

RUCKUS SmartZone Upgrade Guide, 6.0.0

Supporting SmartZone 6.0.0

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Contents

What's New in this Document	5
Before Upgrading to This Release	7
Upgrading APs.....	7
Upgrading ICX Switches.....	8
Data Migration Recommendations.....	8
Upgrade Considerations.....	8
SmartZone Upgrade Paths	11
Virtual SmartZone Minimum Requirements	13
Virtual SmartZone Minimum Requirements.....	13
Hypervisor Hardware Performance Requirements.....	13
Hypervisor CPU/IO Requirements - Private Hypervisor	13
Network Latency Requirement between vSZ nodes	14
Public Cloud Platform - Instance Resource Type	16
Change Log of vSZ Resource Plan.....	18
Supported Platforms.....	18
Hypervisor CPU/IO Requirements - Self Own Hypervisor.....	19
Maximum Supported AP and Switch Management	21
Upgrading the Controller	23
Performing the Upgrade	25
Verifying the Upgrade	27
Rolling Back to a Previous Software Version	29
Uploading an AP Firmware Bundle	31
AP Image Signing.....	31
Upgrading the Data Plane.....	31
Multiple AP Firmware Support in the SZ100/vSZ-E/SZ300/vSZ-H	35
Previous Major AP Releases Supported	35
EoL APs and APs Running Unsupported Firmware Behavior	37
APs Running Unsupported Firmware Releases.....	37
Upgrade FAQs	39
Do I Need a Valid Support Contract to Upgrade Firmware?.....	39
Is My Controller Supported by the Firmware Upgrade?.....	39
Is My Access Point Supported by the Firmware Upgrade?	39
How Do I Get Support?.....	40

What's New in this Document

TABLE 1 Key Features and Enhancements in SmartZone 6.0.0 (July 2023)

Feature	Description	Reference
Change Log of vSZ Resource Plan	Updated: Update to disk size in new and existing vSZ setup.	Virtual SmartZone Minimum Requirements on page 13

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, and R5.2.2 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 5.2.2, 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 6.0.0
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 in SZ6.0 (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 SZ6.0.

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 6.0 Release Notes for the updated release information.

Application Signature Package

AP DPI feature uses an Application Signature Package that in general it can be optionally updated when a new version is available.

Before Upgrading to This Release

Upgrading ICX Switches

NOTE

Upgrading the signature pack from R5.1 or R5.1.1 to R6.0 is not supported.

Do follow this mandatory process before upgrading AP zone firmware:

1. Download Signature package by visiting the RUCKUS support site:
 - Regular Sigpack only for SZ6.0: <https://support.ruckuswireless.com/software/2573>
 - Non-Regular Sigpack for SZ6.0 and older releases: <https://support.ruckuswireless.com/software/2574>
2. Manually upgrade the signature package by navigating to **Firewall > Application Control > Signature Package**. (more details can be found in Administrator Guide, in section *Working with Application Signature Package*)

Once this is done, AP zones can be upgraded. [SCG-108730]

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

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 2 Previous release builds

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

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

- Virtual SmartZone Minimum Requirements..... 13
- Supported Platforms..... 18
- Hypervisor CPU/IO Requirements - Self Own Hypervisor..... 19

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

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 3 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
3,000	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 3 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 4 vSZ High Scale required resources

AP Count Range		Minimum vCPU per node	Minimum RAM per node ^[1]	Minimum Disk Size per node ^[2]	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
3,501	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 ^[*4]	18	150	20	3/7 Days	2	5
101	500	4	16	150	15	3/7 Days	2	4
1	100	2-4 ^[*3]	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 5 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					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 6 vSZ Essentials required resources

AP Count Range		Minimum vCPU per node	Minimum RAM per node ^[1]	Minimum Disk Size per node ^[2]	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 6 vSZ Essentials required resources (continued)

AP Count Range		Minimum vCPU per node	Minimum RAM per node ^[1]	Minimum Disk Size per node ^[2]	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 ^[*3]	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 7 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 ^[*4]	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 8 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 8 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 9 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 10 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 Platforms

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.

```
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. This has no impact to upgrade from the previous version. For a new vSZ setup, follow the new disk size specified in the resource table. For an existing vSZ setup, shutdown the VM and increase the 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.

Supported Platforms

This section displays summary of platforms supported by vSZ in this release version.

Hypervisors supported by vSCG/vSZ

TABLE 11 Supported Hypervisors

Vendor	Hypervisor	Version
VMWare	ESXi	5.5 and later (7.0 or later recommended)
Microsoft	Windows Server Hyper-V	Windows Server Hyper-V (2016 and 2019)
KVM	CentOS	7.4(1708), 7.5 (1804), 7.7 (1908), 8 (1905), 8.2 (2004), and 8.3.(2011)
OpenStack	CentOS	Rocky, Queens, Ussuri, and Victoria
Nutanix	Nutanix	Nutanix Community Edition

TABLE 12 Supported Public Cloud Platforms

Vendor
AWS (Amazon Web Service)
Google Cloud
Microsoft Azure

NOTE

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

TABLE 13 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 or assured 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.
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 6.0 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 14 AP and Switch resource table for 1 and 2 nodes

Profile	1 and 2 Nodes				1 or 2 Nodes
	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 15 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 > 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. From the **Upload** page, ensure the **Run Pre-Upgrade Validations** check box is enabled (enabled by default). It triggers data migration validation during upload process.
5. Click **Browse** to select the patch file.
6. 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.
```

7. 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 > 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..... 31
- Upgrading the Data Plane..... 31

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 > 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 R6.0

vSZ-D	Upgrade Procedure
R5.2.2	1. R5.2.2 > R6.0.0

Uploading an AP Firmware Bundle

Upgrading the Data Plane

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

To Upgrade the Data Plane:

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

The **DP Patch** page appears.

FIGURE 1 Upgrading the Data Plane

The screenshot shows the Ruckus SmartZone web interface. The top navigation bar includes the Ruckus logo, a license warning, and user information. The left sidebar shows the navigation menu with 'Administration' expanded to 'Upgrade'. The main content area is titled 'DP Patch' and contains the following sections:

- Patch File Upload:** A section for uploading a patch file (.ximg). It includes a text input field, a 'Browse' button, and an 'Upload' button.
- Patch Available for Upgrade:** A section showing details for a patch file:

Patch File Name	sz100d-installer_5.1.0.0.495.ximg
Patch File Size	220.2MB
Patch Version	5.1.0.0.495
- Data Planes:** A table showing the status of data planes. It includes a 'Backup' button, a 'Restore' button, and a dropdown menu set to 'Upgrade to 5.1.0.0.495'.

Name	DP MAC Address	Current Firmware	Backup Firmware	Last Backup Time	Process State	DP Status
<input type="checkbox"/> SZ100-D	24:C9:A1:3F:06:10	5.1.0.0.495	N/A	N/A	Upgrade completed	Managed

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 6.0.0, 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 16 Supported AP Models

11ac-Wave2		11ac-Wave1		11ax	
Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor
R720	T710	R310		R730	T750
R710	T710S			R750	T750SE
R610	T610			R650	
R510	T610S			R850	
H510	T310C			R550	
H320	T310D			H550	

Upgrade FAQs

How Do I Get Support?

TABLE 16 Supported AP Models (continued)

11ac-Wave2		11ac-Wave1		11ax	
Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor
C110	T310N				
M510	T310S				
R320	T811CM				
	E510				
	T305i				
	T305e				

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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