Guest Only Service” (WLAN service) to “Guest Only Group” (WLAN group).
3. Assign APs on the 1st Floor (where visitors need wireless access) to your “Guest Only Group”.

Any wireless client that associates with APs assigned to the “Guest Only Group” will get the guest-level access privileges defined in your “Guest Only Service.” APs on the 2nd and 3rd floors can remain assigned to the default WLAN Group and provide normal-level access.

Notes About WLAN Groups

Before you start using WLAN groups to provision WLAN settings to APs or AP groups, take note of the following important notes:

- Creating WLAN groups is optional. If you do not need to provide different WLAN services to different areas in your environment, you do not need to create a WLAN group.

- A default WLAN group called “default” exists. The first 27 WLANs that you create are automatically assigned to this default WLAN group.
- A WLAN group can include a maximum of 27 member WLANs. For dual radio APs, each radio can be assigned to only one WLAN group (single radio APs can be assigned to only one WLAN group).

Creating a WLAN Group

Follow these steps to create a WLAN group.

1 Go to *Configuration* > *WLAN*. The WLANs page appears.

2 Look for the WLAN Groups section.

3 Click Create New.

4 In Group Name, type a descriptive name that you want to assign to this WLAN group. For example, if this WLAN will contain WLANs that are designated for guest users, you can name this as Guest WLAN Group.

5 In Description (optional), type some notes or comments about this group.

6 Under WLAN List, select the check boxes for the WLANs that you want to be part of this WLAN group. The VLAN Override and NAS-ID columns for the selected WLANs become active.

7 In the VLAN override settings, choose whether to override the VLAN configured for each member WLAN. Available options include:

   - No Change: Click this option if you want the WLAN to keep the same VLAN tag (default: 1).
   - Tag: Click this option to override the VLAN configured for the WLAN service.

8 In the NAS-ID settings, choose whether to override the NAS-ID configured for each member WLAN. Available options include:

   - No Change: Click this option if you want the WLAN to keep the same NAS-ID tag.
   - User-defined: Click this option to override the NAS-ID that has been assigned to this WLAN service.

9 Click Create New. The Create New form disappears and the WLAN group that you created appears in the table under WLAN Groups.

You may now assign this WLAN group to an AP or AP group.

Viewing Existing WLAN Groups

Follow these steps to view a list of existing WLAN groups.

1 Go to Configuration > WLAN. The WLANs page appears.

2 Look for the WLAN Groups section. All existing WLAN groups and their basic settings are shown, including the:

   - WLAN group name
   - Description

   - Actions (that you can perform)

3. To view WLANs that belong to a particular WLAN group, click the WLAN group name.

You have completed viewing existing WLAN groups.

Deleting WLAN Groups

Follow these steps to delete WLAN groups.

1. Go to *Configuration* > *WLAN*. The WLANs page appears.
2. Scroll down to the *WLAN Group* section.
3. Locate the WLAN group or groups that you want to delete.
4. Select the check boxes (first column) for the WLAN groups that you want to delete.
5. Click **Delete Selected**.

The WLAN groups that you selected disappear from the list. You have completed deleting WLAN groups.

NOTE: If you are deleting a single WLAN group, you can also click the 🗑 icon (under the *Actions* column) that is in the same row as the WLAN group that you want to delete.

Working with WLAN Schedule Profiles

A WLAN schedule profile specifies the hours of the day or week during which a WLAN service will be enabled or disabled. For example, a WLAN for student use at a school can be configured to provide wireless access only during school hours. Create a WLAN schedule profile, and then when you configure a WLAN, select the schedule profile to enable or disable the WLAN service during those hours/days.

NOTE: This feature will not work properly if the system does not have the correct time. To ensure that the system always maintains the correct time, configure an NTP server and point the system to the NTP server's IP address, as described in Configuring the System Time.

NOTE: WLAN service schedule times should be configured based on your browser's current timezone. If your browser and the target AP/WLAN are in different timezones, configure the on/off times according to the desired schedule according to your local browser. For example if you wanted a WLAN in Los Angeles to turn on at 9 AM and your browser was set to New York time, please configure the WLAN service schedule to enable the WLAN at noon. When configuring the service schedule, all times are based on your browser's timezone setting.

Creating a WLAN Schedule Profile

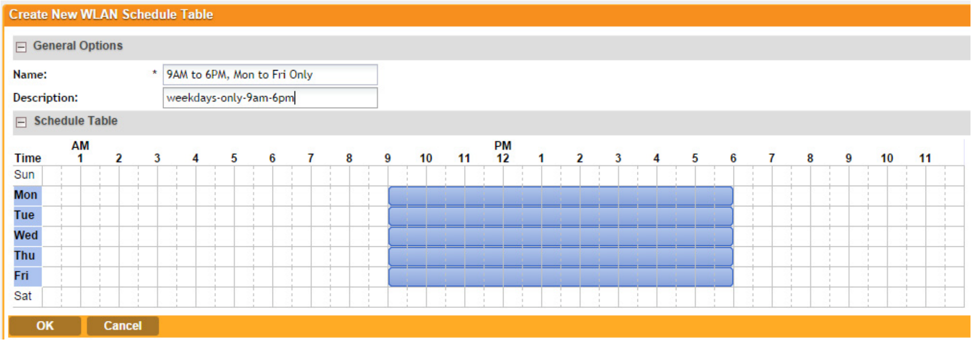
Follow these steps to create a WLAN schedule profile.

1. Go to Configuration > WLAN. The WLANs page appears.
2. Scroll down to the WLAN Schedule Profiles section.
3. Click Create New. The Create New WLAN Schedule Table form appears.
4. Set a WLAN schedule.
   - To enable or disable the WLAN for an entire day, click the day of the week under the Time column.
   - To enable or disable the WLAN for specific hour of a specific day, click the squares in the table. A single square represents 30 minutes (two-15 minute blocks).

   Blue-colored cells indicate the hours when the WLAN is enabled. Clear (or white) cells indicate the hours when the WLAN is disabled.
5. Click Create New. The page refreshes, and then the schedule you created appears in the WLAN Scheduler Profiles section.

You have completed creating a WLAN schedule profile. This WLAN schedule profile will now appear as an option

Figure 29. Creating a schedule profile



Create New WLAN Schedule Table

⊟ General Options

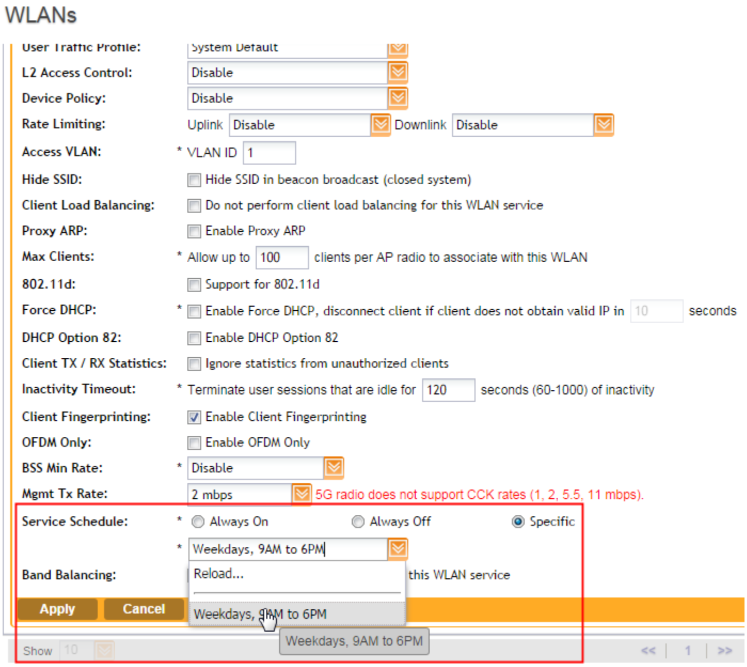
Name: * 9AM to 6PM, Mon to Fri Only

Description: weekdays-only-9am-6pm

⊟ Schedule Table

Time		AM 1	2	3	4	5	6	7	8	9	10	11	PM 12	1	2	3	4	5	6	7	8	9	10	11
Sun																								
Mon										🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦						
Tue										🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦						
Wed										🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦						
Thu										🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦						
Fri										🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦						
Sat																								

Figure 30. Selecting the schedule profile when creating or editing a WLAN



WLANs

User Traffic Profile: System Default

L2 Access Control: Disable

Device Policy: Disable

Rate Limiting: Uplink Disable Downlink Disable

Access VLAN: * VLAN ID 1

Hide SSID: □ Hide SSID in beacon broadcast (closed system)

Client Load Balancing: □ Do not perform client load balancing for this WLAN service

Proxy ARP: □ Enable Proxy ARP

Max Clients: * Allow up to 100 clients per AP radio to associate with this WLAN

802.11d: □ Support for 802.11d

Force DHCP: * □ Enable Force DHCP, disconnect client if client does not obtain valid IP in 10 seconds

DHCP Option 82: □ Enable DHCP Option 82

Client TX / RX Statistics: □ Ignore statistics from unauthorized clients

Inactivity Timeout: * Terminate user sessions that are idle for 120 seconds (60-1000) of inactivity

Client Fingerprinting: ☑ Enable Client Fingerprinting

OFDM Only: □ Enable OFDM Only

BSS Min Rate: * Disable

Mgmt Tx Rate: 2 mbps 5G radio does not support CCK rates (1, 2, 5.5, 11 mbps).

Service Schedule: * ○ Always On ○ Always Off ● Specific

* Weekdays, 9AM to 6PM

Band Balancing: this WLAN service

Viewing WLAN Schedule Profiles

Follow these steps to view a list of existing WLAN schedule profiles.

1 Go to Configuration > WLAN. The WLANs page appears.

2 Look for the WLAN Schedule Profiles section. All existing WLAN schedule profiles and their basic settings are shown, including the:

- WLAN schedule name
- Description
- Actions (that you can perform)

3 To view the schedule that has been defined in a particular schedule profile, click the schedule profile name.

You have completed viewing existing WLAN schedule profiles.

Deleting WLAN Schedule Profiles

Follow these steps to delete WLAN schedule profiles.

1. Go to *Configuration* > *WLAN*. The WLANs page appears.
2. Scroll down to the *WLAN Schedule Profiles* section.
3. Locate the profile or profiles that you want to delete.
4. Select the check boxes (first column) for the profiles that you want to delete.
5. Click **Delete Selected**.

The profiles that you selected disappear from the list. You have completed deleting WLAN schedule profiles.

NOTE: If you are deleting a single profile, you can also click the 🗑 icon (under the *Actions* column) that is in the same row as the profile that you want to delete.

Configuring Access Points

This section describes how to configure the settings of access points that are managed by the controller.

- Configuring Common AP Settings
- Configuring Model-Based Settings
- Configuring AP Tunnel Settings
- Tagging Critical APs
- Managing Access Points

Configuring Common AP Settings

Follow these steps to configure the settings that are common to all APs, such as the country code, mesh options, and radio options.

1. Go to *Configuration* > *Access Points* > *Common Settings*.
2. In the *General Options* section, configure the following:
   - *AP Firmware:* This field shows the current SmartZone AP firmware version on controller. This is not configurable.
   - *Country Code*: Select the country in which you are operating the access points. Different countries and regions maintain different rules that govern which channels can be used for wireless communications. Set the country code to the proper regulatory region ensuring that the controller network does not violate local and national regulatory restrictions.

- *Location*: Type a location name (for example, Ruckus Wireless HQ) for this AP.
- *Location Additional Information*: Type additional information about the AP location (for example, 350 W Java Dr, Sunnyvale, CA 94089, United States).
- *GPS Coordinates*: Type the longitude and latitude coordinates for the AP's location.
- *AP Admin Logon*: Specify the user name and password that administrators can use to log on directly to the managed access point's native web interface. The following boxes are provided:
    - *Logon ID*: Type the admin user name.
    - *Password*: Type the admin password.
- *AP Time Zone*: Set the time zone that you want APs to use by selecting one of the following options:
    - **Follow the System Zone**: Select this option if you want managed APs to use the same time zone as the controller, which the controller obtains from the NTP server you configured in Configuring the System Time.
    - **User Defined**: Select this option if you want to set the time zone used by the APs manually, and then configure the time zone abbreviation (for example, CST, GMT, etc.), GMT offset, and daylight saving time (DST) support.
- *AP IP Mode*: This field shows the IP addressing mode (either **IPv4 only** or **IPv6 only**) that managed APs use. This is the device IP mode that you selected when you completed the Setup Wizard. This field is not configurable.

3 In the *Mesh Options* section, configure the following:

- **Enable mesh networking**: Select this check box if you want managed APs to automatically form a wireless mesh network, in which participant nodes (APs) cooperate to route packets.

NOTE: Dual band APs can only mesh with other dual band APs, while single band APs can only mesh with other single band APs.

- *Mesh Name (ESSID)*: Type a name for the mesh network. Alternatively, do nothing to accept the default mesh name that the controller has generated.
- *Mesh Passphrase*: Type a passphrase that contains at least 12 characters. This passphrase will be used by the controller to secure the traffic between Mesh APs. Alternatively, click **Generate** to generate a random passphrase with 32 characters or more.

4 In *Radio Options*, configure the following:

- Configure the following options under *Radio Options b/g/n (2.4GHz)*:
    - *Channelization*: Set the channel width used during transmission to either **20** or **40** (MHz), or select **Auto** to set it automatically.
    - *Channel*: Select the channel to use for the b/g/n (2.4GHz) radio, or select **Auto** to set it automatically.
    - *TX Power Adjustment*: Select the preferred TX power, if you want to manually configure the transmit power on the 2.4GHz radio. By default, TX power is set to **Full** on the 2.4GHz radio
- Configure the following options under *Radio Options a/n/c (5GHz)*:
    - *Channelization*: Set the channel width used during transmission to either **20**, **40**, or **80** (MHz), or select **Auto** to set it automatically.
    - *Channel (Indoor)*: Select the indoor channel to use for the *a/n/c* (5GHz) radio, or select **Auto** to set it automatically.
    - *Channel (Outdoor)*: Select the outdoor channel to use for the *a/n/c* (5GHz) radio, or select **Auto** to set it automatically.
    - *TX Power Adjustment*: Select the preferred TX power, if you want to manually configure the transmit power on the 5GHz radio. By default, TX power is set to **Full** on the 5GHz radio.

5 In *Syslog Options*, select the **Enable external syslog server for APs** check box if you want to send sys to a remote syslog server. Configure the following options that appear after you select the check box.

- *Server Address*: Type the IP address (IPv4 or IPv6) or host name of the syslog server on the network.
- *Port*: Type the syslog port number on the server. The default port number is 514.
- *Facility for Event*: Select the facility level that will be used by the syslog message. Options include Keep Original (default), Local0, Local1, Local2, Local3, Local4, Local5, Local6, and Local7.
- *Priority*: Accept or change the default severity to priority mapping. See Default Event Severity to Syslog Priority Mapping.

6 In *Advanced Options*, configure the following:

- *Channel Mode*: If you want to allow outdoor APs to use wireless channels that are regulated as indoor-use only, select the Allow indoor channels check box. For more information, see Channel Mode.

- *Background Scanning*: If you want APs to evaluate radio channel usage automatically, enable and configure the background scanning settings on both the 2.4GHz and 5GHz radios. By default, background scanning is enabled on both radios and is configured to run every 20 seconds.
- Auto Channel Selection: You can adjust the AP channel to 2.4 GHz or 5 GHz frequencies by selecting the appropriate check-box. Further, you can automatically adjust the AP to optimize performance by choosing one of the following:
  - Background Scanning
  - ChannelFly
- *Smart Monitor*: To disable the WLANs of an AP whenever the AP uplink or Internet connection becomes unavailable, select the **Enable** check box. And then, configure the following options:
  - *Health Check Interval*: Set the interval (between 5 and 60 seconds) at which the controller will check the AP's uplink connection. The default value is 10 seconds.
  - *Health Check Retry Threshold*: Set the number of times (between 1 and 10 times) that the controller will check the AP's uplink connection. If the controller is unable to detect the uplink after the configured number of retries, the controller will disable the AP's WLANs. The default value is 3 retries.

NOTE: When the controller disables the AP's WLANs, the AP creates a log for the event. When the AP's uplink is restored, the AP sends the event log (which contains the timestamp when the WLANs were disabled, and then enabled) to the controller.

- *VLAN Pooling:* To automatically segment large groups of clients (that may or may not be connected to the same SSID) into multiple smaller subgroups using multiple VLANs, select the **Allow VLAN pooling overlapping** check box. Refer to VLAN Pooling for the additional settings that you need to configure to get VLAN pooling to work on the wireless network.
- *Rogue AP Detection*: Select the **Report rogue access points** check box to enable rogue device detection in logs and email alarm event notifications.
  - **Report all rogue devices**: Send alerts for all rogue AP events.
  - **Report only malicious rogue devices of type**: Select which event types to report. Events include SSID spoofing, same network, and MAC spoofing.

  - **Protect the network from malicious rogue access points**: Select this check box to automatically protect your network from network connected rogue APs, SSID-spoofing APs and MAC-spoofing APs. When one of these rogue APs is detected (and this check box is enabled), the Ruckus Wireless AP automatically begins sending broadcast de-authentication messages spoofing the rogue’s BSSID (MAC) to prevent wireless clients from connecting to the malicious rogue AP. This option is disabled by default.

- *Client Load Balancing*: Improve WLAN performance by enabling load balancing. Load balancing spreads the wireless client load between nearby access points, so that one AP does not get overloaded while another sits idle.

  Load balancing must be enabled on a per-radio basis. To enable load balancing, select the **Enable loading balancing on [2.4GHz or 5GHz]** check box, and then set or accept the default *Adjacent Radio Threshold* values (50dB for the 2.4GHz radio and 43dB for the 5GHz radio).

NOTE: For more information about load balancing, see Client Load Balancing.

- *Band Balancing*: Client band balancing between the 2.4 GHz and 5 GHz radio bands is enabled by default on all WLANs. For more information, see Band Balancing.
- *Location Based Service*: If you have an LBS server on the network, select the **Enable LBS Server** check box, and then select the server from the list.

NOTE: For more information about location based services, see Configuring Location Services.

- *Hotspot 2.0 Venue Profile*: If managed APs are providing Hotspot 2.0 services, select the name of the venue profile that you previously created. See the *Hotspot 2.0 Reference Guide* for this release for more information.
- *Client Admission Control*: To enable client admission control on a specific wireless radio, select the **Enable** check box, and then set the load thresholds on the AP at which it will stop accepting new clients by setting values for the following:
  - Min Client Count
  - Max Radio Load (%)
  - Min Client Throughput (Mbps)

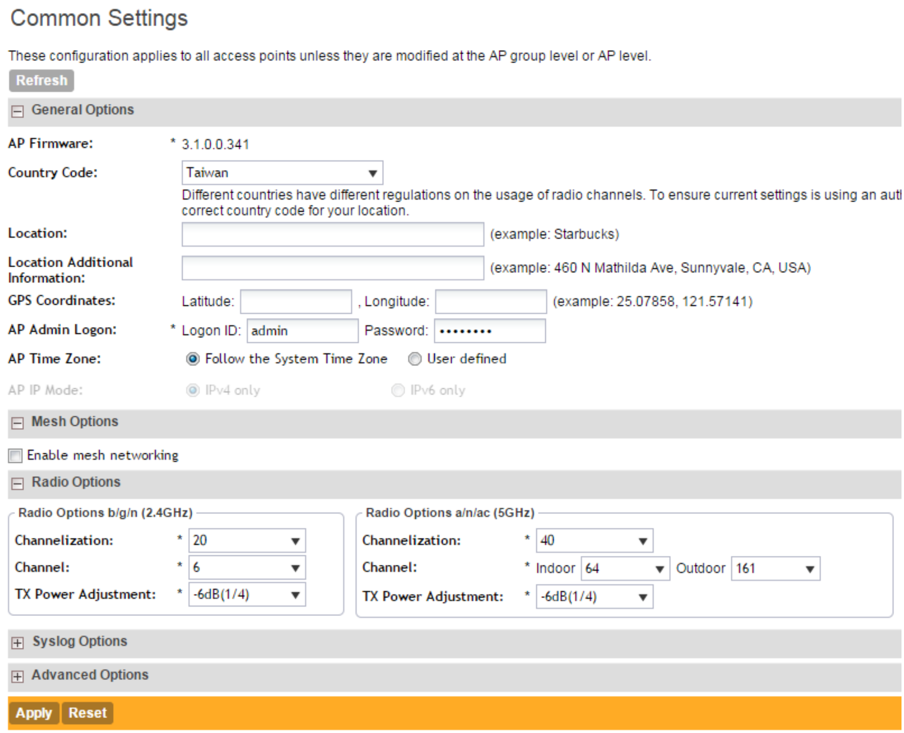
NOTE: For more information about client admission control, see Client Admission Control.

- *AP Reboot Timeout*: Set the time after which the AP will reboot automatically when it is unable to reach the default gateway or the control interface.
    - *Reboot AP if it cannot reach default gateway after [ ] minutes*: The default timeout is 30 minutes.
    - *Reboot AP if it cannot reach SCG after [ ]*: The default timeout is 2 hours.

7 Click **Apply**.

You have completed configuring the common AP settings.

Figure 31. The Common Settings page



Common Settings

These configuration applies to all access points unless they are modified at the AP group level or AP level.

⊟ General Options

AP Firmware: * 3.1.0.0.341

Country Code: Taiwan ▼

Different countries have different regulations on the usage of radio channels. To ensure current settings is using an autl
correct country code for your location.

Location: (example: Starbucks)

Location Additional Information: (example: 460 N Mathilda Ave, Sunnyvale, CA, USA)

GPS Coordinates: Latitude: , Longitude: (example: 25.07858, 121.57141)

AP Admin Logon: * Logon ID: admin Password: ••••••••

AP Time Zone: ● Follow the System Time Zone ○ User defined

AP IP Mode: ● IPv4 only ○ IPv6 only

⊟ Mesh Options

□ Enable mesh networking

⊟ Radio Options

Radio Options b/g/n (2.4GHz)

Channelization: * 20 ▼
Channel: * 6 ▼
TX Power Adjustment: * -6dB(1/4) ▼

Radio Options a/n/ac (5GHz)

Channelization: * 40 ▼
Channel: * Indoor 64 ▼ Outdoor 161 ▼
TX Power Adjustment: * -6dB(1/4) ▼

⊞ Syslog Options

⊞ Advanced Options

Channel Mode

Some countries restrict certain 5GHz channels to indoor use only. For instance, Germany restricts channels in the 5.15 GHz to 5.25 GHz band to indoor use. When ZoneFlex Outdoor APs and bridges with 5 GHz radios (ZoneFlex 7762, 7782, 7761-

CM and 7731) are set to a country code where these restrictions apply, the AP or bridge can no longer be set to an indoor-only channel and will no longer select from amongst a channel set that includes these indoor-only channels when SmartSelect or auto channel selection is used, unless the administrator configures the AP to allow use of these channels.

For instance, if the AP is installed in a challenging indoor environment (such as a warehouse), the administrator may want to allow the AP to use an indoor-only channel. These channels can be enabled for use through the AP CLI or controller web interface by configuring *Configuration* > *Access Points* > *Common Settings* > *Advanced Options* > *Channel Mode* and selecting the **Allow indoor channels (allow ZoneFlex Outdoor APs to use channels regulated as indoor use-only)** check box.

If you have a dual-band ZoneFlex Indoor AP functioning as a RAP with dual-band ZoneFlex Outdoor APs functioning as MAPs, the mesh backhaul link must initially use a non-indoor-only channel. Your ZoneFlex Outdoor MAPs may fail to join if the mesh backhaul link is using a restricted indoor-only channel.

Client Load Balancing

Enabling load balancing can improve WLAN performance by helping to spread the wireless client load between nearby access points, so that one AP does not get overloaded while another sits idle. The load balancing feature can be controlled from within the controller web interface to balance the number of clients per radio on adjacent APs.

“Adjacent APs” are determined by the controller at startup by measuring the RSSI during channel scans. After startup, the controller uses subsequent scans to update the list of adjacent radios periodically and when a new AP sends its first scan report. When an AP leaves, the controller immediately updates the list of adjacent radios and refreshes the client limits at each affected AP.

Once the controller is aware of which APs are adjacent to each other, it begins managing the client load by sending the configured client limits to the APs. These limits are “soft values” that can be exceeded in several scenarios, including:

- When a client’s signal is so weak that it may not be able to support a link with another AP
- When a client’s signal is so strong that it really belongs on this AP.

The APs maintain these configured client limits and enforce them once they reach the limits by withholding probe responses and authentication responses on any radio that has reached its limit.

Key Points About Load Balancing

Before you enable load balancing, keep the following considerations in mind:

- The load balancing rules apply only to client devices; the AP always responds to another AP that is attempting to set up or maintain a mesh network.
- Load balancing does not disassociate clients already connected.
- Load balancing takes action before a client association request, reducing the chance of client misbehavior.
- The process does not require any time-critical interaction between APs and the controller.
- Provides control of adjacent AP distance with safeguards against abandoning clients.
- Can be disabled on a per-WLAN basis. For instance, on a voice WLAN, load balancing may not be desired due to voice roaming considerations.
- Background scanning must be enabled on the WLAN for load balancing to work.

Band Balancing

Band balancing balances the client load on radios by distributing clients between the 2.4 GHz and 5 GHz radios. This feature is enabled by default and set to a target of 25% of clients connecting to the 2.4 GHz band. To balance the load on a radio, the AP encourages dual-band clients to connect to the 5 GHz band when the configured percentage threshold is reached.

VLAN Pooling

When Wi-Fi is deployed in a high density environment such as a stadium or a university campus, the number of IP addresses required for client devices can easily run into the thousands. Placing thousands of clients into a single large subnet or VLAN can result in degraded performance due to factors like broadcast and multicast traffic.

To address this problem, VLAN pooling allows administrators to a deploy pool of multiple VLANs to which clients are assigned, thereby automatically segmenting large groups of clients into multiple smaller subgroups, even when connected to the same SSID. As the client device joins the WLAN, the VLAN is assigned to one of the VLANs in the pool based on a hash of the client’s MAC address.

To use the VLAN pooling feature, you first need to create a VLAN pooling profile, and then you can assign the profile to a specific WLAN or override the VLAN settings of a WLAN group.

Creating a VLAN Pooling Profile

Follow these steps to create a VLAN pooling.

1 Go to *Configuration* > *WLANs*.

2 In the *VLAN Pooling Profiles* section, click **Create New**. The *Create New VLAN Pooling Profile* form appears.

3 In *Name*, type a name for the profile.

4 In *Description* (optional), type a short description for this profile.

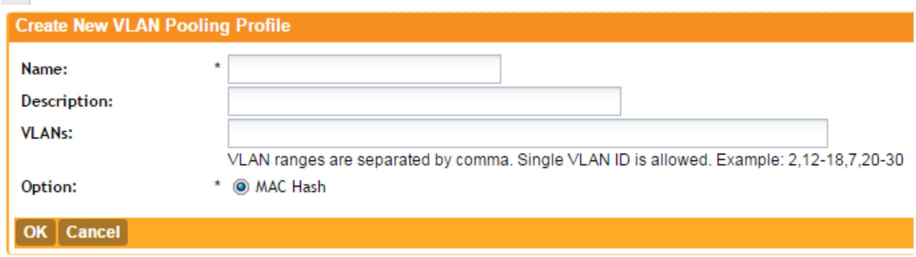
5 In *VLANs*, type the VLAN IDs to be assigned to this pool. VLAN IDs can be separated by hyphens, commas, or a combination (for example, 7-10, 13, 17, 20-28).

6 Click **OK**.

Each VLAN pool can contain up to 16 VLANs, and a maximum of 64 VLAN pools can be created. Each WLAN can be configured with a single VLAN pool.

You have completed creating a VLAN pooling profile.

Figure 32. The Create New VLAN Pooling Profile form



Create New VLAN Pooling Profile

Name: *

Description:

VLANs:

VLAN ranges are separated by comma. Single VLAN ID is allowed. Example: 2,12-18,7,20-30

Option: * ● MAC Hash

Assigning the VLAN Pooling Profile to a WLAN

Follow these steps to assign the VLAN pooling profile to a specific WLAN.

1 Go to *Configuration* > *WLANs*.

2 In the *WLAN Configuration* section, click **Create New** to create a new WLAN or click a WLAN name to edit it.

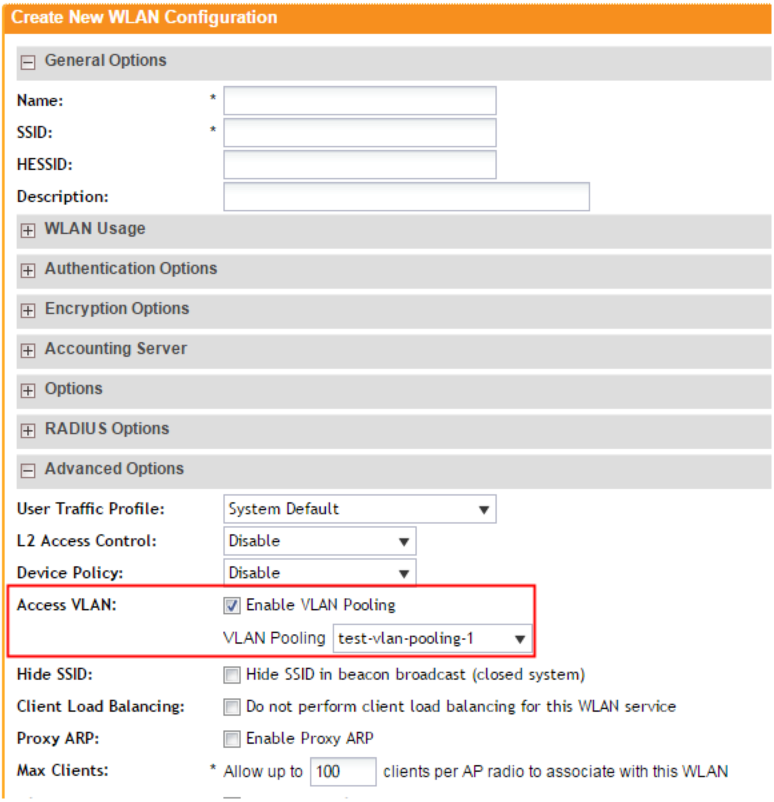
3 Expand the *Advanced Options* section, and locate the *Access VLAN* entry.

4 Select the **Enable VLAN Pooling** check box, and then select the VLAN pooling profile that you created earlier.

5 Click **OK**.

You have completed assigning a VLAN pooling profile to a WLAN. Clients connecting to this WLAN will now be automatically assigned to a VLAN from the specified VLAN pool.

Figure 33. Under the Advanced Options section, locate the Access VLAN entry



Create New WLAN Configuration

⊟ General Options

Name: *
SSID: *
HESSID:
Description:

⊞ WLAN Usage

⊞ Authentication Options

⊞ Encryption Options

⊞ Accounting Server

⊞ Options

⊞ RADIUS Options

⊟ Advanced Options

User Traffic Profile: System Default ▼
L2 Access Control: Disable ▼
Device Policy: Disable ▼
Access VLAN: ☑ Enable VLAN Pooling
VLAN Pooling test-vlan-pooling-1 ▼
Hide SSID: ☐ Hide SSID in beacon broadcast (closed system)
Client Load Balancing: ☐ Do not perform client load balancing for this WLAN service
Proxy ARP: ☐ Enable Proxy ARP
Max Clients: * Allow up to 100 clients per AP radio to associate with this WLAN

Using a VLAN Pooling Profile to Override the VLAN Settings of a WLAN Group

If you want to override the original VLAN settings of a WLAN with the VLAN pool that you created earlier, follow these steps.

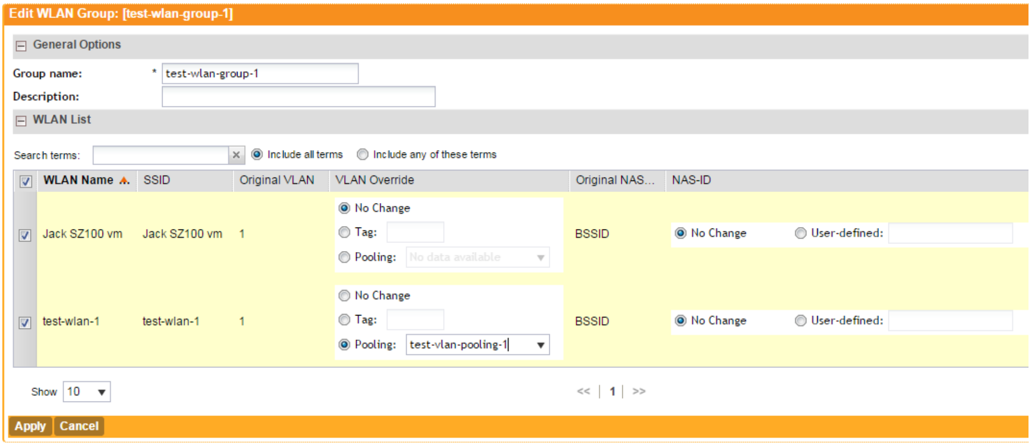
1. Go to *Configuration* > *WLANs*.
2. In the *WLAN Groups* section, click **Create New** to create a new WLAN group or click a WLAN group name to edit it.
3. Expand the *WLAN List* section, and then select the check boxes for the member WLANs for which you want to override the VLAN settings.

4 In the *VLAN Override* column, select **Pooling**, and then select the VLAN pooling profile that you want to apply to each of the selected member WLANs.

5 Click **Apply**.

You have completed overriding the VLAN settings of a WLAN group using a VLAN pooling profile.

Figure 34. In the VLAN Override column, select the VLAN pooling profile to apply each of the selected WLANs



Edit WLAN Group: [test-wlan-group-1]

⊟ General Options

Group name: * test-wlan-group-1

Description:

⊟ WLAN List

Search terms: ● Include all terms ○ Include any of these terms

☑	WLAN Name	SSID	Original VLAN	VLAN Override	Original NAS...	NAS-ID
☑	Jack SZ100 vm	Jack SZ100 vm	1	● No Change ○ Tag: ○ Pooling: No data available	BSSID	● No Change ○ User-defined:
☑	test-wlan-1	test-wlan-1	1	○ No Change ○ Tag: ● Pooling: test-vlan-pooling-1	BSSID	● No Change ○ User-defined:

Show 10

<< | 1 | >>

Configuring Model-Based Settings

The following AP settings can be applied to all APs of a particular model:

- *Internal Heater*: Enable internal heaters (specific AP models only).

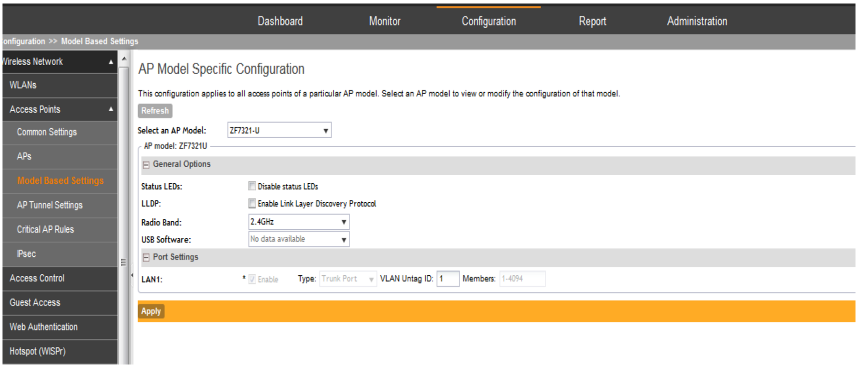
NOTE: For the internal heater to be operational, ZoneFlex 7762 APs must be powered by the supplied PoE injector and its associated power adapter or a standard 802.3at PSE. For the PoE Out port to be operational, ZoneFlex 7762 APs must be powered by the supplied PoE injector and its associated power adapter.

- *PoE Out Ports*: Enable PoE out ports (specific ZoneFlex AP models only).

NOTE: If the controller country code is set to United Kingdom, an additional “Enable 5.8 GHz Channels” option will be available for outdoor 11n/11ac APs. Enabling this option allows the use of restricted C-band channels. These channels are disabled by default and should only be enabled by customers with a valid license to operate on these restricted channels.

- *Disable Status LEDs*: When managed by the controller, you can disable the external LEDs on certain ZoneFlex models, such as the 7300 series APs. This can be useful if your APs are installed in a public location and you don’t want to draw attention to them.
- *External Antenna*: External antenna configuration is available for the 5 GHz radio on the ZoneFlex 7762, and for the 2.4 and 5 GHz radios on the 7782-E APs. Once enabled, enter a gain value in the range of 0 to 90dBi.
- *Radio Band*: (ZoneFlex 7321 only) Select 2.4 GHz or 5 GHz radio band for the 7321 APs.
- *USB Software*: Allows you to select a USB software package for the AP (only Z7321-U is supported).
- *Port Settings*: See Configuring AP Ethernet Ports.

Figure 35. Configuring model-based settings



AP Model Specific Configuration

This configuration applies to all access points of a particular AP model. Select an AP model to view or modify the configuration of that model.

Select an AP Model: ZF7321-U

AP model: ZF7321U

General Options

Status LEDs: □ Disable status LEDs

LLDP: □ Enable Link Layer Discovery Protocol

Radio Band: 2.4GHz

USB Software: No data available

Port Settings

LAN1: * ☑ Enable Type: Trunk Port VLAN Untag ID: 1 Members: 1-4094

Configuring AP Ethernet Ports

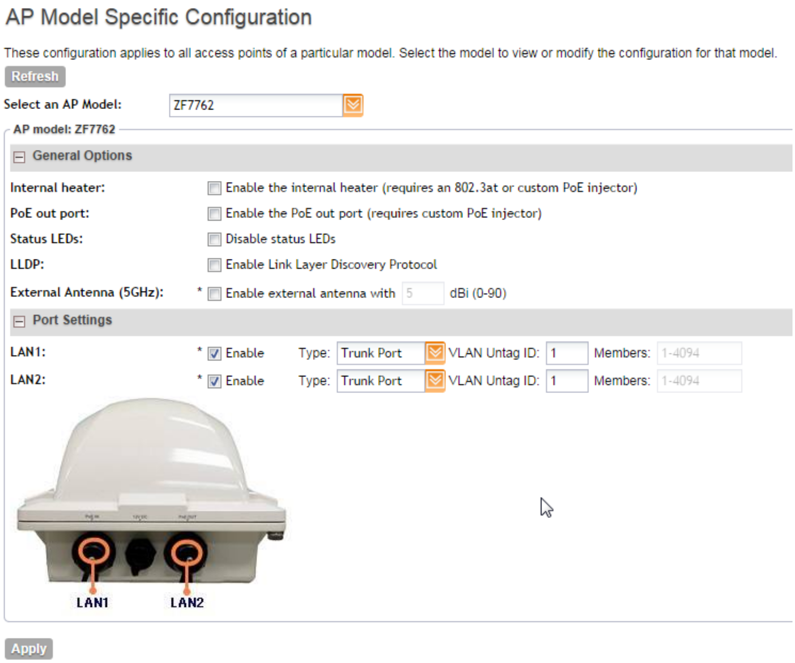
You can use AP groups to control Ethernet ports on all APs of a certain model. Then, if you want to override the port settings for a specific AP, you can do so by editing the AP configuration, enabling the **Override** check box in the *Model Specific Control* section, and then configuring the AP settings that you want to override.

Follow these steps to configure the Ethernet ports for all APs of the same model.

1. Go to *Configuration* > *Access Points* > *Model Based Settings*.
2. In *Select an AP model*, select the AP model that you want to configure from the list.
3. In *Port Setting*, for any enabled ports, you can choose whether the port will be used as a Trunk Port, an Access Port or a General Port. The following restrictions apply:
   - All APs must be configured with at least one Trunk Port.
   - For single port APs (for example, ZoneFlex R300), the single LAN port must be a trunk port and is therefore not configurable.
   - For ZoneFlex 7055, the LAN5/Uplink port on the rear of the AP is defined as a Trunk Port and is not configurable. The four front-facing LAN ports are configurable.
   - For all other APs, you can configure each port individually as either a Trunk Port, Access Port or General Port (see Designating an Ethernet Port Type for more information.)
4. Click **Apply**.

You have completed configuring AP model specific settings.

Figure 36. Configuring AP model specific settings



AP Model Specific Configuration

These configuration applies to all access points of a particular model. Select the model to view or modify the configuration for that model.

Select an AP Model: ZF7762

AP model: ZF7762

⊟ General Options

Internal heater: □ Enable the internal heater (requires an 802.3at or custom PoE injector)

PoE out port: □ Enable the PoE out port (requires custom PoE injector)

Status LEDs: □ Disable status LEDs

LLDP: □ Enable Link Layer Discovery Protocol

External Antenna (5GHz): * □ Enable external antenna with 5 dBi (0-90)

⊟ Port Settings

LAN1: * ☑ Enable Type: Trunk Port VLAN Untag ID: 1 Members: 1-4094

LAN2: * ☑ Enable Type: Trunk Port VLAN Untag ID: 1 Members: 1-4094

NOTE: To disable a LAN port entirely, clear the **Enable** check box.

Designating an Ethernet Port Type

Ethernet ports can be configured as one of the following port types:

- Trunk Ports
- Access Ports
- General Ports

Trunk links are required to pass VLAN information between switches. Access ports provide access to the network and can be configured as members of specific VLANs, thereby separating the traffic on these ports from traffic on other VLANs. General ports are user-defined ports that can have any combination of up to 20 VLAN IDs assigned.

For most ZoneFlex APs, you can set which ports you want to be your Access, Trunk and General Ports from the controller web interface, as long as at least one port on each AP is designated as a Trunk Port.

By default, all ports are enabled as Trunk Ports with Untag VLAN set as 1 (except for ZoneFlex 7025, whose front ports are enabled as Access Ports by default). If configured as an Access Port, all untagged ingress traffic is the configured Untag VLAN, and all egress traffic is untagged. If configured as a Trunk Port, all untagged ingress traffic is the configured Untag VLAN (by default, 1), and all VLAN-tagged traffic on VLANs 1-4094 will be seen when present on the network.

The default Untag VLAN for each port is VLAN 1. Change the Untag VLAN to:

- Segment all ingress traffic on this Access Port to a specific VLAN.
- Redefine the native VLAN on this Trunk Port to match your network configuration.

Trunk Ports

Trunking is a function that must be enabled on both sides of a link. If two switches are connected together, for example, both switch ports must be configured as trunk ports. The Trunk Port is a member of all the VLANs that exist on the AP/switch and carries traffic for all those VLANs between switches.

Access Ports

All Access Ports are set to Untag VLAN 1 by default. This means that all Access Ports belong to the native VLAN and are all part of a single broadcast domain. To remove ports from the native VLAN and assign them to specific VLANs, select Access Port and enter any valid VLAN ID in the VLAN ID field (valid VLAN IDs are 2-4094).

The following table describes the behavior of incoming and outgoing traffic for Access Ports with VLANs configured.

Table 2. Access Ports with VLANs configured

VLAN Settings	Incoming Traffic (from Client)	Outgoing Traffic (to Client)
Access Port, Untag VLAN 1	All incoming traffic is native VLAN (VLAN 1).	All outgoing traffic on the port is sent untagged.
Access Port, Untag VLAN [2-4094]	All incoming traffic is sent to the VLANs specified.	Only traffic belonging to the specified VLAN is forwarded. All other VLAN traffic is dropped.

General Ports

General ports are user-specified ports that can have any combination of up to 20 VLAN IDs assigned. Enter multiple valid VLAN IDs separated by commas or a range separated by a hyphen.

Configuring AP Tunnel Settings

Follow these steps to configure the AP tunnel settings.

1. Go to *Configuration* > *Wireless Network* > *Access Points* > *AP Tunnel Settings*.
2. In *Tunnel Type*, select the tunneling protocol that you want the controller to use for AP traffic. Option include:
   - Ruckus GRE
   - SoftGRE
   - SoftGRE + IPSec

NOTE: Controllers configured with SoftGRE tunnel profiles do not support the Hotspot 2.0 OSEN standard.

CAUTION! Selecting the SoftGRE + IPSec tunneling protocol will prevent APs that do not support Internet Protocol Security (IPsec) from joining the controller.

3. Configure the setting for the tunneling protocol that you selected.

   If you selected Ruckus GRE, configure the following settings:

   - *Ruckus Tunnel Mode*: Select a protocol to use for tunneling WLAN traffic back to the controller.
     - **GRE + UDP**: Select this option to allow APs behind a NAT server to tunnel WLAN traffic back to the controller.
     - **GRE**: Select this option to tunnel regular WLAN traffic only.
   - *Tunnel Encryption*: Select the **Enable tunnel encryption** check box if you want managed APs to decrypt 802.11 packets, and then use an AES encrypted tunnel to send them to the controller. By default, when WLAN traffic is tunneled to the controller, only the management traffic is encrypted; data traffic is unencrypted.
   - *WAN Interface MTU*: Set the maximum transmission unit (MTU) for the tunnel to either Auto (default) or a specific size (850 to 1500 bytes). MTU is the size of the largest protocol data unit that can be passed on the controller network.

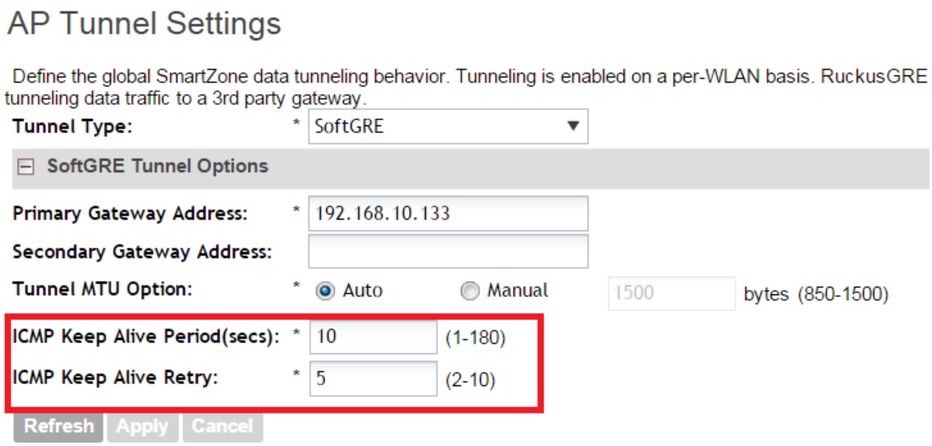
   If you selected Soft GRE, configure the following settings:

- *Name*: Type a name for the profile that you are creating.
- *Description*: Type a short description of the profile.
- *Primary Gateway Address*: Type the IP address or fully-qualified domain name (FQDN) of the primary gateway server.
- *Secondary Gateway Address*: If you have a secondary gateway server on the network, type its IP address or FQDN in the box provided. If the controller is unable to reach the primary gateway server, it will automatically attempt to reach the secondary gateway address that you specify here.
- *Gateway Path MTU*: Set the maximum transmission unit (MTU) for the gateway path. Options include Auto (default) and Manual (range is 850 to 1500 bytes).
- *ICMP Keep Alive Period*: Type the time interval (in seconds) at which APs send a keepalive message to the active third party WLAN gateway. The range is 1 to 180 seconds and the default value is 10 seconds.
- *ICMP Keep Alive Retry*: Type the number of keepalive attempts that APs wait for a response from the active third party WLAN gateway before failing over to the standby WLAN gateway. The range is 2 to 10 retries and the default value is 5 retries.

4 Click **Apply**.

You have completed configuring the AP tunnel settings.

Figure 37. Configuring the AP tunnel settings



AP Tunnel Settings

Define the global SmartZone data tunneling behavior. Tunneling is enabled on a per-WLAN basis. RuckusGRE tunneling data traffic to a 3rd party gateway.

Tunnel Type: * SoftGRE

⊟ SoftGRE Tunnel Options

Primary Gateway Address: * 192.168.10.133

Secondary Gateway Address:

Tunnel MTU Option: * ● Auto ○ Manual 1500 bytes (850-1500)

ICMP Keep Alive Period(secs): * 10 (1-180)

ICMP Keep Alive Retry: * 5 (2-10)

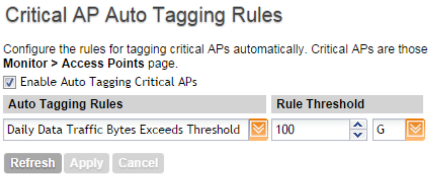
Tagging Critical APs

A critical AP is an AP that exceeds the daily traffic threshold (sum of uplink and downlink) data bytes configured on the controller web interface. Follow these steps to tag critical APs automatically.

1. Go to *Configuration* > *Wireless Network* > *Access Points* > *Critical AP Rules*.
2. Select the **Enable Auto Tagging Critical APs** check box.
3. Under *Auto Tagging Rules*, select **Daily Traffic Bytes Exceeds Threshold**.
4. Under *Rule Threshold*, specify the threshold.
    - In the first box, type a value that you want to set as the traffic threshold. This value will be applied in conjunction with the data unit that you will select in the second box.
    - In the second box, select the data unit for the threshold – M for megabytes or G for gigabytes.
5. Click **Apply**.

APs that exceed the daily traffic threshold that you specified will appear highlighted on the *Access Points* page and the Access Point details page. Additionally, the controller will send an SNMP trap to notify that an AP has been disconnected.

Figure 38. Configuring critical AP tagging rules



Critical AP Auto Tagging Rules

Configure the rules for tagging critical APs automatically. Critical APs are those that exceed the data traffic threshold that you define on this page. You can view a list of critical APs on the **Monitor > Access Points** page.

☑ Enable Auto Tagging Critical APs

Auto Tagging Rules	Rule Threshold	
Daily Data Traffic Bytes Exceeds Threshold	100	G

Creating IPSec Profiles

Follow these steps to create an IPSec profile that APs can use when the AP tunnel settings are set to SoftGRE + IPSec.

1. Go to the *Configuration* > *Access Points* > *IPSec* page.
2. Click **Create New**. The *Create IPSec Profile* form appears.
3. In *General Options*, configure the following:
    - *Name*: Type name for the IPSec profile that you are creating.
    - *Description*: Type a description for this profile.

- *Security Gateway*: Type the IP address or FQDN of the IPSec server. If you use the IP address, the IP address format that you must enter will depend on the IP mode that is configured on the controller.

4. In *Authentication*, configure the following:
   - *Type*: Click **Preshared Key** to use PSK for authentication or click **Certificate** to use an X.509 certificate on the certificate authority (CA) or registration authority (RA) server. The controller uses the CMPv2 protocol to obtain the signed certificate from the CA/RA server.
   - *Preshared Key*: If you clicked **Preshared Key** in *Type*, type the PSK in this box. The PSK must be eight to 128 ASCII characters in length.
5. In *Security Association*, configure the following:
   - *IKE Proposal Type*: Click **Default** to use the default Internet Key Exchange (IKE) security association (SA) proposal type or click **Specific** to manually configure the IKE SA proposal. If you clicked **Specific**, you will need to configure the following settings:
     - *Encryption Algorithm*: Options include 3DES, AES128, AES192, and AES256.
     - *Integrity Algorithm*: Options include MD5, SHA1, AES-XCBC, SHA256, SHA384, and SHA512.
     - *Pseudo-Random Function*: Options include Use integrity ALG, PRF-MD5, PRF-SHA1, PRF-AES-XCBC, PRF-AES-CMAC, PRF-SHA256, and PRF-SHA384.
     - *DH Group*: Options for Diffie-Hellman groups for IKE include modp768, modp1024, modp1536, modp2048, modp3072, modp4096, modp6144, and modp8192.
   - *ESP Proposal Type*: Click **Default** to use the default Encapsulating Security Payload (ESP) SA proposal type or click **Specific** to manually configure the ESP proposal. If you clicked **Specific**, you will need to configure the following settings:
     - *Encryption Algorithm*: Options include 3DES, AES128, AES192, AES256, and NONE.
     - *Integrity Algorithm*: Options include MD5, SHA1, AES-XCBC, SHA256, SHA384, and SHA512
     - *DH Group*: Options for Diffie-Hellman groups for ESP include None, modp768, modp1024, modp1536, modp2048, modp3072, modp4096, modp6144, and modp8192.

6 In *Rekey Options*, configure the following:

- *Internet Key Exchange*: To set time interval at which the IKE key renews, select a time unit (day, hour, or minute) from the drop-down list, and then type a number in the box. To disable IKE rekey, select the **Disable** check box.
- *Encapsulating Security Payload*: To set time interval at which the ESP key renews, select a time unit (day, hour, or minute) from the drop-down list, and then type a number in the box. To disable ESP rekey, select the **Disable** check box.

7 In *Certificate Management Protocol*, configure the following:

- *DHCP Option 43 Sub Code for CA/RA Address*: Set the DHCP Option 43 subcode that will be used to discover the address of the CA/RA server on the network. The default subcode is 8.
- *CA/RA Address*: Type the IP address or FQDN of the CA/RA server. If you use the IP address, the IP address format that you must enter will depend on the IP mode that is configured on the controller.
- *Server Path*: Type the path to the X.509 certificate on the CA/RA server.
- *DHCP Option 43 Sub Code for Subject Name of CA/RA*: Set the DHCP Option 43 subcode that will be used to discover the subject name of the CA/RA server on the network. The default subcode is 5.
- *Subject Name of CA/RA*: Type an ASCII string that represents the subject name of the CA/RA server.

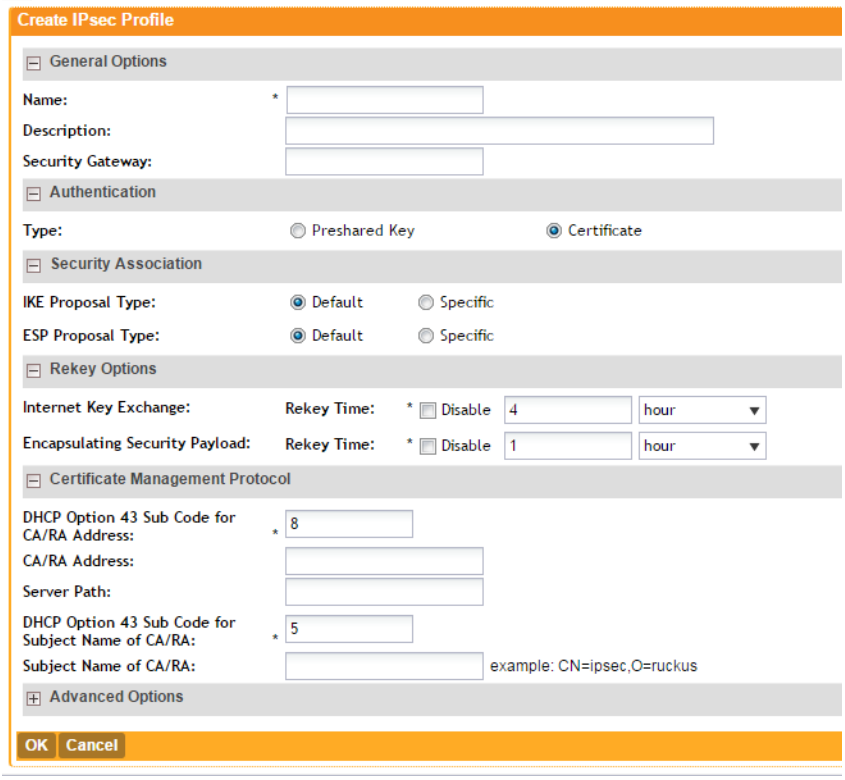
8 In *Advanced Options*, configure the following:

- *DHCP Option 43 Sub Code for Security Gateway*: Set the DHCP Option 43 subcode that will be used to discover the address of the security gateway on the network. The default subcode is 7.
- *Retry Limit*: Set the number of times that the controller will attempt to discover the address of the security gateway. The default retry count is 5. Accepted values are 0 (disable) to 16.
- *Replay Window*: Set the ESP replay window (in packets). The default size is 32 packets. Accepted values are 0 (disable) to 32 packets.
- *IP Compression*: To enable IP Payload Compression Protocol (IPComp) compression before encryption, click **Enable**. The default value is **Disable**.
- *Force NAT-T*: To enforce UDP encapsulation of ESP packets, click **Enable**. The default value is **Disable**.

- *Dead Peer Detection*: By default, the IKE protocol runs a health check with remote peer to ensure that it is alive. To disable this health check, click **Disable**.
- *NAT-T Keep Alive Interval*: To set the keep alive interval (in seconds) for NAT traversal, type a value in the box. The default keep alive interval is 20 seconds. Accepted values are 1 to 65536. To disable the keep alive interval, click **Disable**.
- *FailOver Options*: To configure the failover settings when APs are unable to connect, configure the following:
  - *Retry Period*: Set the number of days (minimum 3 days) during which APs will keep attempting to connect. To keep try indefinitely, select the **Forever** check box.
  - *Retry Interval*: Set the interval (in minutes) between each retry attempt. The default retry interval is 1 minute. Accepted values are from 1 to 30 minutes.
  - *Retry Mode*: If you want APs to fall back to the specified primary security gateway, click **Revertive**. If you want APs to maintain connectivity with the security gateway to which they are currently connected, click **Non-revertive**.

9 Click **OK**.

Figure 39. Creating an IPSec profile



Create IPsec Profile

⊟ General Options

Name: *

Description:

Security Gateway:

⊟ Authentication

Type: ○ Preshared Key ● Certificate

⊟ Security Association

IKE Proposal Type: ● Default ○ Specific

ESP Proposal Type: ● Default ○ Specific

⊟ Rekey Options

Internet Key Exchange: Rekey Time: * □ Disable 4 hour ▼

Encapsulating Security Payload: Rekey Time: * □ Disable 1 hour ▼

⊟ Certificate Management Protocol

DHCP Option 43 Sub Code for CA/RA Address: * 8

CA/RA Address:

Server Path:

DHCP Option 43 Sub Code for Subject Name of CA/RA: * 5

Subject Name of CA/RA: example: CN=ipsec,O=ruckus

⊞ Advanced Options

Managing Access Points

Once you set up the controller, access points will be able to join or register with the controller automatically. After an access point registers successfully with the controller, you can update its configuration by following the steps described in this section.

Viewing a List of Managed Access Points

After an access point registers successfully with the controller, it appears on the Access Points page, along with other managed access points. Follow these steps to view a list of managed access points.

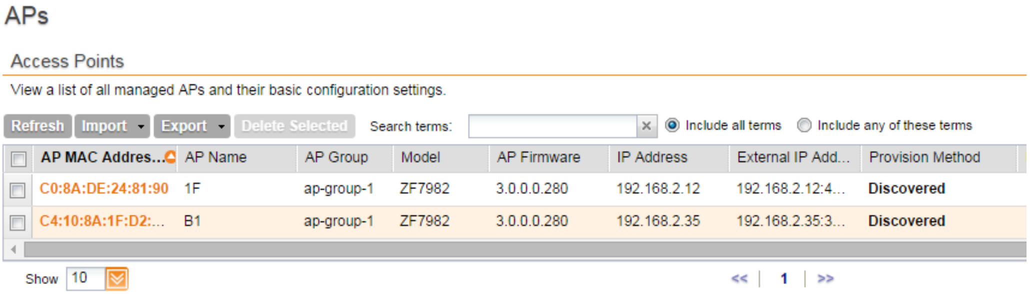
1 Go to *Configuration* > *Wireless Network* > *Access Points*. A list of access points that are being managed by the controller appears on the *Access Points* page. These are all the access points that belong to all management domains.

2 The list of managed access points displays details about each access point, including its:

- AP MAC address
- AP name
- Model (AP model)
- AP firmware
- IP address (internal IP address)
- External IP address
- Provision Method
- Provision State
- Administrative Status
- Status
- Configuration Status
- Registered On (date the access point joined the controller network)
- Registration State
- Actions (actions that you can perform)

NOTE: By default, the *Access Points* page displays 10 access points per page (although you have the option to display up to 250 access points per page). If the controller is managing more than 10 access points, the pagination links at the bottom of the page are active. Click these pagination links to view the succeeding pages on which the remaining access points are listed.

Figure 40. Viewing a list of managed access points



APs

Access Points

View a list of all managed APs and their basic configuration settings.

□	AP MAC Addres...	AP Name	AP Group	Model	AP Firmware	IP Address	External IP Add...	Provision Method
□	C0:8A:DE:24:81:90	1F	ap-group-1	ZF7982	3.0.0.0.280	192.168.2.12	192.168.2.12:4...	**Discovered**
□	C4:10:8A:1F:D2:...	B1	ap-group-1	ZF7982	3.0.0.0.280	192.168.2.35	192.168.2.35:3...	**Discovered**

Provisioning and Swapping Access Points

The controller supports the provisioning and swapping of access points. As an administrator you can:

- Upload a file containing list of AP and the pre-provisioned configuration data for each AP. The controller processes the file and provides details on regarding the import results (including a list of failed APs and failure reasons).
- Modify or delete pre-provisioning data if AP does not connect to the controller
- Monitor the status and stage of the pre-provisioned APs
- Manually lock or unlock APs
- Upload a file containing list of AP pairs for swapping. The controller processes the file and provide the detailed import result (including a list of failed APs and failure reasons).
- Manually enter the AP swap pair
- Delete the swap configuration if AP fails to contact the controller
- Monitor the status and stage of the swapping AP pairs
- Manually swap the APs

Options for Provisioning and Swapping APs

Use the following buttons on the *Access Points* page to perform the AP provisioning and swapping.

- **Import Batch Provisioning APs**: Click this button to import the provisioning file. The controller displays the import results. Any errors that occur during the import process will be listed by the controller.
- **Export All Batch Provisioning APs**: Click this button to download a CSV file that lists all APs that have been provisioned. The exported CSV contains the following information:
  - AP MAC Address
  - Model
  - AP Name
  - Description
  - Location
  - GPS Coordinates
  - Logon ID
  - Password

  - Administrative State
  - IP Address
  - Network Mask
  - Gateway
  - Primary DNS
  - Secondary DNS
  - Provision Checklist
  - Serial Number

NOTE: The exported CSV file for all batch provisioned APs only contains pre-provisioned APs. It does not contain swapping APs or auto discovered APs.

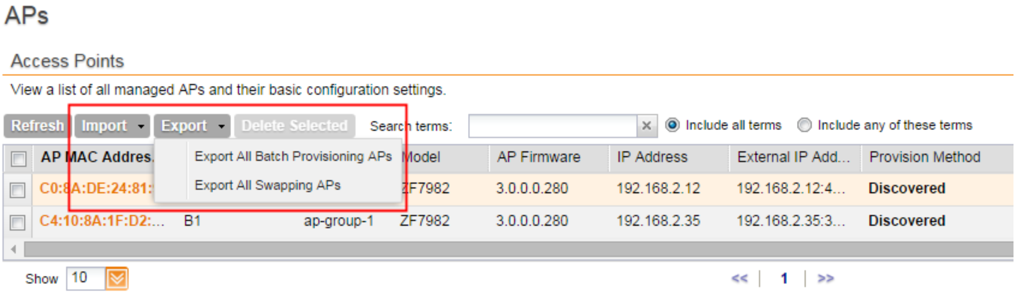
NOTE: If no APs have been pre-provisioned, you will still be able to export the CSV file but it will be empty (except for the column titles).

- **Import Swapping APs**: Manually trigger the swapping of two APs by clicking the swap action in the row. You can also edit the pre-provision configuration only if the AP does not connect to the controller. Click the AP MAC address to bring up the configuration edit form, and then select **Pre-provision Configuration**.
- **Export All Batch Swapping APs**: Click this button to download a CSV file that lists all APs that have been swapped. The exported CSV contains the following information:
  - Swap In AP MAC
  - Swap In AP Model
  - Swap Out AP MAC

NOTE: The exported CSV file for batch swapping APs only contains swapping APs. It does not contain pre-provisioned APs or auto discovered APs.

- **Delete Selected**: To delete multiple pre-provisioned APs simultaneously, select the check boxes before the AP MAC addresses, and then click **Delete Selected**. To delete a single pre-provisioned AP, click the 🗑 icon that is in the same row as the AP MAC address. If the AP has not contacted the controller, the AP record disappears from the table. If the AP comes up later, the controller treats it as a discovered AP. If the AP is connected to the controller, the delete operation is similar to the AP delete operation.

Figure 41. Options for provisioning and swapping APs



APs

Access Points

View a list of all managed APs and their basic configuration settings.

□	AP MAC Addres.			Model	AP Firmware	IP Address	External IP Add...	Provision Method
□	C0:8A:DE:24:81:			ZF7982	3.0.0.0.280	192.168.2.12	192.168.2.12:4...	**Discovered**
□	C4:10:8A:1F:D2:...	B1	ap-group-1	ZF7982	3.0.0.0.280	192.168.2.35	192.168.2.35:3...	**Discovered**

Understanding How Swapping Works

The following table lists how the controller handles swapping by detailing each stage. For example, you have entered swap configuration as *Swap In: A* and *Swap out: B*.

Table 3. AP swapping stages

Stage	State A	Stage A	State B	Stage B
1. Enter data	Swapping	Not Registered	Approved	Waiting for swap in AP registration
2. AP register	Swapping	Waiting for swapping in	Approved	Waiting for swapping out
3. User swap	Approved	Swapped in	Swapping	Swapped out
4: Second swap	Swapping	Swapped out and waiting for swapping in	Approved	Swapped in and waiting for swapping out

Editing AP Configuration

Follow these steps to update the configuration of a managed access point.

1 Go to the Configuration > Wireless Network > Access Points.

2 On the *APs* page, locate the access point whose configuration you want to update.

3 Click the MAC address of the access point. The *Edit AP* configuration form appears.

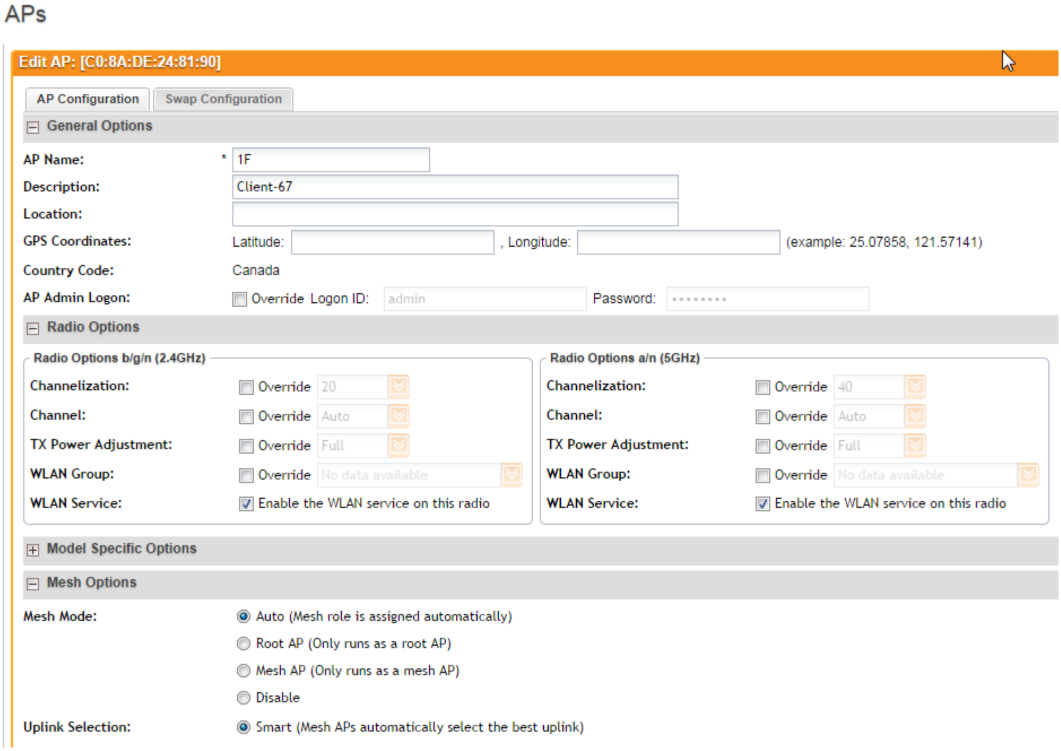
4 Update the access point configuration by modifying the options in the form.

5 Click **OK**.

You have completed editing the AP configuration.

NOTE: The `loc` parameter (which holds the *Location* attribute in the AP configuration) in the controller's Captive Portal redirection to the configured hotspot login portal is encoded using the Hex encoder from the org.apache.commons.codec.binary library. If you have hotspots on the network and you are using an external portal, take note of the encoding mechanism for the `loc` parameter so your external portal can decode it.

Figure 42. The Edit AP configuration form



APs

Edit AP: [C0:8A:DE:24:81:90]

AP Configuration | Swap Configuration

⊟ General Options

AP Name:	* 1F
Description:	Client-67
Location:	
GPS Coordinates:	Latitude: , Longitude: (example: 25.07858, 121.57141)
Country Code:	Canada
AP Admin Logon:	□ Override Logon ID: admin Password: ••••••••

⊟ Radio Options

Radio Options b/g/n (2.4GHz)

Channelization:	□ Override 20
Channel:	□ Override Auto
TX Power Adjustment:	□ Override Full
WLAN Group:	□ Override No data available
WLAN Service:	☑ Enable the WLAN service on this radio

Radio Options a/n (5GHz)

Channelization:	□ Override 40
Channel:	□ Override Auto
TX Power Adjustment:	□ Override Full
WLAN Group:	□ Override No data available
WLAN Service:	☑ Enable the WLAN service on this radio

⊞ Model Specific Options

⊟ Mesh Options

Mesh Mode:
- ● Auto (Mesh role is assigned automatically)
- ○ Root AP (Only runs as a root AP)
- ○ Mesh AP (Only runs as a mesh AP)
- ○ Disable

Uplink Selection: ● Smart (Mesh APs automatically select the best uplink)

Editing Swap Configuration

The controller supports the swapping or replacement of a managed AP with a new AP of the same model. This feature is useful when you want to avoid service interruption because you need to replace an AP in the field.

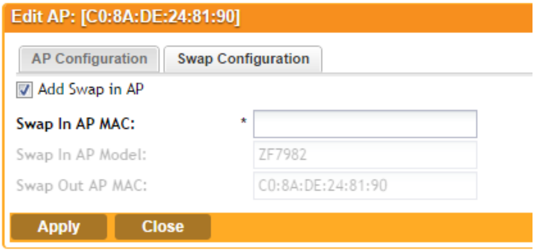
By configuring the swap settings, you can easily and automatically export and apply the settings of the old AP to the new AP.

Follow these steps to configure the swap settings of an AP.

1 Go to the Configuration > Wireless Network > Access Points.
2 On the *APs* page, locate the access point whose swap configuration you want to update.
3 Click the AP MAC address of the access point.
4 Click the **Swap Configuration** tab.
5 Update the access point configuration by modifying the options in the form.
6 Click **OK**.

You have completed editing the swap configuration.

Figure 43. The Edit AP > Swap Configuration form


Edit AP: [C0:8A:DE:24:81:90]

☑ Add Swap in AP

Swap In AP MAC: *

Swap In AP Model: ZF7982

Swap Out AP MAC: C0:8A:DE:24:81:90

Deleting an Access Point

Follow these steps to delete an access point that is currently registered with the controller.

1 Go to the *Configuration* > *Wireless Network* > *Access Points*.
2 On the *APs* page, locate the access point that you want to delete.
3 Once you locate the access point, click the 🗑 icon that is under the *Actions* column. A confirmation message appears.
4 Click **OK**.

The list of managed access points refreshes, and then the access point that you deleted disappears from the list.

NOTE: Wireless clients that are associated with the access point that you deleted will still be able to connect to the network until the next time the access point attempts to rejoin the controller.

NOTE: After you delete an access point, it could take approximately two minutes before it appears on the *Configuration* > *Wireless Network* > *APs* page again.

Controlling Access to the Wireless Network

Working with User Traffic Profiles

A traffic profile defines whether the system will allow or block a particular type of traffic based on a number of attributes, including:

- Source IP address (specific IP address or IP address range)
- Source port number (specific port or port range)
- Destination IP address (specific IP address or IP address range)
- Destination port number (specific port or port range)
- Network protocol (TCP, UDP, etc.)
- Traffic direction

Creating a User Traffic Profile

Follow these steps to create a user traffic profile.

1. Go to *Configuration* > *Wireless Network* > *Access Control*.
2. In the *User Traffic Profiles* section, click **Create New**.
3. In *Name*, type a name for this profile.
4. In *Description*, type a short description for this profile.
5. In *Default Access*, select whether you want the controller to allow or block users using this profile if the user traffic does not match any of the rules you defined.
6. In the *Rules* section, click **Create New**.

NOTE: By default, two default rules exist (Allow DNS and Allow DHCP) when you create a new profile. You can modify these rules or even delete them.

7. In *Source IP*, specify the source IP address to which this rule will apply.
   - To apply this rule to an IP address range, type the network address and the subnet mask.
   - To apply this rule to a single IP, clear the **Subnet** check box, and then enter the IP address.
8. In *Source Port*, specify the source port to which this rule will apply.

- To apply this rule to a port range, type the starting and ending port numbers in the two boxes.
- To apply this rule to a single port number, clear the **Range** check box, and then enter the port number.

9 In *Destination IP*, specify the destination IP address to which this rule will apply.

- To apply this rule to an IP address range, type the network address and the subnet mask.
- To apply this rule to a single IP, clear the **Subnet** check box, and then enter the IP address.

10 In *Destination Port*, specify the source port to which this rule will apply.

- To apply this rule to a port range, type the starting and ending port numbers in the two boxes.
- To apply this rule to a single port number, clear the Range check box, and then enter the port number.

11 In *Protocol*, select the network protocol to which this rule will apply. Supported protocols include:

- TCP
- UDP
- UDPLITE
- ICMP (ICMPv4)
- ICMPV6
- IGMP
- ESP
- AH
- SCTP

12 In *Direction*, leave as is. Only one traffic direction (upstream) is supported in this release.

13 Click **Create New**.

You have completed creating a user traffic profile. The next time you a WLAN, this profile will appear as one of the options for User Traffic Profile.

Viewing User Traffic Profiles

Follow these steps to view a list of existing user traffic profiles.

1. Go to *Configuration* > *Wireless Network* > *Access Control*. The *Access Control* page appears.
2. Look for the *User Traffic Profiles* section. All existing user traffic profiles and their basic settings are shown, including the:
   - User traffic profile name
   - Description
   - Default access (allow or block)
   - Actions (that you can perform)
3. To view the type of traffic that has been defined in a particular user traffic profile, click the profile name.

You have completed viewing existing user traffic profiles.

Assigning Priorities to Traffic Profile Rules

The controller applies the rules you have created to user traffic in the same order as they appear in the table. If you want a particular rule to have higher priority over other rules, click the green up arrow icon under the *Actions* column. If you want a rule to have lower priority, click the green down arrow icon.

When you finish setting the rule priorities, click **OK** to save your changes.

Deleting Traffic Profiles

Follow these steps to delete user traffic schedule profiles.

1. Go to *Configuration* > *Wireless Network* > *Access Control*. The *Access Control* page appears.
2. Scroll down to the *User Traffic Profiles* section.
3. Locate the profile or profiles that you want to delete.
4. Select the check boxes (first column) for the profiles that you want to delete.
5. Click **Delete Selected**.

The profiles that you selected disappear from the list. You have completed deleting user traffic profiles.

NOTE: If you are deleting a single profile, you can also click the 🗑 icon (under the *Actions* column) that is in the same row as the profile that you want to delete.

Controlling L2 Access

Another method to control access to the network is by defining Layer 2/MAC address access control lists (ACLs), which can then be applied to one or more WLANs or WLAN groups. L2 ACLs are either allow-only or deny-only; that is, an ACL can be set up to allow only specified clients or to deny only specified clients. MAC addresses that are in the deny list are blocked at the AP.

Creating an L2 Access Policy

Follow these steps to create an L2 access policy.

1. Go to *Configuration* > *Wireless Network* > *Access Control*.
2. Scroll down to the *L2 Access Control* section, and then click **Create New**.
3. In *Name*, type a name for this policy.
4. In *Description*, type a short description for this policy.
5. In *Restriction*, select the default action that the controller will take if no rules are matched. Available options include:
   - **Only allow all stations listed below**
   - **Only block all stations listed below**
6. In the *Rules* section, click **Create New**.
7. In MAC Address, type the MAC address to which this L2 access policy applies.
8. Click Create New. The page refreshes, and then the L2 access policy that you created appears in the L2 Access Control section.

You have completed creating an L2 access policy.

Viewing L2 Access Policies

Follow these steps to view a list of existing L2 access profiles.

1. Go to *Configuration* > *Wireless Network* > *Access Control*. The *Access Control* page appears.
2. Look for the *L2 Access Control* section. All existing L2 access policies and their basic settings are shown, including the:
   - Profile name
   - Description
   - Default access (allow or block)
   - Actions (that you can perform)

3 To view or change the MAC address has been defined in a particular L2 access policy, click the profile name.

You have completed viewing existing L2 access policies.

Deleting L2 Access Policies

Follow these steps to delete L2 access policies.

1 Go to *Configuration* > *Wireless Network* > *Access Control*. The *Access Control* page appears.

2 Scroll down to the *L2 Access Control* section.

3 Locate the policy or policies that you want to delete.

4 Select the check boxes (first column) for the policies that you want to delete.

5 Click **Delete Selected**.

The policies that you selected disappear from the list. You have completed deleting L2 access policies.

NOTE: If you are deleting a single policy, you can also click the 🗑 icon (under the *Actions* column) that is in the same row as the policy that you want to delete.

Controlling Device Access

In response to the growing numbers of personally owned mobile devices such as smart phones and tablets being brought into the network, IT departments are requiring more sophisticated control over how devices connect, what types of devices can connect, and what they are allowed to do once connected.

Using device access policies, the system can identify the type of client attempting to connect, and perform control actions such as permit/deny, rate limiting, and VLAN tagging based on the device type.

Once a device access policy has been created, you can apply the policy to any WLANs or WLAN groups for which you want to control access by device type. You could, for example, allow only Apple iOS devices on one WLAN and only Linux devices on another.

Creating a Device Access Policy

Follow these steps to create a device access policy.

1. Go to *Configuration* > *Wireless Network* > *Access Control*.
2. Scroll down to the *Device Access Policies* section.
3. In *Name*, type a name for this policy.
4. In *Description*, type a short description for this policy.
5. In *Default Access*, select either **Allow** or **Block**. This is the default action that the system will take if no rules are matched.
6. In the *Rules* section, click **Create New**. The *Create New Device Policy Profile* form appears.
7. Configure the rule settings:
   - *Description*: Type a description for this rule.
   - *Action*: Select either **Allow** or **Block**. This is the action that the system will take if the client matches any of the attributes in the rule.
   - *Device Type*: Select from any of the supported client types.
   - *Uplink Rate*: Select the uplink rate limit for this client type, or click **Disable**.
   - *Downlink Rate*: Select the download rate limit for this client type, or select Disable.
   - *VLAN*: Segment this client type into a specified VLAN (1~4094; if no value is entered, this policy does not impact device VLAN assignment).
8. To add a new rule, click **Create New** again, and then repeat Step 7.

9. When you finish creating all the rules that you want to add to the policy, click **Create New** at the bottom of the form. The page refreshes, and then the policy that you created appears under the Device Policies section.

You have completed creating a device access policy.

Viewing Device Access Policies

Follow these steps to view a list of existing device access policies.

1. Go to *Configuration* > *Wireless Network* > *Access Control*. The *Access Control* page appears.
2. Scroll down to the Device Access Policies section. All existing device access policies and their basic settings are shown, including the:
    - Name
    - Description
    - Default access (allow or block)
    - Actions (that you can perform)
3. To view or update policy settings, click the policy name.

You have completed viewing device access policies.

Deleting Device Access Policies

Follow these steps to delete device access policies.

1. Go to *Configuration* > *Wireless Network* > *Access Control*. The *Access Control* page appears.
2. Scroll down to the *Device Access Policies* section.
3. Locate the policy or policies that you want to delete.
4. Select the check boxes (first column) for the policies that you want to delete.
5. Click **Delete Selected**.

The policies that you selected disappear from the list. You have completed deleting device access policies.

NOTE: If you are deleting a single policy, you can also click the 🗑 icon (under the *Actions* column) that is in the same row as the policy that you want to delete.

Managing Guest Access

Using the controller's guest access features, you can provide visitors to your organization limited access to a guest WLAN with configurable guest policies, or given the option to self-activate their devices to an internal WLAN using Zero-IT activation via the bring your own device (BYOD) onboarding portal (or both).

The following sections describe how to configure guest WLANs and access policies that control guest use of your network.

- Creating a Guest Access Portal
- Viewing Guest Access Portals
- Deleting Guest Access Portals

Creating a Guest Access Portal

Each guest WLAN must be associated with a guest access portal, which defines the behavior of the guest WLAN interface. Follow these steps to create a guest access portal.

1 Go to *Configuration* > *Wireless Network* > *Guest Access*. The *Guest Access Portal* page appears.

2 Click **Create New**. The *Create New Guest Access Portal* form appears.

3 In *General Options*, configure the following:

   - *Portal Name*: Type a name for the guest access portal that you are creating.
   - *Portal Description*: Type a short description of the guest access portal.
   - *Language*: Select the display language to use for the buttons on the guest access logon page.

4 In *Redirection*, select where to redirect the user after successfully completing authentication.

   - **Redirect to the URL that the user intends to visit**: Allows the guest user to continue to their destination without redirection.
   - **Redirect to the following URL**: Redirect the user to a specified web page (entered into the text box) prior to forwarding them to their destination. When guest users land on this page, they are shown the expiration time for their guest pass.

5 In *Guest Access*, configure the following:

- *Guest Pass SMS Gateway*: You can deliver the guest pass to the user using Short Message Service (SMS). But first you need to configure an SMS server on the *Configuration > System > External SMS Gateway* page. If you previously configured an SMS server, you can select it here or you can select Disable.
- *Terms and Conditions*: To require users to read and accept your terms and conditions prior to use, **Show Terms And Conditions** check box. The box below, which contains the default Terms of Use text, becomes editable. Edit the text or leave it unchanged to use the default text.
- *Web Portal Logo*: By default, the guest hotspot logon page displays the Ruckus Wireless logo. To use your own logo, click the **Upload** button, select your logo (recommended size is 138 x 40 pixels, maximum file size is 20KB), and then click **Upload**.
- *Web Portal Title*: Type your own guest hotspot welcome text or accept the default welcome text ("Welcome to the Guest Access login page").

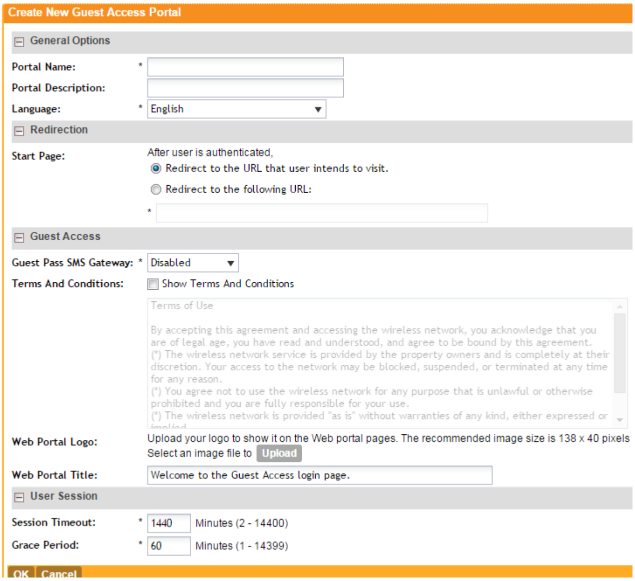
6 In *User Session*, configure the following:

- *Session Timeout*: Specify a time limit after which users will be disconnected and required to log on again.
- *Grace Period*: Set the time period during which clients will not need to re-authenticate after getting disconnected from the hotspot. Enter a number (in minutes) between 1 and 144,000.

7 Click **OK**.

You have completed creating a guest access portal.

Figure 44. Creating a guest access portal



Create New Guest Access Portal

⊟ General Options

Portal Name: *	
Portal Description:	
Language: *	English ▼

⊟ Redirection

Start Page: After user is authenticated,

● Redirect to the URL that user intends to visit.

○ Redirect to the following URL:

*

⊟ Guest Access

Guest Pass SMS Gateway: *	Disabled ▼
Terms And Conditions:	□ Show Terms And Conditions

Terms of Use

By accepting this agreement and accessing the wireless network, you acknowledge that you are of legal age, you have read and understood, and agree to be bound by this agreement.
(*) The wireless network service is provided by the property owners and is completely at their discretion. Your access to the network may be blocked, suspended, or terminated at any time for any reason.
(*) You agree not to use the wireless network for any purpose that is unlawful or otherwise prohibited and you are fully responsible for your use.
(*) The wireless network is provided "as is" without warranties of any kind, either expressed or implied.

Web Portal Logo: Upload your logo to show it on the Web portal pages. The recommended image size is 138 x 40 pixels
Select an image file to Upload

Web Portal Title: Welcome to the Guest Access login page.

⊟ User Session

Session Timeout: *	1440 Minutes (2 - 14400)
Grace Period: *	60 Minutes (1 - 14399)

Viewing Guest Access Portals

Follow these steps to view a list of existing guest access portals.

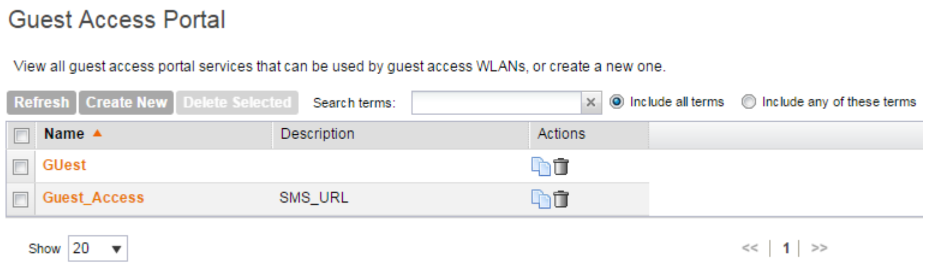
1 Go to *Configuration* > *Wireless Network* > *Guest Access*. The *Guest Access Portal* page appears and displays all existing guest access portals and their basic settings are shown, including the following:

- Name
- Description
- Actions (that you can perform)

2 To view or update policy settings, click the policy name.

You have completed viewing device access policies.

Figure 45. Viewing guest access portals



Guest Access Portal

View all guest access portal services that can be used by guest access WLANs, or create a new one.

Refresh | Create New | Delete Selected | Search terms: ✕ | ● Include all terms | ○ Include any of these terms

□	Name ▲	Description	Actions
□	GUest		⧉🗑
□	Guest_Access	SMS_URL	⧉🗑

Show 20 ▾ << | 1 | >>

Deleting Guest Access Portals

Follow these steps to delete guest access portals.

1 Go to *Configuration* > *Wireless Network* > *Guest Access*. The *Guest Access Portal* page appears.

2 Locate the service or services that you want to delete.

3 Select the check boxes (first column) for the services that you want to delete.

4 Click **Delete Selected**.

The services that you selected disappear from the list. You have completed deleting guest access portals.

NOTE: If you are deleting a single guest access portal, you can also click the 🗑 icon (under the *Actions* column) that is in the same row as the service that you want to delete.

Working with Hotspot (WISPr) Portals

A hotspot is a venue or area that provides Internet access to devices with wireless networking capability such as notebooks and smart phones. Hotspots are commonly available in public venues such as hotels, airports, coffee shops and shopping malls.

Use the controller's *Configuration > Wireless Network > Hotspot (WISPr)* page to configure a traditional (WISPr 1.0) hotspot service to provide public access to users via its WLANs. In addition to the controller and its managed APs, you will need the following to deploy a hotspot:

- Captive Portal: A special web page, typically a login page, to which users that have associated with your hotspot will be redirected for authentication purposes. Users will need to enter a valid user name and password before they are allowed access to the Internet through the hotspot.
- RADIUS Server: A Remote Authentication Dial-In User Service (RADIUS) server through which users can authenticate.

For installation and configuration instructions for the captive portal and RADIUS server software, refer to the documentation that was provided with them. After completing the steps below, you will need to edit the WLAN(s) for which you want to enable the hotspot service.

The controller supports up to 32 WISPr hotspot portal entries, each of which can be assigned to multiple WLANs.

This section covers the following topics:

- Creating a Hotspot (WISPr) Portal

NOTE: In addition to hotspot (WISPr) services, the controller provides Hotspot 2.0 services. For information on Hotspot 2.0 services, see Working with Hotspot 2.0 Services.

Creating a Hotspot (WISPr) Portal

This section describes the basic settings that you need to configure to create a hotspot portal.

NOTE: Before creating a hotspot, you need to create a user defined interface. For information on how to create a user defined interface, see Configuring the User Defined Interface Settings.

Follow these steps to configure the hotspot portal.

1. Click *Configuration* > *Wireless Network* > *Hotspot (WISPr)*. The *Hotspot (WISPr) Portal* page appears.
2. Click **Create New**. The form for creating a new hotspot portal appears.
3. In the *General Options* section, configure the following options:
   - *Portal Name*: Type a name for the hotspot portal.
   - *Portal Description*: Type a description for the hotspot portal.
4. In the *Redirection* section, configure the following options:
   - *Smart Client Support*: Select one of the following options:
     - **None**: Select this option to disable Smart Client support on the hotspot portal.
     - **Enable**: Selection this option to enable Smart Client support.
     - **Only Smart Client Allowed**: Select this option to allow only Smart Clients to connect to the hotspot portal.

     For more information, see Configuring Smart Client Support.
   - *Logon URL*: Type the URL of the subscriber portal (the page where hotspot users can log in to access the service). For more information, see Configuring the Logon URL.
   - *Start Page*: Set where users will be redirected after they log in successfully:
     - **Redirect to the URL that user intends to visit**: You could redirect users to the page that they want to visit.
     - **Redirect to the following URL**: You could set a different page where users will be redirected (for example, your company website).
5. In the *User Session* section, configure the following options:
   - *Session Timeout*: Set a time limit (in minutes) after which users will be disconnected from the hotspot portal and will be required to log on again.

- *Grace Period*: Set the time period (in minutes) during which disconnected users are allowed access to the hotspot portal without having to log on again.

6 In the *Location Information* section, configure the following options:

- *Location ID*: Type the ISO and ITU country and area code that the AP includes in accounting and authentication requests. The required code includes:
  - isocc (ISO-country-code): The ISO country code that the AP includes in RADIUS authentication and accounting requests.
  - cc (country-code): The ITU country code that the AP includes in RADIUS authentication and accounting requests.
  - ac (area-code): The ITU area code that the AP includes in RADIUS authentication and accounting requests.
  - network

  The following is an example of what the Location ID entry should look like: isocc=us,cc=1,ac=408,network=RuckusWireless
- *Location Name*: Type the name of the location of the hotspot portal.

7 In *Walled Garden*, click **Create New** to add a walled garden. A walled garden is a limited environment to which an unauthenticated user is given access for the purpose of setting up an account.

In the box provided, type a URL or IP address to which you want to grant unauthenticated users access. You can add up to 128 network destinations to the walled garden. Network destinations can be any of the following:

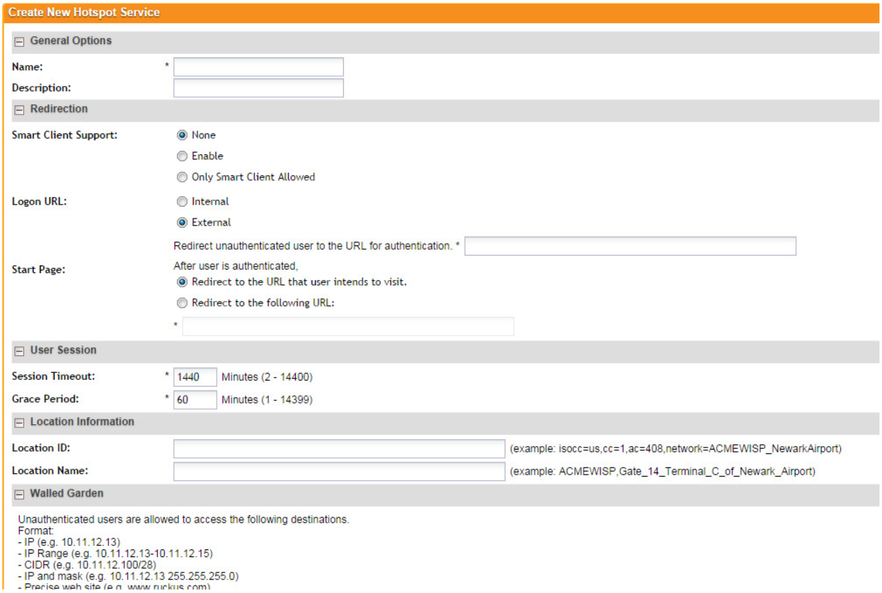
- IP address (for example, 10.11.12.13)
- Exact website address (for example, www.ruckuswireless.com)
- Website address with regular expression (for example, *.ruckuswireless.com, *.com, *)

After the account is established, the user is allowed out of the walled garden. URLs will be resolved to IP addresses. Users will not be able to click through to other URLs that may be presented on a page if that page is hosted on a server with a different IP address. Avoid using common URLs that are translated into many IP addresses (such as www.yahoo.com), as users may be redirected to re-authenticate when they navigate through the page.

8 Click **OK**.

You have completed configuring a hotspot portal. For additional steps that you need to perform to ensure that the hotspot portal works, see Working with Hotspot (WISPr) Portals.

Figure 46. Creating a hotspot



Create New Hotspot Service

General Options

Name: *

Description:

Redirection

Smart Client Support: ● None ○ Enable ○ Only Smart Client Allowed

Logon URL: ○ Internal ● External

Redirect unauthenticated user to the URL for authentication. *

Start Page: After user is authenticated,
● Redirect to the URL that user intends to visit.
○ Redirect to the following URL:
*

User Session

Session Timeout: * 1440 Minutes (2 - 14400)

Grace Period: * 60 Minutes (1 - 14399)

Location Information

Location ID: (example: isocc=us,cc=1,ac=408,network=ACMEWISP_NewarkAirport)

Location Name: (example: ACMEWISP,Gate_14_Terminal_C_of_Newark_Airport)

Walled Garden

Unauthenticated users are allowed to access the following destinations.
Format:
- IP (e.g. 10.11.12.13)
- IP Range (e.g. 10.11.12.13-10.11.12.15)
- CIDR (e.g. 10.11.12.100/28)
- IP and mask (e.g. 10.11.12.13 255.255.255.0)
- Precise web site (e.g. www.ruckus.com)

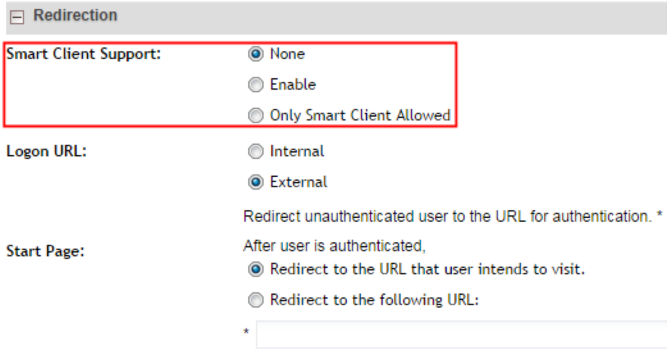
Configuring Smart Client Support

Ruckus Wireless hotspots support the WISPr Smart Client feature, which allows client devices to log on to a hotspot seamlessly without requiring the user to go through the logon page. The controller provides the following options for supporting Smart Clients:

- **None**: Click this option to prevent Smart Client applications from logging on to WLANs that include this hotspot configuration.
- **Enable**: Click this option to allow Smart Client applications to log on to WLANs that include this hotspot configuration.
- **Only Smart Client Allowed**: Click this option to allow only Smart Client applications to log on to WLANs that include this hotspot configuration. All other applications or browsers that attempt to access the hotspot will be shown a custom message, which you can enter in the box provided.

CAUTION! Clicking **Only Smart Client Allowed** requires the use of the internal Subscriber Portal. The Logon URL and Start Page options are unavailable when the **Only Smart Client Allowed** option is selected

Figure 47. Smart Client support options



⊟ Redirection

Smart Client Support: ● None ○ Enable ○ Only Smart Client Allowed

Logon URL: ○ Internal ● External

Redirect unauthenticated user to the URL for authentication. *

Start Page: After user is authenticated,
● Redirect to the URL that user intends to visit.
○ Redirect to the following URL:
*

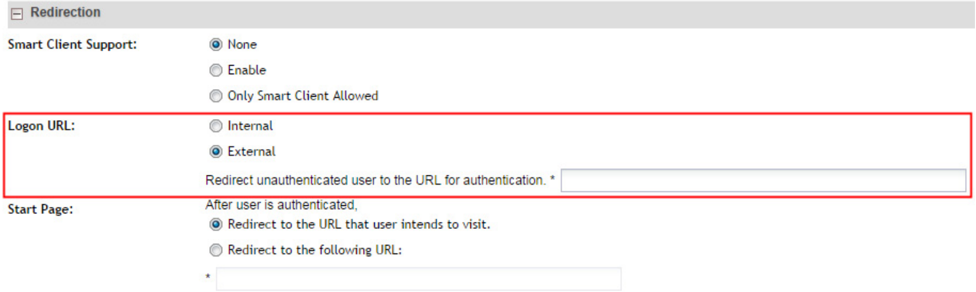
Configuring the Logon URL

The Logon URL refers to the location of the Subscriber Portal module that serves the logon form for authenticating hotspot users. There are two options available for the logon URL: Internal and External.

- **Internal**: Click this option if you want to use the Subscriber Portal module that is built into the controller.
- **External**: Click this option if you want to use the Subscriber Portal module that is installed on an external server. In the text box below, type the URL to the Subscriber Portal on the external server. In the example below, the Subscriber Portal module is installed on a server with the IP address 172.21.11.248, hence the logon URL is:

  ```
  http://172.21.11.248:9997/SubscriberPortal/login
  ```

Figure 48. In Logon URL, click either Internal or External



⊟ Redirection

Smart Client Support: ● None ○ Enable ○ Only Smart Client Allowed

Logon URL: ○ Internal ● External

Redirect unauthenticated user to the URL for authentication. *

Start Page: After user is authenticated,
● Redirect to the URL that user intends to visit.
○ Redirect to the following URL:
*

Assigning a WLAN to Provide a Hotspot Service

After you create a hotspot service, you need to specify the WLANs to which you want to deploy the hotspot configuration.

Follow these steps to configure an existing WLAN to provide the hotspot service.

1 Go to *Configuration* > *Wireless Network* > *WLANs*.

2 In the *WLANs* section, look for the WLAN that you want to assign as a hotspot WLAN, and then click the WLAN name. The *Editing WLAN Config: [WLAN name]* form appears.

3 In *Authentication Type*, click **Hotspot (WISPr)**.

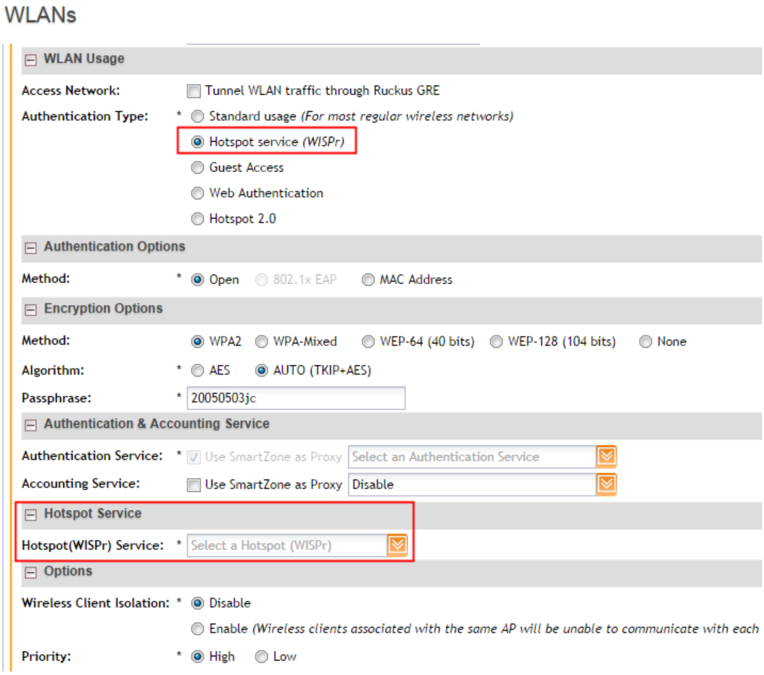
4 Scroll down to the *Hotspot Portal* section (only visible when Authentication Type is set to **Hotspot (WISPr)**).

5 Select the name of the hotspot portal that you previously created.

6 Click **Apply**.

You have completed assigning a WLAN to provide a hotspot service.

Figure 49. Assigning a WLAN to provide hotspot



WLANs

⊟ **WLAN Usage**

Access Network: □ Tunnel WLAN traffic through Ruckus GRE

Authentication Type: * ○ Standard usage *(For most regular wireless networks)*
● Hotspot service *(WISPr)*
○ Guest Access
○ Web Authentication
○ Hotspot 2.0

⊟ **Authentication Options**

Method: * ● Open ○ 802.1x EAP ○ MAC Address

⊟ **Encryption Options**

Method: ● WPA2 ○ WPA-Mixed ○ WEP-64 (40 bits) ○ WEP-128 (104 bits) ○ None

Algorithm: * ○ AES ● AUTO (TKIP+AES)

Passphrase: * 20050503jc

⊟ **Authentication & Accounting Service**

Authentication Service: * ☑ Use SmartZone as Proxy Select an Authentication Service

Accounting Service: □ Use SmartZone as Proxy Disable

⊟ **Hotspot Service**

Hotspot(WISPr) Service: * Select a Hotspot (WISPr)

⊟ **Options**

Wireless Client Isolation: * ● Disable
○ Enable *(Wireless clients associated with the same AP will be unable to communicate with each*

Priority: * ● High ○ Low

Working with Hotspot 2.0 Services

Hotspot 2.0 is a newer Wi-Fi Alliance specification that allows for automated roaming between service provider access points when both the client and access gateway support the newer protocol.

Hotspot 2.0 (also known as "Passpoint™", the trademark name of the Wi-Fi Alliance certification) aims to improve the experience of mobile users when selecting and joining a Wi-Fi hotspot by providing information to the station prior to association.

This information can then be used by the client to automatically select an appropriate network based on the services provided and the conditions under which the user can access them. In this way, rather than being presented with a list of largely meaningless SSIDs to choose from, the Hotspot 2.0 client can automatically select and authenticate to an SSID based on the client's configuration and services offered, or allow the user to manually select an SSID for which the user has login credentials.

The controller's Hotspot 2.0 implementation complies with the IEEE 802.11u standard and the Wi-Fi Alliance Hotspot 2.0 Technical Specification.

See the *Hotspot 2.0 Reference Guide for* this release for information on configuring Hotspot 2.0 services, including:

- Working with Hotspot 2.0 operator profiles
- Working with Hotspot 2.0 identity providers
- Creating a Hotspot 2.0 online signup portal

Working with Web Authentication Services

Web authentication (also known as a "captive portal") redirects users to a logon web page the first time they connect to this WLAN, and requires them to log on before granting access to use the WLAN.

Enabling a web authentication service requires the following steps:

- Adding an AAA Server for the Web Authentication Service
- Creating a Web Authentication Service
- Creating a WLAN for the Web Authentication Service

Adding an AAA Server for the Web Authentication Service

Decide whether you want to use a proxy or non-proxy AAA server. A proxy AAA server is used when APs send authentication/accounting messages to the controller and the controller forwards these messages to an external AAA server. On the other hand, a non proxy AAA server is used when the APs connect to the external AAA server directly.

- For instructions on how to add a proxy AAA server, see Adding a Proxy AAA Authentication Server.
- For instructions on how to add a non-proxy AAA server, see Adding a Non-Proxy AAA Authentication Server.

Creating a Web Authentication Service

Follow these steps to create a web authentication service.

1. Go to *Configuration* > *Wireless Network* > *Web Authentication*. The *Web Authentication Portal* page appears.
2. Click **Create New**.
3. In *General Options*, configure the following options:
   - *Portal Name*: Type a name for the web authentication service that you are creating.
   - *Portal Description*: Type a brief description of the service.
   - *Language*: Select the display language that you want to use on the web authentication portal.
4. In *Redirection*, select where to redirect the user after successfully completing authentication.

- **Redirect to the URL that the user intends to visit**: Allows the guest user to continue to their destination without redirection.
- **Redirect to the following URL**: Redirect the user to a specified web page (entered into the text box) prior to forwarding them to their destination. When guest users land on this page, they are shown the expiration time for their guest pass.

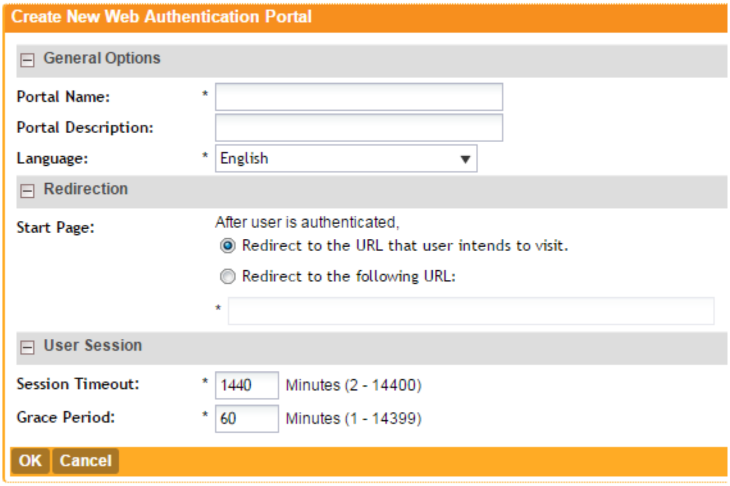
5 In *User Session*, configure the following:

- *Session Timeout*: Set the time (in minutes) after which inactive users will be disconnected and required to log in again.
- *Grace Period*: Set the time period (in minutes) during which disconnected users are allowed access to the hotspot portal without having to log on again.

6 Click **OK**.

You have completed creating a web authentication service.

Figure 50. The Create New Web Authentication Portal page



Create New Web Authentication Portal

⊟ General Options

Portal Name:	*	
Portal Description:		
Language:	*	English ▼

⊟ Redirection

Start Page: After user is authenticated,
● Redirect to the URL that user intends to visit.
○ Redirect to the following URL:
*

⊟ User Session

Session Timeout:	*	1440	Minutes (2 - 14400)
Grace Period:	*	60	Minutes (1 - 14399)

Creating a WLAN for the Web Authentication Service

Follow these steps to create a WLAN that you can use for a web authentication service.

1 Go to *Configuration* > *Wireless Network* > *WLANs*.

2 In the *WLAN Configuration* section, click **Create New**.

3 In *General Options*, configure the following:

- Name
- SSID
- Description

4 In *Authentication Type*, click **Web Authentication**.

5 In *Authentication & Accounting Server*, select the RADIUS and/or RADIUS Accounting server that you created earlier in Adding an AAA Server for the Web Authentication Service.

6 In *Web Authentication*, select the web authentication service that you created earlier in Creating a Web Authentication Service. This service contains, among others, the start page where users will be redirected when they associate with this WLAN.

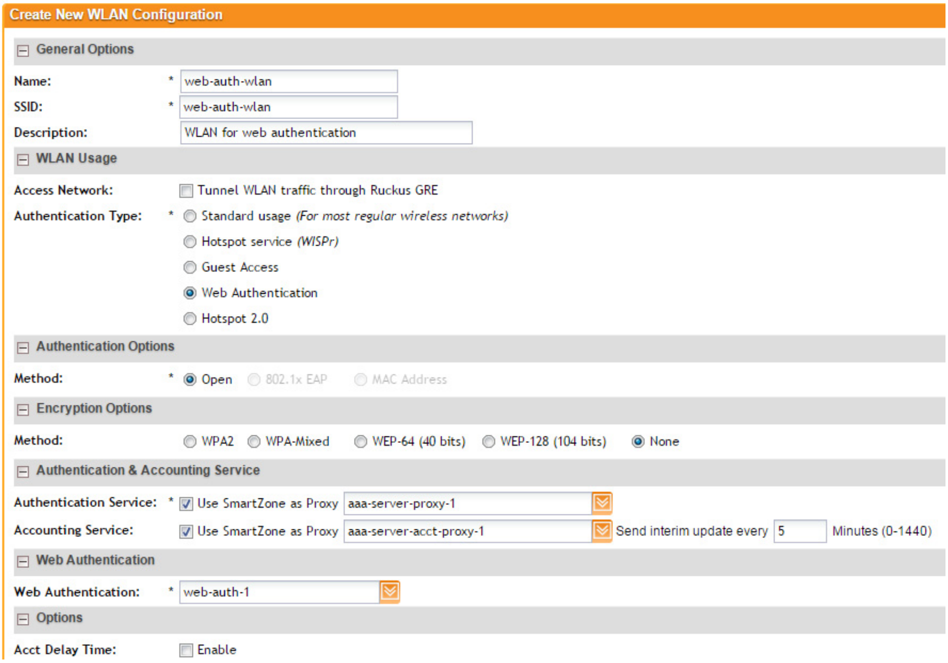
7 Configure the remaining WLAN options as desired. For information on these options, see Creating a WLAN.

8 Click **OK**.

You have completed creating a WLAN for web authentication.

After you create a WLAN that will be used for web authentication, you must then provide all users with the URL to your logon page. After they discover the WLAN on their wireless device or laptop, they open their browser, connect to the logon page and enter the required login information.

Figure 51. Creating a WLAN to provide web authentication



Create New WLAN Configuration

⊟ General Options

Name: * web-auth-wlan

SSID: * web-auth-wlan

Description: WLAN for web authentication

⊟ WLAN Usage

Access Network: □ Tunnel WLAN traffic through Ruckus GRE

Authentication Type: *
○ Standard usage *(For most regular wireless networks)*
○ Hotspot service *(WISPr)*
○ Guest Access
● Web Authentication
○ Hotspot 2.0

⊟ Authentication Options

Method: * ● Open ○ 802.1x EAP ○ MAC Address

⊟ Encryption Options

Method: ○ WPA2 ○ WPA-Mixed ○ WEP-64 (40 bits) ○ WEP-128 (104 bits) ● None

⊟ Authentication & Accounting Service

Authentication Service: * ☑ Use SmartZone as Proxy aaa-server-proxy-1

Accounting Service: ☑ Use SmartZone as Proxy aaa-server-acct-proxy-1 Send interim update every 5 Minutes (0-1440)

⊟ Web Authentication

Web Authentication: * web-auth-1

⊟ Options

Acct Delay Time: □ Enable

Working with AAA Servers

Add AAA servers to the controller so you can use them to authenticate users attempting to associate with controller-managed APs. This section covers:

- Working with Proxy AAA Servers
- Working with Non-Proxy AAA Servers

Working with Proxy AAA Servers

A proxy AAA server is used when APs send authentication/accounting messages to the controller and the controller forwards these messages to an external AAA server.

- Adding a Proxy AAA Authentication Server
- Adding a Proxy AAA Accounting Server
- Deleting Proxy AAA Servers

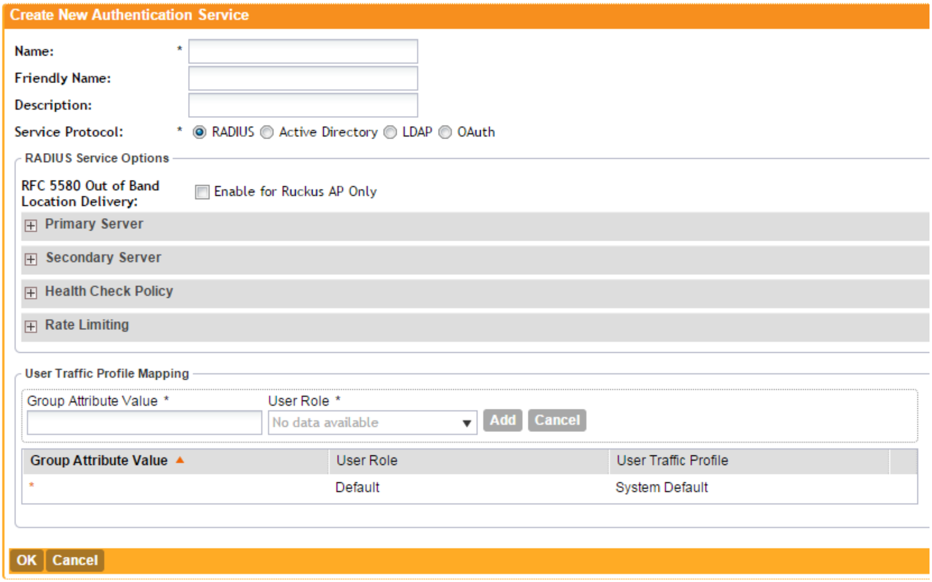
Adding a Proxy AAA Authentication Server

Follow these steps to add an AAA server to the controller that can be use for authenticating users.

1. Go to *Configuration* > *Wireless Network* > *AAA Servers* > *Proxy AAA*.
2. In the *Authentication Service* section, click **Create New**. The *Create New Authentication Service* form appears.
3. In *Name*, type a name for the authentication service that you are adding.
4. In *Friendly Name* (optional), type an alternative name that is easy to remember.
5. In *Description* (optional), type a description for the authentication service.
6. In *Type*, select one of the following options:
    - RADIUS (see RADIUS Service Options)
    - Active Directory
    - LDAP
    - OAuth
7. Configure the settings for the authentication service type that you selected.
8. Click **OK**. The page refreshes and the authentication service you have added appears on the list of existing authentication services.

You have completed adding an authentication service to the controller.

Figure 52. The Create New Authentication Service form



Create New Authentication Service

Name: *

Friendly Name:

Description:

Service Protocol: * ● RADIUS ○ Active Directory ○ LDAP ○ OAuth

RADIUS Service Options

RFC 5580 Out of Band Location Delivery: □ Enable for Ruckus AP Only

⊞ Primary Server

⊞ Secondary Server

⊞ Health Check Policy

⊞ Rate Limiting

User Traffic Profile Mapping

Group Attribute Value * | User Role * No data available

Group Attribute Value ▲	User Role	User Traffic Profile
*	Default	System Default

RADIUS Service Options

If you selected RADIUS in Adding a Proxy AAA Authentication Server, you need to configure the following options:

- *RFC 5580 Out of Band Location Delivery*: If you want out-of-band location delivery (RFC 5580) to apply only to Ruckus Wireless APs, select the **Enable for Ruckus AP Only** check box.
- *Primary Server*: Configure the primary RADIUS server settings.
  - *IP Address*: Type the IP address of the RADIUS server.
  - *Port*: Type the port number of the RADIUS server. The default RADIUS server port number is 1812 and the default RADIUS Accounting server port number is 1813.
  - *Shared Secret*: Type the RADIUS shared secret.
  - *Confirm Secret*: Retype the shared secret to confirm.
- *Secondary Server*: If you have a secondary RADIUS server on the network that you want to use as a backup, select the **Enable Secondary Server** check box, and then configure the settings below.

    - *Automatic Fallback Disable*: By default, when a secondary RADIUS server is enabled and the primary RADIUS server becomes unavailable, the secondary server takes over the handling of RADIUS requests. When the primary server becomes available again, it takes back control over RADIUS requests from the secondary server.

      If you want to prevent the primary server from retaking control over RADIUS requests from the secondary server, select the **Automatic Fallback Disable** check box.
    - *IP Address*: Type the IP address of the secondary AAA server.
    - *Port*: Type the port number of the secondary AAA server port number. The default RADIUS server port number is 1812 and the default RADIUS Accounting server port number is 1813.
    - *Shared Secret*: Type the AAA shared secret.
    - *Confirm Secret*: Retype the shared secret to confirm.
- *Health Check Policy*: These options define the health monitoring settings of the primary and secondary RADIUS servers, when the controller is configured as RADIUS proxy for RADIUS Authentication and Accounting messages.
    - *Response Window*: Set the time (in seconds) after which, if the AAA server does not respond to a request, the controller will initiate the “zombie period” (see below). If the primary AAA server does not respond to RADIUS messages sent after Response Window expires, the controller will forward the retransmitted RADIUS messages to the secondary AAA server. Note that the zombie period is not started immediately after the Response Window expires, but after the configured Response Window plus ¼ of the configured Zombie Period. The default Response Window is 20 seconds.
    - *Zombie Period*: Set the time (in seconds) after which, if the AAA server does not respond to ANY packets during the zombie period, it will be considered to inactive or unreachable. An AAA server that is marked “zombie” (inactive or unreachable) will be used for proxying with a low priority. If there are other live AAA servers, the controller will attempt to use these servers first instead of the zombie AAA server. The controller will only proxy requests to a zombie server only when there are no other live servers. Any request that is proxied to an AAA server will continue to be sent to that AAA server until the home server is marked inactive or unreachable. At that point, the request will fail over to another server, if a live AAA server is available. The default Zombie Period is 40 seconds.

- *Revive Interval*: Set the time (in seconds) after which, if no RADIUS messages are proxied to the AAA server after it has been marked as inactive or unreachable, the controller will mark the AAA server as active again (and assume that it has become reachable again). The default Revive Interval is 120 seconds.
- *No Response Fail*: Click **Yes** to respond with a reject message to the NAS if no response is received from the RADIUS server. Click **No** to skip sending a response.

CAUTION! To ensure that the RADIUS failover mechanism functions correctly, either accept the default values for the Response Window, Zombie Period, and Revive Interval, or make sure that the value for Response Window is always higher than the value for RADIUS NAS request timeout multiplied by the value for RADIUS NAS max number of retries. For information on configuring the RADIUS NAS request timeout and max number of retries, see Configuring WLANs and Configuring WLAN Groups. For 3rd party APs, you must ensure that the configured Response Window on the controller is higher than the RADIUS NAS request timeout multiplied by the RADIUS value. The maximum number of retries is configured at the 3rd party controller/AP.

---

9 *Rate Limiting*: Configure the following options.

- *Maximum Outstanding Requests (MOR)*: Set the maximum outstanding requests per server. Type 0 to disable it, or set a value between 10 and 4096.
- *Threshold (% of MOR)*: Set a percentage value of the MOR at which (when reached) the controller will generate an event. For example, if the MOR is set to 1000 and the threshold is set to 50%, the controller will generate an event when the number of outstanding requests reaches 500.
- *Sanity Timer*: Set a timer (in seconds) that will be started whenever a condition that generates an event is reached. This helps prevent conditions that trigger events which occur frequently.

10 Click **OK**.

You have completed configuring the RADIUS service options.

Adding a Proxy AAA Accounting Server

Follow these steps to add an AAA server to the controller that can be used user accounting user.

1 Go to *Configuration* > *Wireless Network* > *AAA Servers* > *Proxy AAA*.

2 In the *Accounting Service* section, click **Create New**. The *Create New Accounting Service* form appears.

3 In *Name*, type a name for the accounting service that you are adding.

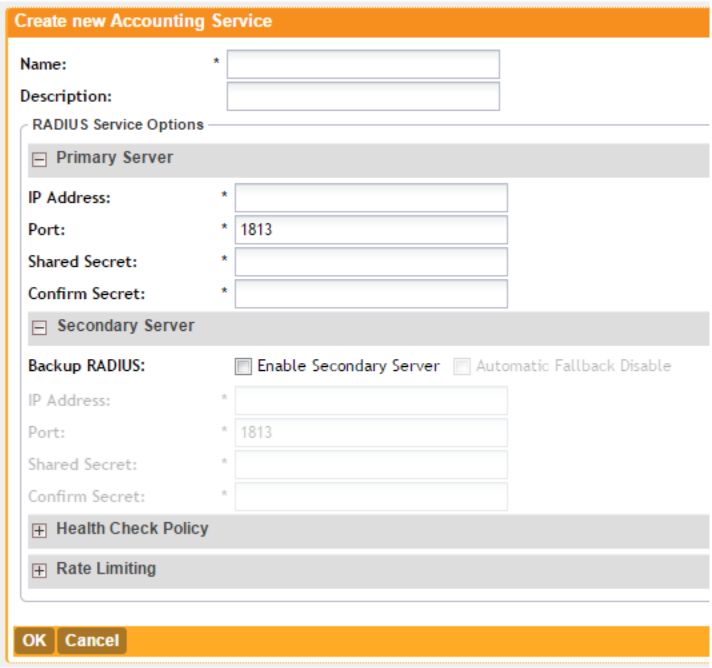
4 In *Description* (optional), type a description for the accounting service.

5 In *RADIUS Service Options*, configure the available options. Refer to see RADIUS Service Options for more information.

6 Click **OK**. The page refreshes and the accounting service you have added appears on the list of existing accounting services.

You have completed adding an accounting service to the controller.

Figure 53. The Create New Accounting Service form



Create new Accounting Service

Name:	*	
Description:		

RADIUS Service Options

⊟ Primary Server

IP Address:	*	
Port:	*	1813
Shared Secret:	*	
Confirm Secret:	*	

⊟ Secondary Server

Backup RADIUS:		□ Enable Secondary Server □ Automatic Fallback Disable
IP Address:	*	
Port:	*	1813
Shared Secret:	*	
Confirm Secret:	*	

⊞ Health Check Policy

⊞ Rate Limiting

OK Cancel

Deleting Proxy AAA Servers

Follow these steps to delete proxy AAA servers.

1 Go to *Configuration* > *Wireless Network* > *AAA Servers*.

1 In the *Proxy AAA* or *Non-Proxy AAA* section, locate the AAA server or servers that you want to delete.

2 Select the check boxes (first column) for the AAA server or servers that you want to delete.

3 Click **Delete Selected**.

The AAA servers that you selected disappear from the list. You have completed deleting AAA servers.

NOTE: If you are deleting a single AAA server, you can also click the 🗑 icon (under the *Actions* column) that is in the same row as the AAA server that you want to delete.

Working with Non-Proxy AAA Servers

A non proxy AAA server is used when the APs connect to the external AAA server directly.

- Adding a Non-Proxy AAA Authentication Server
- Adding a Non-Proxy AAA Accounting Server
- Deleting Non-Proxy AAA Servers

Adding a Non-Proxy AAA Authentication Server

Follow these steps to add a non-proxy AAA authentication server to the controller.

1 Go to *Configuration* > *Wireless Network* > *AAA Servers* > *Non-Proxy AAA*. The *Non-Proxy AAA* page appears.

2 Under the *Authentication Service* section, click **Create New**.

3 In *General Options*, configure the following:

- *Name*: Type a name for the AAA server that you are adding.
- *Description*: Type a short description of the AAA server.
- *Type*: Click the type of AAA server that you are adding. Options include:
    - **RADIUS**
    - **Active Directory**
    - **LDAP**

- *Backup RADIUS* (appears if you clicked **RADIUS** or **RADIUS Accounting** above): Select the **Enable backup RADIUS server** check box if a secondary RADIUS server exists on the network.
- *Global Catalog* (appears if you clicked Active Directory above): Select the Enable Global Catalog support if you the Active Directory server to provide a global list of all objects in a forest.

4 Configure the other options that appear in the form.

If you selected **RADIUS**, configure the following options in the *Primary Server* section:

- *IP Address*: Type the IP address of the AAA server.
- *Port*: Type the port number of the AAA server. The default RADIUS server port number is 1812.
- *Shared Secret*: Type the AAA shared secret.
- *Confirm Secret*: Retype the shared secret to confirm.

  In the *Secondary Server* section, configure the settings of the secondary RADIUS server.

NOTE: The *Secondary Server* section is only visible if you selected the **Enable backup RADIUS server** check box earlier.

- *IP Address*: Type the IP address of the secondary AAA server.
- *Port*: Type the port number of the secondary AAA server port number. The default RADIUS server port number is 1812.
- *Shared Secret*: Type the AAA shared secret.
- *Confirm Secret*: Retype the shared secret to confirm.

If you clicked **Active Directory**, configure the following options:

- *IP Address*: Type the IP address of the AD server.
- *Port*: Type the port number of the AD server. The default port number (389) should not be changed unless you have configured the AD server to use a different port.
- *Windows Domain Name*: Type the Windows domain name assigned to the AD server (for example, domain.ruckuswireless.com).

If you clicked LDAP, configure the following options:

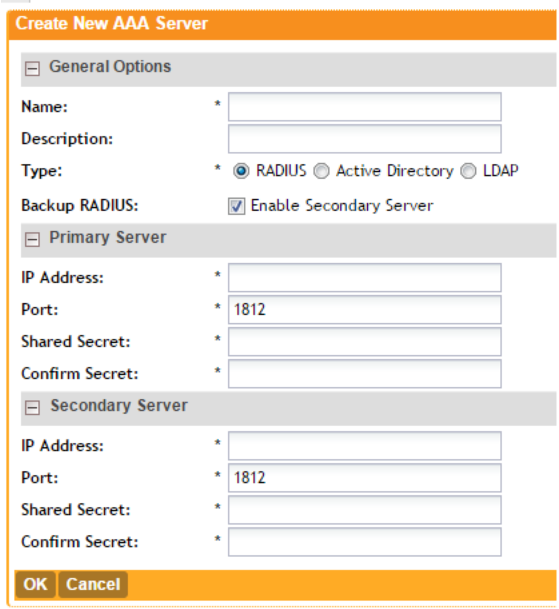
- *IP Address*: Type the IP address of the LDAP server.
- *Port*: Type the port number of the LDAP server.

- *Base DN*: Type the base DN in LDAP format for all user accounts (for example, dc=ldap,dc=com).
- *Admin DN*: Type the admin DN in LDAP format (for example, cn=Admin;dc=<Your Domain>,dc=com).
- *Admin Password*: Type the administrator password for the LDAP server.
- *Confirm Password*: Retype the administrator password to confirm.
- *Key Attribute*: Type a key attribute to denote users (for example, default: uid)
- *Search Filter*: Type a search filter (for example, objectClass=Person).

5 Click **OK**.

You have completed adding a non-proxy AAA authentication server.

Figure 54. The Create New AAA Server form for adding a non-proxy AAA authentication server



Create New AAA Server

⊟ General Options

Name: *

Description:

Type: * ● RADIUS ○ Active Directory ○ LDAP

Backup RADIUS: ☑ Enable Secondary Server

⊟ Primary Server

IP Address: *

Port: * 1812

Shared Secret: *

Confirm Secret: *

⊟ Secondary Server

IP Address: *

Port: * 1812

Shared Secret: *

Confirm Secret: *

Adding a Non-Proxy AAA Accounting Server

Follow these steps to add a non-proxy AAA (RADIUS) accounting server to the controller.

1 Go to *Configuration* > *Wireless Network* > *AAA Servers* > *Non-Proxy AAA*. The *Non-Proxy AAA* page appears.

2 Under the *Accounting Service* section, click **Create New**.

3 In *General Options*, configure the following:

- *Name*: Type a name for the AAA server that you are adding.
- *Description*: Type a short description of the AAA server.
- *Backup RADIUS*: Select the **Enable Secondary Server** check box if a secondary RADIUS accounting server exists on the network.

4 In the *Primary Server* section, configure the following options:

- *IP Address*: Type the IP address of the AAA server.
- *Port*: Type the port number of the AAA server. The default RADIUS accounting server port number is 1813.
- *Shared Secret*: Type the AAA shared secret.
- *Confirm Secret*: Retype the shared secret to confirm.

5 In the *Secondary Server* section, configure the options for the secondary RADIUS accounting server.

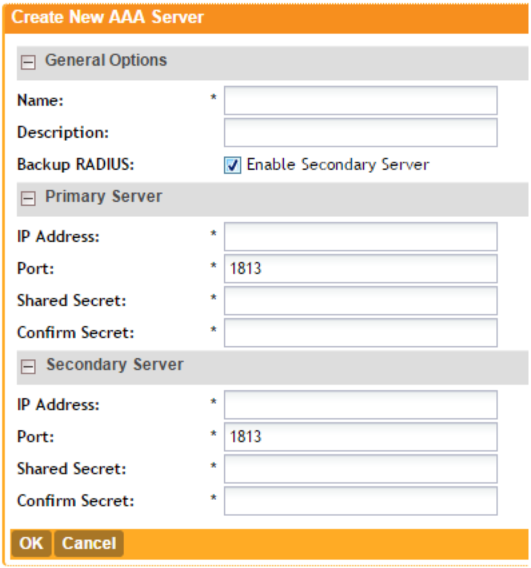
NOTE: The *Secondary Server* section is only visible if you selected the **Enable Secondary Server** check box earlier.

- *IP Address*: Type the IP address of the secondary AAA server.
- *Port*: Type the port number of the secondary AAA server port number. The default RADIUS accounting server port number is 1813.
- *Shared Secret*: Type the AAA shared secret.
- *Confirm Secret*: Retype the shared secret to confirm.

6 Click **OK**.

You have completed adding a non-proxy AAA accounting server.

Figure 55. The Create New AAA Server form for adding a non-proxy AAA accounting server



Create New AAA Server

⊟ General Options

Name:	*	
Description:		
Backup RADIUS:		☑ Enable Secondary Server

⊟ Primary Server

IP Address:	*	
Port:	*	1813
Shared Secret:	*	
Confirm Secret:	*	

⊟ Secondary Server

IP Address:	*	
Port:	*	1813
Shared Secret:	*	
Confirm Secret:	*	

Deleting Non-Proxy AAA Servers

Follow these steps to delete non-proxy AAA servers.

1 Go to *Configuration* > *Wireless Network* > *AAA Servers* > Non-Proxy AAA section.

1 In the *Authentication Service* or *Accounting Service,* locate the AAA server or servers that you want to delete.

2 Select the check boxes (first column) for the AAA server or servers that you want to delete.

3 Click **Delete Selected**.

The AAA servers that you selected disappear from the list. You have completed deleting AAA servers.

NOTE: If you are deleting a single AAA server, you can also click the 🗑 icon (under the *Actions* column) that is in the same row as the AAA server that you want to delete.

Configuring Location Services

If your organization purchased the Ruckus Wireless SmartPositioning Technology (SPoT) location service, the controller must be configured with the venue information that is displayed in the SPoT Administration Portal.

After completing purchase of the SPoT location service, you will be given account login information that you can use to log into the SPoT Administration Portal. The Admin Portal provides tools for configuring and managing all of your “venues” (the physical locations in which SPoT service is deployed). After a venue is successfully set up, you will need to enter the same venue information in the controller.

The following section lists the steps required for configuring the controller to communicate with the SPoT Location Server.

Follow these steps to configure the controller for SPoT communication.

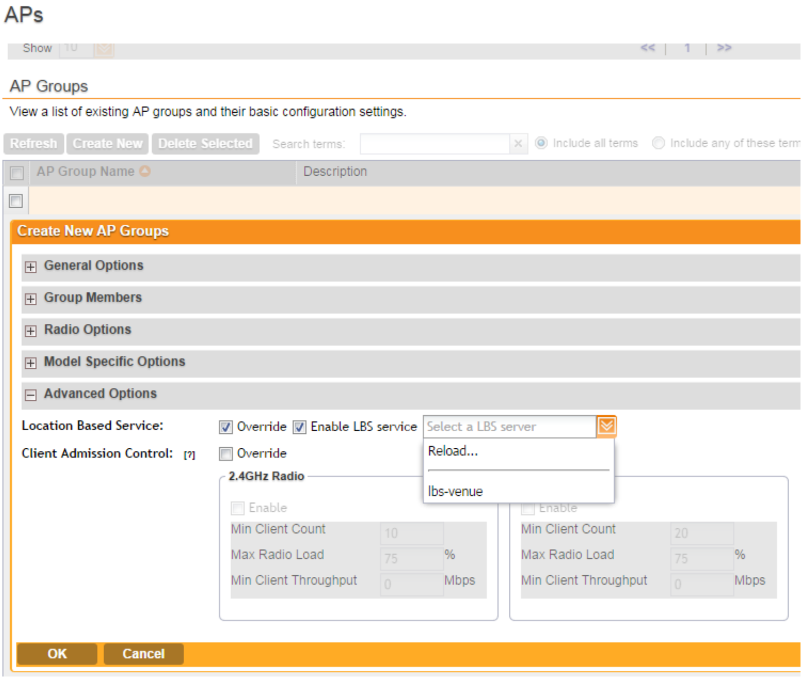
1. Log on to the SPoT Administration Portal.
2. On the *Venues* page, click **Config** next to the venue for which you want to configure Location Services on the controller.
3. In *Controller Settings*, take note of the values for the following:
   - Venue Name
   - Server Address
   - Port
   - Password
4. On the controller web interface, go to *Configuration* > *Wireless Network* > *Location Services*.
5. Click **Create New**.
6. Enter the information you obtain in Step 3 from the SPoT Administration Portal into the four fields provided.
7. Click **OK** to save your changes.
8. Go to *Configuration* > *Wireless Networks* > *Access Points* > *APs*.
9. Scroll down to the *AP Groups* section, and then click **Create New** or click an existing AP group name to configure it for SPoT location services.
10. On the *Create New* or *Edit AP Groups: [{AP Group Name}]* form, scroll down to the Advanced Options section.
11. In *Location Based Service*, configure the following:
    - **Override**: Select this check box.

- **Enable LBS service**: Select this check box, and then select the venue you created earlier.

12 Click **Apply**.

The controller will begin trying to communicate with the SPoT location server. Once the APs have successfully connected to the SPoT server, you can view the status of your SPoT-enabled APs on the *Monitor > Location Services* page. See Monitoring Location Services.

Figure 56. Enabling location services for the AP group



APs

Show 10 << | 1 | >>

AP Groups

View a list of existing AP groups and their basic configuration settings.

Refresh | Create New | Delete Selected | Search terms: ○ Include all terms ○ Include any of these term

□ AP Group Name | Description

Create New AP Groups

⊞ General Options
⊞ Group Members
⊞ Radio Options
⊞ Model Specific Options
⊟ Advanced Options

Location Based Service: ☑ Override ☑ Enable LBS service Select a LBS server (Reload... / lbs-venue)

Client Admission Control: [?] □ Override

2.4GHz Radio: □ Enable; Min Client Count 10; Max Radio Load 75 %; Min Client Throughput 0 Mbps

□ Enable; Min Client Count 20; Max Radio Load 75 %; Min Client Throughput 0 Mbps

OK | Cancel

NOTE: For information on configuring and managing the Ruckus Wireless SmartPositioning Technology (SPoT) service, refer to the *SPoT User Guide*, which is available for download from https://support.ruckuswireless.com.

Configuring Bonjour Gateway Policies

Bonjour™ is Apple's implementation of a zero-configuration networking protocol for Apple devices over IP. It allows OS X and iOS devices to locate other devices such as printers, file servers and other clients on the same broadcast domain and use the services offered without any network configuration required.

Multicast applications such as Bonjour require special consideration when being deployed over wireless networks. Bonjour only works within a single broadcast domain, which is usually a small area. This is by design to prevent flooding a large network with multicast traffic. However, in some situations, a user may want to offer Bonjour services from one VLAN to another.

The controller's Bonjour gateway feature addresses this requirement by providing an mDNS proxy service configurable from the web interface to allow administrators to specify which types of Bonjour services can be accessed from/to which VLANs.

In order for the Bonjour Gateway to function, the following network configuration requirements must be met:

1. The target networks must be segmented into VLANs.
2. VLANs must be mapped to different SSIDs.
3. The controller must be connected to a VLAN trunk port.

Additionally, if the VLANs to be bridged by the gateway are on separate subnets, the network has to be configured to route traffic between them.

Creating a Bonjour Gateway Rule on the AP

Using the Bonjour gateway feature, Bonjour bridging service is performed on a designated AP rather than on the controller. Offloading the Bonjour policy to an AP is necessary if a Layer 3 switch or router exists between the controller and the APs. The controller identifies a single AP that meets the memory/processor requirements (this feature is only supported on certain APs), and delivers a set of service rules - a Bonjour policy - to the AP to perform the VLAN bridging.

NOTE: This feature is only supported on the following access points: R300, R500, R600, R700, 7982, 7372/52, 7055, 7782/81, SC-8800 series.

Here are the requirements and limitations of the Bonjour gateway feature:

- Bonjour policy deployment to an AP takes effect after the AP joins the controller.

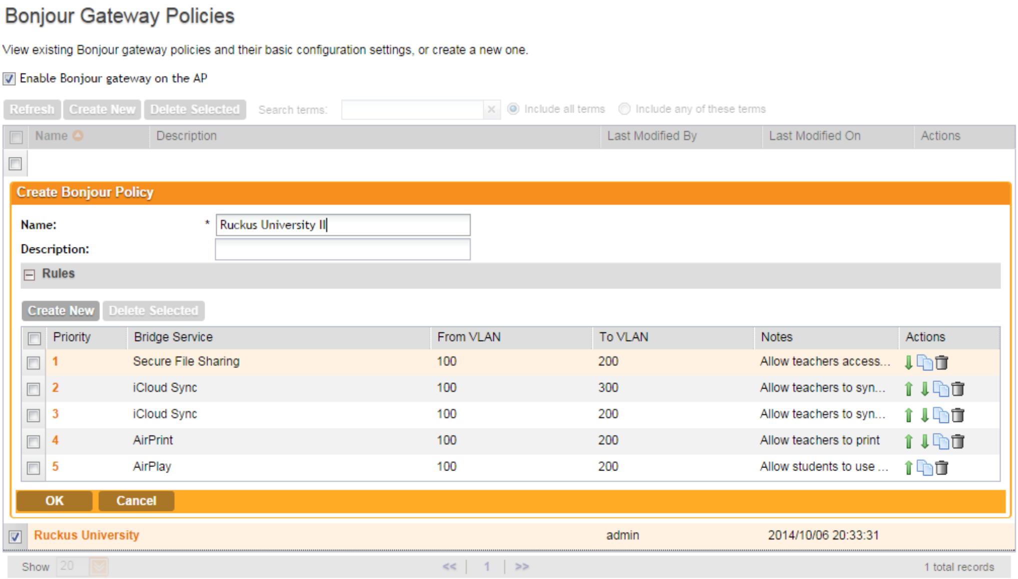
- Some APs of one local area link must be on one subnet. The switch interfaces connected to these APs in a local area link to must be configured in VLAN-trunk mode. Only by doing so can the designated AP can receive all the multicast Bonjour protocol packets from other VLANs.
- Dynamic VLANs are not supported.
- Some AP models are incompatible with this feature due to memory requirements.

Follow these steps to create rules for an AP that will bridge Bonjour services across VLANs.

1. Go to *Configuration* > *Wireless Network* > *Bonjour Gateway Policies*.
2. Click **Create New** to create a Bonjour gateway policy. The *Create Bonjour policy* form appears.
3. In *Name*, type a name for the policy.
4. In *Description*, type a description for the policy.
5. In the *Rules* section, click **Create New** to create a rule.
6. Configure the following options:
   - *Bridge Service*: Select the Bonjour service from the list.
   - *From VLAN*: Select the VLAN from which the Bonjour service will be advertised.
   - *To VLAN*: Select the VLAN to which the service should be made available.
   - *Notes*: Add optional notes for this rule.
7. Click **Save** to save the rule.
8. To create another rule, repeat Step 6 and Step 7.
9. After you finish creating all rules that you require, click **OK**.
10. Select the **Enable Bonjour gateway on the AP** check box.

You have completed creating a Bonjour gateway policy.

Figure 57. Creating a Bonjour gateway policy



Bonjour Gateway Policies

View existing Bonjour gateway policies and their basic configuration settings, or create a new one.

☑ Enable Bonjour gateway on the AP

□	Name	Description	Last Modified By	Last Modified On	Actions
□					
☑	Ruckus University		admin	2014/10/06 20:33:31	

Create Bonjour Policy

Name: * Ruckus University II

Description:

Rules

□	Priority	Bridge Service	From VLAN	To VLAN	Notes	Actions
□	1	Secure File Sharing	100	200	Allow teachers access...	↓ ⧉ 🗑
□	2	iCloud Sync	100	300	Allow teachers to syn...	↑ ↓ ⧉ 🗑
□	3	iCloud Sync	100	200	Allow teachers to syn...	↑ ↓ ⧉ 🗑
□	4	AirPrint	100	200	Allow teachers to print	↑ ↓ ⧉ 🗑
□	5	AirPlay	100	200	Allow students to use ...	↑ ⧉ 🗑

Applying a Bonjour Policy to an AP

Once you have created an Bonjour policy for an AP, you will need to designate the AP that will be responsible for implementing this policy.

Follow these steps to apply an Bonjour policy to an AP.

1 Go to *Configuration* > *Wireless Network* > *Access Points* > *APs*.

2 From the list of APs, click the MAC address of the AP to which you want to apply the Bonjour policy. The *Edit AP [{MAC address}]* form appears.

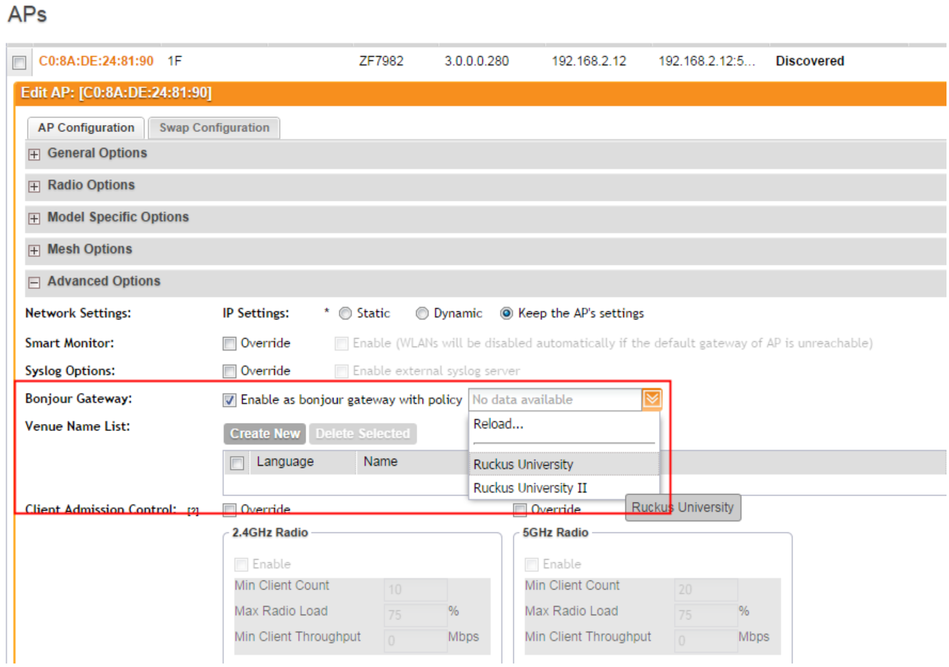
3 Scroll down to the *Advanced Options* section, and then locate the *Bonjour Gateway* option.

4 Select the **Enable as bonjour gateway with policy** check box, and then select the Bonjour policy that you want to apply to the AP (see Figure 58).

5 Click **Apply**.

You have completed applying a Bonjour gateway policy to an AP

Figure 58. Applying a Bonjour gateway policy to an AP



APs

□ C0:8A:DE:24:81:90 1F ZF7982 3.0.0.0.280 192.168.2.12 192.168.2.12:5... Discovered

Edit AP: [C0:8A:DE:24:81:90]

AP Configuration | Swap Configuration

⊞ General Options

⊞ Radio Options

⊞ Model Specific Options

⊞ Mesh Options

⊟ Advanced Options

Network Settings: IP Settings: * ○ Static ○ Dynamic ● Keep the AP's settings

Smart Monitor: □ Override □ Enable (WLANs will be disabled automatically if the default gateway of AP is unreachable)

Syslog Options: □ Override □ Enable external syslog server

Bonjour Gateway: ☑ Enable as bonjour gateway with policy No data available
Reload...
Ruckus University
Ruckus University II

Venue Name List: Create New Delete Selected

□ Language Name

Client Admission Control: [?] □ Override □ Override Ruckus University

Working with AP USB Software Packages

Ruckus Wireless provides an option to upload USB software packages to APs to support several 3G/WiMAX/4G/LTE USB devices. This feature enables the AP to make 3G/WiMAX/4G/LTE wireless network connections.The USB software packages are caller OurFi software packages.

This section covers the following information:

- Viewing AP USB Software Packages
- Uploading the OurFi USB Software Package
- Configuring the USB Software Package for an AP
- Deleting a AP USB Software Package

Viewing AP USB Software Packages

You can view the list of the uploaded software packages from the *AP USB Software Packages* page. These software packages could be associated with an AP.

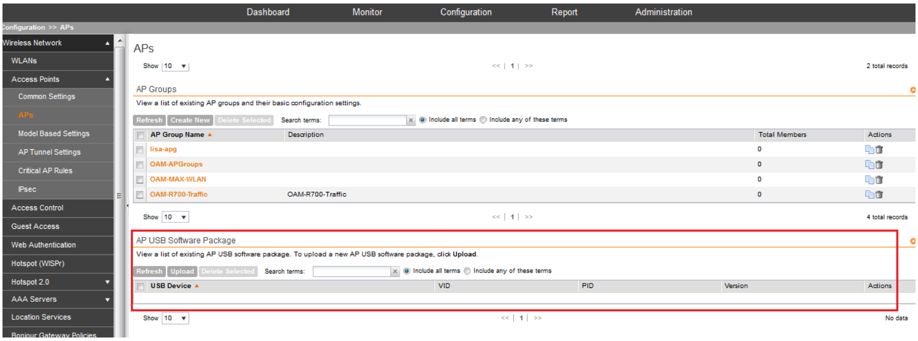
Follow these steps to access the page:

1 Go to **Configuration** > **Access Points** > **APs**.

The *APs* page appears.

2 View the *AP USB Software Package* section in this page as shown in the figure.

Figure 59. AP USB Software Package section



APs

2 total records

AP Groups

View a list of existing AP groups and their basic configuration settings.

Search terms: ● Include all terms ○ Include any of these terms

□	AP Group Name	Description	Total Members	Actions
□	lisa-apg		0	
□	OAM-APGroups		0	
□	OAM-MAX-WLAN		0	
□	OAM-R700-Traffic	OAM-R700-Traffic	0	

4 total records

AP USB Software Package

View a list of existing AP USB software package. To upload a new AP USB software package, click **Upload**.

Search terms: ● Include all terms ○ Include any of these terms

□	USB Device	VID	PID	Version	Actions

No data

The page contains the following USB information:

- *USB Device*: displays the name of the USB device that the USB software package is for.
- *VID*: displays the USB vendor ID.
- *PID*: displays the USB product ID.
- *Version*: displays the version of the USB software package.
- *Actions*: allows you to delete an AP USB software package.

Uploading the OurFi USB Software Package

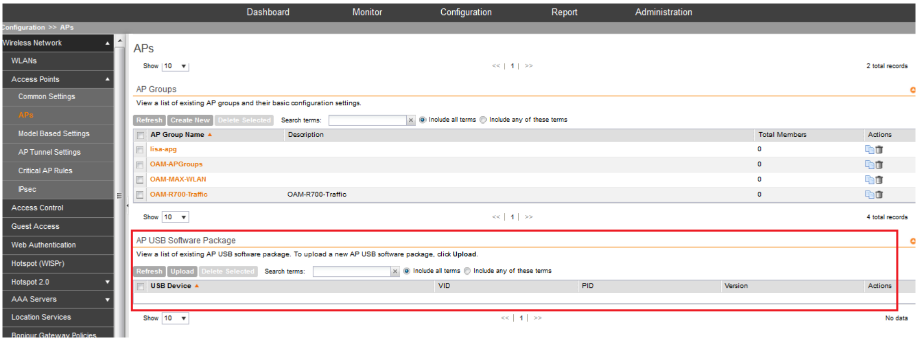
Follow these steps to upload the USB software package.

1 Go to **Configuration** > **Access Points** > **APs**.

The *APs* page appears.

2 The *AP USB Software Package* section appears as shown in the figure.

Figure 60. AP USB Software Package section



View a list of existing AP groups and their basic configuration settings.

AP Group Name	Description	Total Members	Actions
lisa-apg		0	
OAM-APGroups		0	
OAM-MAX-WLAN		0	
OAM-R700-Traffic	OAM-R700-Traffic	0	

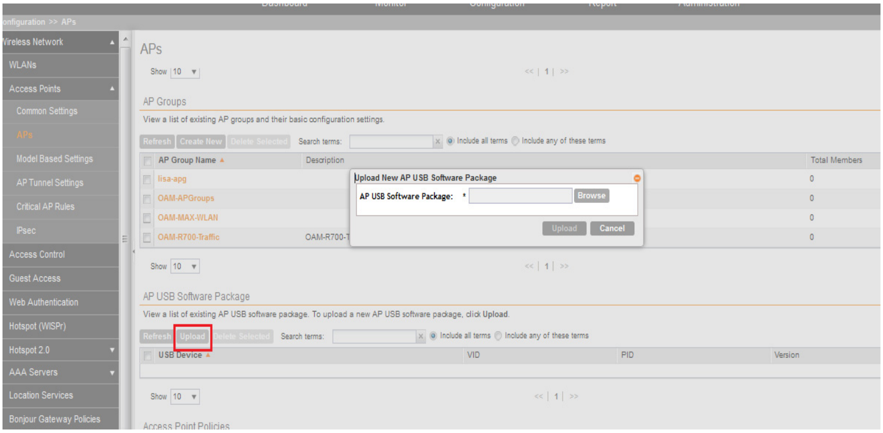
View a list of existing AP USB software package. To upload a new AP USB software package, click **Upload**.

USB Device	VID	PID	Version	Actions

3 Click **Upload**.

The *Upload New AP USB Software Package* dialog appears as shown in the figure.

Figure 61. AP USB software package screen



View a list of existing AP groups and their basic configuration settings.

AP Group Name	Description	Total Members
lisa-apg		0
OAM-APGroups		0
OAM-MAX-WLAN		0
OAM-R700-Traffic	OAM-R700-T	0

View a list of existing AP USB software package. To upload a new AP USB software package, click **Upload**.

USB Device	VID	PID	Version

4 Click **Browse**, and select the software package file (with extension *tar.bz2*) you want to upload.

5 Click **Open**.

6 Click **Upload**.

7 Click **Apply**.

The USB software package is successfully uploaded to the controller.

Configuring the USB Software Package for an AP

The USB software can be uploaded to the AP in the following methods:

- Manual Configuration: you can upload the software packages to an AP by configuring the System, AP Group, and AP model specific settings. After the AP receives the configuration changes, it will download the software package to enable wireless connections. For more information about performing model-specific configuration, see Configuring Model-Based Settings.
- Inserting Dongle: inserting an dongle to the AP allows it to download the USB software if it does not have it.

Currently, the OurFi USB software package is only supported on AP model ZF7321-U.

Deleting a AP USB Software Package

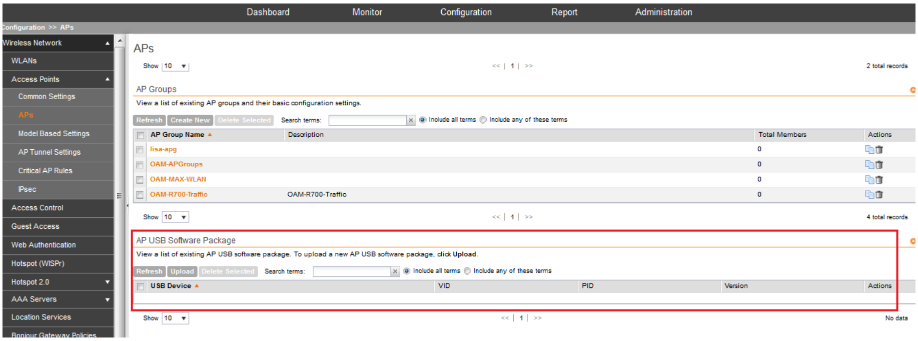
Follow these steps to delete a AP USB software package:

1 Go to **Configuration > Access Points > APs**.

The *APs* page appears.

2 The *AP USB Software Package* section appears as shown in the figure.

Figure 62. AP USB Software Package section



AP Groups

View a list of existing AP groups and their basic configuration settings.

□	AP Group Name	Description	Total Members	Actions
□	lisa-apg		0	
□	OAM-APGroups		0	
□	OAM-MAX-WLAN		0	
□	OAM-R700-Traffic	OAM-R700-Traffic	0	

AP USB Software Package

View a list of existing AP USB software package. To upload a new AP USB software package, click **Upload**.

□	USB Device	VID	PID	Version	Actions

3 Select the USB software package you want to delete.

4 Click the 🗑 icon to delete the software package.

Configuring System Settings

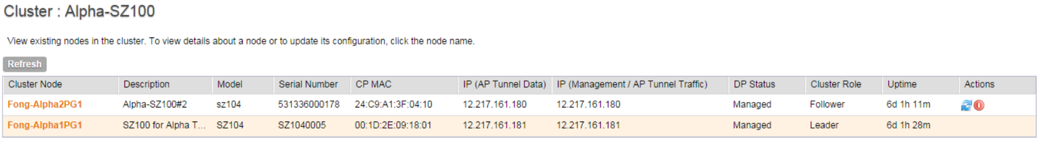
4

In this chapter:

Configuring Network Settings

Follow these steps to view nodes that belong to the cluster, go to **Configuration** > **System** > **Network Settings**. The *Cluster: {Cluster Name}* page appears.

Figure 63. The Cluster: {Cluster Name} page displays all the nodes that belong to the cluster



Cluster : Alpha-SZ100

View existing nodes in the cluster. To view details about a node or to update its configuration, click the node name.

Cluster Node	Description	Model	Serial Number	CP MAC	IP (AP Tunnel Data)	IP (Management / AP Tunnel Traffic)	DP Status	Cluster Role	Uptime	Actions
Fong-Alpha2PG1	Alpha-SZ100#2	sz104	531336000178	24:C9:A1:3F:04:10	12.217.161.180	12.217.161.180	Managed	Follower	6d 1h 11m	🔄 ⓘ
Fong-Alpha1PG1	SZ100 for Alpha T...	SZ104	SZ1040005	00:1D:2E:09:18:01	12.217.161.181	12.217.161.181	Managed	Leader	6d 1h 28m	

To edit the network settings of a node, click the node name. The Cluster Node Configuration form appears and displays the following three tabs:

- Physical Interfaces
- User Defined Interfaces
- Static Routes

Setting the System IP Mode

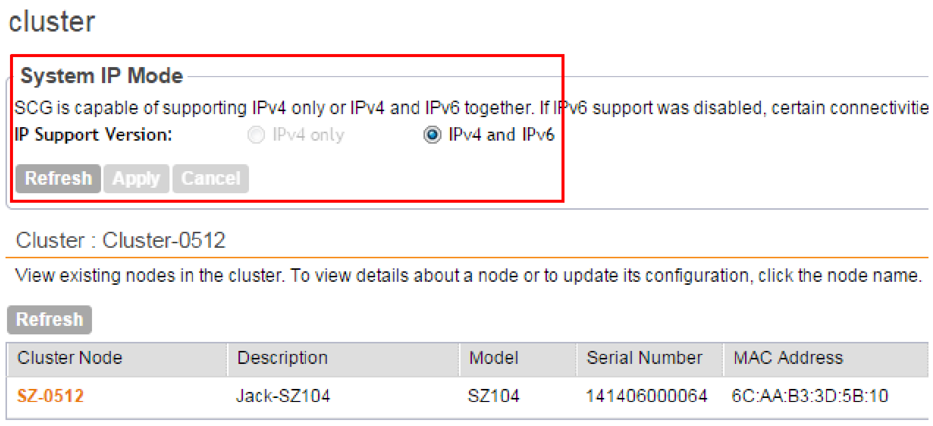
The controller supports IPv4 only and IPv4 and IPv6 addressing modes. The system IP mode controls the format of the IP address that you need to enter in a number of IP address-related settings (for example, cluster plane addresses, static routes, etc.)

Follow these steps to change the controller's system IP mode.

1. Go to *Configuration* > *System* > *Network Settings*. The *Cluster* page appears.
2. In the *System IP Mode* section, select the system IP mode that you want to controller to use. Options include:
   - **IPv4 Only**
   - **IPv4 and IPv6**
3. Click **Apply**.

You have completed setting the system IP mode.

Figure 64. The System IP Mode section



cluster

System IP Mode

SCG is capable of supporting IPv4 only or IPv4 and IPv6 together. If IPv6 support was disabled, certain connectivitie

IP Support Version: ○ IPv4 only ● IPv4 and IPv6

Cluster : Cluster-0512

View existing nodes in the cluster. To view details about a node or to update its configuration, click the node name.

Cluster Node	Description	Model	Serial Number	MAC Address
SZ-0512	Jack-SZ104	SZ104	141406000064	6C:AA:B3:3D:5B:10

Configuring the Physical Interface Settings

Follow these steps to configure the physical interface settings of a node.

1 Locate the interface settings that you want to update. You can update one of the following interfaces:

a Management & AP Control

b AP Tunnel Data

NOTE: If you selected **One Port Grouping** (combined management and AP tunnel traffic into a single interface) when you completed the Setup Wizard, only one interface appears on the *Physical Interface* tab – *Management/AP Tunnel Traffic*.

CAUTION! Although it is possible to use DHCP to assign IP address settings to the management and AP control interface automatically, Ruckus Wireless strongly recommends assigning a static IP address to this interface.

2 Configure the following settings for the interface that you want to update.

a *IP Mode*: Configure the IP address mode by clicking one of the following options:

- **Static**: Click this if you want to assign an IP address to this interface manually.
- **DHCP**: Click this if you want this interface to obtain an IP address automatically from a DHCP server on the network. After you click this option, most of the options below it will be grayed out. Continue to Step 3.

b *IP Address*: Enter the IP address that you want to the assign to this interface.

c *Subnet Mask*: Enter the subnet mask for the IP address above.

d *Gateway*: Enter the IP address of the gateway router.

e *Primary DNS*: Enter the IP address of the primary DNS server.

f *Secondary DNS*: Enter the IP address of the secondary DNS server.

3 If the system IP mode is set to IPv4 and IPv6, you will also need to configure the IPv6 interfaces. Configure the IPv6 address mode by clicking one of the following options in *IP Mode*:

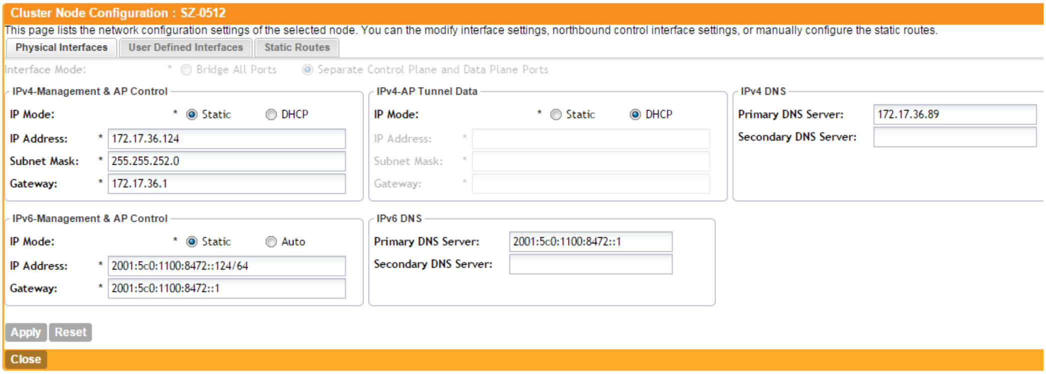
- **Static**: Click this if you want to assign an IPv6 address to this interface manually, and then configure the following:
  - *IP Address*: Enter an IPv6 address (global only) with a prefix length (for example, 1234::5678:0:C12/123) is required. Link-local addresses are unsupported.
  - *Gateway*: Enter an IPv6 address (global or link-local) without a prefix length. For example, 1234::5678:0:C12 (global address without a prefix length) and fe80::5678:0:C12 (link-local address without a prefix length).
- **Auto**: Click this if you want the interface to obtain its IP address from Router Advertisements (RAs) or from a DHCPv6 server on the network.

4 Click **Apply**.

The controller restarts and applies the updated network interface settings. You have completed updating the physical interface settings.

NOTE: For information on how to configure the management IP address from the command line interface, refer to Changing the Management IP Address from the CLI.

Figure 65. The Physical Interface tab on a two-port group controller



Cluster Node Configuration : SZ-0512

This page lists the network configuration settings of the selected node. You can the modify interface settings, northbound control interface settings, or manually configure the static routes.

Interface Mode: * ○ Bridge All Ports ● Separate Control Plane and Data Plane Ports

IPv4-Management & AP Control
IP Mode: * ● Static ○ DHCP
IP Address: * 172.17.36.124
Subnet Mask: * 255.255.252.0
Gateway: * 172.17.36.1

IPv4-AP Tunnel Data
IP Mode: * ○ Static ● DHCP
IP Address: *
Subnet Mask: *
Gateway: *

IPv4 DNS
Primary DNS Server: 172.17.36.89
Secondary DNS Server:

IPv6-Management & AP Control
IP Mode: * ● Static ○ Auto
IP Address: * 2001:5c0:1100:8472::124/64
Gateway: * 2001:5c0:1100:8472::1

IPv6 DNS
Primary DNS Server: 2001:5c0:1100:8472::1
Secondary DNS Server:

Configuring the User Defined Interface Settings

NOTE: The user defined interface (UDI) is unavailable in Virtual SmartZone (High-Scale and Essentials).

Use the *User Defined Interface* tab to configure the hotspot portal settings (captive portal, subscriber portal, and Web proxy). Note that you can only create one user defined interface, and it must be for a hotspot portal and must use the control interface as its physical interface.

NOTE: The control plane and the user-defined interface (UDI) must be on different subnets. If the control plane and UDI are on the same subnet and assigned the same IP address, APs will be unable to communicate with the control plane. If the control plane and UDI are on the same subnet and assigned different IP addresses, hotspot clients will not be redirected to the logon URL for user authentication.

Follow these steps to configure the settings on the User Defined Interface tab.

1 Click the **User Defined Interface** tab.

2 Click the **Create New** button.

3 Configure the following interface settings:

   a *Name*: Enter a name for this interface.

   b *IP Address*: Enter an IP address to assign to this interface.

   c *Subnet Mask*: Enter a subnet mask for the IP address above.

   d *Gateway*: Enter the IP address of the gateway router.

   e *VLAN*: Enter the VLAN ID that you want to assign to this interface.

   f *Physical Interface*: Select **Control Interface**.

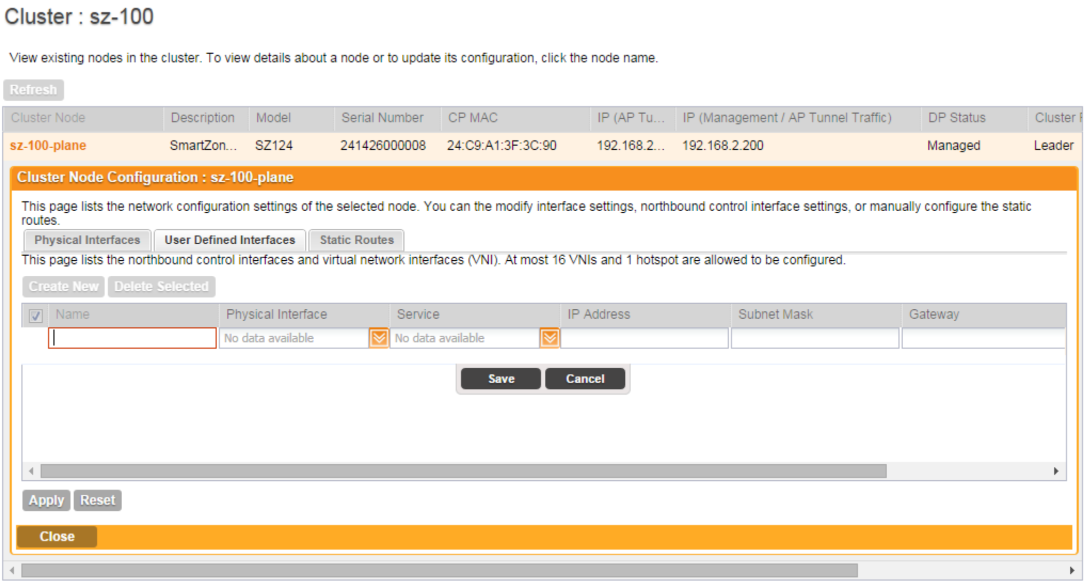
   g *Service*: Select **Hotspot**.

4 Click **Save**.

5 Click **Apply**.

You have completed configuring the user defined interface settings.

Figure 66. The User Defined Interface tab



Cluster : sz-100

View existing nodes in the cluster. To view details about a node or to update its configuration, click the node name.

Cluster Node	Description	Model	Serial Number	CP MAC	IP (AP Tu...	IP (Management / AP Tunnel Traffic)	DP Status	Cluster F
sz-100-plane	SmartZon...	SZ124	241426000008	24:C9:A1:3F:3C:90	192.168.2...	192.168.2.200	Managed	Leader

Cluster Node Configuration : sz-100-plane

This page lists the network configuration settings of the selected node. You can the modify interface settings, northbound control interface settings, or manually configure the static routes.

This page lists the northbound control interfaces and virtual network interfaces (VNI). At most 16 VNIs and 1 hotspot are allowed to be configured.

☑	Name	Physical Interface	Service	IP Address	Subnet Mask	Gateway
		No data available	No data available			

Creating and Configuring Static Routes

To configure a static route, enter the destination IP address and related information for the destination. You can also assign a metric (or priority) to help the controller determines the route to choose when there are multiple routes to the same destination.

Follow these steps to configure a static route.

1 Click the **Static Routes** tab.

2 Click the **Create New** button.

3 Configure the following interface settings:

   a *Network Address*: Enter the destination IP address of this route.

   b *Subnet Mask*: Enter a subnet mask for the IP address above.

   c *Gateway*: Enter the IP address of the gateway router.

   d *Interface*: Select the physical interface to use for this route.

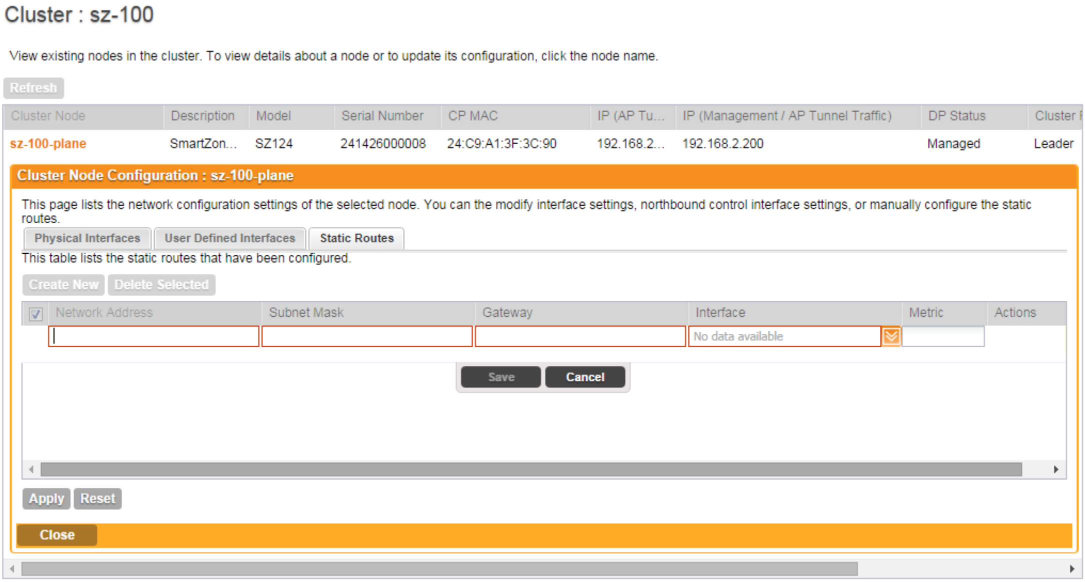
   e *Metric*: This represents the number of routers between the network and the destination.

4 Click **Save**.

5 Click **Apply**.

You have completed configuring a static route.

Figure 67. The Static Route tab



Cluster : sz-100

View existing nodes in the cluster. To view details about a node or to update its configuration, click the node name.

Cluster Node	Description	Model	Serial Number	CP MAC	IP (AP Tu...	IP (Management / AP Tunnel Traffic)	DP Status	Cluster F
sz-100-plane	SmartZon...	SZ124	241426000008	24:C9:A1:3F:3C:90	192.168.2...	192.168.2.200	Managed	Leader

Cluster Node Configuration : sz-100-plane

This page lists the network configuration settings of the selected node. You can the modify interface settings, northbound control interface settings, or manually configure the static routes.

This table lists the static routes that have been configured.

☑	Network Address	Subnet Mask	Gateway	Interface	Metric	Actions
				No data available		

Configuring Log Settings

The controller maintains an internal log file of current events and this file has a fixed capacity. At a certain point, the controller will start deleting the oldest entries in log file to make room for newer entries. If you want to keep a permanent record of all events that the controller generated, you can configure the controller to send the log contents to a syslog server on the network.

Follow these steps to configure the syslog server settings.

1. Go to *Configuration* > *System* > *Log Settings*.
2. Select the **Enable logging to remote syslog server** check box.
3. In *Syslog Server Address*, type the IP address of the syslog server on the network.
4. In *Syslog Server Port*, type the syslog port number on the server.

NOTE: To verify that the syslog server that you intend to use is reachable, click the **Ping Syslog Server** button.

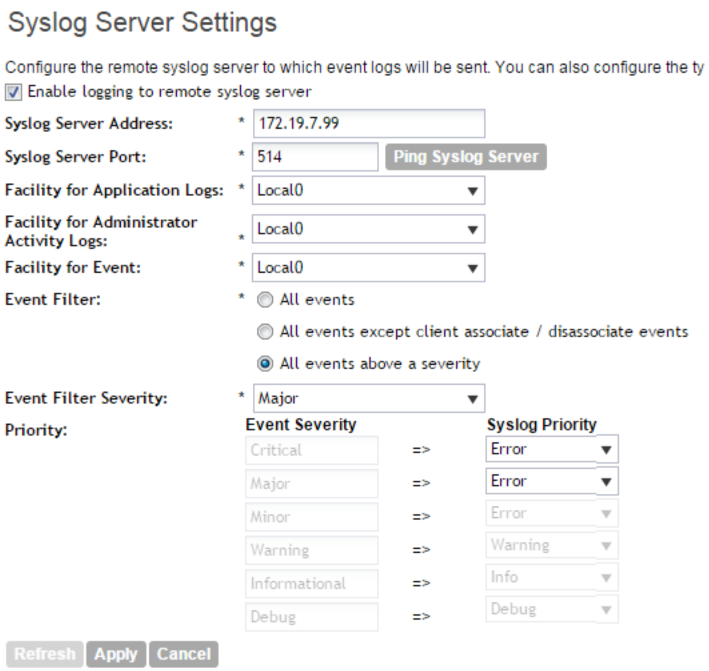
5. Select the facility level (default is **Local0**, range is **Local0** to **Local7**) for each of the following log types:
   - *Facility for Application*
   - *Facility for Administrator*
   - *Facility for Events*
6. In *Event Filter*, select one of the following options to specify which events will be sent to the syslog server:
   - **All events**: Click this option to send all controller events to the syslog server.
   - **All events except client associate/disassociate events**: Click this option to send all controller events (except client association and disassociation events) to the syslog server.
   - **All events above a severity**: Click this option to send all controller events that are above the event severity that you specify in *Event Severity*.
     - *Event Severity*: (This option only appears when **All events above a severity** is selected.) Select the lowest severity level for which events will be sent to the syslog server. For example, if you select **Major**, all events that are major and higher (including critical) will be sent to the syslog server. For the order of event severity that the controller follows, see Event Severity Levels.

7 In *Priority*, accept or change the default severity to priority mapping. See Default Event Severity to Syslog Priority Mapping.

8 Click **Apply**.

You have completed configuring the log settings.

Figure 68. Syslog server settings



Syslog Server Settings

Configure the remote syslog server to which event logs will be sent. You can also configure the ty

☑ Enable logging to remote syslog server

Syslog Server Address: * 172.19.7.99

Syslog Server Port: * 514

Facility for Application Logs: * Local0

Facility for Administrator Activity Logs: * Local0

Facility for Event: * Local0

Event Filter: *
○ All events
○ All events except client associate / disassociate events
● All events above a severity

Event Filter Severity: * Major

Priority:

Event Severity		Syslog Priority
Critical	=>	Error
Major	=>	Error
Minor	=>	Error
Warning	=>	Warning
Informational	=>	Info
Debug	=>	Debug

Event Severity Levels

Table 4 describes the event severity levels (1 to 6, with 1 being the most severe) that the controller follows.

Table 4. Event severity levels in the controller

Level	Message	Description
1	Critical	A critical condition that must resolved immediately
2	Major	An error condition that must be resolved
3	Minor	An error condition that must be checked to determine if it needs to be resolved
4	Warning	Warning message, not an error, but indication that an error will occur if action is not taken
5	Informational	Normal operational messages - may be harvested for reporting, measuring throughput, etc. - no action required.
6	Debug	Info useful to developers for debugging the application, not useful during operations.

Default Event Severity to Syslog Priority Mapping

Table 5 lists the default event severity to syslog priority mapping in the controller.

Table 5. Event severity to syslog priority mapping

Event Severity	Syslog Priority
Critical	Error
Major	Error
Minor	Warning
Warning	Warning
Informational	Info
Debug	Debug

Configuring Event Management

By default, the controller saves a record of all events that occur to its database. You can configure the controller to also send SNMP traps and email notifications for specific events whenever they occur.

NOTE: Verify that global SNMP traps are enabled to ensure that the controller can send SNMP traps for alarms. For information on how to enable global SNMP traps, refer to Enabling Global SNMP Traps.

Follow these steps to configure the controller to send traps and email notifications for events.

1 Go to *Configuration* > *System* > *Event Management*.

2 In the *Email Notification* section, select the **Enable** check box, and then type an email address or email addresses in the *Mail To* box. If you want to send notifications to multiple recipients, use a comma to separate the email addresses.

3 In the *Events* section, go over the table and select the events for which you want to send traps or email notifications (or both).

- If you know the event code, event type, or description, type the full or partial text into the search box on the upper-right hand corner of the table, and then click the magnifying glass (search) icon.
- If you want to select all events, click the check box before the *Code* table heading.

NOTE: By default, the *Events* table displays up to 20 events per page. If you are enabling SNMP traps and email notifications for 10 or more events, Ruckus Wireless recommends changing the number of events shown per page. To do this, scroll down to the bottom of the page, and then change the value for **Show** to `250` (maximum).

4 After you have selected all of the events for which you want to send traps or email notifications, scroll up to the beginning of the *Events* table, and then click **Enable**. A submenu appears and displays the following links:

- **Enable SNMP Trap**: Click this link to enable SNMP trap notifications for all selected events.
- **Enable Email**: Click this link to enable email notifications for all selected events.

- **Enable DB Persistence**: Click this link to enable saving of all selected events to the controller database. If an event is already currently enabled, it will stay enabled after you click this link.

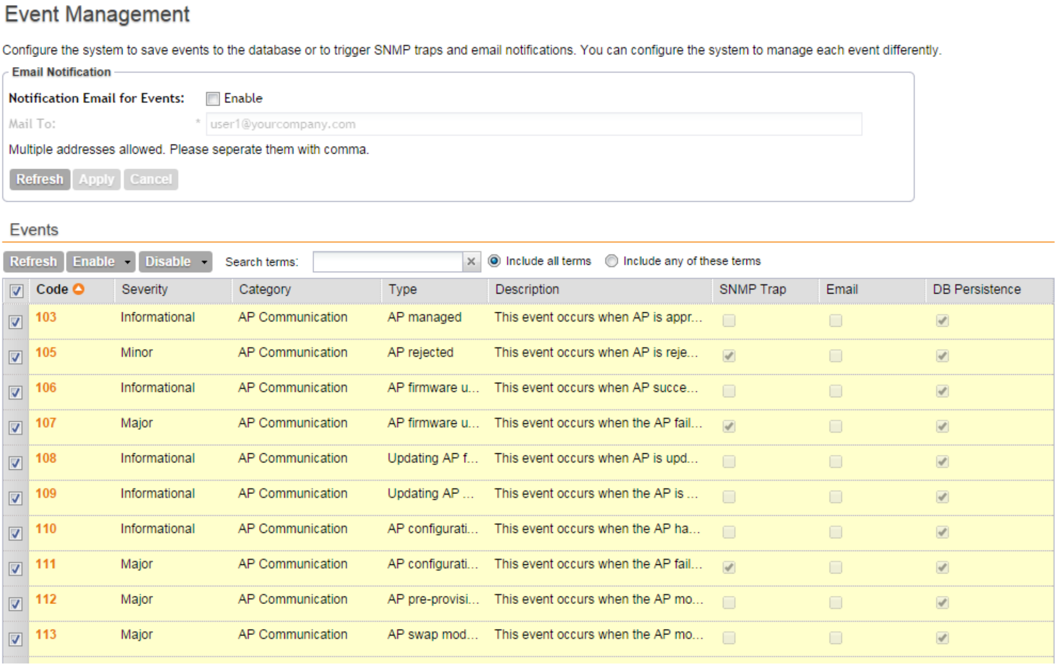
A confirmation message appears.

5 Click **Yes**.

NOTE: You can only enable one of these three notification options at a time (for example, SNMP trap notifications only). If you want to enable another option, repeat steps 5 and 6.

You have completed enabling a notification option for the selected events.

Figure 69. Selecting all events on the Event Management page



Event Management

Configure the system to save events to the database or to trigger SNMP traps and email notifications. You can configure the system to manage each event differently.

Email Notification

Notification Email for Events: □ Enable

Mail To: * user1@yourcompany.com

Multiple addresses allowed. Please seperate them with comma.

Events

Search terms: ● Include all terms ○ Include any of these terms

☑	Code	Severity	Category	Type	Description	SNMP Trap	Email	DB Persistence
☑	103	Informational	AP Communication	AP managed	This event occurs when AP is appr...	□	□	☑
☑	105	Minor	AP Communication	AP rejected	This event occurs when AP is reje...	☑	□	☑
☑	106	Informational	AP Communication	AP firmware u...	This event occurs when AP succe...	□	□	☑
☑	107	Major	AP Communication	AP firmware u...	This event occurs when the AP fail...	☑	□	☑
☑	108	Informational	AP Communication	Updating AP f...	This event occurs when AP is upd...	□	□	☑
☑	109	Informational	AP Communication	Updating AP ...	This event occurs when the AP is ...	□	□	☑
☑	110	Informational	AP Communication	AP configurati...	This event occurs when the AP ha...	□	□	☑
☑	111	Major	AP Communication	AP configurati...	This event occurs when the AP fail...	☑	□	☑
☑	112	Major	AP Communication	AP pre-provisi...	This event occurs when the AP mo...	□	□	☑
☑	113	Major	AP Communication	AP swap mod...	This event occurs when the AP mo...	□	□	☑

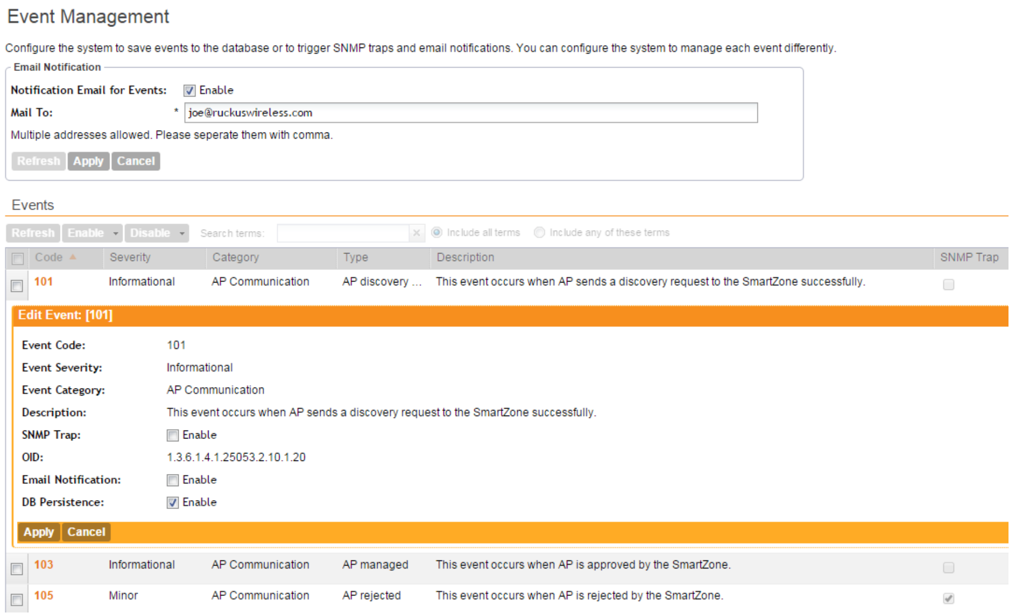
Enabling or Disabling Notifications for a Single Event

Follow these steps to enable or disable notifications for a single event.

1. Go to *Configuration* > *System* > *Event Management*.
2. Under *Events*, locate the event for which you want to enable or disable notifications.
3. Click the event code. The *Edit Event: [Event Code]* form appears.
4. Select the check box for a notification type to enable it, or clear the check box to disable it. Options include:
   - SNMP Trap
   - Email Notification
   - DB Persistence
5. Click **Apply.**

You have completed enable or disabling notifications for a single event.

Figure 70. Select or clear check boxes to enable or disable notifications



Event Management

Configure the system to save events to the database or to trigger SNMP traps and email notifications. You can configure the system to manage each event differently.

Email Notification

Notification Email for Events: ☑ Enable

Mail To: * joe@ruckuswireless.com

Multiple addresses allowed. Please seperate them with comma.

Events

□	Code	Severity	Category	Type	Description	SNMP Trap
□	101	Informational	AP Communication	AP discovery ...	This event occurs when AP sends a discovery request to the SmartZone successfully.	□

Edit Event: [101]

Event Code: 101

Event Severity: Informational

Event Category: AP Communication

Description: This event occurs when AP sends a discovery request to the SmartZone successfully.

SNMP Trap: □ Enable

OID: 1.3.6.1.4.1.25053.2.10.1.20

Email Notification: □ Enable

DB Persistence: ☑ Enable

□	103	Informational	AP Communication	AP managed	This event occurs when AP is approved by the SmartZone.	□
□	105	Minor	AP Communication	AP rejected	This event occurs when AP is rejected by the SmartZone.	☑

Viewing Enabled Notifications for Events

Follow these steps to view the notification types that are enabled for events.

1 Go to *Configuration* > *System*.

2 On the sidebar, click **Event Management**.

3 Scroll down to the bottom of the page, and then select **250** in *Show*. The page refreshes, and then displays up to 250 events.

4 Check the *SNMP Trap*, *Email*, and *DB Persistence* columns on the right side of the table. A check mark under each column indicates that the notification option is enabled for the event.

To view the notification options that are enabled for the events on the next page, click **>>** at the bottom of the table. The page refreshes, and then displays the remaining events.

Configuring Event Thresholds

An event threshold defines a set of conditions related to the controller hardware that need to be met before the controller triggers an event. You can accept the default threshold values or you can update the threshold values to make them more suitable to your deployment or controller environment.

Follow these steps to configure the threshold for an event.

1 Go to *Configuration* > *System* > *Event Threshold*. The *Event Threshold* page appears and displays the list of events with configurable thresholds (see Table 6), including the event code, severity level, default value and accepted range, and unit of measurement for each event.

2 Locate the event threshold that you want to configure.

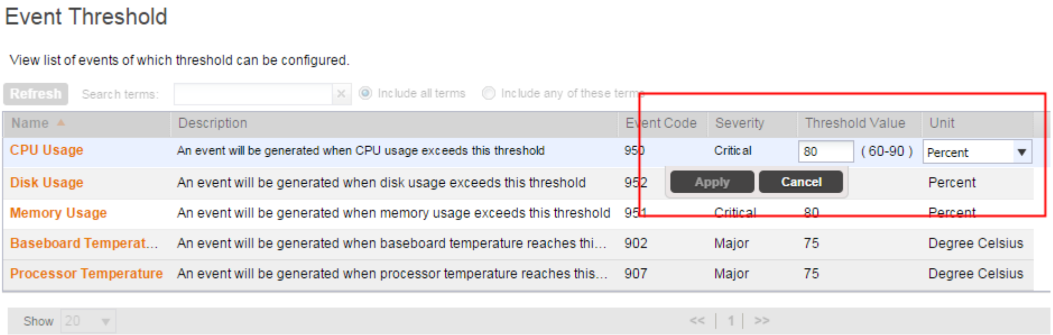
3 Click the event name under the *Name* column. The threshold value for the event become edits. Next to the threshold value, the acceptable range is shown.

4 Edit the threshold value.

5 Click **Apply**.

Repeat the same procedure to edit the threshold of another event.

Figure 71. Configuring the CPU Usage event threshold



Event Threshold

View list of events of which threshold can be configured.

Name ▲	Description	Event Code	Severity	Threshold Value	Unit
CPU Usage	An event will be generated when CPU usage exceeds this threshold	950	Critical	80 (60-90)	Percent
Disk Usage	An event will be generated when disk usage exceeds this threshold	952			Percent
Memory Usage	An event will be generated when memory usage exceeds this threshold	951	Critical	80	Percent
Baseboard Temperat...	An event will be generated when baseboard temperature reaches thi...	902	Major	75	Degree Celsius
Processor Temperature	An event will be generated when processor temperature reaches this...	907	Major	75	Degree Celsius

Events with Configurable Thresholds

Table 6 lists controller hardware events for which you can configure the event thresholds, including their default values and acceptable ranges.

Table 6. List of hardware events with configurable thresholds

Event	Event Code	Severity	Threshold Value	Unit
CPU Usage	950	Critical	Default: 80 Range: 60 to 90	Percent
Disk Usage	952	Critical	Default: 80 Range: 60 to 90	Percent
Memory Usage	951	Critical	Default: 80 Range: 60 to 90	Percent
Baseboard Temperature	902	Major	Default: 75 Range: 0 to 75	Degree Celsius
Processor Temperature	907	Major	Default: 75 Range: 0 to 75	Degree Celsius

Configuring the Northbound Portal Interface

Follow these steps to configure the northbound portal interface.

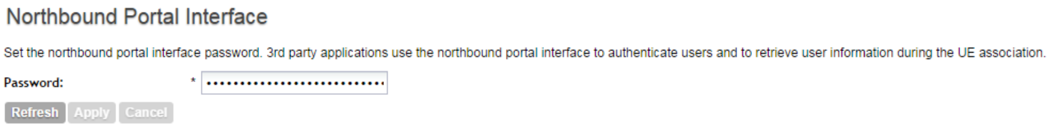
1 Go to *Configuration* > *System* > *Log Settings.*

2 In **Password**, type the password for the northbound portal interface.

3 Click **Apply**.

You have completed setting the password for the northbound portal interface.

Figure 72. The Northbound Portal Interface page



Northbound Portal Interface

Set the northbound portal interface password. 3rd party applications use the northbound portal interface to authenticate users and to retrieve user information during the UE association.

Password: * ••••••••••••••••••••••••••

Configuring the System Time

The controller uses an external network time protocol (NTP) server to synchronize the times across cluster nodes and managed access points.

Follow these steps to set the system time.

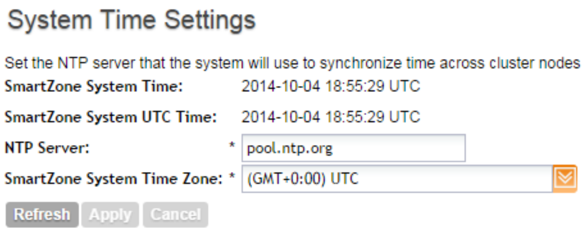
1 Go to *Configuration* > *System* > *System Time.*

2 In *NTP Server*, type the server address that you want to use. The default NTP server address is `pool.ntp.org`.

3 In *System Time Zone*, select the time zone that you want the controller to use. The default time zone is `(GMT +0:00) UTC`.

4 Click **Apply**.

Figure 73. System time settings



System Time Settings

Set the NTP server that the system will use to synchronize time across cluster nodes and managed APs.

SmartZone System Time: 2014-10-04 18:55:29 UTC

SmartZone System UTC Time: 2014-10-04 18:55:29 UTC

NTP Server: * pool.ntp.org

SmartZone System Time Zone: * (GMT+0:00) UTC

How APs Synchronize Time with the Controller

When an AP joins the controller, it automatically synchronizes its time with the controller system time. After that, the AP automatically synchronizes its time with the controller every day.

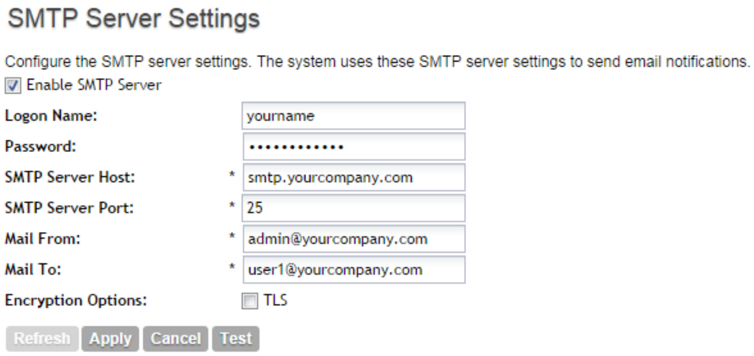
Configuring an External Email Server

If you want to receive copies of the reports that the controller generates or to email guest passes to users, you need to configure the SMTP server settings and the email address from which the controller will send the reports. Follow these steps to configure the SMTP server settings.

1. Go to *Configuration* > *System* > *External Email Server.*
2. Select the **Enable SMTP Server** check box.
3. In **Logon Name**, type the logon or user name provided by your ISP or mail administrator. This might be just the part of your email address before the @ symbol, or it might be your complete email address. If you are using a free email service (such as Hotmail™ or Gmail™), you typically have to type your complete email address.
4. In **Password**, type the password that is associated with the user name above.
5. In **SMTP Server Host**, type the full name of the server provided by your ISP or mail administrator. Typically, the SMTP server name is in the format smtp.company.com.
6. In **SMTP Server Port**, type the SMTP port number provided by your ISP or mail administrator. Often, the SMTP port number is 25 or 587. The default SMTP port value is 25.
7. In **Mail From**, type the email address from which the controller will send email notifications.
8. In **Mail To**, type the email address to which the controller will send alarm messages. You can send alarm messages to a single email address.
9. If your mail server uses encryption, select the encryption method in Encryption Options. Options include **TLS** and **STARTTLS**. Check with your ISP or mail administrator for the correct encryption settings that you need to set.
10. Click **Apply**.

You have completed configuring the external email server that the controller will use to send out email notifications and messages.

Figure 74. The SMTP Server Settings page



SMTP Server Settings

Configure the SMTP server settings. The system uses these SMTP server settings to send email notifications.

☑ Enable SMTP Server

Logon Name:		yourname
Password:		••••••••••••
SMTP Server Host:	*	smtp.yourcompany.com
SMTP Server Port:	*	25
Mail From:	*	admin@yourcompany.com
Mail To:	*	user1@yourcompany.com
Encryption Options:		□ TLS

Configuring External FTP Servers

The controller enables you to automatically back up statistics files, reports, and system configuration backups to an external FTP server. However, before you can do this, you must add at least one FTP server to the controller.

Follow these steps to add an FTP server to which the controller will export data automatically.

1 Go to *Configuration* > *System* > *External FTP Servers.*

2 Click **Create New**. The *Create New FTP Server* form appears.

3 In *FTP Name*, type a name that you want to assign to the FTP server that you are adding.

4 In *FTP Host*, type the IP address of the FTP server.

5 In *Port*, type the FTP port number. The default FTP port number is 21.

6 In *User Name*, type user name of the FTP account that you want to use.

7 In *Password*, type the password that is associated with the FTP user name above.

8 In *Remote Directory*, type the path on the remote FTP server to which data will be exported from the controller. The path must start with a forward slash (/), as shown in Figure 75.

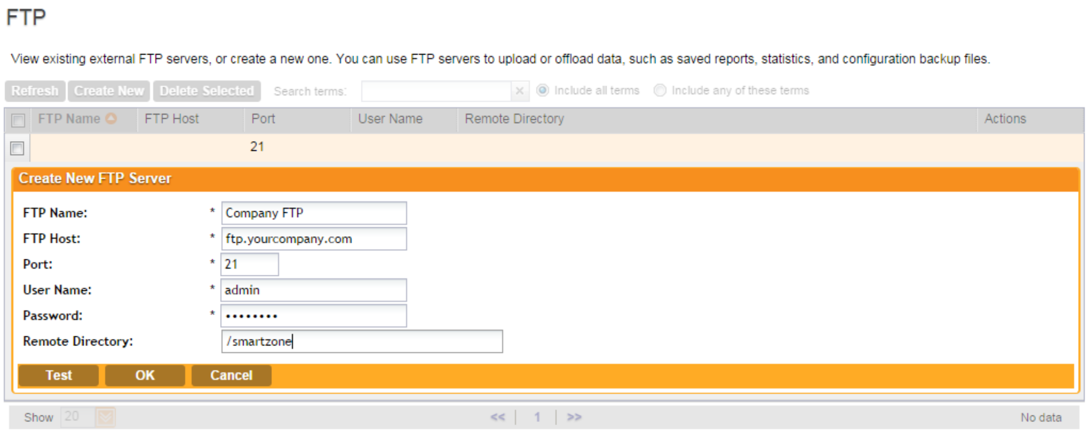
9 To verify that the FTP server settings and logon information are correct, click Test. If the server and logon settings are correct, the following message appears:

```
Test completed successfully.
```

10 Click **OK**.

You have completed adding an FTP server to the controller. You may create additional FTP servers as required.

Figure 75. Adding an external FTP server to the controller



FTP

View existing external FTP servers, or create a new one. You can use FTP servers to upload or offload data, such as saved reports, statistics, and configuration backup files.

□	FTP Name	FTP Host	Port	User Name	Remote Directory	Actions
□			21			

Create New FTP Server

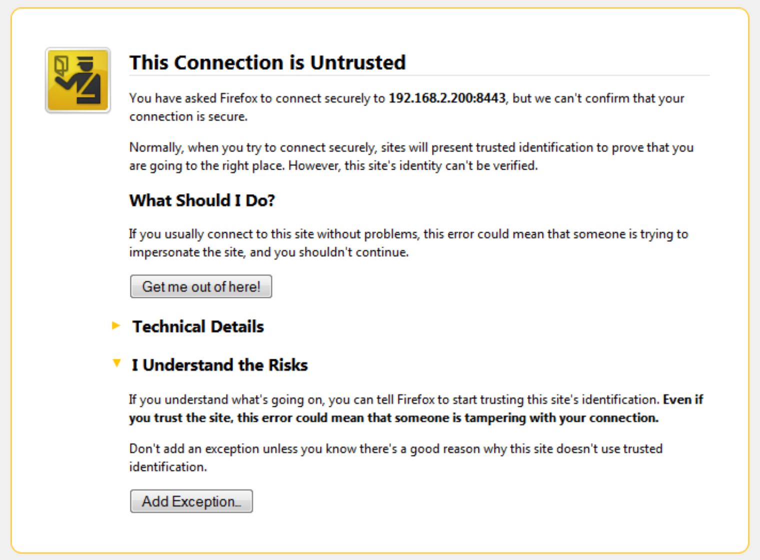
FTP Name:	*	Company FTP
FTP Host:	*	ftp.yourcompany.com
Port:	*	21
User Name:	*	admin
Password:	*	••••••••
Remote Directory:		/smartzone

Managing the Certificate Store

The certificate store is the central storage for all the security certificates that the controller uses for its web interface, AP portal, and hotspots.

By default, a Ruckus Wireless-signed SSL certificate (or security certificate) exists in the controller. However, because this default certificate is signed by Ruckus Wireless and is not recognized by most web browsers, a security warning appears whenever you connect to the web interface or users connect to the AP portal or a hotspot. To prevent these security warnings from appearing, you can import an SSL certificate that is issued by a recognized certificate authority.

Figure 76. The web certificate warning that appears when you attempt to access the controller web interface in Mozilla Firefox



This Connection is Untrusted

You have asked Firefox to connect securely to **192.168.2.200:8443**, but we can't confirm that your connection is secure.

Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.

What Should I Do?

If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.

▸ **Technical Details**

▾ **I Understand the Risks**

If you understand what's going on, you can tell Firefox to start trusting this site's identification. **Even if you trust the site, this error could mean that someone is tampering with your connection.**

Don't add an exception unless you know there's a good reason why this site doesn't use trusted identification.

This section describes the steps you need to perform to import and apply an SSL certificate to the web interface, AP portal, or hotspots. Topics include:

- Generating a Certificate Signing Request
- Importing an SSL Certificate
- Assigning Certificates to Services

NOTE: If you are implementing Hotspot 2.0 on the network and you want to support anonymous authentication using OSU Server-Only Authenticated L2 Encryption Network (OSEN), you will need to import a trust root certificate, server or intermediate certificate and private key.

Generating a Certificate Signing Request

This section describes how to generate a certificate signing request (which you need to obtain a signed certificate) and how to import a signed certificate into the controller.

NOTE: If you already have an SSL certificate that you want to import into the controller, go to Importing an SSL Certificate.

If you do not have an SSL certificate, you will need to create a certificate signing request (CSR) file and send it to an SSL certificate provider to purchase an SSL certificate. The controller web interface provides a form that you can use to create the CSR file. Follow these steps to generate a certificate request.

1. Go to *Configuration* > *System* > *Certificate Store*. The *Certificate Store* page appears.
2. In the *Certificate Signing Request (CSR)* section, click **Generate**. The *Generate New Certificate Signing Request (CSR)* form appears.
3. In *Name*, type a name for this CSR.
4. In *Description*, type a description for this CSR.
5. In the *Certificates Signing Request (CSR)* section, fill out the following boxes:
   - *Common Name*: Type the fully qualified domain name of your Web server. This must be an exact match (for example, `www.ruckuswireless.com`).
   - *Email*: Type your email address (for example, `joe@ruckuswireless.com`).
   - *Organization*: Type the complete legal name of your organization (for example, `Ruckus Wireless, Inc.`). Do not abbreviate your organization name.
   - *Organization Unit*: Type the name of the division, department, or section in your organization that manages network security (for example, `Network Management`).
   - *Locality/City*: Type the city where your organization is legally located (for example, `Sunnyvale`).
   - *State/Province*: Type the state or province where your organization is legally located (for example, `California`) Do not abbreviate the state or province name.
   - *Country*: Select the country where your organization is location from the drop-down list.
6. Click **OK**. The controller generates the certificate request. When the certificate request file is ready, your web browser automatically downloads it.
7. Go to the default download folder of your Web browser and locate the certificate request file. The file name is `myreq.zip`.
8. Use a text editor (for example, Notepad) to open the certificate request file.
9. Go to the website of your preferred SSL certificate provider, and then follow the instructions for purchasing an SSL certificate.

10 When you are prompted for the certificate signing request, copy and paste the entire content of myreq.csr, and then complete the purchase.

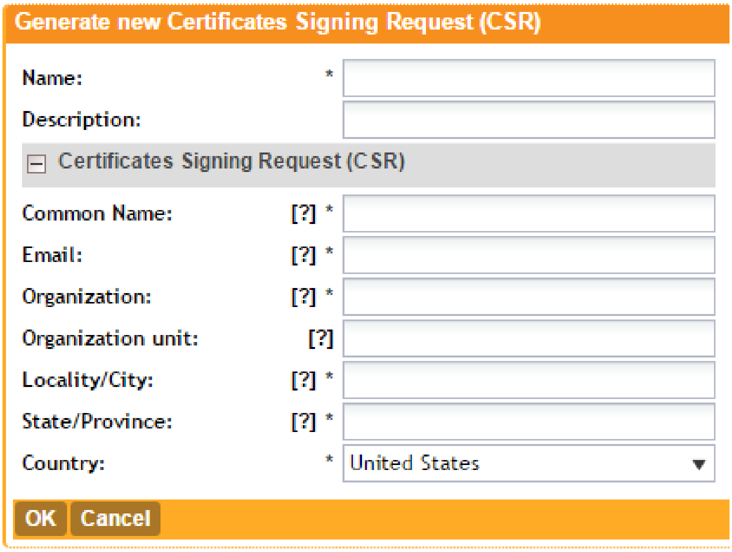
After the SSL certificate provider approves your CSR, you will receive the signed certificate via email. The following is an example of a signed certificate that you will receive from your SSL certificate provider:

```
-----BEGIN CERTIFICATE-----
MIIFVjCCBD6gAwIBAgIQLfaGuqKukMumWhbVf5v4vDANBgkqhkiG9w0B
AQUFADCBƒnsDELMAkGA1UEBhMCVVMxFzAVBgNVBAoTDlZlcmlTaWduLC
BJbmMuMR8wHQYDVQQLƒnBgEFBQcBAQRtMGswJAYIKwYBBQUHMAGGGGh0
dHA6Ly9vY3NwLnZlcmlzaWduLmNvƒnbTBDBggrBgEFBQcwAoY3aHR0cD
ovL1NWUlNlY3VyZS1haWEudmVyaXNpZ24uY29tƒnL1NWUlNlY3VyZTIw
MDUtYWlhLmNlcjBuBggrBgEFBQcBDARiMGChXqBcMFowWDBWƒnFglpbW
FnZS9naWYwITAfMAcGBSsOAwIaBBRLa7kolgYMu9BSOJsprEsHiyEFGD
AmƒnFiRodHRwOi8vbG9nby52ZXJpc2lnbi5jb20vdnNsb2dvMS5naWYw
DQYJKoZIhvcNƒnAQEFBQADggEBAI/S2dmm/kgPeVAlsIHmx-
751o4oq8+fwehRDBmQDaKiBvVXGZ5ZMƒnnoc3DMyDjx0SrI9lkPsn223
CV3UVBZo385g1T4iKwXgcQ7/WF6QcUYOE6HK+4ZGcƒnHermFf3fv3C1-
FoCjq+zEu8ZboUf3fWbGprGRA+MR/dDI1dTPtSUG7/zWjXO5jC//
ƒn0pykSldW/q8hgO8kq30S8JzCwkqrXJfQ050N4TJtgb/
YC4gwH3BuB9wqpRjUahTiƒnK1V1-
ju9bHB+bFkMWIIMIXc1Js62JClWzwFgaGUS2DLE8xICQ3wU1ez8RUPGn
wSxAƒnYtZ2N7zDxYDP2tEiO5j2cXY7O8mR3ni0C30=ƒn
-----END CERTIFICATE-----
```

11 Copy the content of the signed certificate, and then paste it into a text file. Save the file.

You may now import the signed certificate into the controller. Refer to Importing an SSL Certificate for more information.

Figure 77. Generating a certificate signing request



Country: * United States

Importing an SSL Certificate

When you have an SSL certificate issued by an SSL certificate provider, you can import it into the controller and use it for HTTPS communication. To complete this procedure, you will need the following items:

- The signed server certificate
- The intermediate CA certificate (at least one)
- The private key file

NOTE: The file size of each signed certificate and intermediate certificate must not exceed 8192 bytes. If a certificate exceeds 8192 bytes, you will be unable to import it into the controller.

Follow these steps to import a signed server certificate.

1 Copy the signed certificate file, intermediate CA certificate file, and private key file to a location (either on the local drive or a network share) that you can access from the controller web interface.

2 Go to *Configuration* > *SCG System*.

3 On the sidebar, click **Certificate Store**. The *Certificate Store* page appears.

4 In the *Installed Certificates* section, click **Import New**. The *Import New Certificate* form appears.

5 Import the server certificate by completing the following steps:

a In *Server Certificate*, click **Browse**. The *Open* dialog box appears.

b Locate and select the certificate file, and then click **Open**.

6 Import the intermediate CA certificate by completing the following steps:

a In *Intermediate CA certificate*, click **Browse**. The *Open* dialog box appears.

b Locate and select the intermediate CA certificate file, and then click **Open**.

7 If you need to upload additional intermediate CA certificates to establish a chain of trust to the signed certificate, repeat the above step.

NOTE: If you are using this SSL certificate for a Hotspot 2.0 configuration, you must also import a root CA certificate. See the *Hotspot 2.0 Reference Guide* for this release.

8 When you finish uploading all the required intermediate certificates, import the private key file either by uploading file itself or selecting the CSR you generated earlier.

- To upload the private key file, click **Upload**, then click **Browse**, then locate and select the private key file, and then click **Open**.

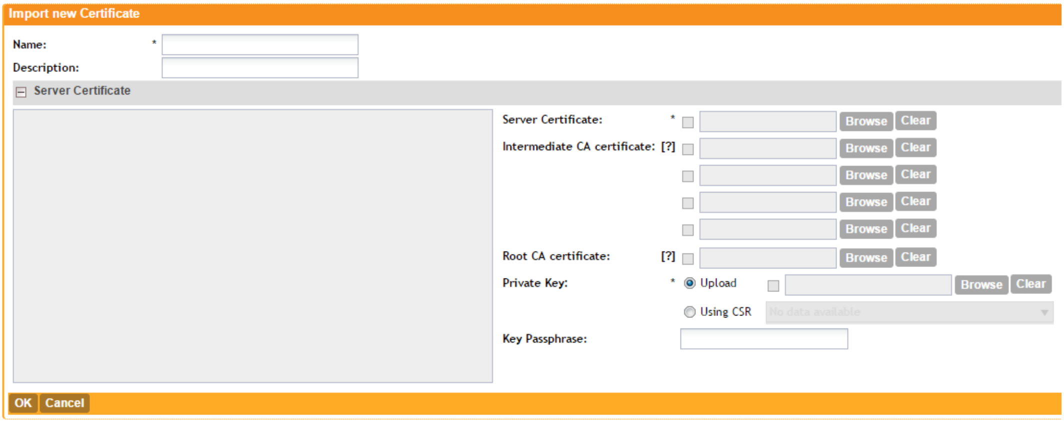
a To select the CSR, click **Using CSR**, then select the CSR that you generated earlier.

9 In *Key Passphrase*, enter the passphrase that has been assigned to private key file.

10 Click **OK**. The page refreshes and the certificate you imported appears in the Installed Certificate section.

You have completed importing a signed SSL certificate to the controller.

Figure 78. The Import New Certificate form



Import new Certificate

Name: *

Description:

⊟ Server Certificate

Server Certificate: * □ Browse Clear

Intermediate CA certificate: [?] □ Browse Clear

□ Browse Clear

□ Browse Clear

□ Browse Clear

Root CA certificate: [?] □ Browse Clear

Private Key: * ● Upload □ Browse Clear

○ Using CSR No data available

Key Passphrase:

OK Cancel

Assigning Certificates to Services

Follow these steps to specify the certificate that each secure service will use.

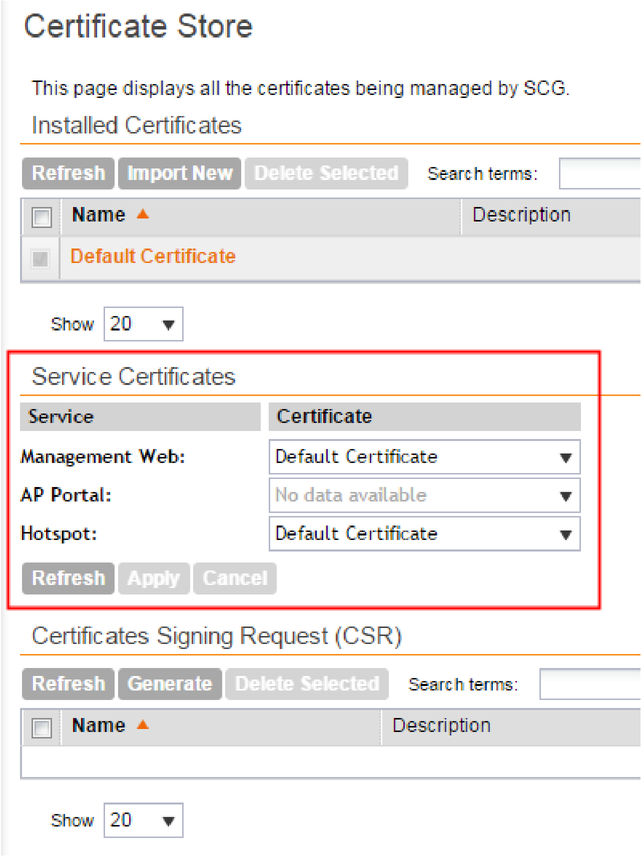
1 Go to *Configuration* > *System* > *Certificate Store*. The *Certificate Store* page appears.

2 In the *Service Certificates* section, select the certificate that you want to use for each service.

3 Click **Apply**.

You have completed assigning certificates to services.

Figure 79. The Service Certificates section



Certificate Store

This page displays all the certificates being managed by SCG.

Installed Certificates

□	Name ▲	Description
☑	Default Certificate	

Service Certificates

Service	Certificate
Management Web:	Default Certificate ▼
AP Portal:	No data available ▼
Hotspot:	Default Certificate ▼

Certificates Signing Request (CSR)

□	Name ▲	Description

Configuring the External SMS Gateway

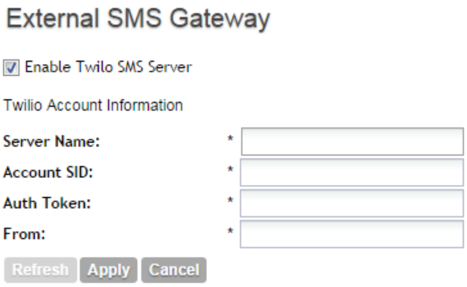
If you want to deliver guest passes to guest users via SMS, you can configure the controller to use an existing Twilio account for SMS delivery. The first step is to inform the controller of your Twilio account information.

Follow these steps to configure an external SMS gateway for the controller.

1. Go to *Configuration* > *System* > *External SMS Gateway*.
2. Select the **Enable Twilio SMS Server** check box.
3. Under Twilio Account Information, configure the following:
   - Server Name
   - Account SID
   - Auth Token
   - From (phone number)
4. Click **Apply.**

You have completed configuring the external SMS gateway for the controller.

Figure 80. Configuring the external SMS gateway settings



External SMS Gateway

☑ Enable Twilo SMS Server

Twilio Account Information

Server Name: *

Account SID: *

Auth Token: *

From: *

Configuring SNMP Settings

The controller supports the Simple Network Management Protocol (SNMP v2 and v3), which allows you to query controller information, such as system status, AP list, etc., and to set a number of system settings using a Network Management System (NMS) or SNMP MIB browser. You can also enable SNMP traps to receive immediate notifications for possible AP and system issues.

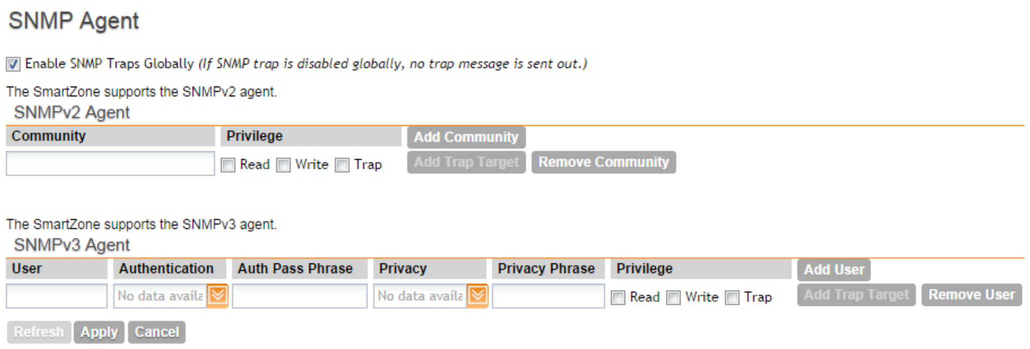
The procedure for enabling the internal SNMP agents depends on whether your network is using SNMPv2 or SNMPv3. SNMPv3 mainly provides security enhancements over the earlier version, and therefore requires you to enter authorization passwords and encryption settings, instead of simple clear text community strings.

Both SNMPv2 and SNMPv3 can be enabled at the same time. The SNMPv3 framework provides backward compatibility for SNMPv1 and SNMPv2c management applications so that existing management applications can still be used to manage the controller with SNMPv3 enabled.

This section covers the following topics:

- Enabling Global SNMP Traps
- Configuring the SNMPv2 Agent
- Configuring the SNMPv3 Agent

Figure 81. Enabling SNMP traps



SNMP Agent

☑ Enable SNMP Traps Globally *(If SNMP trap is disabled globally, no trap message is sent out.)*

The SmartZone supports the SNMPv2 agent.

SNMPv2 Agent

Community	Privilege
	□ Read □ Write □ Trap

The SmartZone supports the SNMPv3 agent.

SNMPv3 Agent

User	Authentication	Auth Pass Phrase	Privacy	Privacy Phrase	Privilege
	No data availa		No data availa		□ Read □ Write □ Trap

Enabling Global SNMP Traps

By default, the global SNMP trap setting is disabled, which means that the controller will be unable to send out trap notifications, even if you enabled the SNMPv2 and SNMPv3 agents to send out traps.

Follow these steps to enable global SNMP traps.

1 Go *Configuration* > *System* > *SNMP Settings*.

2 Select the **Enable SNMP Traps Globally** check box.

3 Click **Apply**. A message appears, confirming that you have updated the global trap settings.

Configuring the SNMPv2 Agent

Follow these steps to configure the SNMPv2 agent.

1 In the *SNMPv2 Agen*t section, click **Add Community**. Options for adding a community appear.

2 Configure the read-only community settings by following these steps:

  a In the text box under *Community*, type the read-only community string (for example, public). Applications that send SNMP Get-Requests to the controller (to retrieve information) will need to send this string along with the request before they will be allowed access.

  b Under Privilege, select the check boxes for the privileges that you want to grant to this community. A read-only community is typically granted the Read privilege. Available privileges include:

  - *Read*
  - *Write*
  - *Trap*: Select this privilege if you want to send SNMP trap notifications for this community. To add a trap target, click **Add Trap Target**, and then configure the following options (required) that appear below:
  - *Target IP Address*: Type the IP address of the SNMP trap server on the network.
  - *Target Port*: Type the SNMP trap server port.

3 Click **Add Community** again. A second set of configuration options for adding a community appears.

4 Configure the read-write community settings by following these steps:

a. In the text box under *Community*, type the read-write community string (for example, private). Applications that send SNMP Set-Requests to the controller (to set certain SNMP MIB variables) will need to send this string along with the request before they will be allowed access. The default value is private.

b. Under *Privilege*, select the check boxes for the privileges that you want to grant to this community. A read-write community is typically granted the Read and Write privileges. Available privileges include:

- *Read*
- *Write*
- *Trap*: Select this privilege if you want to send SNMP trap notifications for this community. When this check box is selected, the **Add Trap Target** button becomes active. Click **Add Trap Target**, and then configure the following settings (required):
  - *Target IP Address*: Type the IP address of the SNMP trap server on the network.
  - *Target Port*: Type the SNMP trap server port.

5. Click Apply.

You have completed configuring the read-only and read-write communities for the SNMPv2 agent. To add another community, click **Add Community** again, and then repeat the procedure above.

Configuring the SNMPv3 Agent

Follow these steps to configure the SNMPv3 agent.

1. In the *SNMPv3 Agent* section, click **Add User**. Options for adding a user appear.
2. Under *User*, type a user name between 1 and 31 characters.
3. Under *Authentication*, select one of the following authentication methods:
   - *None*: Use no authentication.
   - *MD5*: Message-Digest algorithm 5, message hash function with 128-bit output.
   - *SHA*: Secure Hash Algorithm, message hash function with 160-bit output.
4. Under *Auth Pass Phrase*, type a pass phrase between 8 and 32 characters in length.
5. Under *Privacy*, select one of the following privacy methods:

- *None*: Use no privacy method.
- *DES*: Data Encryption Standard, data block cipher.
- *AES*: Advanced Encryption Standard, data block cipher.

6 Under *Privacy Phrase* (active only if you selected either DES or AES above), enter a privacy phrase between 8 and 32 characters in length.

7 Under *Privilege*, select the check boxes for the privileges that you want to grant to this community. A read-only community is typically granted the Read privilege, whereas a read-write community is granted the Read and Write privileges. Available privileges include:

- *Read*
- *Write*
- *Trap*: Select this privilege if you want to send SNMP trap notifications for this community. When this check box is selected, the **Add Trap Target** button becomes active. Click **Add Trap Target**, and then configure the following settings (required):
  - *Target IP Address*: Type the IP address of the SNMP trap server on the network.
  - *Target Port*: Type the SNMP trap server port.

8 Repeat the steps above to create as many SNMPv3 agent users are you require.

9 Click **Apply**.

You have completed configuring the SNMPv3 agent settings.

Managing the User Agent Blacklist

By default, the controller automatically blocks certain user agents (or software used by a user) from accessing hotspots provided by controller-managed APs. These blocked user agents include:

- ZoneAlarm
- VCSoapClient
- XTier NetIdentity
- DivX Player
- Symantec LiveUpdate
- Windows Live Messenger
- StubInstaller

- windows-update-agent
- Windows Live Essentials
- Microsoft Dr. Watson for Windows (MSDW)
- Avast Antivirus Syncer
- Microsoft Background Intelligent Transfer Service (BITS)
- Google Update
- TrendMicro client
- Skype WISPr

When the controller blocks any of these user agents, an error message appears on the user device. You can add or remove user agents to this blacklist.

NOTE: In 3.0 and earlier releases, Microsoft NCSI was included in the user agent blacklist. This prevented Windows Network Awareness, a feature that allows Windows services and applications to automatically select the network connection best suited to their tasks, from working properly. Microsoft NCSI has been removed from the user agent blacklist in 3.1 and later releases.

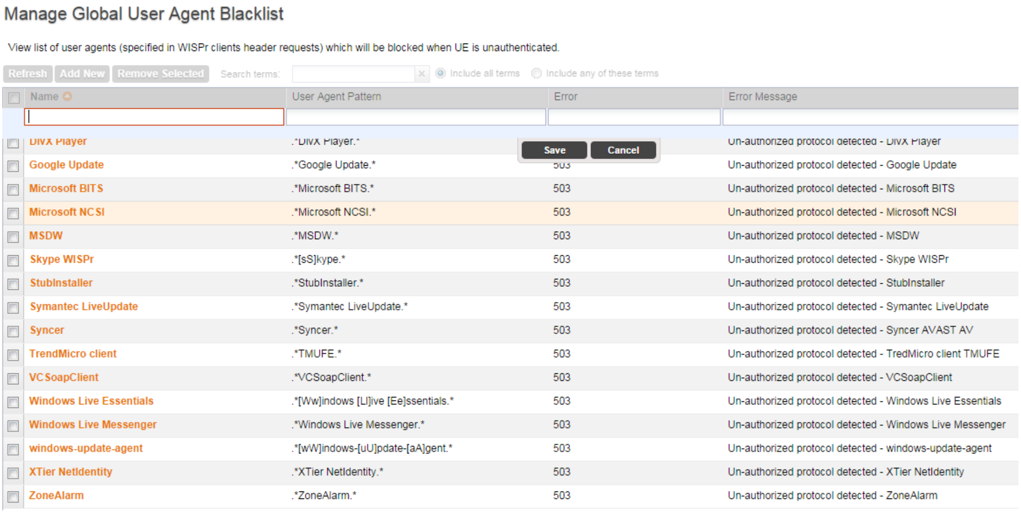
Adding a User Agent to the Blacklist

Follow these steps to add a user agent to the blacklist.

1. Go to *Configuration* > *System* > *Manage User Agent Blacklist*.
2. Click **Add New**. Four boxes appear, where you can enter the name, user agent pattern, error, and error message to display on the user agent.
3. Click **Save**.
4. To add another user agent, repeat Step 2 and Step 3.

You have completed adding an agent to the black list.

Figure 105. Adding a user agent to the black list



Manage Global User Agent Blacklist

View list of user agents (specified in WISPr clients header requests) which will be blocked when UE is unauthenticated.

□	Name	User Agent Pattern	Error	Error Message
□	DivX Player	.*DivX Player.*		Un-authorized protocol detected - DivX Player
□	Google Update	.*Google Update.*	503	Un-authorized protocol detected - Google Update
□	Microsoft BITS	.*Microsoft BITS.*	503	Un-authorized protocol detected - Microsoft BITS
□	Microsoft NCSI	.*Microsoft NCSI.*	503	Un-authorized protocol detected - Microsoft NCSI
□	MSDW	.*MSDW.*	503	Un-authorized protocol detected - MSDW
□	Skype WISPr	.*[sS]kype.*	503	Un-authorized protocol detected - Skype WISPr
□	StubInstaller	.*StubInstaller.*	503	Un-authorized protocol detected - StubInstaller
□	Symantec LiveUpdate	.*Symantec LiveUpdate.*	503	Un-authorized protocol detected - Symantec LiveUpdate
□	Syncer	.*Syncer.*	503	Un-authorized protocol detected - Syncer AVAST AV
□	TrendMicro client	.*TMUFE.*	503	Un-authorized protocol detected - TredMicro client TMUFE
□	VCSoapClient	.*VCSoapClient.*	503	Un-authorized protocol detected - VCSoapClient
□	Windows Live Essentials	.*[Ww]indows [Ll]ive [Ee]ssentials.*	503	Un-authorized protocol detected - Windows Live Essentials
□	Windows Live Messenger	.*Windows Live Messenger.*	503	Un-authorized protocol detected - Windows Live Messenger
□	windows-update-agent	.*[wW]indows-[uU]pdate-[aA]gent.*	503	Un-authorized protocol detected - windows-update-agent
□	XTier NetIdentity	.*XTier NetIdentity.*	503	Un-authorized protocol detected - XTier NetIdentity
□	ZoneAlarm	.*ZoneAlarm.*	503	Un-authorized protocol detected - ZoneAlarm

Deleting User Agents from the Blacklist

Follow these steps to delete user agents from the blacklist.

1 Go to *Configuration* > *System* > *Manage User Agent Blacklist*.

2 Locate the user agents that you want to delete from the blacklist, and then select the check box before the user agent names.

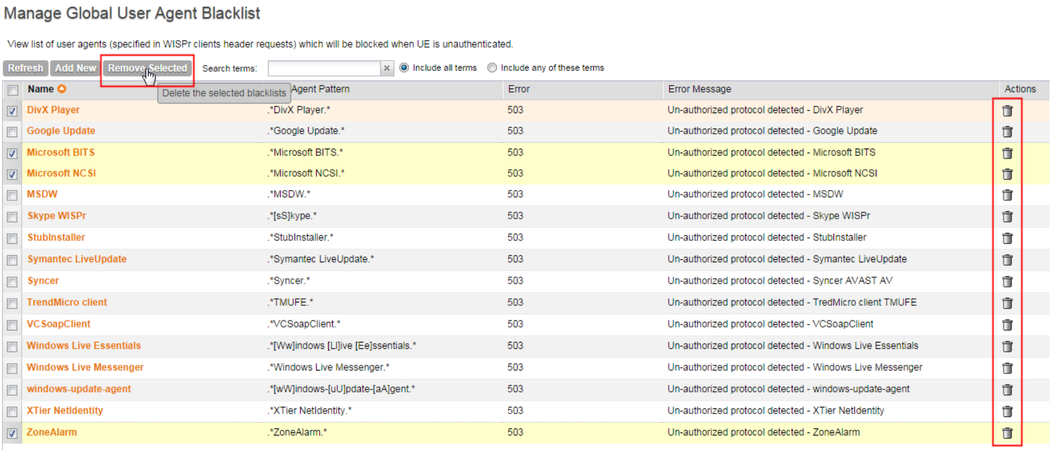
3 Click Remove Selected.

The page refreshes, and then the user agents you deleted disappear from the list.

To delete a single user agent, click the 🗑 icon that is in the same row as the user agent name.

You have completed deleting user agents from the blacklist.

Figure 82. Deleting user agents



Manage Global User Agent Blacklist

View list of user agents (specified in WISPr clients header requests) which will be blocked when UE is unauthenticated.

□	Name	Agent Pattern	Error	Error Message	Actions
☑	DivX Player	.*DivX Player.*	503	Un-authorized protocol detected - DivX Player	🗑
□	Google Update	.*Google Update.*	503	Un-authorized protocol detected - Google Update	🗑
☑	Microsoft BITS	.*Microsoft BITS.*	503	Un-authorized protocol detected - Microsoft BITS	🗑
☑	Microsoft NCSI	.*Microsoft NCSI.*	503	Un-authorized protocol detected - Microsoft NCSI	🗑
□	MSDW	.*MSDW.*	503	Un-authorized protocol detected - MSDW	🗑
□	Skype WISPr	.*[sS]kype.*	503	Un-authorized protocol detected - Skype WISPr	🗑
□	StubInstaller	.*StubInstaller.*	503	Un-authorized protocol detected - StubInstaller	🗑
□	Symantec LiveUpdate	.*Symantec LiveUpdate.*	503	Un-authorized protocol detected - Symantec LiveUpdate	🗑
□	Syncer	.*Syncer.*	503	Un-authorized protocol detected - Syncer AVAST AV	🗑
□	TrendMicro client	.*TMUFE.*	503	Un-authorized protocol detected - TredMicro client TMUFE	🗑
□	VCSoapClient	.*VCSoapClient.*	503	Un-authorized protocol detected - VCSoapClient	🗑
□	Windows Live Essentials	.*[Ww]indows [Ll]ive [Ee]ssentials.*	503	Un-authorized protocol detected - Windows Live Essentials	🗑
□	Windows Live Messenger	.*Windows Live Messenger.*	503	Un-authorized protocol detected - Windows Live Messenger	🗑
□	windows-update-agent	.*[wW]indows-[uU]pdate-[aA]gent.*	503	Un-authorized protocol detected - windows-update-agent	🗑
□	XTier NetIdentity	.*XTier NetIdentity.*	503	Un-authorized protocol detected - XTier NetIdentity	🗑
☑	ZoneAlarm	.*ZoneAlarm.*	503	Un-authorized protocol detected - ZoneAlarm	🗑

Managing Administrators, Administrator Roles, and Administrator Authentication

5

In this chapter:

- Managing Administrator Accounts
- Managing Administrator Roles
- Managing RADIUS Servers for Administrator Authentication

Managing Administrator Accounts

The controller supports the creation of additional administrator accounts. This allows you to share or delegate management and monitoring functions with other members of your organization.

In this section:

- Creating an Administrator Account

Creating an Administrator Account

Follow these steps to create an administrator account.

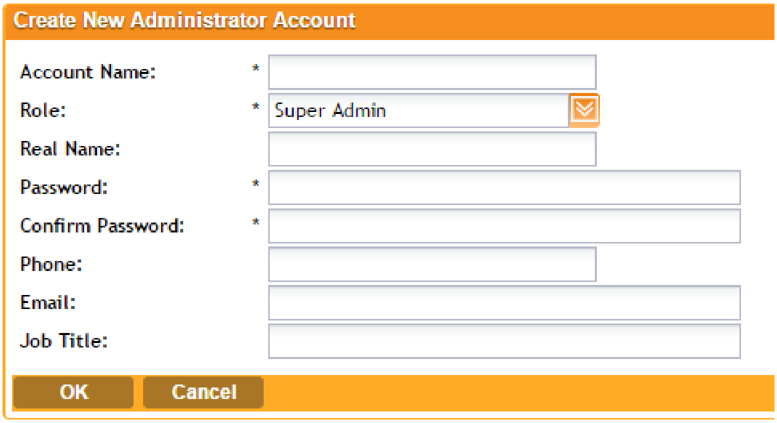
1. Go to *Administration* > *Administrators* > *Administrators*.
2. Click **Create New**. The *Create New Administrator Account* form appears.
3. Configure the following options:
   - *Account Name*: Type the name that this administrator will use to log on to the controller.
   - *Real Name*: Type the actual name (for example, John Smith) of the administrator.
   - *Password*: Type the password that this administrator will use (in conjunction with the Account Name) to log on to the controller.
   - *Confirm Password*: Type the same password as above.
   - *Phone*: Type the phone number of this administrator.

- *Email*: Type the email address of this administrator.
- *Job Title*: Type the job title or position of this administrator in your organization.

4 Click **OK**.

The page refreshes, and then the administrator account that you created appears on the Administrator Accounts page.

Figure 83. The Create New Administrator Account form



Create New Administrator Account

Account Name:	*	
Role:	*	Super Admin
Real Name:		
Password:	*	
Confirm Password:	*	
Phone:		
Email:		
Job Title:		

Managing Administrator Roles

In addition to creating administrator accounts, you can also create administrator roles, which define the tasks that each administrator can perform.

In this section:

- Creating an Administrator Role
- Editing an Administrator Role
- Cloning an Existing Administrator Role

Creating an Administrator Role

Follow these steps to create a new administrator role.

1 Go to *Configuration* > *Administrators* > *Administrator Roles*.

2 Click **Create New**. The *Create New Administrator Role* form appears.

3 Configure the following options:

- *Role Name*: Type a name for the administrator role that you are creating.

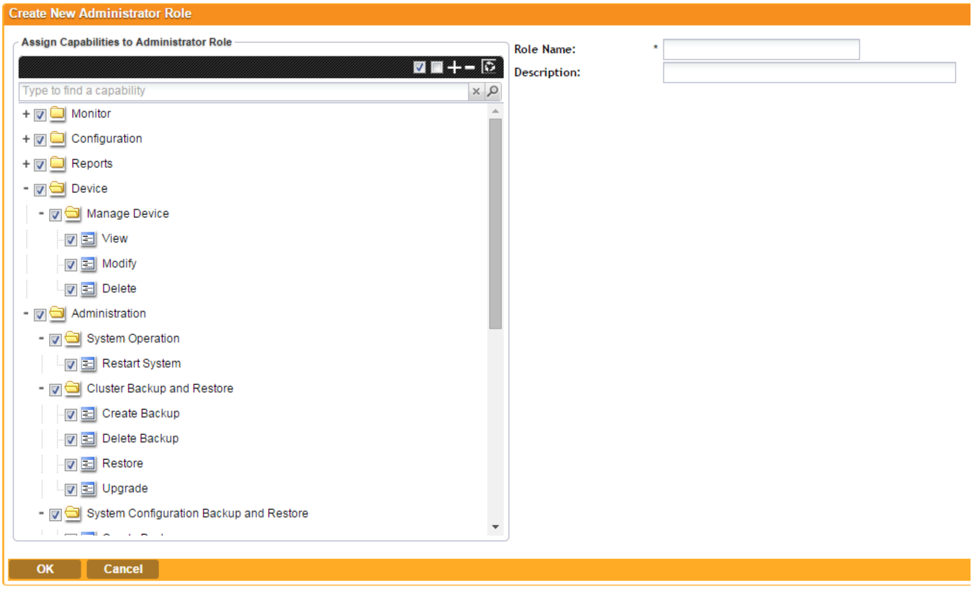
- *Description*: type a short description for the administrator role.
- *Assign Capabilities to Administrator Role* (tree located on the left side of the form): Select the administrator capabilities that you want to assign to this role. If you plan to grant this administrator role most of the capabilities that are available, click **Select All**, and then clear the check boxes for the capabilities that you do not want this role to have.

4 Remember to click the ⊞ icon next to each folder to view all capabilities that are included.

5 Click **OK**.

The page refreshes, and the role you created appears on the page.

Figure 84. The Create New Administrator Role form



Create New Administrator Role

Assign Capabilities to Administrator Role

Type to find a capability

- + ☑ Monitor
- + ☑ Configuration
- + ☑ Reports
- - ☑ Device
  - - ☑ Manage Device
    - ☑ View
    - ☑ Modify
    - ☑ Delete
- - ☑ Administration
  - - ☑ System Operation
    - ☑ Restart System
  - - ☑ Cluster Backup and Restore
    - ☑ Create Backup
    - ☑ Delete Backup
    - ☑ Restore
    - ☑ Upgrade
  - - ☑ System Configuration Backup and Restore

Role Name: *

Description:

OK Cancel

Editing an Administrator Role

Follow these steps to edit an existing administrator role.

1 Go to *Configuration* > *Administrators* > *Administrator Roles*.

2 Click the name of the administrator role that you want to edit. The *Edit Administrator Role* form appears.

3 In the *Assign Capabilities to Administrator Role* tree (located on the left side of the form), add or remove capabilities from the role. Remember to click the ⊞ icon next to each folder to view all capabilities that are included.

- To add a capability, select the check box next to it.
- To remove a capability, clear the check box next to it.

4 Click **Apply**.

You have completed editing an administrator role.

NOTE: The system created administrator roles, which are present by default on the controller, cannot be edited.

Cloning an Existing Administrator Role

If you want to create a new administrator role with capabilities that are similar to an existing role, cloning the existing administrator role may be the faster way to create that new role.

Follow these steps to clone an existing administrator role.

1 Go to *Configuration* > *Administrators* > *Administrator Roles*.

1 Locate the role that you want to clone.

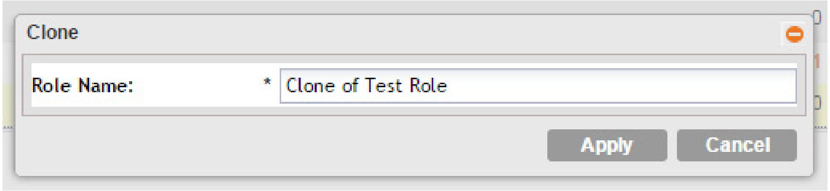
2 Under the *Actions* column, click the ⧉ icon that is in the same row as the role that you want to clone. A dialog appears and prompts you for the name that you want to assign to the clone role. The default name is Clone of [Original Role Name].

3 Type a new name or leave the name as is.

4 Click **Apply**. The page refreshes, and then the role that you created appears on the *Administrator Roles* page.

You have completed cloning an existing administrator role. Unless you want the new role to have exactly the same capabilities as the original role, you may want to edit it.

Figure 85. The Clone dialog box



Role Name: * Clone of Test Role

Managing RADIUS Servers for Administrator Authentication

You can add RADIUS servers that you want to use for authorizing and authenticating administrators.

In this section:

- Adding a RADIUS Server for Administrator Authentication
- Using a Backup RADIUS Server

Adding a RADIUS Server for Administrator Authentication

Follow these steps to add a RADIUS server that the controller can use for authenticating administrators.

NOTE: If you want to use a primary and secondary RADIUS servers for authenticating administrator, follow the steps in Using a Backup RADIUS Server.

1 Go to *Configuration* > *Administrators* > *AAA for Administrators*.

2 Click **Create New**. The *Create New Administrator RADIUS Server* form appears.

3 In *Name*, type a name for the RADIUS server.

4 In *Type*, select the type of RADIUS server that you are using. Options include:

   - **RADIUS**: Click this option to use a Remote Authentication Dial-In User Service (RADIUS) server on the network for authenticating controller administrators.
   - **TACACS+**: Click this option to use a Terminal Access Controller Access-Control System Plus (TACACS+) server on the network for authentication controller administrators.

5 In *Realm*, type the realm (or realms) to which the RADIUS server belongs. If the RADIUS server belongs to multiple realms, use a comma (,) to separate the realm names.

6 Make sure that the **Enable backup RADIUS support** check box is not selected. If you want to use a backup RADIUS server, follow the steps in Using a Backup RADIUS Server instead.

7 In *IP Address*, type the IP address of the RADIUS server.

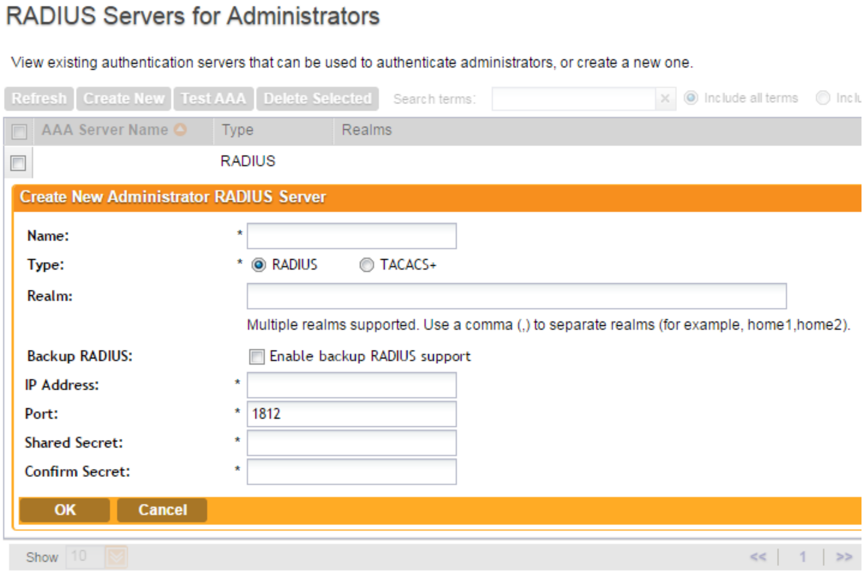
8 In *Port*, type the UDP port that the RADIUS server is using. The default port is 1812.

9 In *Shared Secret*, type the shared secret. Retype the same secret in *Confirm Secret*.

10 Click **OK**.

You have completed adding a RADIUS server for authenticating administrators.

Figure 86. The Create New Administrator RADIUS Server form



RADIUS Servers for Administrators

View existing authentication servers that can be used to authenticate administrators, or create a new one.

□	AAA Server Name	Type	Realms
□		RADIUS	

Create New Administrator RADIUS Server

Name:	*	
Type:	*	● RADIUS ○ TACACS+
Realm:		
		Multiple realms supported. Use a comma (,) to separate realms (for example, home1,home2).
Backup RADIUS:		□ Enable backup RADIUS support
IP Address:	*	
Port:	*	1812
Shared Secret:	*	
Confirm Secret:	*	

Using a Backup RADIUS Server

If a backup RADIUS server is available on the network, you can use it as a backup server when the primary server is unavailable. When you select the check box, additional fields appear that you need to fill in.

Follow these steps to enable support for a backup RADIUS server for authenticating administrators.

1 Select the **Enable backup RADIUS support** check box.

2 In the *Primary Server* section, fill out the IP address, port number, and shared secret as you did in the previous section.

3 In the *Secondary Server* section, fill out the IP Address, port number and shared secret for the backup server (these fields can neither be left empty nor be the same values as those of the primary server).

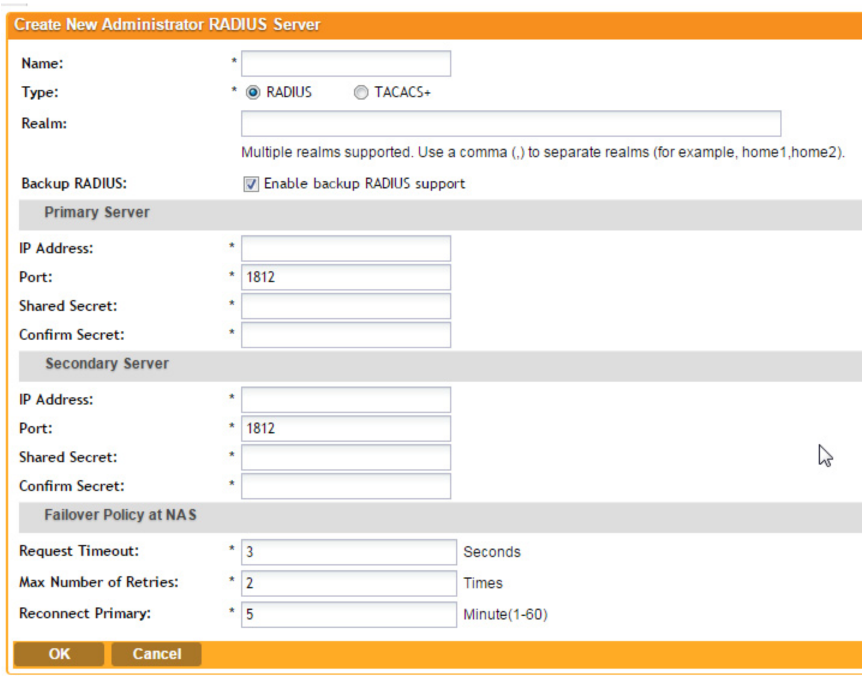
4 In the *Failover Policy* section, configure the following settings:

- *Request Timeout*: Type the timeout period (in seconds) after which an expected RADIUS response message is considered to have failed.
- *Max Number of Retries*: Type the number of failed connection attempts after which the controller will fail over to the backup RADIUS server.
- *Reconnect Primary*: Type the number of minutes after which the controller will attempt to reconnect to the primary RADIUS server after failover to the backup server.

5 Click **OK**.

You have completed adding primary and secondary RADIUS servers for authenticating administrators.

Figure 87. Enabling the backup RADIUS server



Create New Administrator RADIUS Server

Name:	*	
Type:	*	● RADIUS ○ TACACS+
Realm:		
		Multiple realms supported. Use a comma (,) to separate realms (for example, home1,home2).
Backup RADIUS:		☑ Enable backup RADIUS support

Primary Server

IP Address:	*	
Port:	*	1812
Shared Secret:	*	
Confirm Secret:	*	

Secondary Server

IP Address:	*	
Port:	*	1812
Shared Secret:	*	
Confirm Secret:	*	

Failover Policy at NAS

Request Timeout:	*	3	Seconds
Max Number of Retries:	*	2	Times
Reconnect Primary:	*	5	Minute(1-60)

Testing an AAA Server

To ensure that the controller administrators will be able to authenticate successfully with the RADIUS server type that you selected, Ruckus Wireless strongly recommends testing the AAA server after you set it up. The test queries the RADIUS server for a known authorized user and return groups associated with the user that can be used for configuring roles within the controller.

Follow these steps to test an AAA server.

1 Go to *Configuration > Administrators > AAA for Administrators.*

2 Click **Test AAA**. The *Test AAA Servers* form appears.

3 In *Name*, select one of the AAA servers that you previous created.

4 In *User Name*, type an existing user name on the AAA server that you selected.

5 In *Password*, type the password for the user name you specified.

6 Click **Test**.

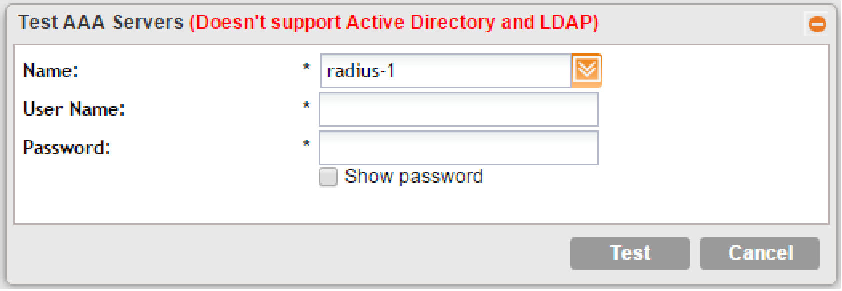
If the controller was able to connect to the authentication server and retrieve the configured groups/attributes, the information appears at the bottom of the page.

If the test was unsuccessful, there are two possible results (other than success) that will be displayed to inform you if you have entered information incorrectly:

- Admin invalid
- User name or password invalid

These results can be used to troubleshoot the reasons for failure to authenticate administrators with an AAA server through the controller.

Figure 88. The Test AAA Servers form



Test AAA Servers (Doesn't support Active Directory and LDAP)

Name: * radius-1

User Name: *

Password: *

□ Show password

Authenticating an Administrator Using an External AAA Server

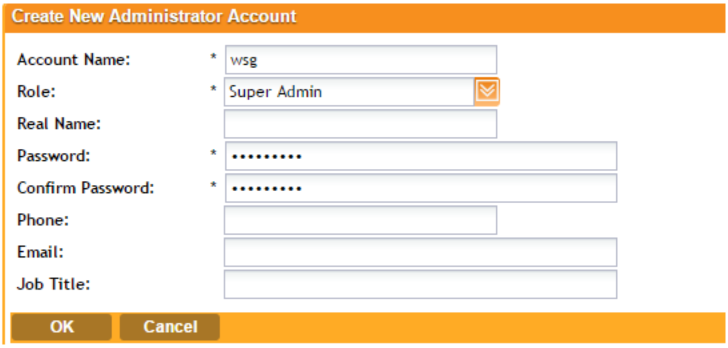
Follow these steps to create and configure an administrator account to be authenticated by an external AAA server.

1 Log on to the controller web interface using a super admin account.

2 Go to *Configuration* > *Administrators*. Create an administrator account (see Creating an Administrator Account for instructions).

Take note of the account name that you assign to the account. You will use this account name later when you log on to the web interface. In the example below, the account name is “wsg”.

Figure 89. Create an administrator account



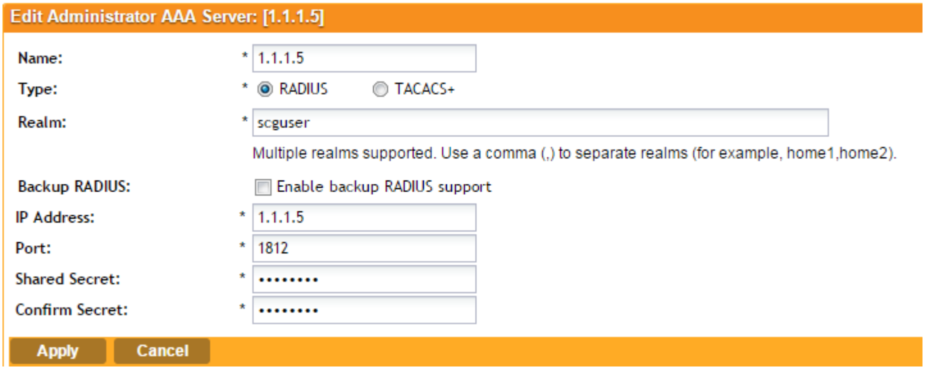
Create New Administrator Account

Account Name:	*	wsg
Role:	*	Super Admin
Real Name:		
Password:	*	•••••••••
Confirm Password:	*	•••••••••
Phone:		
Email:		
Job Title:		

3 Go to *Configuration* > *AAA for Administrators.* Create an AAA server profile (see Adding a RADIUS Server for Administrator Authentication) and specify a realm.

Take note of the realm name. You will use realm name later when you log on to the web interface. In the example below, the realm name is “scguser”.

Figure 90. Create an AAA server profile



Edit Administrator AAA Server: [1.1.1.5]

Name: * 1.1.1.5

Type: * ● RADIUS ○ TACACS+

Realm: * scguser

Multiple realms supported. Use a comma (,) to separate realms (for example, home1,home2).

Backup RADIUS: □ Enable backup RADIUS support

IP Address: * 1.1.1.5

Port: * 1812

Shared Secret: * ••••••••

Confirm Secret: * ••••••••

4 On the FreeRADIUS server, create a dictionary file.

a Name it `dictionary.ruckus`, and then save it in the path `/usr/share/freeradius`.

b Add the following to the dictionary file, and then save it:

```
VENDOR       ruckuswireless 25053
BEGIN-VENDOR ruckuswireless
ATTRIBUTE    WSG-User             10             String
END-VENDOR   ruckuswireless
```

c Save the dictionary file.

5 Edit the `/etc/freeradius/dictionary` file, add the text below, and then save the file.

```
$INCLUDE        /usr/share/freeradius/dictionary.ruckus
```

6 Add the administrator user name you created in Step 2 to the list of FreeRADIUS users. Edit the `/etc/freeradius/users` file, adding the text below, and then save the file.

```
wsg Cleartext-Password := "wsg"
WSG-User="wsg"
```

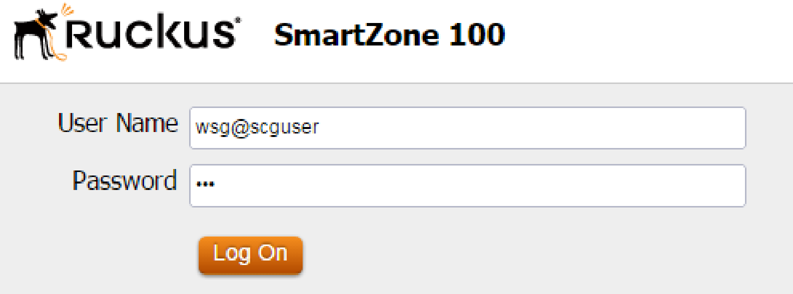
Where:

- The value for `WSG-User` is the is the administrator user name that you created in Step 2.
- The value `wsg Cleartext-Password` is the password you assigned to the administrator user name above.

7 Log on to the controller web interface, and then use the account name and realm combination (accountname@realm) as the user name.

For example, if the account name is “wsg” and the realm name is “scguser”, enter “wsg@scguser” in *User Name*.

Figure 91. In User Name, use {accountname@realmname}



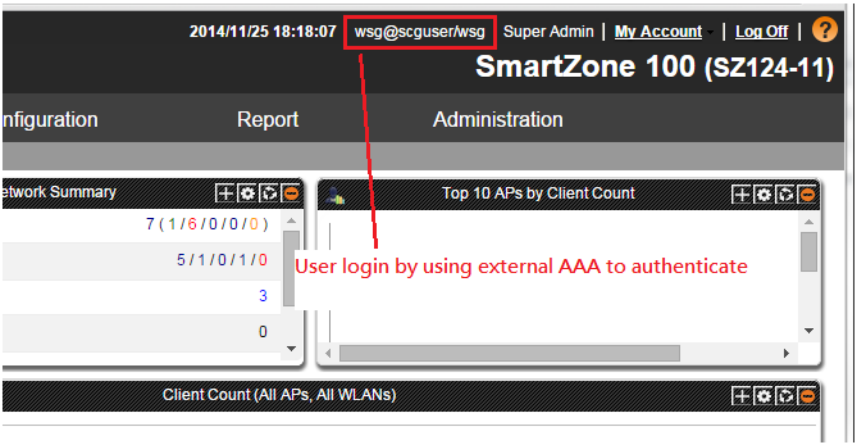
RUCKUS SmartZone 100

User Name: wsg@scguser

Password: •••

8 After you log on successfully, check the miscellaneous bar on the upper-right corner of the web interface and verify that you are logged on using the {accountname@realmname} credentials.

Figure 92. Verify that you are logged on using the {accountname@realmname} credentials



2014/11/25 18:18:07 wsg@scguser/wsg Super Admin | My Account | Log Off |

SmartZone 100 (SZ124-11)

User login by using external AAA to authenticate

You have completed logging on to the web interface using an account authenticated by an external AAA server.

Monitoring the Wireless Network 6

In this chapter:

Monitoring Managed Access Points

This section provides information on how to monitor and view information about the access points that you are managing using the controller.

Topics covered include:

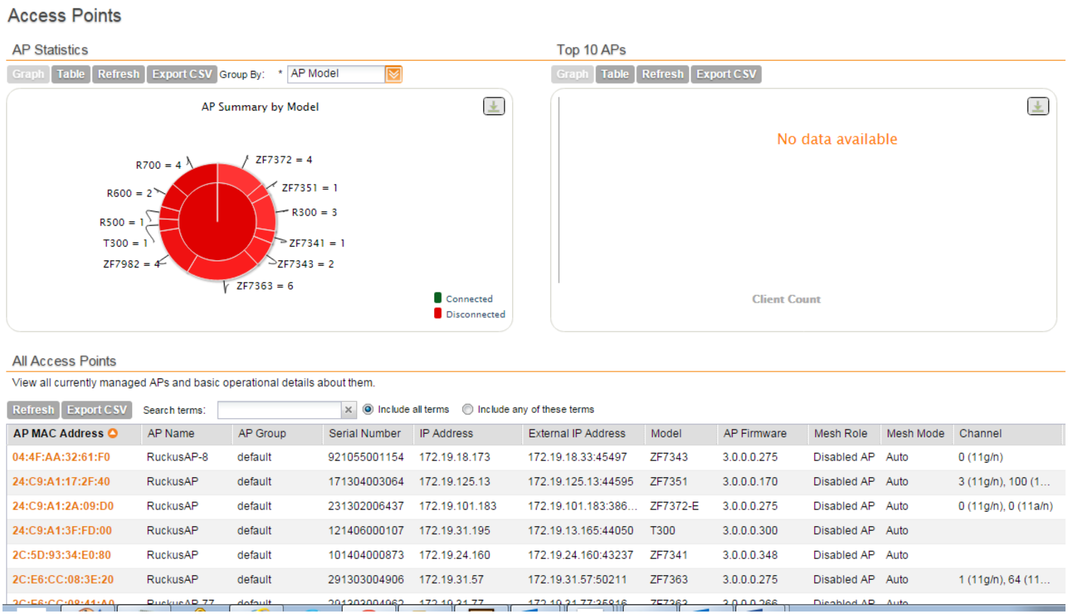
- Viewing a Summary of Access Points
- Exporting the Access Point List to CSV
- Viewing the Configuration of an Access Point
- Downloading the Support Log from an Access Point
- Restarting an Access Point Remotely
- Running Ping and Traceroute on an Access Point
- Viewing the Status of the AP USB Device

Viewing a Summary of Access Points

Follow these steps to view a summary of existing access points.

Go to *Monitor* > *Access Points*. The *Access Points* page appears and displays a table that lists all access points that controller is currently managing.

Figure 93. The Monitor > Access Points page displays all controller-managed access points



View all currently managed APs and basic operational details about them.

AP MAC Address	AP Name	AP Group	Serial Number	IP Address	External IP Address	Model	AP Firmware	Mesh Role	Mesh Mode	Channel
04:4F:AA:32:61:F0	RuckusAP-8	default	921055001154	172.19.18.173	172.19.18.33:45497	ZF7343	3.0.0.0.275	Disabled AP	Auto	0 (11g/n)
24:C9:A1:17:2F:40	RuckusAP	default	171304003064	172.19.125.13	172.19.125.13:44595	ZF7351	3.0.0.0.170	Disabled AP	Auto	3 (11g/n), 100 (1...
24:C9:A1:2A:09:D0	RuckusAP	default	231302006437	172.19.101.183	172.19.101.183:386...	ZF7372-E	3.0.0.0.275	Disabled AP	Auto	0 (11g/n), 0 (11a/n)
24:C9:A1:3F:FD:00	RuckusAP	default	121406000107	172.19.31.195	172.19.13.165:44050	T300	3.0.0.0.300	Disabled AP	Auto	
2C:5D:93:34:E0:80	RuckusAP	default	101404000873	172.19.24.160	172.19.24.160:43237	ZF7341	3.0.0.0.348	Disabled AP	Auto	
2C:E6:CC:08:3E:20	RuckusAP	default	291303004906	172.19.31.57	172.19.31.57:50211	ZF7363	3.0.0.0.275	Disabled AP	Auto	1 (11g/n), 64 (11...
2C:E6:CC:08:41:A0	RuckusAP-77	default	291303004062	172.19.31.77	172.19.31.77:35816	ZF7363	3.0.0.0.266	Disabled AP	Auto	

Table 7 lists the access point details are shown in the table on the *Access Points* page.

Table 7. Access point details

Column Name	Description
AP MAC Address	MAC address of the access point. Clicking this link loads a page that displays detailed information about the access point. See Viewing the Configuration of an Access Point.
AP Name	Name assigned to the access point
AP Group	AP group to which the AP belongs (if any)
Serial Number	Serial number of the AP
IP Address	Internal IP address assigned to the access point
External IP Address	If the device is behind a NAT server, this is the IP address and port number that the controller will use to communicate with the device.
Model	Model number of the Ruckus Wireless access point
AP Firmware	Firmware version that is installed on the access point
Mesh Role	Indicates whether mesh networking is enabled on the access point and the mesh role that is assigned to it. Possible values include: • Disabled: Mesh networking is disabled. • Mesh AP • Root AP • eMesh AP
Mesh Mode	Shows the mesh mode (Auto, Root, Mesh) of the AP
Channel	Indicates the radio channels used by the AP to provide WLAN services
Status	Indicates whether the access point is currently connected (online) or disconnected (offline)
Configuration Status	Show any of the following statuses: • New Configuration: Appears when the AP has pending configuration change from the controller that needs to be applied. • Up-to-date: Appears when the AP's configuration is synchronized with the controller.

Table 7. Access point details (Continued)

Column Name	Description
# of Clients	Indicates the number of wireless clients that are currently associated with the access point. Clicking the number of clients (link, except when zero) loads a page that displays detailed information about the wireless clients. See Viewing a Summary of Wireless Clients.
Last Seen	Indicates the date and time when the access point last reported to the controller
Administrative State	Shows either *Locked* or *Unlocked.*
Registration State	Shows either *Discovery*, *Approved*, or *Rejected.*
Clients Bonjour Gateway	Indicates whether Bonjour gateway service is enabled, disabled or not supported on this AP.
LBS service status	Indicates whether LBS service is enabled, disabled or not supported on this AP.
Actions	Icons for actions that you can perform, including: • ✎ – Click to view detailed configuration of this access point. • 💾 – Click to download the support log from this access point. See Downloading the Support Log from an Access Point. • 🖧 – Click to run network connectivity tests (PING and traceroute) on this access point. • 🔄 – Click to restart the access point.

Exporting the Access Point List to CSV

If you want to be able to view a list of all APs that the controller is currently managing in a spreadsheet program such as Microsoft Excel, export the AP list to a comma-separated value (CSV) file.

Follow these steps to export the AP list to a CSV file.

1 Go to *Monitor > Access Points*.

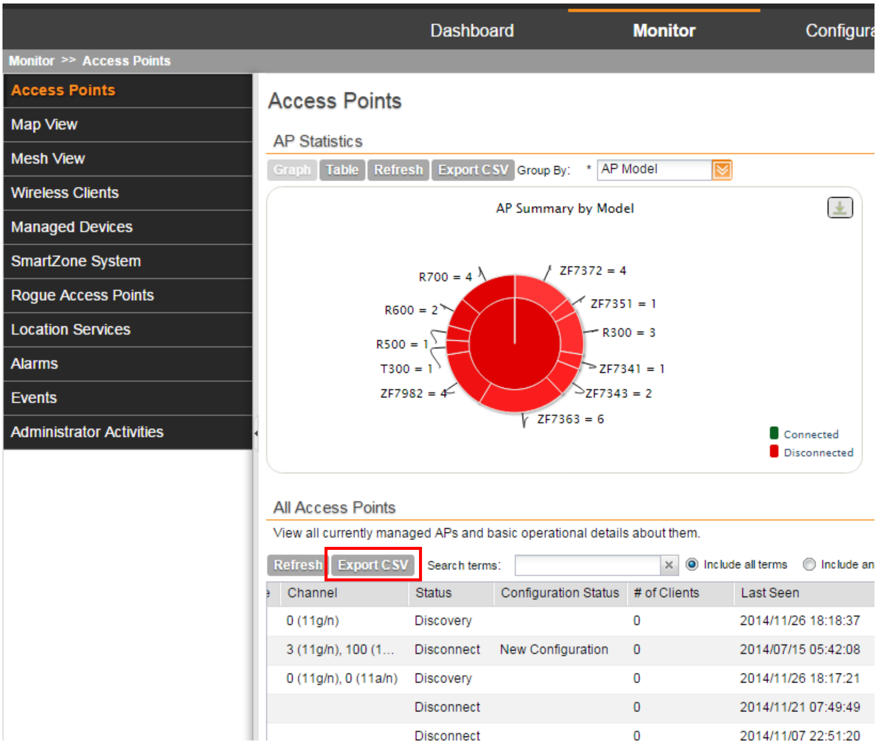
2 Click the **Export CSV** button in the content area.

3 Check the default download folder of your web browser and look for a file named `RuckusAPList.csv`.

4 Use a spreadsheet application (for example, Microsoft™ Excel™) to view the contents of the CSV file.

You have completed exporting the access point list to CSV.

Figure 94. Click Export CSV to download the AP list



View all currently managed APs and basic operational details about them.

Channel	Status	Configuration Status	# of Clients	Last Seen
0 (11g/n)	Discovery		0	2014/11/26 18:18:37
3 (11g/n), 100 (1...	Disconnect	New Configuration	0	2014/07/15 05:42:08
0 (11g/n), 0 (11a/n)	Discovery		0	2014/11/26 18:17:21
	Disconnect		0	2014/11/21 07:49:49
	Disconnect		0	2014/11/07 22:51:20

Viewing the Configuration of an Access Point

Follow these steps to view the configuration of an access point.

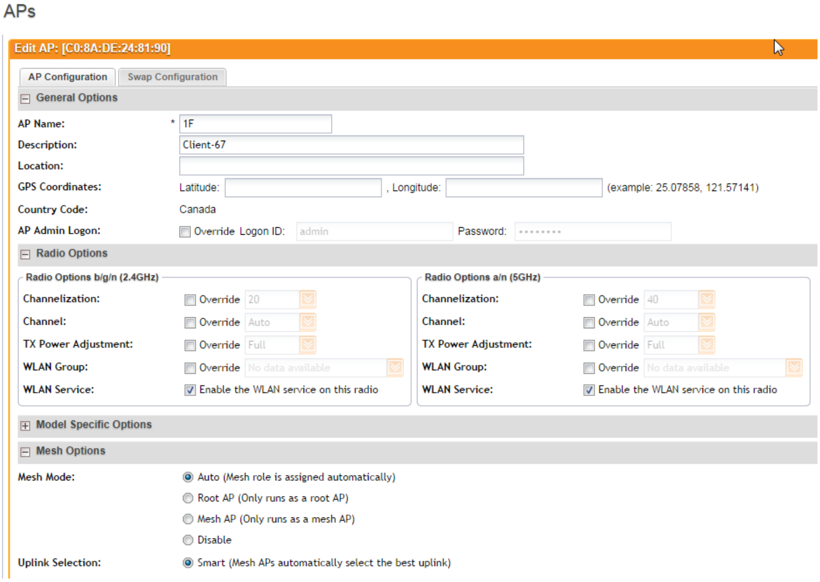
1 Go to *Monitor > Access Points.*

2 On the *Access Points* page, locate the access point whose details you want to view.

3 Under the *Actions* column, click the ✎ icon that is in the same row as the MAC address of the access point.

The page refreshes and displays the *AP Edit: [MAC Address]* form appears, which displays the AP's configuration details (shown in Figure 95).

Figure 95. Page showing the access point configuration details



APs

Edit AP: [C0:8A:DE:24:81:90]

⊟ General Options

AP Name: * 1F

Description: Client-67

Location:

GPS Coordinates: Latitude: , Longitude: (example: 25.07858, 121.57141)

Country Code: Canada

AP Admin Logon: □ Override Logon ID: admin Password: ••••••••

⊟ Radio Options

Radio Options b/g/n (2.4GHz)

Channelization: □ Override 20

Channel: □ Override Auto

TX Power Adjustment: □ Override Full

WLAN Group: □ Override No data available

WLAN Service: ☑ Enable the WLAN service on this radio

Radio Options a/n (5GHz)

Channelization: □ Override 40

Channel: □ Override Auto

TX Power Adjustment: □ Override Full

WLAN Group: □ Override No data available

WLAN Service: ☑ Enable the WLAN service on this radio

⊞ Model Specific Options

⊟ Mesh Options

Mesh Mode:
● Auto (Mesh role is assigned automatically)
○ Root AP (Only runs as a root AP)
○ Mesh AP (Only runs as a mesh AP)
○ Disable

Uplink Selection: ● Smart (Mesh APs automatically select the best uplink)

Downloading the Support Log from an Access Point

If you are experiencing issues with an access point, Ruckus Wireless Support may request you to download the support log from the access point. The support log contains important technical information that may be help Ruckus Wireless Support troubleshoot the issue with the access point.

Follow these steps to download the support log from an access point.

1 Go to *Monitor > Access Points*.

2 On the *Access Points* page, locate the access point from which you want to download the support log.

3 Under the *Actions* column, click the 💾 icon that is in the same row as the MAC address of the access point.

4 Check the default download folder for your web browser and look for a file named `SupportLog_{AP-MAC-address}.log`.

5 Use a text editor (for example, Notepad) to view the contents of the text file.

6 Send the support log file to Ruckus Wireless Support, along with your support request.

You have completed downloading the support log from an access point.

Restarting an Access Point Remotely

Follow these steps to restart an access point remotely from the web interface.

1 Go to *Monitor* > *Access Points*.

2 On the *Access Points* page, locate the access point that you want to restart.

3 Click the 🔄 icon that is in the same row as the MAC address of the access point. The following confirmation message appears:

```
Are you sure you want to restart this AP?
```

4 Click **Yes**. The controller sends a restart command to the access point, and then the access point restarts itself.

You have completed restarting an access point remotely.

Running Ping and Traceroute on an Access Point

The controller web interface provides two commonly used tools – ping and traceroute – that allow you to diagnose connectivity issues on managed access points.

Follow these steps to run the ping and traceroute on an access point.

1 Go to *Monitor* > *Access Points*.

2 On the *Access Points* page, locate the access point on which you want to run the ping or traceroute tool.

3 Click the 🖧 icon that is in the same row as the MAC address of the access point. The Network Connectivity window appears.

4 In *IP Address*, type an IP address to check whether the access point can connect to it. For example, type **`199.238.178.36`** if you want to check if the access point can connect to the Ruckus Wireless website.

5 Click either **Ping** or **Trace Route** (depending on which test you want to run). The blank box below is populated with the test results.

You have completed running a ping or traceroute test.

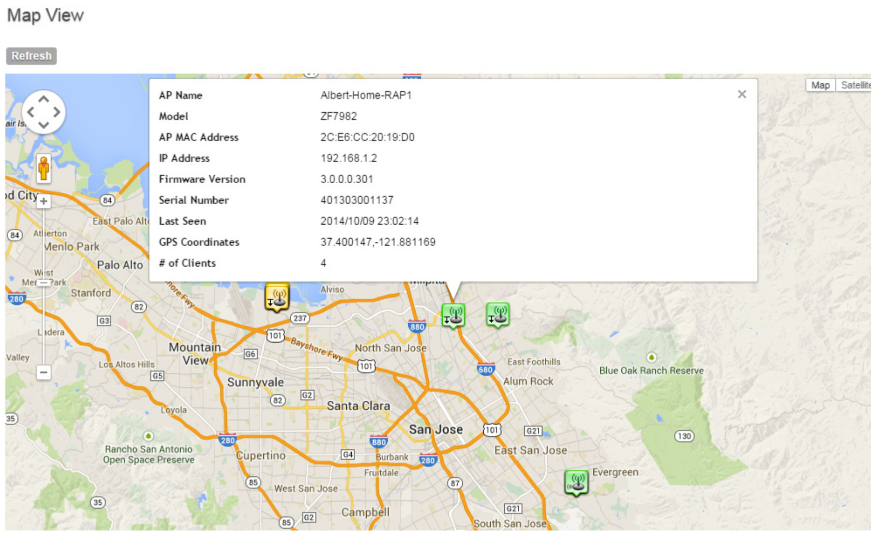
Viewing Managed APs on Google Maps™

If GPS coordinates were configured for some or all of the APs that the controller is managing, you can view the AP locations on Google Maps™.

To view APs that the controller is managing on Google Maps, go to *Monitor > Map View*. The page refreshes and displays managed APs on Google Maps.

To view a summary of details about an AP on the map, click the icon for the AP. A text bubble appears and displays the AP details (see Figure 96).

Figure 96. APs that have their GPS coordinates configured appear on Google Maps



Map View

AP Name	Albert-Home-RAP1
Model	ZF7982
AP MAC Address	2C:E6:CC:20:19:D0
IP Address	192.168.1.2
Firmware Version	3.0.0.0.301
Serial Number	401303001137
Last Seen	2014/10/09 23:02:14
GPS Coordinates	37.400147,-121.881169
# of Clients	4

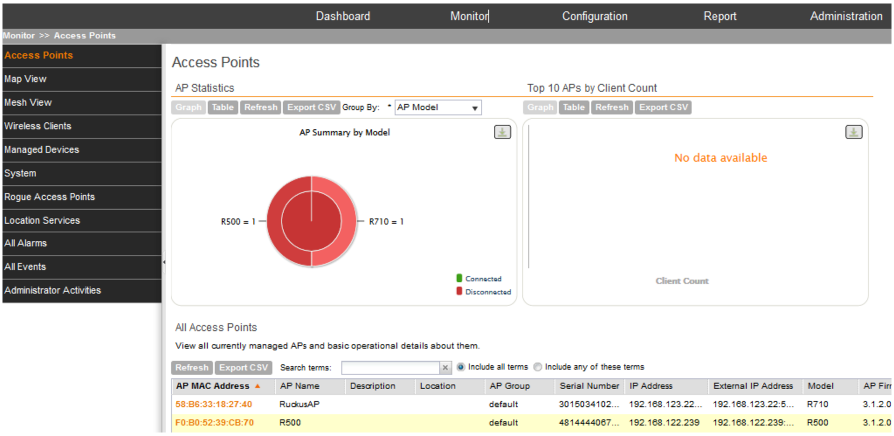
Viewing the Status of the AP USB Device

You can view the status of the USB device by following these steps:

1 Go to **Monitor > Access Points**.

The *Access Points List* page appears displaying the list of APs that are managed by the controller as shown in the figure.

Figure 97. AP list



Access Points

All Access Points

View all currently managed APs and basic operational details about them.

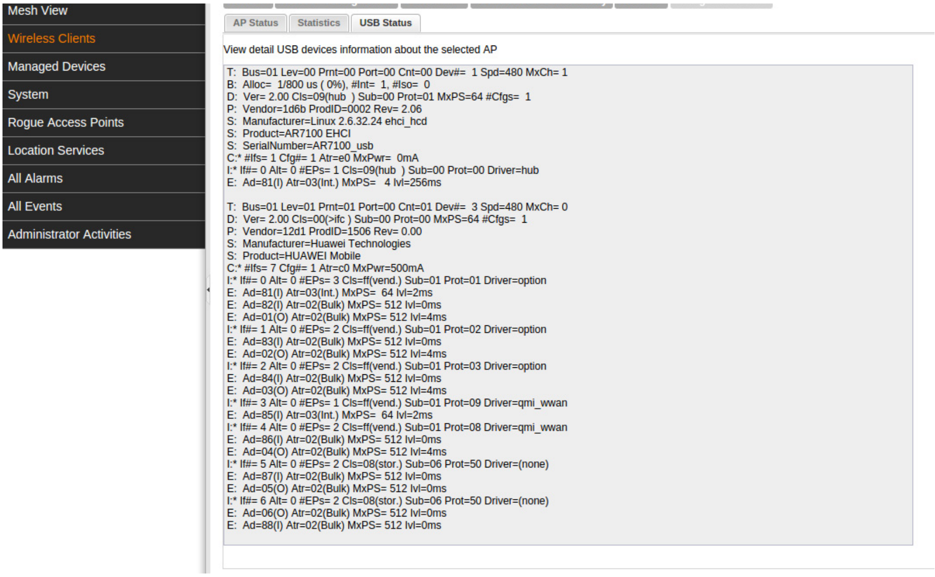
AP MAC Address ▲	AP Name	Description	Location	AP Group	Serial Number	IP Address	External IP Address	Model	AP Fir
58:B6:33:18:27:40	RuckusAP			default	3015034102...	192.168.123.22...	192.168.123.22:5...	R710	3.1.2.0
F0:B0:52:39:CB:70	R500			default	4814444067...	192.168.122.239	192.168.122.239:...	R500	3.1.2.0

2 Select an AP from the *AP MAC Address* column.

A page displaying information about the AP appears.

3 Select the **USB Status** tab to view information about the AP USB software package as shown in the figure.

Figure 98. USB status



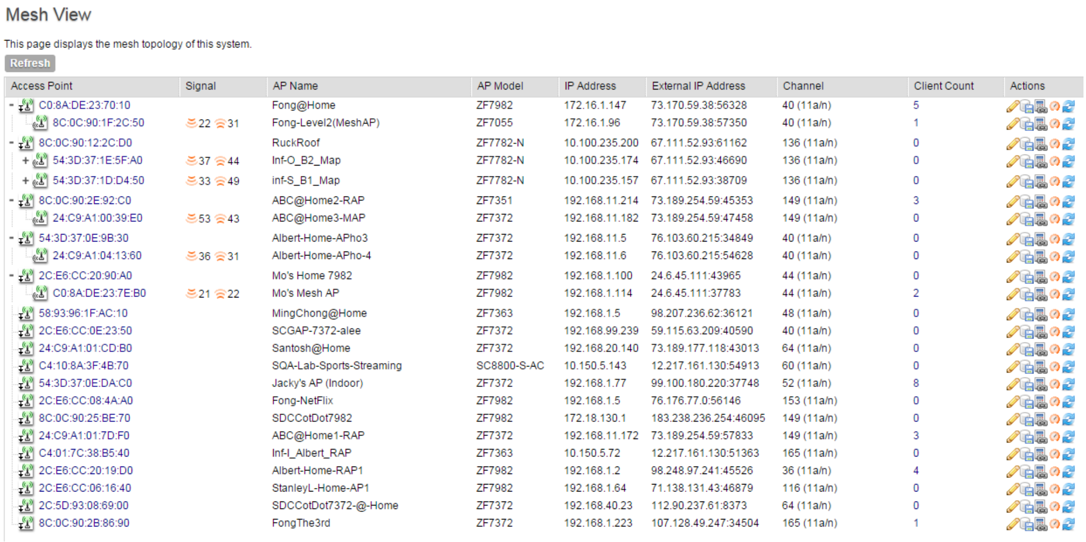
View detail USB devices information about the selected AP

```
T:  Bus=01 Lev=00 Prnt=00 Port=00 Cnt=00 Dev#=  1 Spd=480 MxCh= 1
B:  Alloc=  1/800 us ( 0%), #Int=  1, #Iso=  0
D:  Ver= 2.00 Cls=09(hub  ) Sub=00 Prot=01 MxPS=64 #Cfgs=  1
P:  Vendor=1d6b ProdID=0002 Rev= 2.06
S:  Manufacturer=Linux 2.6.32.24 ehci_hcd
S:  Product=AR7100 EHCI
S:  SerialNumber=AR7100_usb
C:* #Ifs= 1 Cfg#= 1 Atr=e0 MxPwr=  0mA
I:* If#= 0 Alt= 0 #EPs= 1 Cls=09(hub  ) Sub=00 Prot=00 Driver=hub
E:  Ad=81(I) Atr=03(Int.) MxPS=   4 Ivl=256ms

T:  Bus=01 Lev=01 Prnt=01 Port=00 Cnt=01 Dev#=  3 Spd=480 MxCh= 0
D:  Ver= 2.00 Cls=00(>ifc ) Sub=00 Prot=00 MxPS=64 #Cfgs=  1
P:  Vendor=12d1 ProdID=1506 Rev= 0.00
S:  Manufacturer=Huawei Technologies
S:  Product=HUAWEI Mobile
C:* #Ifs= 7 Cfg#= 1 Atr=c0 MxPwr=500mA
I:* If#= 0 Alt= 0 #EPs= 3 Cls=ff(vend.) Sub=01 Prot=01 Driver=option
E:  Ad=81(I) Atr=03(Int.) MxPS=  64 Ivl=2ms
E:  Ad=82(I) Atr=02(Bulk) MxPS= 512 Ivl=0ms
E:  Ad=01(O) Atr=02(Bulk) MxPS= 512 Ivl=4ms
I:* If#= 1 Alt= 0 #EPs= 2 Cls=ff(vend.) Sub=01 Prot=02 Driver=option
E:  Ad=83(I) Atr=02(Bulk) MxPS= 512 Ivl=0ms
E:  Ad=02(O) Atr=02(Bulk) MxPS= 512 Ivl=4ms
I:* If#= 2 Alt= 0 #EPs= 2 Cls=ff(vend.) Sub=01 Prot=03 Driver=option
E:  Ad=84(I) Atr=02(Bulk) MxPS= 512 Ivl=0ms
E:  Ad=03(O) Atr=02(Bulk) MxPS= 512 Ivl=4ms
I:* If#= 3 Alt= 0 #EPs= 1 Cls=ff(vend.) Sub=01 Prot=09 Driver=qmi_wwan
E:  Ad=85(I) Atr=03(Int.) MxPS=  64 Ivl=2ms
I:* If#= 4 Alt= 0 #EPs= 2 Cls=ff(vend.) Sub=01 Prot=08 Driver=qmi_wwan
E:  Ad=86(I) Atr=02(Bulk) MxPS= 512 Ivl=0ms
E:  Ad=04(O) Atr=02(Bulk) MxPS= 512 Ivl=4ms
I:* If#= 5 Alt= 0 #EPs= 2 Cls=08(stor.) Sub=06 Prot=50 Driver=(none)
E:  Ad=87(I) Atr=02(Bulk) MxPS= 512 Ivl=0ms
E:  Ad=05(O) Atr=02(Bulk) MxPS= 512 Ivl=0ms
I:* If#= 6 Alt= 0 #EPs= 2 Cls=08(stor.) Sub=06 Prot=50 Driver=(none)
E:  Ad=06(O) Atr=02(Bulk) MxPS= 512 Ivl=0ms
E:  Ad=88(I) Atr=02(Bulk) MxPS= 512 Ivl=0ms
```

Monitoring the Mesh Network

To view Smart Mesh topologies of any mesh trees present on your network, go to *Monitor* > *Mesh View*. This page also displays non-meshing APs controlled by the controller and provides a number of action icons to troubleshoot and diagnose mesh-related issues.

Figure 99. View the mesh network status on the Monitor > Mesh View page



Mesh View

This page displays the mesh topology of this system.

Access Point	Signal	AP Name	AP Model	IP Address	External IP Address	Channel	Client Count	Actions
- C0:8A:DE:23:70:10		Fong@Home	ZF7982	172.16.1.147	73.170.59.38:56328	40 (11a/n)	5	
8C:0C:90:1F:2C:50	22 31	Fong-Level2(MeshAP)	ZF7055	172.16.1.96	73.170.59.38:57350	40 (11a/n)	1	
- 8C:0C:90:12:2C:D0		RuckRoof	ZF7782-N	10.100.235.200	67.111.52.93:61162	136 (11a/n)	0	
+ 54:3D:37:1E:5F:A0	37 44	Inf-O_B2_Map	ZF7782-N	10.100.235.174	67.111.52.93:46690	136 (11a/n)	0	
+ 54:3D:37:1D:D4:50	33 49	inf-S_B1_Map	ZF7782-N	10.100.235.157	67.111.52.93:38709	136 (11a/n)	0	
- 8C:0C:90:2E:92:C0		ABC@Home2-RAP	ZF7351	192.168.11.214	73.189.254.59:45353	149 (11a/n)	3	
24:C9:A1:00:39:E0	53 43	ABC@Home3-MAP	ZF7372	192.168.11.182	73.189.254.59:47458	149 (11a/n)	0	
- 54:3D:37:0E:9B:30		Albert-Home-APho3	ZF7372	192.168.11.5	76.103.60.215:34849	40 (11a/n)	0	
24:C9:A1:04:13:60	36 31	Albert-Home-APho-4	ZF7372	192.168.11.6	76.103.60.215:54628	40 (11a/n)	0	
- 2C:E6:CC:20:90:A0		Mo's Home 7982	ZF7982	192.168.1.100	24.6.45.111:43965	44 (11a/n)	0	
C0:8A:DE:23:7E:B0	21 22	Mo's Mesh AP	ZF7982	192.168.1.114	24.6.45.111:37783	44 (11a/n)	2	
58:93:96:1F:AC:10		MingChong@Home	ZF7363	192.168.1.5	98.207.236.62:36121	48 (11a/n)	0	
2C:E6:CC:0E:23:50		SCGAP-7372-alee	ZF7372	192.168.99.239	59.115.63.209:40590	40 (11a/n)	0	
24:C9:A1:01:CD:B0		Santosh@Home	ZF7372	192.168.20.140	73.189.177.118:43013	64 (11a/n)	0	
C4:10:8A:3F:4B:70		SQA-Lab-Sports-Streaming	SC8800-S-AC	10.150.5.143	12.217.161.130:54913	60 (11a/n)	0	
54:3D:37:0E:DA:C0		Jacky's AP (Indoor)	ZF7372	192.168.1.77	99.100.180.220:37748	52 (11a/n)	8	
2C:E6:CC:08:4A:A0		Fong-NetFlix	ZF7982	192.168.1.5	76.176.77.0:56146	153 (11a/n)	0	
8C:0C:90:25:BE:70		SDCCotDot7982	ZF7982	172.18.130.1	183.238.236.254:46095	149 (11a/n)	0	
24:C9:A1:01:7D:F0		ABC@Home1-RAP	ZF7372	192.168.11.172	73.189.254.59:57833	149 (11a/n)	3	
C4:01:7C:38:B5:40		Inf-I_Albert_RAP	ZF7363	10.150.5.72	12.217.161.130:51363	165 (11a/n)	0	
2C:E6:CC:20:19:D0		Albert-Home-RAP1	ZF7982	192.168.1.2	98.248.97.241:45526	36 (11a/n)	4	
2C:E6:CC:06:16:40		StanleyL-Home-AP1	ZF7982	192.168.1.64	71.138.131.43:46879	116 (11a/n)	0	
2C:5D:93:08:69:00		SDCCotDot7372-@-Home	ZF7372	192.168.40.23	112.90.237.61:8373	64 (11a/n)	0	
8C:0C:90:2B:86:90		FongThe3rd	ZF7372	192.168.1.223	107.128.49.247:34504	165 (11a/n)	1	

Monitoring Wireless Clients

This section provides information on how to monitor and view information about wireless clients that associate with the managed access points. Topics covered include:

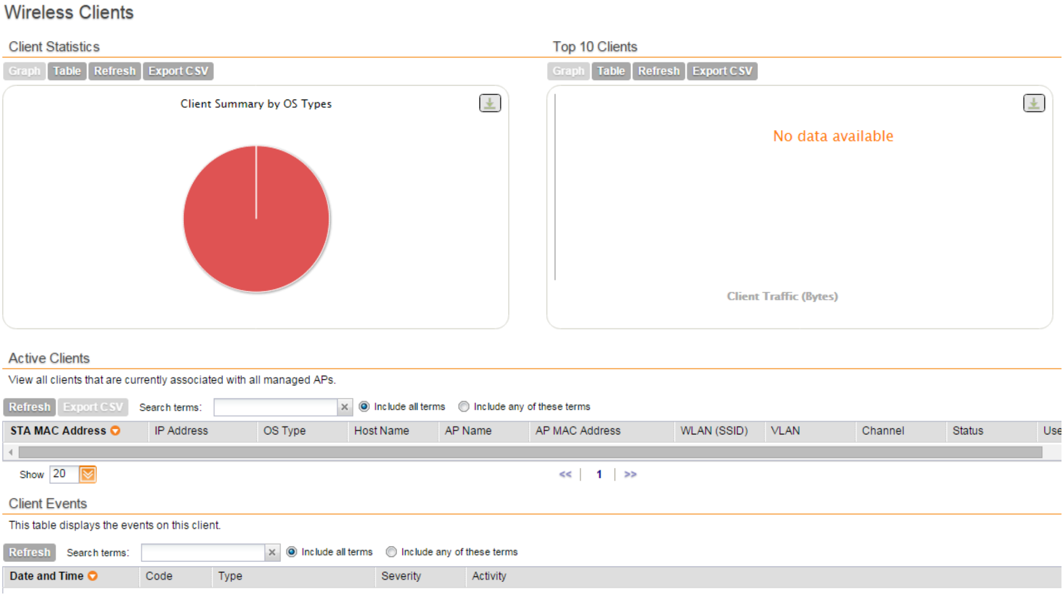
- Viewing a Summary of Wireless Clients
- Exporting the Wireless Client List to CSV
- Viewing Information About a Wireless Client

Viewing a Summary of Wireless Clients

Follow these steps to view a summary of wireless clients that are currently associated with the managed access points.

Go to *Monitor* > *Wireless Clients*. The *Wireless Clients* page appears and displays a table that lists all wireless clients that are currently associated with managed access points.

Figure 100. View all currently active wireless clients on the Monitor > Wireless Clients page



Wireless Clients

Client Statistics

Top 10 Clients

Active Clients

View all clients that are currently associated with all managed APs.

STA MAC Address	IP Address	OS Type	Host Name	AP Name	AP MAC Address	WLAN (SSID)	VLAN	Channel	Status	Use

Client Events

This table displays the events on this client.

Date and Time	Code	Type	Severity	Activity

Table 8 lists the wireless client details that are shown in the table.

Table 8. Wireless client details

Column Name	Description
STA MAC Address	MAC address of the wireless station. Clicking this link loads a page that displays detailed information about the wireless client. See Viewing Information About a Wireless Client.
IP Address	IP address assigned to the wireless client
OS Type	Operating system that the wireless client is using
Host Name	Host name of the wireless client

Table 8. Wireless client details

Column Name	Description
AP Name	Name assigned to the access point. Clicking this link loads a page that displays detailed information about the access point. See Viewing the Configuration of an Access Point.
AP MAC Address	MAC address of the AP
WLAN (SSID)	Name of the WLAN service or SSID with which the wireless client is associated.
VLAN	VLAN ID assigned to the wireless client
Channel	Radio channel used by the wireless client to access the WLAN service on the access point
Status	Indicates whether the wireless client is authorized or unauthorized to access the WLAN service
User Name	Name of the user logged on to the wireless client
Auth Method	Authentication method used by the access point
Encryption Method	Encryption method used by the access point
Actions	Icons for actions that you can perform, including: • 🗑 – Click to disconnect the wireless client from the access point. • ⏲ - Click to start the SpeedFlex wireless performance tool.

Exporting the Wireless Client List to CSV

Follow these steps to export the wireless point list to a CSV file.

1. Go to *Monitor* > *Wireless Clients*.
2. Click the **Export CSV** button in the content area.
3. Check the default download folder of your web browser and look for a file named `clients.csv`.
4. Use a spreadsheet application (for example, Microsoft™ Excel™) to view the contents of the CSV file.

You have completed exporting the wireless client list to CSV.

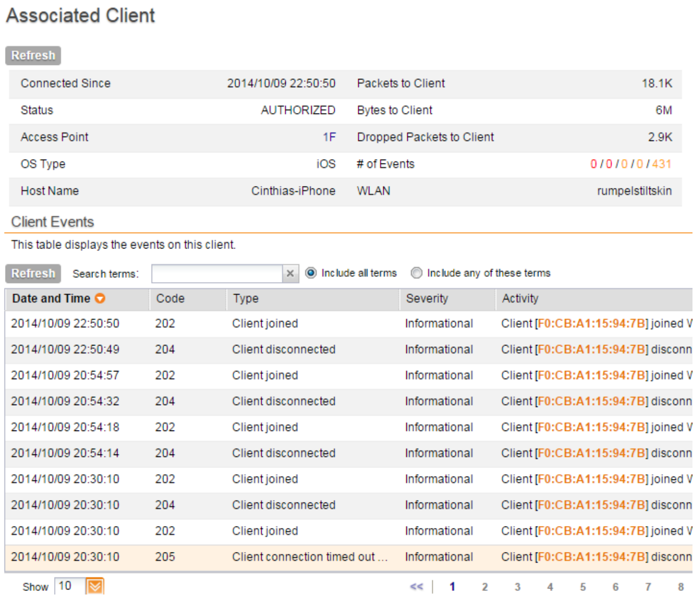
Viewing Information About a Wireless Client

Follow these steps to view information about a wireless client.

1. Go to *Monitor* > *Wireless Clients*.
2. Locate the wireless client whose details you want to view.
3. Under the *STA MAC Address* column, click the MAC address of the wireless client.

The *Associated Client* page appears and displays general information about the wireless client, including its MAC address, IP address, authentication method, encryption method, connection details, operating system, and traffic statistics, among others. Recent connectivity events that occurred on the wireless client are displayed in the *Client Events* section at the bottom of the page.

Figure 101. The Associated Client page shows wireless client information



Associated Client

Refresh

Connected Since	2014/10/09 22:50:50	Packets to Client	18.1K
Status	AUTHORIZED	Bytes to Client	6M
Access Point	1F	Dropped Packets to Client	2.9K
OS Type	iOS	# of Events	0 / 0 / 0 / 0 / 431
Host Name	Cinthias-iPhone	WLAN	rumpelstiltskin

Client Events

This table displays the events on this client.

Refresh Search terms: ● Include all terms ○ Include any of these terms

Date and Time	Code	Type	Severity	Activity
2014/10/09 22:50:50	202	Client joined	Informational	Client [F0:CB:A1:15:94:7B] joined V
2014/10/09 22:50:49	204	Client disconnected	Informational	Client [F0:CB:A1:15:94:7B] disconn
2014/10/09 20:54:57	202	Client joined	Informational	Client [F0:CB:A1:15:94:7B] joined V
2014/10/09 20:54:32	204	Client disconnected	Informational	Client [F0:CB:A1:15:94:7B] disconn
2014/10/09 20:54:18	202	Client joined	Informational	Client [F0:CB:A1:15:94:7B] joined V
2014/10/09 20:54:14	204	Client disconnected	Informational	Client [F0:CB:A1:15:94:7B] disconn
2014/10/09 20:30:10	202	Client joined	Informational	Client [F0:CB:A1:15:94:7B] joined V
2014/10/09 20:30:10	204	Client disconnected	Informational	Client [F0:CB:A1:15:94:7B] disconn
2014/10/09 20:30:10	202	Client joined	Informational	Client [F0:CB:A1:15:94:7B] joined V
2014/10/09 20:30:10	205	Client connection timed out ...	Informational	Client [F0:CB:A1:15:94:7B] disconn

Show 10

<< | 1 2 3 4 5 6 7 8

Measuring Wireless Network Throughput with SpeedFlex

SpeedFlex is a wireless performance tool included in the controller that you can use to measure the downlink throughput between the controller and an AP. When performing a site survey, you can use SpeedFlex to help find the optimum location for APs on the network with respect to user locations.

NOTE: SpeedFlex is unable to measure the throughput between two devices if those two devices are not on the same VLAN or the same subnet.

Follow these steps to measure the throughput of an AP from the controller web interface.

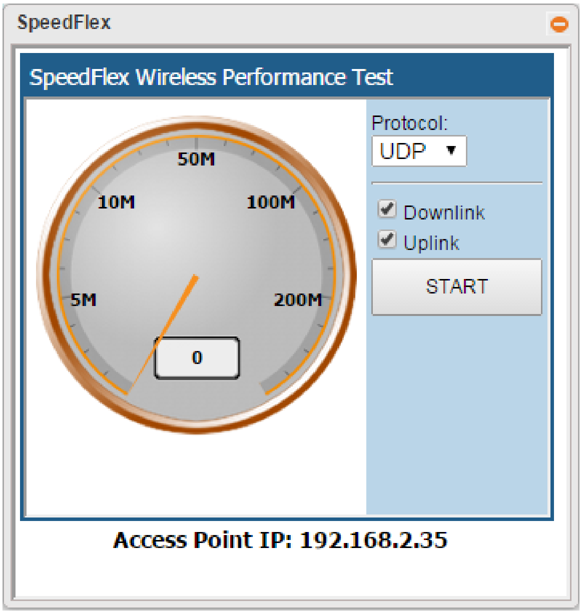
1. Find out the MAC address of the AP that you want to use for this test procedure.
2. Log on to the controller web interface.
3. If you want to test AP throughput, click *Monitor > Access Points*.
4. In the list of APs, look for the MAC address of the AP that you want to test, and then click ⏲ (SpeedFlex icon) that is in the same row. The SpeedFlex Wireless Performance Test interface loads, showing a speedometer and the IP address of the AP that you want to test.
5. In *Protocol*, select **UDP**.

   If you are testing AP throughput, you have the option to test both *Downlink* and *Uplink* throughput. Both options are selected by default. If you only want to test one of them, clear the check box for the option that you do not want to test.
6. Click the **Start** button.

A progress bar appears below the speedometer as SpeedFlex generates traffic to measure the downlink or uplink throughput. One throughput test typically runs for 10-30 seconds. If you are testing AP throughput and you selected both the *Downlink* and *Uplink* options, both tests should take about one minute to complete.

When the tests are complete, the results appear below the **Start** button. Information that is shown includes the downlink/uplink throughput and the packet loss percentage during the tests.

Figure 102. The SpeedFlex page



Access Point IP: 192.168.2.35

Monitoring Managed Devices

Managed devices refer to user equipment (UE) that have associated with the controller-managed APs using the Zero-IT onboarding process.

To view a list of managed devices, go to *Monitor* > *Managed Devices*. The *Managed Devices* page appears and displays all currently managed devices and their details. Table 9 describes the details about managed devices that are displayed on the *Managed Devices* page.

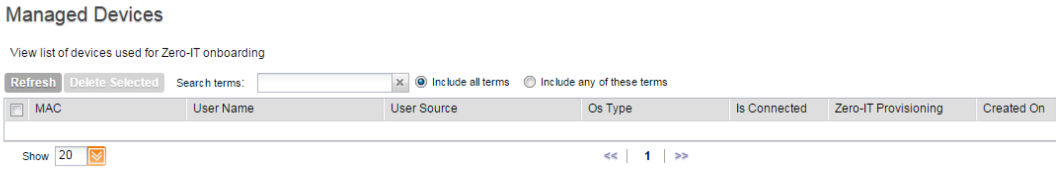
Table 9. Information available on the Managed Devices page

Column	Description
MAC	MAC address of the device
User Name	User name of the device user

Table 9. Information available on the Managed Devices page

Column	Description
User Source	Shows either “Local DB” if the devices was authenticated locally using the SCG database or, if the device was authenticated using an external AAA server, the AAA server name.
OS Type	Operating system used by the device
Is Connected	Current connection status (“Yes” for connected, “No” for disconnected)
Zero-IT Provisioning	
Created On	Date when the device first associated with the controller-managed AP

Figure 103. The Managed Devices page



Managed Devices

View list of devices used for Zero-IT onboarding

Monitoring the System

This section provides information on how to view information about the status of the controller system, including its cluster planes and cluster events. It also describes how to use the chassis view and to start the cluster monitor.

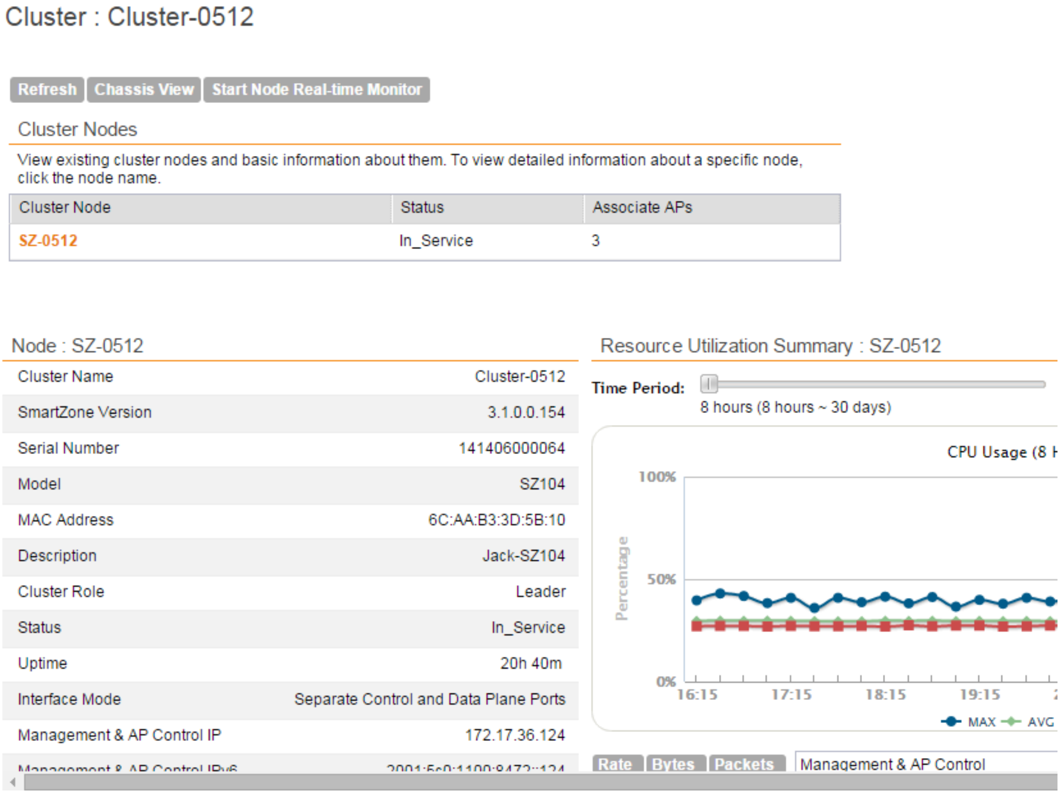
Topics covered include:

- Viewing the System Cluster Overview
- Displaying the Chassis View of Cluster Nodes
- Starting the Node Real-time Monitor

Viewing the System Cluster Overview

The system cluster overview provides summary information the controller cluster. To view the cluster overview, go to *Monitor* > *System*. The *Cluster Node: [{Cluster Name}]* page appears, as shown in Figure 104.

Figure 104. The Cluster Node: [{Cluster Name}] page



Cluster : Cluster-0512

Cluster Nodes

View existing cluster nodes and basic information about them. To view detailed information about a specific node, click the node name.

Cluster Node	Status	Associate APs
SZ-0512	In_Service	3

Node : SZ-0512

Cluster Name	Cluster-0512
SmartZone Version	3.1.0.0.154
Serial Number	141406000064
Model	SZ104
MAC Address	6C:AA:B3:3D:5B:10
Description	Jack-SZ104
Cluster Role	Leader
Status	In_Service
Uptime	20h 40m
Interface Mode	Separate Control and Data Plane Ports
Management & AP Control IP	172.17.36.124
Management & AP Control IPv6	2001:5c0:1100:8472::124

Resource Utilization Summary : SZ-0512

Time Period: 8 hours (8 hours ~ 30 days)

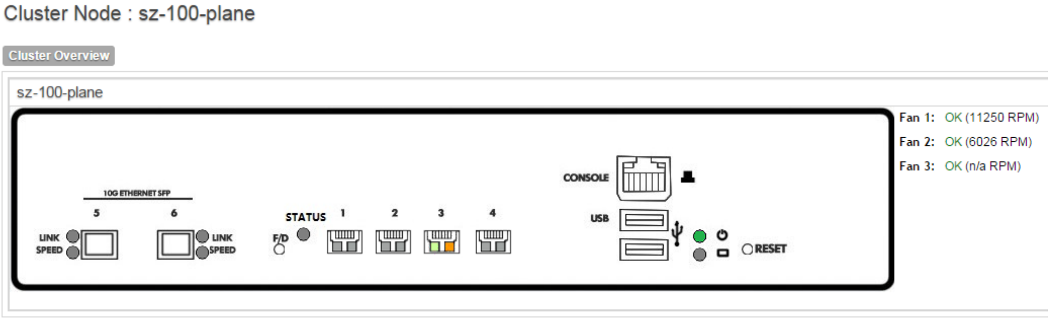
Displaying the Chassis View of Cluster Nodes

The chassis view provides a graphical representation of the control panel (on the front panel of the controller), including the LEDs. Use the LEDs to check the status of the ports and power supplies on the controller. Fan status is also displayed on the chassis view.

To view the chassis of the cluster node, click **Chassis View** on the *Cluster Node: [{Cluster Name}]* page.

NOTE: The information on the chassis view updates automatically every 30 seconds. This polling frequency is not configurable.

Figure 105. The chassis view page displays the chassis of all nodes in the cluster



Cluster Node : sz-100-plane

Cluster Overview

sz-100-plane

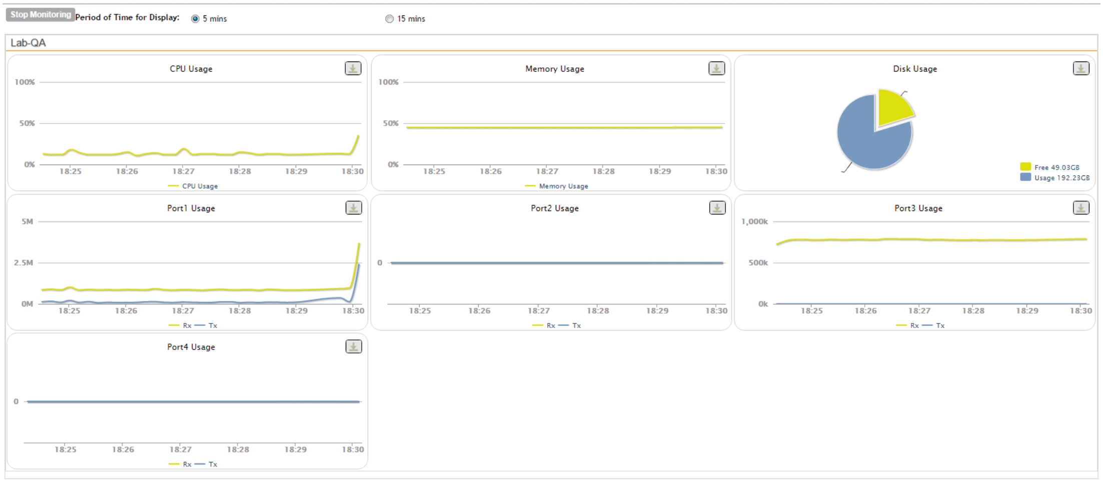
Fan 1: OK (11250 RPM)
Fan 2: OK (6026 RPM)
Fan 3: OK (n/a RPM)

Starting the Node Real-time Monitor

The *Node Real-time Monitor* page displays graphs and charts of the controller system resources. Use this monitor to understand how system resources on the cluster nodes are being used.

To start the cluster real-time monitor, click **Start Node Real-time Monitor** on the *Cluster Node: [{Cluster Name}]* page. A new browser page or tab appears (depending on your browser settings), and then the *Node Real-time Monitor* page appears.

Figure 106. The Node Real-time Monitor page



Period of Time for Display: ● 5 mins ○ 15 mins

The resource graphs and charts that are shown on the Cluster Real-time Monitor page include:

- CPU Usage
- Memory Usage
- Disk Usage
- Port1 Usage
- Port2 Usage
- Port3 Usage
- Port4 Usage

NOTE: On some controller models, you may see additional graphs for Port 5 and Port 6 usage.

To stop the Cluster Real-time Monitor, click the **Stop Monitoring** button on the upper-left part of the page.

Monitoring Rogue Access Points

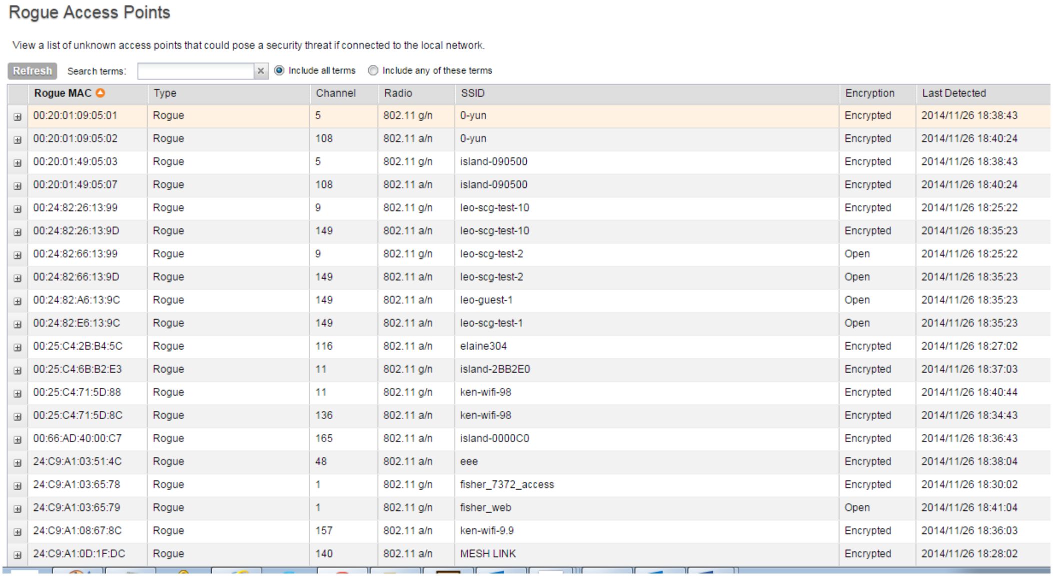
“Rogue” (or unauthorized) APs pose problems for a wireless network in terms of airtime contention, as well as security. Usually, a rogue AP appears in the following way: an employee obtains another manufacturer's AP and connects it to the LAN, to gain wireless access to other LAN resources. This would potentially allow even more unauthorized users to access your corporate LAN - posing a security risk. Rogue APs also interfere with nearby Ruckus Wireless APs, thus degrading overall wireless network coverage and performance.

The controller’s rogue AP detection options include identifying the presence of a rogue AP, categorizing it as either a known neighbor AP or as a malicious rogue.

If you enabled rogue AP detection when you configured the common AP settings (see Configuring Common AP Settings), click *Monitor > Rogue Access Points*. The Rogue Access Points page displays all rogue APs that the controller has detected on the network, including the following information:

- *Rogue MAC*: MAC address of the rogue AP.
- *Type*: Type of rogue AP detected. Possible values include:
  - *Rogue*: A normal rogue AP. This rogue AP has not yet been categorized as malicious or non-malicious.
  - *Malicious AP (SSID-spoof)*: A malicious rogue AP that uses the same SSID as an controller-managed AP (also known as an Evil-twin AP).
  - *Malicious AP (MAC-spoof)*: A malicious rogue AP that has the same BSSID (MAC) as one of the virtual APs managed by the controller.
  - *Malicious AP (Same-Network)*: A malicious rogue AP that is connected to the same wired network.
  - *Malicious AP (User-Blocked)*: A rogue AP that has been marked as malicious by the user.
- *Channel*: Radio channel used by the rogue AP.
- *Radio*: WLAN standards with which the rogue AP complies.
- *SSID*: WLAN name that the rogue AP is broadcasting.
- *Encryption*: Indicates whether the wireless signal is encrypted or not.
- *Last Detected*: Date and time when the rogue AP was last detected by the controller.

Figure 107. The Monitor > Rogue Access Points page



Rogue Access Points

View a list of unknown access points that could pose a security threat if connected to the local network.

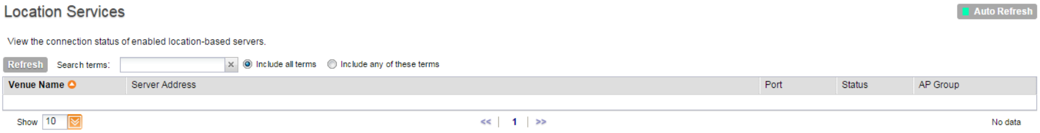
	Rogue MAC	Type	Channel	Radio	SSID	Encryption	Last Detected
⊞	00:20:01:09:05:01	Rogue	5	802.11 g/n	0-yun	Encrypted	2014/11/26 18:38:43
⊞	00:20:01:09:05:02	Rogue	108	802.11 a/n	0-yun	Encrypted	2014/11/26 18:40:24
⊞	00:20:01:49:05:03	Rogue	5	802.11 g/n	island-090500	Encrypted	2014/11/26 18:38:43
⊞	00:20:01:49:05:07	Rogue	108	802.11 a/n	island-090500	Encrypted	2014/11/26 18:40:24
⊞	00:24:82:26:13:99	Rogue	9	802.11 g/n	leo-scg-test-10	Encrypted	2014/11/26 18:25:22
⊞	00:24:82:26:13:9D	Rogue	149	802.11 a/n	leo-scg-test-10	Encrypted	2014/11/26 18:35:23
⊞	00:24:82:66:13:99	Rogue	9	802.11 g/n	leo-scg-test-2	Open	2014/11/26 18:25:22
⊞	00:24:82:66:13:9D	Rogue	149	802.11 a/n	leo-scg-test-2	Open	2014/11/26 18:35:23
⊞	00:24:82:A6:13:9C	Rogue	149	802.11 a/n	leo-guest-1	Open	2014/11/26 18:35:23
⊞	00:24:82:E6:13:9C	Rogue	149	802.11 a/n	leo-scg-test-1	Open	2014/11/26 18:35:23
⊞	00:25:C4:2B:B4:5C	Rogue	116	802.11 a/n	elaine304	Encrypted	2014/11/26 18:27:02
⊞	00:25:C4:6B:B2:E3	Rogue	11	802.11 g/n	island-2BB2E0	Encrypted	2014/11/26 18:37:03
⊞	00:25:C4:71:5D:88	Rogue	11	802.11 g/n	ken-wifi-98	Encrypted	2014/11/26 18:40:44
⊞	00:25:C4:71:5D:8C	Rogue	136	802.11 a/n	ken-wifi-98	Encrypted	2014/11/26 18:34:43
⊞	00:66:AD:40:00:C7	Rogue	165	802.11 a/n	island-0000C0	Encrypted	2014/11/26 18:36:43
⊞	24:C9:A1:03:51:4C	Rogue	48	802.11 a/n	eee	Encrypted	2014/11/26 18:38:04
⊞	24:C9:A1:03:65:78	Rogue	1	802.11 g/n	fisher_7372_access	Encrypted	2014/11/26 18:30:02
⊞	24:C9:A1:03:65:79	Rogue	1	802.11 g/n	fisher_web	Open	2014/11/26 18:41:04
⊞	24:C9:A1:08:67:8C	Rogue	157	802.11 a/n	ken-wifi-9.9	Encrypted	2014/11/26 18:36:03
⊞	24:C9:A1:0D:1F:DC	Rogue	140	802.11 a/n	MESH LINK	Encrypted	2014/11/26 18:28:02

Monitoring Location Services

To monitor SmartPositioning location servers that you have configured on the *Configuration > Wireless Network > Location Services*, go to *Monitor > Location Services*.

NOTE: For information on configuring and administering of Ruckus Wireless SmartPositioning Technology (SPoT) service, see the *SPoT User Guide*, which is available for download on https://support.ruckuswireless.com.

Figure 108. Monitor > Location Services page



Location Services

View the connection status of enabled location-based servers.

Venue Name	Server Address	Port	Status	AP Group

Show 10

No data

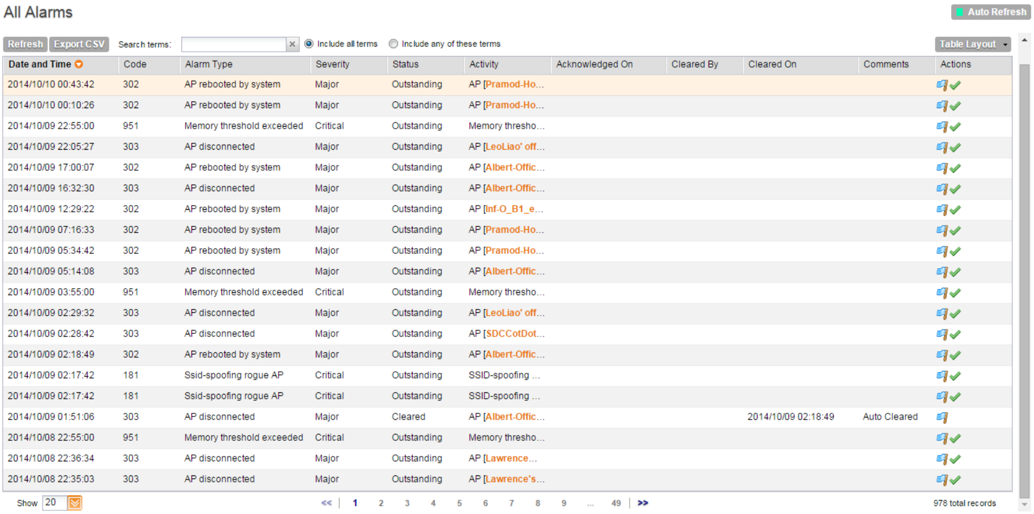
Viewing All Alarms

Alarms are a type of event that typically warrants your attention. Alarms are generated by managed access points and the controller system.

To view recent alarms that have been generated, go to *Monitor > All Alarms*. The *All Alarms* page displays the 20 most recent alarms.

NOTE: By default, the *All Alarms* page displays up to 20 event entries per page. You can change the number of alarms to display per page by selecting a number in **Show**. Options range from 10 to 250 entries per page. Alternatively, you can click the >> (next) link to display the next 20 alarms on another page.

Figure 109. The All Alarms page displays the most recent alarm entries



All Alarms

Date and Time	Code	Alarm Type	Severity	Status	Activity	Acknowledged On	Cleared By	Cleared On	Comments	Actions
2014/10/10 00:43:42	302	AP rebooted by system	Major	Outstanding	AP [Pramod-Ho...					✎✓
2014/10/10 00:10:26	302	AP rebooted by system	Major	Outstanding	AP [Pramod-Ho...					✎✓
2014/10/09 22:55:00	951	Memory threshold exceeded	Critical	Outstanding	Memory thresho...					✎✓
2014/10/09 22:05:27	303	AP disconnected	Major	Outstanding	AP [LeoLiao' off...					✎✓
2014/10/09 17:00:07	302	AP rebooted by system	Major	Outstanding	AP [Albert-Offic...					✎✓
2014/10/09 16:32:30	303	AP disconnected	Major	Outstanding	AP [Albert-Offic...					✎✓
2014/10/09 12:29:22	302	AP rebooted by system	Major	Outstanding	AP [Inf-O_B1_e...					✎✓
2014/10/09 07:16:33	302	AP rebooted by system	Major	Outstanding	AP [Pramod-Ho...					✎✓
2014/10/09 05:34:42	302	AP rebooted by system	Major	Outstanding	AP [Pramod-Ho...					✎✓
2014/10/09 05:14:08	303	AP disconnected	Major	Outstanding	AP [Albert-Offic...					✎✓
2014/10/09 03:55:00	951	Memory threshold exceeded	Critical	Outstanding	Memory thresho...					✎✓
2014/10/09 02:29:32	303	AP disconnected	Major	Outstanding	AP [LeoLiao' off...					✎✓
2014/10/09 02:28:42	303	AP disconnected	Major	Outstanding	AP [SDCCotDot...					✎✓
2014/10/09 02:18:49	302	AP rebooted by system	Major	Outstanding	AP [Albert-Offic...					✎✓
2014/10/09 02:17:42	181	Ssid-spoofing rogue AP	Critical	Outstanding	SSID-spoofing ...					✎✓
2014/10/09 02:17:42	181	Ssid-spoofing rogue AP	Critical	Outstanding	SSID-spoofing ...					✎✓
2014/10/09 01:51:06	303	AP disconnected	Major	Cleared	AP [Albert-Offic...			2014/10/09 02:18:49	Auto Cleared	✎
2014/10/08 22:55:00	951	Memory threshold exceeded	Critical	Outstanding	Memory thresho...					✎✓
2014/10/08 22:36:34	303	AP disconnected	Major	Outstanding	AP [Lawrence...					✎✓
2014/10/08 22:35:03	303	AP disconnected	Major	Outstanding	AP [Lawrence's...					✎✓

Table 10 lists the alarm details that are displayed on the *All Alarms* page.

Table 10. Alarm details

Column Name	Description
Date and Time	Date and time when the alarm was triggered
Code	Alarm code (see the *Alarm and Event Reference Guide* for your controller platform for more information)
Alarm Type	Type of alarm event that occurred (for example, AP reset to factory settings)
Severity	Severity level assigned to the alarm. Possible values include (from most severe to least severe): • Critical • Major • Minor
Status	Indicates whether the alarm has already been cleared or still outstanding
Activity	Displays additional details about the alarm, including (if available) the specific access point, control plane, or data plane that triggered the alarm

Table 10. Alarm details (Continued)

Column Name	Description
Acknowledged On	Date and time when you or another administrator acknowledge the alarm
Cleared By	If the alarm has been cleared, this shows the name of the administrator who cleared the alarm.
Cleared On	If the alarm has been cleared, this shows the date and time when the alarm was cleared.
Comments	If the alarm was cleared manually, this shows the comment entered by the administrator who cleared the alarm. If the alarm was cleared automatically, shows *Auto Cleared*.
Activity	Displays additional details about the alarm, including (if available) the specific access point, control plane, or data plane that triggered the alarm
Actions	Icons for actions that you can perform, including: • ⚑ – Click this to take ownership of issue. Acknowledging an alarm lets other administrators know that someone is already looking into the issue. • ✓ – Click this to clear the alarm. You may clear an alarm to let other administrators know that you have already resolved the issue. When you click this icon, a text box appears where you can enter comments or notes about the resolved issue. Click **Clear** when done.

Exporting the Alarm List to CSV

Follow these steps to export the alarm list to a CSV file.

1. Go to *Monitor* > *All Alarms*.
2. Click the **Export CSV** button in the content area.
3. Check the default download folder of your web browser and look for a file named `alarms.csv`.
4. Use a spreadsheet application (for example, Microsoft™ Excel™) to view the contents of the CSV file.

You have completed exporting the alarm list to CSV.

Clearing Alarms

Clearing an alarm removes the alarm from the list but keeps it on the controller's database. Do one of the following to clear a single alarm or multiple alarms.

- To clear a single alarm, select the check box that is in the same row as the alarm, and then click **Clear Alarm**. Alternatively, click the ✓ icon.
- To clear multiple alarms, select the check boxes for the alarm that you want to clear, and then click **Clear Alarm**.
- To clear all alarms that are currently displayed on the page, click the check box before the *Date and Time* column, and then click **Clear Alarm**.

Acknowledging Alarms

Acknowledging an alarm lets other administrators know that you have examined the alarm. After you acknowledge an alarm, it will remain on the list of alarms and will show the date and time that you acknowledged it. Do one of the following to acknowledge a single alarm or multiple alarms.

- To acknowledge a single alarm, select the check box that is in the same row as the alarm, and then click **Acknowledge Alarm**. Alternatively, click the ⚑ icon.
- To acknowledge multiple alarms, select the check boxes for the alarm that you want to clear, and then click **Acknowledge Alarm**.
- To acknowledge all alarms that are currently displayed on the page, click the check box before the *Date and Time* column, and then click **Acknowledge Alarm**.

Viewing All Events

An event is an occurrence or the detection of certain conditions in and around the network. An AP being rebooted, an AP changing its IP address, and a user updating an AP's configuration are all examples of events.

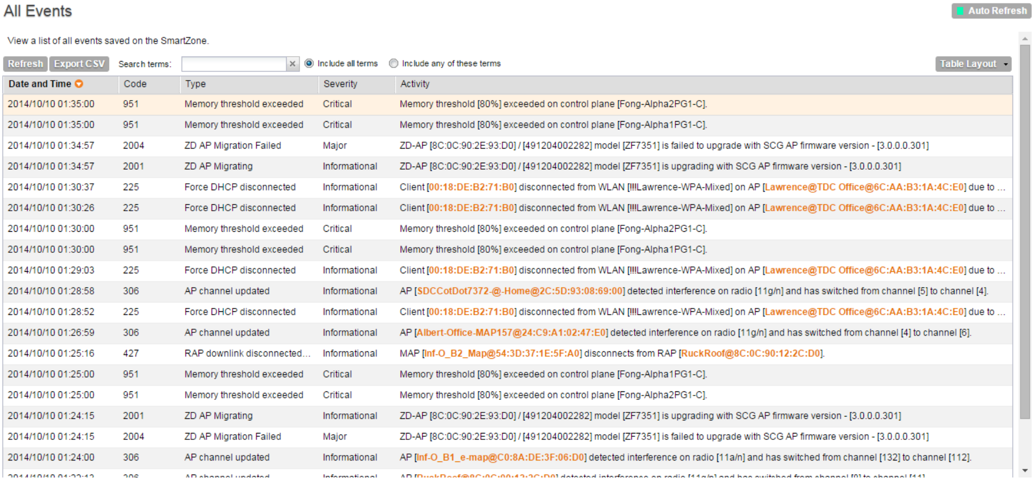
NOTE: Events that require your attention are called *alarms*. For information on alarms, refer to Viewing All Alarms.

Follow these steps to view recent events that have been detected by the controller.

Go to *Monitor* > *All Events*. The *All Events* page appears and displays the 20 most recent events that have occurred.

NOTE: By default, the *Events* page displays up to 20 event entries per page. You can change the number of events to display per page by selecting a number in **Show**. Options range from 10 to 250 entries per page. Alternatively, you can click the **>>** (next) link to display the next 20 events on another page.

Figure 110. The All Events page lists the most recent events that have occurred



All Events

View a list of all events saved on the SmartZone.

Date and Time	Code	Type	Severity	Activity
2014/10/10 01:35:00	951	Memory threshold exceeded	Critical	Memory threshold [80%] exceeded on control plane [Fong-Alpha2PG1-C].
2014/10/10 01:35:00	951	Memory threshold exceeded	Critical	Memory threshold [80%] exceeded on control plane [Fong-Alpha1PG1-C].
2014/10/10 01:34:57	2004	ZD AP Migration Failed	Major	ZD-AP [8C:0C:90:2E:93:D0] / [491204002282] model [ZF7351] is failed to upgrade with SCG AP firmware version - [3.0.0.0.301]
2014/10/10 01:34:57	2001	ZD AP Migrating	Informational	ZD-AP [8C:0C:90:2E:93:D0] / [491204002282] model [ZF7351] is upgrading with SCG AP firmware version - [3.0.0.0.301]
2014/10/10 01:30:37	225	Force DHCP disconnected	Informational	Client [00:18:DE:B2:71:B0] disconnected from WLAN [!!!Lawrence-WPA-Mixed] on AP [Lawrence@TDC Office@6C:AA:B3:1A:4C:E0] due to ...
2014/10/10 01:30:26	225	Force DHCP disconnected	Informational	Client [00:18:DE:B2:71:B0] disconnected from WLAN [!!!Lawrence-WPA-Mixed] on AP [Lawrence@TDC Office@6C:AA:B3:1A:4C:E0] due to ...
2014/10/10 01:30:00	951	Memory threshold exceeded	Critical	Memory threshold [80%] exceeded on control plane [Fong-Alpha2PG1-C].
2014/10/10 01:30:00	951	Memory threshold exceeded	Critical	Memory threshold [80%] exceeded on control plane [Fong-Alpha1PG1-C].
2014/10/10 01:29:03	225	Force DHCP disconnected	Informational	Client [00:18:DE:B2:71:B0] disconnected from WLAN [!!!Lawrence-WPA-Mixed] on AP [Lawrence@TDC Office@6C:AA:B3:1A:4C:E0] due to ...
2014/10/10 01:28:58	306	AP channel updated	Informational	AP [SDCCotDot7372-@-Home@2C:5D:93:08:69:00] detected interference on radio [11g/n] and has switched from channel [5] to channel [4].
2014/10/10 01:28:52	225	Force DHCP disconnected	Informational	Client [00:18:DE:B2:71:B0] disconnected from WLAN [!!!Lawrence-WPA-Mixed] on AP [Lawrence@TDC Office@6C:AA:B3:1A:4C:E0] due to ...
2014/10/10 01:26:59	306	AP channel updated	Informational	AP [Albert-Office-MAP157@24:C9:A1:02:47:E0] detected interference on radio [11g/n] and has switched from channel [4] to channel [6].
2014/10/10 01:25:16	427	RAP downlink disconnected...	Informational	MAP [Inf-O_B2_Map@54:3D:37:1E:5F:A0] disconnects from RAP [RuckRoof@8C:0C:90:12:2C:D0].
2014/10/10 01:25:00	951	Memory threshold exceeded	Critical	Memory threshold [80%] exceeded on control plane [Fong-Alpha1PG1-C].
2014/10/10 01:25:00	951	Memory threshold exceeded	Critical	Memory threshold [80%] exceeded on control plane [Fong-Alpha2PG1-C].
2014/10/10 01:24:15	2001	ZD AP Migrating	Informational	ZD-AP [8C:0C:90:2E:93:D0] / [491204002282] model [ZF7351] is upgrading with SCG AP firmware version - [3.0.0.0.301]
2014/10/10 01:24:15	2004	ZD AP Migration Failed	Major	ZD-AP [8C:0C:90:2E:93:D0] / [491204002282] model [ZF7351] is failed to upgrade with SCG AP firmware version - [3.0.0.0.301]
2014/10/10 01:24:00	306	AP channel updated	Informational	AP [Inf-O_B1_e-map@C0:8A:DE:3F:06:D0] detected interference on radio [11a/n] and has switched from channel [132] to channel [112].

Table 11 lists the event details that are displayed on the *Events* page.

Table 11. Event details

Column Name	Description
Date and Time	Date and time when the event occurred
Code	Event code (see the *Alarm and Event Reference Guide* for your controller platform for more information)
Event Type	Type of event that occurred (for example, AP configuration updated)

Table 11. Event details

Column Name	Description
Severity	Severity level assigned to the event. Possible values include (from most severe to least severe): • Critical • Major • Minor • Warning • Information
Activity	Displays additional details about the event, including (if available) the specific access point, control plane, or data plane that triggered the event

Exporting the Event List to CSV

Follow these steps to export the event list to a CSV file.

1. Go to *Monitor* > *All Events*.
2. Click the **Export CSV** button in the content area.
3. Check the default download folder of your web browser and look for a file named `events.csv`.
4. Use a spreadsheet application (for example, Microsoft™ Excel™) to view the contents of the CSV file.

You have completed exporting the event list to CSV.

Monitoring Administrator Activities

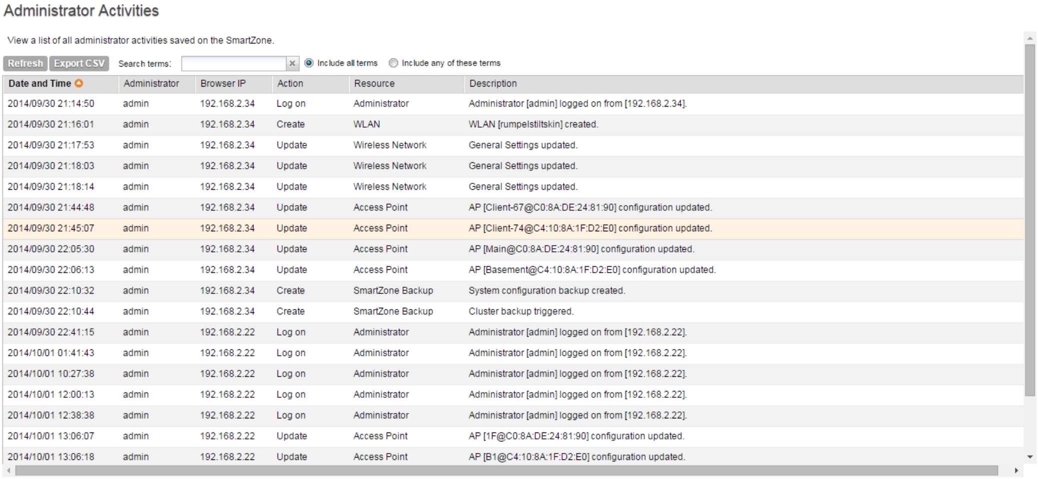
The controller keeps a record of all actions and configuration changes that administrators perform on the server. This feature enables you and other administrators in the organization to determine what changes were made to the controller and by whom.

Follow these steps to view a record of actions that were performed by administrators.

Go to *Monitor* > *Administrator Activities*. The *Administrator Activities* page displays the 20 most recent administrator actions.

NOTE: By default, the *Administrator Activities* page displays up to 20 administrator actions per page. You can change the number of administrator actions to display per page by selecting a number in **Show**. Options range from 10 to 250 entries per page. Alternatively, you can click the **>>** (next) link to display the next 20 administrator actions on another page.

Figure 111. The Administrator Activities page displays the most recent administrator actions



Administrator Activities

View a list of all administrator activities saved on the SmartZone.

Date and Time	Administrator	Browser IP	Action	Resource	Description
2014/09/30 21:14:50	admin	192.168.2.34	Log on	Administrator	Administrator [admin] logged on from [192.168.2.34].
2014/09/30 21:16:01	admin	192.168.2.34	Create	WLAN	WLAN [rumpelstiltskin] created.
2014/09/30 21:17:53	admin	192.168.2.34	Update	Wireless Network	General Settings updated.
2014/09/30 21:18:03	admin	192.168.2.34	Update	Wireless Network	General Settings updated.
2014/09/30 21:18:14	admin	192.168.2.34	Update	Wireless Network	General Settings updated.
2014/09/30 21:44:48	admin	192.168.2.34	Update	Access Point	AP [Client-67@C0:8A:DE:24:81:90] configuration updated.
2014/09/30 21:45:07	admin	192.168.2.34	Update	Access Point	AP [Client-74@C4:10:8A:1F:D2:E0] configuration updated.
2014/09/30 22:05:30	admin	192.168.2.34	Update	Access Point	AP [Main@C0:8A:DE:24:81:90] configuration updated.
2014/09/30 22:06:13	admin	192.168.2.34	Update	Access Point	AP [Basement@C4:10:8A:1F:D2:E0] configuration updated.
2014/09/30 22:10:32	admin	192.168.2.34	Create	SmartZone Backup	System configuration backup created.
2014/09/30 22:10:44	admin	192.168.2.34	Create	SmartZone Backup	Cluster backup triggered.
2014/09/30 22:41:15	admin	192.168.2.22	Log on	Administrator	Administrator [admin] logged on from [192.168.2.22].
2014/10/01 01:41:43	admin	192.168.2.22	Log on	Administrator	Administrator [admin] logged on from [192.168.2.22].
2014/10/01 10:27:38	admin	192.168.2.22	Log on	Administrator	Administrator [admin] logged on from [192.168.2.22].
2014/10/01 12:00:13	admin	192.168.2.22	Log on	Administrator	Administrator [admin] logged on from [192.168.2.22].
2014/10/01 12:38:38	admin	192.168.2.22	Log on	Administrator	Administrator [admin] logged on from [192.168.2.22].
2014/10/01 13:06:07	admin	192.168.2.22	Update	Access Point	AP [1F@C0:8A:DE:24:81:90] configuration updated.
2014/10/01 13:06:18	admin	192.168.2.22	Update	Access Point	AP [B1@C4:10:8A:1F:D2:E0] configuration updated.

Table 12 lists the administrator activity details that are displayed on the *Administrator Activities* page.

Table 12. Administrator activity details

Column Name	Description
Date and Time	Date and time when the alarm was triggered
Administrator	Name of the administrator who performed the action
Browser IP	IP address of the browser that the administrator used to log on to the controller
Action	Action performed by the administrator
Resource	Target of the action performed by the administrator. For example, if the action is `Create` and the object is `Hotspot Service`, this means that the administrator created a new hotspot portal.
Description	Displays additional details about the action. For example, if the administrator created a new hotspot portal, this column may show the following: `Hotspot [company_hotspot] created`

Exporting the Administrator Activity List to CSV

Follow these steps to export the administrator activity list to a CSV file.

1 Go to *Monitor* > *Administrator Activities*.

2 Click the **Export CSV** button in the content area.

3 Check the default download folder for your web browser and look for a file named `audits.csv`.

4 Use a spreadsheet application (for example, Microsoft™ Excel™) to view the contents of the CSV file.

You have completed exporting the administrator activity list to CSV.

Working with Reports 7

In this chapter:

- Types of Reports
- Creating a New Report
- Viewing a List of Existing Reports
- Deleting a Report

Types of Reports

The controller provides the following types of reports:

- Client Number Report
- Client Number vs Airtime Report
- Continuously Disconnected APs Report
- Failed Client Associations Report
- New Client Associations Report
- System Resource Utilization Report
- TX/RX Bytes Report

Client Number Report

The *Client Number* report shows a historical view of the maximum and minimum number of clients connect to the system. Client number can be shown in different time intervals for a specified duration. The report can be generated based on a specific AP, SSID, or radio.

Client Number vs Airtime Report

The *Client Number vs Airtime* report shows a historical view of the average number of clients connected to the system and the corresponding airtime (TX, RX, Busy). Client number and airtime can be shown in different time intervals for a specified duration. The report can be generated based on a specific AP or radio.

Continuously Disconnected APs Report

The *Continuously Disconnected APs* report shows a list of access points disconnected within the specified time range.

Failed Client Associations Report

The *Failed Client Associations* report shows a historical view of the number of failed client associations. Failed client associations can be shown in different time intervals for a specified duration. The report can be generated based on a specific AP, SSID, or radio.

New Client Associations Report

The *New Client Associations* report shows a historical view of the number of new client associations. New client Associations can be shown in different time intervals for a specified duration. The report can be generated based on a specific AP, SSID, or radio.

System Resource Utilization Report

The *System Resource Utilization* report shows a historical view of the CPU and memory usage of the system. The CPU and memory usage can be shown in different time intervals for a specific duration. The report can be generated based on specific plane.

TX/RX Bytes Report

The *TX/RX Bytes* report shows a historical view of the transmitted (TX) and received (RX) bytes of the system. The transmitted and received bytes can be shown in different time intervals for a specified duration. The report can be generated based on a specific AP, SSID or radio.

Creating a New Report

Follow these steps to create a new report.

1. On the *Saved Reports List* page, click **Create New**. The *Create New Report* form appears.
2. Complete the following steps to create a new report:

   Step 1: Define the General Report Details
   Step 2: Define the Resource Filter Criteria
   Step 3: Define the Time Filter
   Step 4: Define the Report Generation Schedule
   Step 5: Enable Email Notifications (Optional)
   Step 7: Save the Report

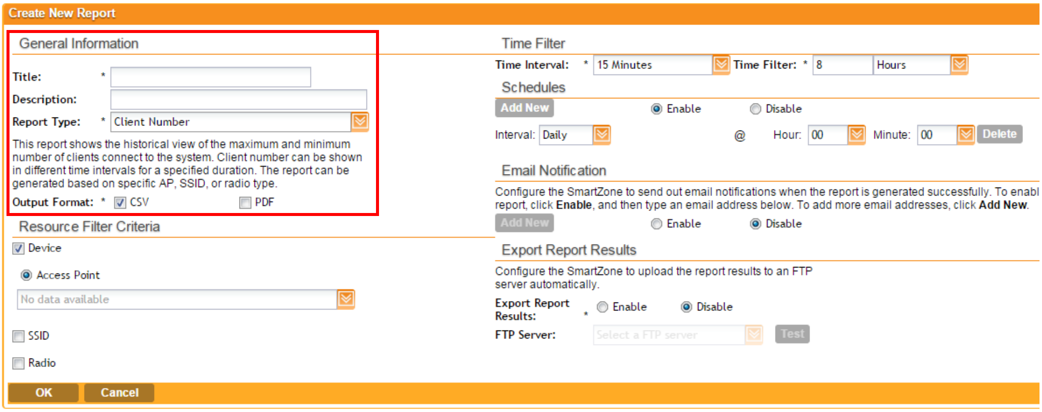
Step 1: Define the General Report Details

Configure the following options in the *General Information* section.

- *Title*: Type a name for the report that you are creating.
- *Description*: Type a brief description for the report.
- *Report Type*: Select the type of report that you want to create. For detailed description of the various report types, refer to Types of Reports.
- *Output Format*: Select the format in which the controller will generate the report. You can select one or both of the following check boxes:
  - **CSV**: A comma-separated version of the report. You will need a spreadsheet application (for example, Microsoft™ Excel™) to view the report in CSV format.
  - **PDF**: A portable document format version of the report. You will need a PDF reader (for example, Adobe™ Acrobat™) to view the report in PDF.

Continue to Step 2: Define the Resource Filter Criteria.

Figure 112. The General Information section



Create New Report

General Information

Title: *

Description:

Report Type: * Client Number

This report shows the historical view of the maximum and minimum number of clients connect to the system. Client number can be shown in different time intervals for a specified duration. The report can be generated based on specific AP, SSID, or radio type.

Output Format: * ☑ CSV □ PDF

Resource Filter Criteria

☑ Device

● Access Point

No data available

□ SSID

□ Radio

OK Cancel

Time Filter

Time Interval: * 15 Minutes Time Filter: * 8 Hours

Schedules

Add New ● Enable ○ Disable

Interval: Daily @ Hour: 00 Minute: 00 Delete

Email Notification

Configure the SmartZone to send out email notifications when the report is generated successfully. To enabl report, click **Enable**, and then type an email address below. To add more email addresses, click **Add New**.

Add New ○ Enable ● Disable

Export Report Results

Configure the SmartZone to upload the report results to an FTP server automatically.

Export Report Results: * ○ Enable ● Disable

FTP Server: Select a FTP server Test

Step 2: Define the Resource Filter Criteria

In this step, you will define the resources upon which the report that you are creating will be generated. Configure the following options in the *Resource Filter Criteria* section.

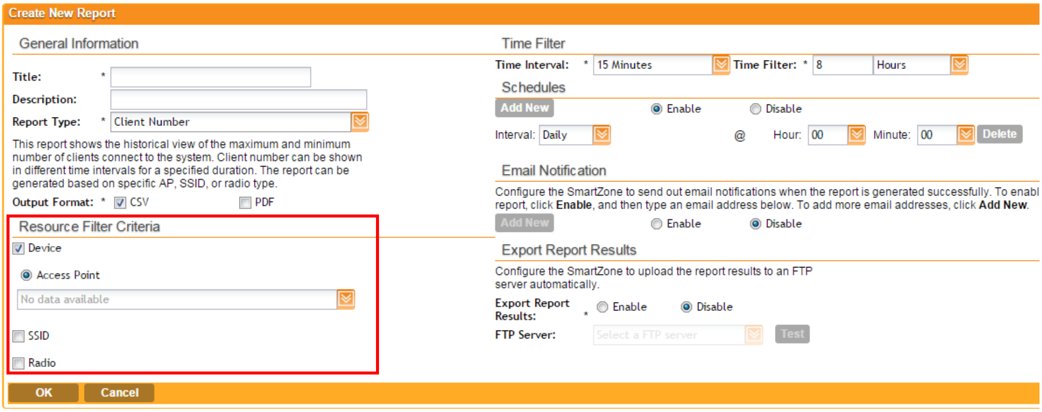
- **Device**: Select one of the following device resources:
  - **Access Point**: If you base the report upon this device resource, you must select the name of the specific access point from the drop-down list. You can only select one access point to include in the report.
- **SSID**: Select the SSID or SSIDs that you want to include in the report. If you want to include multiple SSIDs in the report, select the SSIDs from the drop-down list one at a time. To delete an SSID that you selected previously, click the ✖ icon next to the SSID.

  If you do not select an SSID, all existing SSIDs that belong to the device resource you selected in **Device** will be included in the report.
- **Radio**: Select the radio (2.4G or 5G) that you want to include in the report. If you do not select a radio, both 2.4G and 5G radios belong to the device resource you selected in **Device** will be included in the report.

NOTE: You must select at least one resource. You can also select and define all three available resources.

Continue to Step 3: Define the Time Filter.

Figure 113. The Resource Filter Criteria section



Create New Report

General Information

Title: *

Description:

Report Type: * Client Number

This report shows the historical view of the maximum and minimum number of clients connect to the system. Client number can be shown in different time intervals for a specified duration. The report can be generated based on specific AP, SSID, or radio type.

Output Format: * ☑ CSV □ PDF

Resource Filter Criteria

☑ Device

● Access Point

No data available

□ SSID

□ Radio

Time Filter

Time Interval: * 15 Minutes Time Filter: * 8 Hours

Schedules

● Enable ○ Disable

Interval: Daily @ Hour: 00 Minute: 00

Email Notification

Configure the SmartZone to send out email notifications when the report is generated successfully. To enabl report, click **Enable**, and then type an email address below. To add more email addresses, click **Add New**.

○ Enable ● Disable

Export Report Results

Configure the SmartZone to upload the report results to an FTP server automatically.

Export Report Results: * ○ Enable ● Disable

FTP Server: Select a FTP server

Step 3: Define the Time Filter

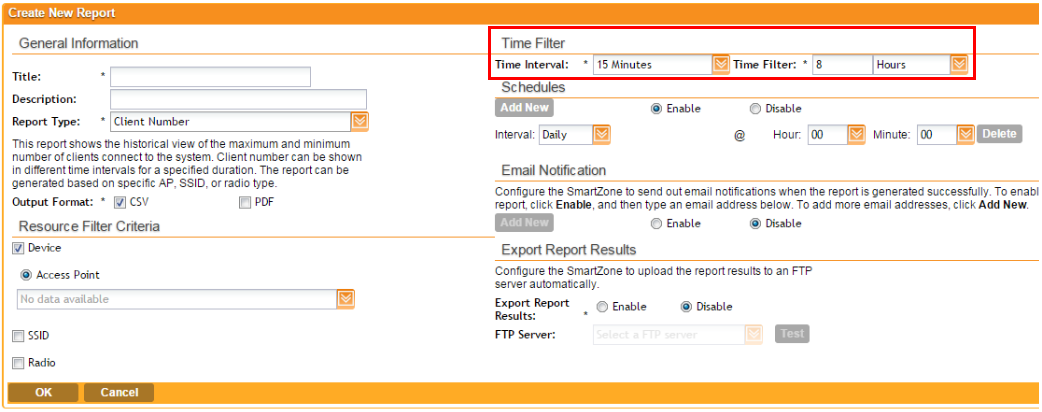
In this step, you will define the time filter to use when generating the report. Configure the following options in the *Time Filter* section.

- *Time Interval*: Select the interval at which to generate the report. Available time interval options include:
  - 15 Minutes
  - Hourly
  - Daily
  - Monthly
- *Time Filter*: Select the time or date period for which to generate the report. Depending on the time interval that you set above, available periods include:
  - Hours
  - Days
  - Months

NOTE: The controller uses this time interval-time filter combination to determine the period from which to generate the report and how often to generate it.

Continue to Step 4: Define the Report Generation Schedule.

Figure 114. The Time Filter section



General Information

Title: *

Description:

Report Type: * Client Number

This report shows the historical view of the maximum and minimum number of clients connect to the system. Client number can be shown in different time intervals for a specified duration. The report can be generated based on specific AP, SSID, or radio type.

Output Format: * ☑ CSV ☐ PDF

Resource Filter Criteria

☑ Device

● Access Point

No data available

☐ SSID

☐ Radio

Time Filter

Time Interval: * 15 Minutes Time Filter: * 8 Hours

Schedules

● Enable ○ Disable

Interval: Daily @ Hour: 00 Minute: 00

Email Notification

Configure the SmartZone to send out email notifications when the report is generated successfully. To enabl report, click **Enable**, and then type an email address below. To add more email addresses, click **Add New**.

○ Enable ● Disable

Export Report Results

Configure the SmartZone to upload the report results to an FTP server automatically.

Export Report Results: * ○ Enable ● Disable

FTP Server: Select a FTP server

Step 4: Define the Report Generation Schedule

In this step, you will define the report generation schedule. Configure the following options in the *Schedules* section.

1 In the *Schedules* section, click **Add New**.

2 In *Interval*, select one of the following time intervals:

- **Monthly**: If you select this interval, select the day of the month in **Every** when the controller will generate the report.
- **Weekly**: If you select this interval, select the day of the week in **Every** when the controller will generate the report.
- **Daily**
- **Hourly**

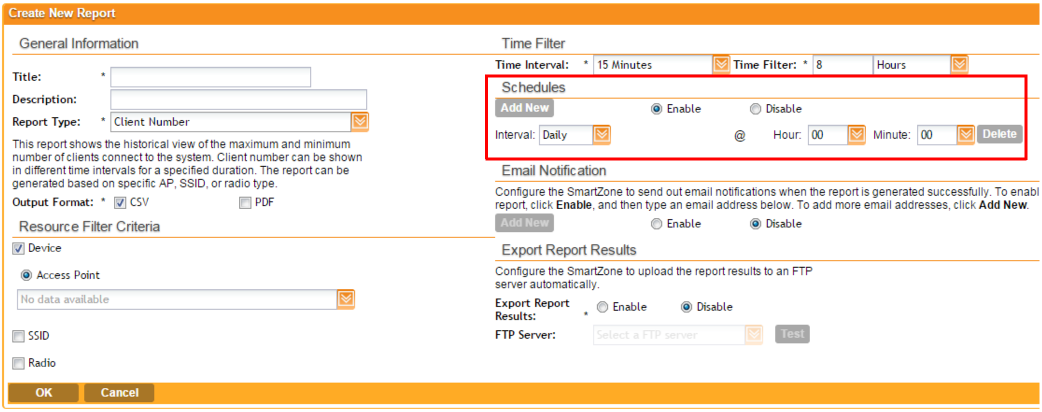
3 In *@Hour* (except when **Hourly** interval is selected above), select the hour of the day when the controller will generate the report. The controller uses the 24-hour clock format.

4 In *Minute*, select the minute of the hour when the controller will generate the report. This minute setting will be used in conjunction with the hour setting that you selected above (except when Hourly interval is selected).

5 If you want to add more schedules, click the **Add New** button again, and then repeat steps 2-4. You can create as many schedules as required. Schedules may overlap if needed.

6 Continue to Step 5: Enable Email Notifications (Optional).

Figure 115. The Time Filter section



Create New Report

General Information

Title: *

Description:

Report Type: * Client Number

This report shows the historical view of the maximum and minimum number of clients connect to the system. Client number can be shown in different time intervals for a specified duration. The report can be generated based on specific AP, SSID, or radio type.

Output Format: * ☑ CSV □ PDF

Resource Filter Criteria

☑ Device

● Access Point

No data available

□ SSID

□ Radio

Time Filter

Time Interval: * 15 Minutes Time Filter: * 8 Hours

Schedules

● Enable ○ Disable

Interval: Daily @ Hour: 00 Minute: 00

Email Notification

Configure the SmartZone to send out email notifications when the report is generated successfully. To enabl report, click **Enable**, and then type an email address below. To add more email addresses, click **Add New**.

○ Enable ● Disable

Export Report Results

Configure the SmartZone to upload the report results to an FTP server automatically.

Export Report Results: * ○ Enable ● Disable

FTP Server: Select a FTP server

Step 5: Enable Email Notifications (Optional)

In this optional step, you can configure the controller to send email notifications whenever a report has been generated. Configure the following in the *Email Notification* section.

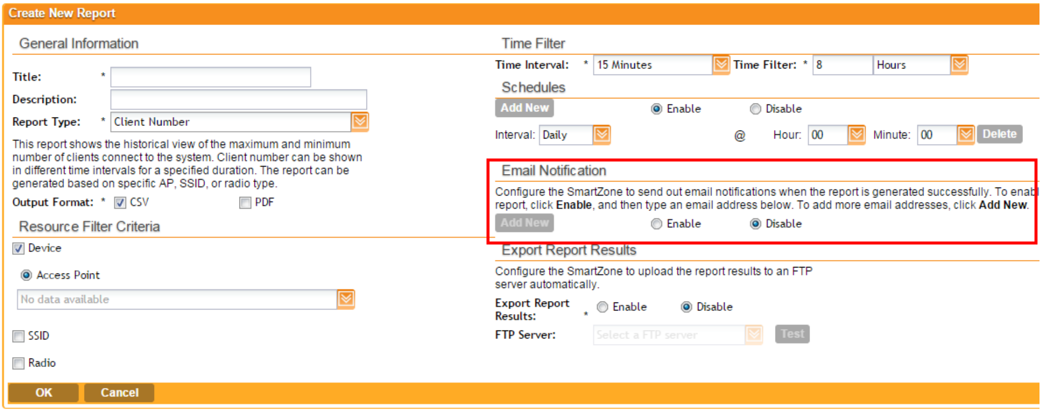
NOTE: Make sure you configure the SMTP settings (see Configuring an External Email Server). If the SMTP settings are not configured, the controller will be unable to send out email notifications even if you enable this feature in this section.

1. In the *Email Notification* section, click the **Enable** button.
2. In the text box below, type the email address to which to send the notification.
3. To add another email address, click **Add New**, and then type the second email address in the text box that appears.

NOTE: You can add as many email addresses as needed by clicking the Add New button, and then typing an additional email address. Note, though, that you must only type a single email address in each text box.

4. Continue to Step 6: Export the Report to an FTP Server (Optional).

Figure 116. The Email Notification section



Create New Report

General Information

Title: *

Description:

Report Type: * Client Number

This report shows the historical view of the maximum and minimum number of clients connect to the system. Client number can be shown in different time intervals for a specified duration. The report can be generated based on specific AP, SSID, or radio type.

Output Format: * ☑ CSV ☐ PDF

Resource Filter Criteria

☑ Device

● Access Point

No data available

☐ SSID

☐ Radio

Time Filter

Time Interval: * 15 Minutes Time Filter: * 8 Hours

Schedules

Add New ● Enable ○ Disable

Interval: Daily @ Hour: 00 Minute: 00 Delete

Email Notification

Configure the SmartZone to send out email notifications when the report is generated successfully. To enabl report, click **Enable**, and then type an email address below. To add more email addresses, click **Add New**.

Add New ○ Enable ● Disable

Export Report Results

Configure the SmartZone to upload the report results to an FTP server automatically.

Export Report Results: * ○ Enable ● Disable

FTP Server: Select a FTP server Test

OK Cancel

Step 6: Export the Report to an FTP Server (Optional)

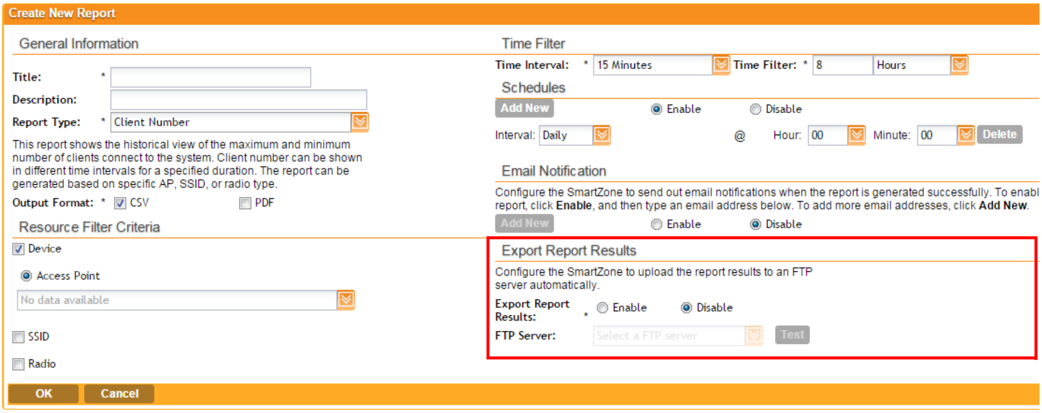
In this optional step, you can configure the controller to automatically upload a copy of a report to an external FTP server whenever it is generated. Configure the following in the *Export Report Results* section.

1 In *Export Report Results*, click **Enable**.

2 In *FTP Server*, select the FTP server to which you want to automatically export the reports. The FTP server options that appear here are those that you created in Configuring External FTP Servers.

3 Continue to Step 7: Save the Report

Figure 117. The Email Notification section



Create New Report

General Information

Title: *

Description:

Report Type: * Client Number

This report shows the historical view of the maximum and minimum number of clients connect to the system. Client number can be shown in different time intervals for a specified duration. The report can be generated based on specific AP, SSID, or radio type.

Output Format: * ☑ CSV ☐ PDF

Resource Filter Criteria

☑ Device

● Access Point

No data available

☐ SSID

☐ Radio

Time Filter

Time Interval: * 15 Minutes Time Filter: * 8 Hours

Schedules

Add New ● Enable ○ Disable

Interval: Daily @ Hour: 00 Minute: 00 Delete

Email Notification

Configure the SmartZone to send out email notifications when the report is generated successfully. To enabl report, click **Enable**, and then type an email address below. To add more email addresses, click **Add New**.

Add New ○ Enable ● Disable

Export Report Results

Configure the SmartZone to upload the report results to an FTP server automatically.

Export Report Results: * ○ Enable ● Disable

FTP Server: Select a FTP server Test

OK Cancel

Step 7: Save the Report

After you complete steps 1 through 5, review the settings that you have configured to make sure they are correct. To save the report, click **OK** at the bottom of the page. The page refreshes, and the report that you created appears in the *Saved Report List* page.

You have completed creating a report.

Viewing a List of Existing Reports

Follow these steps to view a list of reports that have been configured.

Go to **Report** > **Saved Reports**. The *Saved Report List* page appears, displaying a summary of all reports that have been configured. Summary details include:

- Title
- Description
- Report Template
- Time Filter
- Resource Filter
- Schedule
- Status
- Actions that you can perform

To view a report, click the 🔍 icon that is in the same row as the report name. The *Report Result* page appears, displaying versions of the report that have been generated based on the time interval defined in the report schedule. To download and view a comma-separated value (CSV) version of the report, click the **CSV** link that is in the same row as the version that you want to view.

Deleting a Report

Follow these steps to delete an existing report.

1. Go to **Report** > **Saved Reports**. The *Saved Report List* page appears, displaying a summary of all reports that have been configured.
2. From the list of reports, locate the report that you want to delete.
3. Once you locate the report, click the 🗑 icon that is under the *Actions* column. A confirmation message appears.

4 Click **OK**. The list of reports refreshes, and then the report that you deleted disappears from the list.

You have completed deleting a report.

Performing Administrative Tasks 8

In this chapter:

- Backing Up and Restoring Clusters
- Backing Up and Restoring the Controller's Network Configuration from an FTP Server
- Backing Up and Restoring System Configuration
- Resetting a Node to Factory Settings
- Upgrading the Controller
- Working with Logs
- Managing Licenses
- Managing AP Certificate Replacement

Backing Up and Restoring Clusters

Back up the controller cluster periodically to ensure that you can restore the control plane, data plane, and AP firmware versions as well as the system configuration in the cluster if is a system failure occurs.

This section covers the following topics:

- Creating a Cluster Backup
- Restoring a Cluster Backup
- Deleting a Cluster Backup

NOTE: If you are managing an SZ-100, you can also perform these procedures from the command line interface. Note, however, that you will need to execute the commands on each node. For more information, see the *SmartZone 100 Command Line Interface Reference Guide*.

Creating a Cluster Backup

Follow these steps to back up an entire controller cluster.

1 Take note of the current system time. You can view the system time on the *Configuration* > *System* > *System Time*.

2 Go to *Administration* > *Cluster Backup & Restore*.

3 Click **Back Up Entire Cluster**. A confirmation message appears.

4 Click **Yes** to confirm. The following message appears:

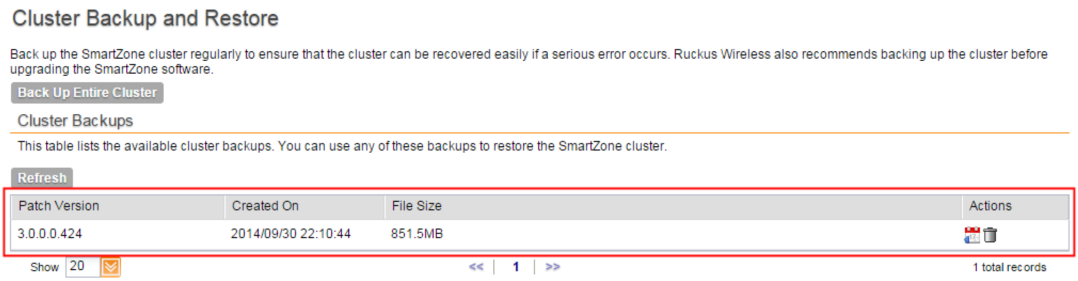
```
The cluster is in maintenance mode. Please wait a few
minutes.
```

When the cluster backup process is complete, a new entry appears in the *Cluster Backups* section with a *Created On* value that is approximate to the time when you started the cluster backup process.

CAUTION! If you have an FTP server, back up the entire cluster and upload the backup files from all the nodes in a cluster to a remote FTP server.

You have completed backing up the controller cluster.

Figure 118. A new entry appears in the Cluster Backups section



Cluster Backup and Restore

Back up the SmartZone cluster regularly to ensure that the cluster can be recovered easily if a serious error occurs. Ruckus Wireless also recommends backing up the cluster before upgrading the SmartZone software.

Cluster Backups

This table lists the available cluster backups. You can use any of these backups to restore the SmartZone cluster.

Patch Version	Created On	File Size	Actions
3.0.0.424	2014/09/30 22:10:44	851.5MB	

Restoring a Cluster Backup

Follow these steps to restore a cluster backup.

CAUTION! You must perform the restore procedure on the exact same node where you generated the cluster backup.

1 Go to **Administration** > **Cluster Backup & Restore**.

2 In the *Cluster Backups* section, locate the cluster backup that you want to restore.

3 Click the 📅 icon that is in the same row as the cluster backup. A confirmation message appears.

4 Click **Yes**. The page refreshes, and then a message appears, informing you that the controller will reboot itself. It also show you the progress status.

NOTE: The cluster restore process may take several minutes to complete.

When the restore process is complete, the controller logs you off the web interface automatically.

CAUTION! Do not refresh the controller web interface while the restore process is in progress. Wait for the restore process to complete successfully.

5 Log back on to the controller web interface.

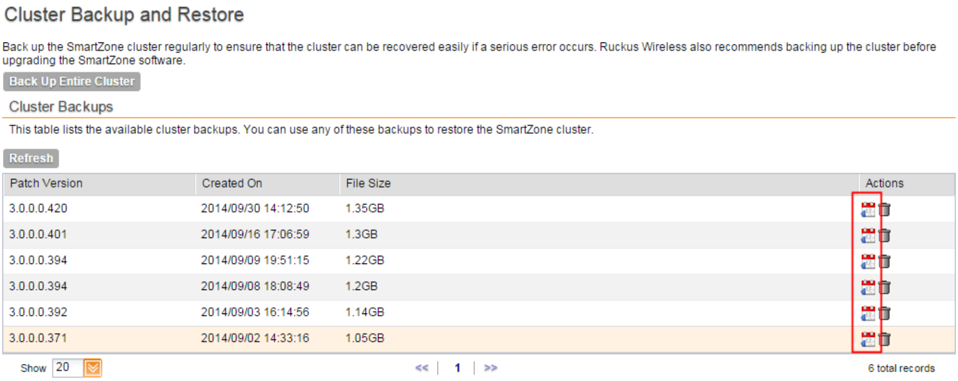
NOTE: If the web interface displays the message "`Cluster is out of service. Please try again in a few minutes.`" appears after you log on to the controller web interface, wait for about three minutes. The dashboard will appear shortly. The message appears because the controller is still initializing its processes.

6 Go to *Administration* > *Upgrade*, and then check the *Current System Information* section and verify that all nodes in the cluster have been restored to the previous version and are all in service.

7 Go to *Administration* > *Diagnostics,* and then click **Application Logs & Status** on the sidebar. Check the *Health Status* column and verify that all of the controller processes are online (see Figure 120).

You have completed restoring the cluster backup.

Figure 119. Under Actions, click the calendar icon to start the cluster restore process



Cluster Backup and Restore

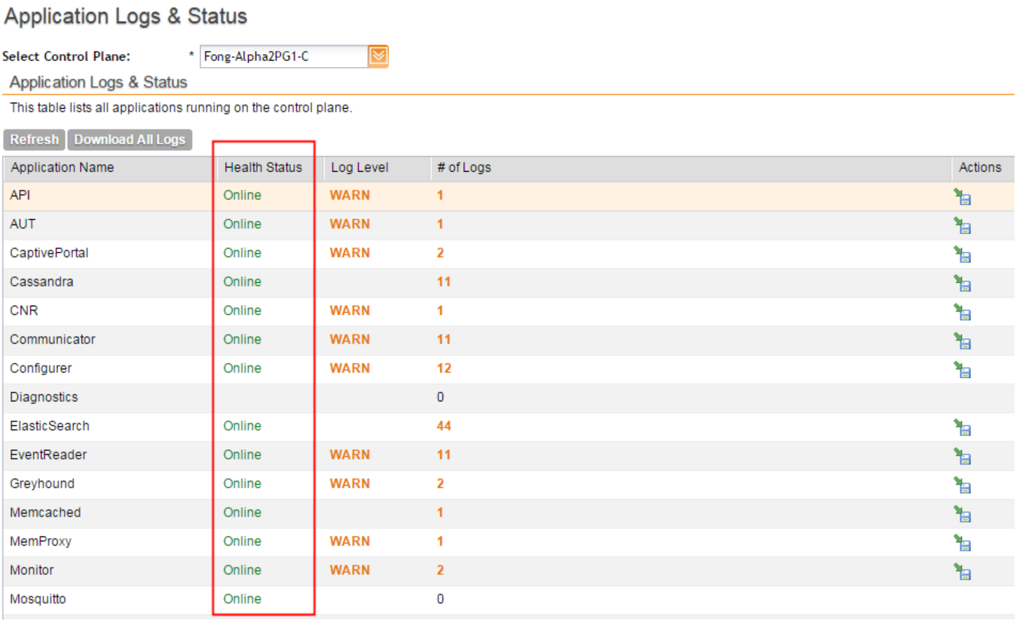
Back up the SmartZone cluster regularly to ensure that the cluster can be recovered easily if a serious error occurs. Ruckus Wireless also recommends backing up the cluster before upgrading the SmartZone software.

Cluster Backups

This table lists the available cluster backups. You can use any of these backups to restore the SmartZone cluster.

Patch Version	Created On	File Size	Actions
3.0.0.420	2014/09/30 14:12:50	1.35GB	📅 🗑
3.0.0.401	2014/09/16 17:06:59	1.3GB	📅 🗑
3.0.0.394	2014/09/09 19:51:15	1.22GB	📅 🗑
3.0.0.394	2014/09/08 18:08:49	1.2GB	📅 🗑
3.0.0.392	2014/09/03 16:14:56	1.14GB	📅 🗑
3.0.0.371	2014/09/02 14:33:16	1.05GB	📅 🗑

Figure 120. After the upgrade is complete, go to the Application Logs & Status page and verify that all of the controller processes are online



Application Logs & Status

Select Control Plane: * Fong-Alpha2PG1-C

Application Logs & Status

This table lists all applications running on the control plane.

Application Name	Health Status	Log Level	# of Logs	Actions
API	Online	WARN	1	⬇
AUT	Online	WARN	1	⬇
CaptivePortal	Online	WARN	2	⬇
Cassandra	Online		11	⬇
CNR	Online	WARN	1	⬇
Communicator	Online	WARN	11	⬇
Configurer	Online	WARN	12	⬇
Diagnostics			0	
ElasticSearch	Online		44	⬇
EventReader	Online	WARN	11	⬇
Greyhound	Online	WARN	2	⬇
Memcached	Online		1	⬇
MemProxy	Online	WARN	1	⬇
Monitor	Online	WARN	2	⬇
Mosquitto	Online		0	

Deleting a Cluster Backup

Follow these steps to delete a cluster backup.

1. Go to **Administration** > **Cluster Backup and Restore**.
2. In the *Cluster Backups* section, locate the cluster backup that you want to delete.
3. Click the 🗑 icon that is in the same row as the cluster backup. The following confirmation message appears:

   ```
   Are you sure you want to delete the selected resource?
   ```
4. Click **Yes**. The page refreshes and the row is deleted from the *Cluster Backups* list.

Backing Up and Restoring the Controller's Network Configuration from an FTP Server

In addition to backing up and restoring the controller's network configuration from its own database, the controller supports backup and restore of its network configuration from an FTP server using the CLI. This section describes the requirements for backing up and restoring the controller network configuration from an FTP server, the information that is included in the backup file, and how to perform the backup and restore process.

Requirements

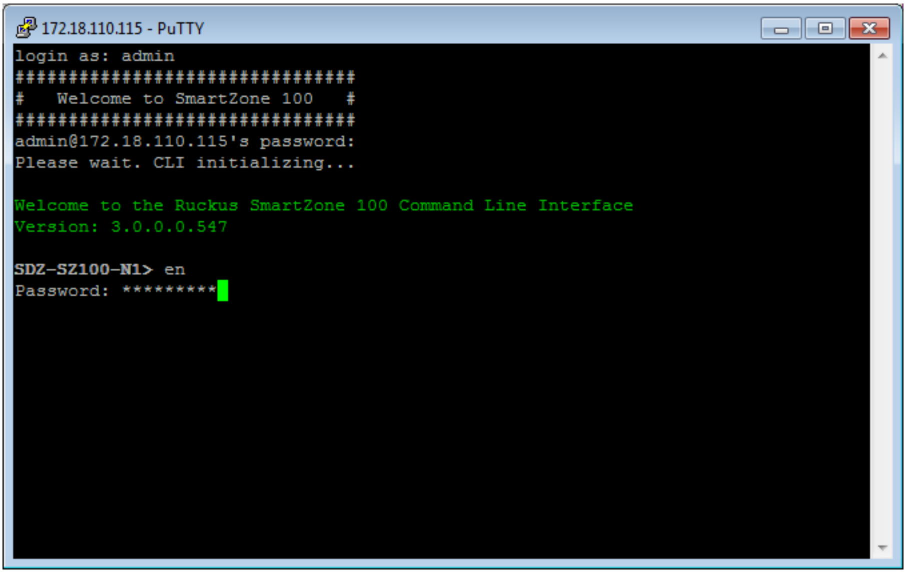
To back up and restore the controller network configuration from an FTP server, the controller must have already been set up and in service. In case of a multi-node cluster, all the nodes in the cluster must be in service.

Backing Up to an FTP Server

Follow these steps to back up the controller network configuration to an FTP server.

1. Log on to the controller from the CLI. See Accessing the Command Line Interface for more information.
2. At the prompt, enter **`en`** to enable privileged mode.

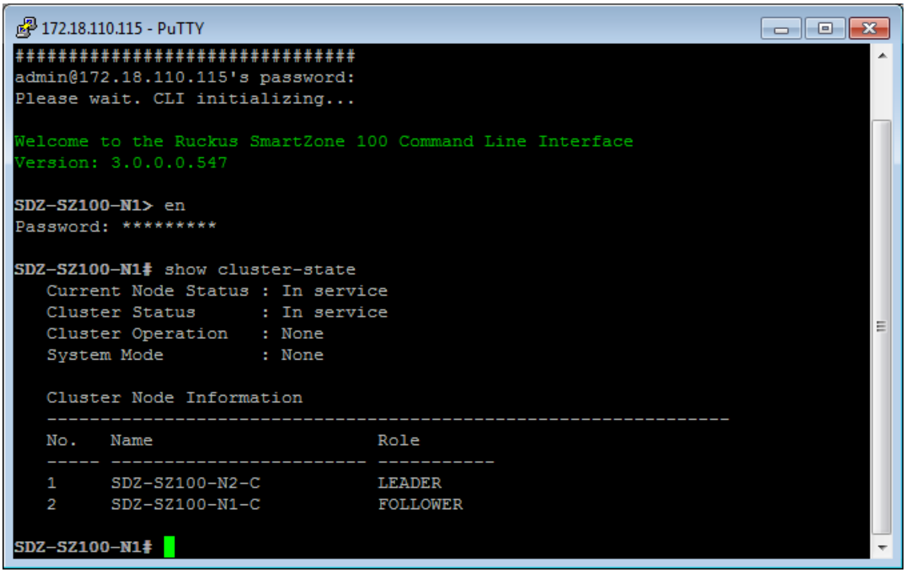
Figure 121. Enable privileged mode



```
login as: admin
################################
#   Welcome to SmartZone 100   #
################################
admin@172.18.110.115's password:
Please wait. CLI initializing...

Welcome to the Ruckus SmartZone 100 Command Line Interface
Version: 3.0.0.0.547

SDZ-SZ100-N1> en
Password: *********
```

3 Enter **`show cluster-state`** to display the statuses of the node and the cluster. Before continuing to the next step, verify that both the node and the cluster are in service.

Figure 122. Verify that both the node and the cluster are in service

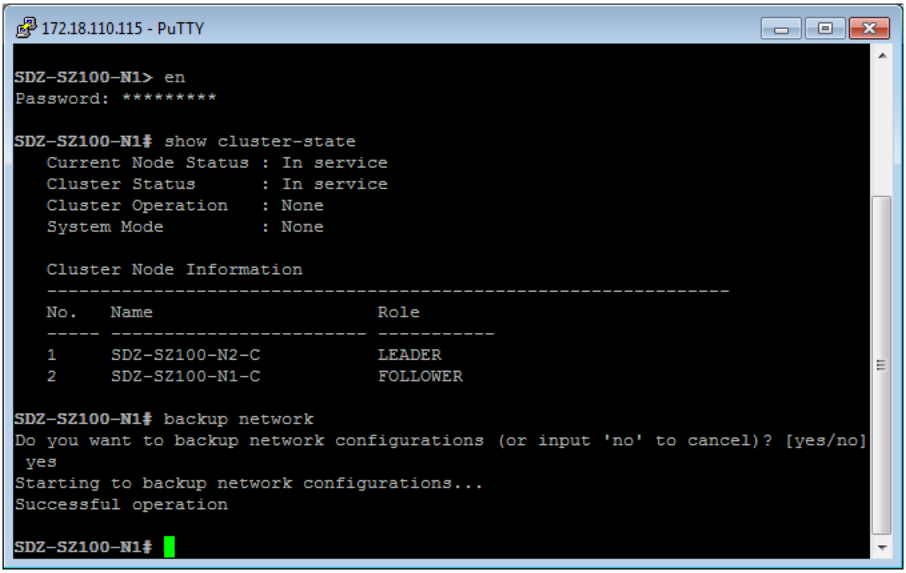


```
################################
admin@172.18.110.115's password:
Please wait. CLI initializing...

Welcome to the Ruckus SmartZone 100 Command Line Interface
Version: 3.0.0.0.547

SDZ-SZ100-N1> en
Password: *********

SDZ-SZ100-N1# show cluster-state
   Current Node Status : In service
   Cluster Status      : In service
   Cluster Operation   : None
   System Mode         : None

   Cluster Node Information
   ----------------------------------------------------------------
   No.   Name                     Role
   ----- ------------------------ -----------
   1     SDZ-SZ100-N2-C           LEADER
   2     SDZ-SZ100-N1-C           FOLLOWER

SDZ-SZ100-N1#
```

4 Enter **`backup network`** to back up the controller network configuration. A confirmation message appears.

5 Enter **`yes`** to confirm. The controller creates a backup of its network configuration on its database.

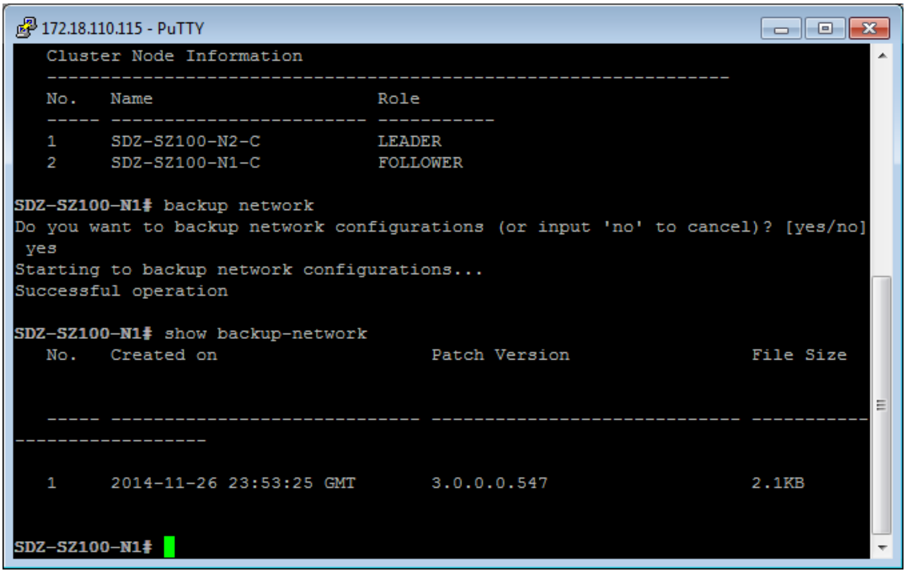
Figure 123. Enter yes to confirm that you want to back up the controller configuration



```
SDZ-SZ100-N1> en
Password: *********

SDZ-SZ100-N1# show cluster-state
   Current Node Status : In service
   Cluster Status      : In service
   Cluster Operation   : None
   System Mode         : None

   Cluster Node Information
   ----------------------------------------------------------------
   No.   Name                     Role
   ----- ------------------------ -----------
   1     SDZ-SZ100-N2-C           LEADER
   2     SDZ-SZ100-N1-C           FOLLOWER

SDZ-SZ100-N1# backup network
Do you want to backup network configurations (or input 'no' to cancel)? [yes/no]
 yes
Starting to backup network configurations...
Successful operation

SDZ-SZ100-N1#
```

6 Enter **`show backup-network`** to view a list of backup files that have been created. Verify that the *Created On* column displays an entry that has a time stamp that is approximate to the time you started the backup.

Figure 124. Enter the "show backup-network" command



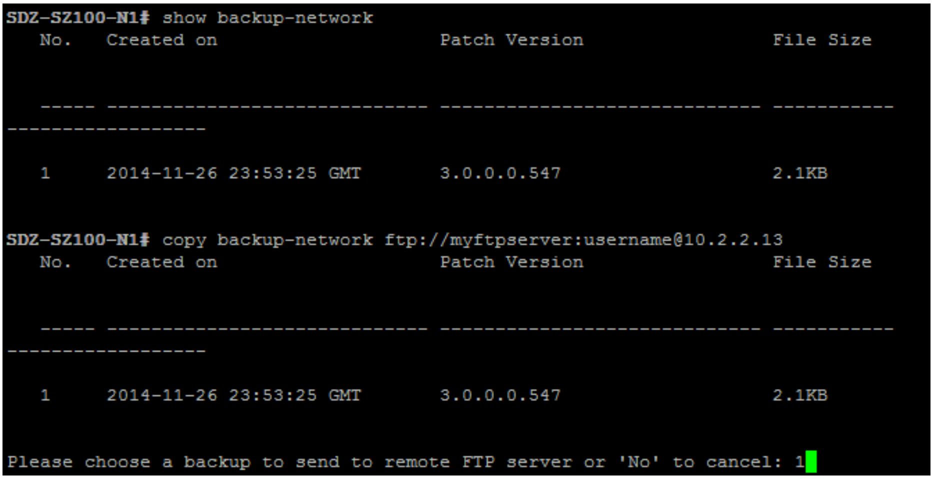
```
   Cluster Node Information
   ----------------------------------------------------------------
   No.   Name                     Role
   ----- ------------------------ -----------
   1     SDZ-SZ100-N2-C           LEADER
   2     SDZ-SZ100-N1-C           FOLLOWER

SDZ-SZ100-N1# backup network
Do you want to backup network configurations (or input 'no' to cancel)? [yes/no]
 yes
Starting to backup network configurations...
Successful operation

SDZ-SZ100-N1# show backup-network
   No.   Created on                    Patch Version                 File Size



   ----- ----------------------------- ----------------------------- -----------
------------------


   1     2014-11-26 23:53:25 GMT       3.0.0.0.547                   2.1KB


SDZ-SZ100-N1#
```

7 Enter **`copy backup-network {ftp-url}`**, where `{ftp-url}` (remove the braces) is the URL or IP address of the FTP server to which you want to back up the cluster configuration.

The console prompts you to choose the number that corresponds to the backup file that you want to export to the FTP server.

8 Enter the number of the backup file that you want to export to the FTP server.

Figure 125. Enter the number that corresponds to the backup file that you want to export to the FTP server



```
SDZ-SZ100-N1# show backup-network
   No.   Created on                    Patch Version                 File Size


   ----- ----------------------------- ----------------------------- -----------
------------------

   1     2014-11-26 23:53:25 GMT       3.0.0.0.547                   2.1KB

SDZ-SZ100-N1# copy backup-network ftp://myftpserver:username@10.2.2.13
   No.   Created on                    Patch Version                 File Size


   ----- ----------------------------- ----------------------------- -----------
------------------

   1     2014-11-26 23:53:25 GMT       3.0.0.0.547                   2.1KB

Please choose a backup to send to remote FTP server or 'No' to cancel: 1
```

The controller encrypts the backup file, and then exports it to the FTP server. When the export process is complete, the following message appears on the CLI:

```
Succeed to copy to remote FTP server
Successful operation
```

9 Using an FTP client, log on to the FTP server, and then verify that the backup file exists. The file format of the backup file is `network_<YYYYMMDDHHmmss>_<controller-version>.bak`.

For example, if you created the backup file on October 24th 2013 at 02:40:22 and the controller version is 2.5.0.0.402, you should see a file named `network_20131024024022_2.5.0.0.402.bak` on the FTP server.

You have completed backing up the controller to an FTP server.

Restoring from an FTP Server

Before you continue, take note of the following limitations with restoring a backup file of the controller's network configuration from an FTP server:

- In this current release, restoring the entire cluster from an FTP server is unsupported. The restore process must be performed on one node at a time.
- Restoring from an FTP server can only be performed using the CLI.

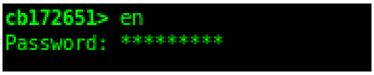
CAUTION! Restoring a backup file to the controller requires restarting all of the controller services.

Follow these steps to restore a backup file of the controller network configuration that you previously uploaded to an FTP back to the controller.

1 Log on to the controller from the CLI. See Accessing the Command Line Interface for more information.

2 At the prompt, enter **`en`** to enable privileged mode.

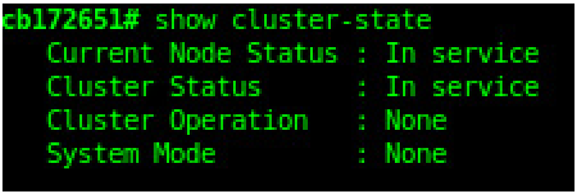
Figure 126. Enable privileged mode



```
cb172651> en
Password: *********
```

3 Enter **`show cluster-state`** to display the statuses of the node and the cluster. Before continuing to the next step, verify that both the node and the cluster are in service.

Figure 127. Verify that both the node and the cluster are in service



```
cb172651# show cluster-state
   Current Node Status : In service
   Cluster Status      : In service
   Cluster Operation   : None
   System Mode         : None
```

4 Enter the following command to log on to the FTP server and check for available backup files that can be copied to the controller:

```
copy <ftp-url> backup-network
```

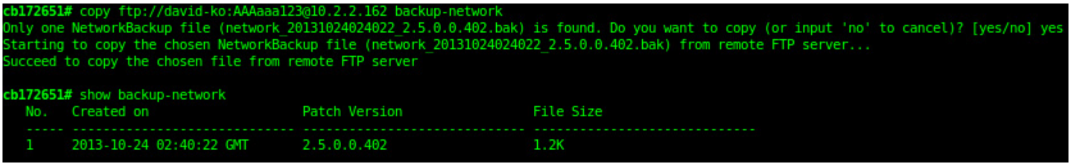
5 If multiple backup files exist on the FTP server, the CLI prompts you to select the number that corresponds to the file that you want to copy back to the controller. If a single backup file exists, the CLI prompts you to confirm that you want to copy the existing backup file to the controller.

When the controller finishes copying the selected backup file from the FTP server back to the controller, the following message appears:

```
Succeed to copy the chosen file from the remote FTP server
```

6 Enter `show backup-network` to verify that the backup file was copied back to the controller successfully.

Figure 128. Verify that the backup file was copied to the controller successfully



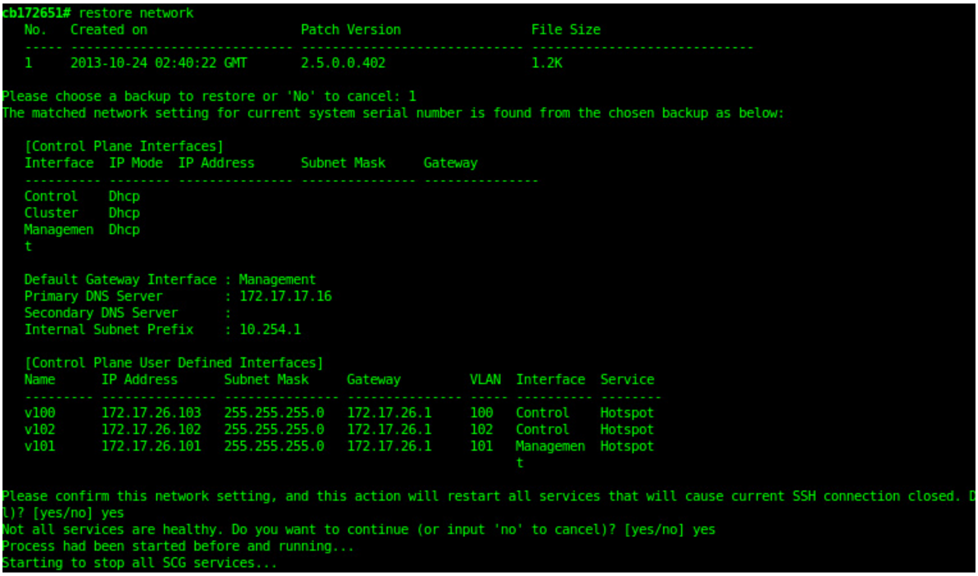
```
cb172651# copy ftp://david-ko:AAAaaa123@10.2.2.162 backup-network
Only one NetworkBackup file (network_20131024024022_2.5.0.0.402.bak) is found. Do you want to copy (or input 'no' to cancel)? [yes/no] yes
Starting to copy the chosen NetworkBackup file (network_20131024024022_2.5.0.0.402.bak) from remote FTP server...
Succeed to copy the chosen file from remote FTP server

cb172651# show backup-network
   No.   Created on                    Patch Version                 File Size
   ----- ----------------------------- ----------------------------- -----------------------------
   1     2013-10-24 02:40:22 GMT       2.5.0.0.402                   1.2K
```

7 Run **`restore network`** to start restoring the contents of the backup file to the current controller. The CLI displays a list of backup files, and then prompts you to select the backup file that you want to restore to the controller.

8 Enter the number that corresponds to the backup file that you want to restore. The CLI displays the network configuration that the selected backup file contains.

If the serial number of the current controller matches the serial number contained in one of the backup files, the CLI automatically selects the backup file to restore and displays the network configuration that it contains.

Figure 129. Enter the number that corresponds to the backup file that you want to restore



```
cb172651# restore network
   No.   Created on                    Patch Version                 File Size
   ----- ----------------------------- ----------------------------- -----------------------------
   1     2013-10-24 02:40:22 GMT       2.5.0.0.402                   1.2K

Please choose a backup to restore or 'No' to cancel: 1
The matched network setting for current system serial number is found from the chosen backup as below:

   [Control Plane Interfaces]
   Interface  IP Mode  IP Address      Subnet Mask     Gateway
   ---------- -------- --------------- --------------- ---------------
   Control    Dhcp
   Cluster    Dhcp
   Managemen  Dhcp
   t

   Default Gateway Interface : Management
   Primary DNS Server        : 172.17.17.16
   Secondary DNS Server      :
   Internal Subnet Prefix    : 10.254.1

   [Control Plane User Defined Interfaces]
   Name      IP Address      Subnet Mask     Gateway         VLAN  Interface  Service
   --------- --------------- --------------- --------------- ----- ---------- --------
   v100      172.17.26.103   255.255.255.0   172.17.26.1     100   Control    Hotspot
   v102      172.17.26.102   255.255.255.0   172.17.26.1     102   Control    Hotspot
   v101      172.17.26.101   255.255.255.0   172.17.26.1     101   Managemen  Hotspot
                                                                   t

Please confirm this network setting, and this action will restart all services that will cause current SSH connection closed. D
l)? [yes/no] yes
Not all services are healthy. Do you want to continue (or input 'no' to cancel)? [yes/no] yes
Process had been started before and running...
Starting to stop all SCG services...
```

9 Type **`yes`** to confirm that you want to restore the selected backup file. The controller starts the restore process and performs the following steps:

a Stop all services.

b Back up the current network configuration. This will enable the controller to roll back to the current configuration, in case there is an issue with the restore process.

c Clean up the current network configuration. The controller deletes its previous network configuration, including static routes, name server, user defined interfaces, etc.

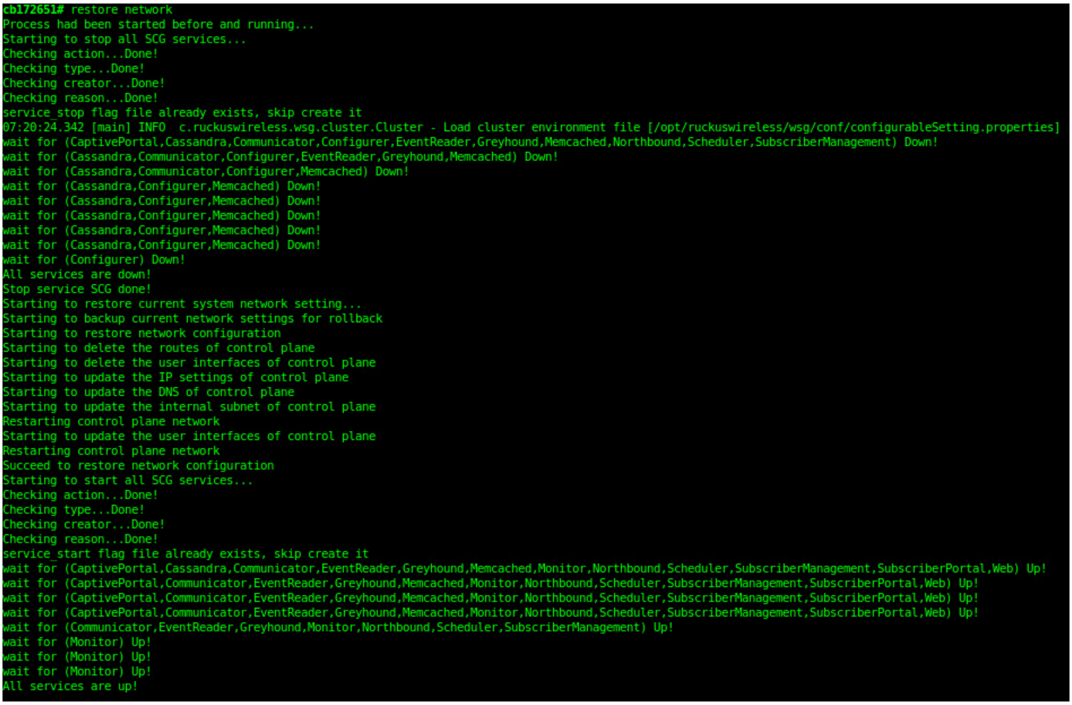
d Restore the network configuration contained in the selected backup file.

e Restart all services.

When the restore process is complete, the following message appears on the CLI:

```
All services are up!
```

Figure 130. The controller performs several steps to restore the backup file

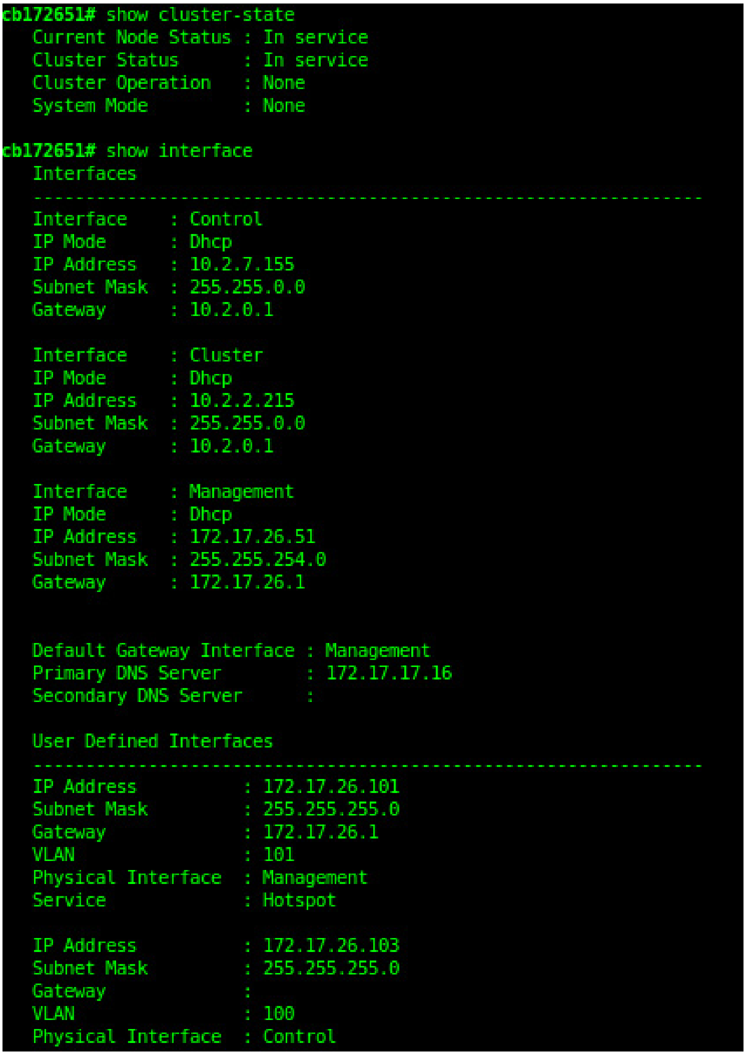


```
cb172651# restore network
Process had been started before and running...
Starting to stop all SCG services...
Checking action...Done!
Checking type...Done!
Checking creator...Done!
Checking reason...Done!
service_stop flag file already exists, skip create it
07:20:24.342 [main] INFO  c.ruckuswireless.wsg.cluster.Cluster - Load cluster environment file [/opt/ruckuswireless/wsg/conf/configurableSetting.properties]
wait for (CaptivePortal,Cassandra,Communicator,Configurer,EventReader,Greyhound,Memcached,Northbound,Scheduler,SubscriberManagement) Down!
wait for (Cassandra,Communicator,Configurer,EventReader,Greyhound,Memcached) Down!
wait for (Cassandra,Communicator,Configurer,Memcached) Down!
wait for (Cassandra,Configurer,Memcached) Down!
wait for (Cassandra,Configurer,Memcached) Down!
wait for (Cassandra,Configurer,Memcached) Down!
wait for (Cassandra,Configurer,Memcached) Down!
wait for (Cassandra,Configurer,Memcached) Down!
wait for (Configurer) Down!
All services are down!
Stop service SCG done!
Starting to restore current system network setting...
Starting to backup current network settings for rollback
Starting to restore network configuration
Starting to delete the routes of control plane
Starting to delete the user interfaces of control plane
Starting to update the IP settings of control plane
Starting to update the DNS of control plane
Starting to update the internal subnet of control plane
Restarting control plane network
Starting to update the user interfaces of control plane
Restarting control plane network
Succeed to restore network configuration
Starting to start all SCG services...
Checking action...Done!
Checking type...Done!
Checking creator...Done!
Checking reason...Done!
service_start flag file already exists, skip create it
wait for (CaptivePortal,Cassandra,Communicator,EventReader,Greyhound,Memcached,Monitor,Northbound,Scheduler,SubscriberManagement,SubscriberPortal,Web) Up!
wait for (CaptivePortal,Communicator,EventReader,Greyhound,Memcached,Monitor,Northbound,Scheduler,SubscriberManagement,SubscriberPortal,Web) Up!
wait for (CaptivePortal,Communicator,EventReader,Greyhound,Memcached,Monitor,Northbound,Scheduler,SubscriberManagement,SubscriberPortal,Web) Up!
wait for (CaptivePortal,Communicator,EventReader,Greyhound,Memcached,Monitor,Northbound,Scheduler,SubscriberManagement,SubscriberPortal,Web) Up!
wait for (Communicator,EventReader,Greyhound,Monitor,Northbound,Scheduler,SubscriberManagement) Up!
wait for (Monitor) Up!
wait for (Monitor) Up!
wait for (Monitor) Up!
All services are up!
```

10 Do the following to verify that the restore process was completed successfully:

- Run **`show cluster-state`** to verify that the node and the cluster are back in service.
- Run **`show interface`** to verify that all of the network configuration settings have been restored.

Figure 131. Verify that the node and cluster are back in service and that the network configuration has been restored successfully



```
cb172651# show cluster-state
   Current Node Status : In service
   Cluster Status      : In service
   Cluster Operation   : None
   System Mode         : None

cb172651# show interface
   Interfaces
   ----------------------------------------------------------------
   Interface    : Control
   IP Mode      : Dhcp
   IP Address   : 10.2.7.155
   Subnet Mask  : 255.255.0.0
   Gateway      : 10.2.0.1

   Interface    : Cluster
   IP Mode      : Dhcp
   IP Address   : 10.2.2.215
   Subnet Mask  : 255.255.0.0
   Gateway      : 10.2.0.1

   Interface    : Management
   IP Mode      : Dhcp
   IP Address   : 172.17.26.51
   Subnet Mask  : 255.255.254.0
   Gateway      : 172.17.26.1


   Default Gateway Interface : Management
   Primary DNS Server        : 172.17.17.16
   Secondary DNS Server      :

   User Defined Interfaces
   ----------------------------------------------------------------
   IP Address          : 172.17.26.101
   Subnet Mask         : 255.255.255.0
   Gateway             : 172.17.26.1
   VLAN                : 101
   Physical Interface  : Management
   Service             : Hotspot

   IP Address          : 172.17.26.103
   Subnet Mask         : 255.255.255.0
   Gateway             :
   VLAN                : 100
   Physical Interface  : Control
```

You have completed importing and applying the network configuration backup from the FTP server to the controller.

Backing Up and Restoring System Configuration

Ruckus Wireless strongly recommends that you back up the controller database periodically. This will help ensure that you can restore the system configuration settings easily if the database becomes corrupted for any reason.

Table 13 lists the information that is included in the system configuration backup file.

Table 13. What's backed up in the system configuration backup file

Configuration Data	Administration Data	Report Data	Identity Data
• Services and profiles • System settings • Administrator accounts	• Cluster backups • System configuration backups • Upgrade settings and history • Uploaded system diagnostic scripts • Installed licenses	• Saved reports • Historical client statistics • Network tunnel statistics	• Created user accounts • Generated guest passes

CAUTION! A system configuration backup does not include control plane settings and user-defined interface settings.

NOTE: If you are managing an SZ-100, you can also perform system configuration backup and restore from the controller's command line interface. For more information, see the *SmartZone 100 Command Line Interface Reference Guide*.

Creating a System Configuration Backup

Follow these steps to create a backup of the controller database.

1. Go to *Administration > Configuration Backup and Restore*.
2. Click **Back Up Configuration**. The following confirmation message appears:

   ```
   Are you sure you want to backup the controller's configuration?
   ```

3. Click **OK**. A progress bar appears as the controller creates a backup of the its database.

When the backup process is complete, the progress bar disappears, and the *Configuration Backup Status* section appears and shows the following information:

- *Latest backup started*: Date and time when configuration backup was initiated
- *Finished at*: Date and time when configuration backup was completed
- *Status*: Shows either `Successful` or `Failed`
- *Progress Status: Shows the current status of the backup process*

The backup file appears under the *System Configuration Backups* section.

Exporting the Configuration Backup to an FTP Server Automatically

In addition to backing up the configuration file manually, you can configure the controller to export the configuration file to an FTP server automatically whenever you click **Back Up Configuration**.

Follow these steps to back up the configuration file to an FTP server automatically.

1. Go to *Administration > System Configuration Backup and Restore.*
2. Go to the *Auto Export Backup* section.
3. In *Auto Export Backup*, click **Enable**.
4. In *FTP Server,* select the FTP server to which you want to export the backup file. The FTP server options that appear here are those that you created in "Configuring External FTP Servers" on page 156.
5. Click **Test**. The controller attempts to establish connection to the FTP server using the user name and password that you supplied. If the connection attempt is successful, the following message appears:

   ```
   FTP server connection established successfully.
   ```

If the connection attempt is unsuccessful, verify that the FTP server details (including the user name and password) are correct, and then click **Test** again.

6 After you verify the controller is able to connect to the FTP server successfully, click **Apply** to save the FTP server settings.

You have completed configuring the controller to export the configuration backup file to an FTP server. When you click the **Back Up Configuration** button (see Creating a System Configuration Backup), a copy of the configuration backup will be uploaded to the FTP server automatically.

Scheduling a Configuration Backup

You also have the option to configure the controller to backup its configuration automatically based on a schedule you specify. Follow these steps to schedule a configuration backup.

1 Go to *Administration* > *Configuration Backup and Restore*.

2 Scroll down to the *Schedule Backup* section.

3 In *Schedule Backup*, click **Enable**.

4 In *Interval*, set the schedule when the controller will automatically create a backup of its configuration. Options include:

- Daily
- Weekly
- Monthly

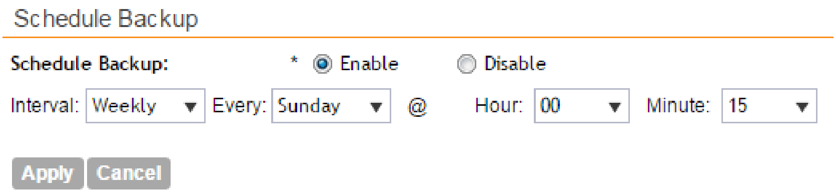
5 Define the schedule further by configuring the following options:

- *Every*: If you selected **Weekly** in the previous step, select the day of the week when the controller will generate the backup. If you selected **Monthly**, select the day of the month.
- *Hour*: Select the hour of the day when the controller will generate the backup.
- *Minute*: Select the minute of the hour.

6 Click **Apply**.

You have completed configuring the controller to create a backup automatically. When a scheduled configuration backup is generated, it appears in the *System Configuration Backups* section.

Figure 132. Configure the schedule in the Schedule Backup section



Schedule Backup

Schedule Backup: * ● Enable ○ Disable

Interval: Weekly ▾ Every: Sunday ▾ @ Hour: 00 ▾ Minute: 15 ▾

Downloading a Copy of the Configuration Backup

After you create a configuration backup, you have the option to download the backup file from the *System Configuration Backups* section. Follow these steps to download the backup file to the computer that you are using to access the controller web interface.

1 Go to *Administration* > *System Configuration Backup and Restore.*

2 Scroll down to the *System Configuration Backups* section.

3 Locate the entry for the backup file that you want to download. If multiple backup files appear in the list, use the date when you created the backup to find the backup entry that you want.

4 Click the 💾 icon that is in the same row as the backup file that you want to download.

Your web browser downloads the backup file to its default download folder.

5 Check the default download folder for your web browser and look for a file that resembles the following naming convention:

```
{Cluster Name}_Backup-
Conf_{MMdd}_db_{MM}_{dd}_{HH}_{mm}.bak
```

For example, if the controller cluster is named `ClusterA` and you created the configuration backup on September 7 at 11:08 AM, the backup file name will be:

```
ClusterA_BackupConf_0907_db_09_07_11_08.bak
```

You have completed downloading a copy of the configuration backup.

Restoring a System Configuration Backup

Follow these steps to restore a backup controller database.

1 Go to *Administration > Configuration Backup and Restore.*

2 In the *System Configuration Backups* section, locate the backup file that you want to restore.

3 Once you locate the backup file, click the 📅 icon that is in the same row as the backup file. A confirmation message appears.

NOTE: Take note of the backup version that you are using. At the end of this procedure, you will use the backup version to verify that the restore process was completed successfully.

---

4 Click **Yes**. The following message appears:

```
System is restoring. Please wait...
```

When the restore process is complete, the controller logs you off the web interface automatically.

5 Log on to the controller web interface.

6 Check the web interface pages (for example, Configuration, Report, and Identity) and verify that the settings and data contained in the backup file have been restored successfully to the controller.

You have completed restoring a system configuration backup file.

Deleting a Configuration Backup

Follow these steps to delete a backup of the controller database

1 Go to *Administration > Configuration Backup and Restore.*

2 In the *System Configuration Backups* section, locate the backup version that you want to delete.

3 Once you locate the backup file, click the 🗑 icon under the *Actions* column. A confirmation message appears.

4 Click **Yes**. The page refreshes, and the backup file that you deleted disappears from the *System Configuration Backups* section.

You have completed deleting a backup file.

Resetting a Node to Factory Settings

You can reset a node in a cluster to factory settings by removing it from the cluster. When you reset a node to factory settings, all of its system configuration settings are completely erased and its IP address reverts to 192.168.2.2.

There are two methods to reset a node to factory settings:

- Using the Web Interface
- Using the CLI

CAUTION! Resetting a node to factory settings will erase all of its system configuration settings, backup files, and cluster settings. Before resetting a node to factory settings, Ruckus Wireless strongly recommends that you export all of the backup files on the controller to an FTP server using either the web interface or CLI.

What Happens After Reset to Factory Settings

Before resetting a node to factory settings, consider the following notes:

- All of the system configuration settings of the node will be erased. This includes all of the domain,, user, and system settings, as well as all of the controller backups.
- The node will revert to its default IP address – 192.168.2.2.
- The controller software version will not be reset to its original software version when you first set it up. It will keep the existing software version at the time you reset it to factory settings.

Using the Web Interface

To remove a node from a cluster, it must be a follower node. If the node that you want to remove from the cluster is the leader node, make sure you demote it to a follower node first before continuing with this procedure.

Follow these steps to remove a node from the cluster and reset it to factory settings.

1. Log on to the controller web interface of the leader node.
2. Go to *Configuration* > *System* > *Network Settings*. The *Cluster: [{Cluster Name}]* page appears.
3. Locate the node that you want to reset.
4. Click the ⛔ icon that is in the same row as the node that you want to reset to factory settings. A confirmation message appears.

5 Click **Yes**. The page refreshes, and then the node the you deleted disappears from the *Cluster: [{Cluster Name}]* page.

You have completed removing a node from the cluster and resetting it to factory settings.

NOTE: After the controller is reset to factory settings, the controller allows the data blade interface IP address and gateway address to be on different subnets.

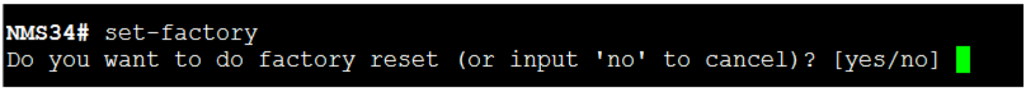
Using the CLI

You can also use the command line interface to remove a node from a cluster and reset it to factory settings. See Accessing the Command Line Interface for information on how to gain access to the CLI.

After you log on to the CLI of the node, follow these steps to reset a node to factory settings.

1 At the prompt, enter **`set-factory`**. A confirmation message appears.

Figure 133. Enter set-factory to reset the node to factory settings



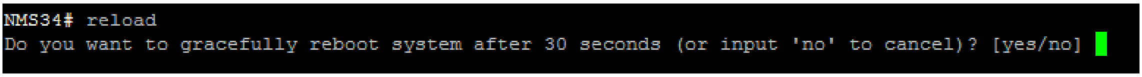
```
NMS34# set-factory
Do you want to do factory reset (or input 'no' to cancel)? [yes/no]
```

2 Enter **`yes`** to confirm.

3 Enter **`reload`**. This command is required to trigger the factory reset process. A confirmation message appears.

4 Enter **`yes`** to confirm. The controller reboots, and then triggers the factory reset process.

Figure 134. Enter reload to trigger the factory reset process



```
NMS34# reload
Do you want to gracefully reboot system after 30 seconds (or input 'no' to cancel)? [yes/no]
```

The controller reboots. You have completed resetting the node to factory default settings.

Upgrading the Controller

Ruckus Wireless may periodically release controller software updates that contain new features, enhancements, and fixes for known issues. These software updates may be made available on the Ruckus Wireless support website or released through authorized channels.

This section covers the following topics:

- Before You Upgrade
- Performing the Upgrade
- Verifying the Upgrade
- Rolling Back to a Previous Software Version

Before You Upgrade

WARNING! Please review the following points carefully before proceeding with the upgrade procedure.

- Although the software upgrade process has been designed to preserve all controller settings, Ruckus Wireless strongly recommends that you back up the cluster before performing an upgrade. Having a cluster backup will ensure that you can easily restore the system if the upgrade process fails for any reason. For information on how to back up the cluster, refer to Creating a Cluster Backup.
- Ruckus Wireless strongly recommends that you ensure that controller interface cables are not altered during the upgrade procedure.
- Ruckus Wireless strongly recommends that you ensure that the power supply is not disrupted during the upgrade procedure.
- Before upgrading the controller, verify that the timestamp of the most recent upgrade or fresh installation process is correct and not later than the current date and time. You can find this information in the *System Upgrade History* section of the *Administration* > *Upgrade* page. If the timestamp is later than the current date and time, DO NOT upgrade the controller. Contact Ruckus Wireless Support for more information.

NOTE: If you are managing an SZ-100, you can also perform system configuration backup, restore, and upgrade from the controller’s command line interface. For more information, see the *SmartZone 100 Command Line Interface Reference Guide*.

Performing the Upgrade

Follow these steps to upgrade the controller software.

CAUTION! Ruckus Wireless strongly recommends backing up the cluster before performing the upgrade. If the upgrade process fails for any reason, you can use the latest backup file to restore the cluster. See Backing Up and Restoring Clusters.

NOTE: Before starting this procedure, you should have already obtained a valid controller software upgrade file from Ruckus Wireless Support or an authorized reseller.

1. Copy the software upgrade file that you received from Ruckus Wireless to the computer where you are accessing the controller web interface or to any location on the network that is accessible from the web interface.
2. Go to *Administration* > *Upgrade*.
3. In the *Patch File Upload* section, click the **Browse** button, and then browse to the location of the software upgrade file. Typically, the file name of the software upgrade file is
   `SZ-installer_{version}.ximg.`
4. Select the software upgrade file, and then click **Open**.
5. Click **Upload** to upload the software upgrade file. The controller uploads the file to its database, and then performs file verification.

   After the file is verified, the *Upgrade Pending Patch Information* section is populated with information about the upgrade file. The **Upgrade** and **Backup & Upgrade** buttons also appear in this section.
6. Start the upgrade process by clicking one of the following buttons:
   - **Upgrade**: Click this button to start the upgrade process without backing up the current cluster or its system configuration.
   - **Backup & Upgrade**: Click this button to back up the cluster and system configuration before performing the upgrade.

CAUTION! Ruckus Wireless strongly recommends usage of backup and upgrade icon while performing the upgrade. If the upgrade process fails for any reason, you can use the latest backup file to restore the cluster. See Backing Up and Restoring Clusters.

A confirmation message appears.

7 Click **Yes**. The controller starts the process that you selected. The screens that appear next will depend on the process that you selected to upgrade immediately or to back up and then upgrade the controller.

When the upgrade (or backup-and-upgrade) process is complete, the controller logs you off the web interface automatically. The controller web interface may display the “The system is down...” message as it completes the upgrade process. Wait for a few minutes until the web interface log on page appears.

When the controller’s logon page appears again, you have completed performing the upgrade. Continue to Verifying the Upgrade to check if the upgrade was completed successfully.

Verifying the Upgrade

Follow these steps to verify that the controller upgrade was completed successfully.

1 Log on to the controller web interface.

2 Go to *Administration* > *Upgrade*.

3 In the *Current System Information* section, check the value for *Controller Version*. If the firmware version is newer than the firmware version that the controller was using before you started the upgrade process, then the upgrade process was completed successfully.

Rolling Back to a Previous Software Version

There are two scenarios in which you may want to roll back the controller software to a previous version:

1 You encounter issues during the software upgrade process and the controller cannot be upgraded successfully. In this scenario, you can only perform the software rollback from the CLI using the `restore local` command. If you have a two-node cluster, run the `restore local` command on each of the nodes to restore them to the previous software before attempting to upgrade them again.

2 You prefer a previous software version to the newer version to which you have upgraded successfully. For example, you feel that the controller does not operate normally after you upgraded to the newer version and you want to restore the previous software version, which was more stable. In this scenario, you can perform the software rollback either from the web interface or the CLI. If you have a two-node cluster, you must have cluster backup on both of the nodes.

To ensure that you will be able to roll back to a previous version, Ruckus Wireless strongly recommends the following before attempting to upgrade the controller software:

- Always back up the controller before attempting a software upgrade. If you are managing a multi-node cluster, back up the entire cluster, and then verify that the backup process completes successfully. See Creating a Cluster Backup for the local backup instructions. If you have a local backup and you want to roll back the controller to a previous software version, follow the same procedure described in Restoring a Cluster Backup.
- If you have an FTP server, back up the entire cluster and upload the backup files from all the nodes in a cluster to a remote FTP server. See Backing Up to an FTP Server for remote backup instructions and Restoring from an FTP Server for remote restore instructions.

Recovering a Cluster from an Unsuccessful Upgrade

If an issue occurs during the upgrade process (for example, a power outage occurs or one of the interfaces goes down), you can recover the cluster if the controller has either a local configuration backup or a remote (FTP) configuration backup.

If the Controller Has Local Configuration Backup

Follow these steps to recover a cluster when the controller has a configuration backup stored locally.

1. Unplug the cluster interface cables of each node in the cluster to isolate each individual node.
2. On each of the nodes in the cluster, perform the following:
   a. Log on to the CLI, and then execute `restore local`. This command will restore the system configuration of the node from a local backup.
   b. When the CLI indicates that the `restore local` command has been completed successfully, plug in the cluster interface cable.

You have completed recovering the controller cluster using a local configuration backup.

If the Controller Has an FTP Backup

Follow these steps to recover a cluster when the controller has a configuration backup on a remote FTP server. See Backing Up to an FTP Server for more information.

You must perform steps on each of the nodes in the cluster.

1 Log on to the CLI of each of the nodes.

2 Execute the **`set-factory`** command to reset the node to factory settings.

NOTE: See Resetting a Node to Factory Settings for more information.

3 Using the CLI, set up the controller as a standalone unit.

4 Copy the cluster configuration backup from the FTP server to the controller.

5 Execute the `restore local` command from the CLI.

6 When the CLI indicates that the `restore local` command has been completed successfully, plug in the cluster interface cable.

Repeat the same procedure until you have restore the cluster configuration backup from the FTP server to all of the nodes in the cluster.

You have completed recovering the controller cluster using an FTP backup.

Working with Logs

This section describes the logs that are available in the controller and how to download them.

- Available System Log Types
- Downloading All Logs
- Downloading Snapshot Logs Generated from the CLI

Available System Log Types

The controller generates logs for all the applications that are running on the server. Table 14 lists the controller applications that are running.

the

Table 14. Controller applications and log types

Application	Description
API	Stands for application program interface (API), this provides an interface for customers to configure and monitor the system
AUT	Manages the sessions in the controller's TTG module
CaptivePortal	Performs portal redirect for clients and manages the walled garden and blacklist
Cassandra	The controller's database server that stores most of the run-time information and statistical data
CNR	An application that obtains TTG configuration updates and applies the settings to related modules
Configurer	Performs configuration synchronization and cluster operations (for example, join, remove, upgrade, backup, and restore)
Diagnostics	An interface that customers can use to upload Ruckus Wireless scripts for performing troubleshooting or applying software patches
ElasticSearch	Scalable real-time search engine used in the controller
Memcached	The controller's memory cache that stores client authentication information for fast authentication or roaming
MemProxy	Replicates MemCached entries to other cluster nodes
Mosquitto	A lightweight method used to carry out messaging between LBS and APs

Table 14. Controller applications and log types

Application	Description
NC	The Node Controller, which monitors all of the controller's TTG processes
Northbound	Performs UE authentication and handles approval or denial of UEs to AP
RadiusProxy	Sets the RADIUS dispatch rules and synchronizes configuration to each cluster node
SMF	An application that monitors the health of TTG processes
SNMP	Provides a framework for the monitoring devices on a network. The SNMP manager is the system used to control and monitor the activities of network hosts using SNMP.
SubscriberManagement	A process for maintaining local user credentials for WISPr authentication
SubscriberPortal	Internal portal page for WISPr (hotspot)
System	Collects and sends log information from all processes
Web	Runs the controller's management web server

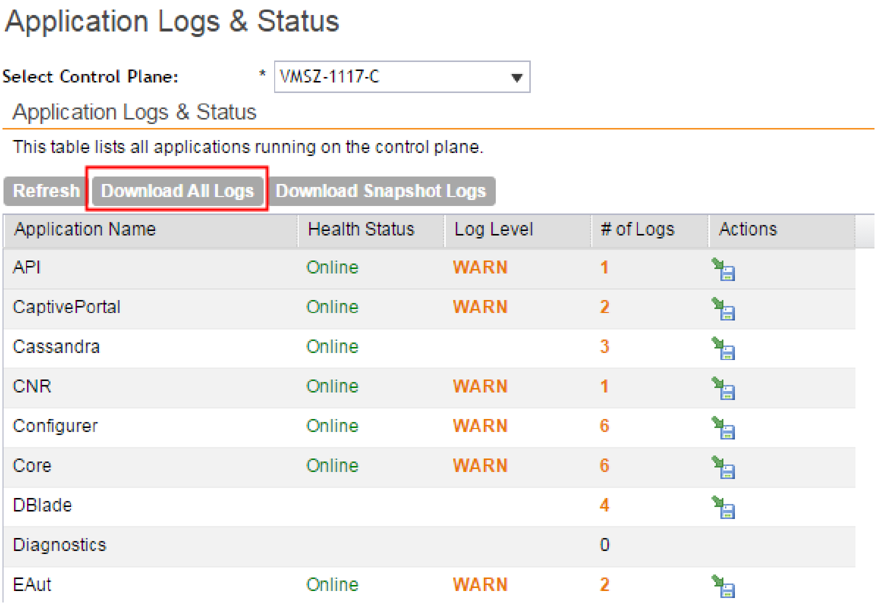
Downloading All Logs

Follow these steps to download all available logs from the controller.

1. Go to *Administration* > *Diagnostics*.
2. On the sidebar, click **Application Logs & Status**.
3. In *Select Control Plane*, select the control plane from which you want to download logs.
4. Click the **Download All Logs** button. Your web browser downloads the logs in GZIP Compressed Tar Archive (with .TGZ extension) to its default download location.
5. Go to your web browser's default download location and verify that the TGZ file was downloaded successfully.
6. Use your preferred compression/decompression program to extract the log files from the TGZ file.
7. When the log files are extracted (for example, `adminweb.log`, `cassandra.log`, `communicator.log`, etc.), use a text editor to open and view the log contents.

You have completed downloading all the controller logs.

Figure 135. Click the Download All Logs button



Application Logs & Status

Select Control Plane: * VMSZ-1117-C ▼

Application Logs & Status

This table lists all applications running on the control plane.

Application Name	Health Status	Log Level	# of Logs	Actions
API	Online	WARN	1	💾
CaptivePortal	Online	WARN	2	💾
Cassandra	Online		3	💾
CNR	Online	WARN	1	💾
Configurer	Online	WARN	6	💾
Core	Online	WARN	6	💾
DBlade			4	💾
Diagnostics			0	
EAut	Online	WARN	2	💾

Downloading Snapshot Logs Generated from the CLI

Snapshot logs contain system and configuration information, such as the AP list, configurations settings, event list, communicator logs, SSH tunnel lists, etc. If you triggered the controller to generate a snapshot from the CLI, you have the option to download snapshot logs from the web interface.

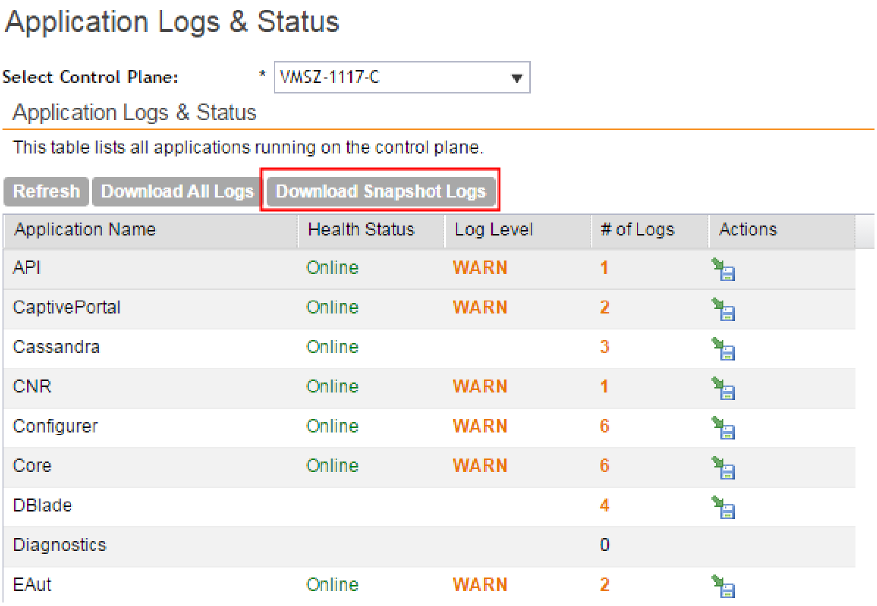
Follow these steps to download the CLI-generated snapshot logs from the web interface.

1. On the CLI, trigger the controller to generate a snapshot.
2. Log on to the web interface.
3. Go to *Administration* > *Diagnostics*.
4. On the sidebar, click **Application Logs & Status**.
5. Click **Download Snapshot Logs**. Your web browser downloads a tar (.TGZ) file that contains all available snapshot logs.
6. Go to your browser's default download folder, and then verify that the snapshot log file or files have been downloaded successfully.

7 Extract the contents of the tar file.

You have completed downloading snapshot logs from the controller.

Figure 136. Click Download Snapshot Logs to download all available snapshot logs



Select Control Plane: * VMSZ-1117-C

Application Logs & Status

This table lists all applications running on the control plane.

Application Name	Health Status	Log Level	# of Logs	Actions
API	Online	WARN	1	💾
CaptivePortal	Online	WARN	2	💾
Cassandra	Online		3	💾
CNR	Online	WARN	1	💾
Configurer	Online	WARN	6	💾
Core	Online	WARN	6	💾
DBlade			4	💾
Diagnostics			0	
EAut	Online	WARN	2	💾

Managing Licenses

NOTE: This section only applies to the SZ-100.

Depending on the number of Ruckus Wireless APs that you need to manage with the controller, you may need to upgrade the controller license as your network expands. The maximum number of access points that the controller can manage is controlled by the license file that came with the controller. If the number of access points on the network exceeds the limit in the license file, you will need to obtain an additional license file and upload it to the controller.

NOTE: For information on obtaining additional license files, contact Ruckus Wireless Support or an authorized Ruckus Wireless reseller.

The maximum number of access points that a license supports depends on its stock-keeping unit (SKU).

This section covers the following topics:

- Default Licenses in the SmartZone 100
- Supported License Types
- Viewing Installed Licenses
- Viewing the License Summary
- Configuring the License Server to Use
- Importing a License File
- Downloading a Copy of the Licenses
- Synchronizing the Controller with the License Server

Default Licenses in the SmartZone 100

The SmartZone 100 comes embedded with default licenses to enable you to manage a limited number of APs right out of the box without having to register or purchase add-on licenses. Table 15 lists the default licenses in the controller.

Table 15. Default licenses

License Type	Number
Default AP Capacity License	50 APs
Default AP Tunneling Capacity License	10 APs
Default End User Support License	90 days

If the default licenses are insufficient for the number of APs that you are planning to manage with the controller, contact Ruckus Wireless Support or an authorized reseller (see Importing a License File for information on how to upload a license file).

All default licenses are activated as soon as you complete the controller setup. Once the controller connects to the license server and successfully downloads add-on license data (if any) from it, the behavior of each default license may change.

- *AP Capacity License*: Any add-on AP capacity licenses will accumulate on top on the default license. For example, if you purchased 100 AP capacity licenses and added them to the controller, the controller will show a total of 150 AP capacity licenses -- this includes the 50 default licenses plus the 100 add-on licenses.
- *AP Tunneling and Support Licenses*: Any add-on AP tunneling or support licenses will replace the default license in controller. Unlike AP capacity licenses, they will not accumulate on top of the default licenses.
- *Time-restricted Default Licenses*: Default licenses with time restriction (for example, the default end user support license) will remain activated until they expire. If a time-restricted add-on license is removed from the controller and a default license of the same type exists on the controller and has not expired, this default license will be reactivated and enabled.

Supported License Types

The SZ100 supports the following types of licenses:

- AP Capacity License
- Default AP Capacity License
- AP Tunneling Capacity License
- Default AP Tunneling Capacity License
- Support License
- Default Support License

AP Capacity License

The AP capacity license (CAPACITY-AP) is an add-on license that enables the management of Ruckus Wireless access points. This is a permanent license (that is, no expiration date).

Default AP Capacity License

The default AP capacity license (CAPACITY-AP-DEFAULT) is same as the AP capacity license. This license, however, is embedded into the controller and is non-transferable. The default AP capacity license allows you to manage up to 50 APs using the controller.

AP Tunneling Capacity License

The AP tunneling capacity license (CAPACITY-RXGW) is an add-on license that enables the management of APs with SoftGRE capability. This is also known as SoftGRE Capacity License or RXGW Capacity License. The AP tunneling capacity license is a permanent license (that is, no expiration date).

Default AP Tunneling Capacity License

The default AP tunneling capacity license (CAPACITY-RXGW-DEFAULT) is the same as the AP tunneling capacity license. This license, however, is embedded into the controller and is non-transferable. The default AP tunneling capacity license allows you to manage up to 10 APs with SoftGRE capability.

Support License

The Support License enables the controller to perform a system upgrade. There are three types of support licenses:

- End User Support License
- Partner Support License
- Advanced Replacement Support License

Default Support License

The default support license (SUPPORT-EU-DEFAULT) is same as the end user support license, but with a 90-day expiration time. This license is embedded into the controller and is non-transferable. The controller comes with one default support license.

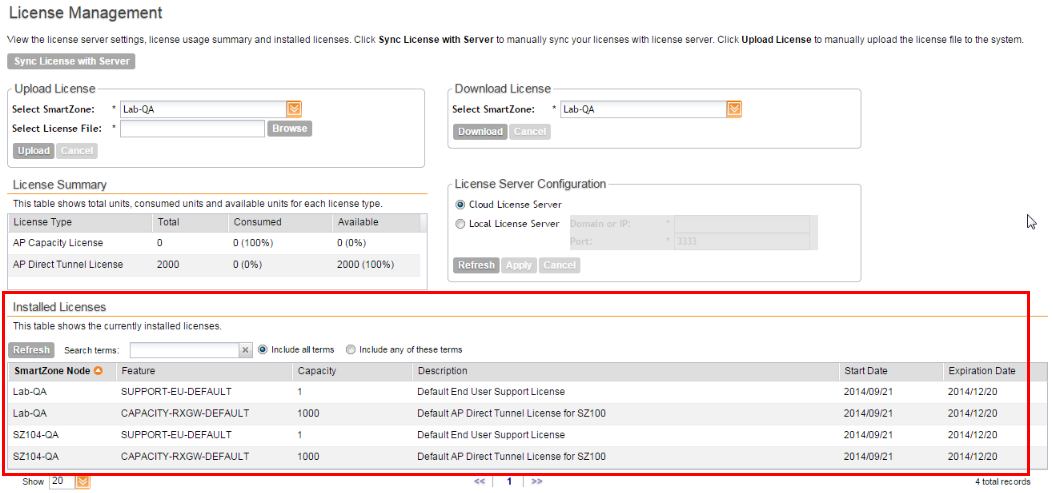
Viewing Installed Licenses

You can view the details of all the licenses that you have uploaded to the controller in the *Installed Licenses* section. Table 16 lists the different columns that appear in the *Installed Licenses* section.

Table 16. Information in the Installed License section

Column Name	Description
Controller Node	The name of the node to which the license was uploaded
Feature	The stock-keeping unit (SKU) code of the license file
Capacity	The number of units or license seats that the license file provides
Description	The type of license (see Supported License Types)
Start Date	The date when the license file was activated
Expiration Date	For time-bound licenses, this column shows the date when the license file expires. For permanent licenses, this column shows "Permanent."

Figure 137. The Installed Licenses section



License Management

View the license server settings, license usage summary and installed licenses. Click **Sync License with Server** to manually sync your licenses with license server. Click **Upload License** to manually upload the license file to the system.

Upload License

Select SmartZone: * Lab-QA

Select License File: *

Download License

Select SmartZone: * Lab-QA

License Summary

This table shows total units, consumed units and available units for each license type.

License Type	Total	Consumed	Available
AP Capacity License	0	0 (100%)	0 (0%)
AP Direct Tunnel License	2000	0 (0%)	2000 (100%)

License Server Configuration

● Cloud License Server

○ Local License Server Domain or IP: *

Port: * 3333

Installed Licenses

This table shows the currently installed licenses.

Search terms: ● Include all terms ○ Include any of these terms

SmartZone Node	Feature	Capacity	Description	Start Date	Expiration Date
Lab-QA	SUPPORT-EU-DEFAULT	1	Default End User Support License	2014/09/21	2014/12/20
Lab-QA	CAPACITY-RXGW-DEFAULT	1000	Default AP Direct Tunnel License for SZ100	2014/09/21	2014/12/20
SZ104-QA	SUPPORT-EU-DEFAULT	1	Default End User Support License	2014/09/21	2014/12/20
SZ104-QA	CAPACITY-RXGW-DEFAULT	1000	Default AP Direct Tunnel License for SZ100	2014/09/21	2014/12/20

Show 20

4 total records

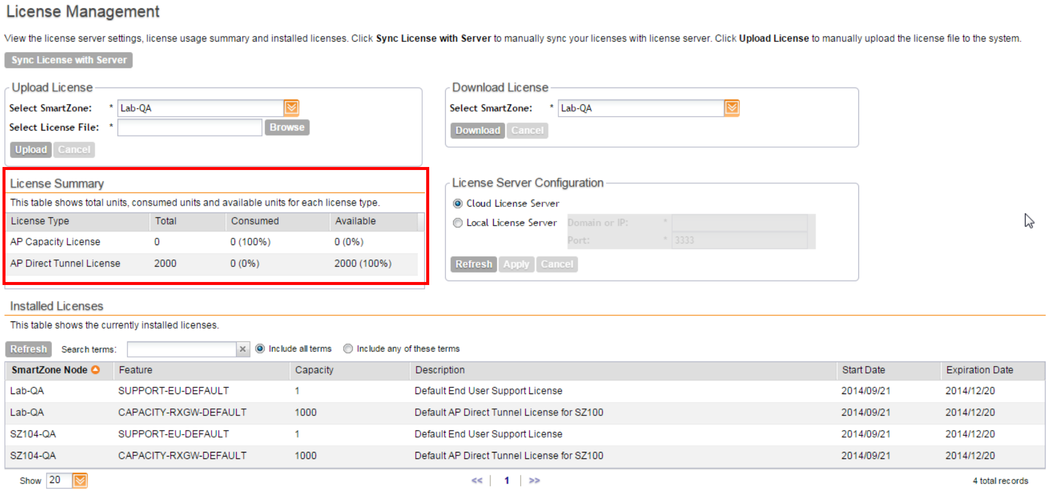
Viewing the License Summary

You can view details of total, consumed, and available licenses for the different license types in the *License Summary* section. Table 17 lists the different columns that appear in the *Installed Licenses* section.

Table 17. Information in the License Summary section

Column Name	Description
License Type	The type of license file
Total	The maximum number of access points that can be supported by all the licenses that have been uploaded to the controller.
Consumed	The number of license seats that have been used. One access point uses up one license seat. For example, if three access points have registered with the controller, the Consumed field will show 3.
Available	The number of license seats remaining. For example, if all your licenses support up to 5000 access points, and the controller has used up three licenses so far, the Available field will show 4997.

Figure 138. The License Summary section



License Management

View the license server settings, license usage summary and installed licenses. Click **Sync License with Server** to manually sync your licenses with license server. Click **Upload License** to manually upload the license file to the system.

Upload License

Select SmartZone: * Lab-QA

Select License File: *

Download License

Select SmartZone: * Lab-QA

License Summary

This table shows total units, consumed units and available units for each license type.

License Type	Total	Consumed	Available
AP Capacity License	0	0 (100%)	0 (0%)
AP Direct Tunnel License	2000	0 (0%)	2000 (100%)

License Server Configuration

● Cloud License Server

○ Local License Server Domain or IP: * Port: * 3333

Installed Licenses

This table shows the currently installed licenses.

Search terms: ● Include all terms ○ Include any of these terms

SmartZone Node	Feature	Capacity	Description	Start Date	Expiration Date
Lab-QA	SUPPORT-EU-DEFAULT	1	Default End User Support License	2014/09/21	2014/12/20
Lab-QA	CAPACITY-RXGW-DEFAULT	1000	Default AP Direct Tunnel License for SZ100	2014/09/21	2014/12/20
SZ104-QA	SUPPORT-EU-DEFAULT	1	Default End User Support License	2014/09/21	2014/12/20
SZ104-QA	CAPACITY-RXGW-DEFAULT	1000	Default AP Direct Tunnel License for SZ100	2014/09/21	2014/12/20

Show 20

4 total records

Configuring the License Server to Use

Ruckus Wireless provides two options for managing the licenses that you have purchased for the controller:

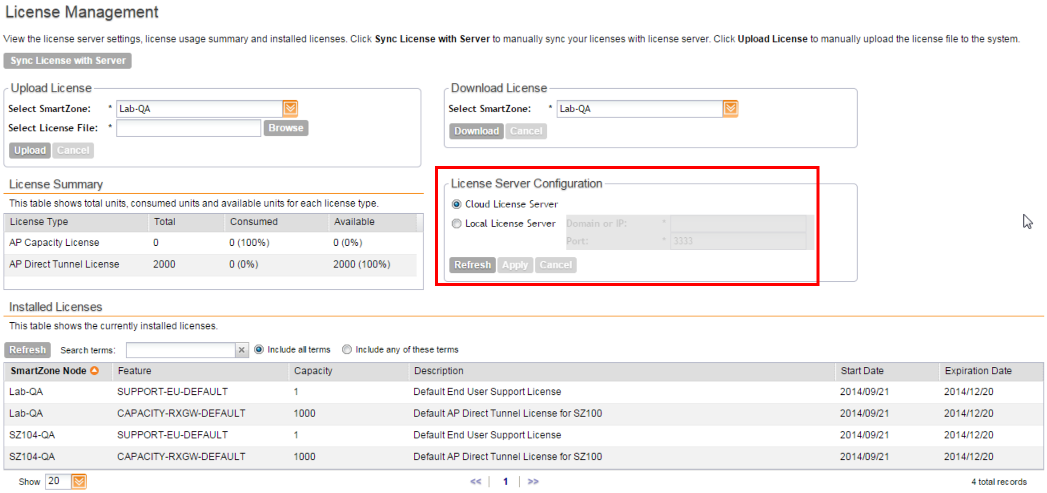
- Cloud License Server: Also known as the SmartLicense server, this a cloud-based server that stores all of the licenses and support entitlements that you have purchased for the controller. For information on how to set up and activate your SmartLicense account, see the *SmartLicense User Guide*.
- Local License Server (LLS): This is a license server that is installed onsite where the controller is deployed. For information on how to obtain and set up the LLS server, see the *SmartCell Gateway Local Licensing Server User Guide*.

Follow these steps to select a license server that the controller will use.

1. Go to *Administration* > *License*.
2. In *License Server Configuration*, select one of the following:
   - *Cloud License Server*: Select this option to use the Ruckus Wireless SmartLicense server.
   - *Local License Server*: Select this option to use an LLS that you have set up on the network, and then configure the following:
     - Domain or IP: Type the FQDN or IP address of the LLS.
     - Port: Type the port number. Port range is from 0 to 65535 (default is 3333).
3. Click **Apply**. A confirmation message appears.
4. Click **Yes**. The controller saves the selected license server configuration, deletes all of its saved license data, and then automatically synchronizing the license information with the selected license server.

You have completed configuring the license server that the controller will use.

Figure 139. The License Server Configuration section



License Management

View the license server settings, license usage summary and installed licenses. Click **Sync License with Server** to manually sync your licenses with license server. Click **Upload License** to manually upload the license file to the system.

Upload License

Select SmartZone: * Lab-QA

Select License File: *

Download License

Select SmartZone: * Lab-QA

License Summary

This table shows total units, consumed units and available units for each license type.

License Type	Total	Consumed	Available
AP Capacity License	0	0 (100%)	0 (0%)
AP Direct Tunnel License	2000	0 (0%)	2000 (100%)

License Server Configuration

● Cloud License Server

○ Local License Server Domain or IP: *

Port: * 3333

Installed Licenses

This table shows the currently installed licenses.

Search terms: ● Include all terms ○ Include any of these terms

SmartZone Node	Feature	Capacity	Description	Start Date	Expiration Date
Lab-QA	SUPPORT-EU-DEFAULT	1	Default End User Support License	2014/09/21	2014/12/20
Lab-QA	CAPACITY-RXGW-DEFAULT	1000	Default AP Direct Tunnel License for SZ100	2014/09/21	2014/12/20
SZ104-QA	SUPPORT-EU-DEFAULT	1	Default End User Support License	2014/09/21	2014/12/20
SZ104-QA	CAPACITY-RXGW-DEFAULT	1000	Default AP Direct Tunnel License for SZ100	2014/09/21	2014/12/20

Show 20

4 total records

Importing a License File

If the controller is disconnected from the Internet or is otherwise unable to communicate with the Ruckus Wireless SmartLicense system (due to firewall policies, etc.), you can manually import a license entitlement file into the controller.

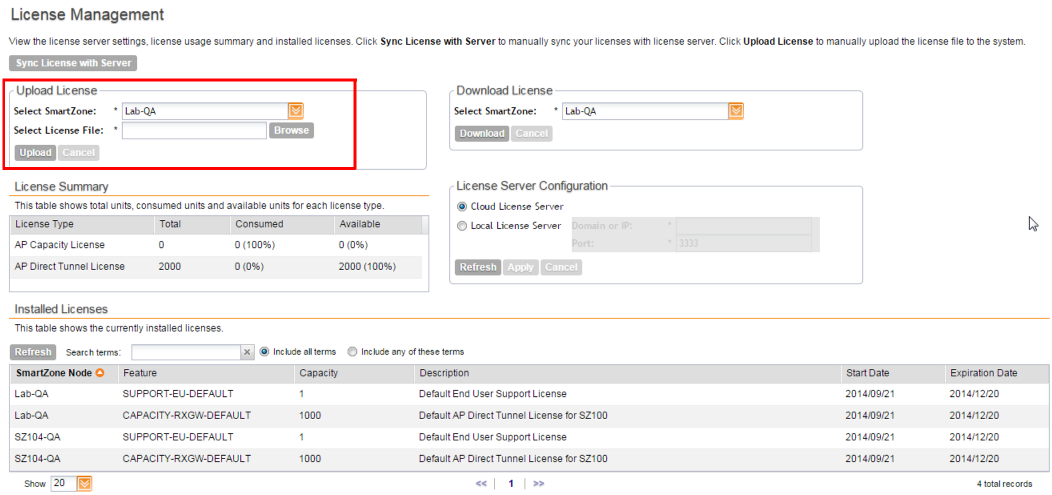
NOTE: The option to import a license file manually into the controller is only available if the controller is using the cloud license server.

Follow these steps to import a license file into the controller.

1. Obtain the license file. You can do this by logging on to your Ruckus Wireless Support account, going to the license management page, and then downloading the license file (the license file is in .bin format).
2. Log on to the controller web interface, and then go to *Administration* > *License*.
3. In *Select Controller* under *Upload License*, select the node for which you are uploading the license file.
4. In *Select License File*, click **Browse**, locate the license file (.bin file) that you downloaded from your Ruckus Wireless Support account, and then select it.
5. Click **Upload**. The page refreshes, and the information in the *Installed Licenses* section changes to reflect the updated information imported from the SmartLicense platform.

You have completed importing a license file manually.

Figure 140. The Upload License section



License Management

View the license server settings, license usage summary and installed licenses. Click **Sync License with Server** to manually sync your licenses with license server. Click **Upload License** to manually upload the license file to the system.

Upload License

Select SmartZone: * Lab-QA

Select License File: *

Download License

Select SmartZone: * Lab-QA

License Summary

This table shows total units, consumed units and available units for each license type.

License Type	Total	Consumed	Available
AP Capacity License	0	0 (100%)	0 (0%)
AP Direct Tunnel License	2000	0 (0%)	2000 (100%)

License Server Configuration

● Cloud License Server

○ Local License Server Domain or IP: * Port: * 3333

Installed Licenses

This table shows the currently installed licenses.

Search terms: ● Include all terms ○ Include any of these terms

SmartZone Node	Feature	Capacity	Description	Start Date	Expiration Date
Lab-QA	SUPPORT-EU-DEFAULT	1	Default End User Support License	2014/09/21	2014/12/20
Lab-QA	CAPACITY-RXGW-DEFAULT	1000	Default AP Direct Tunnel License for SZ100	2014/09/21	2014/12/20
SZ104-QA	SUPPORT-EU-DEFAULT	1	Default End User Support License	2014/09/21	2014/12/20
SZ104-QA	CAPACITY-RXGW-DEFAULT	1000	Default AP Direct Tunnel License for SZ100	2014/09/21	2014/12/20

Show 20

4 total records

Downloading a Copy of the Licenses

If you need to release licenses bound to an offline controller and allow those licenses to be used elsewhere (on a different controller), you can download a copy of the controller licenses.

NOTE: The option to download a copy of the controller licenses is only available if the controller is using the Ruckus Wireless cloud license server

Follow these steps to download a binary copy of the license files.

1 Go to *Administration* > *License*.

2 In *License Server Configuration*, verify that **Cloud License Server** is selected.

3 Locate the *Download License* section.

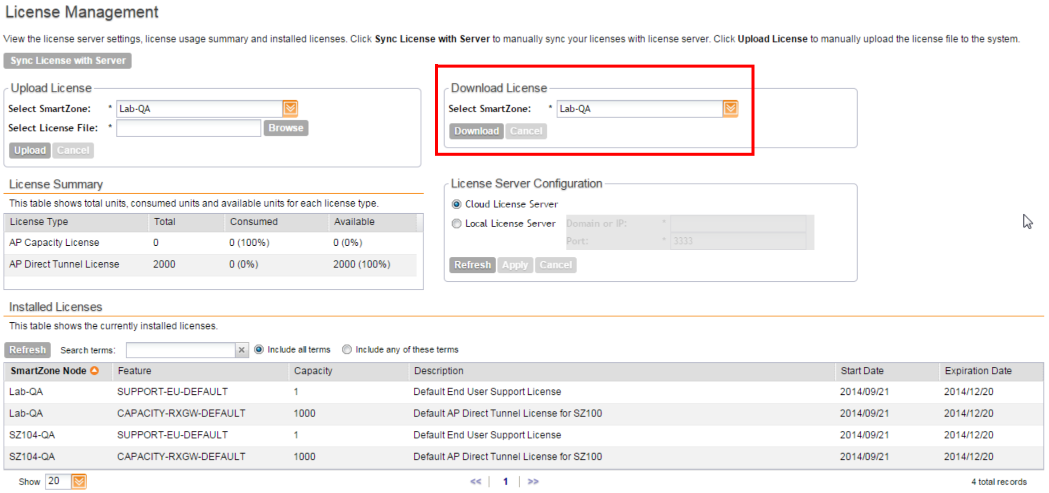
4 In *Select Controller*, select the controller node for which you want to download the license files.

5 Click **Download**. Your web browser downloads the license files from the controller.

6 When the download is complete, go to the default download folder that you have configured for your web browser, and then verify that the binary copy of the license files (with .bin extension) exists.

You have completed downloading copies of the controller licenses.

Figure 141. The Download License section



License Management

View the license server settings, license usage summary and installed licenses. Click **Sync License with Server** to manually sync your licenses with license server. Click **Upload License** to manually upload the license file to the system.

Upload License

Select SmartZone: * Lab-QA

Select License File: *

Download License

Select SmartZone: * Lab-QA

License Summary

This table shows total units, consumed units and available units for each license type.

License Type	Total	Consumed	Available
AP Capacity License	0	0 (100%)	0 (0%)
AP Direct Tunnel License	2000	0 (0%)	2000 (100%)

License Server Configuration

● Cloud License Server

○ Local License Server Domain or IP: * Port: * 3333

Installed Licenses

This table shows the currently installed licenses.

Search terms: ● Include all terms ○ Include any of these terms

SmartZone Node	Feature	Capacity	Description	Start Date	Expiration Date
Lab-QA	SUPPORT-EU-DEFAULT	1	Default End User Support License	2014/09/21	2014/12/20
Lab-QA	CAPACITY-RXGW-DEFAULT	1000	Default AP Direct Tunnel License for SZ100	2014/09/21	2014/12/20
SZ104-QA	SUPPORT-EU-DEFAULT	1	Default End User Support License	2014/09/21	2014/12/20
SZ104-QA	CAPACITY-RXGW-DEFAULT	1000	Default AP Direct Tunnel License for SZ100	2014/09/21	2014/12/20

Show 20

4 total records

Synchronizing the Controller with the License Server

By default, the controller automatically synchronizes its license data with the selected license server every 24 hours. If you made changes to the controller licenses (for example, you purchased additional licenses) and you want the controller to download the updated license data immediately, you can trigger a manual synchronization.

Follow these steps to trigger the controller to manually synchronize with the license server.

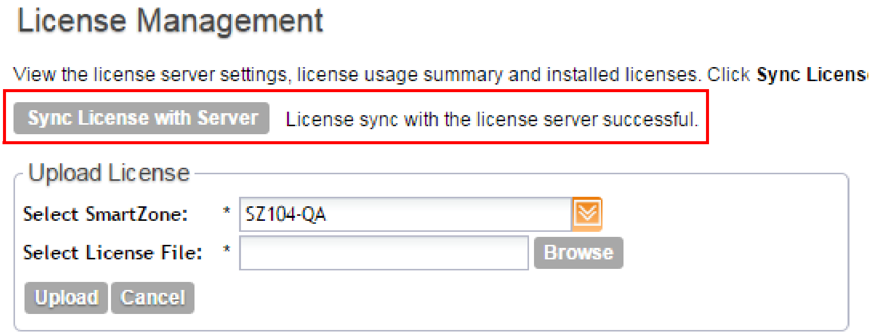
1 Go to *Administration* > *License*.

2 Click **Sync License with Server.** The message “Start sync with license server...” appears as the controller synchronizes its license data with the server.

When the sync process is complete, the message “Sync license with the license server successful” appears. If the previously saved license data are different the latest license data on the server, the information in the Installed Licenses section refreshes to reflect the latest data.

You have completed manually synchronizing the controller with the license server.

Figure 142. A message appears to indicate that the sync process was successful



License Management

View the license server settings, license usage summary and installed licenses. Click **Sync Licens**

Sync License with Server License sync with the license server successful.

Upload License

Select SmartZone: * SZ104-QA

Select License File: *

Managing AP Certificate Replacement

AP certificates are valid for a period of time and have to be replaced when they expire. Certificates installed on Ruckus APs manufactured prior to 2014 require a certificate refresh before November 2016 to avoid service interruption.

There is no operational impact to the system before November 2016.

You will also see the following warning message on the dashboard of the web interface:

****The 90-day temporary AP license for this system will expire on 2016-02-06. Add an AP capacity license to avoid interruption to service.****

Reminder: Some of your APs need to have their Certificate replaced by November 2016. Until then those APs will continue to operate as-is with NO OPERATIONAL impact. You may go to Administration>AP Certificate Replacement and follow the Refresh Process any time before

November 2016.

Please visit https://support.ruckuswireless.com/certificate for details.

The system generates the apCertificateExpireSystem alarm and event when an AP certificate expires.

The following topics are listed in the order required to renew an AP Certificate.

This section covers the following topics:

- Viewing AP Certificate Status
- Exporting AP Certificate Requests
- Requesting AP Certificate Renewal
- Importing AP Certificate Responses

- Confirming AP Certification Status

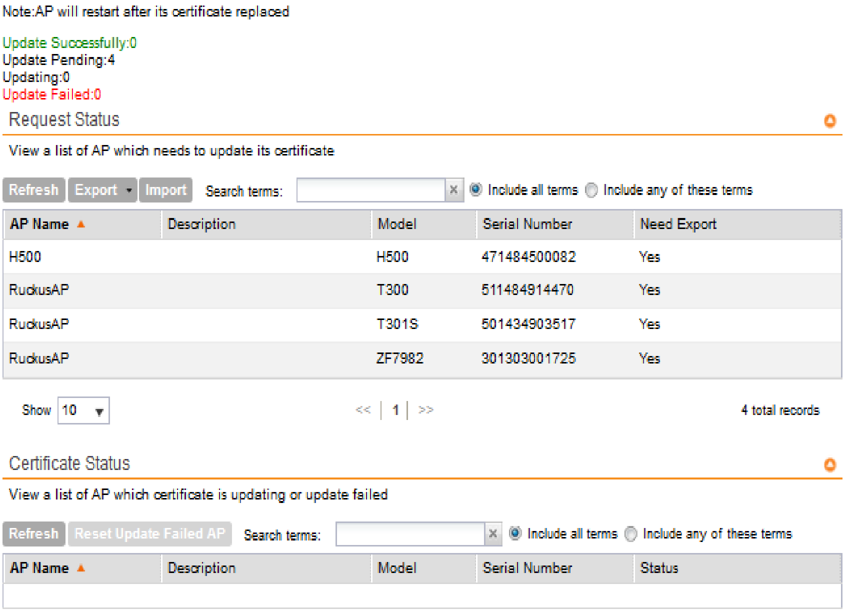
Viewing AP Certificate Status

You can view a certificate for a new AP that is managed by the controller.

1 Go to **Administration > AP Certificate Replacement**.

The *AP Certificate Replacement* page appears.

Figure 143. AP Certificate Replacement page



Note:AP will restart after its certificate replaced

Update Successfully:0
Update Pending:4
Updating:0
Update Failed:0

Request Status

View a list of AP which needs to update its certificate

AP Name ▲	Description	Model	Serial Number	Need Export
H500		H500	471484500082	Yes
RuckusAP		T300	511484914470	Yes
RuckusAP		T301S	501434903517	Yes
RuckusAP		ZF7982	301303001725	Yes

Show 10 ▾ << 1 >> 4 total records

Certificate Status

View a list of AP which certificate is updating or update failed

AP Name ▲	Description	Model	Serial Number	Status

2 In *Request Status* section, view the list of APs which need a certification update.

3 In *Certificate Status* section, view the status of the certification update from the *Status* column

Exporting AP Certificate Requests

You can export a certificate requests for a new AP that is managed by the controller.

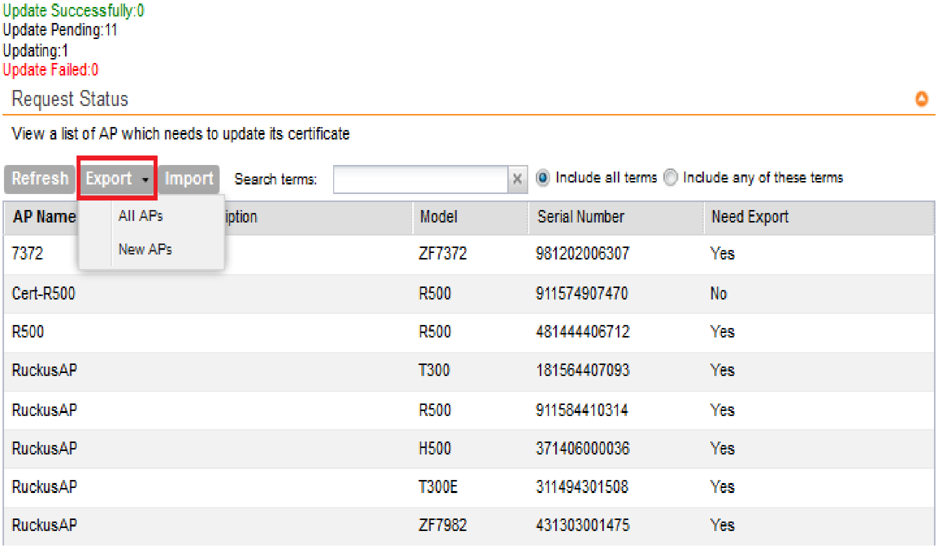
Follow these steps to export AP certificates requests.

1 Go to **Administration > AP Certificate Replacement**.

The *AP Certificate Replacement* page appears.

You can view the status of the certification update for the APs as shown in the figure.

Figure 144. AP Certificate Replacement page



Update Successfully:0
Update Pending:11
Updating:1
Update Failed:0

Request Status

View a list of AP which needs to update its certificate

AP Name	iption	Model	Serial Number	Need Export
7372		ZF7372	981202006307	Yes
Cert-R500		R500	911574907470	No
R500		R500	481444406712	Yes
RuckusAP		T300	181564407093	Yes
RuckusAP		R500	911584410314	Yes
RuckusAP		H500	371406000036	Yes
RuckusAP		T300E	311494301508	Yes
RuckusAP		ZF7982	431303001475	Yes

2 In *Request Status*, view the list of APs.

APs that have already exported the certificate request are marked **No** and the ones which need to export the certificate request are marked **Yes**.

Use the **Search terms** option to look for APs by name, model, serial number, or description.

3 From **Export**, select one of the following:

a **All APs**: to export the certificates for all the APs.

b **New APs**: to export the certificates for new APs or APs that need to regenerate the certificates.

4 Click **OK** to export the file and copy it to your local drive.

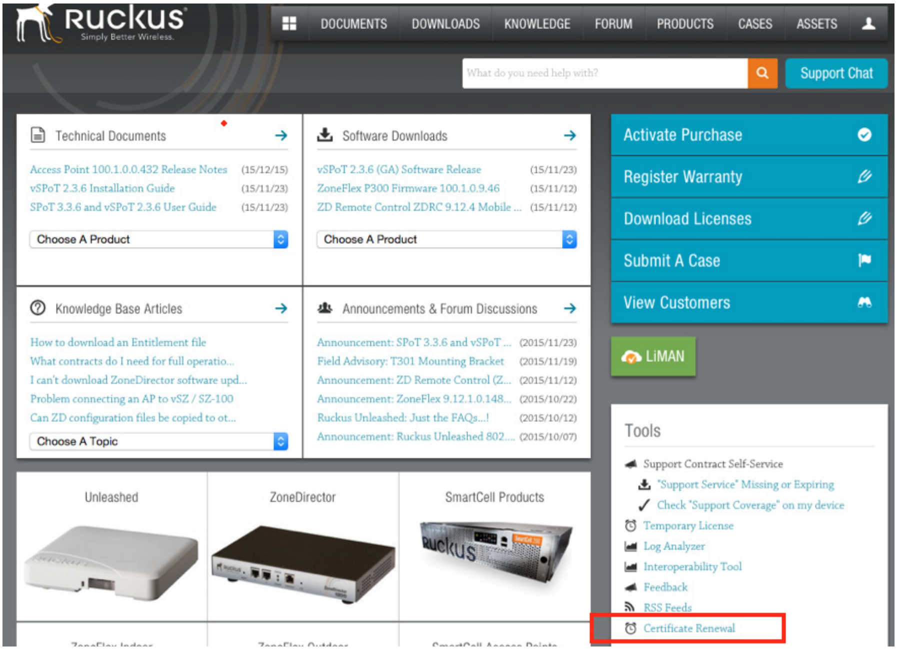
NOTE: All exported AP Certificate request (.req) files generated from a cluster include it's name. To manage multiple export request files, change the filename before uploading it to uniquely identify the file.
For example: cert-scg-cluster5f6433ef-711b-4f44-b38a-ddd485ee2c37-**R500**.req

You have successfully exported the AP certificates request file.

Requesting AP Certificate Renewal

1 Login to https://support.ruckuswireless.com/ with your credentials and click **Certificate Renewal** under *Tools* as shown in the figure.

Figure 145. AP certificate renewal



Technical Documents

Access Point 100.1.0.0.432 Release Notes	(15/12/15)
vSPoT 2.3.6 Installation Guide	(15/11/23)
SPoT 3.3.6 and vSPoT 2.3.6 User Guide	(15/11/23)

Software Downloads

vSPoT 2.3.6 (GA) Software Release	(15/11/23)
ZoneFlex P300 Firmware 100.1.0.9.46	(15/11/12)
ZD Remote Control ZDRC 9.12.4 Mobile ...	(15/11/12)

Knowledge Base Articles

How to download an Entitlement file
What contracts do I need for full operatio...
I can't download ZoneDirector software upd...
Problem connecting an AP to vSZ / SZ-100
Can ZD configuration files be copied to ot...

Announcements & Forum Discussions

Announcement: SPoT 3.3.6 and vSPoT ...	(2015/11/23)
Field Advisory: T301 Mounting Bracket	(2015/11/19)
Announcement: ZD Remote Control (Z...	(2015/11/12)
Announcement: ZoneFlex 9.12.1.0.148...	(2015/10/22)
Ruckus Unleashed: Just the FAQs...!	(2015/10/12)
Announcement: Ruckus Unleashed 802....	(2015/10/07)

Tools

Support Contract Self-Service
"Support Service" Missing or Expiring
✓ Check "Support Coverage" on my device
Temporary License
Log Analyzer
Interoperability Tool
Feedback
RSS Feeds
Certificate Renewal

The *Certificate Renewal* request page appears.

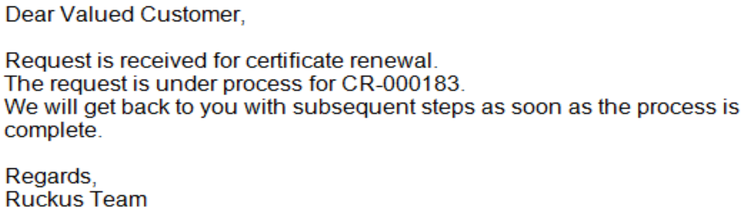
2 Click **Browse** to select the .req file exported from the *Certificate Refresh* page.

3 Enter the e-mail address for communication.

4 Click **Upload**.

You will receive an e-mail acknowledgment from Ruckus Wireless as shown in the figure.

Figure 146. Sample e-mail acknowledgment



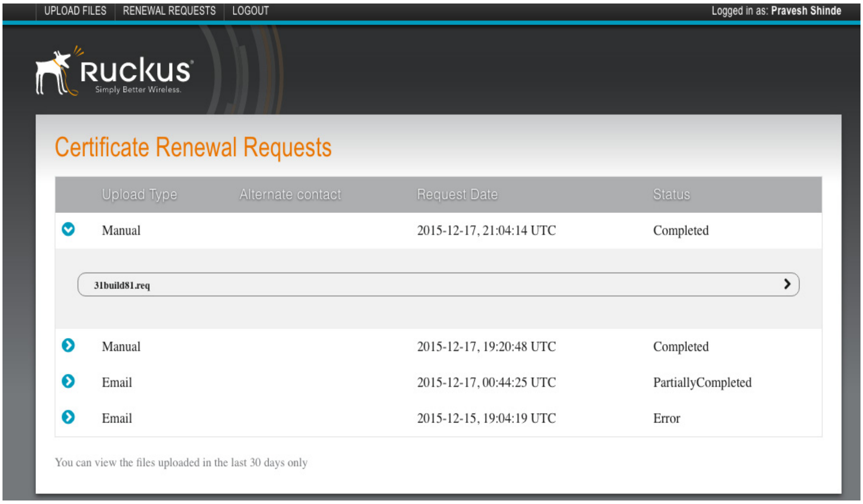
Dear Valued Customer,

Request is received for certificate renewal.
The request is under process for CR-000183.
We will get back to you with subsequent steps as soon as the process is complete.

Regards,
Ruckus Team

5 View the status of your request from the *Certificate Renewal Request* page as shown.

Figure 147. Certificate Renewal Request page



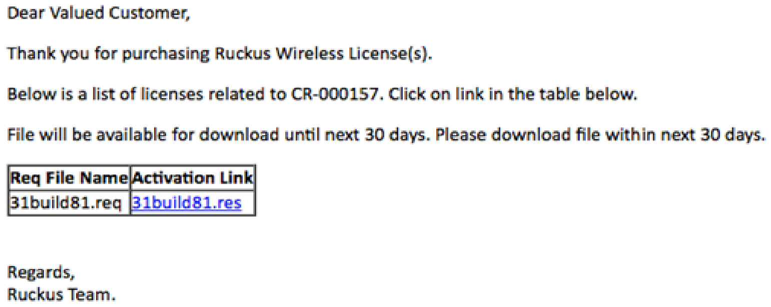
Certificate Renewal Requests

Upload Type	Alternate contact	Request Date	Status
Manual		2015-12-17, 21:04:14 UTC	Completed
31build81.req			
Manual		2015-12-17, 19:20:48 UTC	Completed
Email		2015-12-17, 00:44:25 UTC	PartiallyCompleted
Email		2015-12-15, 19:04:19 UTC	Error

You can view the files uploaded in the last 30 days only

6 After the request is processed, you will receive the following response from Ruckus Wireless, with a link to the .res response file for Import on the *Certificate Refresh* page.

Figure 148. Sample e-mail confirmation from Ruckus Wireless.



Dear Valued Customer,

Thank you for purchasing Ruckus Wireless License(s).

Below is a list of licenses related to CR-000157. Click on link in the table below.

File will be available for download until next 30 days. Please download file within next 30 days.

Req File Name	Activation Link
31build81.req	31build81.res

Regards,
Ruckus Team.

Importing AP Certificate Responses

You can replace an AP certificate by importing a new certificate.

APs requiring new certificates that are included in the request file **will reboot** after Step 5 (described below) is completed.

Consider using a staged approach to import the response files. Use the *Search* terms option to look for APs by name, model, serial number, or description, for larger WiFi networks to minimize service interruption.

Follow these steps to import an AP certificate file you received from Ruckus Wireless.

1 Go to **Administration > AP Certificate Replacement**.

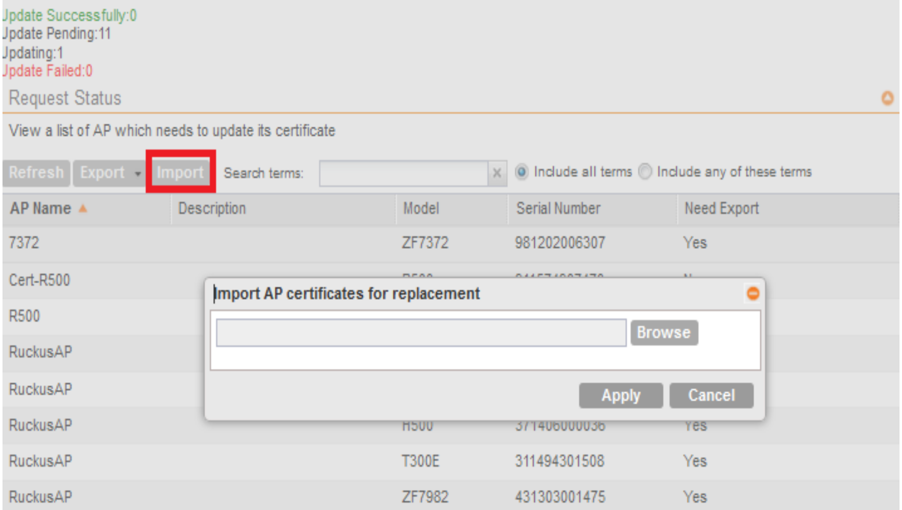
The *AP Certificate Replacement* page appears.

2 In *Request Status*, select the AP response file for import.

3 Click **Import**.

The *Import AP certificates for replacement* screen appears as shown in the figure.

Figure 149. Importing AP certificates



Jpdate Successfully:0
Jpdate Pending:11
Jpdating:1
Jpdate Failed:0

Request Status

View a list of AP which needs to update its certificate

AP Name	Description	Model	Serial Number	Need Export
7372		ZF7372	981202006307	Yes
Cert-R500		[illegible]	[illegible]	[illegible]
R500				
RuckusAP				
RuckusAP				
RuckusAP		H500	371406000036	Yes
RuckusAP		T300E	311494301508	Yes
RuckusAP		ZF7982	431303001475	Yes

Import AP certificates for replacement

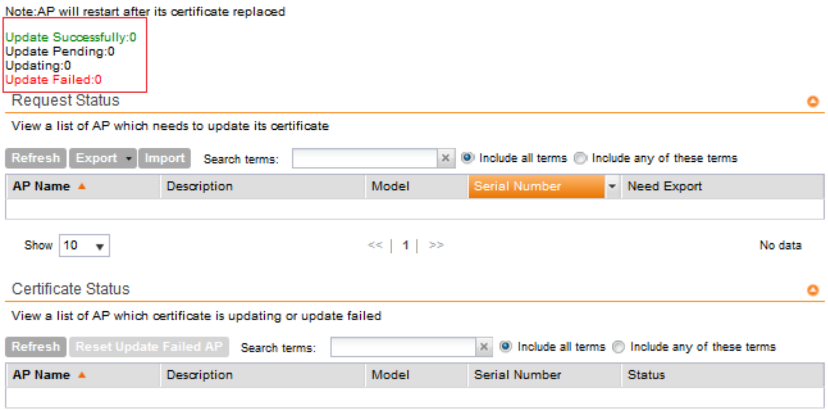
4 Click **Browse**, and select the certificate file.

5 Click **Apply** to import the new certificate to the AP.

NOTE: All APs included in the imported response (.res) file **reboot** after their certificate is refreshed.

The **Update Successfully** counter displays the APs for which certificate refresh was successful, and the *Certificate Status* section displays APs for which certificate refresh is in progress or have failed. You can also view other AP certificate refresh statuses from the **Updating**, **Update Pending** and **Update Failed** counters.

Figure 150. Status of certification update



Note:AP will restart after its certificate replaced

Update Successfully:0
Update Pending:0
Updating:0
Update Failed:0

Request Status

View a list of AP which needs to update its certificate

AP Name ▲	Description	Model	Serial Number	Need Export

Certificate Status

View a list of AP which certificate is updating or update failed

AP Name ▲	Description	Model	Serial Number	Status

There is no operational impact to the system before the year 2016, even if AP certificate refresh fails.

You have successfully imported the certificate to the AP.

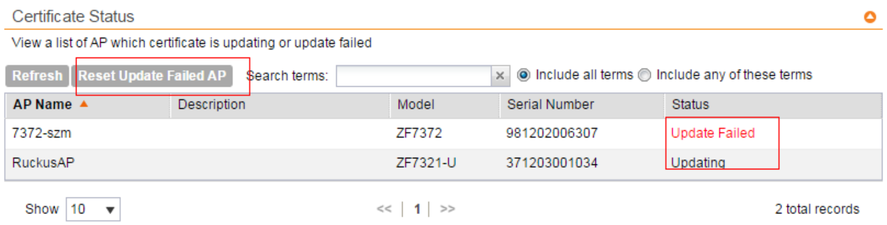
Confirming AP Certification Status

1 Go to **Administration > AP Certificate Replacement**.

The *AP Certificate Replacement* page appears

2 In *Certificate Status* section, view the status of the certification update from the *Status* column.

Figure 151. Certificate status



Certificate Status

View a list of AP which certificate is updating or update failed

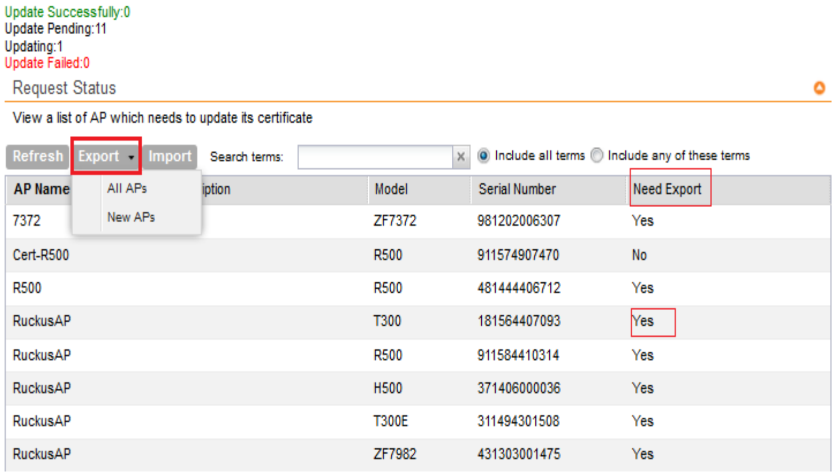
AP Name ▲	Description	Model	Serial Number	Status
7372-szm		ZF7372	981202006307	Update Failed
RuckusAP		ZF7321-U	371203001034	Updating

If the AP is updating, the status displayed against the AP is **Updating**. If the AP certificate does not update, the status displayed against the AP is **Update Failed**.

3 Click **Request Updated Failed AP** to reset the status of the APs for which certification update failed.

After reset, the status of the AP in the *Request Status* section change. APs in need of a new certificate display **Yes** in the *Need Export* column.

Figure 152. APs requiring new certificates



Update Successfully:0
Update Pending:11
Updating:1
Update Failed:0

Request Status

View a list of AP which needs to update its certificate

Search terms: ● Include all terms ○ Include any of these terms

AP Name	iption	Model	Serial Number	Need Export
7372		ZF7372	981202006307	Yes
Cert-R500		R500	911574907470	No
R500		R500	481444406712	Yes
RuckusAP		T300	181564407093	Yes
RuckusAP		R500	911584410314	Yes
RuckusAP		H500	371406000036	Yes
RuckusAP		T300E	311494301508	Yes
RuckusAP		ZF7982	431303001475	Yes

Use the **Search terms** option to look for APs by name, model, serial number, or description.

Ports to Open for AP-Controller Communication

A

AP-SCG/SZ/vSZ Communication

The table below lists the ports that must be opened on the network firewall to ensure that the SCG/SZ/vSZ (controller), managed APs, and RADIUS servers can communicate with each other successfully.

Table 18. Ports to open for AP-SCG/SZ/vSZ communication

Port Number	Layer 4 Protocol	Source	Destination	Configurable from Web Interface?	Purpose
21	TCP	AP	Controller	Yes	FTP upload of reports, statistics, and configuration backups
22	TCP	AP	Controller (control plane)	No	SSH tunnel
49	TCP	TACACS + server	Controller	Yes	TACACS+ based authentication of controller administrators
91	TCP	AP	Controller (control plane)	No	AP firmware upgrade
123	UDP	AP	Controller (control plane)	No	NTP sync up • Not required in 2.1.2, 2.1.3, 2.5.1, 2.6, 3.0 • Required in1.x, 2.1, 2.1.1, 2.5
443	TCP	AP	Controller (control plane)	No	Access to the SCG/vSZ/ SZ web interface via HTTPS
23232	TCP	AP	SCG (data plane)	No	GRE tunnel

Table 18. Ports to open for AP-SCG/SZ/vSZ communication

Port Number	Layer 4 Protocol	Source	Destination	Configurable from Web Interface?	Purpose
23233	UDP	AP	SCG (data plane)	Yes	GRE tunnel (required only when tunnel mode is GRE over UDP)
12222/ 12223	UDP	AP	Controller	No	LWAPP discovery
1812/1813	UDP	AP	RADIUS	Yes	AAA authentication and accounting
8022	No (SSH)	Any	Management interface	Yes	Management ACL for one-port configuration
8090	TCP	Any	Controller	No	Allows unauthorized UEs to browse to an HTTP website
161	UDP	Any	Management interface	No	SNMP
162	UDP	Any	Management interface	No	SNMP traps
16384 to 65000	TCP	AP	Controller	No	FTP port for LWAPP ZD/ AP firmware upgrade
18301	TCP/UDP	AP	Controller	No	SpeedFlex
67	UDP	AP	Control interface	No	DHCP server
7443	TCP	Any	Management interface	No	Public API
8099	TCP	Any	Management interface	No	Unauthorized UE for WISPr HTTPS
8100	TCP	Any	Management interface	No	Unauthorized UE for WISPr HTTP web proxy
8111	TCP	Any	Management interface	No	Unauthorized UE for WISPr HTTPS web proxy
8443	TCP	Any	Management interface	No	Management via web interface

Table 18. Ports to open for AP-SCG/SZ/vSZ communication

Port Number	Layer 4 Protocol	Source	Destination	Configurable from Web Interface?	Purpose
9080	HTTP	Any	Management interface	No	Northbound API HTTP interface
9443	HTTPS	Any	Management interface	No	Northbound API HTTPS interface
9997	TCP	Any	Management interface	No	Internal WISPr HTTP subscriber portal
9998	TCP	Any	Management interface	No	Internal WISPr HTTP subscriber portal
9996	TCP	Client	Controller interface	No	HotSpot 2.0 portal for onboarding and remediation
9999	TCP	Client	Controller interface	No	HotSpot 2.0 trust CA verification
8200	TCP	Client	Controller interface	No	HotSpot 2.0 Oauth in HTTP
8222	TCP	Client	Controller interface	No	HotSpot 2.0 Oauth in HTTPS

AP-ZD Communication

The table below lists the ports that must be opened on the network firewall to ensure that the ZoneDirector (ZD), its managed APs, and other network devices can communicate with each other successfully.

Table 19. Ports to open for AP-ZoneDirector communication

Port Number	Layer 4 Protocol	From (Sender)	To (Listener)	Configurable from Web Interface?	Purpose
21	TCP	AP	ZD	No	AP firmware upgrade (the firewall must be stateful for PASV FTP transfers)
22	TCP	AP	ZD	No	AP statistics reporting (via SSH)
22	TCP	Any	ZD	No	Access to the ZoneDirector CLI (via SSH)
49	TCP	TACACS+ server	ZD	Yes	TACACS+ based authentication of ZoneDirector administrators
80	TCP	Any	ZD	No	Access to the ZoneDirector web interface (via HTTP)
443	TCP	ZD	FlexMaster	No	Registration, inform, firmware upgrade messages
8443	TCP	Any	ZD	No	Access to the ZoneDirector web interface (via HTTPS)
18301	UDP	AP	ZD	No	SpeedFlex
12222/ 12223	UDP	AP	ZD	No	LWAPP discovery
443/33003	TCP	ZD (primary)	ZD (backup)	No	Smart Redundancy

Table 19. Ports to open for AP-ZoneDirector communication

Port Number	Layer 4 Protocol	From (Sender)	To (Listener)	Configurable from Web Interface?	Purpose
Varies (specified in FM Inventory 'Device Web Port Number Mapping')	TCP	FlexMaster	ZD	Yes	Access to the ZoneDirector web interface

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