



RUCKUS SmartZone (LT-GD) Management Guide, 6.1.2

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Contact Information, Resources, and Conventions

Contacting RUCKUS Customer Services and Support

The Customer Services and Support (CSS) organization is available to provide assistance to customers with active warranties on their RUCKUS products, and to customers and partners with active support contracts.

For product support information and details on contacting the Support Team, go directly to the RUCKUS Support Portal using <https://support.ruckuswireless.com>, or go to <https://www.ruckusnetworks.com> and select **Support**.

What Support Do I Need?

Technical issues are usually described in terms of priority (or severity). To determine if you need to call and open a case or access the self-service resources, use the following criteria:

- Priority 1 (P1)—Critical. Network or service is down and business is impacted. No known workaround. Go to the **Submit a Case** section.
- Priority 2 (P2)—High. Network or service is impacted, but not down. Business impact may be high. Workaround may be available. Go to the **Submit a Case** section.
- Priority 3 (P3)—Medium. Network or service is moderately impacted, but most business remains functional. Click the **CONTACT** tab at the top of the page and explore the **Self-Service Online Help** options.
- Priority 4 (P4)—Low. Requests for information, product documentation, or product enhancements. Click the **CONTACT** tab at the top of the page and explore the **Self-Service Online Help** options.

Open a Case

When your entire network is down (P1), or severely impacted (P2), call the appropriate telephone number listed below to get help:

- Continental United States: 1-855-782-5871
- Canada: 1-855-782-5871
- Europe, Middle East, Africa, Central and South America, and Asia Pacific, toll-free numbers are available at <https://support.ruckuswireless.com/contact-us> and Live Chat is also available.
- Worldwide toll number for our support organization. Phone charges will apply: +1-650-265-0903

We suggest that you keep a physical note of the appropriate support number in case you have an entire network outage.

Self-Service Resources

The RUCKUS Support Portal at <https://support.ruckuswireless.com> offers a number of tools to help you to research and resolve problems with your RUCKUS products, including:

- Technical Documentation—<https://support.ruckuswireless.com/documents>
- Community Forums—<https://community.ruckuswireless.com>
- Knowledge Base Articles—<https://support.ruckuswireless.com/answers>
- Software Downloads and Release Notes—https://support.ruckuswireless.com/#products_grid
- Security Bulletins—<https://support.ruckuswireless.com/security>

Using these resources will help you to resolve some issues, and will provide the Technical Assistance Center (TAC) with additional data from your troubleshooting analysis if you still require assistance through a support case or Return Merchandise Authorization (RMA). If you still require help, open and manage your case at https://support.ruckuswireless.com/case_management.

Document Feedback

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

You can email your comments to RUCKUS at #Ruckus-Docs@commscope.com.

When contacting us, include the following information:

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

For example:

- RUCKUS SmartZone Upgrade Guide, Release 5.0
- Part number: 800-71850-001 Rev A
- Page 7

RUCKUS Product Documentation Resources

Visit the RUCKUS website to locate related documentation for your product and additional RUCKUS resources.

Release Notes and other user documentation are available at <https://support.ruckuswireless.com/documents>. You can locate the documentation by product or perform a text search. Access to Release Notes requires an active support contract and a RUCKUS Support Portal user account. Other technical documentation content is available without logging in to the RUCKUS Support Portal.

White papers, data sheets, and other product documentation are available at <https://www.ruckusnetworks.com>.

Online Training Resources

To access a variety of online RUCKUS training modules, including free introductory courses to wireless networking essentials, site surveys, and products, visit the RUCKUS Training Portal at <https://commscopeuniversity.myabsorb.com/>. The registration is a two-step process described in this [video](#). Create a CommScope account and then register for, and request access for, CommScope University.

Document Conventions


The following table lists the text conventions that are used throughout this guide.


Table 1. Text Conventions


Convention	Description	Example
monospace	Identifies command syntax examples	device(config)# interface ethernet 1/1/6
bold	User interface (UI) components such as screen or page names, keyboard keys, software buttons, and field names	On the Start menu, click All Programs .
<i>italics</i>	Publication titles	Refer to the <i>RUCKUS Small Cell Release Notes</i> for more information.


Notes, Cautions, and Safety Warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

 **Note:** A NOTE provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

 **Attention:** An ATTENTION statement indicates some information that you must read before continuing with the current action or task.

 **CAUTION:** A CAUTION statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

 **DANGER:** A DANGER statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Command Syntax Conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.
<i>italic text</i>	Identifies a variable.
[]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{x y z}	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
x y	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, member[member...].

Convention	Description
\	Indicates a “soft” line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

About This Guide

New In This Document

New In This Document

Table 1. Key Features and Enhancements in SmartZone 6.1.2 Rev E (October 2024)

Feature	Description	Reference
Support for non-proxy mode for Hotspot 2.0 access WLAN when controllers are down or unreachable.	Updated: A new non-proxy authentication profile called RADIUS (Hotspot 2.0) allows configuring a WLAN with Hotspot 2.0 to use the non-proxy communication method.	<ul style="list-style-type: none">• HS2.0 Access WLAN with Non-Proxy Mode• Creating Non-Proxy Authentication AAA Server
SoftGRE Failback Trigger	<ul style="list-style-type: none">• New: SoftGRE Failback Trigger feature concept template explaining the feature.• Updated: Adding a new field in the task topic associated with this feature.	<ul style="list-style-type: none">• SoftGRE Failback Trigger• Creating a SoftGRE Profile

Parent topic: [About This Guide](#)

Authentication

[HS2.0 Access WLAN with Non-Proxy Mode](#)

[Creating Non-Proxy Authentication AAA Server](#)

[Creating Proxy Authentication AAA Servers](#)

[Authentication Support Matrix](#)

[Non-Proxy \(Social Login\)](#)

[Creating Realm Based Authentication Profile](#)

[Fast Initial Link Setup \(FILS\)](#)

HS2.0 Access WLAN with Non-Proxy Mode


The WLAN enables non-proxy authentication to extend the Hotspot 2.0 (HS2.0) Access network when the AP discovers that the controller is down.

Feature Overview

In a Hotspot 2.0 access WLAN, the Access Point (AP) typically forwards User Equipment (UE) requests to the controller, which then communicates with the AAA server. This new feature introduces a non-proxy mode for scenarios where the controller is down or unreachable.

When the non-proxy server is enabled, the APs can detect controller downtime. If the APs find that the controller is down or unreachable for 5 minutes, they switch their configuration to communicate directly with the AAA server, allowing them to authorize UEs without relying on the controller.

The non-proxy mode serves as a backup option and cannot be used independently in Hotspot 2.0 networks. Once the controllers are back online, the AP automatically switches its configuration back to the regular proxy mode, ensuring seamless operation and minimal network disruption.

 **Note:** You can configure non-proxy authentication settings within the Hotspot 2.0 (HS2.0) WLAN profile, but these settings cannot function independently.

Requirements

The feature is supported in SmartZone release 6.1.2 and in all later releases starting from release 7.1.1.

Considerations

The feature has the following considerations.

- The AP must support the IEEE 802.1X authentication protocol.
- The default Identity Provider (as configured in the **Identity Providers** section of the Hotspot 2.0 WLAN Profile) is used for No Match and Unspecified authentication realm mapping.
- The non-proxy authentication service serves as a backup authentication option and is not used independently in Hotspot 2.0.
- The AP will switch to non-proxy RADIUS authentication only if the controller is down or cannot be reached.
- The **Backup RADIUS** option and **User Role Mapping** are not supported when the **Non-Proxy (AP Authenticator)** AAA Server is configured with **Type** option **RADIUS(Hotspot 2.0)**.
- There is a 5-minute timeout before switching to non-proxy mode to avoid connection interruptions. During this time, the AP cannot authorize UEs.
- Only one non-proxy RADIUS server can be configured, even if multiple identity providers are set within a Hotspot 2.0 WLAN profile.
- Non-proxy RADIUS settings can be configured through the Hotspot 2.0 WLAN profile in the UI.

Best Practices

This feature has no special recommendations for feature enablement or usage.

Prerequisites

This feature has no prerequisites to feature enablement or usage.

Parent topic: [Authentication](#)

Creating Non-Proxy Authentication AAA Server

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


1. From the main menu, click **Security > Authentication > Non-Proxy (AP Authenticator)**.
2. Select a zone from the system tree and click **Create**.
The **Create AAA Server** page is displayed.

Figure 1. Create AAA Server


3. Configure the following options:

◦ General Options

- **Name:** Enter a name for the AAA server that you are creating.
- **Description:** Enter a short description of the AAA server.
- **Type:** Select the type of AAA server that you are creating. Options include **RADIUS**, **Active Directory**, **LDAP**, and **RADIUS(Hotspot 2.0)**.
When you select the **Type** as **RADIUS(Hotspot 2.0)**, configure a non-proxy AAA server as a fallback server for Hotspot 2.0 WLANs. The APs will communicate this authentication server when the controller is unreachable.

 **Note:** Hotspot 2.0 profiles use proxy AAA by default and will only switch to non-proxy AAA when the AP is not able to contact the controller. This option does not support the **Backup RADIUS** option and **User Role Mapping**.

- **Backup RADIUS:** Toggle the button to **ON** to enable the Secondary Server option only if a secondary RADIUS server exists on the network.

 **Note:** This option is not supported when the server **Type** is set to **RADIUS(Hotspot 2.0)**.

◦ Primary Server

- If you select the server **Type** as **RADIUS**, configure the following options:


- **IP Address:** The IP address of the AAA server. Both IPv4 and IPv6 addressing formats are supported.
- **Port:** The port number of the AAA server. The default RADIUS server port number is 1812.
- **Shared Secret:** The AAA shared secret used for authentication.
- **Confirm Secret:** Re-enter the shared secret to confirm.

If you have enabled the secondary server for **Backup RADIUS**, you must provide the same information as for the primary server.

- If you select the server **Type** as **Active Directory**, configure the following options:
 - **IP Address:** Enter the IPv4 address of the Active Directory server.
 - **Port:** Enter the port number of the Active Directory server. The default port number (389) must not be changed unless you have configured the Active Directory server to use a different port.
 - **Windows Domain Name:** Enter the Windows domain name assigned to the Active Directory server (for example, dc=domain,dc=ruckuswireless,dc=com).
- If you select the server **Type** as **LDAP**, configure the following options:
 - **IP Address:** Enter the IPv4 address of the LDAP server.
 - **Port:** Enter the port number of the LDAP server. The default port number is 389.
 - **Base Domain Name:** Enter the base domain name in LDAP format for all the user accounts (for example, dc=ldap,dc=com).
 - **Admin Domain Name:** Enter the administrator domain name in LDAP format (for example, cn=Admin;dc=Your Domain,dc=com).
 - **Admin Password:** Enter the administrator password for the LDAP server.
 - **Confirm Password:** Re-enter the administrator password to confirm.
 - **Key Attribute:** Enter a key attribute to identify users (for example, default: uid).
 - **Search Filter:** Enter a search filter (for example, objectClass=Person).
- If you select the server **Type** as **RADIUS(Hotspot 2.0)**, configure the following options:
 - **IP Address:** The IP address of the AAA server. Both IPv4 and IPv6 addressing formats are supported.
 - **Port:** The port number of the AAA server. The default RADIUS server port number is 1812.

- **Shared Secret:** The AAA shared secret used for authentication.
- **Confirm Secret:** Re-enter the shared secret to confirm.



4. Under **User Role Mapping:**

 **Note:** When mapping group attribute values to a user role, avoid special characters, wildcard entries, or duplicate entries in any order. Only the first-matched entry will be mapped to the user role.

 **Note:** **User Role Mapping** is not supported when the server **Type** is set to **RADIUS(Hotspot 2.0)**.


a. Click **Create**. The **Create User Traffic Profile Mapping** dialog box is displayed.

b. In **Group Attribute Value:** Enter the value to be sent from AAA as part of an Access-Accept message.

c. In **User Role:** Select a user role from the list. Click the  icon to create a user role or click the  icon to modify an existing user role.

d. Click **OK**.

5. Click **OK**.

 **Note:** You can edit, clone, and delete a AAA server by selecting the options **Configure**, **Clone**, and **Delete**, respectively, from the **Non-Proxy (AP Authenticator)** tab.

Video

Non-Proxy AAA Configuration. This video provides a brief overview of non-proxy AAA server configuration.

Video:

[Click to play video in full screen mode.](#)

Parent topic: [Authentication](#)

Related information

[Video: Creating a Proxy or Non-Proxy Authentication service](#)

Creating Proxy Authentication AAA Servers

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

1. Select **Security > Authentication > Proxy (SZ Authenticator)**.
2. Select a Zone from the system tree and click **Create**.

The **Create Authentication Service** is displayed.

Figure 1. Creating an Authentication Service


3. Configure the following options:

- **Name:** Enter a name for the authentication service that you are adding.
- **Friendly Name:** Enter an alternative name that is easy to remember.
- **Description:** Enter a description for the authentication service.
- **Service Protocol:** Select the type of service protocol for the authentication service you are adding. Options are **RADIUS**, **Active Directory**, and **LDAP**.
 - If you select **RADIUS**, refer to [RADIUS Service Options](#) for more information.
 - If you select **Active Directory**, configure the following options:
 - **Global Catalog:** Select the **Enable Global Catalog** support if you want the Active Directory server to provide a global list of all objects.
 - **Primary Server:** For Encryption, select the **Enable TLS Encryption** check box if you want to use the Transport Layer Security (TLS) protocol to secure communication with the server.

Note: You must also configure the Trusted CA certificates to support TLS encryption.

- IP Address: Enter the IPv4 address of the Active Directory server.
- Port: Enter the port number of the Active Directory server. The default port number (389) must not be changed unless you have configured the Active Directory server to use a different port.
- Windows Domain Name: Enter the Windows domain name assigned to the Active Directory server (for example, domain.ruckuswireless.com).
- If you select **LDAP**, configure the following options:
 - a. Select **Enable TLS Encryption** check box, if you want to use the Transport Layer Security (TLS) protocol to secure communication with the server.
 - 🔗 **Note:** You must also configure the Trusted CA certificates to support TLS encryption.
 - b. IP Address: Enter the IPv4 address of the LDAP server.
 - c. Port: Enter the port number of the LDAP server.
 - d. Base Domain Name: Enter the base domain name in LDAP format for all user accounts (for example, dc=ldap,dc=com).
 - e. Admin Domain Name: Enter the administrator domain name in LDAP format (for example, cn=Admin;dc=**Your Domain**,dc=com).
 - f. Admin Password: Enter the administrator password for the LDAP server.
 - g. Confirm Password: Re-enter the administrator password to confirm.
 - h. Key Attribute: Enter a key attribute to denote users (for example, default: uid).
 - i. Search Filter: Enter a search filter (for example, objectClass=Person).
- User Role Mapping:
 - 🔗 **Note:** While mapping group attribute value to a user role, avoid special characters, wild-card entries, or duplicate entries regardless of the order. Only the first-matched entry will be mapped to the user role.
 - a. Click +Create. The Create User traffic Profile Mapping dialog box is displayed.
 - b. In the **Group Attribute Value** field, enter the value to be sent from AAA as part of an Access-Accept.




c. Select a **User Role** from the list or click  to create a new user role. For more information, refer to **User Roles** in the *RUCKUS SmartZone User Management Guide*.

d. Click **OK**.

The mapped user profile is listed.

4. Click **OK**.

 **Note:** You can also edit, copy, and delete an AAA server by selecting the options **Configure**, **Clone**, and **Delete**, respectively, from the **Proxy (SZ Authenticator)** tab.

Parent topic: [Authentication](#)

RADIUS Service Options

These are the Radius service options available for the primary and secondary servers.

RFC 5580 Out of Band Location Delivery: If you want out-of-band location delivery (RFC 5580) to apply only to RUCKUS APs, select the **Enable for Ruckus AP Only** check box.

Configure the primary RADIUS server settings as shown in the following table.

Table 1. Primary Server Options

Option	Description
IP Address or FQDN	Type the IP address or the Fully Qualified Domain Name (FQDN) of the RADIUS server. IPv4 and IPv6 addressing formats are supported.
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.


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 in the following table.

Table 2. Secondary Server Options

Option	Description
Backup RADIUS	<p>Select Enable Secondary Server.</p> <p>When a secondary RADIUS server is enabled and the primary RADIUS server becomes unavailable, the secondary Automatic Fallback Disable 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.</p>
IP Address	Type the IP address of the secondary AAA server. IPv4 and IPv6 addressing formats are supported.
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.

The following 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.

Table 3. Health Check Policy

Option	Description
Response Window	<p>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). Response Window</p> <p>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.</p> <p> Note: The zombie period is not started immediately after the Response Window expires, but after the configured Response Window plus</p>

Option	Description
	<p>• $\frac{1}{4}$ of the configured Zombie Period. The default Response Window is 20 seconds</p>
Zombie Period	<p>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.</p> <p>An AAA server that is marked zombie (inactive or unreachable) will be used to proxy 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.</p> <p>The controller will only proxy requests to a zombie server only when there are no other live servers. Any request that is sent as a proxy 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.</p>
Revive Interval	<p>Set the time (in seconds) after which, if no RADIUS messages are sent as proxy 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.</p>
No Response Fail	<p>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.</p>

- **Note:** To ensure that the RADIUS fail-over 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 third 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.

Configure the following options.

Table 4. Rate Limiting

Options	Description
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. Threshold (% of MOR) 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.

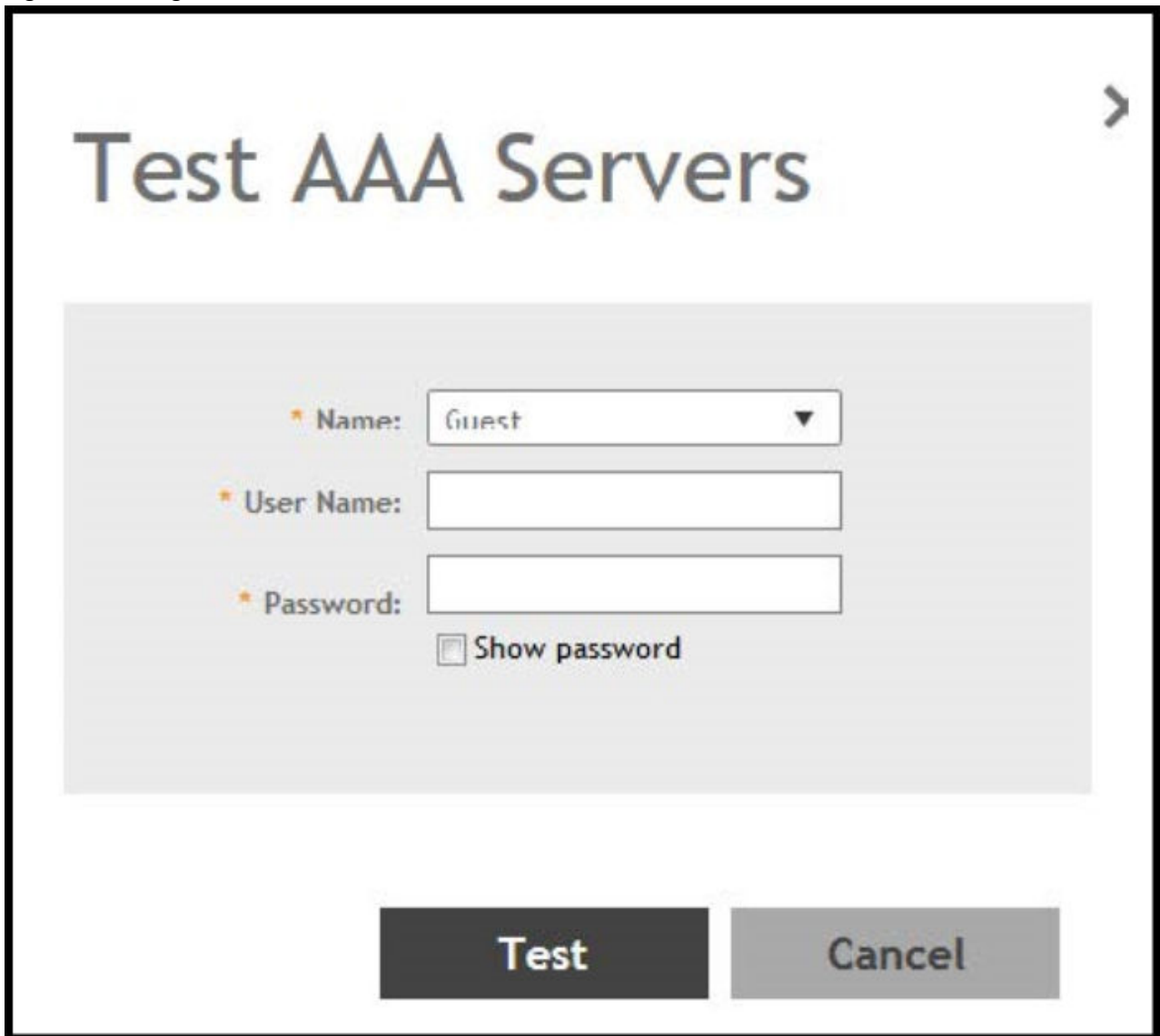
Parent topic: [Creating Proxy Authentication AAA Servers](#)

Testing AAA Servers

To ensure that the controller administrators will be able to authenticate successfully with the RADIUS server type that you selected, RUCKUS strongly recommends testing the AAA server after you set it up.

1. Go to **Security > Authentication**.
2. Select the **Proxy (SZ Authenticator)** tab, and then select the zone for which you want to test the AAA server.
3. Click **Test AAA**.
The **Test AAA Server** page appears.

Figure 1. Testing an AAA Server



Test AAA Servers

* Name: Guest ▼

* User Name:

* Password:

☐ Show password

Test Cancel

4. Configure the following:

- a. Name: Select one of the AAA servers that you previously created.
- b. User Name: Type an existing user name on the AAA server that you selected.
- c. Password: Type the password for the user name you specified.

5. 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** or **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.

Parent topic: [Creating Proxy Authentication AAA Servers](#)

Authentication Support Matrix

It is important to understand the compatibility between AAA servers and different WLANs.

Proxy Mode

In proxy mode, authentication requests are set through the controller.

Table 1. Proxy Mode Compatibility

Authentication Source	802.1X	HS 2.0 Secure	Web Auth	Hotspot/WISPr
Local Database	No	Yes	No	Yes
IDM-Provisioned Local DB	Yes	Yes	NA	NA
Active Directory	No*	No	Yes	Yes
RADIUS	Yes	Yes	Yes	Yes
LDAP	Yes	No	Yes	Yes

Note:

To support 802.1X with Active Directory, an external RADIUS server (such as NPS) must be used.

- Note:** IDM Provisioned username (also called local cache credential) is relevant only in secure access after Onboarding.
- Note:** 802.1X (MSCHAPv2 via built-in RADIUS using AD-NPS), WebAuth, and WISPr support AD authentication from SmartZone release in 3.2.
- Note:** 802.1X, WebAuth, and WISPr support LDAP authentication from SmartZone release in 3.2. For 802.1X authentication, the user password must be in clear text in the LDAP database.

Non-proxy Mode

In the Non-proxy mode, authentication requests are sent directly by AP and not through the controller. The local database is stored on the controller, therefore, authentication sources such as local database and IDM-provisioned local databases are not supported.

Table 2. Non-proxy Mode Compatibility

Authentication Source	802.1X	Zero-IT Onboard	HS 2.0 Onboard	HS 2.0 Secure	Web Auth	Hotspot/WISPr
Active Directory	No	No*	No*	No	Yes	No
RADIUS	Yes	No*	No*	No	Yes	Yes*
LDAP	No	No*	No*	No	Yes	No

(*) From the configuration it may seem like non-proxy RADIUS is supported in WISPr, but the call flow goes through the controller.

Profile Configuration

The following table details proxy and non-proxy AAA server configurations against various platforms.

Table 3. Profile Configuration

Feature	SZ100	vSZ-E	vSZ-H	Description
Per-Zone ProxyAAA Profiles	NA	NA	NA	Ability to configure a ProxyAAA profile in a specific zone
Global ProxyAAA Profiles	Yes	Yes	Yes	Ability to configure a ProxyAAA profile globally and then use it across zones
Per-Zone NonProxy AAA Profiles	NA	NA	Yes	Ability to configure a Non ProxyAAA profile in a specific zone
Global NonProxy AAA Profiles	Yes	Yes	No	Ability to configure a Non Proxy AAA profile globally and then use it across zones


Dynamic Policy Assignment (Proxy Authentication Types)

The following table details dynamic policy assignments across authentication types.

Table 4. Dynamic Policy Assignment (Proxy)

Feature	802.1X	Zero-IT Onboard	HS 2.0 Onboard	HS 2.0 Secure	Web Auth	Hotspot/ WISPr	MAC Auth	Description
Dynamic Role Assignment	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Ability to assign a user to a particular local role via a group/role attribute from RADIUS, AD, LDAP. From SmartZone 3.4, Role can contain UTP. Therefore, when you assign a role, you also get the ACL and Rate Limiting policies.
Dynamic VLAN / VLAN Pool	Yes	NA	NA	NA	No	No	Yes	Ability to assign a user to a VLAN through a VLAN attribute from RADIUS, AD, LDAP. From SmartZone release 3.5, you can also assign VLANs and VLAN



Feature	802.1X	Zero-IT Onboard	HS 2.0 Onboard	HS 2.0 Secure	Web Auth	Hotspot/ WISPr	MAC Auth	Description
								pools based on the user role.
Dynamic UTP	Yes				Yes	Yes	Yes	Ability to assign a user to a UTP through an attribute from an authentication source.
Dynamic ACL	Yes	Yes	Yes	No	Yes	Yes	Yes	Ability to assign a specific ACL to a user through an attribute from RADIUS, AD, LDAP.
Dynamic Rate Limit	Yes	Yes	Yes			Yes	Yes	Ability to assign a specific Rate Limit to a user through an attribute from RADIUS, AD, LDAP.

 **Note:** In dynamic ACL and Rate limit, since ACL and rate limit are associated with a UTP, assigning a UTP also assigns an ACL or rate limit.

Dynamic Policy Assignment (Non-Proxy Authentication Types)

The following table details dynamic policy assignments across authentication types.

Table 5. Dynamic Policy Assignment (Non-Proxy)

Feature	802.1X	HS 2.0 Secure	Web Auth	Description
Dynamic Role Assignment	No			Ability to assign a user to a local role through a group/role attribute from the authentication source.
Dynamic VLAN / VLAN Pool				Ability to assign a user to a VLAN through a VLAN attribute from the authentication source.
Dynamic UTP				<p>Ability to assign a user to a UTP through an attribute from the authentication source.</p> <p> Note: From SmartZone release 3.4, UTP contains ACL and rate limit.</p>
Dynamic ACL				<p>Ability to assign a specific ACL to a user through an attribute from the authentication source.</p> <p> Note: ACLs are a part of a UTP. If you configure a UTP without a rate limit, you</p>


Feature	802.1X	HS 2.0 Secure	Web Auth	Description
				<ul style="list-style-type: none"> effectively only have an ACL.
Dynamic Rate Limit				<p>Ability to assign a specific Rate Limit to a user through an attribute from the authentication source.</p> <ul style="list-style-type: none"> Note: Rate limiting is also a part of a UTP. If you configure a UTP without ACL, you effectively only have a rate limiting policy.

Other Authentication Features

The following table details authentication support for various authentication features.

Table 6. Authentication Features

Feature	Supported	Description
Test AAA - RADIUS	Yes	Ability to test a specific username/password against a configured RADIUS server.
Test AAA - Active Directory	Yes	Ability to test a specific username/password against a configured AD server.
Test AAA - LDAP	Yes	<p>Ability to test a specific username/password against a configured LDAP server.</p> <ul style="list-style-type: none"> Note: Only Non-Proxy LDAP is supported at the Zone Level.

Feature	Supported	Description
Test AAA - Return a Role	Yes - supported by RADIUS, AD and LDAP	Ability to return a role assignment when testing a AAA server.
RADIUS CoA - Change Role		Ability to change a user's Role through a Change of Authorization (CoA).
RADIUS CoA - Change VLAN		Ability to change a user's VLAN through a Change of Authorization (CoA).
RADIUS CoA - Change ACL		Ability to change a user's ACL through a Change of Authorization (CoA).
RADIUS CoA - Change Rate Limit		Ability to change a user's rate limit through a Change of Authorization (CoA).
RADIUS CoA - Change Authorization		<p>Ability to authorize or deauthorize a user through a Change of Authorization (CoA).</p> <p> Note: The controller does not provide support for CoA or DM in non-proxy mode.</p>


PAP/CHAP Support

The following table details PAP and CHAP support for various authentication features.

Table 7. PAP/CHAP Support

Feature	802.1X	Web Auth	Hotspot/ WISPr	MAC Auth	Notes
Proxy-Mode					
Active Directory	Yes	Yes*	Yes	No	PAP / CHAP is supported for Web Authentication and HotSpot/ WISPr. NPS interface (AD) is required for WebAuthenticait

Feature	802.1X	Web Auth	Hotspot/ WISPr	MAC Auth	Notes
					on (CHAP) and 802.1X (MSCHAPv2).
RADIUS	Yes	Yes*	Yes	Yes	
LDAP	Yes	Yes*	Yes	No	PAP / CHAP is supported for Web Authentication and HotSpot/ WISPr
LDAP-TLS	Yes	Yes*	Yes	No	This support is available from SmartZone version 3.5.
Active Directory (TLS)	Yes	Yes*	Yes	No	This support is available from SmartZone version 3.5. NPS interface (AD) is required for WebAuthenticait on (CHAP) and 802.1X (MSCHAPv2).
Non-proxy Mode					
Active Directory	No	Yes*	Yes	No	
RADIUS	Yes	Yes*	Yes	Yes	
LDAP	No	Yes*	Yes	No	

 **Note:** (*) This is an AP CLI setting:

```
set aaa auth-method pap|chap
```

It is a global setting for all WebAuth WLANs on the AP. The default is CHAP.

Parent topic: [Authentication](#)

Non-Proxy (Social Login)

To configure social media profile for a user, use client ID and client secret options. Social media login can be activated by turning **On** the Social Media enable button.

Parent topic: [Authentication](#)

Creating Social Media Login Profile

When end-user associated with an OAuth 2.0 WLAN, launches his browser. AP redirects it to the OAuth 2.0 provider login page. The end-user should enter his account and password to authenticate with OAuth 2.0 provider. AP sets the end-user status as authenticated and user is able to use internet.

To configure social media authentication configuration, perform the following:

1. Go to **Security > Authentication > Non-Proxy (Social Login)**.
This displays the zones associated with the Non-Proxy (Social Login).
2. In the **Non-Proxy (Social Login)** screen, select a **Zone** and click **Create**.
This displays **Create Social Media Login Profile** page.
3. Enter the values in **General Options** and enable the **Social Auth Option** tabs.
4. After you have enabled the **Social Media Logins** it is mandatory to provide the client ID/Secret. If you don't have one, click on the hyperlink provided in **Create Social Media Login Profile** screen to generate a and for particular social media website.
5. Add domains to the **Whitelisted Domain** field by entering the domain name. For example,
 - LinkedIn - *.[licdn.com](#), *.[linkedin.com](#)
 - Google - *.[geotrust.com](#), *.[gstatic.com](#)
 - Facebook - *.[facebook.com](#), *.[fbcdn-profile-a.akamaihd.net](#), *.[fstatic-a.akamaihd.net](#)
 - Microsoft - *.[geotrust.com](#), *.[live.com](#), *.[microsoftonline.com](#), *.[auth.gfx.ms](#), *.[msauth.net](#)


 **Note:** Microsoft based Social media authentication do not support corporate accounts, but personnel email account.

Figure 1. Create Social Media Login Profile

The screenshot shows a web form titled "Create Social Media Login Profile". It has two main sections: "General Options" and "Social Auth Option".

General Options:

- Name:** A text input field.
- Description:** A text input field.

Social Auth Option:

- Social Media Logins:** A section with four toggle switches, all currently set to "OFF":
 - LinkedIn: OFF
 - Google: OFF
 - Microsoft: OFF
 - Facebook: OFF
- Whitelisted Domain:** A section with a text input field, followed by buttons: "+ Add", "Import CSV" (with a dropdown arrow), "Cancel" (with an 'X' icon), and "Delete" (with a trash icon). Below this is a list box labeled "Whitelisted Domain" which is currently empty.

At the bottom right of the form are two large buttons: "OK" and "Cancel".

Parent topic: [Non-Proxy \(Social Login\)](#)

Creating Realm Based Authentication Profile

An authentication profile defines the authentication policy when the controller is used as a Radius proxy service for WLANs.

1. Go to **Security > Authentication > Realm Based Proxy**.

2. Click **Create**.

This displays **Create Authentication Profile** page.

Figure 1. Creating a Realm Based Proxy Authentication Profile

Create Authentication Profile

Name:

Description:

☐ OFF Configure PLMN identifier

Realm Based Authentication Service ▼

[+ Create](#) [Configure](#) [Delete](#)

Realm	Protocol	Auth Service	Auth Method	Dynamic VLAN ID
No Match	NA	NA-Disabled	Non-3GPP Call Flow	N/A
Unspecified	NA	NA-Disabled	Non-3GPP Call Flow	N/A

Note: If device onboarding was done with credential type 'remote', then map your 'realm' value to its respective authentication service PLUS define 'Unspecified' realm & map it to corresponding authentication service to properly handle legacy (non-Hotspot 2.0) devices.

OK **Cancel**

3. Configure the following:

- a. Name: Type a name for the authentication service profile that you are creating.
- b. Description: Type a short description of the authentication service profile.
- c. Realm-Based Authentication Service
 - Realm: Type where the realm is **No Match** or **Unspecified**.
 - Protocol: Displays the type of protocol.
 - Auth Service: Select a default authentication service for the realm.
 - Auth Method: Select an authorization method as 3GPP or Non-3GPP call flow.
 - Dynamic VLAN ID: Type the vlan ID.
- d. 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.

4. Click **OK**.


Parent topic: [Authentication](#)

Fast Initial Link Setup (FILS)

Enable Fast Initial Link Setup (FILS) for 802.1X EAP WLAN and select the realm-based AAA configuration and DHCP server IP address.

Combines the authentication, authorization, and DHCP to reduce EAP frames and skip EAPOL 4-way handshake when station reconnects or roams. It requires AAA to support Higher Layer Protocol (HLP) and EAP-RP. The DHCP server requires the Rapid commit. The following WLAN feature combinations are supported by FILS:

- 802.1x(FILS) + WISPr
- 802.1x(FILS) + MAC Auth
- 802.1x(FILS) + 802.11w
- 802.1x(FILS) + FT

 **Note:** FILS provides MAC support. When FILS is enabled, the DHCP Rapid Commit Proxy is also enabled by default. However, it is hidden in the screen.

Parent topic: [Authentication](#)

Create Fast Initial Link Setup (FILS) Realm Profile


Complete the following steps to create Fast Initial Link Setup (FILS) Realm Profile.

1. Go to **Security > Authentication > FILS Realm Proxy**.
This displays **Create FILS Realm Profile** screen.
2. In the **Create FILS Realm Profile** screen, enter the following details:
 - Name: Name the profile.
 - Description: Short description for the profile.
 - Realms: Name the Realm and click **Add**.

The Realm Name is displayed below.

- Click **Ok**.

The new profile is displayed in the **FILS Realm Profile** screen.

 **Note:** The **FILS Realm Profile** can be created from the **Fast Initial Link Setup** by clicking + corresponding to the **Realm Profile**.

Parent topic: [Fast Initial Link Setup \(FILS\)](#)

Accounting

[Creating Non-Proxy Accounting AAA Servers](#)

[Creating Proxy Accounting AAA Servers](#)

[Creating Realm Based Proxy](#)

Creating Non-Proxy Accounting AAA Servers

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

1. Go to **Security > Accounting > Non-Proxy**.
2. Select a **Zone** and click **Create**.
The **Create AAA Server** page appears.

Figure 1. Creating an AAA Server

Create AAA Server

General Options ▼

* Name:

Description:

Type: ☒ RADIUS Accounting

Backup RADIUS: ☐ OFF ☐ Enable Secondary Server

Primary Server ▼

* IP Address:

* Port:

* Shared Secret:

* Confirm Secret:

OK

Cancel

3. Configure the following:

a. General Options

- Name: Type a name for the AAA server that you are creating.
- Description: Type a short description of the AAA server.
- Type: By default, the **RADIUS Accounting** option is selected.

 **Note:** RFC-5580 is used to convey access-network ownership and location information based on the civic and geospatial location formats in RADIUS protocol.

- Cluster Redundancy: Click the **Enable Service for Standby Cluster** option to enable cluster redundancy.

🔗 **Note:** Cluster Redundancy option is available only when this functionality is enabled in cluster configuration.

- Backup RADIUS (appears if you clicked RADIUS above): Click the **Enable Secondary Server** check box if a secondary RADIUS server exists on the network.

b. If you selected RADIUS, configure the following options in the Primary and Secondary server sections:

- 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 1813.
- Shared Secret: Type the AAA shared secret.
- Confirm Secret: Retype the shared secret to confirm.

4. Click **OK**.

You have completed creating a Non-proxy Accounting AAA server.

🔗 **Note:** You can also edit, clone and delete an AAA server by selecting the options **Configure**, **Clone** and **Delete** respectively, from the **Non-Proxy** tab.

Parent topic: [Accounting](#)

Creating Proxy Accounting 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.

1. Select **Security > Accounting > Proxy**.
2. Select a Zone from the system tree and click **Create**.
The **Create Accounting Service** page appears.

Figure 1. Creating an Accounting Service

Create Accounting Service

Name:

Description:

Service Protocol: ☒ RADIUS Accounting

ClusterRedundancy: ☐ OFF Enable Service for Standby Cluster

RADIUS Service Options

Primary Server

IP Address:

Port:

Shared Secret:

Confirm Secret:

Primary Server (Standby Cluster)

OK Cancel

3. Configure the following:

- a. Name: Type a name for the authentication service that you are adding.
- b. Description: Type a description for the authentication service.
- c. Service Protocol: By default, the RADIUS Accounting is selected. For more information, see [RADIUS Service Options](#).

Note: RFC-5580 is used to convey access-network ownership and location information based on the civic and geospatial location formats in RADIUS protocol.

- d. Cluster Redundancy: Click the **Enable Service for Standby Cluster** option to enable cluster redundancy.

Note: Cluster Redundancy option is available only when this functionality is enabled in cluster configuration.

4. Click **OK**.

You have completed creating a Proxy Accounting AAA server.

- Note:** You can also edit, clone and delete an AAA server by selecting the options **Configure**, **Clone** and **Delete** respectively, from the **Proxy** tab.

Parent topic: [Accounting](#)

Creating Realm Based Proxy

An accounting profile defines the accounting policy when the controller is used as a RADIUS proxy for WLAN services.

1. Go to **Security > Access Control > Accounting > Realm Based Proxy**.
2. Click **Create**.

The **Create Accounting Profile** page appears.

Figure 1. Creating an Accounting Profile

Create Accounting Profile

Name:

Description:

Realm Based Accounting Service ▼

+ Create **Configure** **Delete**

Realm	Protocol	Accounting Service
No Match	NA	NA-Disabled
Unspecified	NA	NA-Disabled

Note: A realm to service mapping define the accounting service for each of the realm specified in this table. When the accounting service for a particular realm is 'NA', then accounting is disabled.

OK **Cancel**

3. Configure the following:
 - a. Name: Type a name for the authentication service that you are adding.
 - b. Description: Type a description for the authentication service.
 - c. Accounting Service per Realm: Specify the accounting service for each of the realms specified in this table. If you set the accounting service for a particular realm to NA-Disabled, then the accounting request is rejected. To create a new service click, **Create** and then configure **Realm** and **Accounting Service**.

- **Note:** RFC-5580 is used to convey access-network ownership and location information based on the civic and geospatial location formats in RADIUS protocol.

4. Click **OK**.

You have completed creating a Realm-based proxy Accounting AAA server.

- **Note:** You can also edit, clone and delete an AAA server by selecting the options **Configure**, **Clone** and **Delete** respectively, from the **Realm Based Proxy** tab.

Parent topic: [Accounting](#)

ECDSA

[Elliptic Curve Digital Signature Algorithm \(ECDSA\) Certificate and Keys Support](#)

[Cloud Computing Compliance Criteria Catalogue - BSI C5](#)

[Configuring ECDSA and Keys at Zone Level](#)

[Mapping Server ECDSA Certificates](#)

[Enabling ECDSA Certificates Support for RADIUS with Transport Layer Security \(TLS\)](#)

Elliptic Curve Digital Signature Algorithm (ECDSA) Certificate and Keys Support

The ECDSA is a digital signature algorithm which uses keys derived from elliptic curve cryptography.

The SmartZone provides an option to disable/enable the ECDSA certification on a per-zone basis. The APs in the zone with ECDSA certificate enabled receives an additional controller-signed certificate from the SmartZone. The 2K MIC (Manufacturer Installed Certificates) on the APs is still used as the trust anchor for the SmartZone. The 2K MIC and corresponding key (2k length) remains untouched, backward compatibility of the zone only allows 2K certificate/key.

The SmartZone managed APs issue ECDSA signed certificates which are valid only among the same SmartZone cluster nodes.

The ECDSA is faster than RSA in key generation and signing operations. Signature algorithms are used in TLS handshake and SSH authentication.

Parent topic: [ECDSA](#)

Cloud Computing Compliance Criteria Catalogue - BSI C5

The C5 catalogue specifies minimum requirements for secure cloud computing.

By adhering the BSI C5 requirements and guidelines, RUCKUS AP provides a secure, reliable, and trustworthy communication environment.

The following are the secure features in AP and SmartZone:

- Uses a stronger certificate and key in both client and server authentication.

- Removes weak ciphers and algorithms.
- Replaces DropbearSSH to OpenSSH on AP.

Parent topic: [ECDSA](#)

Configuring ECDSA and Keys at Zone Level

To configure ECDSA certificates, enable the **SSH/TLS Key Enhance Mode**.

By default, the **SSH/TLS Key Enhance Mode** is disabled.

This configuration is available only with new installation and upgraded versions of the Access Points. The ECDSA certificates are available only after enabling the **SSH/TLS Key Enhance Mode**. To generate and share the ECDSA certificates, AP should join and be a part of this zone.

To enable **SSH/TLS Key Enhance Mode** at the zone level, perform the following:

1. Click **Network > Wireless > Access Points**
This displays the **Access Points** page.
2. In the system tree, click **Create Domain/Zone/Group (+)** icon.
This displays the **Create Zone** page.
3. In the **Create Zone** page, navigate to **General Options** section and enable the **SSH/TLS Key Enhance Mode**.

Figure 1. SSH/TLS Key Enhance Mode

Create Zone

* Name: Description:

Type: ☒ Domain ☐ Zone

Parent Group:

Link Switch Group: ☒ OFF

General Options

AP Firmware:

Country Code:
Different countries have different regulations on the usage of radio channels. To ensure that this zone is using an authorized radio channel, select the correct country code for your location.

Location: (example: Ruckus HQ)

Location Additional Information: (example: 350 W Java Dr, Sunnyvale, CA, USA)

GPS Coordinates: Latitude: Longitude: (example: 37.411272, -122.019616)

Altitude:

AP Admin Logon: * Logon ID: * Password:

AP Time Zone: ☒ System defined ☐ User defined

AP IP Mode: ☒ IPv4 only ☐ IPv6 only ☐ Dual

[?] Historical Connection Failures: ☒ OFF

[?] DP Group: +

☒ OFF Enforce the priority of DP Group
This action will disconnect the already established tunnels to vDPs and re-establish to new vDPs as per the priority defined.

SSH Tunnel Encryption: ☒ AES 128 ☐ AES 256

SSH/TLS Key Enhance Mode: ☒ OFF

Mesh Options

After enabling the **SSH/TLS Key Enhance Mode**, navigate to **Administration > System > Certificates > Certificate Mapping** to map the server's ECDSA certificates.

Parent topic: [ECDSA](#)

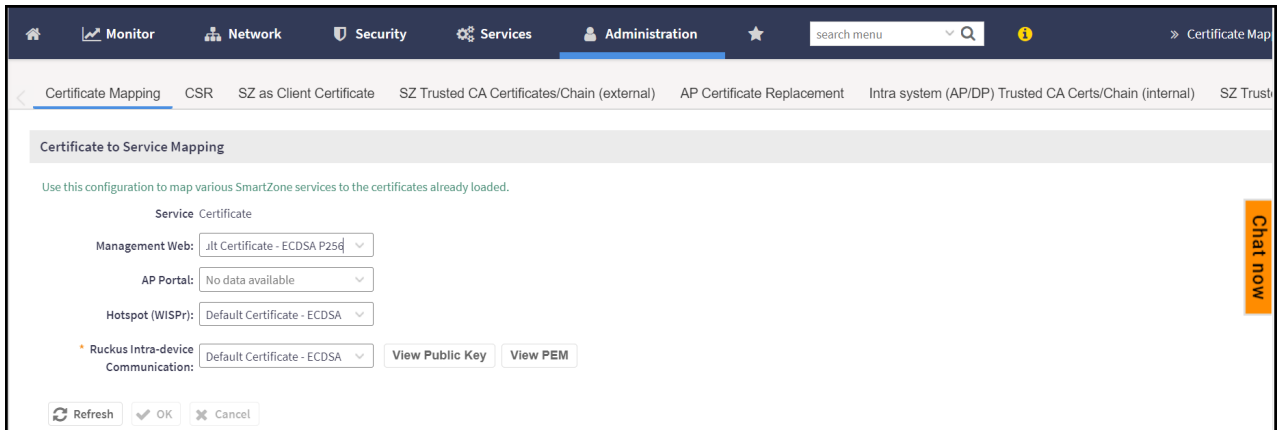
Mapping Server ECDSA Certificates

After enabling the **SSH/TLS Key Enhance Mode** at the zone level. You can map the ECDSA certificates to SmartZone (server certificate). This mapping ensures that SmartZone (server) is using 2K/3K RSA or ECDSA certificates during the TLS handshake.

To map the **ECDSA** certificates, perform the following:

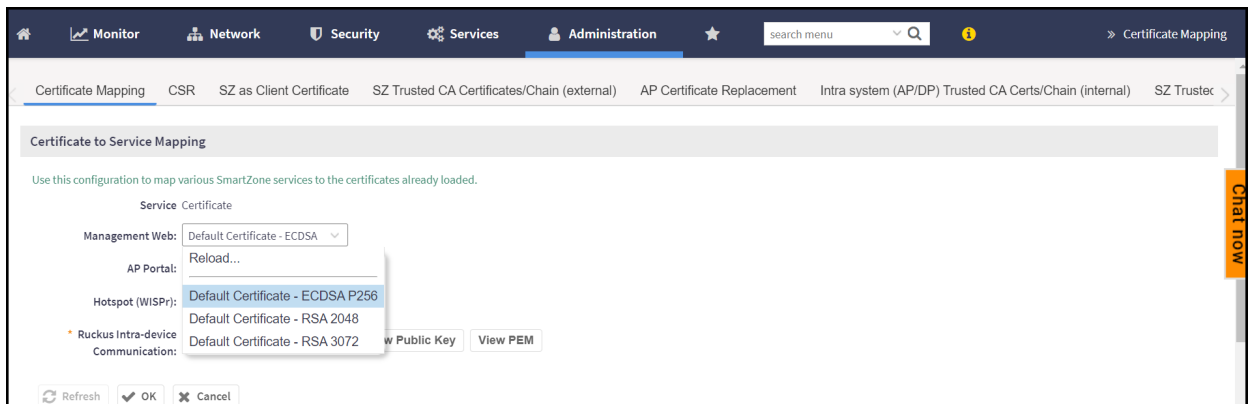
1. Click **Administration > System > Certificates > Certificate Mapping**. This displays **Certificate Mapping** page.

Figure 1. Certificate Mapping



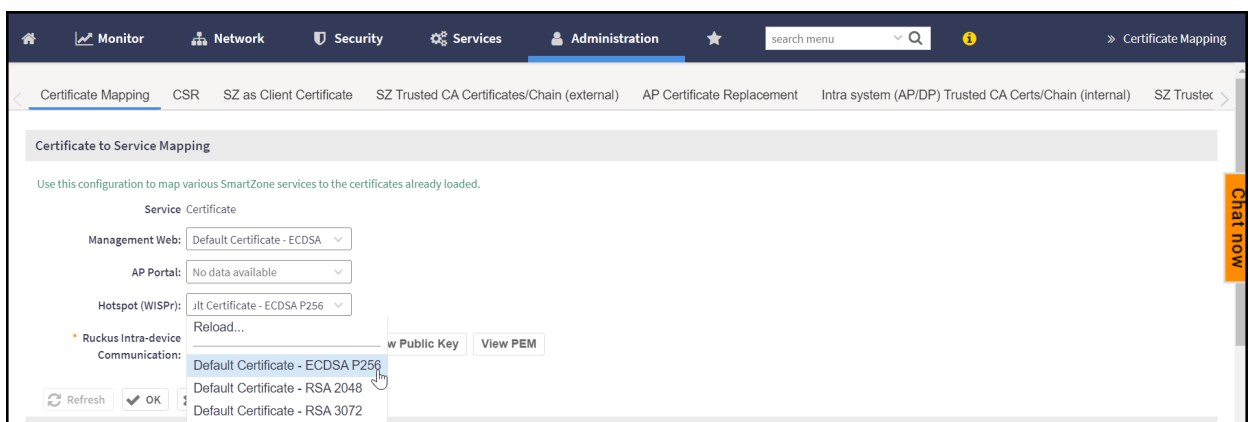
- **Management Web:** SmartZone uses 2K/3K based certificates to map the services when user access SmartZone user interface via web browser.

Figure 2. Management Web



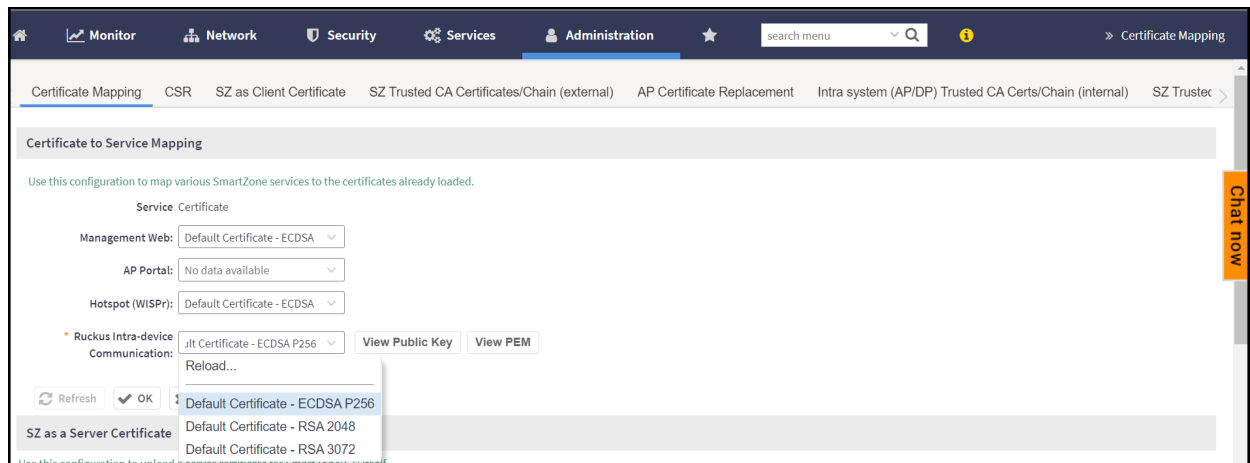
- **Hotspot (WISPr):** SmartZone re-directs the login portal to connected user (via web browser) for authentication.

Figure 3. Hotspot (WISPr)



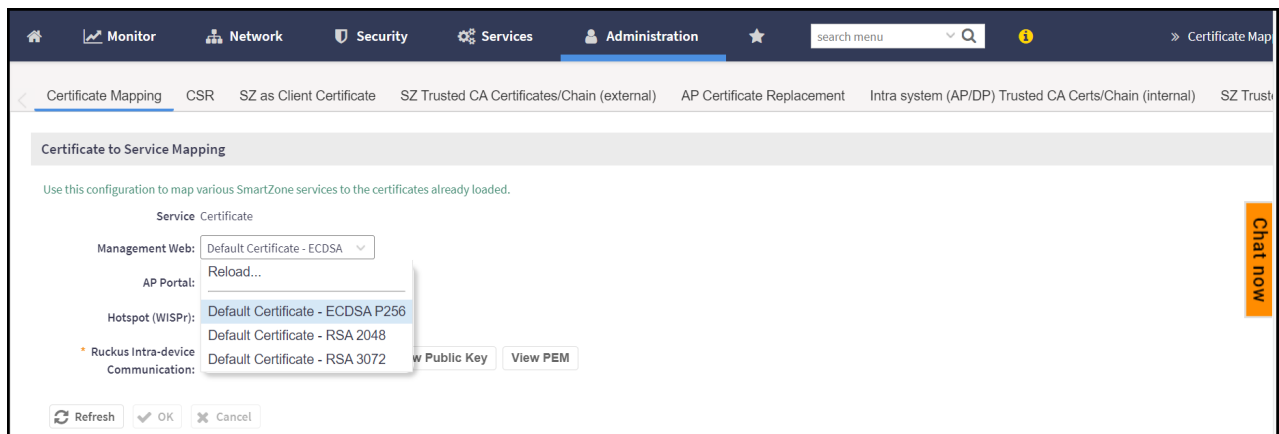
- **Ruckus Intra-device Communications:** SmartZone uses 2K/3K based certificates to map the services when AP/ICX joins the **SSH/TLS Key Enhance Mode** enabled zone/switch group.

Figure 4. Ruckus Intra-device Communication



2. You view the new **ECDSA** certificates in the **Certificate to Service Mapping** section.

Figure 5. ECDSA Certificates



3. Click the drop-down menu and select the pre-loaded certificate to map various SmartZone services.
 - **ECDSA P256:** This supports the signing of data with Elliptic Curve methods. The signing and verification is performed using P256 method. The calculation is hash of the message (h), public key (QA) and private key (dA).
 - **RSA 2048:** This is an asymmetric encryption. Each side has a public and private key. The default 2K certificate is renamed as RSA 2048.
 - **RSA 3072:** This is again an asymmetric encryption. RSA can work with keys of different keys of length.
4. Select the certificates and click **OK** and the settings are mapped to various SmartZone services.

Parent topic: [ECDSA](#)

Enabling ECDSA Certificates Support for RADIUS with Transport Layer Security (TLS)

Transport Layer Security (TLS) encrypts communication between a client and server.

To enable TLS encryption from **Proxy (SZ Authenticator)**, perform the following:

1. Click **Security > Authentication > Proxy (SZ Authenticator)**.
This displays the **Proxy (SZ Authenticator)** page.
2. In the **Proxy (SZ Authenticator)**, click **Create**.
This displays **Create Authentication Service** page.
3. Navigate to **RADIUS Service Options** and enable **Encryption TLS**.
The ECDSA certificates are enabled for RADIUS server.

Figure 1. Encryption TLS_Authentication Service

The screenshot shows the 'Create Authentication Service' page. Under the 'RADIUS Service Options' section, the 'Encryption' toggle is set to 'ON' with 'TLS' selected. A red circle highlights this section. Below it, the 'Server Certificate' dropdown menu is open, showing options: 'Disable', 'Reload...', 'Default Certificate - ECDSA P256', 'Default Certificate - RSA 2048', and 'Default Certificate - RSA 3072'. A red rectangle highlights this dropdown menu. The 'OK' button is visible next to the dropdown.

To enable TLS encryption from **Proxy**, perform the following:

1. Click **Security > Accounting > Proxy**.

This displays **Proxy** page.

2. In the **Proxy**, click **Create**.

This displays the **Create Accounting Service** page.

3. Navigate to **RADIUS Service Options** and enable **Encryption TLS**.

The ECDSA certificates are enabled for RADIUS server.

Note: The ECDSA certificates is available only for RADIUS service protocol option.

Figure 2. Encryption TLS_Accounting Service

Create Accounting Service

* Name:

Description:

Service Protocol: ☒ RADIUS Accounting

RADIUS Service Options

Encryption: ☒ ON ☐ TLS

* CN/SAN Identity:
CN/SAN value should match with CN/SAN of server certificate

OCSP Validation: ☒ OFF * OCSP URL:

Client Certificate:

Primary Server

* IP Address/FQDN:

* Port:

Server Certificate:
Reload...
Disable
Default Certificate - ECDSA P256
Default Certificate - RSA 2048
Default Certificate - RSA 3072

OK Cancel

Parent topic: [ECDSA](#)

Administrator and Roles

Managing Administrator and Roles

Managing Administrator and Roles

The controller must be able to manage various administrators and roles that are created within the network to assign tasks and functions, and to authenticate users.



Parent topic: [Administrator and Roles](#)


Creating User Groups

Creating user groups and configuring their access permissions, resources, and administrator accounts allows administrators to manage a large number of users.

Perform the following steps to create user groups.

1. Go to **Administration > Administration > Admins and Roles**.
2. Select the **Groups** tab.
3. Select the system domain, and click **Create**.
The **Create User Group** is displayed.
4. Configure the following options:
 - a. **Permission**
 - a. **Name**: Type the name of the user group you want to create.
 - b. **Description**: Type a short description for the user group you plan to create.
 - c. **Permission**: Select one of the access permission for the user group from the drop-down menu. You can also grant admin permission to generate guest passes. Select the **Custom** option to manually assign role-based permission in the **Resource** tab page.
 - d. **Account Security**: Select the account security profile that you created to manage the administrator accounts.
 - e. Click **Next**.


- b. Resource: From **Select Resources**, choose the resources that you want to assign to this user group. If you have selected **Custom** permission option in the previous step, you can assign the required permission (**Read**, **Modify** or **Full Access**) to these resources. The resources available are SZ, AP, WLAN, User/Device/App, Admin, Guest Pass, MVNO and ICX. Click the  icon and they appear under **Selected Resources** now. Use the  icon to deselect the resources assigned to the group. To select the right set of resource permission, refer to Resource Group Details.




 **Note:** To create User Groups, migrating Domain User Roles prior to 3.5, with DPSK permissions, Users must be granted with "User/Device/App" resource.

- c. Click **Next**.

- d. Administrator: From **Available Users**, choose the users you want to assign to this user group. Click the



icon and they appear under **Selected Users** now. Use the  icon to deselect the users assigned to the group.


You can also create Administrator Accounts by clicking the  icon. The **Create Administrator Account** page appears where you can configure the administrator account settings. You can edit the user settings by clicking the  icon and delete the user from the list by clicking  icon.

- e. Click **Next**.

- f. Review: Verify the configuration of the user group. Click **Back** to make modifications to the configuration settings.

- g. Click **OK** to confirm.

You have created the user groups.

 **Note:** You can also edit and delete the group configuration by selecting the options **Configure**, and **Delete** respectively, from the **Groups** tab.

Parent topic: [Managing Administrator and Roles](#)

Resource Group Details

The Resource Group table lists the resources available for each Resource Category. This helps the users to select the right set of resource permission for the Admin type.

Table 1. Resource Group Table

Resource Category	Resources
SZ	System Settings Cluster Settings and Cluster Redundancy Control Planes and Data Planes Firmware and Patches Cluster and Configuration Backups Licensing Cluster Stats and Health System Events and Alarms System Certificates WISPr Northbound Interface SCI Integration
AP	Zones and Zone Templates AP groups AP Settings AP Stats and Health Maps AP Events and Alarms Bonjour Policies Location Services Ethernet Port Profiles Tunneling Profiles and Settings AP Zone Registration
WLAN	WLANs WLAN Groups and Templates AAA Services L2-7 Policies

Resource Category	Resources
	<ul style="list-style-type: none"> Rate Limiting Application Policies Device OS Policies QoS Controls Hotspots and Portals Hotspot 2.0 Service Schedules VLAN Pools
User/Device/App	<ul style="list-style-type: none"> User Roles Local Users DPSK Guest Passes Application Usage Client and Device Details
Admin	<ul style="list-style-type: none"> Domains Administrators Administrative Groups Administrative Activity AAA for Admins
Guest Pass	<ul style="list-style-type: none"> Guest Pass Guest Pass Template
MVNO	MVNO
ICX Switch	<ul style="list-style-type: none"> ICX Switch Switch Group Switch Clients

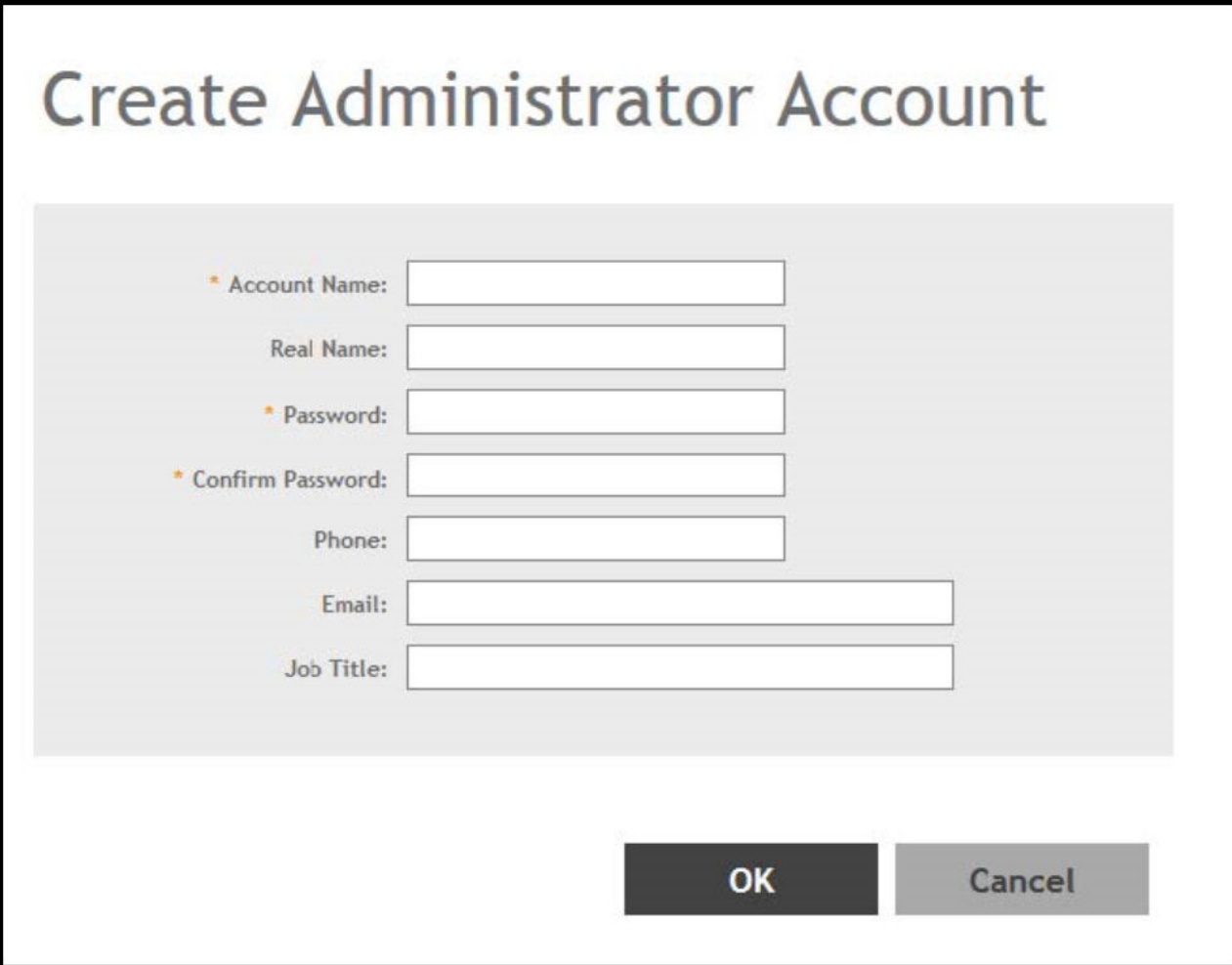
Resource Category	Resources
	Registration Rule CLI Session

Parent topic: [Creating User Groups](#)

Creating 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. You can also modify the status of the administrator account by locking or unlocking it.

1. Go to **Administration > Administration > Admins and Roles**.
2. Select the **Administrators** tab.
3. Click **Create**.
The **Create Administrator Account** page appears.

Figure 1. Creating an Administrator Account

Create Administrator Account

* Account Name:

Real Name:

* Password:

* Confirm Password:

Phone:


Email:


Job Title:

OK **Cancel**

4. Configure the following:

- a. Account Name: Type the name that this administrator will use to log on to the controller.
- b. Real Name: Type the actual name (for example, John Smith) of the administrator.
- c. Password: Type the password that this administrator will use (in conjunction with the Account Name) to log on to the controller.
- d. Confirm Password: Type the same password as above.
- e. Phone: Type the phone number of this administrator.
- f. Email: Type the email address of this administrator.
- g. Job Title: Type the job title or position of this administrator in your organization.
- h. Click **OK**.

 **Note:** You can also edit, delete, or unlock the admin account by selecting the options **Configure**, **Delete** or **Unlock**, from the **Administrator** tab.

 **Note:** Administrator users mapped to different domain other than system domain have to log in using accountname@domain as the User.

Parent topic: [Managing Administrator and Roles](#)

Unlocking an Administrator Account

When multiple user access authentications fail, the administrator account is locked. A super administrator can however unlock the administrator account.

Typically, the account gets locked when the user attempts to login with a wrong user ID or password multiple times, or when the time duration/session time to access the account has ended.

You must login as a super administrator in order to unlock the account.

1. Go to **Administration > Administration > Admins and Roles**.
2. Select the **Administrators** tab.
3. From the list of accounts, select the one which needs to be unlocked. The **Status** of such an account is displayed as *Locked*.
4. Click **Unlock**.
The administrator account is now unlocked, the **Status** field against the account now displays *Unlocked*.

Parent topic: [Creating Administrator Accounts](#)

Configuring Administrator Accounts

To configure the account security of System Default Super Admin account, you can set session idle timeout, password expiration, and password reuse rules.

You must log in as a **System Default Super Admin** to set the rules.

1. Select **Administration > Administration > Admins and Roles**.
2. Click the **Administrators** tab.
3. Select the administrator account (admin) and click **Configure** to set the additional security enhancements. The **Edit Administrator Account** page appears.

Figure 1. Configuring an Administrator Account

Edit Administrator Account: admin ✕

Account Name:

Real Name:

New Password:

Confirm New Password:

Phone:

Email:

Job Title:

Account Lockout: ☐ Off Lock account for (1-1440) minutes after (1-100) authentic attempt

Session Idle Timeout: ☐ Off (1-1440) minutes

Password Expiration: ☐ Off Require password change every (1-365) days

Password Reuse: ☐ Off Passwords cannot be the same as the last (1-6) times

Minimum Password Length: ☐ Off Password must be at least (8-64) characters
 When minimum password length is changed, admin should change password well. Minimum password length changes apply for all future passwords on

Password Complexity: ☐ Off Password must be fulfilled as below:

- At least one upper-case character
- At least one lower-case character
- At least one numeric character
- At least one special character
- At least 8-chars within the old password should be changed

Minimum Password Lifetime: ☐ Off Password should not be changed twice within the 24 hours.

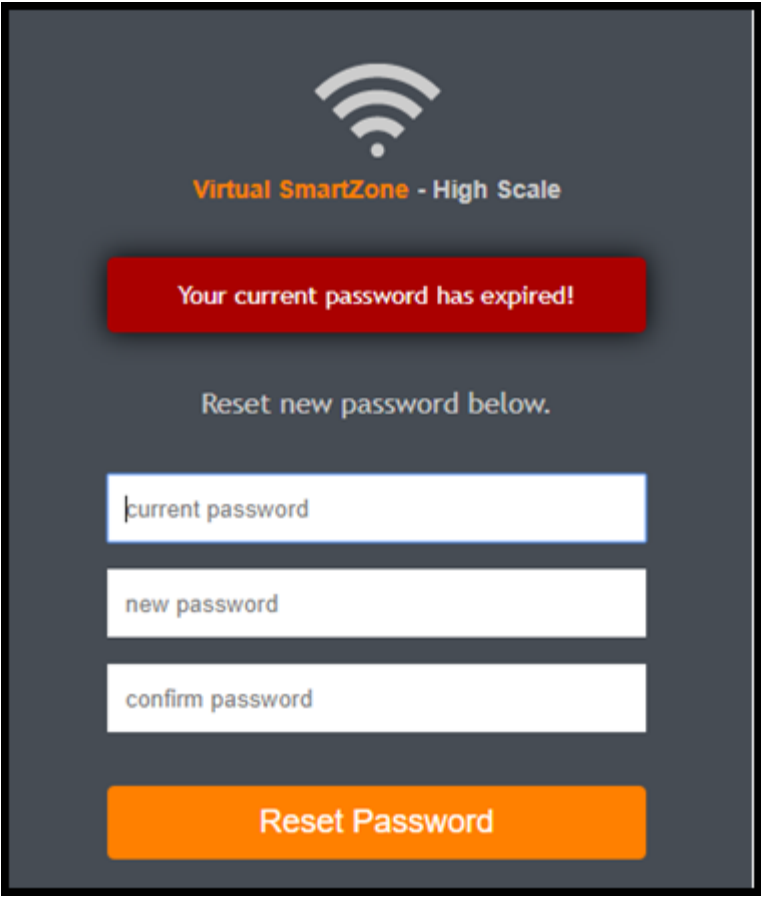
OK **Cancel**

4. Configure the following fields:

- Real Name: Enter the name of the administrator.
- Phone: Enter the phone number.

- Email: Enter the email address.
- Job Title: Enter the role.
- Account Lockout: You can configure the security profile to lock the account based on the duration of the session or number of failed attempts to access the account. Provide the values as necessary. Click the button to enable the feature.
- Session Idle Timeout: Click the button and enter the timeout duration in minutes.
- Password Expiration: Click the button and type the number of days for which the account's password is valid. After the configured number of days, the password expires, and the account is inaccessible. You must change the password before the expiration day to have continued access to the account. By default, the password is valid for 90 days. It can be configured for validity from a minimum of 1 day, to a maximum of 365 days.
If your password has expired, you are prompted to change or reset your password as soon as you log in. Reset the password as shown in the following figure.

Figure 2. Resetting the Old Password



The screenshot shows a dark gray login screen for 'Virtual SmartZone - High Scale'. At the top is a white Wi-Fi icon. Below it, a red banner displays the message 'Your current password has expired!'. Underneath the banner, the text 'Reset new password below.' is shown. There are three white input fields stacked vertically, labeled 'current password', 'new password', and 'confirm password'. At the bottom of the form is a large orange button with the text 'Reset Password'.

- Password Reuse: Prevents the reuse of passwords. Click the button to enable this option. By default, the value is 4 (last 4 passwords cannot be reused).

- **Minimum Password Length:** Indicates the minimum number of characters required for a password. If there is a change in the number of characters, the Admin must manually change the passwords for all users. Enter the minimum number of characters required for a password.
- **Password Complexity:** Ensures that the password satisfies the following rules:
 - At least one upper-case character
 - At least one lower-case character
 - At least one numeric character
 - At least one special character
 - At least eight characters from the previous password is changed

Select the options you want to apply..

- **Minimum Password Lifetime:** Ensures that the password is not changed twice within a period of 24 hours. Select the option, if appropriate.

5. Click **OK**.
The **Password Confirmation** page is displayed.
6. Enter the **password**.
7. Click **OK** to apply the new configuration.

Parent topic: [Managing Administrator and Roles](#)

Working with AAA Servers

You can configure the controller to use external AAA servers to authenticate users.

Parent topic: [Managing Administrator and Roles](#)

Configuring SZ Admin AAA Servers

To add and manage AAA servers that the controller can use to authenticate users, complete the following steps.

1. Select **Administration > Administration > Admins and Roles > AAA**.
2. From **AP AAA Servers**, click **Create**.
The **Create Administrator AAA Server** page is displayed.

Figure 1. Creating an Administrator AAA Server

Create Administrator AAA Server

Backup RADIUS: ☒ ON ☐ Enable Secondary Server

Primary Server ▼

* IP Address / FQDN Name: commscope.radius1.com

* Port: 1812

* Protocol: ☒ PAP ☐ CHAP ☐ PEAP

* Shared Secret:

* Confirm Secret:

Secondary Server ▼

* IP Address / FQDN Name: commscope.radius2.com

* Port: 1812

* Protocol: ☒ PAP ☐ CHAP ☐ PEAP

* Shared Secret:

* Confirm Secret:

3. Enter the AAA server name.
 4. For **Type**, select the type of AAA server to authenticate users:
 - **RADIUS**
 - **TACACS+**
 - **Active Directory**
 - **LDAP**
 5. For **Realm**, enter the realm or service.
Multiple realms or services are supported. Separate multiple realms or services with a comma.
- Note:** Because the user login format (User Account + @ + Realm) includes a special character, the at symbol (@), the user account must not include the at symbol (@) separately on the AAA server.

6. Enable **Default Role Mapping**.

You can select **auto-mapping** for the system to automatically map between the AAA and SZ accounts.

If **Default Role Mapping** is disabled, the AAA administrator must be mapped to a local SZ Admin user with matching AAA attributes for the RADIUS, TACACS+, Active Directory, or LDAP servers.

- On a RADIUS server, the user data can use the VSA `Ruckus-WSG-User` attribute with a value depending on the SZ users or permissions you want the RADIUS user to map.
- On a TACACS+ server, the user data can use the `user-name` attribute with the `user1`, `user2`, or `user3` value depending on the SZ users or permissions you want the TACACS+ user to map.
- On an Active Directory or LDAP server, the user data can belong to the group `cn=Ruckus-WSG-User-SZAdminName` (for example, `cn=Ruckus-WSG-User-User1`, depending on the SZ users or permissions you want the Active Directory or LDAP user to map).

 **Note:** You can use the mapping attributes on AAA and enable **Default Role Mapping** at the same time, but the mapping attributes override **Default Role Mapping**.


7. For **Backup RADIUS**, select **Enable Secondary Server** if a secondary RADIUS server exists on the network. Refer to step 9 for configuration settings.

8. Under **Primary Server**, configure the settings of the primary AAA server.

- **IP Address or FQDN** : Enter the IP address or Fully Qualified Domain Name (FQDN) of the AAA server.

 **Note:** The FQDN option can be configured only for the RADIUS server.

- **Port**: Enter the UDP port that the RADIUS server is using. The default port is 1812.
- **Protocol**: Select the **PAP** or **CHAP** or **PEAP** protocol.

 **Note:** For the PEAP and PAP protocols, you must configure the Trusted CA certificate to support PEAP and EAP connection.

- **Shared Secret**: Enter the shared secret.
- **Confirm Secret**: Re-enter the shared secret to confirm.
- **Windows Domain name**: Enter the domain name for the Windows server.
- **Base Domain Name**: Enter the name of the base domain.

- **Admin Domain Name:** Enter the domain name for the administrator.
- **Admin Password:** Enter the administrator password.
- **Confirm New Password:** Re-enter the password to confirm.
- **Key Attribute:** Enter the key attribute, such as UID.
- **Search Filter:** Enter a filter by which you want to search, such as objectClass=*

For **Active Directory**, configure the settings for the **Proxy Agent**.


- **User Principal Name:** Enter the Windows domain Administrator name
- **Password:** Enter the administrator password.
- **Confirm Password:** Re-enter the password to confirm.

9. Under **Secondary Server**, configure the settings of the secondary RADIUS server.

- **IP Address:** Enter the IP address of the AAA server.
- **IP Address or FQDN:** Enter the IP address or Fully Qualified Domain Name (FQDN) of the AAA server.

 **Note:** The FQDN option can be configured only for the RADIUS and Secondary server.

- **Port:** Enter the UDP port that the RADIUS server is using. The default port is 1812.
- **Protocol:** Select the **PAP** or **CHAP** or **PEAP** protocol.

 **Note:** For the PEAP and PAP protocols, you must configure the Trusted CA certificate to support PEAP and EAP connection respectively.


- **Shared Secret:** Enter the shared secret.
- **Confirm Secret:** Re-enter the shared secret to confirm.

10. Under **Failover Policy at NAS**, configure the settings of the secondary RADIUS server.

- **Request Timeout:** Enter the timeout period in seconds. After the timeout period, an expected RADIUS response message is considered to have failed.
- **Max Number of Retries:** Enter the number of failed connection attempts. After the maximum number of attempts, the controller tries to connect to the backup RADIUS server.

- **Reconnect Primary:** Enter the time in minutes, after that the controller connects to the primary server.

11. Click **OK**.

 **Note:** You can also edit, clone, or delete the server by selecting the options **Configure**, **Clone**, or **Delete**, from the **Administrator** tab.

Parent topic: [Working with AAA Servers](#)

Testing SZ Admin AAA Servers

To ensure that the controller administrators are able to authenticate successfully with the RADIUS server type that you selected, RUCKUS 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.

1. Select **Administration > Admins & Roles > AAA**.
2. Select the created AAA server and click **Test AAA**.
An example for testing a RADIUS server is shown in the following figure.

Figure 1. Testing an AAA Server: RADIUS

Test AAA Servers

Name: peapIPv6 ▼

Protocol: PEAP

User Name: ramu
(Test with username ONLY.)

Password:
☐ Show password

AAA testing : Success! Associated with Auto Mapping [CACDEV]

Test Cancel

The **Protocol** field is displayed only for RADIUS server that depends on the SZ AAA server configuration.

3. In the **Name** field, select the AAA server that you created.
4. In the **User Name** field, enter an existing user name that is associated to a user group.
- **Note:** For TACACS+ server, test with username appended with configured service.
5. In the **Password** field, enter password for the user name you specified.
6. Click **Test**.

If the username is associated with a user group, the following message is displayed: AAA testing: Success! Associated with Auto Mapping. If the username is not associated with any user group, the following message is displayed: "AAA testing: Success! No SZ User or Default role mapping associated".

Parent topic: [Configuring SZ Admin AAA Servers](#)

Configuring Switch AAA Servers

To add and manage AAA servers that the controller can use to authenticate users, complete the following steps.

1. Select **Network > Wired > Switches > AAA**.
2. Select **Switch Group**. On the **Details** pane, click **Configuration > Common Configuration > Configure > AAA Server > Create**.

The **Create AAA Server** page is displayed.

Figure 1. Creating Switch AAA Server

Create AAA Server

* Name:

* Type: ☒ Radius ☐ TACACS+ ☐ Local User

* IP Address:

* Auth. Port:

* Acct. Port:

* Shared Secret:


* Confirm Shared Secret:


* Purpose:

- Default
- Authentication
- Accounting

OK **Cancel**

3. Enter the AAA server name.
4. For **Type**, select the type of AAA server to authenticate users:
 - **RADIUS**
 - **TACACS+**
 - **Local User**
5. Enter the following information:
 - **IP Address:** Enter the IP address of the AAA server.
 - **Auth Port:** Enter the authentication port that the server is using.
 - **Acct Port:** Enter the accounting port that the server is using.
 - **Shared Secret:** Enter the shared secret.
 - **Confirm Shared Secret:** Re-enter the shared secret to confirm.
 - **Purpose:** You can configure multiple RADIUS servers by selecting either **Default**, **Authentication** or **Accounting** from the list.
6. Click **OK**.

 **Note:** You can also edit or delete the server by selecting the options **Configure** or **Delete** from the **Administrator** tab.

 **Note:** ICX switch fails to delete the TACACS+ and Radius AAA servers when pushed from the controller or virtual controller if SNMP query is disabled in the switch or if the switch is pre-configured before joining controller or virtual controller.

Parent topic: [Working with AAA Servers](#)

Configuring Switch AAA Server Settings

To configure and manage AAA servers, complete the following steps.

1. Select **Network > Wired > Switches > AAA**.
2. Select **Switch AAA Setting** Select **Switch Group Configuration** **Common Configuration** **Configure AAA**, configure the following.
Login Authentication

- **SSH Authentication:** Enable the option for secure authentication.
- **Telnet Authentication:** Enable the option to set Telnet authentication. This option requires SSH authentication to be enabled.
- **First Pref:** Select the first preferred authentication system.
- **Second Pref:** Select the second preferred authentication system.
- **Third Pref:** Select the third preferred authentication system.

Authorization

- **Command Authorization:** Enable this option to assign the following authorization services:
 - **Level:** Select the required privilege: **Port Config**, **Read Only**, or **Read Write**.
 - **Server 1:** Select the authorization method for the first server.
 - **Server 2:** Select the authorization method for the second server.
- **Exec Authorization:** Enable this option to authorize the user to access the privilege mode.
 - **Server 1:** Select the authorization method for the first server.
 - **Server 2:** Select the authorization method for the second server.

Accounting

- **Command Accounting:** Enable this option to track the following accounting services:
 - **Level:** Select the required privilege: **Port Config**, **Read Only**, or **Read Write**.
 - **Server 1:** Select the tracking method for the first server.
 - **Server 2:** Select the tracking method for the second server.
- **Exec Accounting:** Enable this option to track the services in the privilege mode.
 - **Server 1:** Select the tracking method for the first server.
 - **Server 2:** Select the tracking method for the second server.

3. Click **OK**.

Parent topic: [Working with AAA Servers](#)

AAA Server Authentication

Complete AAA-based authentication for the AAA server by performing one of the following steps.

1. Enable **Default Role Mapping** to map the external AAA users to a single SZ local admin user.
2. Apply the permissions of AAA users on SZ using the corresponding AAA server attributes.

Following is an example:

- a. Create three user groups with the following access permissions in SZ:

- Group1 with SZ super permission
- Group2 with SZ AP admin permission
- Group3 with SZ read-only permission

- b. Create three SZ local users corresponding to the user groups as follows:

- Bind User1 with Group1
- Bind User2 with Group2
- Bind User3 with Group3

 **Note:** Following are the attribute values on AAA servers:

- RADIUS: Ruckus-WSG-User=User1 or User2 or User3.
- TACACS+: user-name=User1 or User2 or User3.
- Active Directory and LDAP: Group cn=Ruckus-WSG-User-User1 or Ruckus-WSG-User-User2 or cn=Ruckus-WSG-User-User3.

- c. Select **Administrator > Administrator > Admins and Roles > AAA** and click **Create** to create an Admin AAA profile.

Refer to [Working with AAA Servers](#).

Parent topic: [Working with AAA Servers](#)

About RADIUS Support

Remote Authentication Dial-In User Service (RADIUS) is an Authentication, Authorization, and Accounting protocol used to authenticate controller administrators.

In addition to selecting RADIUS as the server type, complete the following steps for RADIUS-based authentication to work on the controller.

1. Edit the RADIUS configuration file (users) on the RADIUS server to include the user names.
For example,


```
Peter  Cleartext-Password := "user_345"
       Ruckus-WSG-User = "User2"

Tony   Cleartext-Password := "user_456"
       Ruckus-WSG-User = "User3"

Steve  Cleartext-Password := "user_567"
       Ruckus-WSG-User = "User1"

~
```

2. On the controller web interface, select **Administration > Administration > Admins and Roles > Administrators**, and click **Create** to create an administrator account with super as the user name.

 **Note:** Refer to [Creating Administrator Accounts](#). In this example, RADIUS can use User1, User2, or User3.


3. Select **Administration > Administration > Admins and Roles > Groups** and assign an administrator role to the super administrator account.

 **Note:** Refer to [Creating User Groups](#).

4. When adding a server type for administrators, select RADIUS as the authentication server type.

 **Note:** Refer to [Configuring SZ Admin AAA Servers](#).

5. Test the RADIUS server using the account username@super-login.

 **Note:** The value of super-login depends on the realm configured for the AAA profile. Refer to [Creating Administrator Accounts](#).

Parent topic: [Working with AAA Servers](#)

About TACACS+ Support

Terminal Access Controller Access-Control System Plus (TACACS+) is one of the Authentication, Authorization and Accounting protocols used to authenticate controller administrators. TACACS+ is an extensible AAA protocol that provides customization and future development features, and uses TCP to ensure reliable delivery.

In addition to selecting TACACS+ as the server type, complete the following steps for TACACS+ based authentication to work on the controller.

1. Edit the TACACS+ configuration file (`tac_plus.conf`) on the TACACS+ server to include the service user name.

For example,

```
key = test@1234
accounting file = /var/log/tac_acct.log
user = username {
    member = show
    login = cleartext "password1234!"
}
group = show {
    service = super-login {
        user-name = super <==mapped to the user account in the controller
    }
}
```

2. On the controller web interface, select **Administration > Administration > Admins and Roles > Administrators**, and click **Create** to create an administrator account with `super` as the user name.

 **Note:** Refer to [Creating Administrator Accounts](#).

3. Select **Administration > Administration > Admins and Roles > Groups** and assign an administrator role to the `super` administrator account.

 **Note:** Refer to [Creating User Groups](#).

4. When adding a server type for administrators, select TACACS+ as the authentication server type.

 **Note:** Refer to [Configuring SZ Admin AAA Servers](#).

5. Test the TACACS+ server using the account `username@super-login`.

Parent topic: [Working with AAA Servers](#)

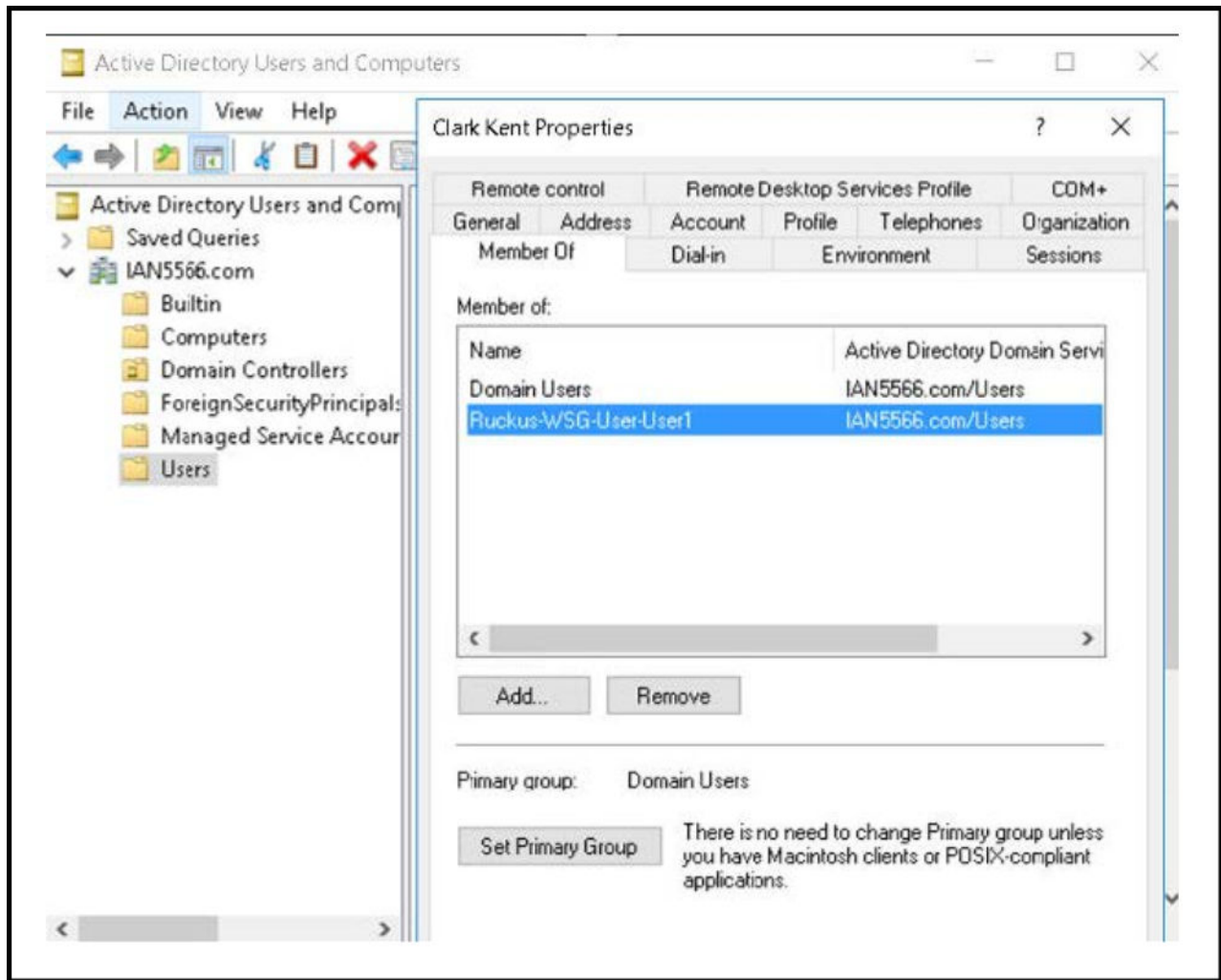
About Active Directory (AD) Support

Active Directory is a domain service that authenticates and authorizes users in a Windows environment.

In addition to selecting AD as the server type, you must also complete the following steps for AD-based authentication to work on the controller.

1. Edit the AD configuration file on the AD server to include the service user name.

Figure 1. About Active Directory Support



2. On the controller web interface, select **Administration > Administration > Admins and Roles > Administrators**, and click **Create** to create an administrator account with **super** as the user name.

Note: Refer to [Creating Administrator Accounts](#). In this example, Active Directory can use User1 only.

3. Select **Administration > Administration > Admins and Roles > Groups**, and then assign an administrator role to the super administrator account.

Note: Refer to [Creating User Groups](#).

4. When you add an AAA server for administrators, select **Active Directory** as the authentication server type.

Note: Refer to [Configuring SZ Admin AAA Servers](#).

- Test the AD server using the account `username@super-login`.

Note: The value of super-login depends on the realm configured for the AAA profile. Refer to [Creating Administrator Accounts](#).

Parent topic: [Working with AAA Servers](#)

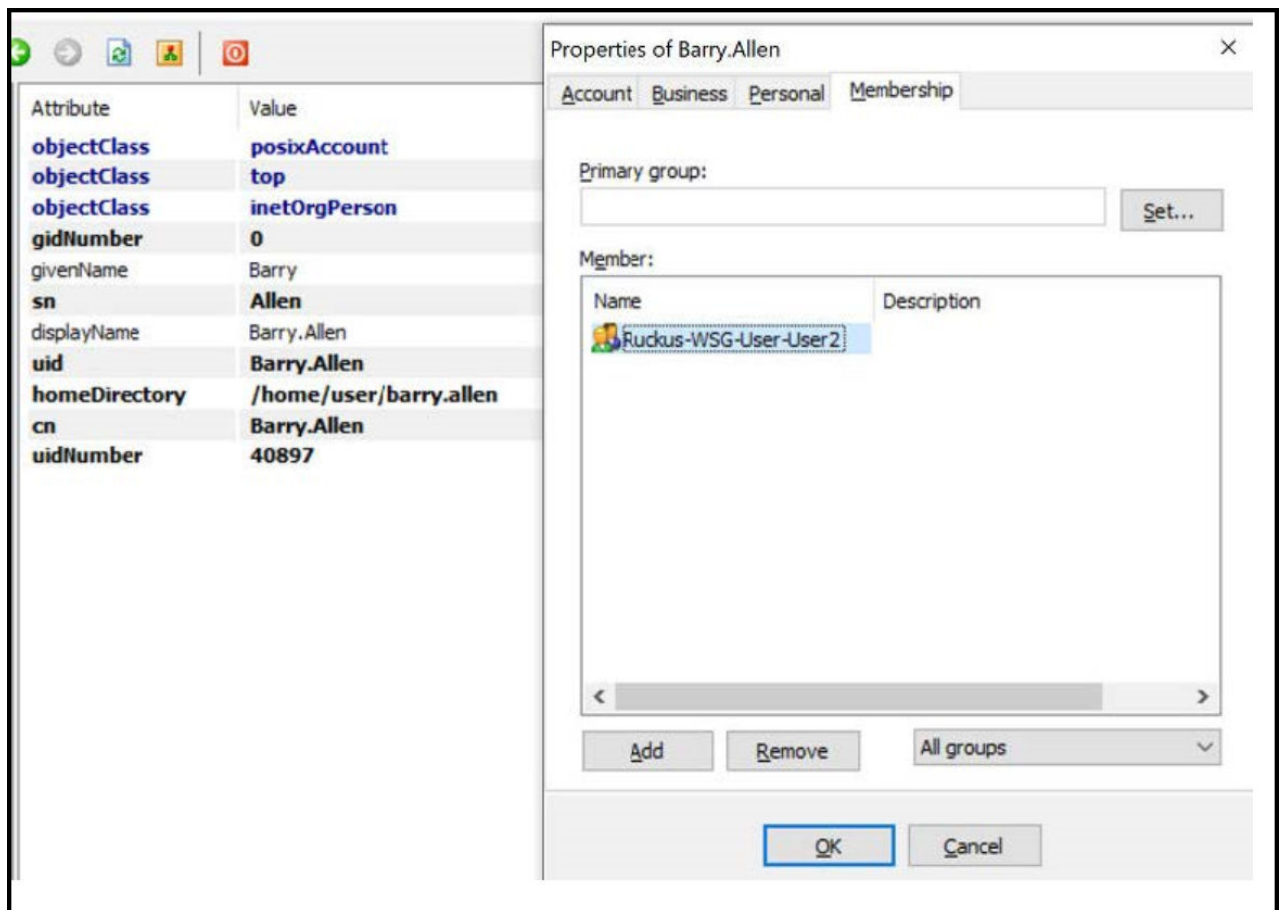
About LDAP Support

Lightweight Directory Access Protocol (LDAP) is an application protocol used to access and maintain directory information services.

In addition to selecting LDAP as the server type, you must also complete the following steps for LDAP-based authentication to work on the controller.

- Edit the LDAP configuration file on the LDAP server to include the service user name.

Figure 1. Supporting LDAP Configuration



- On the controller web interface, select **Administration > Administration > Admins and Roles > Administrators**, and click **Create** to create an administrator account with `super` as the user name.

 **Note:** Refer to [Creating Administrator Accounts](#). In this example, LDAP can use User2 only.


3. Select **Administration > Administration > Admins and Roles > Groups** and assign an administrator role to the super administrator account.

 **Note:** Refer to [Creating User Groups](#).

4. When you add an AAA server for administrators, select **LDAP** as the authentication server type.

 **Note:** Refer to [Configuring SZ Admin AAA Servers](#).

5. Test the LDAP server using the account `username@super-login`.

 **Note:** The value of super-login depends on the realm configured for the AAA profile. Refer to [Creating Administrator Accounts](#).

Parent topic: [Working with AAA Servers](#)

Enabling the Access Control List

You can control access to management interfaces from CLI or SSH.

1. Go to **Administration > Administration > Admins and Roles**.
2. Select the **Access Control List** tab.
3. Select **Enable**.
4. Click **Create**.
The **Management Interface Access Control Rule** page appears.

Figure 1. Management Interface Access Control Rule


The screenshot shows a configuration window titled "Management Interface Access Control Rule". It contains the following fields and options:

- Name:** A text input field.
- Description:** A text input field.
- Type:** Three radio button options: ☒ Single IP, ☐ IP Range, and ☐ Subnet.
- Single IP:** A sub-section containing an **IP Address:** text input field.

At the bottom right of the dialog are two buttons: **OK** and **Cancel**.

5. Configure the following:

- a. Name: Type the name that rule you want to create to access the management interface.
- b. Description: Type a short description for the rule.
- c. Type: Select one of the following
 - Single IP: Type the IP address of the interface that can be accessed per this rule.
 - IP Range: Type the range of IP address that will be allowed access.
- d. Subnet: Type the network address and subnet mask address of the interface that will be allowed access.
- e. Click **OK**.

 **Note:** You can also edit and delete the list by selecting the options **Configure** and **Delete** respectively, from the **Access Control List** tab.

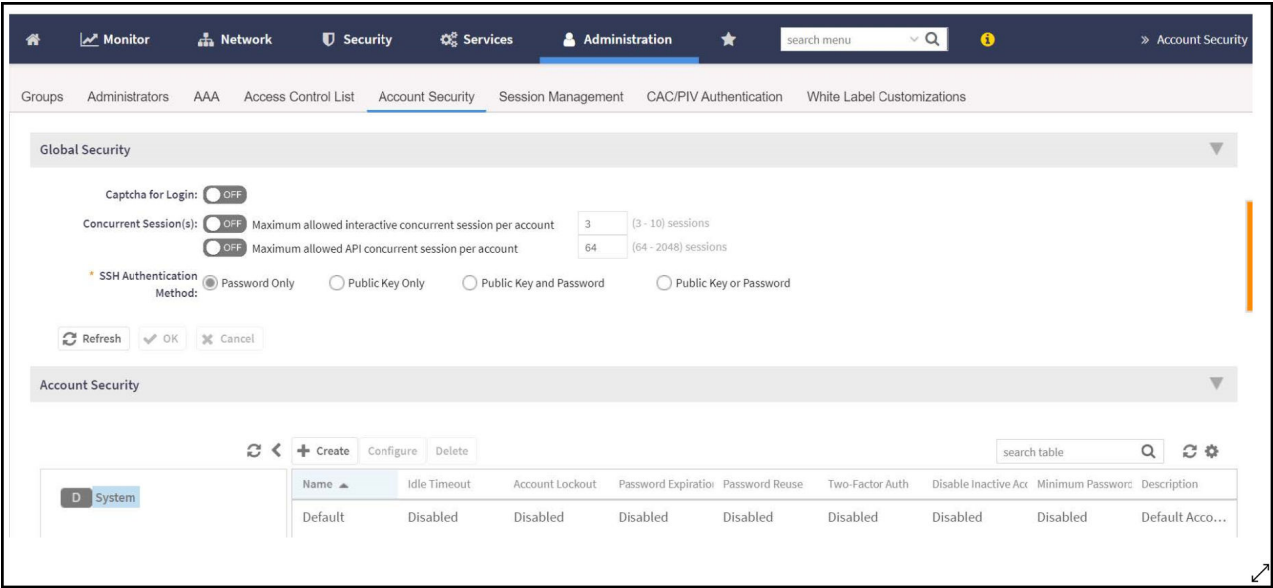
Parent topic: [Working with AAA Servers](#)

Creating Account Security

Creating an account security profile enables end-users to control administrative accounts to better manage admin accounts, passwords, login, and DoS prevention.

- 1. Go to **Administration > Administration > Admins and Roles**.
- 2. Select the **Account Security** tab.
The **Global Security** section and **Account Security** section are displayed.

Figure 1. Account Security page



- 3. From Global Security, configure the following:
 - a. Captcha for Login: select the option to enable Captcha for log in. The captcha feature provides additional security to ensure a human is signing into the account, and not a robot. If this feature is enabled; when you log into the web interface, the captcha characters are displayed in the login page as shown in the following example.

Figure 2. Captcha Enabled in the Login Page



Type the characters as shown in the captcha picture and log in. The characters in the captcha image are case sensitive and can be refreshed if not clear.

- b. Concurrent sessions: Click the required options and enter the number of sessions allowed:
 - **Maximum allowed interactive concurrent session per account**
 - **Maximum allowed API concurrent sessions per account**
 - c. Click **OK**.
4. From **Account Security**, click **Create**.
The **Create Account Security** page is displayed.
- Figure 3.** Creating Account Security

Create Account Security

Name:

Description:

Session Idle Timeout: ☒ ON 15 (1-1440) minutes

Account Lockout: ☐ OFF Lock account for 30 (1-1440) minutes after 6 (1-100) failed authentication attempts

☒ ON Lock account forever after 3 (1-100) failed attempts during 15 (1-1440) minute time period.

This option does not apply to AAA Admin Users.

Password Expiration: ☒ ON Require password change every 90 (1-365) days

Password Reuse: ☒ ON Passwords cannot be the same as the last 4 (1-6) times

Two-Factor Authentication: ☐ OFF Require two-factor authentication via SMS

You have to verify your one-time code first to enable it

Disable Inactive Accounts: ☒ ON Lock admin accounts if they have not been used in the last 90 (1-1000) days

Minimum Password Length: ☒ ON Password must be at least 8 (8-64) characters

When minimum password length is changed, admin should change passwords for all users manually as well. Minimum password length changes apply for all future passwords only

Password Complexity: ☐ OFF Password must be fulfilled as below:

When the password complexity is turned from off to on, admin should change all users' passwords manually. The password complexity rule will only be applied to the upcoming password changes.

- At least one upper-case character
- At least one lower-case character

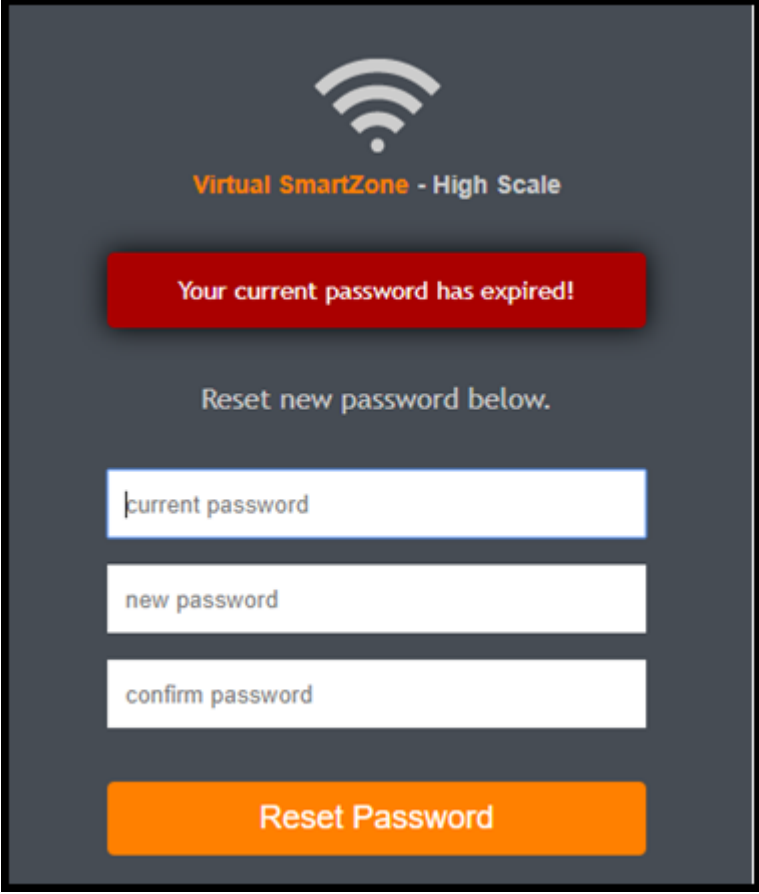
5. Configure the following:

- Name: Type the name of the security profile that you want to create.
- Description: Provide a short description for the profile.
- Session Idle Timeout: Click the button and enter the timeout duration in minutes.
- Account Lockout: You can configure the security profile to lock the account based on the duration of the session or number of failed attempts to access the account. Provide the values as necessary. Enable and configure one of the following:
 - Enter the account lockout time and number of failed authentication attempts.
 - Enter the number of failed attempts after which the account is locked and the corresponding time period. After three unsuccessful login attempts in a time interval of 15 minutes, the account is locked and must be released by an Administrator.
- Password Expiration: Click the button and type the number of days for which the account's password will be valid. After the configured number of days, the password will expire and render the account

inaccessible. You must change the password before the expiration day to have continued access to the account. By default, the password is valid for a period of 90 days. It can be configured for validity from a minimum of 1 day, to a maximum of 365 days.

If your password has expired, you are prompted to change or reset your password as soon as you log in. Reset the password as shown in the figure.

Figure 4. Resetting the Old Password

The image shows a web interface for resetting a password. At the top, there is a Wi-Fi icon and the text "Virtual SmartZone - High Scale". Below this, a red banner displays the message "Your current password has expired!". Underneath the banner, the text "Reset new password below." is shown. There are three input fields: "current password", "new password", and "confirm password". At the bottom, there is an orange button labeled "Reset Password".

Virtual SmartZone - High Scale

Your current password has expired!

Reset new password below.

current password

new password

confirm password

Reset Password


- Password Reuse: Prevents the reuse of passwords. Click the button to enable this option. By default, the value is 4 (last 4 passwords cannot be reused).
- Disable Inactive Accounts: Locks the admin user IDs that are inactive for the specified period of time. Click the button and specify the number of days.
- Minimum Password Length: Indicates the minimum number of characters required for a password. If there is a change in the number of characters, the Admin must manually change the passwords for all users. Enter the minimum number of characters required for a password.
- Password Complexity: Ensures that the password applies the following rules:
 - At least one upper-case character
 - At least one lower-case character

- At least one numeric character
- At least one special character
- At least eight characters from the previous password is changed

Select the appropriate options.

- Minimum Password Lifetime: Ensures that the password is not changed twice within a period of 24 hours. Select the option.

6. Click **OK** to submit the security profile/form.
The newly created profile is added under the **Account Security** section.

 **Note:** You can also edit or delete the profile by selecting the options **Configure** or **Delete**, from the **Administrator** tab.

With new enhancements to account security, SmartZone has a complete feature set to make PCI compliance very simple and straightforward. In addition to local PCI enforcement settings, SmartZone also integrates with SCI for reporting and analytics. SCI version 5.0 and later supports a PCI compliance report, which is based on the relevant PCI-related configuration settings throughout SmartZone. To facilitate the SmartCell Insight PCI report, the SmartZone is capable of sending the following information to SCI:

- Configuration messages as separated GPB messages
- WLAN configuration
- Default configuration changes
- Controller information that identifies the controller model
- Encryption details of communication, for example: CLI, SSH, telnet, Web, API
- Inactive user IDs and session timeout
- Authentication mechanism enforced on user IDs
- Enforcement of password
- Supported mechanism on SZ that can be provided to SCI
- User IDs that are locked after failed attempts
- Authentication credentials that are unreadable and encrypted during transmission
- Enforcement of password standards

- Disallowing duplicate password feature is enabled
- If rogue AP detection is enabled on each AP

To learn more about SCI and the PCI compliance report it provides, check the product page (<https://www.ruckuswireless.com/products/smart-wireless-services/analytics>) and documentation on the RUCKUS support page (<https://support.ruckuswireless.com>).

Parent topic: [Working with AAA Servers](#)

Terminating Administrator Sessions

From the **Session Management** tab, you can view and also terminate the Administrator sessions that are currently running.

1. From the controller web interface, select **Administration > Admin and Roles > Session Management**
2. Select the administrator session you want to discontinue and click **Terminate**.
The **Password Confirmation** page displays.
3. Enter the password and click **OK**. The session ends.
You can terminate all CLI and web interface sessions that you have logged in to.

Figure 1. Sample Session Termination for Web Interface Session.

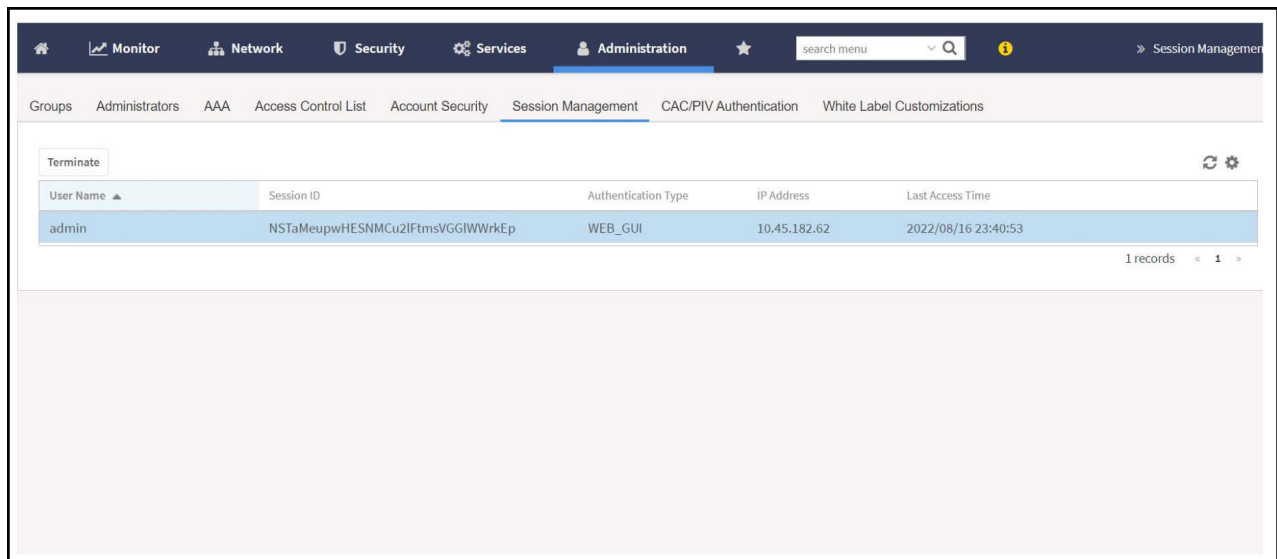


Figure 2. Sample Session Termination for CLI Session.

```

[root@IRAWAT ~]# ssh admin@10.1.200.102
The authenticity of host '10.1.200.102 (10.1.200.102)' can't be established.
RSA key fingerprint is 03:f8:c0:07:99:1f:cd:d7:83:22:9f:81:17:5e:b5:97.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.1.200.102' (RSA) to the list of known hosts.
Access to this system is reserved only for authorized administrators.
This is a default login banner and can be configured by authorized administrators of the system
admin@10.1.200.102's password:
Last login: Fri Jan 11 05:26:59 2019

en
Please wait. CLI initializing...

Welcome to the Ruckus SmartZone 100 Command Line Interface
Version: 5.1.1.0.242

VSZ100>
VSZ100>
VSZ100> en
Password: *****

VSZ100# Connection to 10.1.200.102 closed by remote host.
Connection to 10.1.200.102 closed.

```

- Click the **Admin** icon in the upper right corner and select log off from the drop-down list.

Figure 3. Logging out from the UI

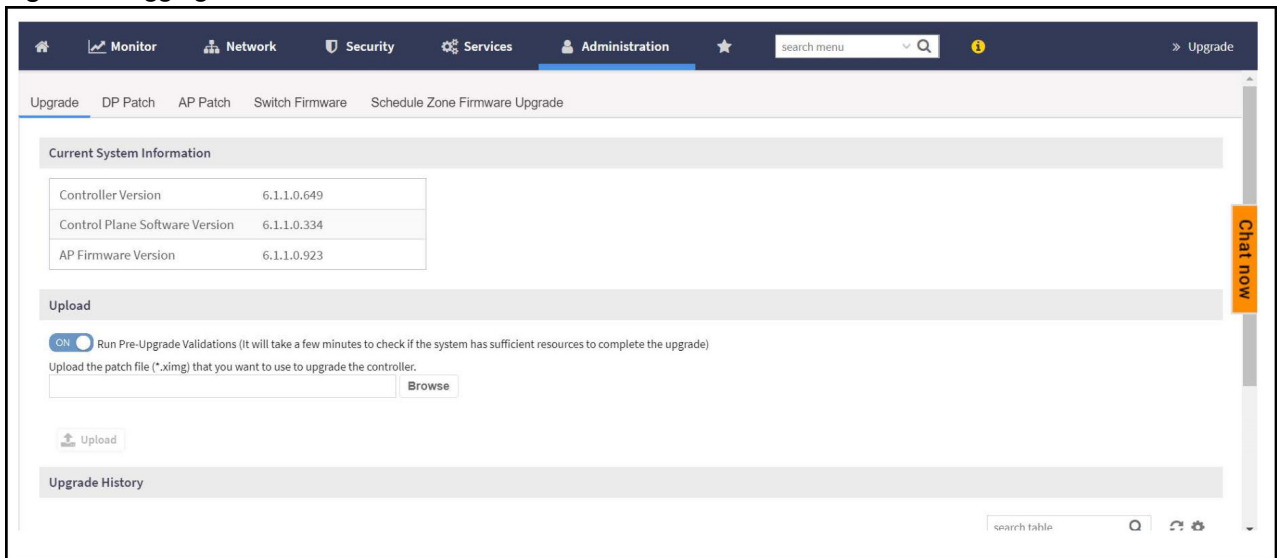
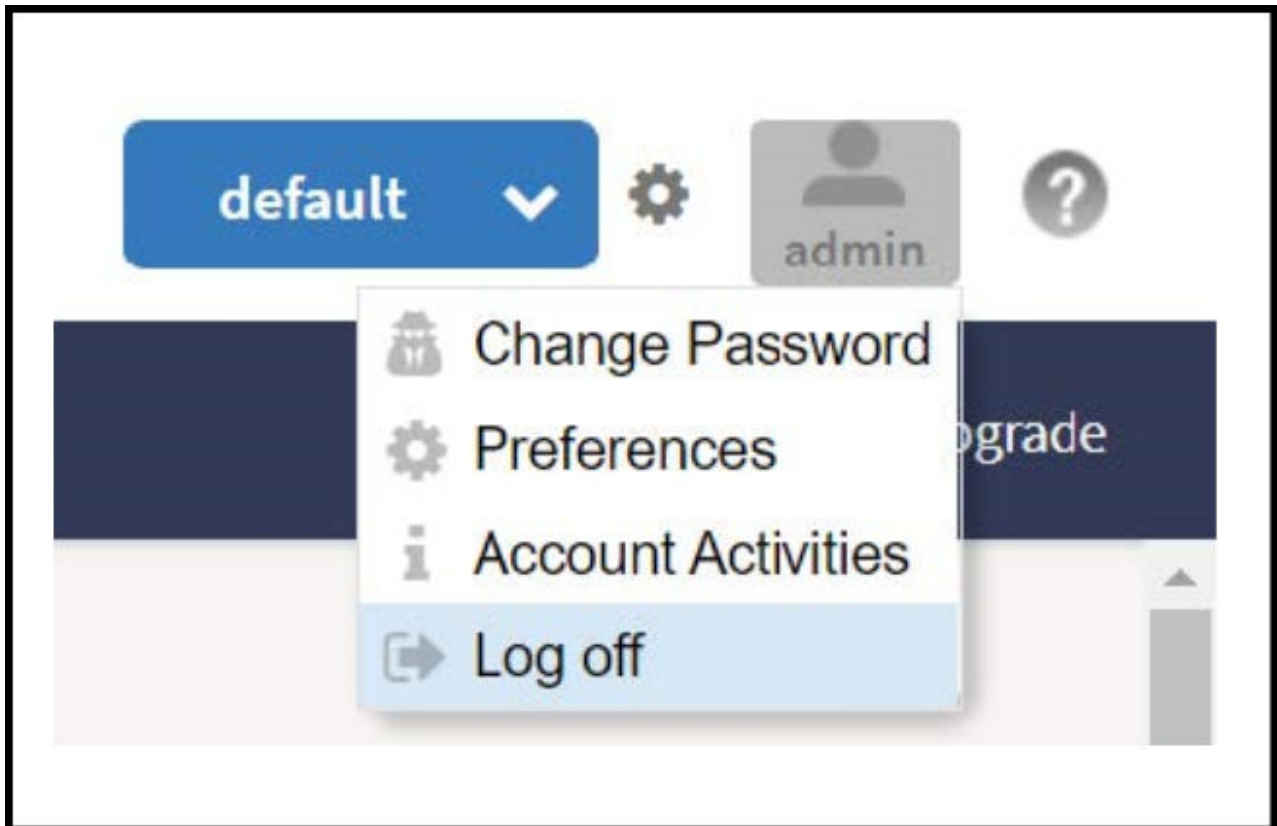


Figure 4. Logging out from the UI Default



5. You can also logout by typing "exit" command in the SSH session.

Figure 5. Logging out from the SSH session

```
[C:\~] $ ssh admin@10.174.89.143

Connecting to 10.174.89.143:22...
Connection established.
To escape to local shell, press 'Ctrl+Alt+J'.
Access to this system is reserved only for authorized administrators.
This is a default login banner and can be configured by authorized administrators of the system

WARNING! The remote SSH server rejected X11 forwarding request.
Last login: Fri Mar 13 21:47:18 2020 from 10.174.96.102
Please wait. CLI initializing...

Welcome to the Ruckus Virtual SmartZone - High Scale Command Line Interface
Version: 5.1.1.3.1227

SZ9> en
Password: *****

SZ9# exit

SZ9> exit

Connection closing...Socket close.
Connection closed by foreign host.

Disconnected from remote host(10.174.89.143:22) at 18:29:41.

Type 'help' to learn how to use Xshell prompt.
[C:\~] $
```

6. You can also logout by typing "exit" command at the console prompt.

Figure 6. Logging out using the console prompt

```

FIPS-SZ300 login: admin
Password:
Last login: Fri Mar 27 12:29:37 from 10.174.88.51
enPlease wait. CLI initializing...

Welcome to the Ruckus SmartZone 300 Command Line Interface
Version: 5.1.1.3.1227

FIPS-SZ300> en
Password: *****

FIPS-SZ300# exit

FIPS-SZ300> exit

Access to this system is reserved only for authorized administrators.
This is a default login banner and can be configured by authorized administrators of the system
FIPS-SZ300 login:

```

7. You can also logout by typing "logout" at the CLI prompt

Figure 7. Logging out using CLI prompt

```

[C:\~]$ ssh admin@10.174.89.143

Connecting to 10.174.89.143:22...
Connection established.
To escape to local shell, press 'Ctrl+Alt+J'.
Access to this system is reserved only for authorized administrators.
This is a default login banner and can be configured by authorized administrators of the system

WARNING! The remote SSH server rejected X11 forwarding request.
Last login: Fri Mar 27 22:54:00 2020 from 10.45.239.142
Please wait. CLI initializing...

Welcome to the Ruckus Virtual SmartZone - High Scale Command Line Interface
Version: 5.1.1.3.1245

SZ9> en
Password: *****

SZ9# logout

Connection closing...Socket close.

Connection closed by foreign host.

Disconnected from remote host(10.174.89.143:22) at 20:56:54.

Type 'help' to learn how to use Xshell prompt.
[C:\~]$

```

Parent topic: [Managing Administrator and Roles](#)

White Label Customization

White Label Customization allows the Managed Service Provider (MSP) domain user or the partner domain user with the permission to access White Label Customization to customize their company logo, company icon, and company name.

Complete the following steps to display the company logo, company icon, and company name on the controller.

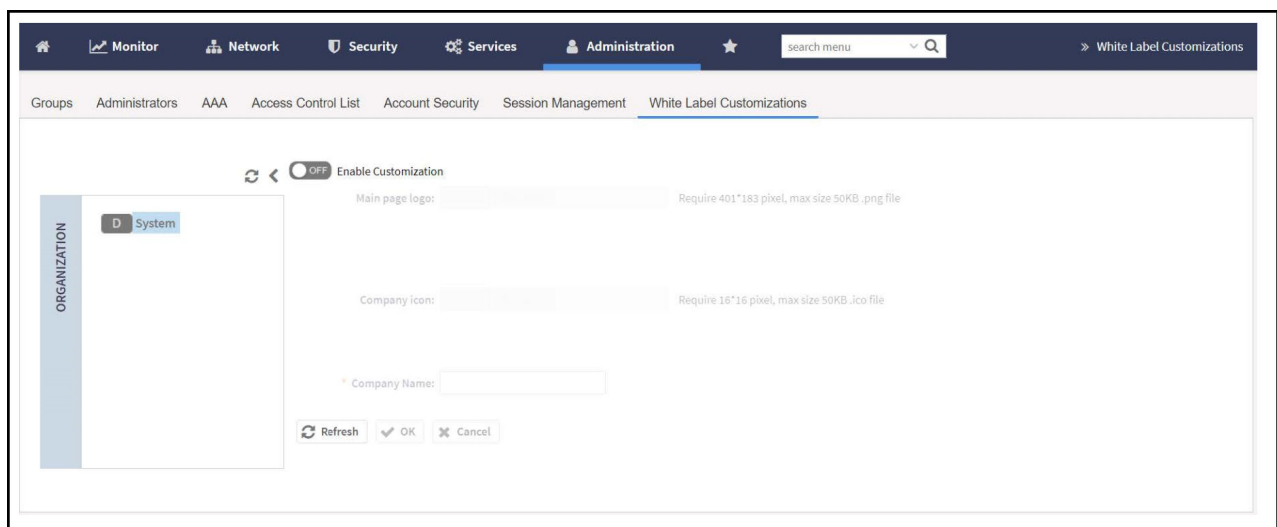
Note: If you do not have the White Label Customization permission, you cannot access white label customizations.

1. From the **Dashboard**, Click the **Administration** tab.
2. From **Administration**, select **Admins and Roles**.
3. Click the **White Label Customizations** tab.
4. Set the **Enable Customization** button to ON.

Note: The partner domain user can view only their own domain to configure logo, icon and name of the company.

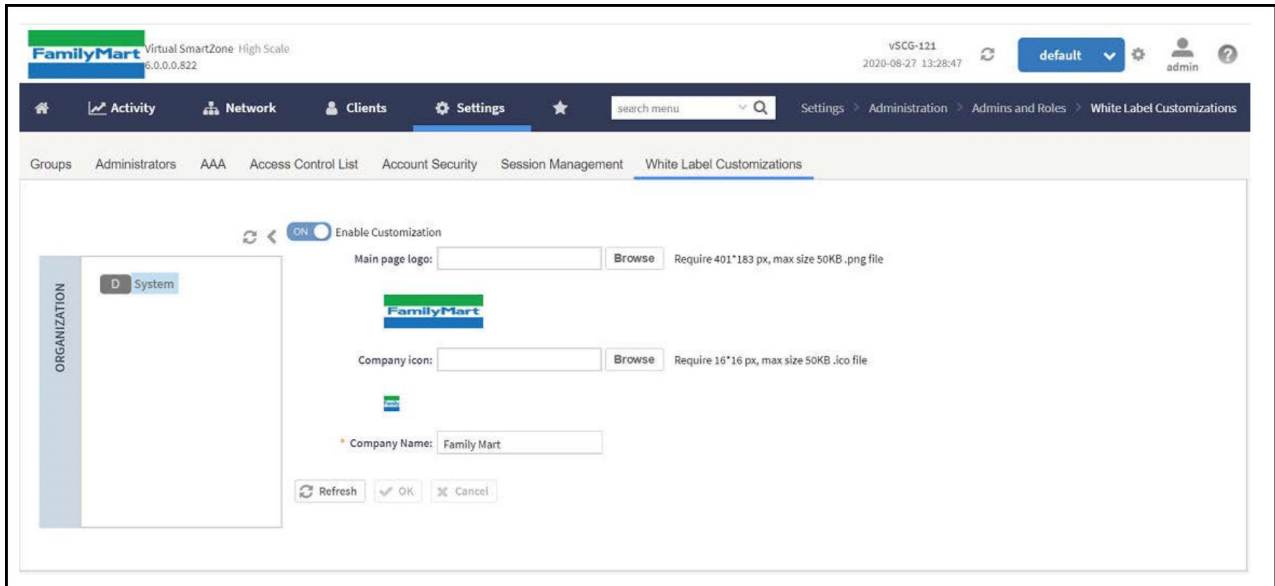
- a. **Main page logo:** Click **Browse** to select the company logo.
- b. **Company icon:** Click **Browse** to select the company icon.
- c. **Company Name:** Enter the name of the company.

Figure 1. Enabling White Label Customization



- Click **OK** to confirm settings or click **Cancel** to disable customization.

Figure 2. New Logo Replaces Initial Logo



- Click **Refresh** to refresh the page.

Parent topic: [Managing Administrator and Roles](#)

Vendor-Specific Attribute (VSA) Profile

The SmartZone UI provides the VSA profile, where the user can define VSAs to be included in authentication and accounting messages. The AP receives the configuration from the Change and Configuration Management (CCM) and appends the VSAs to each user equipment (UE) authentication and accounting request and forwards the requests to the AAA server.

For HotSpot WISPr, the UE authentication is handled by the northbound Interface (NBI) where Real Application Clusters (RAC) appends the VSAs to the authentication messages and the AP appends the VSAs to the accounting messages.

Parent topic: [Managing Administrator and Roles](#)

Creating a Vendor-Specific Attribute Profile

Perform the following procedure to add the VSAs in the RADIUS authentication and accounting messages.

- Select **Services > Others > Vendor Specific Attribute**.
- From the **Vendor Specific Attributes Profile** page, select the zone for which you want to create a VSA profile. and click **Create**.

The **Create Vendor Specific Attribute Profile** page is displayed.

Figure 1. Creating a Vendor-Specific Attribute Profile

Create Vendor Specific Attribute Profile

Name:

Description:

Attributes:

Vendor ID	Key ID	Value	Type	Radius Message
<input type="text"/>	<input type="text"/>	<input type="text"/>	String	Both

+ Add Import CSV Cancel Delete

Vendor ID	Key ID	Value	Type	Radius Message

No data 1

OK Cancel

3. Enter the profile name and description.
4. Under **Attributes**, define the VSA profile by completing the following steps:
 - a. In the **Vendor ID** field, enter an integer from 1 through 65536.

Note: Do not configure the vendor IDs 25053 (Ruckus) and 14122 (WISPr) because they are reserved for internal use only. If you try to configure these vendor IDs, the system throws an error message.
 - b. In the **Key ID** field, enter an integer from 0 through 255.
 - c. In the **Value** field, enter an integer or string depending on the **Type** selected.

Note: The integer range is from 0 through 2147483647. The maximum length of a string is 247 characters.
 - d. In the **Type** list, select from the following options:
 - Integer
 - String
 - e. In the **Radius Message** list, select from the following options:
 - **Accounting:** The attributes defined in the VSA profile are included in the accounting messages.


- **Authentication:** The attributes defined in the VSA profile are included in the authentication messages.
- **Both:** The attributes defined in the VSA profile are included in both the accounting and authentication messages.

5. Click **Add** to add the VSA profile or click **Import CSV** to upload a CSV file containing multiple VSA profiles.


 **Note:** To download a CSV template, click the **Import CSV** arrow and select **Download a CSV Sample**.


The VSA profiles are added to the **Attributes** table. Check the VSA information in the **Attributes** table for any modifications.


 **Note:** You can edit the VSAs by clicking the **Vendor ID** in the **Attributes** table.

 **Note:** A maximum of 32 VSAs can be added to a VSA profile. A maximum of 4 VSA profiles can be configured for a zone.

6. Click **OK** to update the VSA profile to the database.

 **Note:** To edit a VSA profile, select a VSA profile and click **Configure** in the **Vendor Specific Attribute Profile** page.

 **Note:** To associate a VSA profile to a WLAN, refer to [Associating a VSA Profile to a WLAN Configuration](#).

 **Note:** You can also configure a VSA profile in the zone and WLAN templates. For more information, refer to *Working with Zone Templates* and *Working with WLAN Templates* respectively .

Parent topic: [Managing Administrator and Roles](#)

Associating a VSA Profile to a WLAN Configuration

Perform the following procedure to associate a VSA profile to a WLAN configuration.

1. On the main menu, click **Network > Wireless LANs**.
The **Wireless LANs** page is displayed.
2. Select the zone where the VSA profiles are created and click **Create**.
The **Create WLAN Configuration** page is displayed.

Figure 1. Creating a WLAN Configuration

Create WLAN Configuration

* Name:

* SSID:

Description:

* WLAN Group: +

[?] Network Segmentation: ☒ ON ☐ Disable Enable Network Segmentation role configuration

Authentication Options ▶

Encryption Options ▶

Data Plane Options ▶

Authentication & Accounting Service ▼

* [?] Authentication Service: ☒ ON ☐ Disable Use the controller as proxy
 Select an authentication s +

Accounting Service: ☒ ON ☐ Disable Use the controller as proxy
 Disable +

3. Under **General Options**, enter the WLAN name and SSID.
4. Under **Authentication and Accounting Service**, complete the following steps: select the authentication service profile.
 - a. Under **Authentication Service**, click **Use the controller as proxy** and select the authentication service profile.
 - b. Under **Accounting Service**, click **Use the controller as proxy** and select the accounting service profile.
5. Under **Radius Options**, click **Vendor Specific Attribute Profile** and select a VSA profile.

Note: By default, **Vendor Specific Attribute Profile** is disabled.

Note: Click to configure the VSA profile.

6. Under **Advanced Options**, in **Access VLAN**, enter the VLAN ID.

Note: Enter an integer from 2 through 4094 for **VLAN ID**.

7. Click **OK**.

- **Note:** The WLAN configuration is shown in the **Access Points** page for the zone where VSA profiles are created.

Parent topic: [Managing Administrator and Roles](#)

Global Filters Overview

Global filters allow the administrator to define a system scope or system context that applies to all pages of the system as they navigate to different menus. For example, if your system includes 5 zones, but you want to view Zone1 and Zone2 only, you can create and apply such a filter. As you navigate throughout the system, the view will be restricted to show only the data, objects, and profiles contained within Zones 1 and 2.

Configuring Global Filters

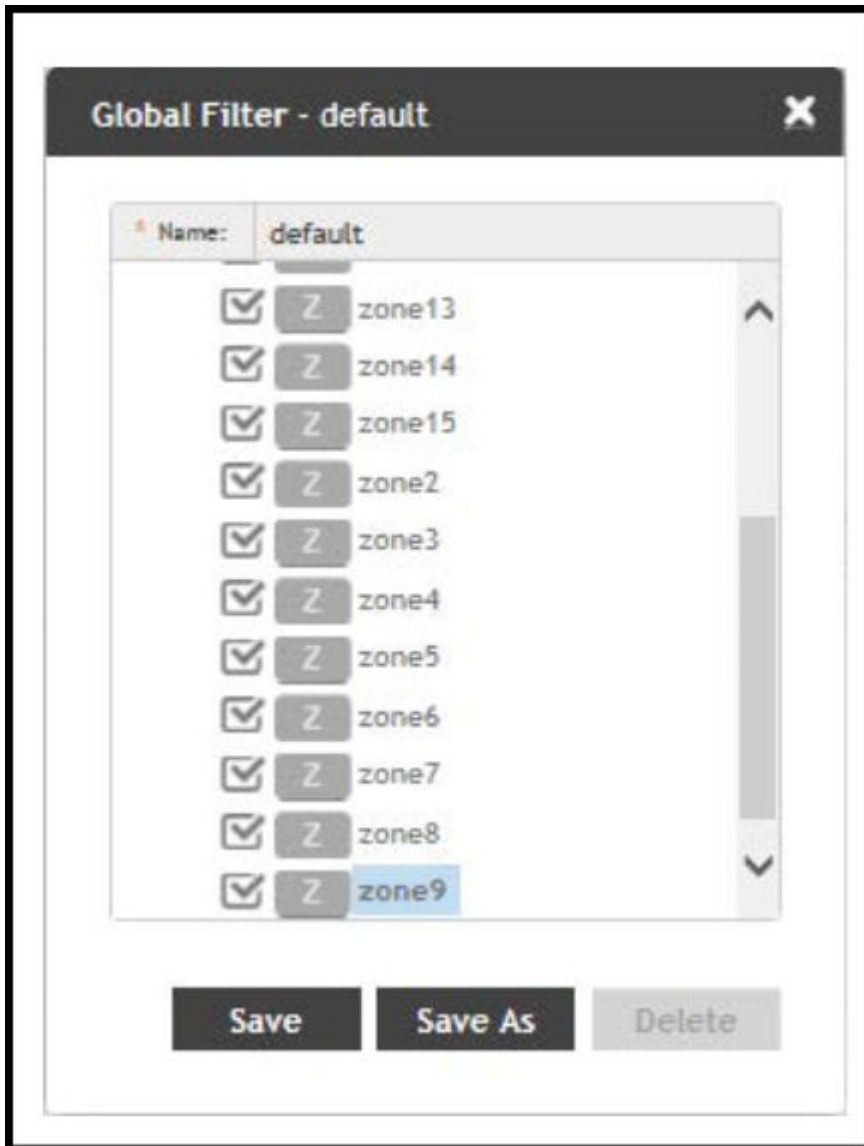
The Global filter setting allows you to set your preferred system filter.

To set the global filter follow the below steps.

1. On the controller web interface, click  . The **Global Filter - default** page is displayed.

The below figure appears.

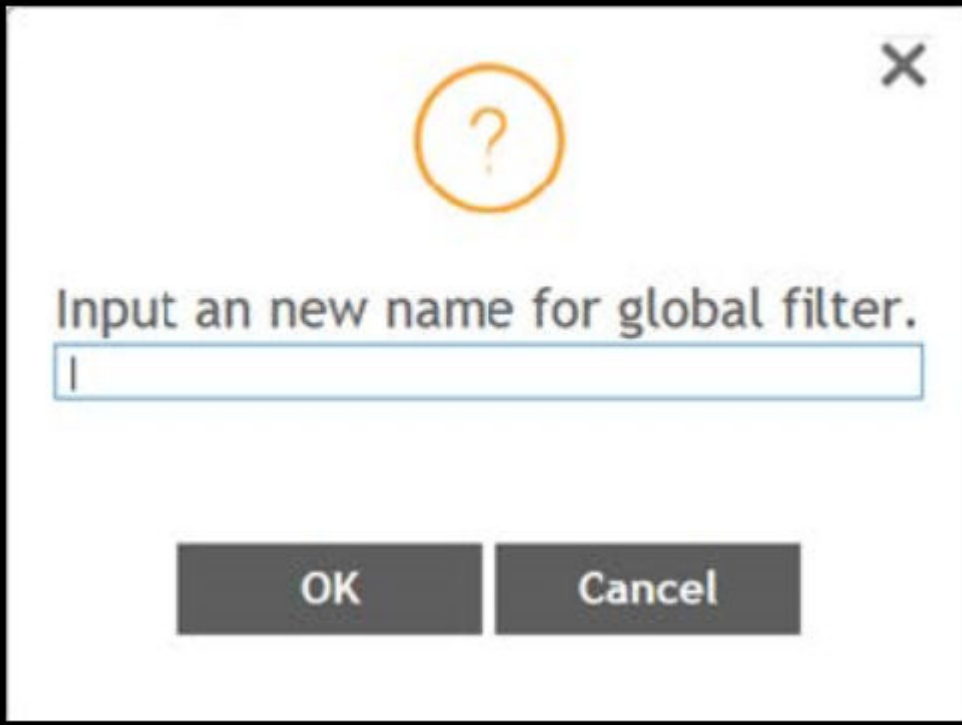
Figure 1. Global Filter Form




2. Select or clear the required system filters and click

- **Save**—To save the filter settings with the default group.
- **Save As**—To save the filter settings as a new group. The below figure appears. Enter a new name for the group and click **OK**.

Figure 2. New Name Form



A modal dialog box with a black border. At the top center is an orange circle containing a question mark. In the top right corner is a grey 'X' button. Below the question mark, the text "Input an new name for global filter." is displayed. Underneath this text is a text input field with a blue border and a vertical cursor. At the bottom of the dialog are two dark grey buttons: "OK" on the left and "Cancel" on the right.

- **Note:** You can delete the filter setting. To do so, click the Filter  setting button. The Global Filter form appears, click **Delete**.

Parent topic: [Global Filters Overview](#)

Backup and Restore

[Cluster](#)

[Configuration](#)

[Support Information](#)

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Cluster

[Administering the Cluster](#)

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[Creating a Cluster Backup](#)

[Replacing a Controller Node](#)

[Restoring a Cluster Automatically on Upgrade Failure](#)

Parent topic: [Backup and Restore](#)

Administering the Cluster

[SmartZone Cluster Mode](#)

Parent topic: [Cluster](#)

SmartZone Cluster Mode

SmartZone system state has two cluster modes.

The two cluster modes are -

- Crash mode
- Suspend mode

Crash mode

The system cluster enters this mode when system meets unexpected error during fresh install or reboot flow. The system runs into ir-recoverable error and should be set to reset-factory settings.

System enters into **Crash mode** in any one of the below conditions:

1. System reboot with environment inconsistency.
 - a. Model
 - b. Port group (SZ 100)
 - c. Firmware Version
2. Fresh install fail.
3. Join cluster fail.

Suspend mode

The system enters this mode if there is an environment error during reboot flow. The configurator sets up suspend flag and stops all applications. The system can be recovered by rebooting as it is a temporary fail.

System enters into **Suspend mode** in any one of the below conditions:

1. Platform applications cannot be launched successfully.
2. Failed on membership authentication in cluster .

To check status of the cluster state, use **show cluster-state** command.

Figure 1. Crash and Suspended modes

```
dean300-3# show cluster-state
Current Management Service Status : Out of service
Current Node Status : Out of service
Cluster Status : In service
Cluster Operation : None
System Mode : Suspend
```

```
dean100521-3# show cluster-state
Current Management Service Status : Out of service
Current Node Status : Out of service
Cluster Status : In service
Cluster Operation : None
System Mode : Crash
```

To recover system in case of **Suspend mode**, use **reload** command. System automatically detects suspend flag and clears before launching applications.

Figure 2. reload

```
login as: admin
#####
#       Welcome to vSZ       #
#####
admin@10.206.20.243's password: *****
Please wait. CLI initializing...

Welcome to the Ruckus Virtual SmartZone - High Scale Command Line Interface
Version: 5.2.1.0.145
% System is in Suspend Mode. Please reboot system to recover.

deanvszh521-3> en
Password: *****

deanvszh521-3# reload
Do you want to gracefully reboot system after 30 seconds (or input 'no' to cancel)? [yes/no] yes
Server would be rebooted in 30 seconds
```

To reset system to factory settings in case of **Crash mode**, use **set-factory** command.

Figure 3. set-factory

```
#####
#       Welcome to vSZ       #
#####
admin@10.206.20.244's password: *****
Please wait. CLI initializing...

Welcome to the Ruckus Virtual SmartZone - High Scale Command Line Interface
Version: 5.2.1.0.171
% System is in Crash Mode. Please set-factory system to recover.

deanvszh52geocrash> en
Password: *****

deanvszh52geocrash# set-factory
```

Parent topic: [Adminstrating the Cluster](#)

Disaster Recovery

Creating cluster backup and restoring cluster configurations periodically helps manage disaster recovery.

Parent topic: [Cluster](#)

Backing up Cluster Configuration

RUCKUS 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.

The following are backed up in the system configuration backup file:

Table 1. Contents of a cluster configuration backup file

Configuration Data	Administration Data	Report Data	Identity Data
AP zones	Cluster backup	Saved reports	Created profiles
Third-party AP zones	System configuration backups	Historical client statistics	Generated guest passes
Services and profiles	Upgrade settings and history	Network tunnel statistics	
Packages	Uploaded system diagnostic scripts		
System settings	Installed licenses		
Management domains			
Administrator accounts			
MVNO accounts			

A system configuration backup does not include control plane settings, data plane settings, and user-defined interface settings.

1. Go to **Administration > Administration > Backup and Restore**.

2. Select the **Configuration** tab.

3. In System Configuration Backup History, click **Backup**.

The following confirmation message appears: Are you sure you want to back up the controller's configuration?

4. Click **Yes**.

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 backup file appears under the **System Configuration Backup History** section.

 **Note:**

The system will limit the configuration backup to 5 scheduled and 50 Manual backup files.

Parent topic: [Disaster Recovery](#)

Scheduling a Configuration Backup

You also have the option to configure the controller to backup its configuration automatically based on a schedule you specify.

1. Go to **Administration > Administration > Backup and Restore**.
2. Select the **Configuration** tab.
3. In Schedule Backup, you can configure the controller to backup its configuration automatically based on a schedule you specify.
 - a. In Schedule Backup, click **Enable**.
 - b. In Interval, set the schedule when the controller will automatically create a backup of its configuration. Options include: Daily, Weekly and Monthly.
 - c. Hour: Select the hour of the day when the controller must generate the backup.
 - d. Minute: Select the minute of the hour.
 - e. Click **OK**.

Parent topic: [Backing up Cluster Configuration](#)

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 **Backup**.

Follow these steps to back up the configuration file to an FTP server automatically.

1. Go to **Administration > Administration > Backup and Restore**.
2. Select the **Configuration** tab.
3. In Auto Export Backup, you can configure the controller to export the configuration file to an FTP server automatically whenever you back up the configuration file.
 - a. In Auto Export Backup, click **Enable**. In the **Name prefix** field, type the prefix name of the backup file. The maximum length of the prefix name must not be more than 32 characters.
 - b. FTP Server: Select the FTP server to which you want to export the backup file.
 - c. 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, a success message is displayed. 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.
 - d. Click **OK**.

4. After you verify the controller is able to connect to the FTP server successfully, click **OK** to save the FTP server settings.

Parent topic: [Backing up Cluster Configuration](#)

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 History** section.

1. Go to **Administration > Administration > Backup and Restore**.
2. Select the **Configuration** tab.
3. Locate the entry for the backup file that you want to download. If multiple backup files appear on the list, use the date when you created the backup to find the backup entry that you want.
4. Click **Download**.
Your web browser downloads the backup file to its default download folder. NOTE: When your web browser completes downloading the backup file, you may see a notification at the bottom of the page.
5. Check the default download folder for your web browser and look for a file that resembles the following naming convention: **[Name prefix]_Configuration_[datetime]_[Version].bak**


The controller will combine the prefix name with the date and time stamp to generate the filename for automatic backup. For example, RUCKUS_Configuration_20200902071625GMT_6.0.0.0.817.bak.

Parent topic: [Backing up Cluster Configuration](#)

Restoring a System Configuration Backup

In the event of a failure or emergency where you may need to go back to the previous version of a cluster, you will have to restore your system configuration backup and restart the cluster.

1. Go to **Administration > Administration > Backup and Restore**.
2. Select the **Configuration** tab.
3. Once you locate the backup file, click **Restore** 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.
Check the web interface pages and verify that the setting and data contained in the backup file have been restored successfully to the controller.

Parent topic: [Backing up Cluster Configuration](#)

Creating a Cluster Backup

Backing up the cluster (includes OS, configuration, database and firmware) periodically enables you to restore it in the event of an emergency. RUCKUS also recommends that you back up the cluster before you upgrade the controller software.

1. Go to **Administration > Administration > Backup and Restore**.
2. Select the **Cluster** tab.
3. In Cluster Backup and Restore, click **Backup Entire Cluster** to backup both nodes in a cluster.
The following confirmation message is displayed: Are you sure you want to back up the cluster?
4. Click **Yes**.
The following message is displayed: The cluster is in maintenance mode. Please wait a few minutes.

When the cluster backup process is complete, a new entry is displayed in the **Cluster Backups History** section with a **Created On** value that is approximate to the time when you started the cluster backup process.

Parent topic: [Cluster](#)


Restoring a Cluster Backup

You must be able to restore a cluster to its previous version in the case of a failure.

1. Go to **Monitor > Troubleshooting&Diagnostics > Application Logs**.
2. Select the **Cluster** tab.
3. In Cluster Backup History, select the cluster and click **Restore**.
The following confirmation message appears:

Are you sure you want to restore the cluster?

4. Click **Yes**.
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.

 **Attention:** Do not refresh the controller web interface while the restore process is in progress. Wait for the restore process to complete successfully.

5. Log on to the controller web interface.
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 **Diagnostics > Application Logs**, and then under **Application Logs & Status** check the **Health Status** column and verify that all of the controller processes are online.

Parent topic: [Creating a Cluster Backup](#)

Replacing a Controller Node

[Replacing a Controller Node in Single Node Cluster](#)

[Replacing a Controller Node in Multi-Node Cluster](#)

[Performing a Wipe-out Upgrade for Controller Node](#)

Parent topic: [Cluster](#)

Replacing a Controller Node in Single Node Cluster

This section describes how to replace a controller node in single node cluster. Original configuration backup and a new node are required.

Parent topic: [Replacing a Controller Node](#)

Step 1: Wipe-out Upgrade Controller Node

If the Controller node does not match with the existing cluster version, prepare a new Controller and wipe-out upgrade to the same version of the running cluster. See [Performing a Wipe-out Upgrade for Controller Node](#).

Parent topic: [Replacing a Controller Node in Single Node Cluster](#)

Parent topic: [Replacing a Controller Node in Multi-Node Cluster](#)

Step 2: Join New Controller Node


Set up the node as a new controller. For step by step instructions, see the Getting Started Guide.

Parent topic: [Replacing a Controller Node in Single Node Cluster](#)

Step 3: Configuration Restore

With original configuration backup follow the steps to restore the configuration in cluster:

1. Prepare the new controller to which you will restore the cluster backup.
 - a. Either obtain a new controller or factory reset an existing controller.
 - b. Log on to the controller as a system administrator.
 - c. Run the setup command to configure the controller's network settings.
 - d. Complete the controller setup process from the **CLI**.
2. After you complete the controller setup, log on to the controller web interface as a system administrator.
3. Go to **Administration > Administration>Backup and Restore**.

 **Note:** For SmartZone 5.2.1 or earlier releases, select **Administration > Backup and Restore**.

4. Select the **Configuration** tab.
5. Click **Upload**. After the configuration file is uploaded successfully, it appears in the Configuration section.
6. Restore the configuration backup to the node either using the web interface or the **CLI**.
 - To use the web interface:
 - a. Go to **Administration > Backup and Restore** page.
 - b. In the **Configuration** tab, locate the configuration backup file that you want to restore.
 - c. Click **Restore**.
 - d. Follow the prompts (if any) to complete the restore process.
 - To use the **CLI**:
 - a. Log on to the **CLI** of the node as a system administrator.
 - b. Run the **restore config** command.

Parent topic: [Replacing a Controller Node in Single Node Cluster](#)

Replacing a Controller Node in Multi-Node Cluster

This section describes how to replace a controller node in a multi-node cluster. Removing a node and joining a new node is the standard process to replace a node.

Parent topic: [Replacing a Controller Node](#)

Step 1: Wipe-out Upgrade Controller Node

If the Controller node does not match with the existing cluster version, prepare a new Controller and wipe-out upgrade to the same version of the running cluster. See [Performing a Wipe-out Upgrade for Controller Node](#).

Parent topic: [Replacing a Controller Node in Single Node Cluster](#)

Parent topic: [Replacing a Controller Node in Multi-Node Cluster](#)

Step 2: Remove RMA Controller Node

Choose a controller that will remain in the cluster and follow the steps:

1. Log on to the web interface of the chosen controller using administrator credentials.
2. Go to **Network > Data and Control Plane>Cluster** and locate the node that you want to replace in the cluster planes.

 **Note:** For SmartZone 5.2.1 or earlier releases, select **System > Cluster**.

3. Click **Delete** to remove the node from the cluster.

Parent topic: [Replacing a Controller Node in Multi-Node Cluster](#)

Step 3: Join the New Controller Node

To join the new controller into the running cluster:

1. Prepare a proper version of the controller by wipe-out upgrade. See [Performing a Wipe-out Upgrade for Controller Node](#).
2. Set up the node as a new controller, and then join the existing cluster. For step by step instructions, refer to the Getting Started Guide.

Parent topic: [Replacing a Controller Node in Multi-Node Cluster](#)

Performing a Wipe-out Upgrade for Controller Node

If the firmware version on this controller (shown in the Cluster Information page) does not match the firmware version for new cluster setup or join an existing, a message appears and prompts you to upgrade the controller's firmware. Click **Upgrade**, and then follow the prompts to perform the upgrade.

Note: Refer [Cautions & Limitations of Administrating a Cluster](#) for more information.

- For controller running firmware version 5.1 or later can do wipe-out upgrade successfully to greater than 5.1.
- For controller running firmware version earlier than 5.1, apply a KSP patch to make wipe-out upgrade successful Contact Ruckus support to receive a KSP patch to apply the patch from CLI.

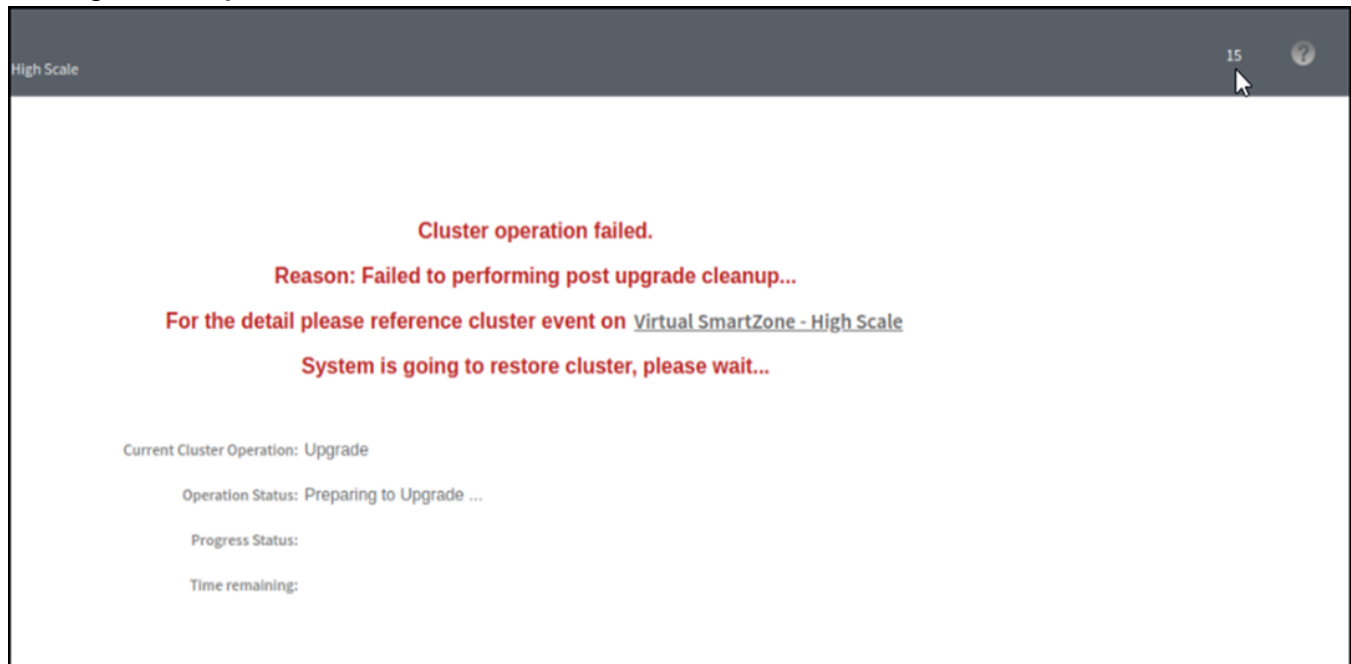
Parent topic: [Replacing a Controller Node](#)

Restoring a Cluster Automatically on Upgrade Failure

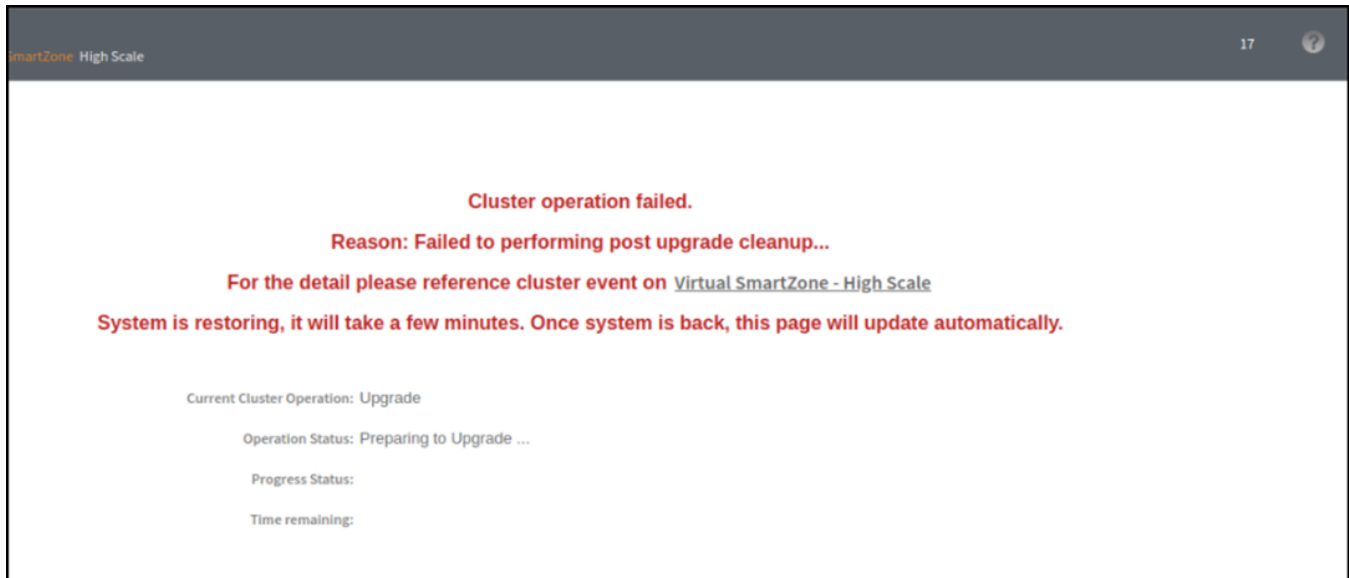
When cluster upgrade fails in the middle, the system will automatically restore the cluster with the backup file prepared in the beginning of the upgrade process and goes back to previous version of the image. The user does not need to manually restore the cluster.

When the cluster fails to upgrade and a restore action is triggered, the system performs the following process:

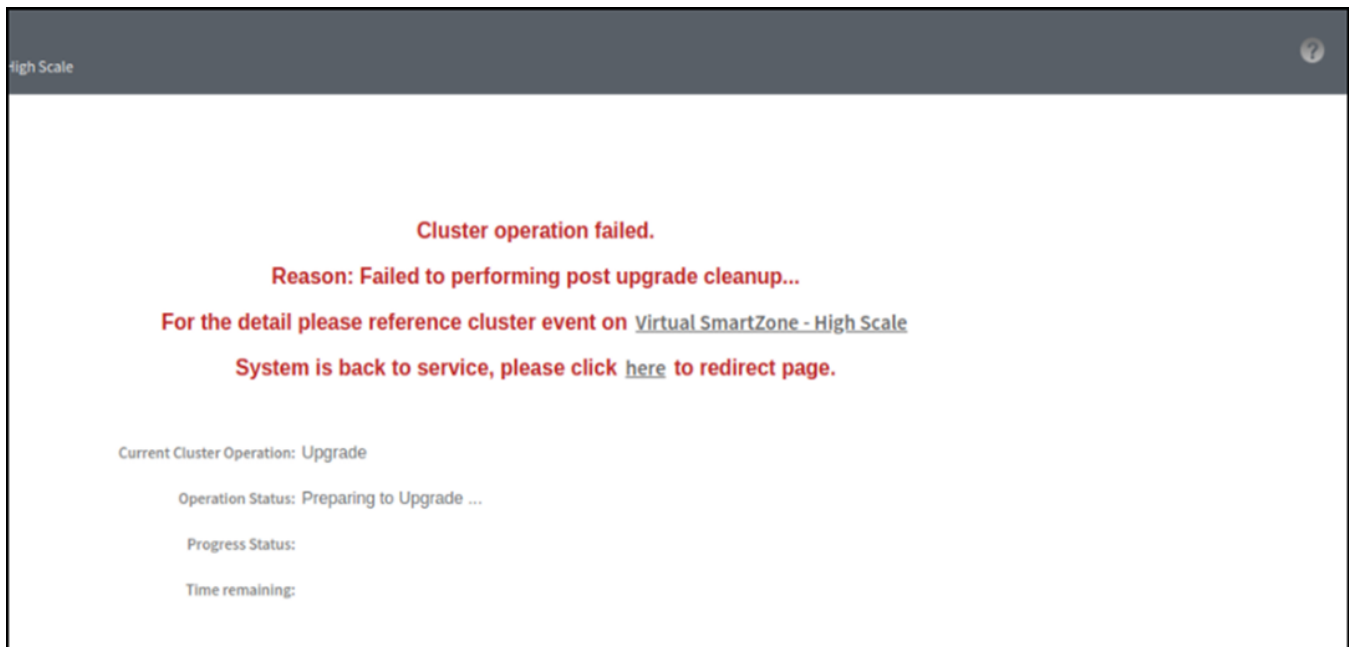
Starting a restore process



Restoring cluster



Cluster back to service



Parent topic: [Cluster](#)

Configuration

[Backed Up Configuration Information](#)

[Backing Up and Restoring the Controller's Network Configuration from an FTP Server](#)

[Backing Up to an FTP Server](#)

[Restoring from an FTP Server](#)

Parent topic: [Backup and Restore](#)

Backed Up Configuration Information

The following list show which configuration information will be backing up.

- AP zones
- AP zone global configuration
- Zone templates
- WLAN templates
- AP registration rules
- Access point information
- General system settings
- Web certificate
- SNMP agent
- Alarm to SNMP agent
- Cluster planes
- Management interface ACL
- Domain information
- User credentials and information
- Mobile Virtual Network Operators (MVNO) information

Parent topic: [Configuration](#)

Backing Up and Restoring Configuration

Configuration backup creates a backup of all existing configuration information on the controller. In addition to backing up a different set of information, configuration backup is different from cluster backup in a few ways:

- The configuration backup file is smaller, compared to the cluster backup file.
- The controller can be configured to back up its configuration to an external FTP server automatically.

- Configuration backup does not back up any statistical files or general system configuration.

Parent topic: [Backed Up Configuration Information](#)

Backing Up Configuration

There are two methods you can use to back up the controller configuration:

- [Backing Up Configuration from the CLI](#)
- [Backing Up Configuration from the Web Interface](#)

Parent topic: [Backed Up Configuration Information](#)

Backing Up Configuration from the CLI

There are two methods you can use to back up the controller configuration either using the web interface or CLI (Command Line Interface).

Follow these steps to back up the controller configuration from the **CLI**.

1. Log on to the controller **CLI** as a system administrator.
2. Run the **enable** command to enable privileged mode on the **CLI**.

```
ruckus> enable
Password: *****
ruckus#
```

3. Run the **backup config** command to start backing up and transferring the node configuration to an FTP server.

```
ruckus# backup config <ftp-username> <ftp-password> <ftp-server-address> <ftp-
server-port>
Do you want to backup configuration (yes/no)? yes
Backup Configuration process starts
Backup Configuration process has been scheduled to run. You can check backup
version using 'show backup-config'
```

4. Run the **show backup-config** command to verify that the backup file has been created.

Parent topic: [Backing Up Configuration](#)

Backing Up Configuration from the Web Interface

1. For information on how to back up the controller configuration to an external FTP server automatically, see [Backing up Cluster Configuration](#).
2. In **Auto Export Backup**, click **Enable**.
3. In **FTP Server**, select the FTP server to which you want to export the backup file.

4. 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.
5. After you verify the controller is able to connect to the FTP server successfully, click **OK** to save the FTP server settings.

Parent topic: [Backing Up Configuration](#)

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's network configuration from an FTP server, the information that is included in the backup file, and how to perform the backup and restore process.

To back up and restore the controller's 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.

The following table lists the network configuration that is backed up from the control and data planes when you perform a backup procedure to an FTP server.

Table 1. Information that is backed up to the FTP server

Control Plane	Data Plane
<ul style="list-style-type: none"> • Control interface • Cluster interface • Management interface • Static routes • User-defined interfaces 	<ul style="list-style-type: none"> • Primary interface • Static routes • Internal subnet prefix

Parent topic: [Configuration](#)

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 controller's command line interface (CLI). For more information, see the corresponding *Command Line Interface Reference Guide* for your controller platform.

2. At the prompt, enter `en` to enable privileged mode.

Figure 1. Enable privileged mode

```
dean300-1> en
Password: *****
```

3. Enter `-` 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 2. Verify that both the node and the cluster are in service

```
dean300-1# show cluster-state
Current Management Service Status : In service
Current Node Status : In service
Cluster Status : In service
Cluster Operation : None
System Mode : None
```

4. Enter `backup network` to back up the controller network configuration, including the control plane and data plane information.

The controller creates a backup of its network configuration on its database.

Figure 3. Run `backup network`

```
login as: admin
#####
# Welcome to SmartZone 300 #
#####
admin@10.206.20.239's password: *****
Last successful login: 2019-12-31 01:14:43
Last successful login from: 10.206.6.196
Failed login attempts since last successful login: 0
Account privilege changes: No
Please wait. CLI initializing...

Welcome to the Ruckus SmartZone 300 Command Line Interface
Version: 5.2.0.0.649

dean300-1> en
Password: *****

dean300-1# backup network
Do you want to backup network configurations (or input 'no' to cancel)? [yes/no] yes
Starting to backup network configurations...
Successful operation
```

5. 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 4. Enter the show backup-network command

```
dean300-1# show backup-network
```

No.	Created on	Patch Version	File Size
1	2019-12-31 01:15:30 GMT	5.2.0.0.649	3.9KB

- 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 **CLI** prompts you to choose the number that corresponds to the backup file that you want to export to the FTP server.

- Enter the number of the backup file that you want to export to the FTP server.

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 indicates that you have exported the backup file to the FTP server success
```

Figure 5. Succeed to copy to remote FTP server

```
dean300-1# copy backup-network ftp://test:test@192.168.10.83
```

No.	Created on	Patch Version	File Size
1	2019-12-31 01:15:30 GMT	5.2.0.0.649	3.9KB

```

Please choose a backup to send to remote FTP server or 'No' to cancel: 1
Starting to copy the chosen backup to remote FTP server...
Starting to encrypt backup file...
Starting to generate checksum for backup file...
Succeed to copy to remote FTP server
Successful operation

```

- 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.

Parent topic: [Configuration](#)

Restoring from an FTP Server

Before you continue, take note of the following limitations with restoring a backup file of the controller network configuration from an FTP server:

- Only release 2.1 and later support restoring 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's network configuration that you previously uploaded to an FTP back to the controller.

1. Log on to the controller from the **CLI**. For more information, see the corresponding *Command Line Interface Reference Guide* for your controller platform.

2. At the prompt, enter **en** to enable privileged mode.

Figure 1. Enable privileged mode

```
dean300-1> 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 2. Verify that both the node and the cluster are in service

```
dean300-1# show cluster-state
Current Management Service Status : In service
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 3. Verify that the backup file was copied to the controller successfully

```
dean300-1# copy ftp://test:test@192.168.10.83 backup-network
Only one NetworkBackup file (network_20191231011530_5.2.0.0.649.bak) is found. Do you want to copy (or input 'no' to cancel)? [yes/no] yes
Starting to copy the chosen NetworkBackup file (network_20191231011530_5.2.0.0.649.bak) from remote FTP server...
Succeed to copy the chosen file from remote FTP server

dean300-1# show backup-network
```

No.	Created on	Patch Version	File Size
1	2019-12-31 01:15:30 GMT	5.2.0.0.649	3.9KB

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.

Figure 4. Enter the number that corresponds to the backup file that you want to restore

```
dean300-1# restore network
```

No.	Created on	Patch Version	File Size
1	2019-12-31 01:15:30 GMT	5.2.0.0.649	3.9KB

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
-----
Cluster    DHCP
Control    DHCP
Management Static    10.206.20.239    255.255.252.0    10.206.23.254

Access & Core Separation : Disabled
Default Gateway Interface : Management
Primary DNS Server       : 10.10.10.10
Secondary DNS Server     : 10.10.10.106
Internal Subnet Prefix   : 10.254.1.0/24
Control NAT IP           :
```

```
[IPv6 Control Plane Interfaces]
Interface  IP Mode  IP Address      Gateway
-----
Control    Static   2001:b030:2516:110::3012/64    2001:b030:2516:110::1
Management Static   2005:b030:2516:110::3012/64    2005:b030:2516:110::1

Please confirm this network setting, and this action will restart all services (or input 'no' to cancel)? [yes/no] yes
Process had been started before and running...
Starting to stop all SmartZone services...
```

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.

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.

10. Restore the network configuration contained in the selected backup file.

11. Restart all services.

When the restore process is complete, the following message appears on the CLI: All services are up!

Figure 5. The controller performs several steps to restore the backup file

```
Please confirm this network setting, and this action will restart all services (or input 'no' to cancel)? [yes/no] yes
Process had been started before and running...
Starting to stop all SmartZone services...
Process had been started before and running...
Stop service configurator done!
Wait for (Cassandra,Communicator,EAut,ElasticSearch,EventReader,Grayhound,LogMgr,MdProxy,Mosquitto,MsgDist,NginX,Northbound,Observer,RabbitMQ,Radi
usProxy,ScgUniversalExporter,Scheduler,SessMgr,StatsHandler,SubscriberManagement,SubscriberPortal,Switchm,Web) down.
Wait for (Cassandra,SubscriberManagement) down.
Wait for (Cassandra,SubscriberManagement) down.
Wait for (Cassandra,SubscriberManagement) down.
Wait for (Cassandra) down.
Wait for (Cassandra) down.
Wait for (Cassandra) down.
All services are down.
Starting to restore current system network setting...
Starting to start all SmartZone services...
All interfaces get the IP.

=====
Controller IP : IPv4:192.168.10.166 IPv6:2001:b030:2516:110::3012/64
Cluster IP   : 192.168.30.92
Management IP : IPv4:10.206.20.239 IPv6:2005:b030:2516:110::3012/64
=====
/opt/ruckuswireless/wsg/cli/bin/configurer.py (#494): libcommon.SystemTools.runCmd(sCmd, return_message=False): execute CMD [[/opt/ruckuswireless/
sg/auto_scaling/auto_scaling start]]
Mem:      total      used      free      shared  buff/cache  available
Swap:      0          0          0      188024    10425188    159439640

Wait for (Cassandra,Communicator,EAut,ElasticSearch,EventReader,Grayhound,LogMgr,MdProxy,Mosquitto,MsgDist,NginX,Northbound,Observer,RabbitMQ,Radi
usProxy,ScgUniversalExporter,Scheduler,SessMgr,StatsHandler,SubscriberManagement,SubscriberPortal,Switchm,Web) up.
Wait for (Cassandra,Communicator,EAut,ElasticSearch,EventReader,Grayhound,LogMgr,MdProxy,Mosquitto,MsgDist,NginX,Northbound,Observer,RabbitMQ,Radi
usProxy,ScgUniversalExporter,Scheduler,SessMgr,StatsHandler,SubscriberManagement,SubscriberPortal,Switchm,Web) up.
Wait for (Communicator,EAut,EventReader,Grayhound,LogMgr,MdProxy,Mosquitto,MsgDist,NginX,Northbound,Observer,RabbitMQ,RadiusProxy,ScgUniversalExp
orter,Scheduler,SessMgr,StatsHandler,SubscriberManagement,SubscriberPortal,Switchm,Web) up.
Wait for (Communicator,EAut,EventReader,Grayhound,LogMgr,Mosquitto,NginX,Northbound,Observer,RadiusProxy,ScgUniversalExporter,Scheduler,SessMgr,S
atsHandler,SubscriberManagement,SubscriberPortal,Switchm,Web) up.
Wait for (Communicator,EAut,EventReader,Grayhound,LogMgr,Mosquitto,NginX,Northbound,Observer,RadiusProxy,ScgUniversalExporter,Scheduler,SessMgr,S
atsHandler,SubscriberManagement,SubscriberPortal,Switchm,Web) up.
Wait for (Communicator,EAut,EventReader,Grayhound,LogMgr,Mosquitto,NginX,Northbound,Observer,RadiusProxy,ScgUniversalExporter,Scheduler,SessMgr,S
atsHandler,SubscriberManagement,SubscriberPortal,Switchm,Web) up.
Wait for (EAut,RadiusProxy,ScgUniversalExporter,Switchm) up.
Wait for (ScgUniversalExporter,Switchm) up.
Wait for (ScgUniversalExporter,Switchm) up.
All services are up.
Successful operation
```

12. 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 6. Verify that the node and cluster are back in service and that the network configuration has been restored successfully

```
dean300-1# show cluster-state
Current Management Service Status : In service
Current Node Status : In service
Cluster Status : In service
Cluster Operation : None
System Mode : None
```

Cluster Node Information

```
-----
No.    Name                               Role
-----
1      dean300-1-C                       LEADER
```

```
dean300-1# show interface
```

Interfaces

```
-----
Interface : Control
IP Mode   : DHCP
IP Address : 192.168.10.166
Subnet Mask : 255.255.255.0
Gateway   :
```

```
Interface : Cluster
IP Mode   : DHCP
IP Address : 192.168.30.92
Subnet Mask : 255.255.255.0
Gateway   :
```

```
Interface : Management
IP Mode   : Static
IP Address : 10.206.20.239
Subnet Mask : 255.255.252.0
Gateway   : 10.206.23.254
```

```
Access & Core Separation : Disabled
Default Gateway Interface : Management
Primary DNS Server       : 10.10.10.10
Secondary DNS Server     : 10.10.10.106
```

User Defined Interfaces

```
-----
```

You have completed importing and applying the network configuration backup from the FTP server to the controller.

Parent topic: [Configuration](#)

Support Information

The **Help** tab provides access to online REST API and administration guides.

To access these guides, select **Adminstraion** > **Help** and select the required guide.

Parent topic: [Backup and Restore](#)

WPA3 R3 Support

SAE Hash to Element (H2E)

Instead of generating password with ECC/FFC groups by looping, H2E provides a way for direct hashing to obtain the ECC/FFC password element.

An AP that supports H2E sets the SAE H2E bit in Extended RSN Capabilities field in Beacon and Probe Response.

Transition Disable Indication

Tansition Disable Indication



- Transition on/off option is provided in the Encryption Options.
- Beacon Protection

Beacon Protection can only be enabled when PMF is enabled. When Beacon Protection is enabled, the bit 84 in Extended Capability IE should be set to 1. AP should protect Beacon via adding MMIE in all Beacon frames. The BIGTK (Beacon Integrity Group Temporal Key) and BIPN (BIGTK Packet Number) is used for this purpose.

BIGTK should be renewed whenever there are GTK (Group Temporal Key) updates.

- Operating Channel Validation (OCV)

AP and STA need to include OCI (Operating Channel Information) as below if it indicates it is OCV Capable.

- Set bit 14 (OCVC) in RSN capability in RSNE.
- Add OCI KDE (00-0F-AC-13) in EAPOL M2/M3 and group key update M1/M2 frames. If OCI KDE is incorrect, AP should silently discard the frame.

Parent topic: [Backup and Restore](#)

Troubleshooting Client Connections

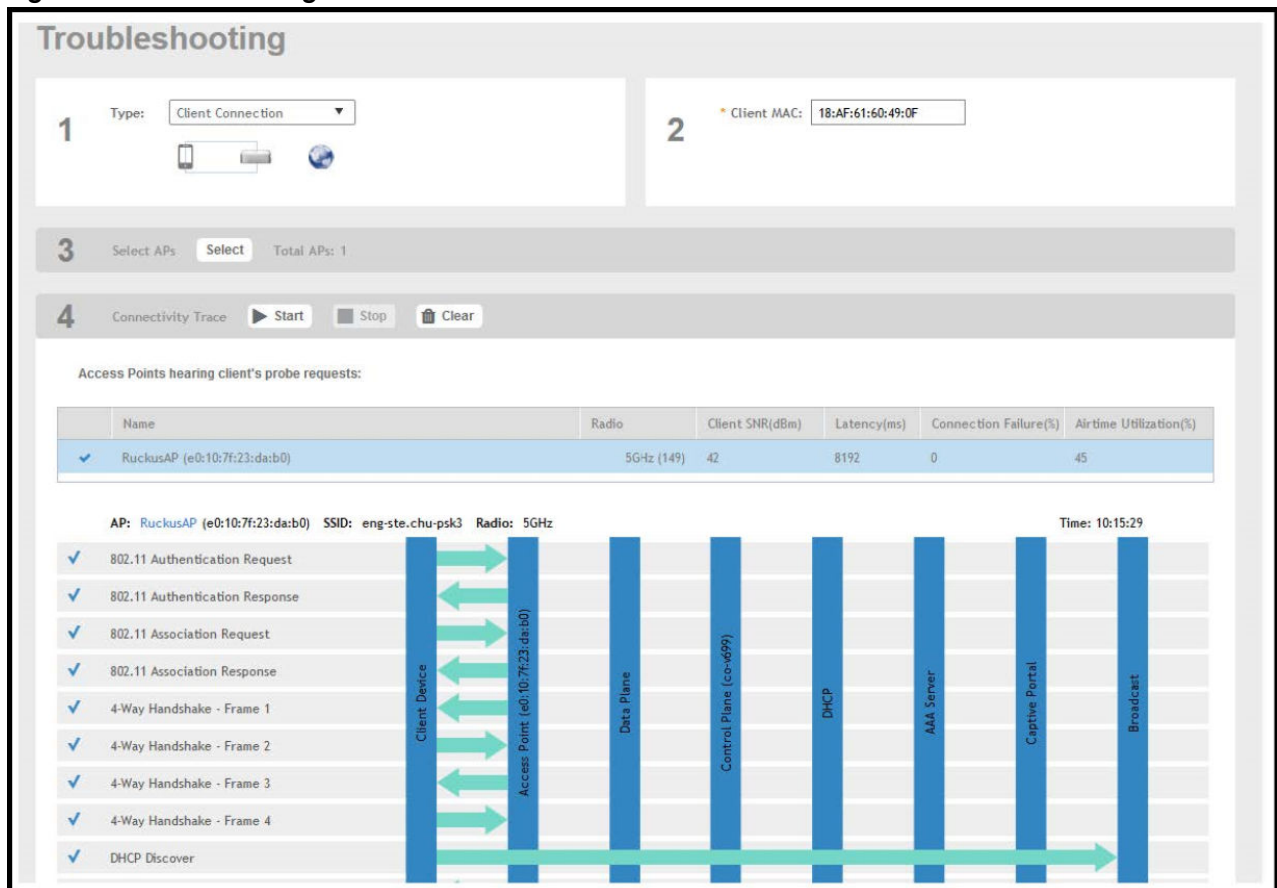
Network administrators can connect to client devices and analyze network connection issues in real time.

The network administrator types the MAC address of the client device and starts services to identify the connectivity issue. The APs assigned to the client device relay data frames from the device to the controller. The administrator can analyze these frames to determine which stage of the connection is causing problems.

Perform the following steps to troubleshoot client connections.

1. In the main menu, click **Monitor**. Select **Troubleshooting** from **Troubleshooting & Diagnostics** menu. This displays **Troubleshooting** window as shown in the below example.

Figure 1. Troubleshooting - Client Connections



2. In Type, select **Client Connection** from the drop-down menu.
3. In **Client MAC**, click settings, and choose **Historical Client** or **Connected Client** to view the client list.
4. Enter the MAC address of the client device with connectivity issues, or select the client device from the drop-down, which lists the **MAC Address**, **Hostname**, and **OS Type**.

You can search or sort the drop-down list by Client MAC, Hostname, or OS Type.

5. In Select APs, click **Select**.

The **Select APs** page is displayed.

6. Select an AP to communicate between the client and the controller, and then click **OK**.

7. In Connectivity Trace, click **Start**.

The controller configures the APs to receive data frames from the target client and relay frames to the controller based on the client filter.

The APs that receive probe requests from the target client are listed in a table, along with the AP's operating channel and the RSSI at which the client's frames were received. This stage of the connection identifies whether there are acceptable APs for the client to connect to.

The following items are displayed:

- AP Name and MAC Address
- Radio: The 2.4 or 5 GHz radio of the AP and the channel number the radio is operating on
- Client SNR: The signal-to-noise ratio received, in dB
- Latency: Time delay in connecting the AP to the client
- Connection Failures: The percentage of AP-client connection attempts that failed
- Airtime Utilization: The percentage of air time that was used by the client to transfer data

At this stage, the tool displays the statuses `Client is in a discovery state and not currently connected` (when the tool starts or when the client is already connected to an AP) and `Client is attempting a new connection` (when the target client sends an 802.11 authentication request frame to an AP to initiate a connection).

Use the list of APs that communicated with the client to determine whether the client chose the best AP based on signal quality and other health metrics.

When the client sends an 802.11 authentication request frame, a flow diagram depicting different stages of the AP-client connection is initiated. This sends a trigger frame to the AP, and it is highlighted from the list for reporting APs.

The Flow ladder in the diagram shows the step-by-step exchange of information between devices during the connection process. As the steps are completed, colored arrows are displayed when the step depicts a warnings (yellow) or event (for example, red for failure). Typical warning scenarios include time delays or a failed negotiation for an unsupported EAP type. Failure conditions are also highlighted as red arrows, typically when the connection itself fails.

 **Note:** The following authentication types are supported:

- Open
- PSK (WPA2-Personal)
- 802.1X (PEAP, TTLS, TLS, SIM)
- WISPr

8. Click **Stop** to terminate the connection between the AP and the client.

Video:

Client Connection Troubleshooting Demo. Overview of how to use the Client Connection tool.

[Click to play video in full screen mode.](#)

Related information

[Video: Client connection troubleshooting - entered wrong PW initially on Client Side, resolved, retested](#)

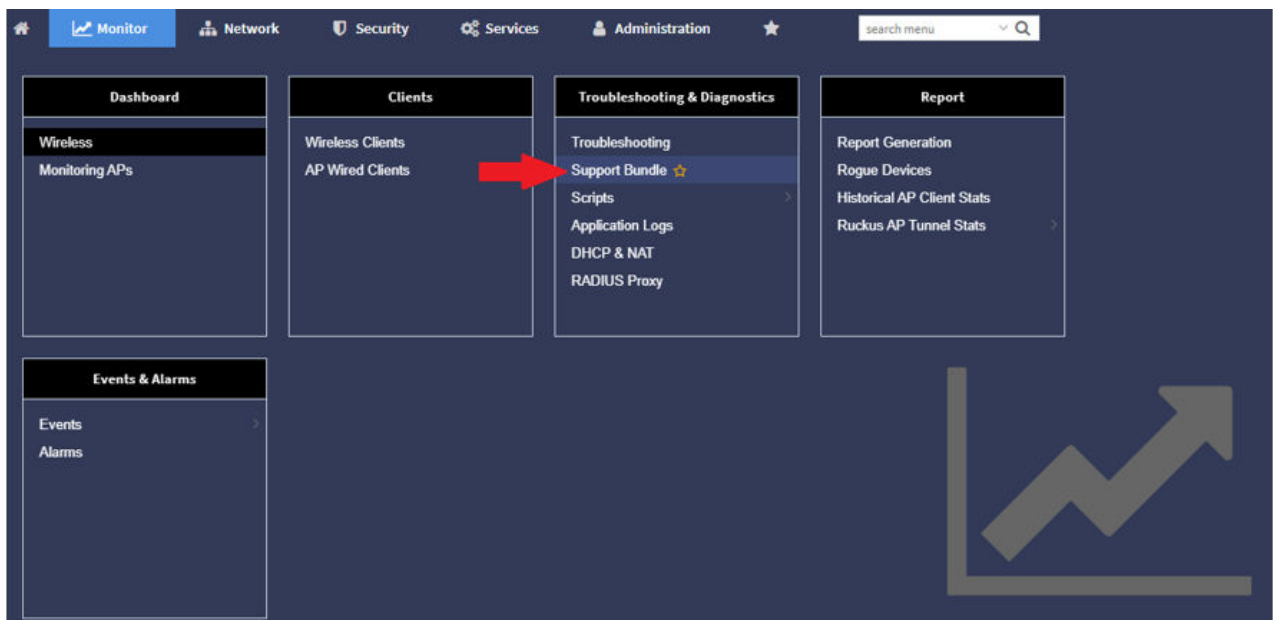
Support Bundle

Support Bundle allows you to gather the bundle log files from the controller and APs.

Complete the following steps to enable Support Bundle.

1. From the controller web interface, go to **Monitor > Troubleshooting & Diagnostics > Support Bundle**.
The **Support Bundle** dialog box is displayed.

Figure 1. Accessing the Support Bundle



2. Configure the following options:

Figure 2. Support Bundle Dialog Box

- **Category:** Select the type of support bundle from the list.
- **WLAN:** Select the WLAN on which the log collection will be performed from the list.
- **Targeted AP(s):** Select the APs from the list. The list contains the APs that have served the selected WLAN and are limited to the same zone.
- ⓘ **Note:** Any APs with a firmware version earlier than SmartZone 6.1 are disabled. A maximum of three APs can be displayed for the selected WLAN.
 - The disconnected APs cannot be selected by the user.
 - When the support bundle process is running, user cannot change the **Application Log**.
- **Duration:** Enter the time period for log selection (in seconds). The minimum value is 10 seconds, and the maximum value is 300 seconds.
- **Logs Selection:** Set **SZ Key Application Logs** or **SZ Snapshot Logs** to **ON**, this allows the application to collect different types of logs. If you use **SZ Key Application Logs**, a message is displayed to indicate that the application log level changes and this affect the application performance.
- **AP Packet Capture:** Set **AP Packet Capture** to **ON**, and complete the following options:
 - **Capture Interface:** Select **2.4 GHz** or **5 GHz** for the wireless interface.

- **Client MAC Address Filter:** Enter the MAC address.
 - **Frame Type Filter:** Set the required options (**Management**, **Control**, and **Data**) to **ON**.
3. Click **OK**.
 4. To download Support Bundle output files, click **File Ready** in the **Key Application Logs** or **AP Support Bundle** columns.

Figure 3. Support Bundle Download Options

Delete										
WLAN	Duration (Seconds)	AP Packet Capture	Start Time	End Time	Key Application Status	Key Application Logs	AP Status	AP Support Bundle	Snapshot Status	Snapshot Logs
TDC-5F-1	300	True	2020/12/15 01:59:10	N/A	Collecting		Collecting		Collecting	
TDC-5F-1	100	True	2020/11/06 20:10:10	2020/11/06 20:11:50	Not Enabled		Send command failed		Terminated	
TDC-5F-1	100	False	2020/11/06 20:30:00	2020/11/06 20:31:40	Completed	File Ready (322MB)	Partial completed	File Ready (50MB)	Completed	File Ready (655MB)
<div> <div>WLAN</div> <div>TDC-5F-1</div> <div>Targeted AP(s)</div> <div>AP1@AA:BB:CC:DD:EE:FF : Completed</div> <div>AP2@AA:BB:CC:DD:EE:F1 : Completed</div> <div>AP3@AA:BB:CC:DD:EE:F2 : Send Command Failed</div> <div>AP Packet Capture</div> <div>False</div> <div>Capture Interface</div> <div>N/A</div> <div>Mac Address Filter</div> <div>N/A</div> </div>										

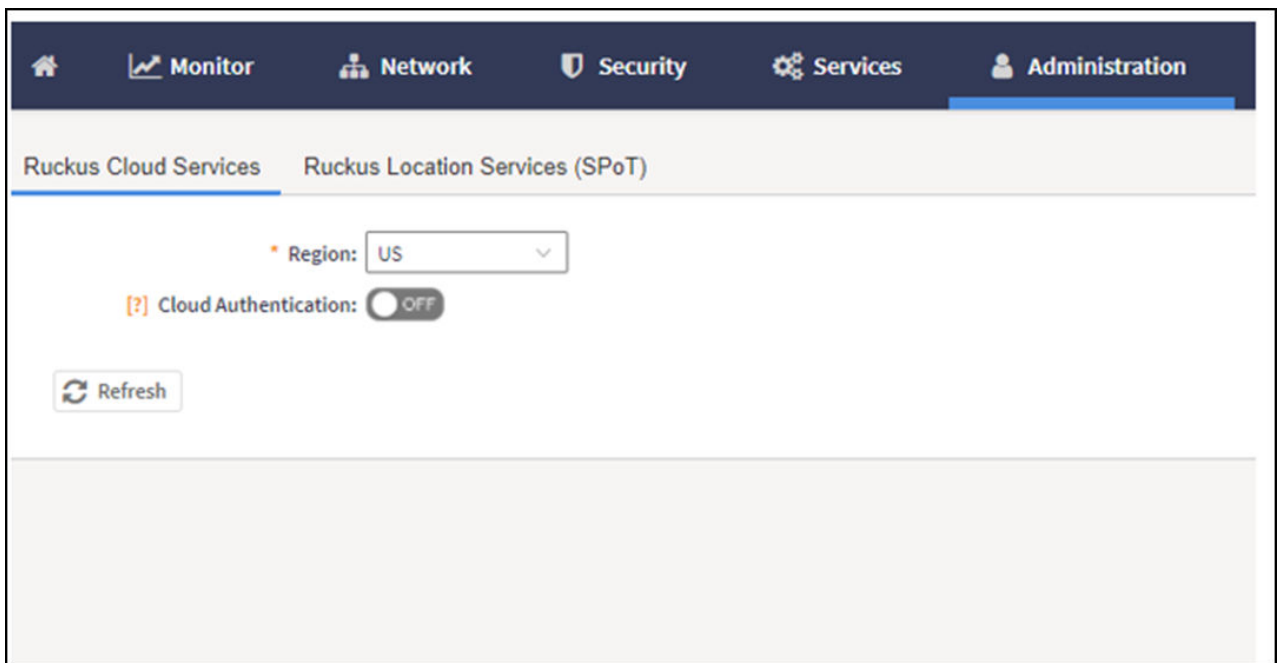
Configuring Cloud Services

Complete the following steps to enable cloud analytics on SmartZone.

1. From the main menu, go to **Administration** > **External Services** > **Ruckus Services**, and select **Ruckus Cloud Services**.

The **Ruckus Cloud Services** page is displayed.

Figure 1. Configuring Cloud Services



2. For **Region**, select a specific cluster region to control. Options include US, EU, and Asia.

Figure 2. The Log in Page

Ruckus Cloud Services Ruckus Location Services (SPoT)

• Region: US

[?] Cloud Authentication: ON

Cloud Account: [Masked]

Connection Status: Connected

Service Details

RUCKUS AI: Enabled

[?] RUCKUS AI: ON

Connection Status: Connected

Connection Details

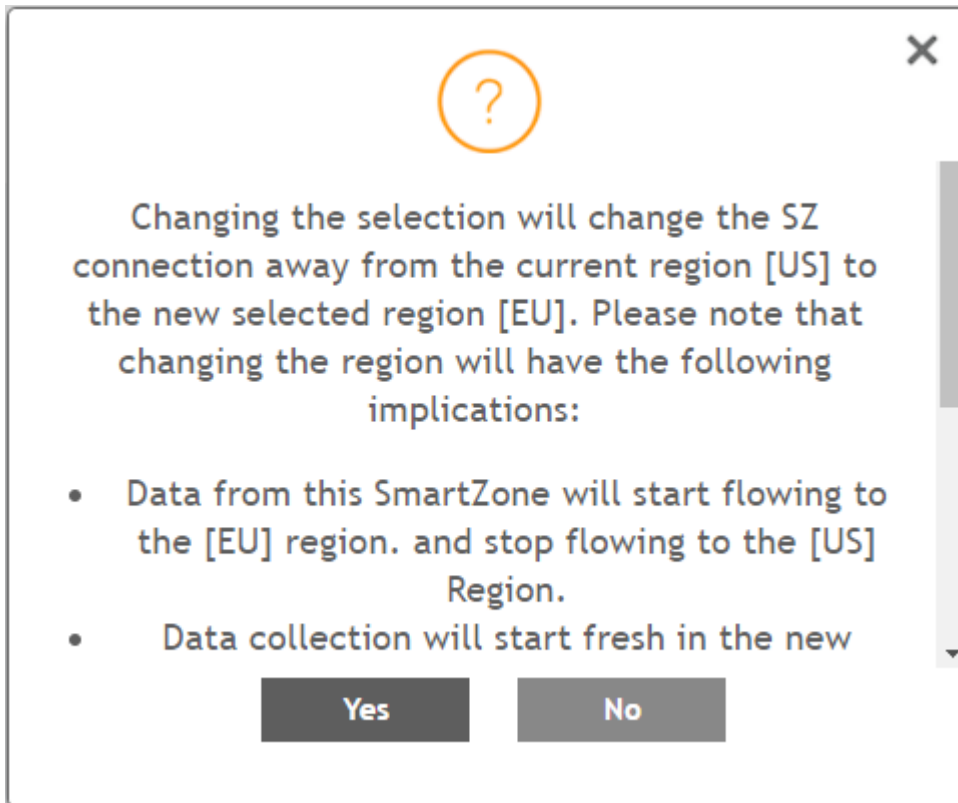
[?] AP Registrar Synchronization: OFF

Refresh

🔗 **Note:** The option to select a region is available only when **Cloud SZ Services** is disabled.

A confirmation dialog box is displayed.

Figure 3. Confirming the Region Change




3. Click **Yes** to confirm.

An error message is displayed if the cluster receives an unexpected response.

4. Select **Cloud SZ Services**.

You are redirected to sign in to your RUCKUS Cloud account for authentication. The RUCKUS cloud account name, connection status, and service details for RUCKUS Cloud front are displayed.

 **Note:** The **Service Details** within **Connection Status** display the list of SmartZone enabled and disabled services.

5. Select **RUCKUS AI**.

The connection status for RUCKUS Cloud AI is displayed.

6. Select **AP Registrar Synchronization**.

Figure 4. Selecting Export All Batch Provisioning APs

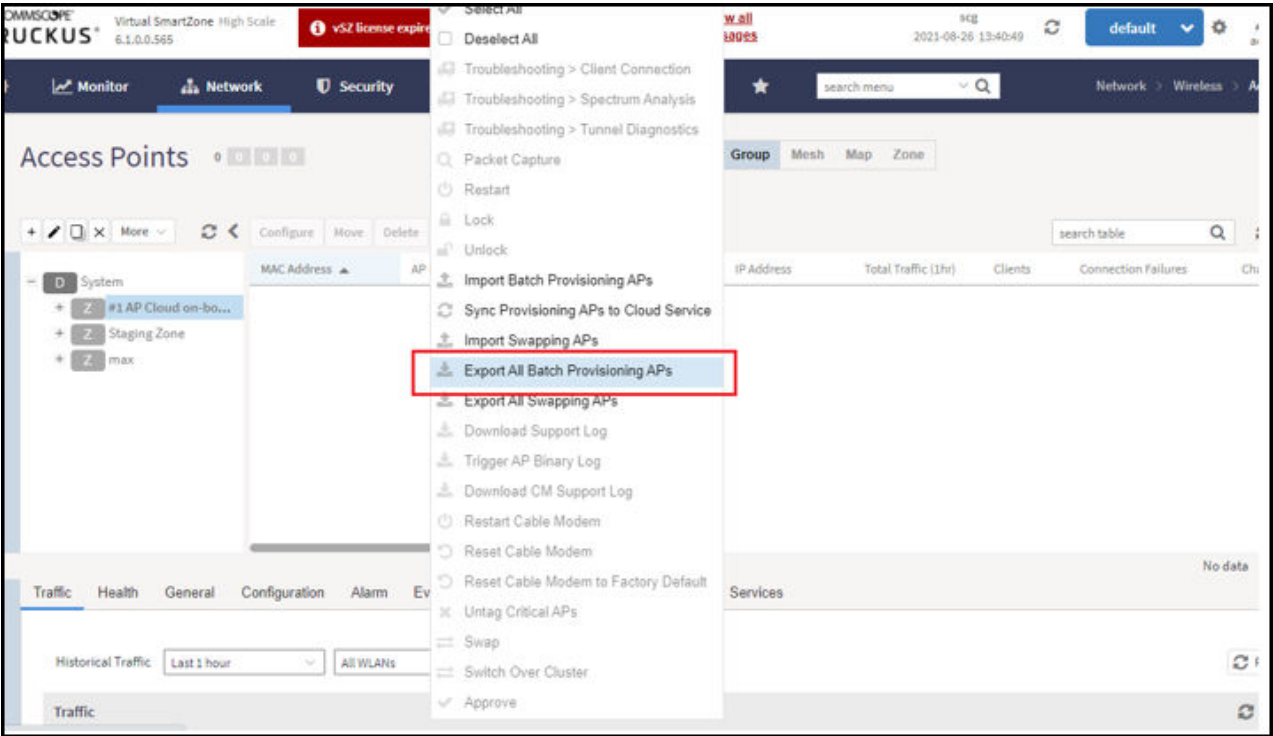


Figure 4. Exporting the CSV File

The screenshot shows a Microsoft Excel spreadsheet with the following data:

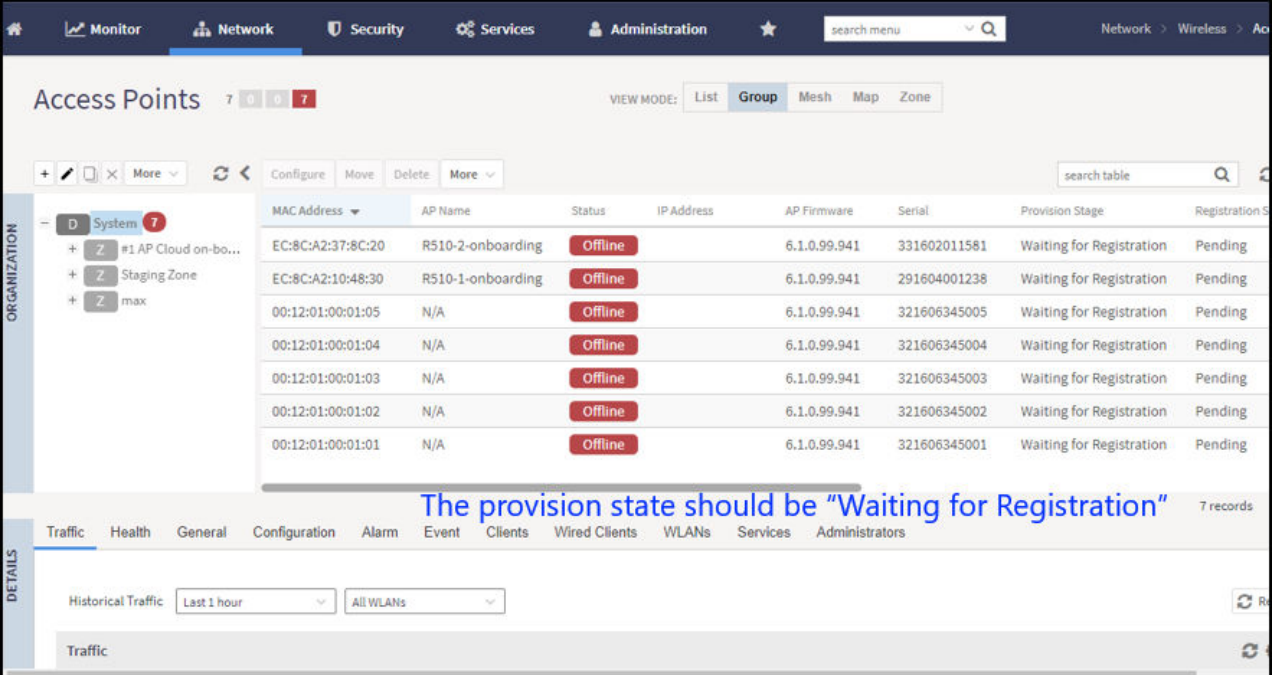
AP Mac Address	Zone Name	Model	AP Name	Description	Serial Number	IPv6 Address	IPv6 Gateway	IPv6 Primary	IPv6 Secondary
EC:8C:A2:10:48:30	#1 AP Cloud on-boarding		R510-1-onboarding		291604001238				
EC:8C:A2:37:8C:20	#1 AP Cloud on-boarding		R510-2-onboarding		331602011581				
00:12:01:00:01:01	#1 AP Cloud on-boarding				321606345001				
00:12:01:00:01:02	#1 AP Cloud on-boarding				321606345002				
00:12:01:00:01:03	#1 AP Cloud on-boarding				321606345003				
00:12:01:00:01:04	#1 AP Cloud on-boarding				321606345004				
00:12:01:00:01:05	#1 AP Cloud on-boarding				321606345005				

AP MAC Address, Zone Name and Serial Number is mandatory

- Go to **Network > Access points**. Select an AP and click **More..** From the list, select **Export All Batch Provisioning APs**. A blank provisioning AP template is exported from SZ. Ensure that the AP MAC address, the zone name, and the serial number are entered in the CSV file.
- Import the provisioning AP list to an AP Zone.

 **Note:** The provision stage of the AP should be "Waiting for Registration".

Figure 6. Importing CSV File

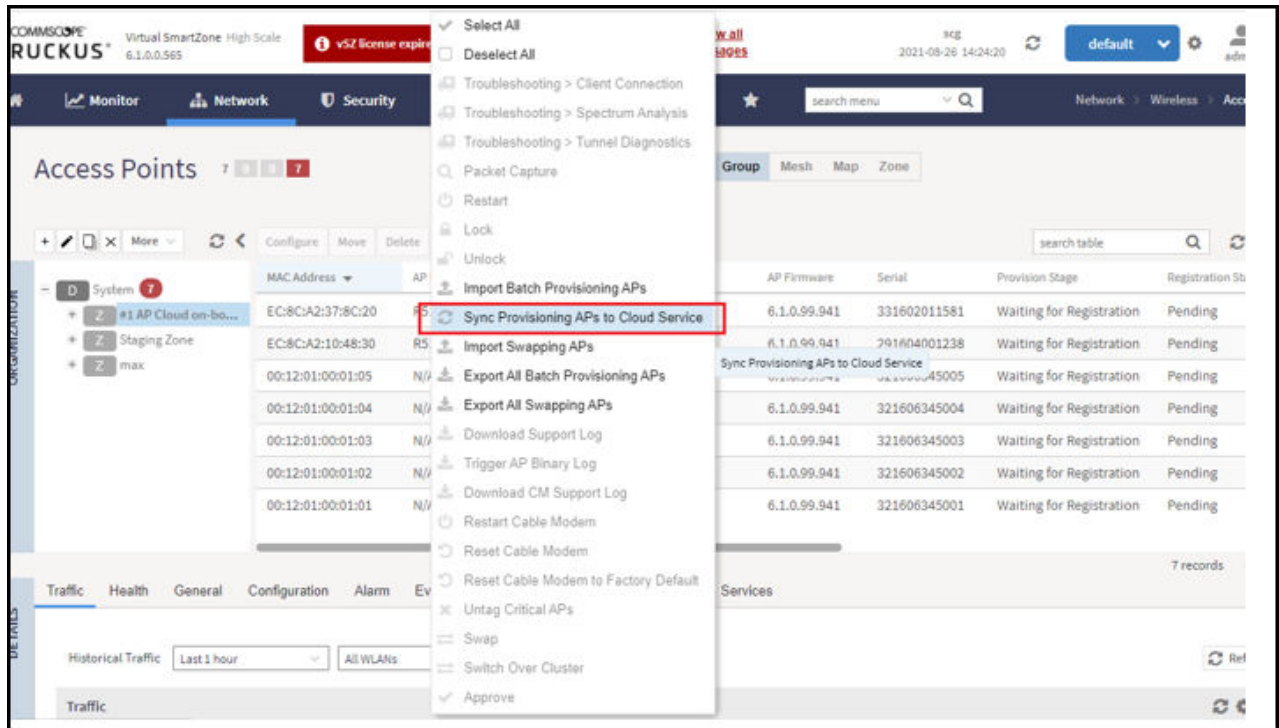


The screenshot shows the 'Access Points' page in the RUCKUS SmartZone (LT-GD) Management Guide. The page displays a table of APs with columns: MAC Address, AP Name, Status, IP Address, AP Firmware, Serial, Provision Stage, and Registration S. The 'Provision Stage' column shows 'Waiting for Registration' for all listed APs. A blue text overlay states: "The provision state should be "Waiting for Registration"". The interface includes a sidebar with 'ORGANIZATION' and 'DETAILS' sections, and a top navigation bar with tabs like Monitor, Network, Security, Services, and Administration.

MAC Address	AP Name	Status	IP Address	AP Firmware	Serial	Provision Stage	Registration S
EC:8C:A2:37:8C:20	R510-2-onboarding	Offline	6.1.0.99.941	331602011581	Waiting for Registration	Pending	
EC:8C:A2:10:48:30	R510-1-onboarding	Offline	6.1.0.99.941	291604001238	Waiting for Registration	Pending	
00:12:01:00:01:05	N/A	Offline	6.1.0.99.941	321606345005	Waiting for Registration	Pending	
00:12:01:00:01:04	N/A	Offline	6.1.0.99.941	321606345004	Waiting for Registration	Pending	
00:12:01:00:01:03	N/A	Offline	6.1.0.99.941	321606345003	Waiting for Registration	Pending	
00:12:01:00:01:02	N/A	Offline	6.1.0.99.941	321606345002	Waiting for Registration	Pending	
00:12:01:00:01:01	N/A	Offline	6.1.0.99.941	321606345001	Waiting for Registration	Pending	

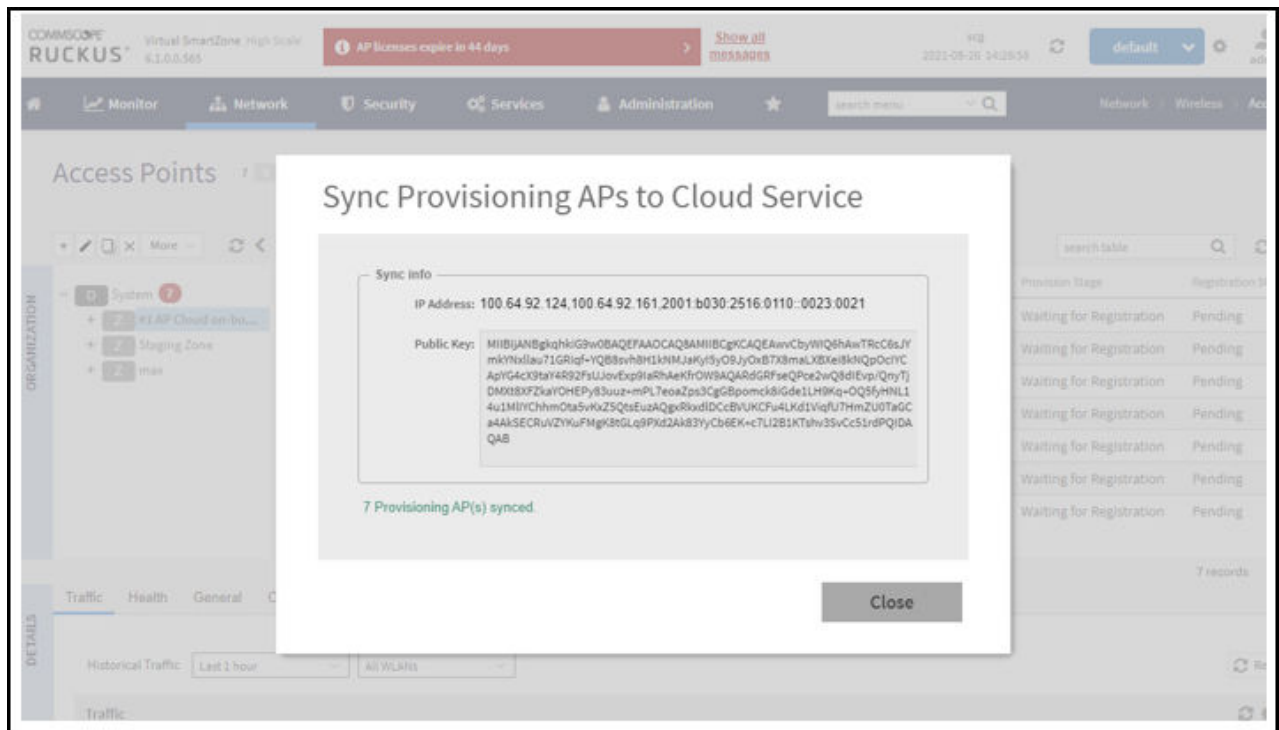
- Click **More**, and select **Sync Provisioning APs to Cloud Service** from the list.

Figure 7. Selecting Sync Provisioning APs to Cloud Service



10. Ensure synchronization is successful.

Figure 8. Ensuring Synchronization Success



Working with Data and Control Plane

Viewing the System Cluster Overview

Control Planes and Data Planes

Interface and Routing

Displaying the Chassis View of Cluster Nodes

Configuring the Control Plane

Monitoring Cluster Settings

Powering Cluster Back

Viewing the System Cluster Overview

The system cluster overview provides summary information of the controller cluster.

- **Note:** An out-of-service node must be fixed within 45 days to avoid license disruption and to avail continuous services. A warning message on the out-of-service status of the node is listed on the header bar.

To view the cluster settings:

- From the main menu, click **Network** > **Cluster**. The **Cluster** page is displayed..

- **Note:** The UDI is not accessible on the ESXi hypervisor as the default network driver of vSZ is VMXNET3 and it has a limitation for VLAN interface of VM. To resolve this issue, change the network driver to E1000.

Parent topic: [Working with Data and Control Plane](#)

Control Planes and Data Planes

Control planes and data planes are used to control traffic.

The control plane manages and exchanges routing table information. The control plane packets are processed by the router to update the routing table information. The data plane forwards the traffic along the path according to the logic of the control plane.

You can view historical and real time traffic of the nodes. To view the traffic:

1. From the Controller page, select the node.
2. Click the Traffic & Health from the lower end of the page.
3. Select the option from the drop-down:
 - **Historical Data**, and enter the time frame for which you want.
 - **Real Time Data**, enter the duration in minutes and click **Start**.

The Cluster Node Traffic and Health tab displays as shown in the diagram below.

Figure 1. Viewing the Cluster Traffic



Parent topic: [Working with Data and Control Plane](#)

Interface and Routing

To configure a cluster node, you must define interface and routing information.

Interface

You can only create one user defined interface, and it must be for a hotspot service and must use the control interface as its physical interface. The control plane and the UDI must be on different subnets. If the control plane and UDI are on the same subnet, and assigned with 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.

- 🔗 **Note:** The user defined interface (UDI) is available in Virtual SmartZone (High-Scale and Essentials) from release 5.1.1.

Static Routing

Static routing is used to manually configure routing entry. Static routes are fixed and do not change if the network is changed or reconfigured. Static routing are usually used to maximize efficiency and to provide backups in the event that dynamic routing information fails to be exchanged.

Parent topic: [Working with Data and Control Plane](#)

Displaying the Chassis View of Cluster Nodes

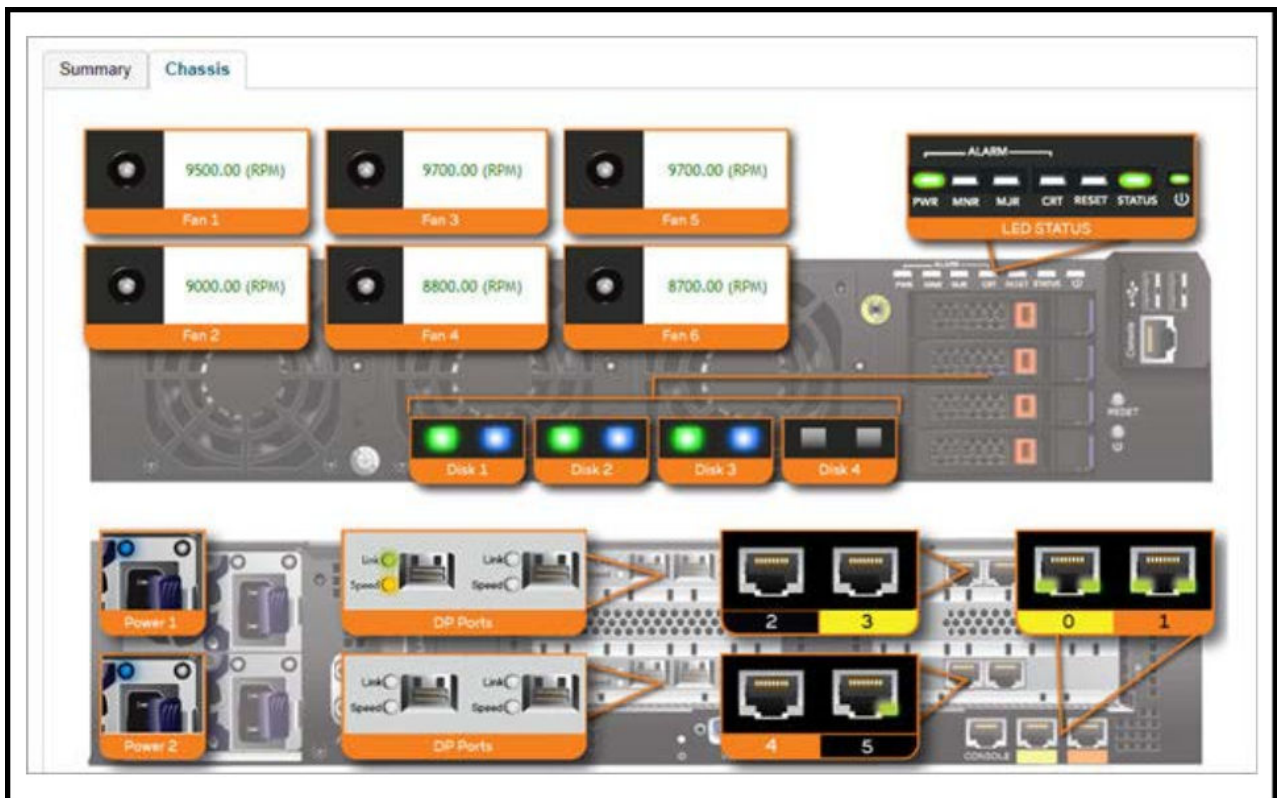
The chassis view provides a graphical representation of the control panel (on the front panel of the controller), including the LEDs.

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:

1. From the Cluster page, select the node.
2. From the lower-left side of the page, click the **Chassis** tab to display the Chassis tab information.

Figure 1. Cluster Node Chassis



- port 1 and 2 are management ports

- ports (3-4 or 3-6) are data ports

Parent topic: [Working with Data and Control Plane](#)

Configuring the Control Plane

Control Plane configuration includes defining the physical interface, user defined interface and static routes.

To configure a control plane:

1. Go to **Network > Data and Control Plane > Cluster**.
2. Select the control plane from the list and click **Configure**. The Edit Control Plane Network Settings form appears.
3. Configure the settings as explained in the table below.
4. Click **OK**.


 **Note:** You must configure the **Control** interface, **IPv4 Cluster** interface, and **Management** interface to be on three different subnets. Failure to do so may result in loss of access to the web interface or failure of system functions and services.

Table 1. Configuring Control Plane

Field	Description	Your Action
Physical Interfaces		
IPv4-Control Interface	Indicates the management and IP control settings.	Select the IP Mode : <ul style="list-style-type: none"> ◦ Static (recommended)—To manually assign an IP address to this interface manually. <ul style="list-style-type: none"> ◦ Enter the IP Address. ◦ Enter Subnet Mask. ◦ Enter the Gateway router address. ◦ Enter Control NAT IP address.

Field	Description	Your Action
		<ul style="list-style-type: none"> ◦ DHCP—To automatically obtain an IP address from a DHCP server on the network. ◦ Enter Control NAT IP.
IPv4-Cluster Interface	Indicates the IPv4 cluster interface settings	<p>Select the IP Mode:</p> <ul style="list-style-type: none"> ◦ Static (recommended)—To manually assign an IP address to this interface manually. ◦ Enter the IP Address. ◦ Enter Subnet Mask. ◦ Enter the Gateway router address. ◦ DHCP—To automatically obtain an IP address from a DHCP server on the network.
IPv4-Management Interface	Indicates the IPv4 management interface settings	<p>Select the IP Mode:</p> <ul style="list-style-type: none"> ◦ Static (recommended)—To manually assign an IP address to this interface manually. ◦ Enter the IP Address. ◦ Enter Subnet Mask. ◦ Enter the Gateway router address. ◦ DHCP—To automatically obtain an IP address from a DHCP server on the network.
IPv6-Control Interface	Indicates the IPv6 control interface settings	Select the IP Mode :

Field	Description	Your Action
		<ul style="list-style-type: none"> ◦ Static (recommended)—To manually assign an IP address to this interface manually. ◦ Enter the IPv6 IP Address (global only) with a prefix length (for example, 1234::5678:0:C12/123) is required. Link-local addresses are unsupported. ◦ Enter the IPv6 Gateway 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—To automatically obtain an IP address from Router Advertisements (RAs) or from a DHCPv6 server on the network.
IPv6-Management Interface	Indicates the IPv6 management interface settings	<p>Select the IP Mode:</p> <ul style="list-style-type: none"> ◦ Static (recommended)—To manually assign an IP address to this interface manually. ◦ Enter the IPv6 IP Address (global only) with a prefix length (for example, 1234::5678:0:C12/123) is required. Link-local addresses are unsupported. ◦ Enter the IPv6 Gateway address (global or link-local) without a prefix length. For example, 1234::5678:0:C12 (global address without

Field	Description	Your Action
		<p>a prefix length) and fe80::5678:0:C12 (link-local address without a prefix length).</p> <ul style="list-style-type: none"> ◦ Auto—To automatically obtain an IP address from Router Advertisements (RAs) or from a DHCPv6 server on the network.
Access & Core Separation	Indicates that the management interface (core side) to be the system default gateway and the control interface (access side) to be used only for access traffic.	Select the Enable check box.
IPv4 Default Gateway & DNS	<p>Indicates the IPv4 gateway that you want to use - Control, Cluster, and Management.</p> <ul style="list-style-type: none"> • Note: When Access & Core Separation is enabled, the Default Gateway field is hidden. • Note: The default gateway is NOT set to Control Interface. To properly route AP/UE traffic back through Control Interface, please make sure to enable Access & Core Separation or add static routes in Control Plane Network Settings on Web GUI. 	<ol style="list-style-type: none"> Default Gateway—Choose the Interface for which you want to assign the default gateway setting. Primary DNS Server—Enter the server details. Secondary DNS Server—Enter the server details.
IPv6 Default Gateway & DNS	<p>Indicates the IPv6 gateway that you want to use - Control, Cluster, and Management.</p> <ul style="list-style-type: none"> • Note: When Access & Core Separation is enabled, the 	<ol style="list-style-type: none"> Default Gateway—Choose the Interface for which you want to assign the default gateway setting.

Field	Description	Your Action
	<ul style="list-style-type: none"> • Default Gateway field is hidden. • Note: The default gateway is NOT set to Control Interface. To properly route AP/UE traffic back through Control Interface, please make sure to enable Access & Core Separation or add static routes in Control Plane Network Settings on Web GUI. 	<p>b. Primary DNS Server—Enter the server details.</p> <p>c. Secondary DNS Server—Enter the server details.</p>
User Defined Interfaces <p>• Note: The control plane and the 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.</p>		
Name	Indicates the name of the interface.	Enter a name.
Physical Interfaces	Indicates the physical interface.	Select Control Interface .
Service	Indicates the service.	Select Hotspot , the hotspot must use the control interface as its physical interface.
IP Address	Indicates the IP address that you want to assign to this interface.	Enter the IP address.
Subnet Mask	Indicates the subnet mask for the IP address.	Enter the subnet mask.
Gateway	Indicates the IP address of the gateway router.	Enter the gateway IP address.
VLAN	Indicates the VLAN ID that you want to assign to this interface.	Enter the VLAN ID.
Add	Adds the interface settings.	Click Add .
Static Routes		

Field	Description	Your Action
Network Address	Indicates the destination IP address of this route.	Enter the IP address.
Subnet Mask	Indicates a subnet mask for the IP address.	Enter the subnet mask.
Gateway	Indicates the IP address of the gateway router.	Enter the IP address of the gateway router.
Interface	Indicates the physical interface to use for this route.	Select the interface.
Metric	Represents the number of routers between the network and the destination.	Enter the number of routers.
Add	Adds the static route settings.	Click Add .

- 🔗 **Note:** You can also delete or restart a control plane. To do so, select the control plane from the list and click **Delete** or **Restart** respectively.

Parent topic: [Working with Data and Control Plane](#)

Rebalancing APs

AP rebalancing helps distribute the AP load across nodes that exist within a cluster.

When a multi-node cluster is upgraded, the node that reboots the last typically does not have any APs associated with it.

When you click **Rebalance APs**, the following process is triggered:

1. The controller calculates the average AP count based on the number of available control planes and data planes.
2. The controller calculates how many APs and which specific APs must be moved to other nodes to distribute the AP load.
3. The controller regenerates the AP configuration settings based on the calculation result.
4. The web interface displays a message to inform the administrator that the controller has completed its calculations for rebalancing APs.
5. Each AP that needs to be moved to a different node retrieves the updated AP configuration from the controller, reads the control planes and data planes to which it must connect, and then connects to them.

When the AP rebalancing process is complete, which typically takes 15 minutes, one of the following events is generated:

- Event 770: Generate ApConfig for plane load rebalance succeeded.
- Event 771: Generate ApConfig for plane load rebalance failed.

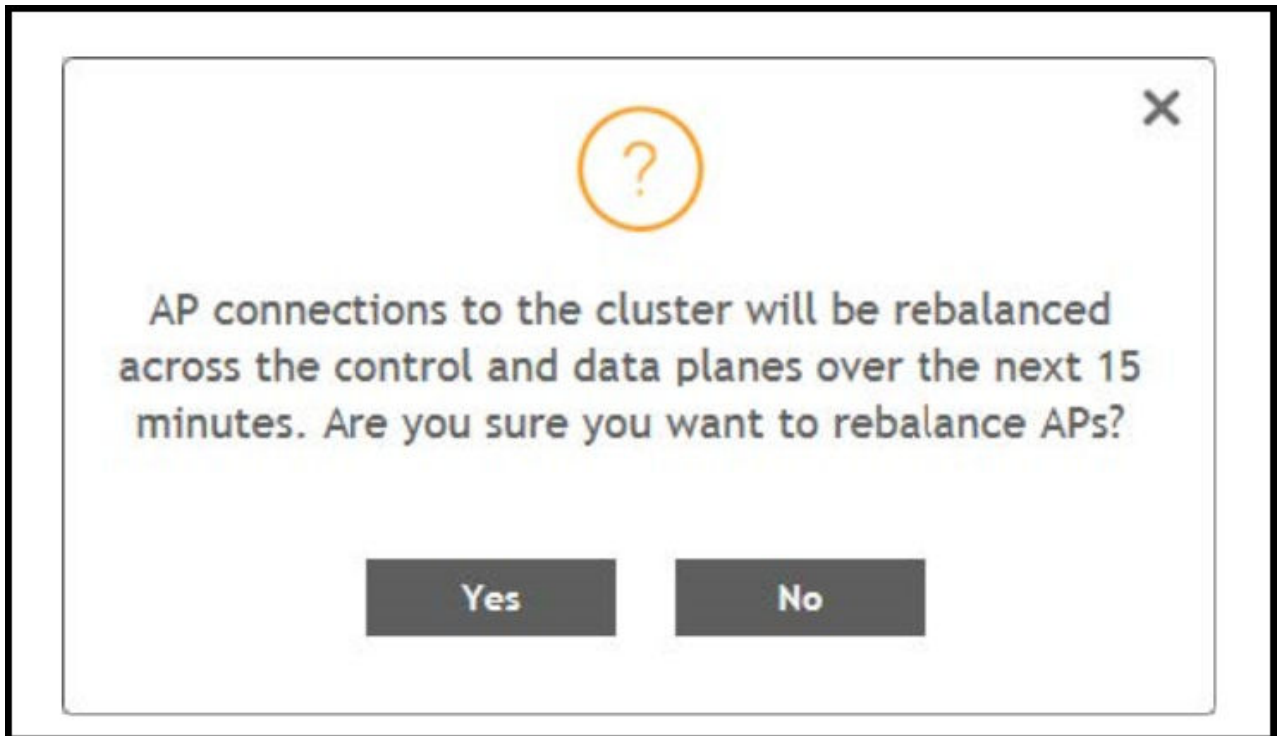
 **Note:**

- APs may recreate the Ruckus-GRE tunnel to a different data plane.
- Devices associated with an AP that uses the Ruckus-GRE tunnel may temporarily lose network connection for a short period of time (typically, around five minutes) during the AP rebalancing process.
- When node affinity is enabled, AP rebalancing is disallowed on those nodes.
- When data plane grouping is enabled, AP rebalancing is disallowed on those data planes.
- AP rebalancing only supports APs running release 3.2 firmware. APs running on legacy firmware will not be rebalanced.


To rebalance APs across the nodes:

1. From the main menu, go to **Network > Data and Control Plane > Cluster**.

Figure 1. AP Rebalancing Form



- From the **Control Planes**, select a cluster, and click **More** tab. Select **Rebalance APs** from the list, the controller rebalances AP connections across the nodes over the next 15 minutes.

 **Note:** If you want to repeat this procedure, you must wait 30 minutes before the controller will allow you to rebalance APs again.

Parent topic: [Configuring the Control Plane](#)

Monitoring Cluster Settings

You can select the following tabs to view the status of the cluster settings:

- **Summary**—Details such as name, model, serial number, bandwidth, data driver, number of core, data interface details, management interface details, IP details, memory usage, and disk usage.
- **Network Settings**—Details such as control interface, cluster interface, management interface, DNS server, and routes. Appears only for Control Plane.
- **Configuration**—Details such as physical interfaces, user-defined interfaces, and static routes interfaces.
- **Traffic & Health**—Details on historical or real-time data such as CPU usage, memory usage, disk usage, disk IO utilization, interface, port usage for control planes and CPU-only usage, memory usage, and port usage for data planes. For control planes, the CPU usage data additionally provides information on the steal time, which is the percentage of time that a virtual CPU waits for a real CPU while the hypervisor serves another

virtual processor. CPU and IO performance are measured at setup stage. The setup flow is blocked if the performance is lower than the threshold.

- **DHCP/NAT**—Details on DHP relay and NAT statistics.
- **System**—Details of process name and its health status. Appears only for Data Plane.
- **Alarm**—Details of alarms generated. You can clear alarms or acknowledge alarms that are generated.
- **Event**—Details of events that are generated.
- **DP Zone Affinity**—Details of the data plane, for example, name, profile version, version match information, DP count, and description. Appears only for Data Plane.

Parent topic: [Working with Data and Control Plane](#)

Clearing or Acknowledging Alarms

You can clear or acknowledge an alarm.

To clear an alarm:

1. From the **Monitor > Events and Alarms > Alarms**, select the alarm form the list.
2. Click **Clear Alarm**, the Clear Alarm form appears.
3. Enter a comment and click **Apply**.

To acknowledge an alarm:

1. From the **Alarm** tab, select the alarm form the list.
2. Click **Acknowledge Alarm**, the Are you sure you want to acknowledge the selected form appears.
3. Click **Yes**.

Parent topic: [Monitoring Cluster Settings](#)

Filtering Events

You can view a list of events by severity or date and time.


To apply filters:

1. Go to **Monitor > Events and Alarms > Events**, select the  icon.

The Apply Filters form appears.

2. Complete the following criteria.

- **Severity:** Select a severity level to filter the list of events.
- **Category:** Select a category from the list.
- **Date and Time:** Select the events by their **Start** and **End** dates.

 **Note:** You can filter events that generated in the last seven days.

3. Click **OK**, all the events that meet the filter criteria are displayed on the Event page.

Parent topic: [Monitoring Cluster Settings](#)

Powering Cluster Back

SmartZone cluster nodes may need to be shut down for physical migration/maintenance purpose.

To avoid SmartZone enter crash mode, the cluster needs to form back in time (within Two-and-Half hours). To power up the nodes, perform the following:

1. Power up all nodes at the same time period.
2. All nodes are connected by network.
3. During the setup, it is strongly recommended to configure static IP address to SmartZone interface, if the node's interface IP address settings is configured to DHCP. Make sure the DHCP server assigns a fixed IP address to the interfaces.

Parent topic: [Working with Data and Control Plane](#)

Events and Alarms

Events

Alarms

Events

Event

Switch Event Management

Event Management

Event Threshold

Switch Custom Events

Parent topic: [Events and Alarms](#)

Event

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.

Parent topic: [Events](#)

Viewing Events

In the main menu, click **Monitor** and hover the mouse on **Events** from the **Events & Alarms** menu. From the **Events** drop-down list select **Events**

This displays **Events** page. The **Events** page displays the below information.

You can also click the  icon to apply filters, to display events based on time and severity.

Events can be searched with "OR" or "AND" options as displayed in the below images.

Figure 1. Search Events with OR Option

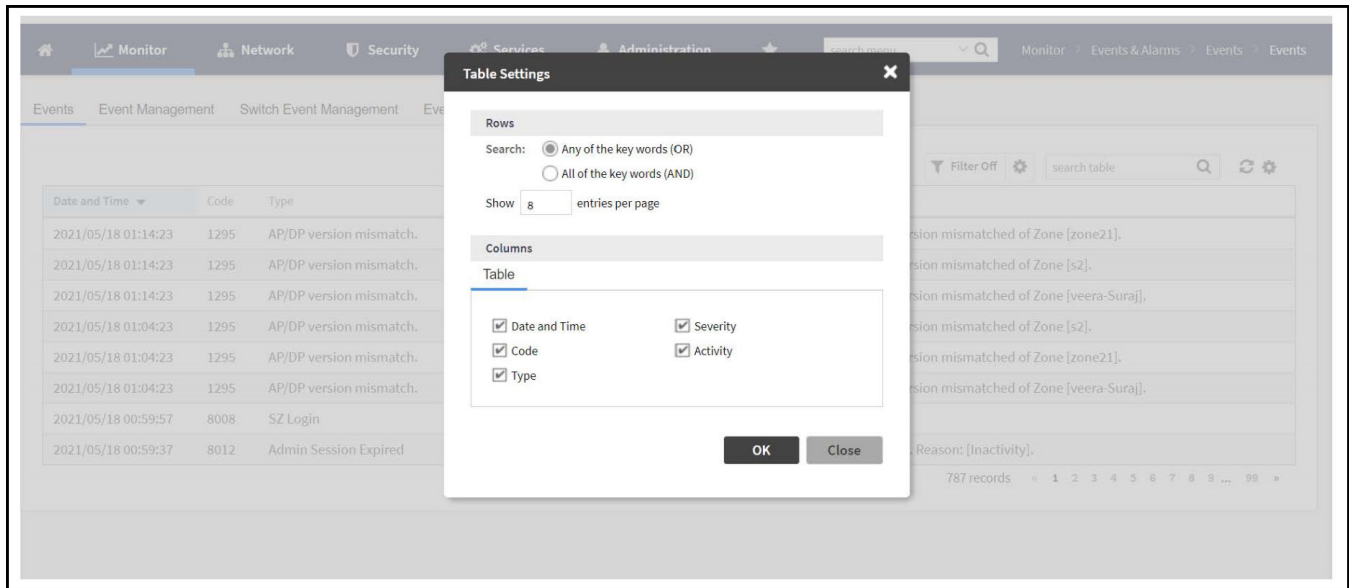
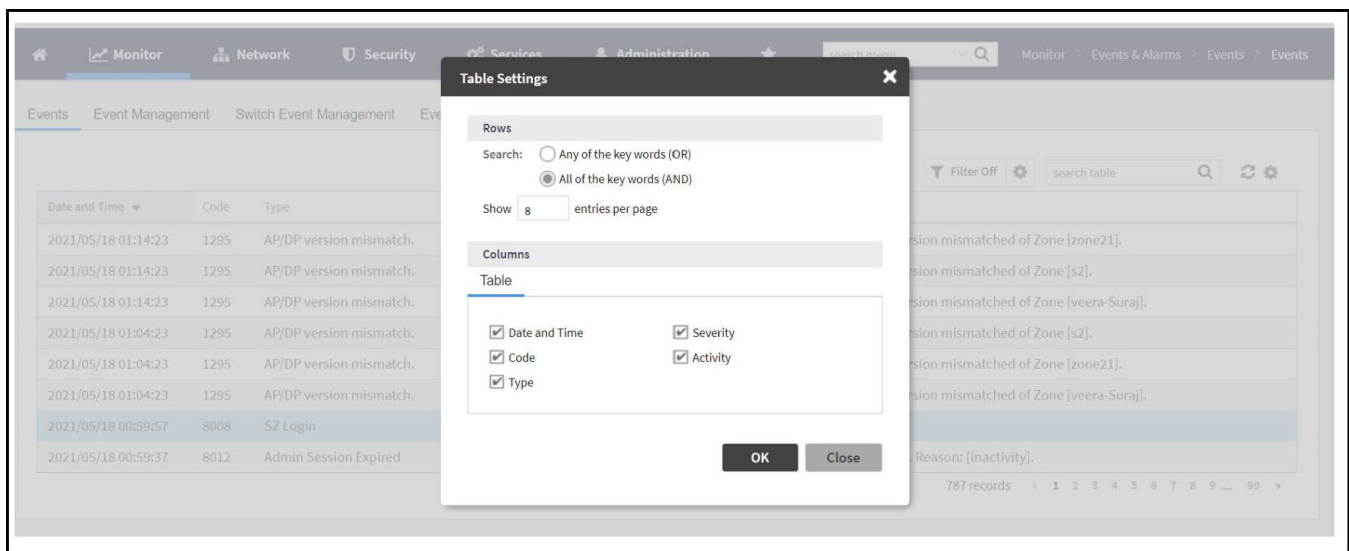


Figure 2. Search Events with AND Option



- **Date and Time:** Displays the date and time when the event occurred
- **Code:** Displays the event code (see the Alarm and Event Reference Guide for your controller platform more information).
- **Type:** Displays the type of event that occurred (for example, AP configuration updated).
- **Severity:** Displays the severity level assigned to the events such as Critical, Debug, Informational, Warning, Major etc.
- **Activity:** Displays additional details about the event, including (if available) the specific access point, control plane, or data plane that triggered the event.

Parent topic: [Event](#)

Switch Event Management

[Sending SNMP Traps and Email Notifications for Switch Events](#)

Parent topic: [Events](#)

Sending SNMP Traps and Email Notifications for Switch Events

You can configure the controller to send SNMP traps and email notifications by System Domain, Partner Domain, Domain (under System Domain), and Switch Group (level 1 group) for switch events.

You must verify that global SNMP traps are enabled to ensure that the controller can send SNMP traps for alarms:

- System domain:
 - For viewing system domain event notification settings and email notification setting, SZ permission and Read or higher (Modify or FULL_ACCESS) access level is required.
 - For editing system domain event notification settings and email notification setting, SZ permission and Modify or FULL_ACCESS access level is required.
- Partner domain and domain (under system domain):
 - For editing event notification settings and email notification setting, Admin permission and Modify or FULL_ACCESS access level permission is required.
 - For editing switch group event notification settings and email notification setting, ICX Switch permission and Modify or FULL_ACCESS access level permission is required.
 - To view switch group event notification settings and email notification setting, ICX Switch permission and Read access level permission is required.
 - The events grid shows only Switch events that fall under event category "Switch" or "Switch Custom Event".
 - For Highscale deployments, the staging group is not configureable.
 - For Enterprise deployments, only the level-one switch group is configurable.
 - The cache data for event notification is kept for five minutes after which the cache will be cleaned. If the notification is changed within five minutes, the user needs to wait for five minutes for setting the update.

To configure switch event management:


In the main menu, click **Monitor** and hover mouse on **Events** from the **Events & Alarms** menu. In the **Events** drop-down list select **Switch Event Management**.

This displays **Switch Event Management** page. The **Switch Event Management** page displays the below information.

- Email Notification: 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. Then, click **OK**.
- Events: View the table and select the events for which you want to send traps or email notifications (or both). Select the **Enable** or **Disable** options from the drop-down menu, and configure the following:
System Domain: Displays global setting for Switch event.
- Enable SNMP Notification: Select to enable SNMP trap notifications for all selected events.
- Enable Email: Select to enable email notifications for all selected events.
- Enable DB Persistence: Select 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.

Partner Domain: Displays notification setting for the partner domain.

- Enable Override: Select the option to enable override settings as follows:
 - Partner domain or domain under system domain setting overrides the system domain setting.
 - Switch group setting overrides the partner domain, the domain under system domain, and the system domain setting.
- Enable Email: Select to enable email notifications for all the selected events.

 **Note:** To select or clear all events, click **More** and select **Select All** or **Deselect All** respectively.

There are twenty seven events. Following information related to the event are displayed:

- Code: displays the event code.
- Severity: displays the severity of the event such as Information, Minor and so on.
- Category: displays the category under which the event falls under, such as AP communication.
- Type: displays the event type such as AP managed, AP rejected and so on.
- Override (Partner domain, domain under system domain and level-one switch group): display the override system domain settings.

- SNMP Notification (Specific to system domain): displays SNMP trap notifications for all selected events.
- Email (System domain, partner domain, domain under system domain and level-one switch group): displays email notifications for all selected events.
- DB persistence (Specific to system domain): displays DB persistence for all selected events.
- OID (Specific to system domain): Displays OID for events.
- Description: displays a short note on the events.

Parent topic: [Switch Event Management](#)

Event Management

[Sending SNMP Traps and Email Notifications for Events](#)

Parent topic: [Events](#)

Sending SNMP Traps and Email Notifications for Events

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.

Verify that global SNMP traps are enabled to ensure that the controller can send SNMP traps for alarms.

You can also manage notifications of the event for each zone by clicking the zones displayed in the tree structure. Event configuration for each zone is independent including:

- Enabling or disabling E-mail notification settings
- Recipient E-mail address
- Enabling or disabling DB persistence settings
- Enabling or disabling SNMP trap settings

You can also manually trigger SNMP traps without generating events using CLI. You can use the **#trigger-trap <event code>** command to trigger traps for respective events with their default attributes.

You can acquire the status of a specific client MAC address by using the query RUCKUS-CTRL-MIB. For more information, see the *SmartZone SNMP MIB Reference Guide*.

In the main menu, click **Monitor** and hover mouse on **Events** from the **Events & Alarms** menu. In the **Events** drop-down list select **Event Management**.

This displays **Event Management** page. The **Events** page displays the below information.

- **Email Notification:** 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. Then, click **OK**.
- **Events:** View the table and select the events for which you want to send traps or email notifications (or both). Select the **Enable** or **Disable** options from the drop-down menu, and configure the following:
 - **Enable SNMP Notification:** 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.

Following information related to the event are displayed:

- **Code:** displays the event code.
- **Severity:** displays the severity of the event such as Information, Minor and so on.
- **Category:** displays the category under which the event falls under, such as AP communication.
- **Type:** displays the event type such as AP managed, Ap rejected and so on.
- **Zone Override:** display the override status of the zone.

Parent topic: [Event Management](#)

Event Threshold

Configuring Event Threshold

Parent topic: [Events](#)

Configuring Event Threshold

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.

1. In the main menu, click **Monitor** and hover mouse on **Events** from the **Events & Alarms** menu. In the **Events** drop-down list select **Event Threshold**.
This page displays the list of events with configurable thresholds including the event code, severity level, default value and accepted range, and unit of measurement for each event.
2. Identify the event threshold that you want to configure.

3. Click the event name under the **Name** column.
The threshold value for the event becomes editable. Next to the threshold value, the acceptable range is displayed.
4. Edit the threshold value.
For **Client Count**, you can also edit the **Trigger Criterion** value between the range 1000-999999. When the client count exceeds 1000 users and when the client count drop percentage is more than 50% within an hour, the **Threshold Value** range of 50%-95% is breached. This generates event 956 and alarm 956 which are displayed in the **Events** and **Alarms** dashboard.
5. Click **OK**.

Parent topic: [Event Threshold](#)

Switch Custom Events

Creating Custom Events for ICX Switches


Parent topic: [Events](#)

Creating Custom Events for ICX Switches

You can create custom events by specifying that a particular switch status, for example a particular CPU utilization, memory utilization, or text pattern, generates an alarm or an event. Therefore, there are 3 types of custom events - CPU, Memory and TextPattern.

Because the polling interval between the switch and the controller is 5 minutes, the switch status cannot be obtained in real time. However, you can monitor memory and CPU utilization by creating an event or alarm that is triggered when a particular threshold is reached. You can also create a custom event to monitor for switch events based on text patterns.

To create a customer event, perform the following steps.

 **Note:** **DB Persistence** must be enabled to generate custom events.

1. In the main menu, click **Monitor** and hover mouse on **Events** from the **Events & Alarms** menu. In the **Events** drop-down list select **Switch Custom Events**.
This displays **Switch Custom Events** page.

Figure 1. Types of custom events available

Event Name	Event Type	Event Severity	Threshold	Event Description	Text Pattern	Time Window
Warning CPU Usage	CPU	Warning	20	Switch CPU usage is over Warning t...	N/A	N/A
Major CPU Usage	CPU	Major	30	Switch CPU usage is over Major thr...	N/A	N/A
Critical CPU Usage	CPU	Critical	50	Switch CPU usage is over Critical th...	N/A	N/A
Warning Memory Usage	Memory	Warning	88	Switch Memory usage is over Warni...	N/A	N/A
Major Memory Usage	Memory	Major	92	Switch Memory usage is over Major ...	N/A	N/A
Critical Memory Usage	Memory	Critical	95	Switch Memory usage is over Critic...	N/A	N/A

2. Click **Create**.

The **Create Switch Custom Events** page is displayed as shown in the following example.

Note: You can only create new TextPattern custom events. Custom events of CPU or Memory type can only be edited or configured, and cannot be created.

Figure 2. Creating custom events for switches - TextPattern type

Create Switch Custom Event

Event Name:

Event Description:

Event Type: TextPattern

Event Contains The Text:

Threshold: Times

Time Window:

Event Severity:

OK Cancel

Configure the following:

- Event Name: Enter the name of the event. For example, you can provide a name to identify the text pattern to be displayed in the event description.
- Event Description: Enter a detailed description of the event.
- Event Type: Displays the type of event. Here, **Text Pattern**.
- Event Contains The Text: Enter the text used in the event to be monitored.
- Threshold: Enter the number of times the user-defined status is achieved.
- Time Window: Select the time frame within which the threshold is achieved. You can select from a few hours to two days.
- Event Severity: Select the severity level of the custom event. Options include **Warning**, **MAJOR**, **Critical**.

Figure 3. Editing custom events for switches - CPU/Memory type

The screenshot shows a dialog box titled "Edit Switch Custom Event". It contains the following fields and values:

- Event Name:** Warning CPU Usage
- Event Description:** Switch CPU usage is over Warning threshold, 20%
- Event Type:** CPU
- Threshold:** 20 %
- Event Severity:** Warning

At the bottom right of the dialog are two buttons: "OK" and "Cancel".

Configure the following:

- Event Name: Displays the name of the event.
- Event Description: Displays a detailed description of the event.
- Event Type: Displays the type of event. Here, **CPU**.
- Threshold: Enter the percentage of times the user-defined status is achieved.

- **Event Severity:** Displays the severity level of the custom event. Options include **Warning**, **Major**, and **Critical**.

3. Click **OK**.

Parent topic: [Switch Custom Events](#)

Alarms

Configuring Alarms

Parent topic: [Events and Alarms](#)


Configuring Alarms

Alarms are a type of event that typically warrants your attention. Alarms are generated by managed access points and the controller system (control plane and data plane).

In the main menu, click **Monitor** and hover mouse on Events from the **Events & Alarms** menu. Click **Alarms**. This displays the **Alarms** page with the following information

- **Date and Time:** Displays the date and time when the alarm was triggered.
- **Code:** Displays the alarm code (see the Alarm and Reference Guide for your controller platform for more information).
- **Alarm Type:** Displays the type of alarm event that occurred (for example, AP reset to factory settings).
- **Severity:** Displays the severity level assigned to the events such as Critical, Major, Minor and Warning.
- **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.
- **Acknowledged On:** Displays the date and time when the administrator acknowledge the alarm.
- **Cleared By:** Displays information about who cleared the alarm.
- **Cleared On:** Displays the date and time when the alarm was cleared.
- **Comments:** Displays administrator notes recorded during alarm management.



Note: Click  to export the alarms details to a CSV file. Check the default download folder of your web browser and look for a file named [alarms.csv](#) and view it using a spreadsheet application (for example, Microsoft Excel®).

Parent topic: [Alarms](#)

Clearing Alarms

Clearing an alarm removes the alarm from the list but keeps it on the controller's database.

To clear an alarm:

1. Select the alarm from the list and click **Clear Alarm**. The **Clear Alarm** page appears.
2. Type your comments and select **Apply**.

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.

To acknowledge an alarm:

1. Select the alarm from the list and click **Acknowledge Alarm**.

This message appears:

Are you sure you want to acknowledge the selected alarms?

2. Select **Yes**.

Applying Filters

You can view a list of alarms by date, time, severity and status.


1. Click the  icon.

The **Apply Filters** page appears. Configure the following:

- a. **Severity:** Select the severity level by which you want to filter the list of alarms.
- b. **Status:** Select the status by which you want to filter the list of alarms.
- c. **Date and Time:** Select the alarms by their start and end dates.

2. Click **OK**.

All the alarms that meet the filter criteria are displayed on the **Alarms** page and the display changes to **Filter On**.

You can export the alarms into a CSV file by clicking the  icon.

File Transfer Protocol

Configuring File Transfer Protocol Server Settings


Configuring File Transfer Protocol Server Settings

The controller enables you to automatically back up statistics files, reports, and system configuration backups to an external File Transfer Protocol (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 **Administrator > External Services > FTP**.
2. Click **Create**, the Create FTP Server form appears.
3. Enter an **FTP Name** that you want to assign to the FTP server that you are adding.
4. Select the required **Protocol**; **FTP** or **SFTP** (Secure FTP) protocol.
5. Enter the **FTP Host**, IP address of the FTP server.
6. Enter the **FTP Port**, number. The default FTP port number is 21.
7. Enter a **User Name** for the FTP account that you want to use.
8. Enter a **Password** that is associated with the FTP user name.
9. For **Remote Directory**, enter the remote FTP server path to which data will be exported from the controller. The path must start with a forward slash (/)
10. To verify that the FTP server settings and logon information are correct, click **Test**. If the server and logon settings are correct, a confirmation message stating, "**FTP server connection established successfully**" appears.
11. Click **OK**.

 **Note:** You can edit or delete an existing FTP setting. To do so, select the FTP setting from the list and click **Configure** or **Delete** respectively.

Parent topic: [File Transfer Protocol](#)

Replacing Hardware Components

This section describes replacement of hardware components (including hard disk drives, power supply units, and system fans) on the controller.

Installing or Replacing Hard Disk Drives

You can install up to six hot-swappable SAS or SATA hard disk drives on the controller. The drives go into carriers that connect to the SAS/SATA backplane board once the carriers with drives attached are inserted back into the drive bays. The controller ships with six drive carriers.

⚠ CAUTION: If you install fewer than six hard disk drives, the unused drive bays must contain the empty carriers that ship with the server to maintain proper cooling.

Parent topic: [Replacing Hardware Components](#)

Ordering a Replacement Hard Disk

To order a replacement hard disk for the controller, contact your RUCKUS sales representative and place an order for FRU part number 902-0188-0000 (Hard Drive, 600GB, 10K RPM, 64MB Cache 2.5 SAS 6Gb/s, Internal).

⚠ CAUTION: Use only FRU part number 902-0188-0000 as replacement hard disk for the controller. Using other unsupported hard disks will render the controller hardware warranty void.

Parent topic: [Installing or Replacing Hard Disk Drives](#)

Removing the Front Bezel

You must remove the front bezel to add or replace a hard drive in one of the drive bays. It is not necessary to remove the front chassis cover or to power down the system. The hard drives are hot-swappable.

Follow these steps to remove the front bezel of the controller.

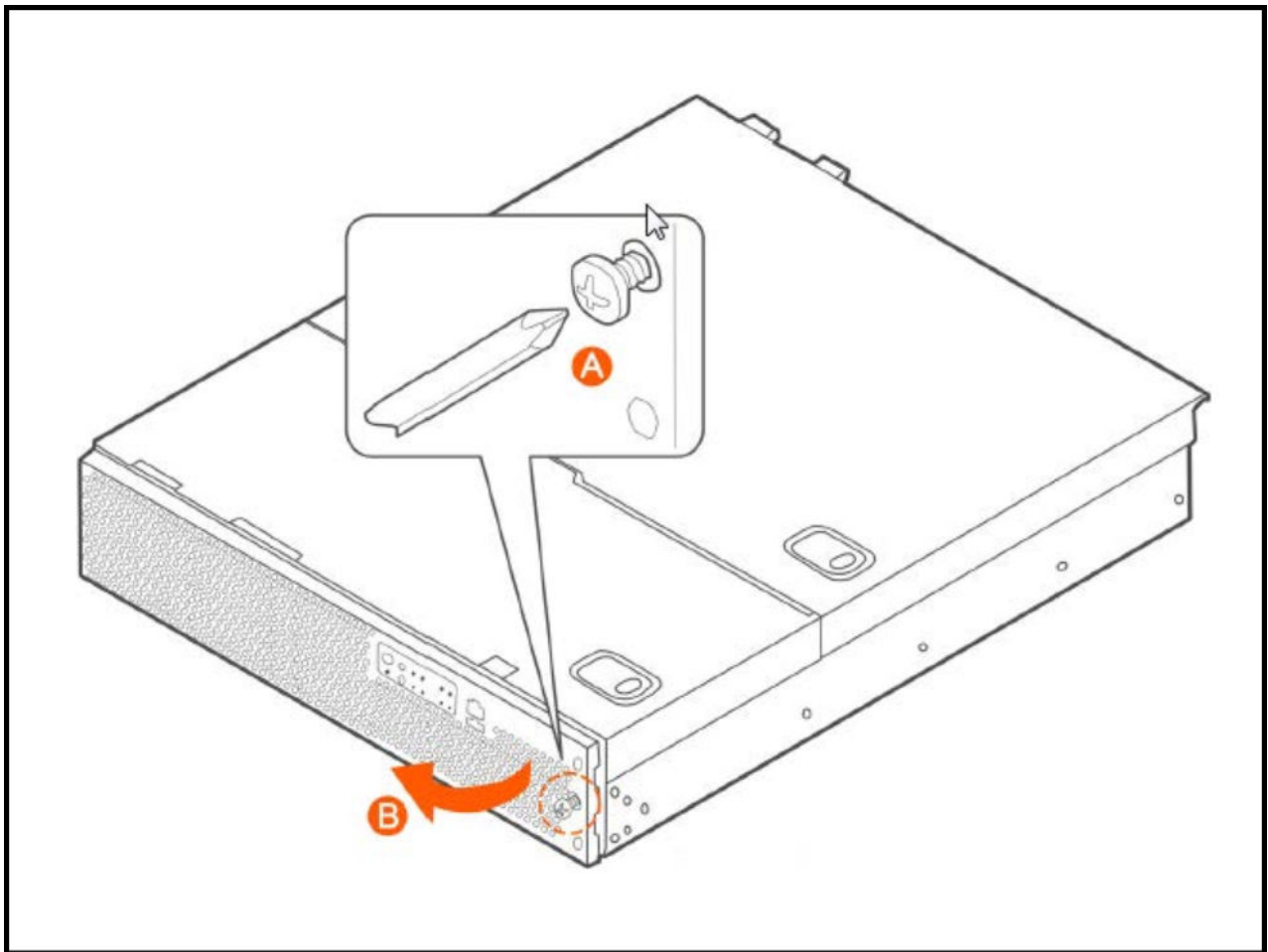
You need to remove the front bezel for tasks such as:

- Installing or removing hard disk drives or an SD flash card
- Observing the individual hard disk drive activity/fault indicators
- Replacing the control panel LED/switch board

The server does not have to be powered down just to remove the front bezel.

1. Loosen the captive bezel retention screw on the right side of the bezel (see A in [Figure 6](#)).
2. Rotate the bezel to the left to free it from the pins on the front panel (see B in [Figure 6](#)), and then remove it.

Figure 1. Removing the front bezel



Parent topic: [Installing or Replacing Hard Disk Drives](#)

Removing an HDD Carrier from the Chassis

Follow these steps to remove a hard disk drive carrier from the chassis.

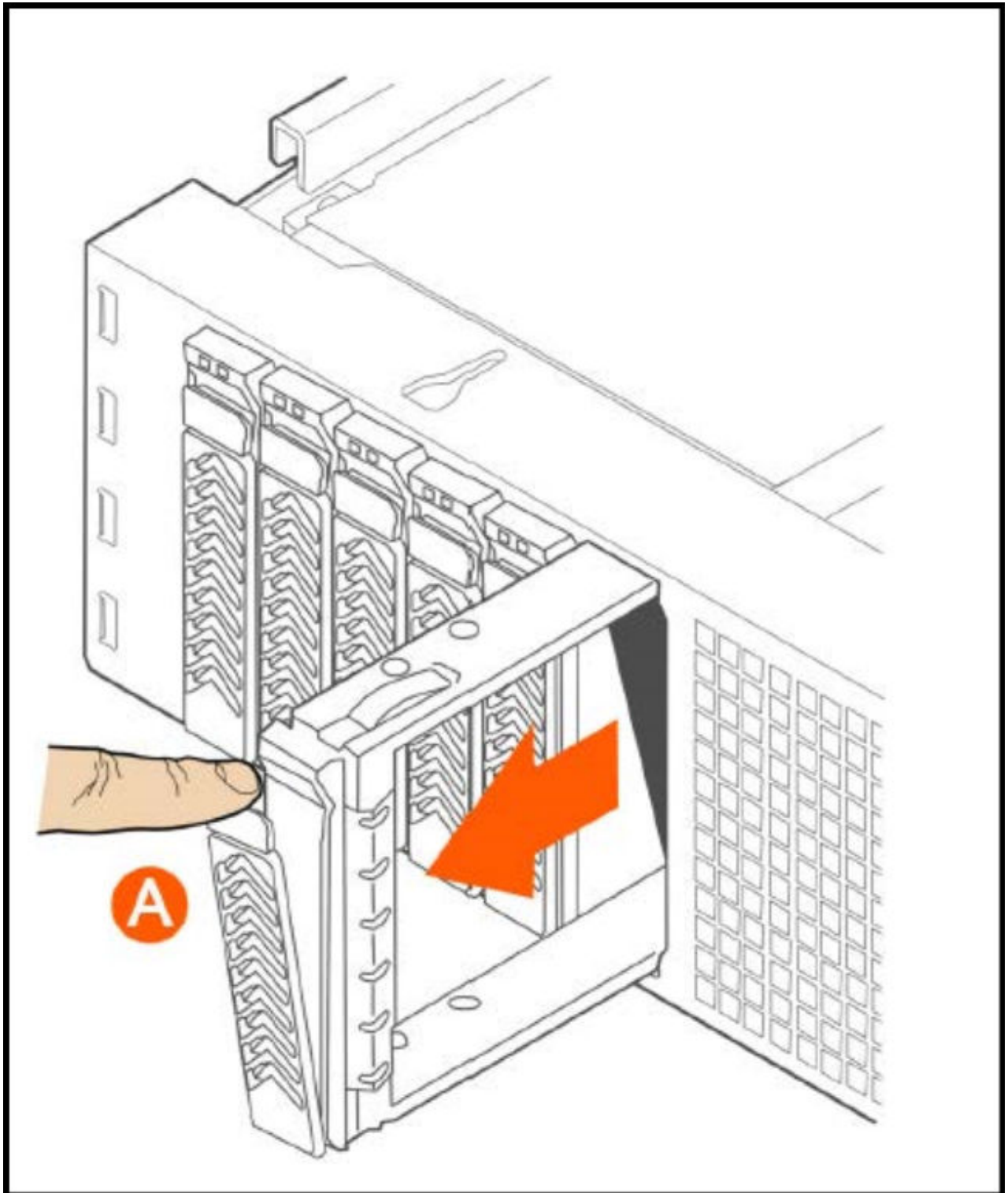
1. Remove the front bezel (see [Removing the Front Bezel](#)).
2. Select the drive bay where you want to install or replace the drive.
Drive bay 0 must be used first, then drive bay 1 and so on. The drive bay numbers are printed on the front panel below the drive bays.

3. Remove the drive carrier by pressing the green button to open the lever.

(See A in [Figure 1](#)).

4. Pull the drive carrier out of the chassis.

Figure 1. Removing the drive carrier



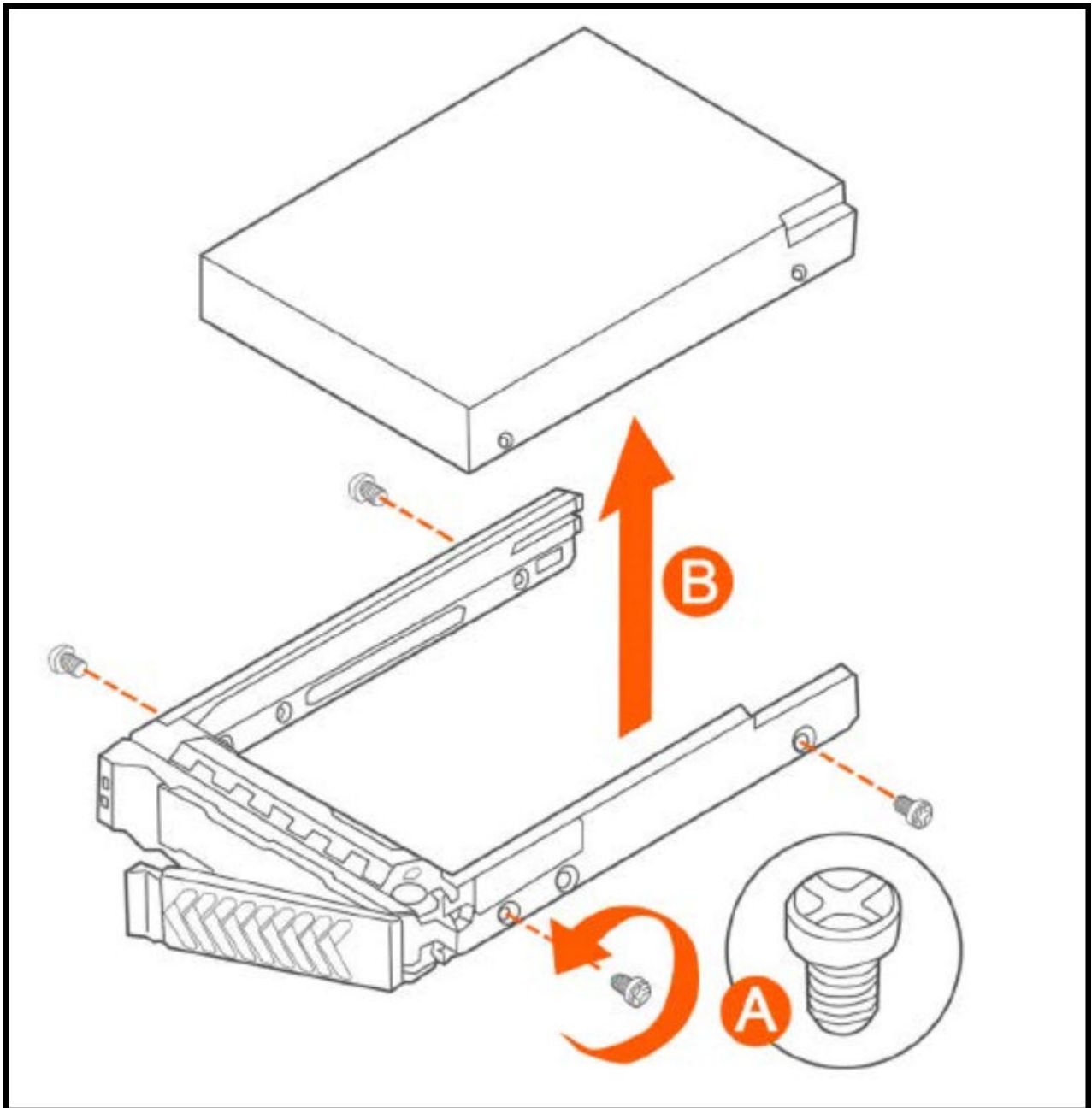
Parent topic: [Installing or Replacing Hard Disk Drives](#)

Installing a Hard Drive in a Carrier

Follow these steps to install a hard drive in a drive carrier.

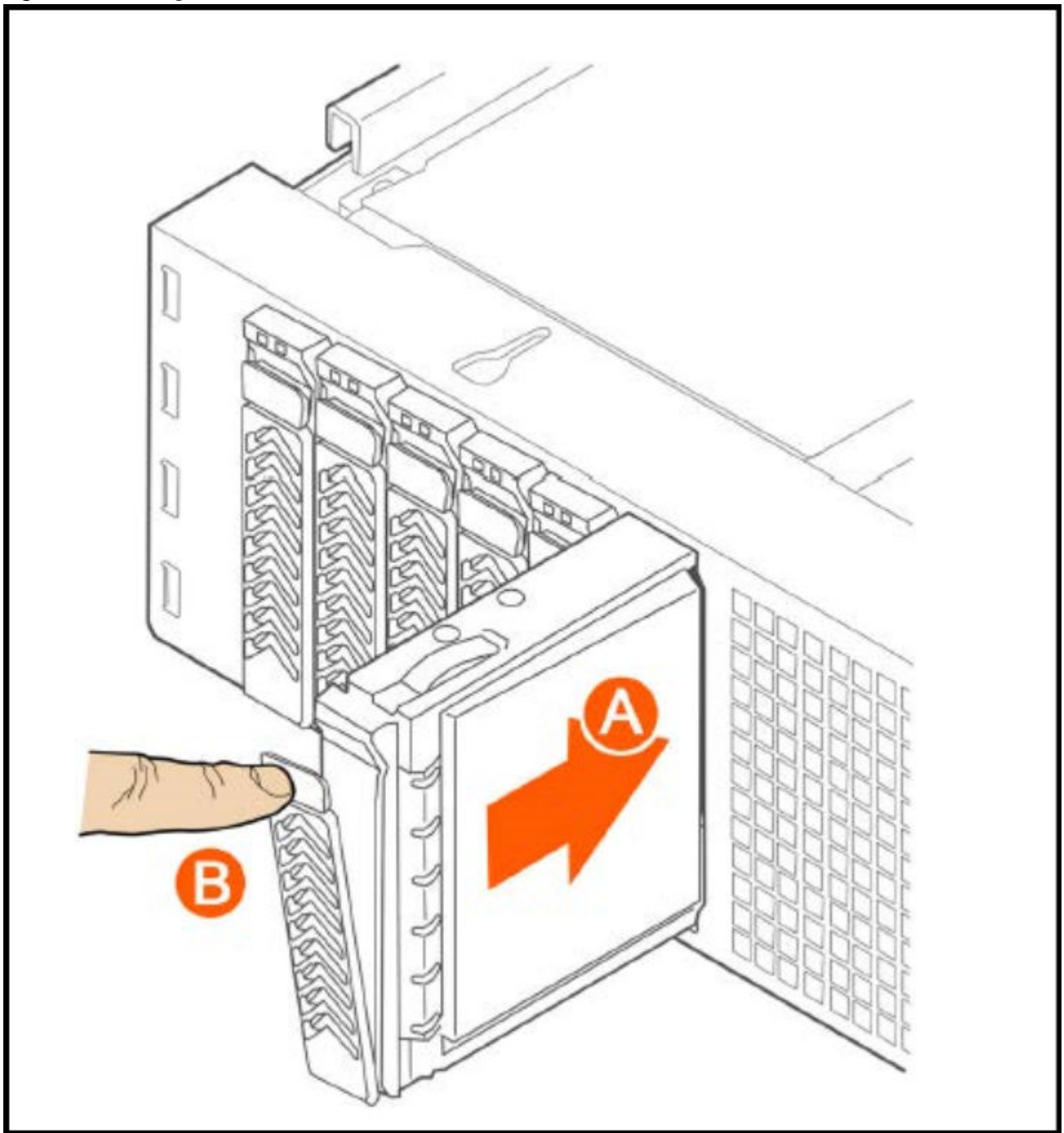
1. If a drive is already installed (that is, if you are replacing the drive), remove it by unfastening the four screws that attach the drive to the drive carrier (see A in [Figure 1](#)). Set the screws aside for use with the new drive.
2. Lift the drive out of the carrier (see B in [Figure 1](#)).

Figure 1. Removing the hard drive



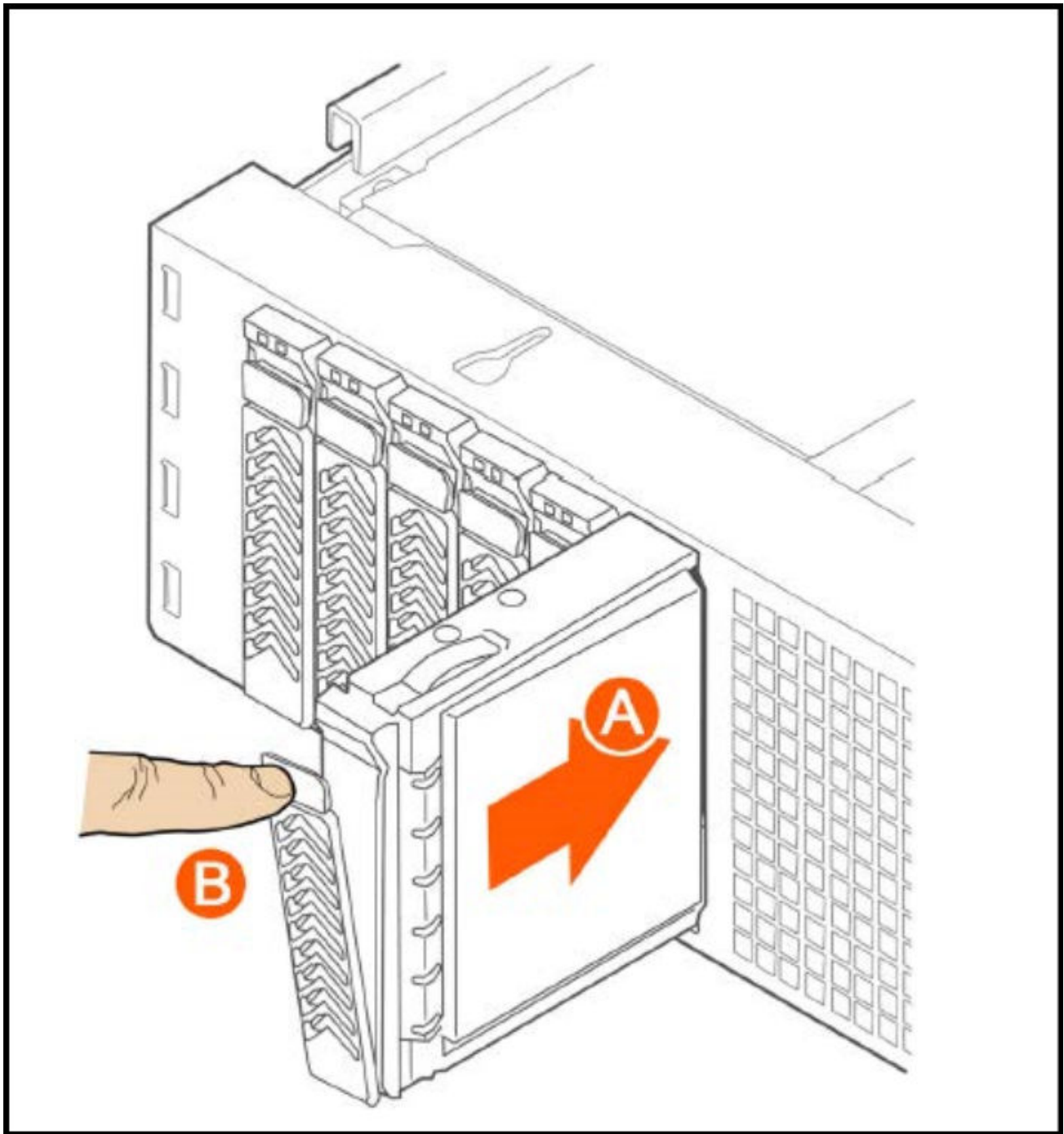
3. Install the new drive in the drive carrier (see A in [Figure 2](#)), and then secure the drive with the four screws that come with the carrier (see B).

Figure 2. Installing the hard drive



4. With the drive carrier locking lever fully open, push the hard drive carrier into the drive bay in the chassis until it stops (see A in [Figure 3](#)).

Figure 3. Inserting the carrier back into the chassis



5. Press the locking lever until it snaps shut and secures the drive in the bay.

You have completed installing or replacing the hard drive onto the controller.

- **Note:** The new hard drive will synchronize automatically with the existing RAID array. During the synchronization process, the HDD LED on the controller will blink amber and green alternately. When the process is complete, the HDD LED will turn off.

Parent topic: [Installing or Replacing Hard Disk Drives](#)

Reinstalling the Front Bezel

Follow these steps to reinstall the front bezel on the controller.

1. Insert the tabs on the left side of the bezel into the slots on the front panel of the chassis.
2. Move the bezel toward the right of the front panel and align it on the front panel pins.
3. Snap the bezel into place and tighten the retention screw to secure it.

Parent topic: [Installing or Replacing Hard Disk Drives](#)

Replacing PSUs

The controller includes two redundant, hot-swappable power supply units (2 AC PSUs or 2 DC PSUs). No chassis components need to be removed to add or replace a PSU.

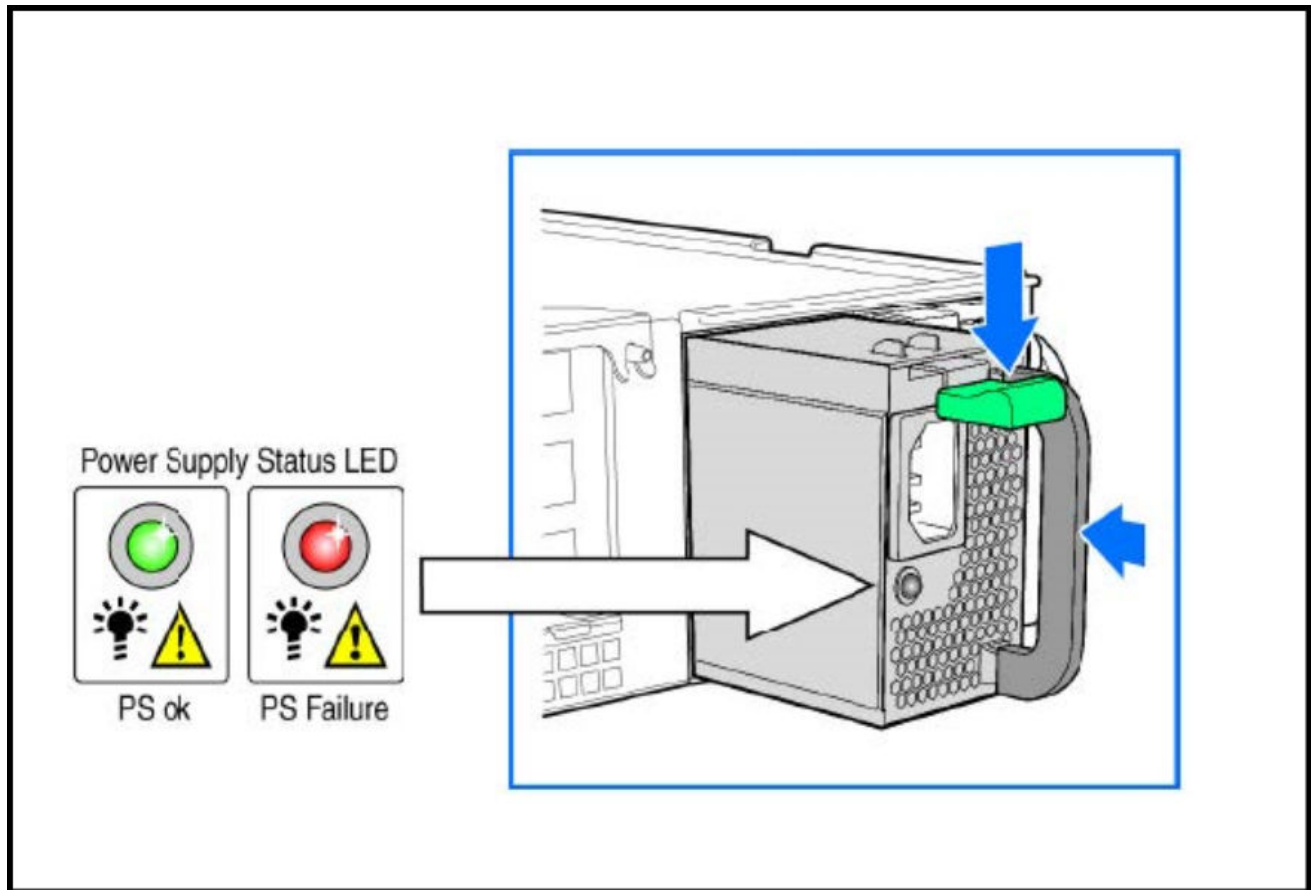
Follow these steps to remove and replace a PSU.

1. Identify the faulty PSU by looking at the PSU status LED (red indicates PSU failure, green indicates normal operation).
2. Press and hold the green safety lock downward while grasping the PSU handle.
3. Pull outward on the handle, sliding the PSU all the way out of the rear of the machine.
4. Insert the new PSU into the slot and, while holding the green safety lock, slide the PSU into the slot until it locks in place.

The PSU status LED turns green, indicating that the PSU is operating normally.

🔧 **Note:** If you are installing a DC power supply, there are two threaded studs for chassis enclosure grounding. A 90° standard barrel, two-hole, compression terminal lug with 5/8-inch pitch suitable for a #14-10 AWG conductor must be used for proper safety grounding. A crimping tool may be needed to secure the terminal lug to the grounding cable.

Figure 1. Replacing a PSU



Parent topic: [Installing or Replacing Hard Disk Drives](#)

Replacing System Fans

The controller includes six redundant, hot-swappable system fans (four 80mm fans and two 60mm fans). There are also two fans located inside the power supply units. Redundancy for the two PSU fans is only achieved when both PSUs are installed.

If any of the system fans requires replacement, the replacement procedure is identical.

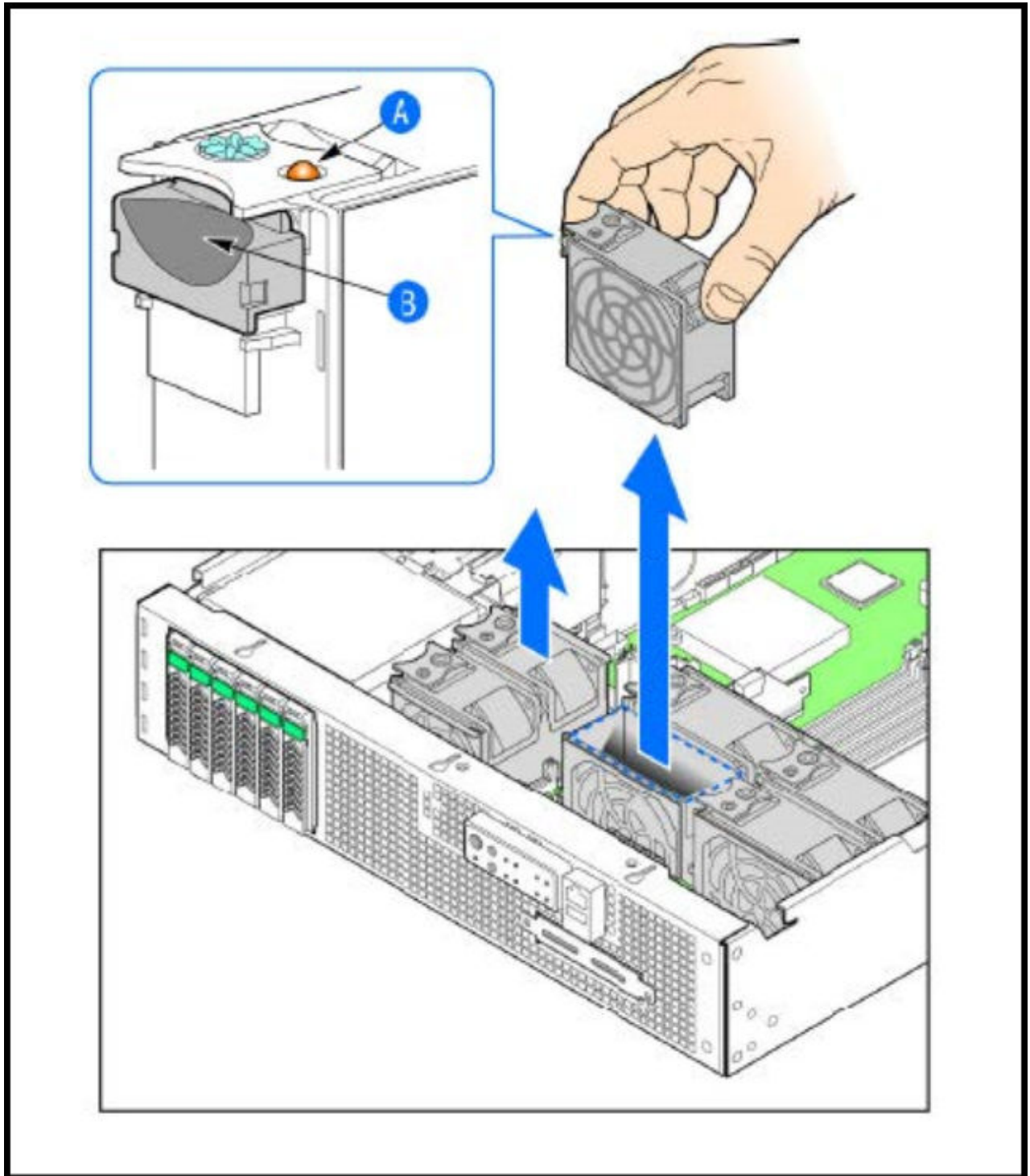
Electrostatic discharge (ESD) can damage internal components such as printed circuit boards and other parts. RUCKUS recommends that you only perform this procedure with adequate ESD protection. At a minimum, wear an anti-static wrist strap attached to the ESD ground strap attachment on the front panel of the chassis.

Follow these steps to replace a system fan.

1. Open the front chassis cover of the controller. It may be necessary to extend the controller into a maintenance position.
2. Identify the faulty fan. Each fan has a "service required" LED that turns amber when the fan is malfunctioning.

3. Remove the faulty fan by grasping both sides of the fan assembly, using the plastic finger guard on the left side and pulling the fan out of the metal fan enclosure.
4. Slide the replacement fan into the same metal fan enclosure. Use the edges of the metal enclosure to align the fan properly and ensure the power connector is seated properly in the header on the side of the enclosure.
5. Apply firm pressure to fully seat the fan.
6. Verify that the (service required) LED on the top of the fan is not lit.
7. Close the front chassis cover and return the controller to its normal position in the rack, if necessary.

Figure 1. Replacing a system fan




Parent topic: [Installing or Replacing Hard Disk Drives](#)

MVNO


Managing Mobile Virtual Network Operator (MVNO) Accounts

Managing Mobile Virtual Network Operator (MVNO) Accounts

A Mobile Virtual Network Operator (MVNO) uses a host carrier network to service its mobile users. An MVNO account is created for each operator and the MVNO page lists the accounts that are created.

1. Go to **Administration > Administration > MVNO**.
The **MVNO** page appears displaying information about MVNO accounts created.
 2. Click **Create** to create an MVNO account.
The **The Mobile Virtual Network Operator** page appears.
 3. Configure the following:
 - a. The Mobile Virtual Network Operator Summary
 - a. 'Domain Name: Type a domain name to which this account will be assigned
 - b. Description: Type a brief description about this domain name.
 - b. AP Zones of Mobile Virtual Network Operator: Displays the AP zones that are allocated to this MVNO account
 - a. Click **Add AP Zone**. The **Add AP Zone** page appears.
 - b. AP Zone: Select the AP zone you want to add to the MVNO account from the drop-down menu.
 - c. Click **OK**.
-  **Note:** You can only select a single AP zone at a time. If you want to grant the MVNO account management privileges to multiple AP zones, select them one at a time.
- c. WLAN Services: Configure the WLAN services to which the MVNO account that you are creating will have management privileges.
 - a. Click **Add WLAN**. The **Add WLAN** page appears.

b. SSID: Select the WLAN to which the MVNO account will have management privileges.

 **Note:** You can only select one WLAN service at a time. If you want to grant the MVNO account management privileges to multiple WLAN service zones, select them one at time.

c. Click **OK**.

d. Super Administrator: Configure and define the logon details and management capabilities that will be assigned to the account.

a. Account Name: Type the name that this MVNO will use to log on to the controller.

b. Real Name: Type the actual name (for example, John Smith) of the MVNO.

c. Password: Type the password that this MVNO will use (in conjunction with the Account Name) to log on to the controller.

d. Confirm Password: Type the same password as above. f) In Phone, type the phone number of this MVNO.

e. Phone: Type the phone number of the administrator.


f. Email: Type the email address of this MVNO.

g. Job Title: Type the job title or position of this MVNO in his organization.

e. RADIUS Server for Administrator Authorization and Authentication: See [Configuring SZ Admin AAA Servers](#) for more information.

4. Click **OK**.

You have created an MVNO account.

 **Note:** You can also edit and delete the account by selecting the options **Configure**, and **Delete** respectively, from the **MVNO** page.

Parent topic: [MVNO](#)

Administrator Activities


Monitoring Administrator Activities

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.

1. Go to **Administration > Administration > Admin Activities**.
2. Select the **Admin Activities** tab. the **Admin Activities** page displays the administrator actions. The following information is displayed:
 - Date and Time: Date and time when the alarm was triggered
 - Administrator: Name of the administrator who performed the action
 - Source IP: Displays the IP address of the device form which the administrator manages the controller.
 - 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 service.
 - Description: Displays additional details about the action. For example, if the administrator created a new hotspot service, this column may show the following: **Hotspot [company_hotspot]** .



Click  to export the administrator activity list to a CSV file. You can view the default download folder of your web browser to see the CSV file named **clients.csv**. Use a spreadsheet application (for example, Microsoft® Excel®) to view the contents of the CSV file.

Parent topic: [Administrator Activities](#)

Support Information

The **Help** tab provides access to online REST API and administration guides.
To access these guides, select **Adminstraion** > **Help** and select the required guide.

Parent topic: [Backup and Restore](#)

Rest API

Table 1. SmartZone Rest API rate

Release Summary	Rate
SZ API Read Support Rate	170 / min
SZ API Write Support Rate	135 / min

Parent topic: [Support Information](#)

Rest API

Table 1. SmartZone Rest API rate

Release Summary	Rate
SZ API Read Support Rate	170 / min
SZ API Write Support Rate	135 / min

Parent topic: [Support Information](#)

Navigating the Dashboard

[Setting Up the Controller for the First Time](#)

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[Configuring Global Filters](#)

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[Controller User Interface \(UI\)](#)

Setting Up the Controller for the First Time

The controller must first be set up on the network.

 **Note:** Setting up the controller is described in the Getting Started Guide or Quick Setup Guide for your controller platform.

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.

 **Note:** While deploying vSZ, iSCSI must be used for block storage and make the hosts see everything as Direct-attached storage (DAS) for real-time database access/synchronisation as it requires lower latency and a high number of r/w transactions. Due to higher r/w latency, SAN and NAS might not be suitable for vSZ deployment.

You can deploy vSZ and vSZ-D via vCenter 6.7 on ESXi. Some of the new features (for example, location based services, rogue AP detection, force DHCP, and others) that this guide describes may not be visible on the controller web interface if the AP firmware deployed to the zone you are configuring is earlier than this release. To ensure that you can view and configure all new features that are available in this release, RUCKUS recommends upgrading the AP firmware to the latest version.

Parent topic: [Navigating the Dashboard](#)

Logging in to the Web Interface


Before you can log in 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 controller web interface on any computer that can reach the Management (Web) interface on the IP network.

Complete the following steps to log in to the controller web interface.

1. Start a web browser on a computer that is on the same subnet as the Management (Web) interface. The following web browsers are supported:
 - Google Chrome
 - Safari
 - Mozilla Firefox
 - Internet Explorer
 - Microsoft Edge
2. In the address bar, enter the IP address that you assigned to the Management (Web) interface, and append a colon (:) and 8443 (the management port number of the controller) to the end of the address.

For example, if the IP address that you assigned to the Management (Web) interface is 10.10.101.1, 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 (Web) interface IP address to connect to the controller web interface. Because the default SSL certificate (or security certificate) that the controller is using for HTTPS communication is signed by RUCKUS and is not recognized by most web browsers, a browser security warning may be displayed.

The controller web interface logon page is displayed.

3. Log in to the controller web interface using the following credentials:
 - **User Name:** admin
 - **Password:** Password you set in the Setup Wizard
4. Click **Log On**.

The controller web interface displays the **Dashboard**, which indicates that you have logged on successfully.

Parent topic: [Navigating the Dashboard](#)

Controller Web Interface Features

The controller web interface is the primary graphical front end for the controller and is the primary interface. You can use the controller web interface to take the following actions:

- 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 backup and restoring system configuration, upgrading the cluster, downloading support, performing system diagnostic tests, viewing the status of controller processes, uploading additional license, and other administrative tasks

The following table describes the controller web interface components.

Table 1. Controller Web Interface Components

Component	Description	Action
Main Menu	Lists the menus for administrative tasks.	Select the required menu and submenu.
Tab Page	Displays the options specific to the selected menu.	Select the required tab page.
Content Area	Displays tables, forms, and information specific to the selected menu and tab page.	View the tables, forms, and information specific to the selected menu, submenu, and tab page. Double-click an object or profile in a table, for example, a WLAN, to edit the settings.
Header Bar	Displays information specific to the controller web interface.	Select the required option (from left to right): <ul style="list-style-type: none"> • Warning: Lists the critical issues to be resolved.

Component	Description	Action
		<ul style="list-style-type: none"> • System Date and Time: Displays the current system date and time. • Refresh: Refreshes the web page. • Global filter: Allows you to set the preferred system filter. • My Account link: Allows you to: <ul style="list-style-type: none"> • Change password • Set session preference • View account activities such as login information and privilege changes • Log off • Online Help: Allows access to web help.

You can use the **Menu** icon to expand and shrink the **Main menu**. Shrinking the main menu increases the size of the content area for better readability and viewing.

Parent topic: [Navigating the Dashboard](#)

Changing the Administrator Password

Follow these steps to change the administrator password.

1. On the controller web interface, select **Change Password** from the **default** list.

The following window is displayed.

Figure 1. Change Password Form



A screenshot of a 'Change Password' dialog box. The dialog has a title bar with a close button (X) in the top right corner. Inside the dialog, there is a light gray rectangular area containing three password input fields. Each field is preceded by a red asterisk and a label: 'Old Password:', 'New Password:', and 'Confirm Password:'. Below these fields are two buttons: a dark gray 'Change' button and a light gray 'Cancel' button.

2. Enter:

- **Old Password**—Your current password.
- **New Password**—Your new password.
- **Confirm Password**—Your new password.

3. Click **Change**, your new password is updated.

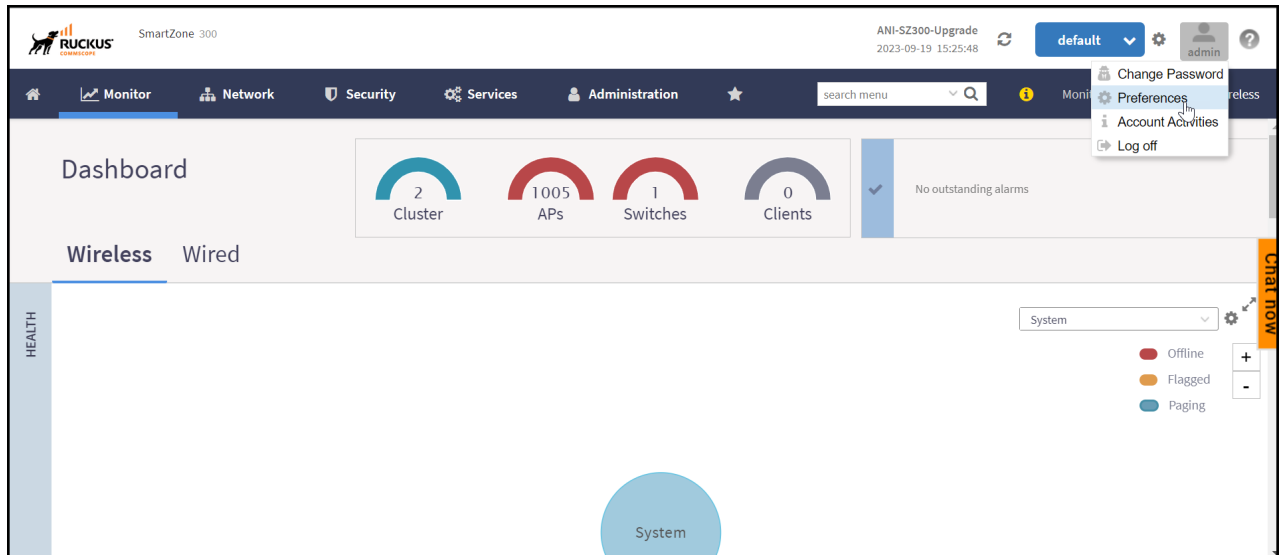
Parent topic: [Navigating the Dashboard](#)

Setting User Preferences

You can configure the language in which the user interface must appear, and also customize the session time for the interface.

1. In the controller web interface, click on the **user profile** and click **Preferences**. This displays **User Preferences** page.

Figure 1. User Profile Menu - Preferences



2. In the **User Preferences** page, enter the following details.

- **Session Idle Timeout Setting** - Enter the duration in **minutes** for the web interface session to refresh.
- **Language** - Select the language of your choice from the drop-down list to view the web interface content. The following languages are supported in the application -
 - Spanish
 - Brazilian Portuguese
 - French
 - German
 - Italian
 - Russian
 - Simplified Chinese
 - Traditional Chinese
 - Korean
 - Japanese
- **Use Legacy Menu** - By default this button is **Off**, enable this button to view the old menu (prior to release 6.0.0).

- **Usage Data Collection** - By default this button is **Off**, enable this button to collect data for analytics. For more information on data collection, click on the link corresponding to the field.
- **Customer Support Chat Bot** - By default this button is **On**, this button enables the chat support feature which is available in the main screen.

Figure 2. User Preferences

User Preferences

* Session Idle Timeout Settings: 30 Minutes (1-1440)

Language: English

Use Legacy Menu: OFF

[?] Usage data collection: ON For more info on privacy policy click [here](#)

Customer support chatbot: ON

OK Cancel

Parent topic: [Navigating the Dashboard](#)

Logging Off the Controller

You can log off the controller by using either the web interface or the Command Line Interface (CLI).

Logging off Using the Web Interface

1. On the controller web interface, select **Log off** from the **default** list.

The following message is displayed: Are you sure you want to log off?

2. Click **Yes**.

You have completed logging off the web interface

Logging off Using CLI

1. To schedule a shutdown at the CLI prompt, enter the command **shutdown** and specify the delay in seconds before controller shuts down.
2. To shutdown the controller immediately, enter the command **shutdown now**.

Parent topic: [Navigating the Dashboard](#)

Configuring Global Filters

The Global filter setting allows you to set your preferred system filter.

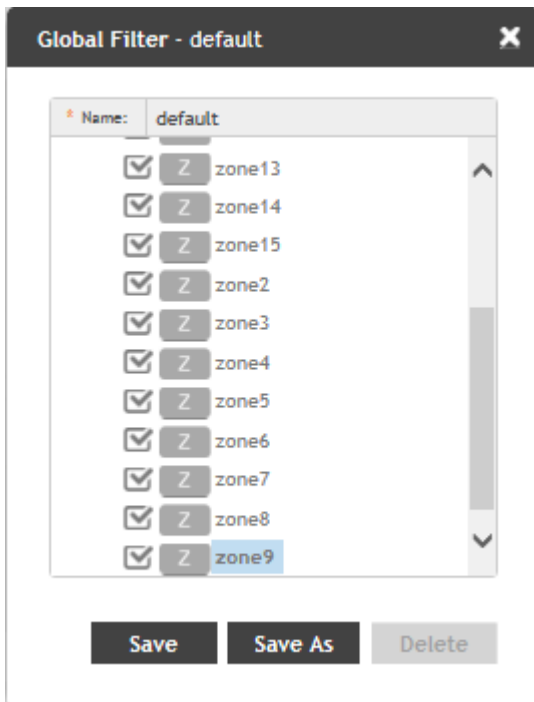
Global filters allow the administrator to define a system scope or system context that applies to all pages of the system as they navigate to different menus. For example, if your system includes 5 zones, but you want to view Zone1 and Zone2 only, you can create and apply such a filter. As you navigate throughout the system, the view will be restricted to show only the data, objects, and profiles contained within Zones 1 and 2.

To set the global filter:

1. On the controller web interface, click  . The **Global Filter - default** page is displayed.

The below figure appears.

Figure 1. Global Filter Form

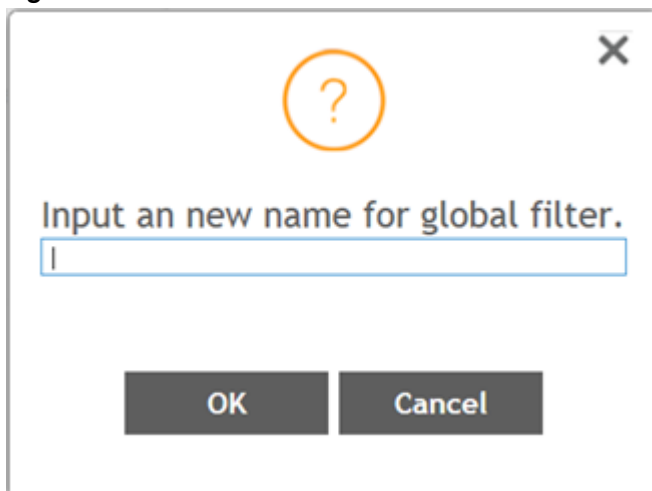


The dialog box titled "Global Filter - default" shows a list of system filters. The "Name:" field is set to "default". The list contains 11 items, each with a checked checkbox and a "Z" icon: zone13, zone14, zone15, zone2, zone3, zone4, zone5, zone6, zone7, zone8, and zone9. The "zone9" item is highlighted. At the bottom are three buttons: "Save", "Save As", and "Delete".


2. Select or clear the required system filters and click

- **Save**—To save the filter settings with the default group.
- **Save As**—To save the filter settings as a new group. The below figure appears. Enter a new name for the group and click **OK**.

Figure 2. New Name Form



The "New Name Form" dialog box features a large orange question mark icon at the top. Below it, the text "Input an new name for global filter." is displayed above a text input field. At the bottom are two buttons: "OK" and "Cancel".

Note: You can delete the filter setting. To do so, click the Filter  setting button. The Global Filter form appears, click **Delete**.

Parent topic: [Navigating the Dashboard](#)

Warnings and Notifications

This section explains about warnings and notifications.

Parent topic: [Navigating the Dashboard](#)

Warnings

Warnings are displayed in the Miscellaneous bar. They are issues which are critical in nature. Warnings cannot be removed or acknowledged unless the critical issue is resolved.

Figure 1. Sample Warning Message



A list of warning messages that appear are as follows:

- Default 90-day support expiring soon
- System support expiring soon
- System support has expired
- Default 90-day AP license expiring soon
- Default AP license has expired
- Default 90-day RTU license expiring soon
- RTU has expired
- AP Certificate Expiration
- Node Out of Service
- Cluster Out of Service
- VM Resource Mismatch
- Suggested AP Limit Exceeded
- AP/DP version mismatch

Parent topic: [Warnings and Notifications](#)

Setting Global Notifications

Notifications are integrated with existing alarms and they are displayed only when a notification alarm exists and is not acknowledged by the administrator. Notifications can be viewed from the **Content** area. Administrators can acknowledge the notification by either:

- Clearing the alarm
- Acknowledging the Alarm


For more information, refer to the “Managing Alarms and Events” chapter.

Alarm severity are of three types:

- Minor
- Major
- Critical

The administrator can change the alarm severity shown on the dashboard. To do so:

1. From the Notifications area, Click the **Setting** icon, this displays **Settings - Global Notification** window.
2. From the **Lowest alarm severity** drop-down, select the required severity level.
3. Click **OK**. Notifications corresponding to the selected alarm severity and severity above it are displayed in the Notification area of the Dashboard.

 **Note:** RUCKUS AI is configured on the SmartZone (controller) platform. When the user connects to RUCKUS AI through the controller, a status tag is displayed in the controller header and the browser re-directs the user to RUCKUS AI page. Currently, this feature is dependent on RUCKUS AI.

Parent topic: [Warnings and Notifications](#)

Controller User Interface (UI)

Prior to release 6.0.0, the controller menu had vertical layout that resulted in some menu items not being visible on the screen. So, to make navigation easier, a new menu was introduced in release 6.0.0 release. The new menu has features such as **Category**, **Favorite**, **Search** and **Breadcrumbs**.

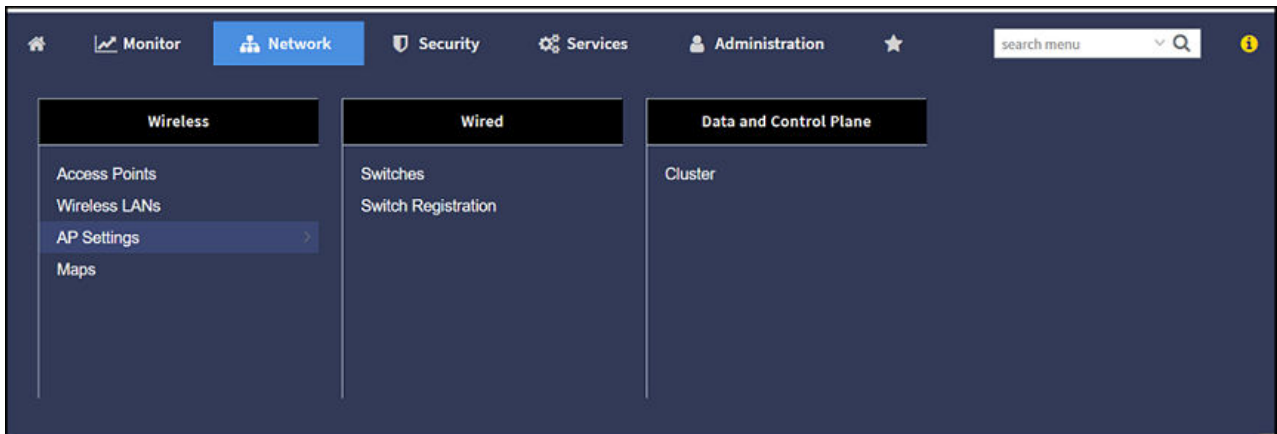
- **Category** - The menu items are organized into distinct categories or groups making it easier to find and access specific functionalities. The various categories are **Monitor**, **Network**, **Security**, **Services** and **Administration**.

Figure 1. Displaying Categories on the Menu Bar



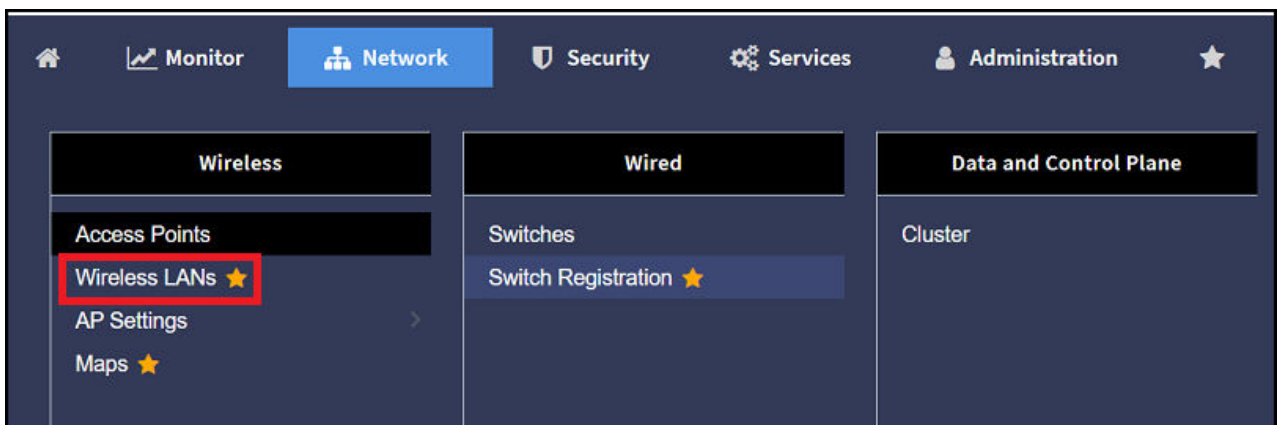
For example, the menu items under the category **Network** are displayed as per the screenshot below.

Figure 2. Displaying Menu Items in the Network Category



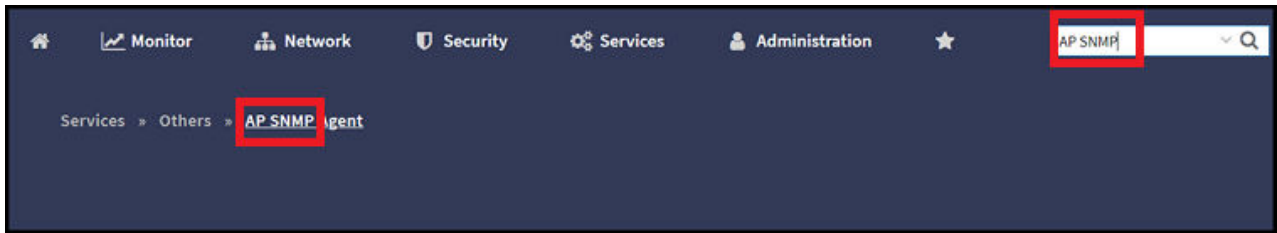
- Favorite - The **Star** icon allows you to mark certain menu items as their favorites or frequently accessed options. This feature saves time by providing quick access to the functions you use most often. The star icon acts like a toggle allowing you to add or remove menu item from your favorite list.

Figure 3. Marking Favorites



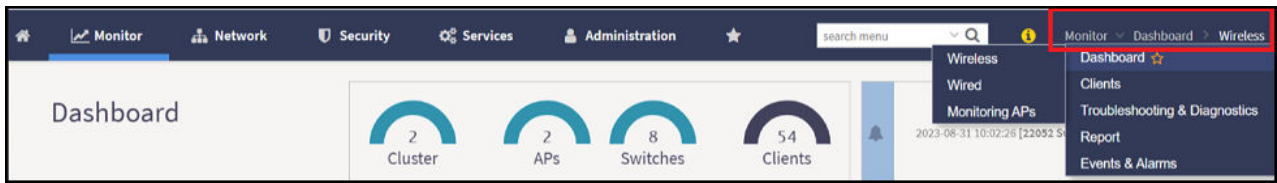
- Search - The **Search** menu increases the usability by allowing you to input keywords specific terms to find relevant information. When you use a search option, it queries the system and returns results that match your input, making it easier to locate specific content or data. It helps you in quickly find what you are looking for.

Figure 4. Using the Search Field



- Breadcrumb - The **Breadcrumb** is a navigation aid that shows your current location within the menu hierarchy. This allows you to see where you are and easily navigate back to previous levels.

Figure 5. Displaying Breadcrumb



- Search History - The **Search History** typically refers to a record of the searches you've conducted. It can include the keywords or phrases you entered when searching for information.

Figure 6. Search History



Parent topic: [Navigating the Dashboard](#)

Syslog

Configuring the Remote Syslog Server

Configuring the Remote Syslog Server

The controller maintains an internal log file of current events and alarms, but this internal log file has a fixed capacity. Configure the log settings so you can keep copies of the logs that the controller generates.

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 alarms and 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 remote syslog server:

1. Go to **Administration > System Info > Syslog**.
2. Select the **Enable logging to remote syslog server** check box.
3. Configure the settings as explained in the following table.
4. Click **OK**.

Table 1. Syslog Server Configuration Settings

Field	Description	Your Action
Primary Syslog Server Address	Indicates the syslog server on the network.	<ol style="list-style-type: none"> Enter the server address. Enter the Port number. Choose the Protocol type. Click Ping Syslog Server. If the syslog server is reachable, a flashing green circle and the message Success appears after the button.
SecondarySyslog ServerAddress	Indicates the backup syslog server on the network, if any, in case the primary syslog server is unavailable.	<ol style="list-style-type: none"> Enter the server address.

Field	Description	Your Action
		<ul style="list-style-type: none"> b. Enter the Port number. c. Choose the Protocol type. d. Click Ping Syslog Server. If the syslog server is reachable, a flashing green circle and the message Success appears after the button.
Application Logs Facility	Indicates the facility for application logs.	<ul style="list-style-type: none"> a. Select the option from the drop-down. Range: 0 through 7. b. Select one of the following Filter Severity: <ul style="list-style-type: none"> a. Emerg b. Alert c. Crit d. Error e. Warning f. Notice g. Info h. Debug: Default option
Administrator Activity Logs Facility	Indicates the facility for administrator logs.	<ul style="list-style-type: none"> a. Select the option from the drop-down. Range: 0 through 7. b. Select one of the following Filter Severity:

Field	Description	Your Action
		<ul style="list-style-type: none"> a. Emerg b. Alert c. Crit d. Error e. Warning f. Notice g. Info h. Debug: Default option
Other Logs Filter Severity	Indicates the facility for comprehensive logs.	Select one of the following Filter Severity : <ul style="list-style-type: none"> a. Emerg b. Alert c. Crit d. Error e. Warning f. Notice g. Info h. Debug: Default option
Event Facility	Indicates the facility for event logs.	Select the option from the drop-down. Range: 0 through 7.
Event Filter	Indicates the type of event that must be sent to the syslog server.	Choose the required option:

Field	Description	Your Action
		<ul style="list-style-type: none"> ◦ All events — Send all controller events to the syslog server. ◦ All eventsexceptclientassociation/disassociationevents — Send all controller events (except client association and disassociation events) to the syslog server. ◦ All events above a severity — Send all controller events that are above the event severity to the syslog server.
Event Filter Severity applies to Event Filter > All events above a severity	Indicates the lowest severity level. Events above this severity level will be sent to the syslog server.	<p>Select the option from the drop-down.</p> <ul style="list-style-type: none"> a. Critical b. Major c. Minor d. Warning e. Informational f. Debug: Default option
Priority	Indicates the event severity to syslog priority mapping in the controller.	<p>Choose the Syslog Priority among Error, Warning, Info and Debug, for the following event severities:</p> <ul style="list-style-type: none"> ◦ Critical ◦ Major ◦ Minor

Field	Description	Your Action
		<ul style="list-style-type: none">◦ Warning◦ Informational◦ Debug

Parent topic: [Syslog](#)

Reports

Report Generation

Report Generation

Creating Reports

Generating Reports

Parent topic: [Reports](#)

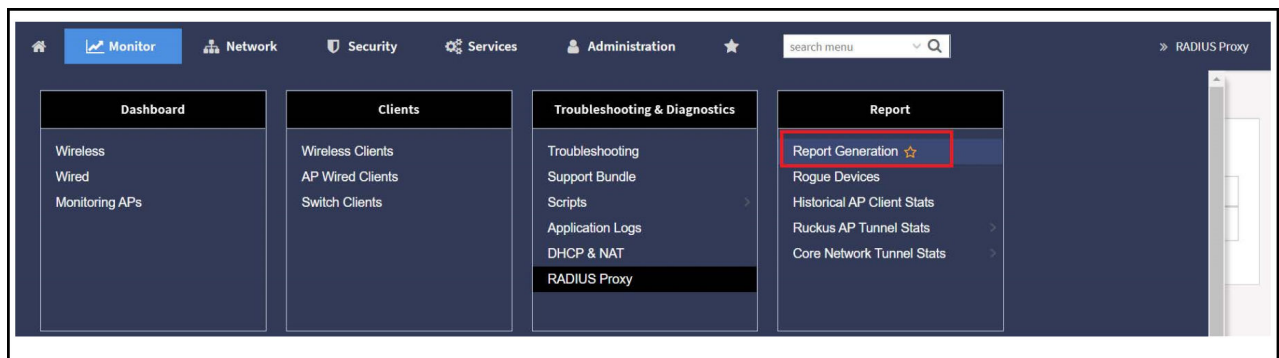
Creating Reports

You can create reports to obtain a historical view of the maximum and minimum number of clients connected to the system, the number of clients connected at different time intervals, and the traffic statistics for the switches. Complete the following steps to create a new report.

1. From the main menu, go to **Monitor>Report >Report Generation**.

The **Report Generation** page is displayed.

Figure 1. Report Generation Screen



2. Click **Create**. The **Create Report** dialog box is displayed.

Figure 2. Create Report Dialog Box


3. Enter the required parameters as described in the following table.

Table 1. Report Parameters

Field	Description	Your Action
General Information		
Title	Indicates the report name.	Enter a title for the report.
Description	Describes the report type.	Enter a short description.
Report Category	Provides an option to generate reports for system or switch devices in the network.	Select System or Switch as appropriate.
Report Type	Specifies the report type.	Select the required report type.
Output Format	Specifies the report output format.	Select the required report output format.
Resource Filter Criteria		
Device	Indicates the level of resource filtering for which you want to generate the report; for example, Management Domains, AP Zone or Access Point (if you select the System option), and Switch.	Enter the device or switch name or select the device or switch from the list and select the option.
SSID	Indicates the SSID for which you want to generate the report.	Select the check box and select the SSID for which you want the report. You can select All SSIDs

Field	Description	Your Action
		to generate reports for all the SSIDs available. This option is convenient because you do not have to update the resource filter criteria periodically.
Radio	Indicates the frequency for which you want to generate the report.	Select the check box and select the required frequency: <ul style="list-style-type: none"> ◦ 2.4G ◦ 5G ◦ 6GHz/5GHz
Time Filter		
Time Interval	Defines the time interval at which to generate the report.	Select the required time interval.
Time Filter	Defines the time duration for which to generate the report.	Select the required time filter.
Schedules		
Enable/Disable	Specifies the scheduled time when a report must be generated. By default, the current system time zone is also displayed.	By default, this option is disabled. Select Enable and Interval , Hour , and Minute . You can add multiple schedules. You can also click Add New to include more schedules.
Email Notification		
Enable/Disable	Triggers an email notification when the report is generated.	By default, this option is disabled. Select Enable , click Add New , and enter the email address. You can add multiple email addresses.
Export Report Results		
Enable/Disable	Automatically uploads the reports to an FTP server.	By default, this option is disabled. Select Enable , and select the FTP server from the drop-down list and click Test .

4. Click **OK**.

 **Note:** You can also edit or delete a report by selecting the **Configure** or **Delete** options.

Parent topic: [Report Generation](#)

Generating Reports

Complete the following steps to generate a report.

1. From the main menu, go to **Monitor > Report > Report Generation**.

The **Report Generation** page is displayed.

2. Select the required report from the list, and click **Generate**. The **Report Generated** form is displayed.
3. Click **OK**. The report is generated and listed in the **Report Results** pane.
4. From the **Result Links** column, select the required format, and click **Open** to view the report.

Parent topic: [Report Generation](#)

Short Message Service

Configuring the Short Message Service (SMS) Gateway Server

Configuring the Short Message Service (SMS) Gateway Server

You can define the external gateway services used to distribute guest pass credentials to guests. To configure an external SMS gateway for the controller follow the below steps.

1. Go to **Administrator > External Services > SMS**.
2. Select the **Enable Twilio SMS Server** check box to use an existing Twilio account for SMS delivery.
3. Enter the following Twilio Account Information:
 - **Server Name**, type the name of the server.
 - **Account SID**, type the account number.
 - **Auth Token**, type the token number to authenticate the external SMS gateway.
 - **From**, type the phone number from which the message must be sent.
4. Click **OK**.

You have completed adding an SMS gateway to the controller. You will receive a guest pass key from your Twilio Trial account.

Parent topic: [Short Message Service](#)

Simple Mail Transfer Protocol

Configuring Simple Mail Transfer Protocol (SMTP) Server Settings

Configuring Simple Mail Transfer Protocol (SMTP) Server Settings

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 **Administrator > External Services > SMTP**.
2. Select **Enable SMTP Server**.
3. Enter the **Logon Name** 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. Enter the associated **Password**.
5. For **SMTP Server Host**, enter 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. For **SMTP Server Port**, enter 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. For **Mail From**, enter the source email address from which the controller sends email notifications.
8. For **Mail To**, enter the recipient email address to which the controller sends alarm messages. You can send alarm messages to a single email address.
9. Select the **Encryption Options**, if your mail server uses encryption.
 - **TLS**
 - **STARTTLS**

Check with your ISP or mail administrator for the correct encryption settings that you need to set.

10. Click **Test**, to verify if the SMTP server settings are correct. The test completed successfully form appears, click **OK**.
11. Click **OK**.

Parent topic: [Simple Mail Transfer Protocol](#)

Simple Network Management Protocol

Enabling Global SNMP Notifications

Enabling Global SNMP Notifications

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.

Parent topic: [Simple Network Management Protocol](#)

Configuring SNMP v2 Agent


To configure SNMP v2 Agent settings:

1. Go to **Services > Others > AP SNMP Agent**. The **AP SNMP Profile** page is displayed.
2. To configure the SNMPv2 Agent, click **Create** and update the details as explained in the following table.

Table 1. SNMP v2 Agent Settings

Field	Description	Your Action
Name	Indicates the AP SNMP profile name.	Enter a name.
Description	Provides a brief explanation of the profile.	Enter a brief explanation.
Community	Indicates that applications which send SNMP Get-Requests to the controller (to retrieve information) will need to send this string along with the request	Enter a name.

Field	Description	Your Action
	before they will be allowed access.	
Privilege	Indicates the privileges granted to this community.	<p>Select the required privileges:</p> <ul style="list-style-type: none"> ◦ Read-Only—Privilege only to read. ◦ Read-Write—Privilege only to read and write. ◦ Notification—Privilege to: <ul style="list-style-type: none"> ◦ Trap—Choose this option to send SNMP trap notification. ◦ Inform—Choose this option to send SNMP notification. <ul style="list-style-type: none"> a. Enter the Target IP address. b. Enter the Target Port number. c. Click Add.

 **Note:** You can also edit or delete an SNMPv2 agent. To do so, select the SNMPv2 agent from the list and click **Configure** or **Delete** respectively.

3. Click **OK**.

Parent topic: [Enabling Global SNMP Notifications](#)


Configuring SNMP v3 Agent

1. Go to **Services > Others > AP SNMP Agent**.
2. To configure the SNMPv3 Agent, click **Create** and update the details as explained in the following table.

Table 1. SNMPv3 Agent Settings

Field	Description	Your Action
Name	Indicates the AP SNMP profile name.	Enter a name.
Description	Provides a brief explanation of the profile.	Enter a brief explanation.
User	Indicates that applications which 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.	Enter a name.
Authentication	Indicates the authentication method.	<p>Choose the required option:</p> <ul style="list-style-type: none"> ◦ SHA—Secure Hash Algorithm, message hash function with 160-bit output. <ul style="list-style-type: none"> a. Enter the Auth Pass Phrase. b. Choose the Privacy option. <ul style="list-style-type: none"> • None: Use no privacy method. • DES: Data Encryption Standard, data block cipher. • AES: Advanced Encryption Standard, data block cipher. c. Enter a Privacy Phrase, 8 through 32 characters. ◦ MD5—Message-Digest algorithm 5, message hash function with 128-bit output. <ul style="list-style-type: none"> a. Enter the Auth Pass Phrase. b. Choose the Privacy option.

Field	Description	Your Action
		<ul style="list-style-type: none"> • None: Use no privacy method. • DES: Data Encryption Standard, data block cipher. • AES: Advanced Encryption Standard, data block cipher. <p>c. Enter a Privacy Phrase, 8 through 32 characters.</p>
Privilege	Indicates the privileges granted to this community.	<p>Select the required privileges:</p> <ul style="list-style-type: none"> ◦ Read-Only—Privilege only to read. ◦ Read-Write—Privilege only to read and write. ◦ Notification—Privilege to: <ul style="list-style-type: none"> ◦ Trap—Choose this option to send SNMP trap notification. ◦ Inform—Choose this option to send SNMP notification. <p>a. Enter the Target IP address.</p> <p>b. Enter the Target Port number.</p> <p>c. Click Add.</p>

 **Note:** You can also edit or delete an SNMPv3 agent. To do so, select the SNMPv3 agent from the list and click **Configure** or **Delete** respectively.

3. Click **OK**.

Parent topic: [Enabling Global SNMP Notifications](#)

Creating a RUCKUS GRE Profile

Generic Routing Encapsulation (GRE) provides a way to encapsulate arbitrary packets (payload packet) inside of a transport protocol, and transmit them from one tunnel endpoint to another. You can configure the RUCKUS GRE tunnel profile of the controller to manage AP traffic.

To create a GRE profile follow the below steps.

- **Note:** You can also edit, clone and delete the profile by selecting the options **Configure**, **Clone** and **Delete** respectively, from the **Ruckus GRE** tab.

1. From the main menu go to **Services > Tunnels & Ports**.
2. Select the **Ruckus GRE** tab, and select the system to create the profile.
3. Click **Create**.

The **Create Ruckus GRE Profile** page is displayed.

Figure 1. Creating a Ruckus GRE Profile

The screenshot displays the 'Create Ruckus GRE Profile' configuration window. It contains the following fields and options:

- Name:** GRE-UDP-ENC
- Description:** GRE-UDP-ENC
- Ruckus Tunnel Mode:** GRE+UDP (dropdown menu)
- Tunnel Encryption:** Disable, ☒ AES 128, ☐ AES 256
- Tunnel MTU:** ☒ Auto, ☐ Manual (850 bytes)
- Tunnel Failover:** ☒ OFF
- Keep Alive Interval:** 10 (range 1-255)
- Keep Alive Retry:** 6 (range 0-20)

At the bottom right, there are **OK** and **Cancel** buttons.

4. Type a name for the profile in the **Name** box.

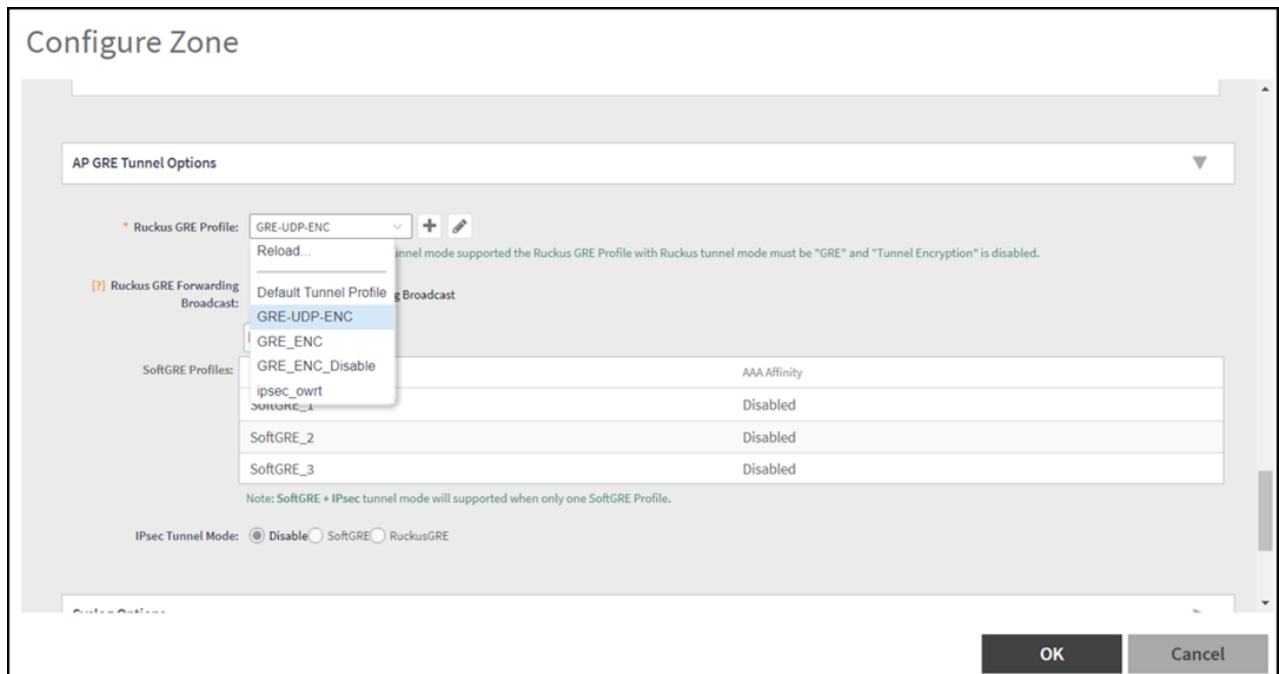
5. Type a description for the profile in the **Description** box.
6. Select a protocol to use for tunneling WLAN traffic back to the data plane by choosing one of the following after clicking the drop-down arrow in the **Ruckus Tunnel Mode** box:
 - **GRE + UDP**—Select this option to allow APs behind a NAT server to tunnel WLAN traffic back to the data plane.
 - **GRE**—Select this option to tunnel regular WLAN traffic only.
7. To allow managed APs to decrypt 802.11 packets, and then use an AES encrypted tunnel to send them to the data plane. Select one of the **Tunnel Encryption** options:
 - Click the **Disable** radio button to allow only the management traffic to be encrypted; data traffic is unencrypted. This is the default option.
 - Click the **AES 128** radio button to use an AES 128-byte encryption tunnel.
 - Click the **AES 256** radio button to use an AES 256-byte encryption tunnel.

MTU is the size of the largest protocol data unit that can be passed on the controller network.

8. Set the maximum transmission unit (MTU) for the tunnel using one of the **Tunnel MTU** options:
 - Click the **Auto** radio button. This is the default option.
 - Click the **Manual** radio button and enter the maximum number of bytes. For IPv4 traffic the range is from 850-1500 bytes, for IPv6 traffic the range is from 1384 to 1500 bytes.
9. Set the Tunnel failover option to either OFF or On. By default it is in OFF mode.
10. Enter the **Keep Alive Interval** value. By default the interval value is 10 and the range is between 1-255.
11. Enter the **Keep Alive Retry** value. By default the retry value is 06 and the range is between 0-20.
12. Click **OK**.

Using the created GRE profile in an AP Zone and WLAN


13. From the main menu go to **Network > Wireless > Access Points > Zone** profile to use the created GRE profile.
 14. Select the GRE profile from the drop down list. Enable or disable the RUCKUS GRE forwarding broadcast. By default the option is turned OFF. Select the SoftGRE profiles and IPsec Tunnel Mode.
- Figure 2.** Applying the Ruckus GRE Profile



15. From the main menu go to **Network > Wireless LANs > WLAN** profile to use the created GRE profile.

16. Another option is navigate to the Zone level configuration and find **AP GRE Tunnel**.



17. Click  to create a new profile.

18. Go to the required WLAN to use the GRE profile.

SoftGRE Failback Trigger

The SoftGRE Failback Timer allows Access Points (APs) to automatically revert from a secondary to a primary gateway after a specified period. The SoftGRE Failback Timer is designed to enhance the reliability and efficiency of network operations.

Feature Overview

When the primary gateway for SoftGRE tunnels experiences an outage, APs seamlessly transition to a secondary SoftGRE tunnel for continued operation. However, reverting APs to the primary gateway once it is restored can be challenging without automation. This feature introduces a configurable timer that automates this process, ensuring APs return to the primary gateway after it has been reachable for a set duration.

You can configure the timer between 60 and 1440 minutes, with a default setting of 60 minutes. You can enable or disable this feature through a toggle button labeled “Gateway Failback Trigger” on the controller interface.

 **Note:** By default, the Gateway Failback Trigger option is disabled.

Requirements

To implement this feature ensure the following requirements are met.

- The feature is supported in release 6.1.2 and in all subsequent releases of 7.1.
- You must configure a secondary gateway to ensure seamless failover and failback operations.

Considerations

The following considerations must be taken into account:

- The Gateway Failback Trigger and AAA Affinity features cannot be enabled simultaneously.
- Ensure the primary gateway is stable and reliable before setting a short failback timer.
- Monitor the network performance to determine the optimal timer setting for your environment.

Best Practices

Here are some best practices to ensure the smooth functioning of this feature:

- Start with the default timer setting of 60 minutes, and adjust it as needed based on network performance and stability.
- Regularly update the firmware to maintain compatibility and access the latest features.

Prerequisites

Consider the following prerequisites before you start using the feature.

- Ensure all APs and controllers are running the compatible firmware versions.
- Configure the primary and secondary SoftGRE tunnels correctly before enabling the failback feature.

Creating a SoftGRE Profile

You can configure a SoftGRE tunnel profile that, when applied at the network level for a venue, directs all encapsulated data traffic to a third-party, centralized gateway.

Complete the following steps to create a SoftGRE tunnel profile:

1. From the main menu, click **Services > Tunnels and Ports > SoftGRE**.
2. Click **Create**.
The **Create SoftGRE Profile** page is displayed.

Figure 1. Creating SoftGRE Profile

Create SoftGRE Profile

* Name:

Description:

Gateway IP Mode: ☒ IPv4 ☐ IPv6

* Primary Gateway Address:

Secondary Gateway Address:

Gateway Path MTU: ☒ Auto ☐ Manual bytes (IPv4:850-9018, IPv6:1384-9018)
Please check Ethernet MTU on AP, Tunnel MTU gets applied only if its less than Ethernet MTU.

Gateway Failback Trigger: ☒ ON ☐ Secondary to Primary Gateway timer minutes (60-1440)
Gateway Failback Trigger and AAA Affinity cannot be enabled simultaneously.

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

* ICMP Keep Alive Retry: (2-20)


Force Disassociate Client: ☒ OFF When AP fails over to another tunnel.

OK **Cancel**

Configure the following parameters.

3. **Profile Name:** Enter a name for the profile.
4. **Description:** (Optional) Enter the description for the SoftGRE profile.

5. **Gateway IP Mode:** Select either **IPv4** or **IPv6** option as the addressing mode.
6. **Primary Gateway Address:** Enter the IP address or fully qualified domain name (FQDN) of the primary gateway server.
7. **Secondary Gateway Address:** Enter the IP address or fully qualified domain name (FQDN) of the secondary gateway server.


 **Note:** If the controller cannot reach the primary gateway server, it automatically connects to the secondary gateway at the IP address you specified.

8. **Gateway Path MTU:** Set the maximum transmission unit (MTU) for the gateway path. Select one of the following options:
 - **Auto:** This is the default option.
 - **Manual:** The transmission range is from 850 through 1500 bytes.
9. **Gateway Failback Trigger:** Toggle the switch to **ON** to allow the AP to automatically revert from the secondary gateway server to primary gateway server when the primary is restored. When enabled, the **Secondary to Primary Gateway Timer** text box becomes interactive, letting you set a timer between 60 and 1440 minutes; when the gateway address has been reachable for the configured amount of time, the AP reverts to the primary SoftGRE gateway.

 **Note:**

- The **Gateway Failback Trigger** and the **AAA Affinity** options cannot be enabled together.
- By default, the **Gateway Failback Trigger** option is disabled. The AP will continue using the secondary SoftGRE to which it failed over, even after the primary server is restored, until either the AP reboots or connectivity to the secondary SoftGRE is lost.
- By default, the **Secondary to Primary Gateway Timer** value is set to 60 minutes.

10. **ICMP Keep Alive Period (secs):** Enter the time interval in seconds.

 **Note:** The time interval refers to how often APs send a keep-alive message to the active third-party WLAN gateway. The range is 1 to 180 seconds, with a default value of 10 seconds.

11. **ICMP Keep Alive Retry:** Enter the number of keep-alive attempts.

- **Note:** Keep-alive attempts refer to the number of times APs wait for a response from the active third-party WLAN gateway before failing over to the standby gateway. The range is 2 to 10 attempts, with a default value of 5 attempts.

12. **Force Disassociate Client:** Enable this option to disassociate the client when the AP fails over to another tunnel.

- **Note:** You must select this option if you have enabled **AAA Affinity** while configuring the zone.

13. Click **OK**.

You have created the SoftGRE profile.

- **Note:** You can also edit, clone, and delete the profile by selecting the options **Configure**, **Clone**, and **Delete**, respectively, from the **SoftGRE** tab.

Troubleshooting through Spectrum Analysis

Interference between wireless devices is seen to increase dramatically due to the increase in the number of device used, and the availability of only three non-interfering channels in 802.11. This reduces the performance of the wireless network, therefore, it is important to monitor the spectrum usage in a particular area and efficiently allocate the spectrum as needed to wireless devices.

In addition, spectrum analysis provides the flexibility to troubleshoot issues remotely, identify sources of interferences within the network and allow administrators access to the RF health of the network environment.

APs which are put in spectrum-mode transmit data to the controller, which in turn displays the data in specturm-mode for analysis.

1. In the main menu, click **Monitor**. Select **Troubleshooting** from **Troubleshooting & Diagnostics** menu. This displays **Troubleshooting** window as shown in the below example.

Figure 1. Troubleshooting - Spectrum Analysis



2. In Type, select **Spectrum Analysis** from the drop-down menu.
3. In AP MAC Address, select the AP that needs to be in the spectrum analysis-mode.
4. In Spectrum Capture, select the radio frequency values (2.4GHz or 5GHz) for the analysis from the **Radio** option.
The 2.4GHz band spans from 2400 - 2480 GHz and 5GHz band spans from 5.15 - 5.875 GHz.

You can select and view the spectrum analysis trends in these graphs:

- **Spectrum Usage:** This chart uses a color-based view to show collections of data points over time. As more data samples are measured at a specific frequency and amplitude coordinate, the color shown at that coordinate will change. If you choose to view colors by amplitude, the warm colors depict higher amplitude and cool colors lower amplitudes. If you view the colors by density, the warm colors depict a high number of samples at a given coordinate and cool colors show low number of samples at a given coordinate.
- **Real-Time FFT :** This chart is a second-by-second (2sec) update of measured data across the band. If you view by Amplitude (signal strength), then the chart displays both average and maximum amplitudes of energy measured across the band for that sample period. If you view by Utilization (duty cycle), then the chart displays the percentage (%) of time at which the frequency is utilized at an amplitude above N. The amplitude threshold is configurable but the default is -85dBm.
- **Swept Spectrogram:** This chart displays a waterfall of color over time, where each horizontal line in the waterfall represents one sample period (e.g. 2 seconds), and the full waterfall display spans 2 minutes of time (60 sample bins of 2sec each). There are two display options for the spectrogram chart:
 - **Amplitude:** Shows both average and maximum amplitude of energy measured across the band for that sample period.
 - **Utilization:** Shows the percentage of time at which the frequency is utilized at an amplitude above N. The amplitude threshold is configurable but the default is -85dBm.

5. After you select the parameters that you want to use to view the graphs, click **Start**.

6. Click **Stop** to terminate viewing spectrum analysis trends.

Troubleshooting and Diagnostics

Application Logs

DHCP & NAT

RADIUS Proxy

Application Logs

Application Logs

System Logs

Parent topic: [Troubleshooting and Diagnostics](#)

Application Logs

The controller generates logs for all the applications that are running on the server.

Viewing and Downloading Logs

Complete the following steps to view and download logs.

1. From the main menu, click **Monitor**.
2. Under **Troubleshooting & Diagnostics**, click **Application Logs**.
The **Application Logs** screen is displayed.
3. Select a control plane from the **Select Control Plane** dropdown list to view and download logs.
4. Select the **Log Type** and click **Download**. You can download the logs using the following options.

Table 1. Download Options

Options	Description
Download Logs	Downloads all logs for the selected application.
Download All Logs	Downloads all available logs from the controller. In your web browser's default download location, verify that the TGZ file was downloaded successfully. You must use your preferred compression/decompression program to extract the log files from the TGZ file. When the log

Options	Description
	files are extracted (for example, adminweb.log, cassandra.log, communicator.log, and so on), use a text editor to open and view the log contents.
Download Snapshot Logs	<p>Downloads snapshot logs that contain system and configuration information, such as the AP list, configurations settings, event list, communicator logs, SSH tunnel lists, and so on.</p> <p>If you triggered the controller to generate a snapshot from the CLI, you have the option to download snapshot logs from the web interface. In your web browser's default download folder, verify that the snapshot log file or files have been downloaded successfully. Extract the contents of the .tar file.</p>

Parent topic: [Application Logs](#)

System Logs

The controller generates logs for all the applications that are running on the server.

The following table lists the controller applications that are running.

Table 1. Controller Applications and Log Types for SZ300 and vSZ-H controller platforms

Application	Description
Cassandra	The controller database server that stores most of the run-time information and statistical data
Communicator	Communicates with access points and retrieves statuses, statistics, and configuration updates
Configurer	Performs configuration synchronization and cluster operations (for example, join, remove, upgrade, backup, and restore)
Diagnostics	An interface that can be used to upload RUCKUS scripts (.ksp files) for troubleshooting or applying software patches. This interface displays the diagnostic scripts and system patch scripts that are uploaded to a node.
EventReader	Receives event messages from access points and saves the information to the database

Application	Description
LogMgr	Organizes the application logs into a common format, segregates them, and copies them into the respective application log files
MdProxy	MdProxy on AP and controller connect to AP-MD and controller-MD respectively. MdProxy on controller receives messages and retrieves the message header. It also forwards the response to controller-MD. This message is sent to MdProxy on AP through AP-MD. MdProxy on AP removes the MSL header and responds to the connection on which the request was received.
MemCached	The controller 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
MsgDist	The message distributor (MD) maintains a list of communication points for both local applications and remote MDs to perform local and remote routing.
NginX	A web server that is used as a reserve proxy server or an HTTP cache
Northbound	As an interface between SP and AAA, performs UE authentication and handles approval or denial of UEs to APs
RadiusProxy	Sets the RADIUS dispatch rules and synchronizes configuration to each cluster node
Scheduler	Performs task scheduling and aggregates statistical data
SNMP	Provides a framework for the monitoring devices on a network. The SNMP manager is used to control and monitor the activities of network hosts using SNMP. As an agent that responds to queries from the SNMP Manager, SNMP Traps with relevant details are sent to the SNMP Manager when configured.
SubscriberManagement	Maintains local user credentials for WISPr authentication

Application	Description
SubscriberPortal	Internal portal page for WISPr (hotspot)
System	Collects and sends log information from all processes
Web	Runs the controller management web server

Table 2. Controller Applications and Log Types for SZ100 and vSZ-E controller platforms

Application	Description
API	The application program interface (API) provides an interface for customers to configure and monitor the system
CaptivePortal	Performs portal redirect for clients and manages the walled garden and blacklist
Cassandra	The controller database server that stores most of the run-time information and statistical data
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 scripts for performing troubleshooting or applying software patches
ElasticSearch	Scalable real-time search engine used in the controller
MemCached	The controller 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
Northbound	Performs UE authentication and handles approval or denial of UEs to APs
RadiusProxy	Sets the RADIUS dispatch rules and synchronizes configuration to each cluster node
SNMP	Provides a framework for the monitoring devices on a network. The SNMP manager is used to control and monitor the activities of network hosts using SNMP.

Application	Description
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 management web server

Parent topic: [Application Logs](#)

DHCP & NAT


[Viewing DHCP and NAT Information](#)

Parent topic: [Troubleshooting and Diagnostics](#)

Viewing DHCP and NAT Information


DHCP or NAT functionality on controller managed APs and DPs (data planes) allows customers to reduce costs and complexity by removing the need for DHCP server or NAT router to provide IP addresses to clients. For data traffic aggregation and services delivery, choose the appropriate user profile for DHCP and NAT services on the virtual controllers.

Complete the following steps to view DHCP servers and NAT router information.

 **Note:** You must be aware of the DHCP and NAT information of the controller to monitor the health of the controller.

1. From the main menu go to **Monitor > Troubleshooting&Diagnostics > DHCP&NAT** in High or Enterprise virtual controllers or **Monitor > Troubleshooting&Diagnostics > DHCP** in SZ300 or SZ100 controller platforms.
2. Select **DHCP** to monitor **DHCP Relay (DP)** of the data planes. It displays information pertaining to relay packets, server packets and the number of IP addresses assigned when **DHCP Relay** is enabled in **Core Network Tunnel > Bridge or L2oGRE**.


Figure 1. DHCP Relay

DHCP							
DHCP Relay(DP)							
							
Data Plane	DHCP Server IP	DISCOVER	OFFER	REQUEST	ACK	DHCP Option 82	DHCP Packets Dropped

The following options are seen on virtual controllers.


- From the main menu go to **Monitor > Troubleshooting&Diagnostics > DHCP&NAT > > DHCP (DP)** to monitor data planes. It displays information pertaining to data planes, status and other related information to data planes

Figure 2. DHCP DP

DHCP (DP)												
												
Data Plane	Status	DISCOVER	OFFER	REQUEST	NAK	ACK	RELEASE	INFORM	DECLINE	DROP	ERROR	
vdp611-4	Enabled	3	3	29	0	29	0	0	0	0	0	
vdp611-3	Enabled	55	55	3798	6	3792	11	0	0	0	0	

- Select **NAT (DP)** to monitor the NAT router information of the data planes. It displays information the server packets and the number of used ports.

Figure 3. NAT DP

NAT (DP)						
						
Data Plane	Status	Public VLAN	Num of Pools	Up Stream(kbps)	Down Stream(kbps)	
vdp611-4	Enabled	N/A	1	0	0	
vdp611-1	Enabled	N/A	1	0	0	
vdp611-3	Enabled	N/A	1	0	0	

3 records 1

Parent topic: [DHCP & NAT](#)

RADIUS Proxy

[Viewing RADIUS Proxy Settings](#)

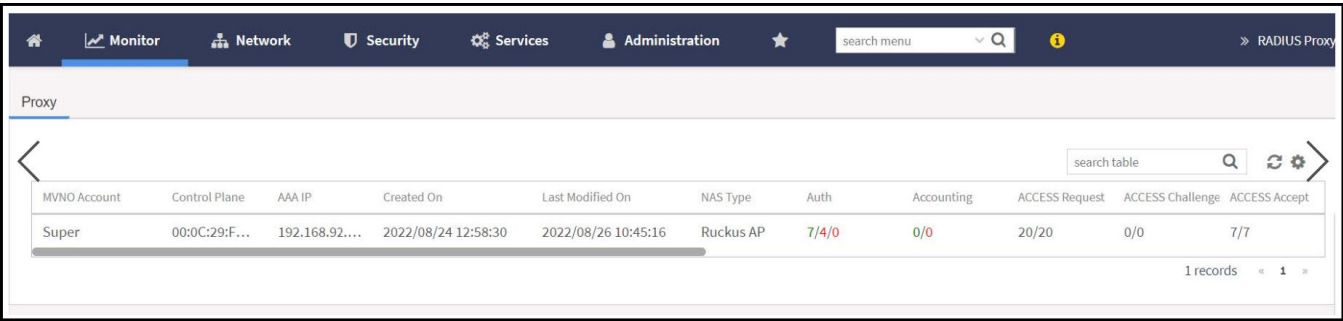
Parent topic: [Troubleshooting and Diagnostics](#)

Viewing RADIUS Proxy Settings

You must be aware of the RADIUS Proxy settings on the controller to monitor the health of the controller.

Go to **Monitor > Troubleshooting and Diagnostics > RADIUS Proxy**. The **Proxy** page appears displaying the RADIUS settings.

Figure 1. Diagnostics - RADIUS Proxy



MVNO Account	Control Plane	AAA IP	Created On	Last Modified On	NAS Type	Auth	Accounting	ACCESS Request	ACCESS Challenge	ACCESS Accept
Super	00:0C:29:F...	192.168.92....	2022/08/24 12:58:30	2022/08/26 10:45:16	Ruckus AP	7/4/0	0/0	20/20	0/0	7/7


Parent topic: [RADIUS Proxy](#)


Upgrade


Upgrading the Controller

Upgrading the Controller

RUCKUS 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 support website or released through authorized channels.

 **CAUTION:** Although the software upgrade process has been designed to preserve all controller settings, RUCKUS strongly recommends that you back up the controller cluster before performing an upgrade. Having a cluster backup will ensure that you can easily restore the controller system if the upgrade process fails for any reason.

 **CAUTION:** RUCKUS strongly recommends that you ensure that all interface cables are intact during the upgrade procedure.

 **CAUTION:** RUCKUS strongly recommends that you ensure that the power supply is not disrupted during the upgrade procedure.

Parent topic: [Upgrade](#)

Performing the Upgrade

RUCKUS strongly recommends backing up the controller cluster before performing the upgrade. If the system crashes for any reason, you can use the latest backup file to restore the controller cluster.

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.


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.

Before starting this procedure, you should have already obtained a valid controller software upgrade file from RUCKUS Support Team or an authorized reseller.

1. Copy the software upgrade file that you received from RUCKUS 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 > Administration > Upgrade**.


3. Select the **Upgrade** tab.

In Current System Information, the controller version information is displayed.

 **Note:** The **Upgrade History** tab displays information about previous cluster upgrades.

4. In Upload, select the **Run Pre-Upgrade Validations** check box to verify if the data migration was successful. This option allows you to verify data migration errors before performing the upgrade.
5. Click **Browse** to select the patch file.
6. Click **Upload** to upload the controller configuration to the one in the patch file.
The controller uploads the file to its database, and then performs file verification. After the file is verified, the **Patch for Pending Upgrade** section is populated with information about the upgrade file. If data migration was unsuccessful, the following error is displayed: Exception occurred during the validation of data migration. Please apply the system configuration backup and contact system administrator.
7. Click **Backup & Upgrade** to perform the upgrade. The backup operation is done before the system upgrade flow starts. The backup file will be used to restore cluster automatically while the upgrade process fails. Refer to [Creating a Cluster Backup](#) for more information.

When the forced backup-and-upgrade process is complete, the controller logs you off the web interface automatically. When the controller log on page appears again, you have completed upgrading the controller. In the **Current System Information** section, check the value for controller version. If the firmware version is newer than the firmware version that controller was using before you started the upgrade process, then the upgrade process was completed successfully.

 **Note:** APs periodically send scheduled configuration requests to the controller, including the firmware version. Therefore, when an AP joins a zone for the first time, the firmware version is verified by the controller. If the firmware version is different from that which is configured for the zone, the controller responds with a request to upgrade it, after which the AP initiates a request to upgrade the firmware using HTTP.

Parent topic: [Upgrading the Controller](#)

Uploading an AP Patch File

New AP models and firmware updates are supported without the need to upgrade the controller image by using the AP patch files supplied by RUCKUS.

1. Go to **Administration > Administration > Upgrade**.
2. Select the **AP Patch** tab.
3. In Patch File Upload, click **Browse** to select the patch file (with extension .patch).

4. Click **Open**.
5. Click **Upload**. The upload status bar is displayed, and after the patch file is uploaded, the section is populated with the patch filename, size, firmware version, and supporting AP models.
6. Click **Apply Patch**. The apply patch status bar is displayed.

After the patch file is updated, you will be prompted to log out.

When you login again, the **AP Patch History** section displays information about the patch file such as start time, AP firmware and model.


You have successfully updated the AP models and AP firmware with the patch file, without having to upgrade the controller software.

Parent topic: [Upgrading the Controller](#)

Verifying the Upgrade

You can verify that the controller upgrade was completed successfully.

1. Go to **Administration > Administration > Upgrade**.
2. In the **Current System Information** section, check the value for Controller Version. If the firmware version is newer than the firmware version that controller was using before you started the upgrade process, then the upgrade process was completed successfully.

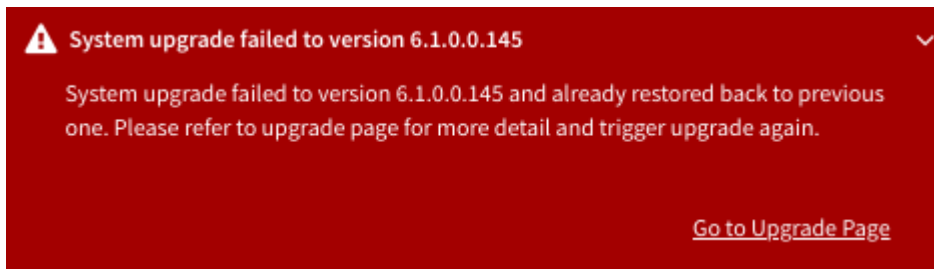
 **Note:** APs periodically send scheduled configuration requests to the controller, including the firmware version. Therefore, when an AP joins a zone for the first time, the firmware version is verified by the controller. If the firmware version is different from that which is configured for the zone, the controller responds with a request to upgrade it, after which the AP initiates a request to upgrade the firmware using HTTP.

Parent topic: [Upgrading the Controller](#)

Verifying Upgrade Failure and Restoring Cluster

When the restore operation is complete and user log in the dashboard again, the following Global Warning message is displayed stating that the system upgrade failed and has been restored to the previous version.

Figure 1. Global Warning Message



Note: Click the **Go to Upgrade Page** link to initiate the **Backup & Upgrade** process again.

For more information on system restore:

1. Go to **Administration > Administration > Upgrade**.

The **Upgrade History** lists the information of upgrade success or upgrade failure with restore operation.

Figure 2. Upgrade History Table

Upgrade History						
System upgrade failed to version 6.1.0.0.145 and already restored back to previous one.						
You could click the button to ignore related warning message. <input checked="" type="checkbox"/> Ignore						
Start Time	State	System Version	Control Plane Software Version	AP Firmware Version	Path File Name	Upgrade Elapsed
2021/03/22 16:14:16	Failed And Restored	6.0.0.0.1025->6.1.0.0.145	6.0.0.0.1025->6.1.0.0.126	6.0.0.0.1273->6.1.0.0.145	vscg-6.1.0.0.145.ximg	16m 56s
2021/03/22 15:23:33	Successful	6.0.0.0.1025	6.0.0.0.1025	6.0.0.0.1273	Fresh Installation	16m 6s
2 records 1						

2. To avoid the global warning message to keep appearing on the window, click **Ignore**.

Parent topic: [Upgrading the Controller](#)

Rolling Back to a Previous Software Version

There are scenarios in which you may want to roll back the controller software to a previous version.

Here are two:

- 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 command. If you have a two nodes controller cluster, run the restore command on one of the nodes to restore them to the previous software before attempting to upgrade them again. The restore command will trigger restore action on all nodes of the cluster if all nodes could be connected to each other. Confirm if each node can be restored back to the previous version. If any node does not roll back to the previous version, execute the restore command again on the failure node.
- 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 controller 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 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 [Creating 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.

Parent topic: [Upgrading the Controller](#)

Upgrading the Data Plane

You can view and upgrade the virtual data plane version using patch files. This feature is applicable only for virtual platforms.

Upgrading vSZ-D

vSZ support APs starting version 3.4. You must first upgrade vSZ before upgrading vSZ-D, because only a new vSZ can handle an old vSZ-D. There is no order in upgrading the AP zone or vSZ-D. During the vSZ upgrade, all tunnels stay up except the main tunnel which moves to the vSZ. Once the upgrade procedure is completed, allow ten minutes for the vSZ-D to settle.

Upgrade to R5.0 does not support data migration (statistics, events, administrator logs). Only the existing system and the network configuration is preserved. For more information, contact Ruckus support.

Upgrading SZ100-D

SZ100-D is shipped with 3.6.1 release version and you must upgrade it to 5.1 release version. As vSZ manages SZ100-D, ensure that vSZ has the same or later version than SZ100-D. Otherwise, upgrade vSZ before upgrading SZ100-D. SmartZone release 5.1.1 supports SZ100-D. For more information, refer to the Ruckus SmartZone100-D Quick Setup Guide.

To Upgrade the Data Plane:

1. Go to **Administration > Administration > Upgrade**.
2. Select the **DP Patch** tab.
The **DP Patch** page appears.

Figure 1. DP Patch - Data Plane Upgrade

The screenshot shows the 'DP Patch - Data Plane Upgrade' interface. At the top, there are tabs for 'vSZ-D' and 'SZ-D'. Below the tabs, there is a section titled 'Patch Available for Upgrade' which displays the following information:

- Patch File Name: sz100d-installer_5.1.0.0.299.img
- Patch File Size: 220.1MB
- Patch Version: 5.1.0.0.299

Below this section is a 'Data Planes' section. It contains a table with the following columns: Name, DP MAC Address, Current Firmware, Backup Firmware, Last Backup Time, Process State, and DP Status. The table lists one data plane, 'SZ100-D', with a 'Managed' status.

Name	DP MAC Address	Current Firmware	Backup Firmware	Last Backup Time	Process State	DP Status
SZ100-D	94:F6:65:2A:49:40	5.1.0.0.297	5.1.0.0.297	2018-08-08 14:54:17	Backup completed	Managed

3. In **Patch File Upload**, click **Browse** to select the patch file (.ximg file).
4. Click **Upload**. The patch files is uploaded.

The controller automatically identifies the Type of DP (vSZ-D or SZ-D) and switches to the specific Tab page. Uploads the file to its database, and then performs file verification. After the file is verified, the **Patch for Pending Upgrade** section is populated with information about the upgrade file.

The following details are displayed:

- Patch File Name: Displays the name of the patch file.
 - Patch File Size: Displays the size of the patch file.
 - Patch Version: Displays the version of the patch file.
5. In **Data Planes**, identify the data plane you want to upgrade, and then choose a patch file version from **Select upgrade version**.
 6. Click **Apply** to apply the patch file version to the virtual data plane.
The following information about the virtual data plane is displayed after the patch file upgrade is completed.
 - Name: Displays the name of the virtual data plane.
 - DP MAC Address: Displays the MAC IP address of the data plane.
 - Current Firmware: Displays the current version of the data plane that has been upgraded.
 - Backup Firmware: Displays the backup version of the data plane.

- Last Backup Time: Displays the date and time of last backup.
- Process State: Displays the completion state of the patch file upgrade for the virtual data plane.
- DP Status: Displays the DP status.

You have successfully upgraded the virtual data plane.

Note: To have a copy of the data plane firmware or move back to the older version, you can select the data plane from the list and click **Backup** or **Restore** respectively.

Parent topic: [Upgrading the Controller](#)

Uploading the Switch Firmware to the Controller

You can upload the latest available firmware to a switch from the controller, thereby upgrading the firmware version of the switch.

1. Select **Administration > Administration > Upgrade**.
2. Select the **Switch Firmware** tab.

Figure 1. Upgrading the Switch Firmware

The screenshot shows the 'Switch Firmware' tab in the 'Upgrade' section. It includes a 'Firmware Upload' section with a text input field and a 'Browse' button. Below this is an 'Upload' button. The 'Uploaded Switch Firmwares' section contains a table with two rows of firmware versions and their supported models. A 'Delete' button and a search bar are also visible.

Firmware Version	Models Supported
B207	ICX7150, ICX7750, ICX7650, ICX7250, ICX7450
B208	ICX7150, ICX7750, ICX7650, ICX7250, ICX7450

3. In Firmware Upload click **Browse** to select the firmware file for upgrading the switch.
4. Click **Open**.
5. Click **Upload**. The upload status bar is displayed, and after the firmware file is uploaded, the **Uploaded Switch Firmwares** section is populated with the firmware version and switch models it supports.

You have successfully uploaded the switch firmware to the controller.

Parent topic: [Upgrading the Controller](#)

Scheduling a Firmware Upgrade for Selected Switches


You can upgrade or downgrade the firmware version of a switch or multiple switches that you are monitoring. You can upgrade the firmware on demand or schedule a firmware update for a list of selected switches.

Prerequisites

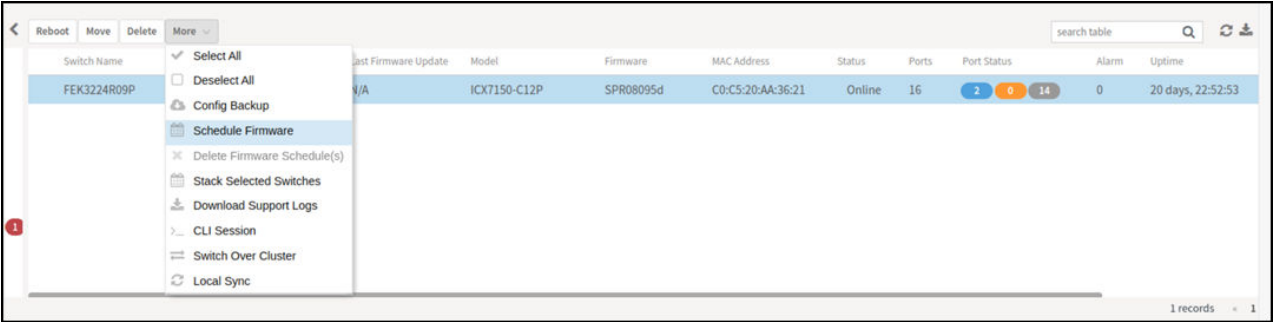
- Upload a valid FastIron firmware version (newer than version 8.0.80) to the controller.
- Sync the controller with the NTP server. On the controller user interface, navigate to **Administration > System > Time** then click **Sync Server**.

Scheduling Firmware Upgrade

1. From the main menu, click **Network > Wired > Switches**.
The **Switches** page is displayed.
2. Select a **Domain > Switch Group** or specific **Switch Group** and select the **Switch** that you want to upgrade.

 **Note:** To upgrade the firmware for multiple switches simultaneously, hold down the **Ctrl** key as you select the desired switches.

3. Click **More > Schedule Firmware**.
- Figure 1.** Selecting Schedule Firmware



The **Upgrade Firmware** dialog box is displayed.

Figure 2. Scheduling Firmware Upgrade

Upgrade Firmware (Group)

* Only firmwares compatible will be shown in the dropdown. Each device will be upgraded based on its current firmware type.

Uploaded Firmwares: FI09010d v

Apply Firmware: ☐ Now ☒ Later

* Schedule Firmware: 📅 !

Note: Schedule will be executed

Warning: Make sure firmware upgrade is scheduled during off-peak hours. Automatic config-backup [run at 02:00] will be performed before the upgrade.

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S	M	T	W	T	F	S
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	1	2	3	4
5	6	7	8	9	10	11

Time:

14

↕

18

↕

Now
OK

Cancel

4. Complete the following fields:

- **Uploaded Firmwares:** Select the firmware version that you want the switch to be upgraded to.
- **Firmware Type:** Select type of firmware you want to upload to the switch. Options include **Switch** and **Router** images.
- **Apply Firmware:** Set when you want to apply the new firmware version to the switch. You can select **Now** or **Later** to schedule your upgrade. If you select **Later**, then you must select the date and time from the **Schedule Firmware** field.



Figure 3. Scheduling Firmware Upgrade

Upgrade Firmware (Group)

* Only firmwares compatible will be shown in the dropdown. Each device will be upgraded based on its current firmware type.

Uploaded Firmwares:

Apply Firmware: ☐ Now ☒ Later

* Schedule Firmware:  

Note: Schedule will be executed

Warning: Make sure firmware upgrade is scheduled on-demand or automatic config-backup [run at selected switch(es)]

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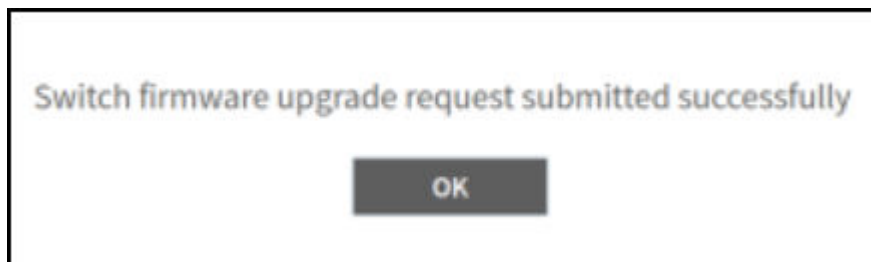
>

S	M	T	W	T	F	S
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	1	2	3	4
5	6	7	8	9	10	11

Time:

The switch upgrade request success message is displayed.

Figure 4. Switch Upgrade Request Success



- Click **OK**.
- To monitor the firmware upgrade progress, select the target switch and click the **Firmware History** tab. Hover your cursor over any message in the **Status** field for a tooltip providing additional information regarding that stage of the upgrade process.

The images of six stages of completion along with their tooltips are shown below.

Figure 5. Preparing Phase with Tooltip

LLDP Neighbors Wired Clients Firmware History Troubleshooting			
search table <input type="text"/>			
Firmware Version	Image Name	Status	Failure Reason
FI08095d	SPR08095dufi	Preparing Phase	N/A
			1 records 1

Figure 6. Backup Image Start with Tooltip

LLDP Neighbors Wired Clients Firmware History Troubleshooting			
search table <input type="text"/>			
Firmware Version	Image Name	Status	Failure Reason
FI08095d	SPR08095dufi	Backup image start	N/A
			1 records 1

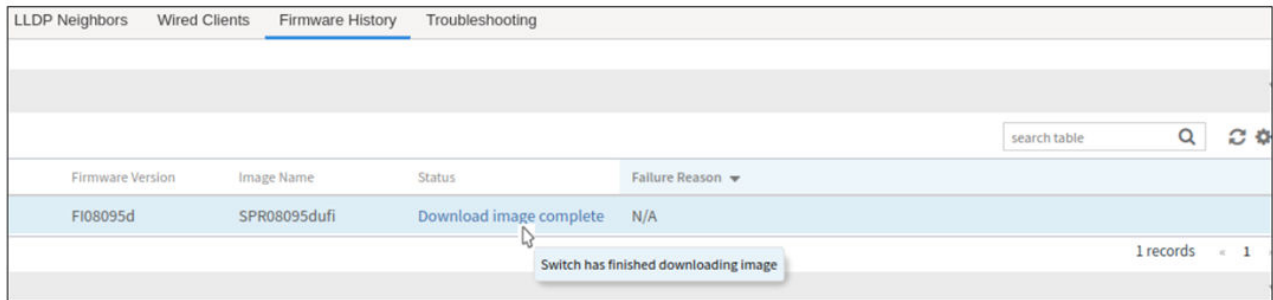
Figure 7. Backup Image Complete with Tooltip

LLDP Neighbors Wired Clients Firmware History Troubleshooting			
search table <input type="text"/>			
Firmware Version	Image Name	Status	Failure Reason
FI08095d	SPR08095dufi	Backup image complete	N/A
			1 records

Figure 8. Download Image Start with Tooltip

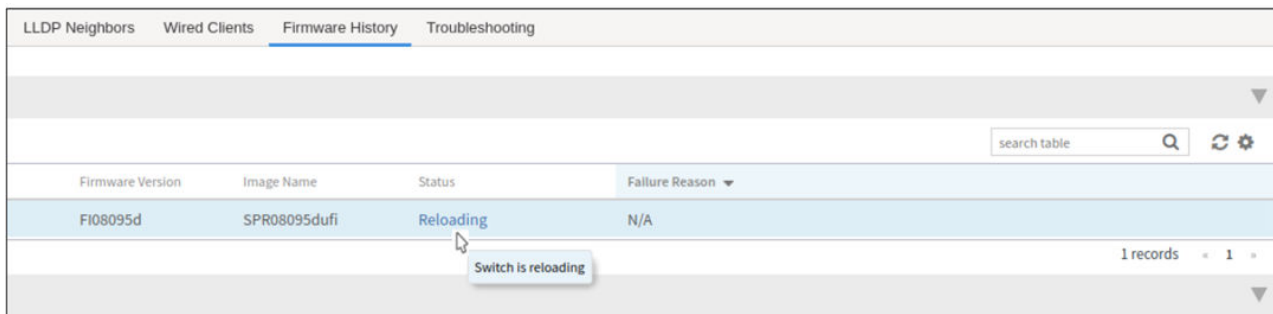
LLDP Neighbors Wired Clients Firmware History Troubleshooting			
search table <input type="text"/>			
Firmware Version	Image Name	Status	Failure Reason
FI08095d	SPR08095dufi	Download image start	N/A
			1 records

Figure 9. Download Image Complete with Tooltip



LLDP Neighbors Wired Clients Firmware History Troubleshooting			
search table 🔍 ⌂ ⚙️			
Firmware Version	Image Name	Status	Failure Reason ▼
F108095d	SPR08095dufi	Download image complete	N/A
1 records 1			

Figure 10. Reloading phase with tooltip




LLDP Neighbors Wired Clients Firmware History Troubleshooting			
search table 🔍 ⌂ ⚙️			
Firmware Version	Image Name	Status	Failure Reason ▼
F108095d	SPR08095dufi	Reloading	N/A
1 records 1			

Parent topic: [Upgrading the Controller](#)

Scheduling a Firmware Upgrade for Switch Group

You can upgrade a switch group on a Level 1 group that has no default firmware setting. The forced upgrade allows the device to remain in the same firmware type (Layer 2 still Layer 2, Layer 3 still Layer 3) with only a change to the version type.

 **Note:** If the switch group has a default firmware selected the **Firmware Upgrade** option is unavailable.

 **Note:**

Beginning with FastIron release 10.0.0, a switch ("Layer 2") image will no longer be provided for ICX devices. Only the router ("Layer 3") image will be available. On Upgradeto FastIron 10.0.00, the configuration of any ICX devices operating with the switch image will automatically be translated to the equivalent router image configuration.The target upgrade to 10.0.0 supports only router code.

The following features are deprecated as a result of this change:

- The IP default gateway
- The management VLAN
- Global configuration of the IP address (Going forward, the IP address must be configured at the interface level for each port.)

Refer to the RUCKUS FastIron Software Upgrade Guide for additional details.

Complete the following steps to perform a firmware upgrade on the switch group.

- 1. On the menu, click **Network > Wired > Switches** to display the **Switches** window.
- 2. In the **Organization** tab, select a **Domain > Switch Group** or **Switch Group**.
- 3. Click **More > Firmware Upgrade** to display the **Upgrade Firmware (Group)** dialog box.

Figure 1. Selecting Firmware Upgrade for a Switch Group

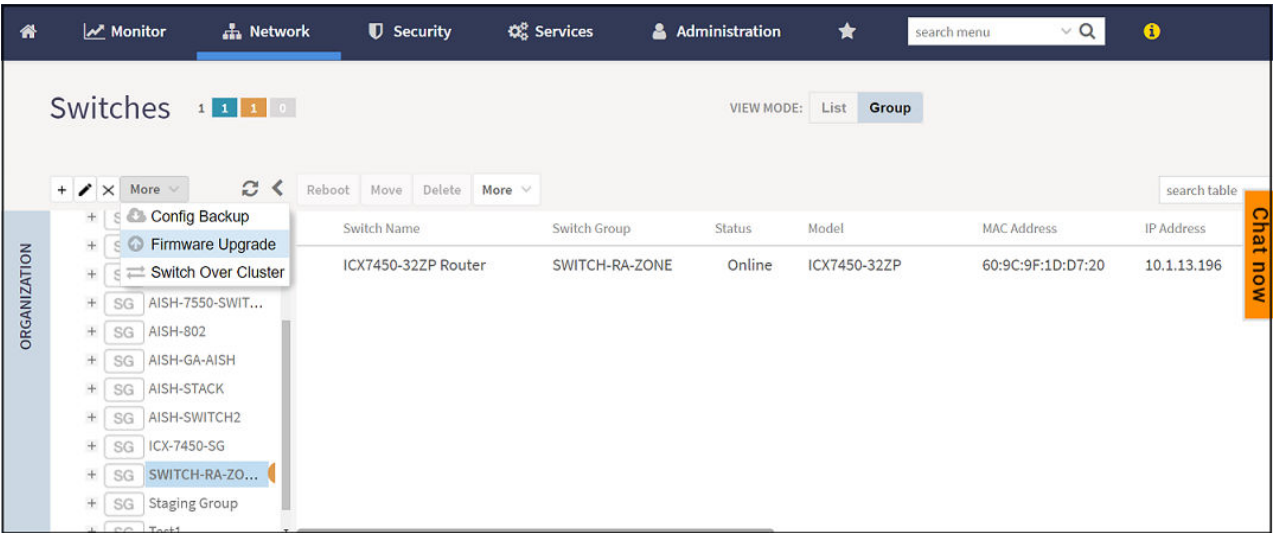


Figure 2. Scheduling the Upgrade for a Switch Group

Upgrade Firmware (Group)

* Only firmwares compatible will be shown in the dropdown. Each device will be upgraded based on its current firmware type.

Uploaded Firmwares: FI09010d ▼

Apply Firmware: ☒ Now ☐ Later

Schedule Firmware: 📅

Note: Schedule will be executed based on local(browser) timezone.

Warning: Make sure firmware upgrade is not scheduled at same time when on-demand or automatic config-backup [run at 00:00 hours everyday] is scheduled for the selected switch(es)

OK
Cancel

4. Complete the following fields:

- **Uploaded Firmwares:** Select firmware from the list.
- **Apply Firmware:** Select **Now** or **Later** to set the new firmware version to the switch group.
- **Schedule Firmware:** If you select **Later** for **Apply Firmware**, you must select the date to schedule the upload.

5. Click **OK**.

Parent topic: [Upgrading the Controller](#)

Cautions & Limitations of Administrating a Cluster

[Wipeout Upgrade](#)

[Cluster Upgrade](#)

Parent topic: [Upgrading the Controller](#)

Wipeout Upgrade

Wipe-out upgrade can be done to a controller firmware running

- a version later than 5.1 to a version later than 5.1
- a version earlier than 5.1 by applying a KSP patch to make the wipe-out upgrade successful.

Contact Ruckus support to receive a KSP patch file to patch from CLI.

Parent topic: [Cautions & Limitations of Administrating a Cluster](#)

Cluster Upgrade

For issues during software upgrade, you can only perform the software rollback from the CLI using the restore command. If you have a two nodes controller cluster, run the restore command on one of the nodes to restore them to the previous software before attempting to upgrade them again. The restore command will trigger restore action on all nodes of the cluster if all nodes could be connected to each other. Confirm if each node could be restored back to the previous version. If any node does not roll back to previous version, execute the restore command again on the failure node. Refer [Rolling Back to a Previous Software Version](#).

Parent topic: [Cautions & Limitations of Administrating a Cluster](#)

ZD Migration

ZoneDirector to SmartZone Migration

ZoneDirector to SmartZone Migration


SmartZone controllers are better equipped to handle large WiFi deployments such as within campuses and when customers are vastly distributed; therefore, RUCKUS recommends that you migrate existing ZoneDirector deployments to SmartZone controller deployments. You can migrate ZoneDirector AP configuration information to SmartZone controllers from the controller itself, using a migration tool.

The AP models should be supported by the controller.

 **Note:** Not more than 50 AP's will be migrated from Zone Director to Smart Zone.

Table 1. Migration Support Matrix


SmartZone Version	ZoneDirector Version
3.5.x	9.13x
3.6.x	9.13.x, 10.0.x, 10.1.x
5.0.x	9.13.x, 10.0.x, 10.1.x
5.1.x	9.13.x, 10.0.x, 10.1.x, 10.2.x
5.2.x	9.13.x, 10.0.x, 10.1.x, 10.2.x, 10.3.x, 10.4.x
6.x	9.13.x, 10.0.x, 10.1.x, 10.2.x, 10.3.x, 10.4.x, 10.5.x

 **CAUTION:** Do not power off the AP during the migration process.

1. Go to **Administration > Administration > ZD Migration**.
The **ZoneDirector Migration** page appears.
2. Configure the following:
 - a. ZoneDirector IP Address: Type the IP address of the ZD that you want to migrate.
 - b. Admin Credentials: Enter the username and password details to access/login to ZD.
 - c. Click **Connect**. Lists of APs connected to the ZD deployment are displayed.

- d. Click **Select AP** to choose the AP information that you want to migrate from ZD.
- e. Click **Migrate** to migrate the AP. The controller imports the ZD configuration and applies it to the selected AP.

The **ZoneDirector Migration Status** section displays the status of the migration. When completed successfully, a success message is displayed. If migration fails, a failure message is displayed and you can attempt the migration process again.

 **Note:** To migrate ZoneDirector Mesh APs to SmartZone, upgrade ZoneDirector to its supported version. For information on the supported versions, refer to the release notes.

Parent topic: [ZD Migration](#)



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