

# RUCKUS SmartZone Upgrade Guide, 6.1.0

**Supporting SmartZone 6.1.0**

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# Preface

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## 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 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.commscope.com/ruckus> 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 **Open 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 **Open a Case** section.
- Priority 3 (P3)—Medium. Network or service is moderately impacted, but most business remains functional. Go to the **Self-Service Resources** section.
- Priority 4 (P4)—Low. Requests for information, product documentation, or product enhancements. Go to the **Self-Service Resources** section.

### 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://forums.ruckuswireless.com/>
- Knowledge Base Articles—<https://support.ruckuswireless.com/answers>
- Software Downloads and Release Notes—[https://support.ruckuswireless.com/#products\\_grid](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 TAC with additional data from your troubleshooting analysis if you still require assistance through a support case or RMA. If you still require help, open and manage your case at [https://support.ruckuswireless.com/case\\_management](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](mailto:#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.commscope.com/ruckus>.

## 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](#). You 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	<code>device(config)# interface ethernet 1/1/6</code>
<b>bold</b>	User interface (UI) components such as screen or page names, keyboard keys, software buttons, and field names	On the <b>Start</b> menu, click <b>All Programs</b> .
<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
<b>bold text</b>	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, <i>member[member...]</i> .
\	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.





# New In This Document

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**TABLE 2** Key Features and Enhancements in SmartZone 6.1.0 (December 2021)

Feature	Description	Reference
Upgrade information	<b>Updated:</b> Supported SmartZone release for upgrade.	<ul style="list-style-type: none"><li>• <a href="#">Before Upgrading to This Release</a> on page 11</li><li>• <a href="#">SmartZone Upgrade Paths</a> on page 15</li></ul>
Resource table	<b>Updated:</b> Resources specific to SmartZone 6.1.0 release.	<ul style="list-style-type: none"><li>• <a href="#">Virtual SmartZone Minimum Requirements</a> on page 17</li><li>• <a href="#">Supported Hypervisors</a> on page 22</li><li>• <a href="#">Maximum Supported AP and Switch Management</a> on page 25</li></ul>
Firmware support	<b>Updated:</b> AP firmware releases that the controller retains.	<a href="#">Multiple AP Firmware Support in the SZ100/vSZ-E/SZ300/vSZ-H</a> on page 39
SZ6.1.0 new UI	<b>Updated:</b> New UI path and images updated.	<ul style="list-style-type: none"><li>• <a href="#">Performing the Upgrade</a> on page 29</li><li>• <a href="#">Verifying the Upgrade</a> on page 31</li><li>• <a href="#">Uploading an AP Firmware Bundle</a> on page 35</li><li>• <a href="#">Upgrading the Data Plane</a> on page 35</li></ul>



# Before Upgrading to This Release

Due to underlying changes of the database in this release, data will be dropped during the upgrade. It is recommended that you read the following content carefully before upgrading to this release.

## IMPORTANT

Upgrade from SmartZone (SZ) R5.2.0, R5.2.1, R5.2.2, R6.0.0 to R6.1.0 is supported.



## CAUTION

Data migration is not supported if system upgrades from release 3.6.x. Existing system and network configuration is preserved, but data such as status and statistics, alarms or events, administrator logs, and mesh uplink history is not migrated to the new release. Contact RUCKUS support for concerns or additional clarifications. [SCG-73771]



## CAUTION

When SZ meets the following conditions before upgrading:

- Access & core separation feature is enabled
- UDI interface exists
- There are static routes for UDI interface

Then, after upgrading to release 6.1.0, static routes for the UDI interface will be placed in an incorrect routing table so these destinations will not be reachable. [ER-9597]

For assistance, contact RUCKUS support team using <https://support.ruckuswireless.com>.

SmartZone Release	System Upgrade directly to SZ 6.1.0
6.0.0	Y
5.2.2	Y
5.2.1	Y
5.2.0	Y

## NOTE

- Due to change in EAP supplicant timeout from default 12 seconds to 60 seconds (SCG-124967), client fails to get IP when RADIUS proxy switch to secondary server.

It is recommended to change the Radius Option values in WLAN before upgrading the SZ/AP to SZ6.1.

Following are values recommended under Radius option in WLAN configuration:

- NAS Request Timeout = 5
- NAS Max Number of Retries Retry = 6
- DP Zone Affinity is renamed to DP Group and DP Group is renamed as Internal DP Group. Please refer to the Admin Guide for DP Group details on this feature.
- It is recommended to upgrade the controller Virtual SmartZone (vSZ) before updating the data plane version because if the data plane version is higher than controller vSZ version then data plane cannot be managed by vSZ platform.

## Upgrading APs

Refer to the SmartZone R6.1.0 Release Notes for the updated release information.

## Dynamic Signature Package (Sigpack) Update

AP DPI feature uses an Application Signature Package that in general it can be optionally updated when a new version is available. Administrators or users can dynamically upgrade Sigpack from the RUCKUS support site.

For manual upgrade, follow below steps:

1. Download Signature package by visiting the RUCKUS support site:
  - Regular Sigpack only for controller release 6.1.0: <https://support.ruckuswireless.com/software/3156-smartzone-6-1-0-0-675-sigpack-1-540-1-regular-application-signature-package>
  - Non-Regular Sigpack for controller release 6.1.0 and older releases: <https://support.ruckuswireless.com/software/3157-smartzone-6-1-0-0-675-sigpack-1-540-1-application-signature-package>
2. Manually upgrade the signature package by navigating to **Security > Application Control > Application Signature package**.

### NOTE

More details can be found in Administrator Guide, in section *Working with Application Signature Package*

If 802.11ac Wave 1 APs are on legacy firmware (AP firmware prior to R6.1.0 release), you cannot download the current Sigpack version 1-540-1 regular Sigpack but can download the current non-regular Sigpack. If 802.11ac Wave 1 APs are on R6.1 firmware, clients can download both 1-540-1 regular and non regular signature packs. [SCG-123375]

### NOTE

As R5.1.x to R6.1.0 release upgrade is not supported, RUCKUS does not have any signature-package upgrade restrictions during zone upgrade.

## Upgrading ICX Switches

RUCKUS ICX switches starting from 08.0.90 releases supports unified images which require two step process from prior releases. The two step process is:

1. **Step 1** - Upgrade from **08.0.80 (non- Unified FastIron Image (UFI) or UFI) > 08.0.90 UFI**
2. **Step 2** - Upgrade from **08.0.90 UFI > 08.0.90a UFI**

### NOTE

Refer to RUCKUS FastIron Software Upgrade Guide, 08.0.90 for details.

Ensure that the image version in both primary and secondary partition use 8.0.80 or later version.

## Data Migration Recommendations

If you need to preserve your data or reports, consider the following recommended options before upgrading:

- Leverage an existing SCI platform to send statistics and reports to SCI before the upgrade.

### NOTE

SCI comes with a free 90-day evaluation.

- Backup and export existing statistics and reports using Export tools or Streaming API before the upgrade.

# Upgrade Considerations

Before upgrading, consider these additional points.

- Before uploading a new AP patch, RUCKUS strongly recommends that you save a cluster backup, in case you want to restore the previous AP patch.
- Before upgrading the controller, RUCKUS strongly recommends that you back up the entire cluster. In case the upgrade fails, you can use the cluster backup to roll back the cluster to its previous state.
- When upgrading vSZ-E/vSZ-H, if the memory/CPU allocation of the current VM instance does not match the lowest resource level of the new VM instance to which the new vSZ-E/vSZ-H version will be installed, you will lose the capacity for APs. On the other hand, if the new VM instance has insufficient hard disk space, a warning message appears after you upload the upgrade image, but you will still be able to perform the upgrade.



## **WARNING**

LAG users must go through the following process before upgrade to avoid losing IP connectivity:

1. Disable secondary port of the LAG in the AP.
2. Disable Bonding on the AP using AP CLI.
3. Upgrade the AP Zone.
4. Enable LAG using controller GUI.
5. Enable secondary port on the AP.
6. Disable the secondary port from the switch.



# SmartZone Upgrade Paths

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Before you upgrade the controller, verify that it is running a release build that can be upgraded to this release.

To help ensure that the cluster firmware upgrade process can be completed successfully, the cluster interfaces of all nodes must be connected and up. [SCG-34801]

**TABLE 3** Previous release builds

Platform	Release Build
SZ300	5.2.0 > 6.1.0, 5.2.1 > 6.1.0, 5.2.2 > 6.1.0 or 6.0.0 > 6.1.0
SZ100	5.2.0 > 6.1.0, 5.2.1 > 6.1.0, 5.2.2 > 6.1.0 or 6.0.0 > 6.1.0
vSZ	5.2.0 > 6.1.0, 5.2.1 > 6.1.0, 5.2.2 > 6.1.0 or 6.0.0 > 6.1.0
vSZ-D	5.2.0 > 6.1.0, 5.2.1 > 6.1.0, 5.2.2 > 6.1.0 or 6.0.0 > 6.1.0
SZ100-D	5.2.0 > 6.1.0, 5.2.1 > 6.1.0, 5.2.2 > 6.1.0 or 6.0.0 > 6.1.0

If you are running an earlier version, you must first upgrade to appropriate version for your model, as shown in the above list, before upgrading to this release.





# Virtual SmartZone Minimum Requirements

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## Virtual SmartZone Minimum Requirements

### NOTE

One or more resources can be higher than the specified requirements. For example, if the instance requires 24Gb RAM, assigning 32Gb RAM is supported.

## Hypervisor Hardware Performance Requirements

vSZ requires enough hardware resources to sustain the service. vSZ cannot support deployment in low performance hypervisor.

- Sharing hardware server to multiple vSZ instances is not recommended.
- vSZ needs to be deployed on dedicated hardware resource to avoid different VM instance grabbing CPU or IO resources, which can impact vSZ stability in a hypervisor, especially in a scenario where thousands of APs per node are deployed.
- vSZ needs to reach both CPU and IO requirement. Measure the hypervisor hardware performance before deploying vSZ.
- Disks IO is most important in vSZ cluster. Disk IO is the slowest subsystem in a server, which means that write-heavy clusters can easily saturate their disks, which in turn become the bottleneck of the cluster. Avoid network-attached storage (NAS). People routinely claim their NAS solution is faster and more reliable than local drives. NAS is often slower, displays larger latencies with a wider deviation in average latency, and is a single point of failure.

## Hypervisor CPU/IO Requirements - Private Hypervisor

### CPU Performance Requirement

- CPU single core events per second/per core need > 180 events/sec
- Required CPU level is higher than the Intel Xeon CPU E5-4620 v4 with 2.10 GHz

### IO performance requirement detail

vSZ require high IO performance deploy environment. Measure the hypervisor IO performance before deployment. vSZ IO throughput requirements :

- IO requirement per resource level - Refer to the **Disk IO Requirement** column in the resource table.
- Avoid network-attached storage (NAS/SAN). The general claim is that the NAS/SAN solution is faster and more reliable than the local drives. NAS/SAN is often slower, displays larger latencies with a wider deviation in average latency, and is a single point of failure.
- Virtual Disk - Preallocated/Eager Zeroed/Fixed Size is required to provide good performance and low latency for IO. Avoid using "Thick Provision Lazy Zeroed/Dynamic Expanding" to impact IO performance. [\*].

### How to benchmark vSZ CPU/IO Performance

- The vSZ setup process will detect the IO performance at first setup step.
- Use the SZ CLI in **debug-tools > system > system performance**. The command will run system benchmark on CPU and IO for vSZ.

## Network Latency Requirement between vSZ nodes

A fast and reliable network is important for performance in a distributed system. Low latency helps ensure that nodes can communicate easily, while high bandwidth helps shared movement and recovery. Avoid clusters that span multiple data centers, even if the data centers are located in close proximity. It is highly recommended to avoid clusters that span large geographic distances.

vSZ requires low network latency between vSZ nodes on the control & cluster interface network. vSZ cannot support deployment in high network latency environment.

vSZ interface network latency between nodes: Cluster Interface network latency need < 60 ms.

Before upgrading vSZ to this release, verify that the virtual machine on which vSZ is installed has sufficient resources to handle the number of APs, wireless clients and ICX Switches that you plan to manage. See the tables below for the **required** virtual machine system resources.

The values for vCPU, RAM, and Disk Size are linked together and cannot be changed individually. When changing one of these parameters, all three values need to **match exactly** with an existing Resource Level. Taking vSZ-H Resource Level 5 as an example: when adjusting the number of vCPU from 4 to 6, the amount of RAM needs to be adjusted to 22GB and the Disk Size needs to be adjusted to 300GB, thereby matching all the values of Resource Level 6.

### NOTE

The vSZ deployed in the Nutanix Hypervisor introduces more overhead on memory. The 10K AP per node is not sustained on 48GB memory setting. [SCG-113477]

**Workaround:** When deploying vSZ on Nutanix it is recommended to allocate more memory for vSZ usage. For a 10K AP resource level, setup needs 24 core CPU and 50 GB (+2GB) memory to control. Alternatively decrease to 25% AP deployment in vSZ resource level. For example, 7500 AP in 10K AP resource level.



### WARNING

These vSZ required resources may change from release to release. Before upgrading vSZ, always check the required resource tables for the release to which you are upgrading.

### NOTE

When initially building up the network it can use a higher Resource Level than needed for the number of APs first deployed, if all the three parameters (vCPU, RAM and Disk Size) **match exactly** with that higher Resource Level.

### ATTENTION

It is recommended that there should be only one concurrent CLI connection per cluster when configuring vSZ.

In the following tables the high scale resources are broken into two tables for easy readability. These tables are based on the *AP Count Range*.

**TABLE 4** vSZ High Scale required resources

AP Count Range		Max Clients	Nodes per Cluster	AP Count per Node (without Switch)	AP/Switch Capacity Ratio	Maximum Switch (w/o AP)
From	To			Max		Max
10,001	30,000	300,000	4	10,000	5 : 1	6,000
	20,000	200,000	3			4,000
6,001	10,000	100,000	1-2	10,000	5 : 1	2,000
5,001	6,000	60,000	1-2	6,000	5 : 1	1,200
3,001	5,000	50,000	1-2	5,000	5 : 1	1,000
2,501	3,000	30,000	1-2	3,000	5 : 1	600
1,001	2,500	25,000	1-2	2,500	5 : 1	500
501	1,000	20,000	1-2	1,000	5 : 1	200
101	500	10,000	1-2	500	5 : 1	100

**TABLE 4** vSZ High Scale required resources (continued)

AP Count Range		Max Clients	Nodes per Cluster	AP Count per Node (without Switch)	AP/Switch Capacity Ratio	Maximum Switch (w/o AP)
From	To			Max		Max
1	100	2,000	1-2	100	5 : 1	20

**TABLE 5** vSZ High Scale required resources

AP Count Range		Minimum vCPU per node	Minimum RAM per node <sup>[1]</sup>	Minimum Disk Size per node <sup>[2]</sup>	Minimum Disk IO Requirement per node	Preserved Event/Alarm Days	Concurrent CLI Connection	Resource Level
From	To	Logic Processor	GB	GB	MiB/s	Max	Max (per node not per cluster)	
10,001	30,000	24	48	600	45	3/7 Days	4	8
	20,000							
6,001	10,000	24	48	600	45	3/7 Days	4	7
5,001	6,000	16	30	300	35	3/7 Days	2	6.6
3,001	5,000	12	28	300	30	3/7 Days	2	6.5
2,501	3,000	8	24	300	30	3/7 Days	2	6.1
1,001	2,500	6	22	300	25	3/7 Days	2	6
501	1,000	4-6 <sup>[*4]</sup>	18	150	20	3/7 Days	2	5
101	500	4	16	150	15	3/7 Days	2	4
1	100	2-4 <sup>[*3]</sup>	13	150	15	3/7 Days	2	3

In the following tables the essential scale resources are broken into two tables for easy readability. These tables are based on the AP Count Range.

**TABLE 6** vSZ Essentials required resources

AP Count Range		Maximum Clients	Nodes per Cluster	AP Count per Node	AP/Switch Capacity Ratio	Maximum Switch (w/o AP)
From	To			Max		Max
1025	3,000	60,000	4	1,024	5 : 1	600
	2,000	40,000	3			400
501	1,024	25,000	1-2	1,024	5 : 1	204
101	500	10,000	1-2	500	5 : 1	100
1	100	2,000	1-2	100	5 : 1	20

**NOTE**

The recommended vCPU core for the vSZ-E with AP Count Range 1 through 100 is 2-4.

**TABLE 7** vSZ Essentials required resources

AP Count Range		Minimum vCPU per node	Minimum RAM per node <sup>[1]</sup>	Minimum Disk Size per node <sup>[2]</sup>	Minimum Disk IO Requirement	Preserved Event/Alarm Days	Concurrent CLI Connection	Resource Level
From	To	Logic Processor	GB	GB	MiB/s	Max	Max (per node not per cluster)	
1025	3,000	8	20	250	20	7 Days	2	3
	2,000							

## Virtual SmartZone Minimum Requirements

### Virtual SmartZone Minimum Requirements

**TABLE 7** vSZ Essentials required resources (continued)

AP Count Range		Minimum vCPU per node	Minimum RAM per node <sup>[1]</sup>	Minimum Disk Size per node <sup>[2]</sup>	Minimum Disk IO Requirement	Preserved Event/ Alarm Days	Concurrent CLI Connection	Resource Level
From	To	Logic Processor	GB	GB	MiB/s	Max	Max (per node not per cluster)	
501	1,024	8	20	250	20	7 Days	2	2
101	500	4	16	150	15	7 Days	2	1.5
1	100	2-4 <sup>[*3]</sup>	13	150	15	7 Days	2	1

**NOTE**

[1] - vSZ-H and vSZ-E have different report interval. For example, AP sends the status to vSZ-E every 90 seconds but to vSZ-H it is sent every 180 seconds, which means that vSZ-E need more RAM in scaling environment based on the resource level.

[2] - NICs assigned to direct IO cannot be shared. Moreover, VMware features such as vMotion, DRS, and HA are unsupported.

## Public Cloud Platform - Instance Resource Type

In the following tables the high scale resources are broken into two tables for easy readability. These tables are based on the *AP Count Range*.

**TABLE 8** vSZ High Scale

AP Count Range		Max Clients	Nodes per Cluster	AP Count per Node (without Switch)	Maximum Switch (w/o AP)
From	To			Max	Max
10,001	30,000	300,000	4	10,000	6,000
	20,000	200,000	3		4,000
6,001	10,000	100,000	1-2	10,000	2,000
3,001	6,000	60,000	1-2 <sup>[*4]</sup>	6,000	1,200
1,001	3,000	30,000	1-2	3,000	600
501	1,000	20,000	1-2	1,000	200
101	500	10,000	1-2	500	100
1	100	2,000	1-2	100	20

**TABLE 9** vSZ High Scale

AP Count Range		Minimum Disk Size	Recommended Machine Type for AWS	Recommended Machine type for Azure	Disk IO Requirement
From	To	GB			
10,001	30,000	600	c5.9xlarge (36 vCPU/72 GB RAM)	F32s_v2 (32 vCPU/64 GB RAM)	45
	20,000				
6,001	10,000	600	c5.9xlarge (36 vCPU/72 GB RAM)	F32s_v2 (32 vCPU/64 GB RAM)	45
3,001	6,000	300	c5.4xlarge (16 vCPU/32 GB RAM)	F16s_v2 (16 vCPU/32 GB RAM)	35
1,001	3,000	300	m5.2xlarge (8 vCPU/32 GB RAM)	D8s_v3 (8 vCPU/32 GB RAM)	25
501	1,000	150	r5.xlarge (4 vCPU/32GB RAM)	E4s_v3 (4 vCPU/32 GB RAM)	20
101	500	150	m5.xlarge (4 vCPU/16 GB RAM)	D4s_v3 (4 vCPU/16 GB RAM)	15

**TABLE 9** vSZ High Scale (continued)

AP Count Range		Minimum Disk Size	Recommended Machine Type for AWS	Recommended Machine type for AZure	Disk IO Requirement
From	To	GB			
1	100	150	r5.large (2 vCPU/16 GB RAM)	DS11_v2 (2 vCPU/14 GB RAM) or D4s_v3 (4 vCPU/16 GB RAM)	15

In the following tables the essential scale resources are broken into two tables for easy readability. These tables are based on the *AP Count Range*.

**TABLE 10** vSZ Essentials required resources

AP Count Range		Maximum Clients	Nodes per Cluster	AP Count per Node	Maximum Switch (w/o AP)
From	To			Max	Max
1025	3,000	60,000	4	1,024	600
	2,000	40,000	3		400
501	1,024	25,000	1-2	1,024	204
101	500	10,000	1-2	500	100
1	100	2,000	1-2	100	20

**NOTE**

The recommended vCPU core for the vSZ-E with **AP Count Range** 1 through 100 is 2-4.

**TABLE 11** vSZ Essentials required resources

AP Count Range		Minimum Disk Size	Recommended Machine Type for AWS	Recommended Machine type for AZure	Disk IO Requirement
From	To	GB			
1025	3,000	250	m5.2xlarge (8 vCPU/32 GB RAM)	D8s_v3 (8 vCPU/32 GB RAM)	20
	2,000				
501	1,024	250	m5.2xlarge (8 vCPU/32 GB RAM)	D8s_v3 (8 vCPU/32 GB RAM)	20
101	500	150	m5.xlarge (4 vCPU/16 GB RAM)	D4s_v3 (4 vCPU/16 GB RAM)	15
1	100	150	r5.large (2 vCPU/16 GB RAM)	DS11_v2 (2 vCPU/14 GB RAM) or D4s_v3 (4 vCPU/16 GB RAM)	15

## Virtual SmartZone Minimum Requirements

### Supported Hypervisors

#### NOTE

- [1] - Increase the vSZ total memory 2~4 GB when running on special or extreme deploy environment when vSZ raise a memory exceed (90%) alarm. For example:
  - Deploy 4-node vSZ cluster on Nutanix with full 30K AP capacity.
  - One vSZ node down in 4-node vSZ cluster to long term sustain 30K AP in 3 alive vSZ nodes.  
  
The solution should be recovered the fail vSZ node as soon as possible. But if user need run 3 nodes with 30K AP in long term sustain, it need to increase the vSZ memory to run.
  - All APs with full statistic reports (AVC, HCCD, UE, ...) to SZ on full load stress condition.
- [2] - Required Disk Type
  - AWS: General Purpose SSD (gp2)
  - GCE: SSD
  - Azure: Standard-SSD
- [3] - If deployed hardware CPU computing performance is not good as recommended in 100 AP resource level, the 2 cores CPU setting cannot be supported. Upgrade to 4 cores instead of 2 cores in this case.
- [4] - If deployed hardware CPU computing performance is not good as recommended Hypervisor (like Hyper-V) in 4-CPU setting to support 1000K AP, upgrade to 6 cores instead of 4 cores in this case.
- The 6000 AP resource profile level could support to 4 nodes cluster. The total supported AP number will be up to 18,000 APs in a 4 node vSZ cluster.
- Workaround if virtualization platform always need Thin Provision/Lazy Zeroed/Dynamic Expanding case.

User could skip this setup validation and user has to understand the risk user skip. In high APs deployment environment, high IO performance is required. It is a hidden command and not recommended to execute in production deployment.

```
CLI # debug
CLI(debug)# debug-tools
(debug tool-set) system $ use sz
(debug tool-set) sz $ skip-setup-capability-check
```

## Change Log of vSZ Resource Plan

- New support for 3000, 6000 APs resource level for more flexible deployment and better cost effectiveness for customer.
- Due to system limitation for the minimum disk requirement, the base disk size requirement is increased from 100 GB to 150 GB on low level resource profile. No impact for user to upgrade from previous version. Requires new setup vSZ to follow new disk size.
- As the resource level has hit the system limitation in some case, for the vSZ-E 1024 APs resource level memory is increased from 18 GB to 20 GB. No impact for user to upgrade from previous version. User need to change only the memory setting when encountering memory usage alarm exceeding 90%.
- Adding additional notes vSZ memory required in extreme vSZ deployment and cases.
- New session, vSZ-H instance Resource Allocate Instruction, is added.

## Supported Hypervisors

This section displays summary of hypervisors supported by vSCG/vSZ versions 2.5, 3.4 and above.  
Hypervisors supported by vSCG/vSZ

**TABLE 12** Hypervisors supported by vSCG/vSZ

Keywords	Customer Environment
vSCG, KVM, ESXi, Hyper-V	vSZ (AKA vSCG) version 2.5+

**TABLE 13** Supported Platforms

vSZ version 3.4 and above
VMWare ESXi 5.5 and later
Windows Server Hyper-V (2012 R-2)
KVM CentOS 7.0 (64bit)
AWS (Amazon Web Service)
Google Cloud
Microsoft Azure
OpenStack, CentOS; Stein, Rocky, and Queens
Nutanix, Nutanix Community Edition

vSZ (vSCG) Version 2.5
VMWare ESXi 5.1
RHEL KVM 6.5 (See RHEL 6 Hypervisor Deployment Guide)

**NOTE**

RUCKUS only supports usage of vSZ on the above named virtualization platforms.

**TABLE 14** Unsupported Platforms

vSZ
Sangfor HCI
VMWare Workstation/Workstation Player
Oracle VM Virtual Box

**NOTE**

The above mentioned hypervisor platforms are not currently supported by RUCKUS SZ. If vSZ is run on any of the platforms officially not supported/QA'd by RUCKUS, any errors encountered in vSZ cannot be investigated by RUCKUS support. The above list is not exhaustive, it serves only to clarify the unsupported hypervisors.

## Hypervisor CPU/IO Requirements - Self Own Hypervisor

### Benchmarking vSZ CPU/IO Performance

System Benchmark Tool included in this release can be used to measure Hypervisor performance. It provides the benchmark result and performance measure to run vSZ on CPU (Central Processing Unit) and IO (Input Output).

#### Command Location:

```
CLI > debug > debug-tools > system-performance
```

#### Performance Requirement

CPU	CPU single core events per second/per core need > 180 events/second.
-----	--

## Virtual SmartZone Minimum Requirements

Hypervisor CPU/IO Requirements - Self Own Hypervisor

IO	Requirements change per resource level. Refer to resource table for minimum values (column 'Disk IO requirement')
----	---



# Maximum Supported AP and Switch Management

The tables below list the maximum supported resources between APs and switches.

SmartZone 6.1.x support dynamic (linear) AP/Switch capacity based on capacity ratio. No AP/Switch mode, only mix mode and AP/Switch support number base on total amount connect AP/Switch capacity.

## Capacity Ratio

High scale profile with higher switch support capacity to 5:1 from 8:1

vSZ-H L6 ~ L8

5:1 (10000 AP : 2000 switches)

## Example: Calculating the Total Capacity

- 200 APs + 100 switches (1:5)  
 $(200 \times 1) + (100 \times 5) = 700$  (Total Capacity) This requirement could use L5, since the total capacity is smaller than 1,000.
- 400 APs + 10 switches (1:5)  
 $(400 \times 1) + (10 \times 5) = 450$  (Total Capacity) This requirement could use L4, since the total capacity is smaller than 500.

## NOTE

These required resources may change from release to release. Before upgrading, always check the required resource tables for the release to which you are upgrading.

**TABLE 15** AP and Switch resource table for 1 and 2 nodes

Profile	1 and 2 Nodes				1 or 2 Nodes AP/Switch Capacity Ratio
	AP Mode		Switch Mode		
SZ100	1,024	0	0	204	5:1
SZ144	2,000	0	0	400	5:1
SZ300	10,000	0	0	2,000	5:1
vSZ-E L1	100	0	0	20	5:1
vSZ-E L1.5	500	0	0	100	5:1
vSZ-E L3	1,024	0	0	204	5:1
vSZ-H L3	100	0	0	20	5:1
vSZ-H L4	500	0	0	100	5:1
vSZ-H L5	1,000	0	0	200	5:1
vSZ-H L6	2,500	0	0	500	5:1
vSZ-H L6.5	5,000	0	0	1,000	5:1
vSZ-H L8	10,000	0	0	2,000	5:1

## Maximum Supported AP and Switch Management

In the following tables for three and four nodes are broken into two tables for easy readability.

**TABLE 16** AP and Switch resource table for 3 and 4 nodes

Profile	3 Nodes					4 Nodes				
	AP Mode		Switch Mode		AP/Switch Capacity Ratio	AP Mode		Switch Mode		AP/Switch Capacity Ratio
SZ100	2,000	0	0	400	5:1	3,000	0	0	600	5:1
SZ144	4,000	0	0	800	5:1	6,000	0	0	1,200	5:1
SZ300	20,000	0	0	4,000	5:1	30,000	0	0	6,000	5:1
vSZ-E L3	2,000	0	0	400	5:1	3,000	0	0	600	5:1
vSZ-H L8	20,000	0	0	4,000	5:1	30,000	0	0	6,000	5:1

# Upgrading the Controller

---

Consult the RUCKUS Support website on a regular basis for updates that can be applied to your RUCKUS network devices.



**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.



# Performing the Upgrade

---

RUCKUS strongly recommends backing up the controller cluster before performing the upgrade. If the upgrade process fails for any reason, you can use the latest backup file to restore the controller cluster.

Before starting this procedure, you should have already obtained a valid controller software upgrade file from RUCKUS Support or an authorized reseller.

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.

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. Select **Administration > Administration > Upgrade > Upgrade**.

In **Current System Information**, the controller version information is displayed.

## NOTE

The **Upgrade History** tab displays information about previous cluster upgrades.

3. From **Upload**, ensure the **Run Pre-Upgrade Validations** check box is enabled (enabled by default ). It triggers data migration validation during upload process.
4. Click **Browse** to select the patch file.
5. Click **Upload** to upload new image (.ximg file) to system. The controller uploads the file to its database, and then performs the data migration verification. After the verification is done, the **Patch for Pending Upgrades** section is populated with information about the upgrade file. If verification is failed, the following error is displayed:

```
Exception occurred during the validation of data migration. Please apply the system configuration backup and contact system administrator.
```

6. If the controller configuration upload was successful, click **Backup & Upgrade** to back up the controller cluster and system configuration before performing the upgrade.

When the upgrade (or 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.

Go to the next task to verify the upgrade.



# Verifying the Upgrade

---

You can verify that the controller upgrade was completed successfully.

1. Go to **Administration > Administration > Upgrade > 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. If the firmware version is different from that which is configured for the AP zone, the controller responds with a request to upgrade the firmware on the AP.

**NOTE**

Starting SZ6.0, when the controller fails while processing the upgrade flow and automatically triggers the restore action to the previous version, a notification is displayed in the Global Warning section on the Dashboard.





# Rolling Back to a Previous Software Version

---

If you encounter issues during the software upgrade process and the controller cannot be upgraded successfully, you may want to roll back the controller software to a previous version.

To be able to restore the software to the previous software version, you must perform a cluster backup before upgrading. To roll back to the previous version, perform either Step 1 or Step 2 depending on the outcome of the software upgrade.

1. If the upgrade fails, access all the node's command-line interface (CLI) and run the **restore** command to the local system simultaneously.
2. If the upgrade succeeded, the restore can be run from either the CLI or through the WebUI.

For details about performing a cluster backup, see the “Backing Up and Restoring Clusters” section of the appropriate product *Administration Guide*.



# Uploading an AP Firmware Bundle

- AP Image Signing..... 35
- Upgrading the Data Plane..... 35

When RUCKUS introduces a new AP model, an AP firmware bundle (also known as a patch) is made available for download from the RUCKUS Support website. Download the AP firmware bundle to a local computer, import it into SmartZone, and the new AP model is now supported.

1. Select **Administration > Administration > Upgrade > 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.

## AP Image Signing

AP image signing involves digitally signing the RUCKUS header and body of the AP firmware, and authenticating the firmware as valid to be installed on the AP. AP firmware images are available in the following types:

- Un-Signed Image (USI): Has the capability to sign and verify. It only contains a Header and Body. The Body usually contains both the kernel and file system information.
- Intermediate Signed Image (IUI): Has the capability to sign and verify, and it allows installation of both signed and unsigned images.
- Fully Signed Image (FSI): Allows only RUCKUS-signed firmware to be installed on the AP. It does not allow installation of unsigned or tampered images.

AP image signing is a two step upgrade or downgrade procedure where in the AP firmware can be upgraded from type USI to ISI, ISI to FSI, and vice-versa in the same order.

### NOTE

You cannot upgrade an image from USI to FSI as the formats of these images are different. Attempting such an upgrade triggers an *AP image signing failed* event.

## Upgrading the Data Plane

You can view and upgrade the virtual data plane version using patch files. This feature is only supported on vSZ-H and vSZ-E.

Upgrading from earlier versions to R6.1

vSZ-D	Upgrade Procedure
R6.0.0	1. R6.0.0 > R6.1.0

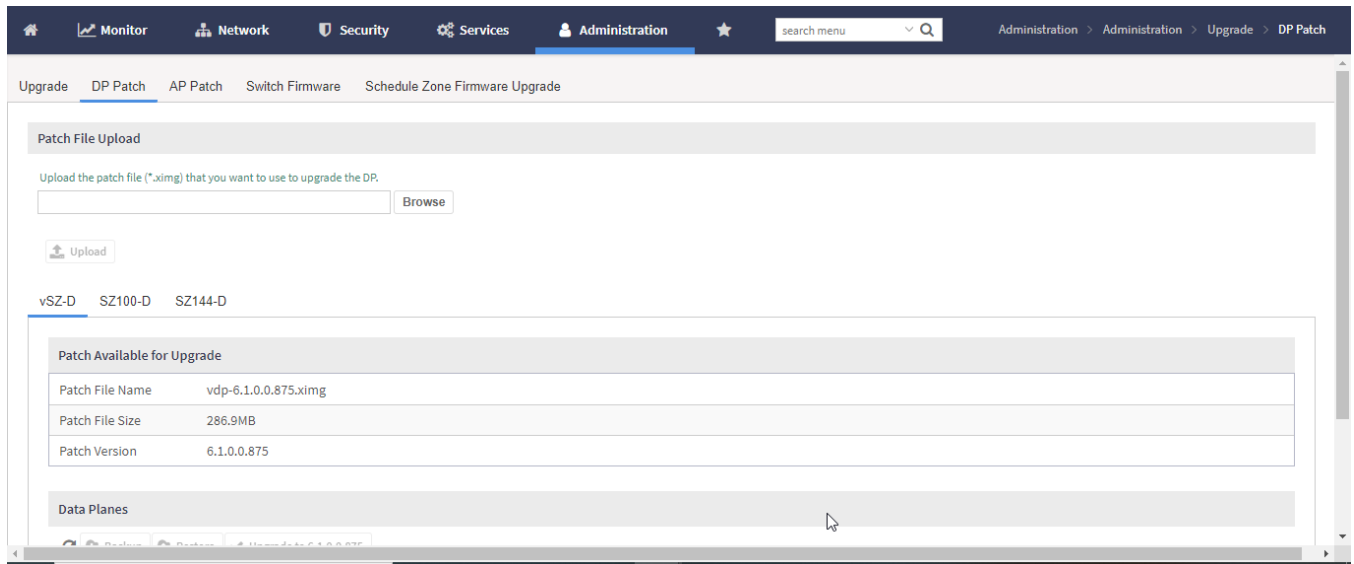
**Uploading an AP Firmware Bundle**  
 Upgrading the Data Plane

vSZ-D	Upgrade Procedure
R5.2.2	1. R5.2.2 > R6.1.0
R5.2.1	1. R5.2.1 > R6.1.0
R5.2	1. R5.2.0 > R6.1.0
R5.1.2	1. R5.1.2 > R5.2.0 2. R5.2.0 > R6.1.0
R5.1.1	1. R5.1.1 > R5.2.0 2. R5.2.0 > R6.1.0
R5.1.0	1. R5.1.0 > R5.2.0 2. R5.2.0 > R6.1.0
R5.0.0	1. R5.0 > R5.1 2. R5.1 > R5.2.0 3. R5.2.0 > R6.1.0
R3.6.2	1. R3.6.2 > R5.2.0 2. R5.2.0 > R6.1.0

To Upgrade the Data Plane:

1. Select **Administration > Administration > Upgrade**.
2. Select the **DP Patch** tab.  
 The **DP Patch** page appears.

**FIGURE 1** Upgrading the Data Plane



3. In **Patch File Upload**, click **Browse** to select the patch file (.ximg file).

4. Click **Upload**.

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 upgrade 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**, choose a patch file version from the **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 ungraded 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. To upgrade the data plane to the latest firmware, select the data plane and click **Upgrade to x.x.x.x**



# Multiple AP Firmware Support in the SZ100/vSZ-E/SZ300/vSZ-H

The AP firmware releases that APs use are configured at the zone level. This means that APs that belong to one zone could use a different AP firmware release from APs that belong to another zone.

## REMEMBER

Before you proceed with upgrading the controller to this release, do ensure that all AP zones are running one the supported firmwares as explained below.

## Previous Major AP Releases Supported

This platform release can support the latest AP firmware release, plus the most recent Short-term (ST) 6.0 and Long-term (LT) 5.2.x AP firmware releases.

## NOTE

A Short-term (ST) or Long-term (LT) release version refers to the first two digits of the release number. For example, 5.2.1 and 5.2.2 are considered part of the same Long-term release version, which is 5.2.0.

The AP firmware releases that the controller will retain depends on the controller release version from which you are upgrading:

Upgrade path	AP firmware releases in controller
5.2.x > 6.0.x > 6.1.x	5.2.x or 6.0.x > 6.1.x
5.1.x > 5.2.x > 6.1.x	5.2.x > 6.1.x
5.0 > 5.1.x > 5.2.x > 6.1.x	5.2.x > 6.1.x





# EoL APs and APs Running Unsupported Firmware Behavior

---

Understanding how the SZ300/vSZ-H controllers handle APs that have reached End-of-Life (EoL) status and AP running unsupported firmware can help you design an upgrade plan that will minimize impact on wireless users in your organization.

**NOTE**

SZ300/vSZ-H devices are referred to as controllers in this section.

## APs Running Unsupported Firmware Releases

- APs running AP firmware releases that are unsupported by the controller release can still connect to the controller.
- Once connected to the controller and assigned to a zone, the AP will be upgraded to the AP firmware assigned to the zone to which it belongs.



# Upgrade FAQs

- [Do I Need a Valid Support Contract to Upgrade Firmware?](#)
- [Is My Controller Supported by the Firmware Upgrade?](#)
- [Is My Access Point Supported by the Firmware Upgrade?](#)
- [How Do I Get Support?](#)

## Do I Need a Valid Support Contract to Upgrade Firmware?

You must have a valid support contract to upgrade the SmartZone software. If you do not have a valid support contract, contact your reseller to purchase an appropriate support contract. After downloading and installing the software, select **Administer > Support** from the WebUI for information on activating your support contract.

### NOTE

By downloading the SmartZone software and subsequently upgrading SmartZone to version 6.1.0, be advised that the software will periodically connect to RUCKUS and RUCKUS will collect the hardware serial number, software version and build number. RUCKUS will transmit a file back to the SmartZone device that will be used to display the current status of your SmartZone support contract. Any information collected from the SmartZone device may be transferred and stored outside of your country of residence where data protection standards may be different.

## Is My Controller Supported by the Firmware Upgrade?

This guide supports the following SmartZone models:

- SmartZone 300 (SZ300)
- SmartZone 100 (SZ100)
- Virtual SmartZone (vSZ)
- Virtual SmartZone Data Plane (vSZ-D)

For information about the specific models and modules supported in a SmartZone model, refer to the appropriate hardware installation guide.

## Is My Access Point Supported by the Firmware Upgrade?

TABLE 17 Supported AP Models

11ax		11ac-Wave2		11ac-Wave1
Indoor	Outdoor	Indoor	Outdoor	Indoor
R730	T750	R720	T710	R310
R750	T750SE	R710	T710S	
R650	T350C	R610	T610	
R550	T350D	R510	T310C	
R850	T350SE	H510	T310S	
R350		C110	T310N	

## Upgrade FAQs

### How Do I Get Support?

**TABLE 17** Supported AP Models (continued)

11ax		11ac-Wave2		11ac-Wave1
H550		H320	T310D	
H350		M510	T811CM	
		R320	T610S	
			E510	
			T305E	
			T305I	

## How Do I Get Support?

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

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