ArubaOS 6.4.4.1

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Release Notes

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ArubaOS 6.4.4.1 is a software patch release that includes fixes to issues identified in previous releases.

Chapter Overview

- Regulatory Updates on page 10 lists the regulatory updates in ArubaOS 6.4.4.x release versions.
- Resolved Issues on page 12 lists and describes the issues resolved in ArubaOS 6.4.4.x release versions.
- Known Issues and Limitations on page 16 lists and describes the known and outstanding issues identified in ArubaOS 6.4.4.x release versions.
- Upgrade Procedure on page 18 describes the procedures for upgrading a controller to this release.

Important Points to Remember

If you modify the configuration of an AP, those changes take effect immediately; you do not need to reboot the controller or the AP for the changes to affect the current running configuration. Certain commands, however, automatically force the AP radio to restart.

AirGroup

Support for Wired Users

Starting from ArubaOS 6.4.3.0, AirGroup does not support wired users.

AP Settings Triggering a Radio Restart

Changing the following settings triggers the radio to restart on the AP-200 Series, AP-205H, AP-210 Series, AP-220 Series, AP-270 Series and AP-320 Series access points. When the radio restarts, wireless services will be briefly interrupted. Clients will automatically reconnect to the network when the radio is again up and running.

Table 1: *Profile Settings in ArubaOS 6.4.x*

Profile	Settings
802.11a/802.11g Radio Profile	• Channel • Enable Channel Switch Announcement (CSA) • CSA Count • High throughput enable (radio) • Very high throughput enable (radio) • TurboQAM enable • Maximum distance (outdoor mesh setting) • Transmit EIRP • Advertise 802.11h Capabilities • Beacon Period/Beacon Regulate • Advertise 802.11d Capabilities
Virtual AP Profile	• Virtual AP enable • Forward Mode • Remote-AP operation

SSID Profile	• ESSID
	• Encryption
	• Enable Management Frame Protection
	• Require Management Frame Protection
	• Multiple Tx Replay Counters
	• Strict Spectralink Voice Protocol (SVP)
	• Wireless Multimedia (WMM) settings
	  ▪ Wireless Multimedia (WMM)
	  ▪ Wireless Multimedia U-APSD (WMM-UAPSD) Powersave
	  ▪ WMM TSPEC Min Inactivity Interval
	  ▪ Override DSCP mappings for WMM clients
	  ▪ DSCP mapping for WMM voice AC
	  ▪ DSCP mapping for WMM video AC
	  ▪ DSCP mapping for WMM best-effort AC
	  ▪ DSCP mapping for WMM background AC

High-throughput SSID Profile	• High throughput enable (SSID) • 40 MHz channel usage • Very High throughput enable (SSID) • 80 MHz channel usage (VHT)
802.11r Profile	• Advertise 802.11r Capability • 802.11r Mobility Domain ID • 802.11r R1 Key Duration • key-assignment (CLI only)
Hotspot 2.0 Profile	• Advertise Hotspot 2.0 Capability • RADIUS Chargeable User Identity (RFC4372) • RADIUS Location Data (RFC5580)

Supported Browsers

The following browsers are officially supported for use with ArubaOS 6.4.4.1 WebUI:

- Microsoft Internet Explorer 10.x and 11 on Windows 7 and Windows 8
- Mozilla Firefox 23 or later on Windows Vista, Windows 7, Windows 8, and Mac OS
- Apple Safari 5.1.7 or later on Mac OS

Contacting Support

Table 2: *Contact Information*

Main Site	http://www.arubanetworks.com/
Support Site	https://support.arubanetworks.com/
Airheads Social Forums and Knowledge Base	http://community.arubanetworks.com/
North American Telephone	1-800-943-4526 (Toll Free) 1-408-754-1200
International Telephone	http://www.arubanetworks.com/support-services/contact-support/
Software Licensing Site	https://licensing.arubanetworks.com/
End-of-life Information	http://www.arubanetworks.com/support-services/end-of-life/
Security Incident Response Team (SIRT)	http://www.arubanetworks.com/support-services/security-bulletins/
Support Email Addresses	
Americas, EMEA, and APAC	support@arubanetworks.com
Security Incident Response Team (SIRT)	sirt@arubanetworks.com

Chapter 2
Regulatory Updates

This chapter describes the regulatory update in this release.

Contact your local Aruba sales representative about device availability and support for your country.

Periodic regulatory changes may require modifications to the list of channels supported by an AP. For a complete list of channels supported by an AP using a specific country domain, access the controller Command Line Interface (CLI) and execute the **show ap allowed-channels country-code <country-code> ap-type <ap-model>** command.

The following Downloadable Regulatory Table (DRT) file versions are supported in ArubaOS 6.4.4.1:

- DRT-1.0_52042

For a complete list of countries certified with different AP models, refer to the respective DRT release notes at support.arubanetworks.com.

This section describes the issues resolved in this release.

AirGroup

Table 3: *AirGroup Resolved Issues*

Bug ID	Description
125346	**Symptom:** A memory leak was observed in mDNS process. This issue is resolved by removing the AP names assigned to all AP modes. **Scenario:** This issue was observed in network topologies with AirGroup cluster and APs in "only BG mode" in the AP neighborhood. This issue was observed when mDNS queries with AP neighborhood information were sent from one controller to another (within a cluster). This issue was observed in controllers running ArubaOS version later than 6.4.3.0. **Platform:** All platforms. **Reported Version:** ArubaOS 6.4.4.0.

AP-Platform

Table 4: *AP-Platform Resolved Issues*

Bug ID	Description
125538	**Symptom:** AP-105 access points did not send PPPoE PADI after upgrading a controller to ArubaOS 6.4.4.0. This issue is resolved by updating the ethernet driver. **Scenario:** This issue was observed because the hardware configuration did not occur during ethernet initialization and the SAPD link state was shown as down. This issue was observed in AP-105 access points connected to controllers running ArubaOS 6.4.4.0. **Platform:** AP-105 access points. **Reported Version:** ArubaOS 6.4.4.0.

AP-Wireless

Table 5: *AP-Wireless Resolved Issues*

Bug ID	Description
123866	**Symptom:** AP-130 Series and RAP-155 access points stopped responding and rebooted. The log files for the event listed the reason as **Reboot caused by kernel panic: Fatal exception**. Improvements in the kernel module resolved this issue. **Scenario:** The kernel panic issue was triggered due to corruption in the memory mapped buffer that was used to send packets to ARM/WIDS process. This issue was observed in AP-130 Series and RAP-155 access points running ArubaOS 6.4.2.x, ArubaOS 6.4.3.x, or ArubaOS 6.4.4.x. **Platform:** AP-130 Series and RAP-155 access points. **Reported Version:** ArubaOS 6.4.2.7.
125316	**Symptom:** On disabling an AP radio, unknown Wi-Fi packets were observed on channel 1. Improvements in the kernel module of the AP resolved this issue. **Scenario:** This issue was seen when an AP radio is disabled in either 2.4 GHz or 5 GHz. This issue was observed in AP-320 Series access points running ArubaOS 6.4.4.0. **Platform:** AP-320 Series access points. **Reported Version:** ArubaOS 6.4.4.0.

Base OS Security

Table 6: *Base OS Security Resolved Issues*

Bug ID	Description
116486 123621	**Symptom:** The number of clients displayed in the output of the **show-user-table** command was different from the number of clients displayed in the WebUI by navigating to **Monitoring > CONTROLLER > Clients**. The fix ensures that the same number of clients is displayed in the CLI and the WebUI. **Scenario:** This issue was observed in controllers running ArubaOS 6.4.2.10. **Platform:** All platforms. **Reported Version:** ArubaOS 6.4.2.10.
123707 123809 126351	**Symptom:** The **authentication** process on the controller stopped responding and crashed. Avoiding a conflict while deleting an internally created net destination entry resolved this issue. **Scenario:** This issue was seen when a **write memory** command was executed on the master controller leading to a full configuration synchronization on the local controller. The **authentication** process crash was caused while deleting an internally created net destination entry from an Access Control List (ACL). This issue was observed in local controllers running ArubaOS 6.3.x or ArubaOS 6.4.x. **Platform:** All platforms. **Reported Version:** ArubaOS 6.3.1.14.
125232	**Symptom:** User-role and Access Control List (ACL) related configuration was lost when the controller rebooted. This issue is resolved by reducing the range in the **time-range** command in the CLI. **Scenario:** This issue was observed when controllers with large time-range configurations rebooted and user-role and ACL configurations were are not saved. **Platform:** All platforms. **Reported Version:** ArubaOS 6.4.2.8.

Controller-Datapath

Table 7: *Controller-Datapath Resolved Issues*

Bug ID	Description
123618 125286 124086	**Symptom:** Datapath crashed unexpectedly. This issue is resolved by using DMA channel distribution, avoiding station invalidation, and increasing page size. **Scenario:** This issue was observed when loading 8000 users on 7205 controllers. **Platform:** 7205 controllers. **Reported Version:** ArubaOS 6.4.4.

Controller-Platform

Table 8: *Controller-Platform Resolved Issues*

Bug ID	Description
124513	**Symptom:** All controllers in a network crashed and rebooted unexpectedly due to high memory consumption by the **isakmpd** process. This issue is resolved by freeing the temporary variable that is used for every tunnel. **Scenario:** This issue occurred when the **isakmpd** process did not free the temporary variable that was used for each tunnel causing memory leaks. This happened on the responder that was configured to use Fully Qualified Domain Name (FQDN) as the Internet Key Exchange (IKE) identity. This issue was observed on controllers running ArubaOS 6.4.2.9. **Platform:** All platforms. **Reported Version:** ArubaOS 6.4.2.9.

IPsec

Table 9: *IPsec Resolved Issues*

Bug ID	Description
113132 113711 124010	**Symptom:** A controller crashed repeatedly on the **ISAKMPD** module. This issue is resolved by avoiding stack corruption and logging it using counter. **Scenario:** This issue was observed with MacOS clients connected to controllers in a congested network and was caused by stack corruption. The **ISAKMPD** crash was observed when MacOS mode-config IKEv1 clients retried a XAUTH even after sending a response to the **config-mode** request. **Platform:** All platforms. **Reported Version:** ArubaOS 6.3.1.12.

LLDP

Table 10: *LLDP Resolved Issues*

Bug ID	Description
116554	**Symptom:** The console of a controller frequently displayed the log message **lldp[3538]: <235008> <WARN> |lldp| Function: lldp_recv Interface 0/8 recieved lldpdu meant for slot 1785 and ingress_idx 65576**. This issue is resolved by dropping the LLDP frames. **Scenario:** This issue was observed when clients sent LLDP messages. This issue was observed in controllers running ArubaOS 6.4.2.6 and ArubaOS 6.4.2.8. **Platform:** All platforms. **Reported Version:** ArubaOS 6.4.2.6.

This chapter describes the known issues and limitations identified in this release.

If there is any specific bug that is not documented in this section, contact Aruba Technical Support with your case number.

AP-Platform

Table 11: *AP-Platform Known Issues*

Bug ID	Description
121629 124058	**Symptom:** AP-125 stops responding and reboots. The log files for the event lists the reason as an NMI watchdog interrupt. **Scenario:** This issue is observed in AP-125 connected to a controller running ArubaOS 6.4.2.6. **Platform:** AP-125 access points. **Reported Version:** ArubaOS 6.4.2.6. **Workaround:** None.

AP-Wireless

Table 12: *AP-Wireless Known Issues*

Bug ID	Description
124572	**Symptom:** Intel 7260 11ac clients connected to AP-135 reaches the default threshold limit of Tx retries, which causes an increase in the jitter, when voice calls are made. **Scenario:** This issue is observed while sending data to Intel 7260 11ac downstream. This issue is observed in AP-135 connected to controllers running ArubaOS 6.4.2.6. **Platform:** AP-135 access points. **Reported Version:** ArubaOS 6.4.2.6.

ARM

Table 13: *ARM Known Issues*

Bug ID	Description
112409	**Symptom:** The wireless chipset for 802.11ac-capable does not dynamically switch from 80 MHz to 40/20 MHz even with strong interference. **Scenario:** This issue is observed in AP-220 Series and other 802.11ac-capable access points connected to controllers running ArubaOS 6.4.2.4. **Platform:**AP-200 Series, AP-210 Series, AP-220 Series, and AP-270 Series access points. **Reported Version:** ArubaOS 6.4.2.4. **Workaround:** None.
113843	**Symptom:** After changing **cm-band-a-min-signal** parameter to 10 in the **rf arm-profile**, cellular handoff assist is triggered even if clients are associated with 2.4 GHz and have strong signal strength. **Scenario:** This issue is observed in controllers running ArubaOS 6.4.0.3. **Platform:** All platforms. **Reported Version:** ArubaOS 6.4.0.3. **Workaround:** None.

Controller-Datapath

Table 14: *Controller-Datapath Known Issues*

Bug ID	Description

122939	**Symptom:** AP-2xx Series of access points experience amplified packet loss during voice calls.
	Scenario: This issue is observed when spectrum monitoring is enabled on the AP. This issue is observed in AP-2xx Series access points running ArubaOS 6.4.2.x, ArubaOS 6.4.3.x, or ArubaOS 6.4.4.x.
	Platform: AP-2xx Series access points.
	Reported Version: ArubaOS 6.4.2.5.
	Workaround: Disable spectrum monitoring. The following example disables spectrum monitoring for an 802.11a radio profile:
	`(host)(config) #rf dot11a-radio-profile default`
	`(host) (802.11a radio profile "default") #no spectrum-monitoring`

Station Management

Table 15: *Station Management Known Issues*

Bug ID	Description
124275	**Symptom:** All clients obtain IP addresses from the same VLAN even though a RADIUS server vendor specific attribute (VSA) specifies a VLAN pool with multiple VLANs. **Scenario:** This issue is observed when a RADIUS server VSA overrides the Virtual AP VLAN(s) with a different VLAN pool that is configured with the even assignment type. This issue is observed in a controller running ArubaOS 6.4.2.6. **Platform:** All platforms. **Reported Version:** ArubaOS 6.4.2.6. **Workaround:** Change the VLAN assignment type to **hash** from **even** using the following CLI command: `(host) (config) #vlan-name <name> assignment hash`

Maximum Number of NAT Pools

A controller supports a maximum of 60 NAT pools.

This chapter details software upgrade procedures. Aruba best practices recommend that you schedule a maintenance window for upgrading your controllers.

Read all the information in this chapter before upgrading your controller.

Topics in this chapter include:

Upgrade Caveats

Before upgrading to this version of ArubaOS, take note of these known upgrade caveats.

- AP LLDP profile is not supported on AP-120 Series in ArubaOS 6.4.x.
- Starting from ArubaOS 6.3.1.0, the local file upgrade option in the 620 and 650 controller WebUIs have been disabled.
- ArubaOS 6.4.x does not allow you to create redundant firewall rules in a single ACL. ArubaOS will consider a rule redundant if the primary keys are the same. The primary key is made up of the following variables:
  - source IP/alias
  - destination IP/alias
  - proto-port/service

  If you are upgrading from ArubaOS 6.1 or earlier and your configuration contains an ACL with redundant firewall rules, upon upgrading, only the last rule will remain.

  For example, in the below ACL, both ACE entries could not be configured in ArubaOS 6.4.x. When the second ACE is added, it overwrites the first.

```
(host) (config) #ip access-list session allowall-laptop
(host) (config-sess-allowall-laptop)# any any any  permit time-range test_range
(host) (config-sess-allowall-laptop)# any any any  deny
(host) (config-sess-allowall-laptop)#end
(host) #show ip access-list allowall-laptop

ip access-list session allowall-laptop
allowall-laptop
---------------
Priority  Source  Destination  Service  Action  TimeRange
--------  ------  -----------  -------  ------  ---------
1         any     any          any      deny
```

- ArubaOS 6.4.x supports only the newer MIPS controllers (7200 Series, 7000 Series, M3, 3200XM, 3400, 3600, and 600 Series). Legacy PPC controllers (200, 800, 2400, SC1/SC2) and 3200 controllers are not supported. Do not upgrade to ArubaOS 6.4.x if your deployment contains a mix of MIPS and PPC controllers in a master-local setup.
- When upgrading the software in a multicontroller network (one that uses two or more Aruba controllers), special care must be taken to upgrade all the controllers in the network and to upgrade them in the proper sequence. (See Upgrading in a Multicontroller Network on page 22.)

GRE Tunnel-Type Requirements

This section describes the important points to remember when configuring an L2 GRE tunnel with respect to tunnel-type:

- ArubaOS 6.4.4.0 continues to support L2 GRE tunnel type zero, but it is recommended to use a non-zero tunnel type.
- If both L2 and L3 tunnels are configured between end point devices, you must use a non-zero tunnel type for L2 GRE tunnels.

Important Points to Remember and Best Practices

Ensure a successful upgrade and optimize your upgrade procedure by taking the recommended actions provided in the following list. You should save this list for future use.

- Schedule the upgrade during a maintenance window and notify your community of the planned upgrade. This prevents users from being surprised by a brief wireless network outage during the upgrade.
- Avoid making any other changes to your network, such as configuration changes, hardware upgrades, or changes to the rest of the network during the upgrade. This simplifies troubleshooting.
- Know your network and verify the state of your network by answering the following questions:
  - How many APs are assigned to each controller? Verify this information by navigating to the **Monitoring > NETWORK > All Access Points** section of the WebUI, or by executing the **show ap active** and **show ap database** CLI commands.
  - How are those APs discovering the controller (DNS, DHCP Option, Broadcast)?
  - What version of ArubaOS is currently on the controller?
  - Are all controllers in a master-local cluster running the same version of software?
  - Which services are used on the controllers (employee wireless, guest access, remote AP, wireless voice)?
- Resolve any existing issues (consistent or intermittent) before you upgrade.
- If possible, use FTP to load software images to the controller. FTP is faster than TFTP and offers more resilience over slow links. If you must use TFTP, ensure the TFTP server can send over 30 MB of data.

- Always upgrade the non-boot partition first. If problems occur during the upgrade, you can restore the flash, and switch back to the boot partition. Upgrading the non-boot partition gives you a smoother downgrade path should it be required.
- Before you upgrade to this version of ArubaOS, assess your software license requirements and load any new or expanded licenses you may require. For a detailed description of these new license modules, refer to the "Software Licenses" chapter in the *ArubaOS 6.4.x User Guide*.

Memory Requirements

All Aruba controllers store critical configuration data on an onboard compact flash memory module. Ensure that there is always free flash space on the controller. Loading multiple large files such as JPEG images for RF Plan can consume flash space quickly. To maintain the reliability of your WLAN network, the following compact memory best practices are recommended:

- Confirm that there is at least 60 MB of free memory available for an upgrade using the WebUI, or execute the **show memory** command to confirm that there is at least 40 MB of free memory available for an upgrade using the CLI. Do not proceed unless this much free memory is available. To recover memory, reboot the controller. After the controller comes up, upgrade immediately.
- Confirm that there is at least 75 MB of flash space available for an upgrade using the WebUI, or execute the **show storage** command to confirm that there is at least 60 MB of flash space available for an upgrade using the CLI.

In certain situations, a reboot or a shutdown could cause the controller to lose the information stored in its compact flash card. To avoid such issues, it is recommended that you execute the **halt** command before power cycling.

If the output of the **show storage** command indicates that there is insufficient flash memory space, you must free up some used memory. Any controller logs, crash data, or flash backups should be copied to a location off the controller, then deleted from the controller to free up flash space. You can delete the following files from the controller to free up some memory before upgrading:

- **Crash Data:** Execute the **tar crash** command to compress crash files to a file named **crash.tar**. Use the procedures described in Backing up Critical Data on page 20 to copy the **crash.tar** file to an external server, and then execute the **tar clean crash** command to delete the file from the controller.
- **Flash Backups:** Use the procedures described in Backing up Critical Data on page 20 to back up the flash directory to a file named **flash.tar.gz**, and then execute the **tar clean flash** command to delete the file from the controller.
- **Log files:** Execute the **tar logs** command to compress log files to a file named **logs.tar**. Use the procedures described in Backing up Critical Data on page 20 to copy the **logs.tar** file to an external server, and then execute the **tar clean logs** command to delete the file from the controller.

Backing up Critical Data

It is important to frequently back up all critical configuration data and files on the compact flash file system to an external server or mass storage device. At the very least, you should include the following files in these frequent backups:

- Configuration data
- WMS database
- Local user database
- Licensing database
- Floor plan JPEGs

- Custom captive portal pages
- x.509 certificates
- Controller Logs

Backing up and Restoring Compact Flash in the WebUI

The WebUI provides the easiest way to back up and restore the entire compact flash file system. The following steps describe how to back up and restore the compact flash file system using the WebUI on the controller:

1. Click the **Configuration** tab.
2. Click **Save Configuration** at the top of the page.
3. Navigate to the **Maintenance > File > Backup Flash** page.
4. Click **Create Backup** to back up the contents of the compact flash file system to the **flashbackup.tar.gz** file.
5. Click **Copy Backup** to copy the file to an external server.

   You can later copy the backup file from the external server to the compact flash file system using the file utility in the **Maintenance > File > Copy Files** page.
6. To restore the backup file to the Compact Flash file system, navigate to the **Maintenance > File > Restore Flash** page and click **Restore**.

Backing up and Restoring Compact Flash in the CLI

The following steps describe the backup and restore procedure for the entire compact flash file system using the controller's command line:

1. Make sure you are in the **enable** mode in the controller CLI, and execute the following command:

   ```
   (host) # write memory
   ```
2. Execute the **backup** command to back up the contents of the compact flash file system to the **flashbackup.tar.gz** file.

   ```
   (host) # backup flash
   Please wait while we tar relevant files from flash...
   Please wait while we compress the tar file...
   Checking for free space on flash...
   Copying file to flash...
   File flashbackup.tar.gz created successfully on flash.
   ```
3. Execute the **copy** command to transfer the backup flash file to an external server or storage device.

   ```
   (host) copy flash: flashbackup.tar.gz ftp: <ftphost> <ftpusername> <ftpuserpassword>
   <remote directory>
   (host) copy flash: flashbackup.tar.gz usb: partition <partition-number>
   ```

   You can later transfer the backup flash file from the external server or storage device to the compact flash file system by executing the **copy** command.

   ```
   (host) # copy tftp: <tftphost> <filename> flash: flashbackup.tar.gz
   (host) # copy usb: partition <partition-number> <filename> flash: flashbackup.tar.gz
   ```
4. Execute the **restore** command to untar and extract the **flashbackup.tar.gz** file to the compact flash file system.

   ```
   (host) # restore flash
   ```

Upgrading in a Multicontroller Network

In a multicontroller network (a network with two or more Aruba controllers), special care must be taken to upgrade all controllers based on the controller type (master or local). Be sure to back up all controllers being upgraded, as described in Backing up Critical Data on page 20.

NOTE

For proper operation, all controllers in the network must be upgraded with the same version of ArubaOS software. For redundant (VRRP) environments, the controllers should be of the same model.

To upgrade an existing multicontroller system to this version of ArubaOS:

1. Load the software image onto all controllers (including redundant master controllers).
2. If all the controllers cannot be upgraded with the same software image and rebooted simultaneously, use the following guidelines:
   a. Upgrade the software image on all the controllers. Reboot the master controller. After the master controller completes rebooting, you can reboot the local controllers simultaneously.
   b. Verify that the master and all local controllers are upgraded properly.

Installing the FIPS Version of ArubaOS 6.4.4.1

Download the FIPS version of the software from https://support.arubanetworks.com.

Instructions on Installing FIPS Software

Follow the steps below to install the FIPS software that is currently running a non-FIPS version of the software:

1. Install the FIPS version of the software on the controller.
2. Execute the **write erase** command to reset the configuration to the factory default; otherwise, you cannot log in to the controller using the CLI or WebUI.
3. Reboot the controller by executing the **reload** command.

This is the only supported method of moving from non-FIPS software to FIPS software.

Upgrading to ArubaOS 6.4.4.1

The following sections provide the procedures for upgrading the controller to ArubaOS 6.4.4.1 by using the WebUI or CLI.

Install Using the WebUI

CAUTION

Confirm that there is at least 60 MB of free memory and at least 75 MB of flash space available for an upgrade using the WebUI. For details, see Memory Requirements on page 20.

NOTE

When you navigate to the **Configuration** tab of the controller's WebUI, the controller may display the **Error getting information: command is not supported on this platform** message. This error occurs when you upgrade the controller from the WebUI and navigate to the **Configuration** tab as soon as the controller completes rebooting. This error is expected and disappears after clearing the Web browser cache.

Upgrading From an Older Version of ArubaOS

Before you begin, verify the version of ArubaOS currently running on your controller. If you are running one of the following versions of ArubaOS, you must download and upgrade to an interim version of ArubaOS before upgrading to ArubaOS 6.4.4.1.

- For controllers running ArubaOS 3.x.versions earlier than ArubaOS 3.4.4.1, download the latest version of ArubaOS 3.4.5.x.
- For controllers running ArubaOS 3.x or those running ArubaOS 5.0.x versions earlier than ArubaOS 5.0.3.1, download and install the latest version of ArubaOS 5.0.4.x.
- For controllers running ArubaOS 6.0.0.0 or 6.0.0.1 versions, download and install the latest version of ArubaOS 6.0.1.x.

Follow step 2 to step 11 of the procedure described in Upgrading From a Recent Version of ArubaOS on page 23 to install the interim version of ArubaOS, and then repeat steps 1 through 11 of the procedure to download and install ArubaOS 6.4.4.1.

Upgrading From a Recent Version of ArubaOS

The following steps describe the procedure to upgrade from one of these recent versions of ArubaOS:

- 3.4.4.1 or later
- 5.0.3.1 or latest version of 5.0.x
- 6.0.1.0 or later 6.x

Install the ArubaOS software image from a PC or workstation using the WebUI on the controller. You can also install the software image from a TFTP or FTP server using the same WebUI page.

1. Download ArubaOS 6.4.4.1 from the customer support site.
2. Upload the new software image(s) to a PC or workstation on your network.
3. Validate the SHA hash for a software image:
   a. Download the **Aruba.sha256** file from the download directory.
   b. To verify the image, load the image onto a Linux system and execute the **sha256sum <filename>** command or use a suitable tool for your operating system that can generate a **SHA256** hash of a file.
   c. Verify that the output produced by this command matches the hash value found on the support site.

The ArubaOS image file is digitally signed, and is verified using RSA2048 certificates preloaded on the controller at the factory. Therefore, even if you do not manually verify the SHA hash of a software image, the controller will not load a corrupted image.

4. Log in to the ArubaOS WebUI from the PC or workstation.
5. Navigate to the **Maintenance > Controller > Image Management** page.
   a. Select the **Local File** option.
   b. Click **Browse** to navigate to the saved image file on your PC or workstation.
6. Select the downloaded image file.
7. Choose the nonboot partition from the **Partition to Upgrade** radio button.
8. Choose **Yes** in the **Reboot Controller After Upgrade** radio button to automatically reboot after upgrading. Choose **No**, if you do not want the controller to reboot immediately.

Note that the upgrade will not take effect until you reboot the controller.

9. Choose **Yes** in the **Save Current Configuration Before Reboot** radio button.
10. Click **Upgrade**.

When the software image is uploaded to the controller, a popup window displays the **Changes were written to flash successfully** message.

11. Click **OK**.

    If you chose to automatically reboot the controller in step 8, the reboot process starts automatically within a few seconds (unless you cancel it).

12. When the reboot process is complete, log in to the WebUI and navigate to the **Monitoring > NETWORK > All WLAN Controllers** page to verify the upgrade.

When your upgrade is complete, perform the following steps to verify that the controller is functioning as expected.

1. Log in to the WebUI to verify all your controllers are up after the reboot.
2. Navigate to the **Monitoring > NETWORK > Network Summary** page to determine if your APs are up and ready to accept clients. In addition, verify that the number of access points and clients are what you would expect.
3. Verify that the number of access points and clients are what you would expect.
4. Test a different type of client for each access method that you use and in different locations when possible.
5. Complete a backup of all critical configuration data and files on the compact flash file system to an external server or mass storage facility. See Backing up Critical Data on page 20 for information on creating a backup. If the flash (Provisioning/Backup) image version string shows the letters *rn*, for example, 3.3.2.11-rn-3.0, note those AP names and IP addresses. The RAP-5/RAP-5WN reboots to complete the provisioning image upgrade.

Install Using the CLI

Confirm that there is at least 40 MB of free memory and at least 60 MB of flash space available for an upgrade using the CLI. For details, see Memory Requirements on page 20.

Upgrading From an Older Version of ArubaOS

Before you begin, verify the version of ArubaOS currently running on your controller. For more information, see Upgrading From an Older Version of ArubaOS on page 22.

Follow steps 2 through 7 of the procedure described in Upgrading From a Recent Version of ArubaOS on page 24 to install the interim version of ArubaOS, and then repeat steps 1 through 7 of the procedure to download and install ArubaOS 6.4.4.1.

Upgrading From a Recent Version of ArubaOS

The following steps describe the procedure to upgrade from one of these recent versions of ArubaOS:

- 3.4.4.1 or later
- 5.0.3.1 or latest version of 5.0.x
- 6.0.1.0 or later 6.x

To install the ArubaOS software image from a PC or workstation using the CLI on the controller:

1. Download ArubaOS 6.4.4.1 from the customer support site.
2. Open an SSH session on your master (and local) controllers.
3. Execute the **ping** command to verify the network connection from the target controller to the SCP/FTP/TFTP server.

```
(hostname)# ping <ftphost>
```

or

```
(hostname)# ping <tftphost>
```

or

```
(hostname)# ping <scphost>
```

4. Execute the **show image version** command to check if the ArubaOS images are loaded on the controller's flash partitions. The partition number appears in the **Partition** row; **0:0** is partition 0, and **0:1** is partition 1. The active boot partition is marked as **Default boot**.

```
(hostname) #show image version
---------------------------------
Partition               : 0:0 (/dev/ha1)
Software Version        : ArubaOS 6.1.1.0 (Digitally Signed - Production Build)
Build number            : 28288
Label                   : 28288
Built on                : Thu Apr 21 12:09:15 PDT 2012
---------------------------------
Partition               : 0:1 (/dev/hda2) **Default boot**
Software Version        : ArubaOS 6.1.3.2 (Digitally Signed - Production Build)
Build number            : 38319
Label                   : 38319
Built on                : Fri June 07 00:03:14 2013
```

5. Execute the **copy** command to load the new image onto the nonboot partition.

```
(hostname)# copy ftp: <ftphost> <ftpusername> <image filename> system: partition <0|1>
```

or

```
(hostname)# copy tftp: <tftphost> <image filename> system: partition <0|1>
```

or

```
(hostname)# copy scp: <scphost> <scpusername> <image filename> system: partition <0|1>
```

or

```
(hostname)# copy usb: partition <partition-number> <image filename> system: partition <0|1>
```

The USB option is available on the 7010, 7030, and 7200 Series controllers.

6. Execute the **show image version** command to verify that the new image is loaded.

```
(hostname)# show image version

---------------------------------
Partition               : 0:0 (/dev/hda1) **Default boot**
Software Version        : ArubaOS 6.4.4.1 (Digitally Signed - Production Build)
Build number            : 52172
Label                   : 52172
Built on                : Wed Oct 21 02:00:40 PDT 2015
---------------------------------
Partition               : 0:1 (/dev/hda2)
Software Version        : ArubaOS 6.4.3.0 (Digitally Signed - Production Build)
Build number            : 49296
Label                   : 49296
Built on                : Sun Mar 15 01:15:24 PDT 2015
```

7. Reboot the controller.

```
(hostname)# reload
```

8. Execute the **show version** command to verify that the upgrade is complete.

```
(hostname)# show version
```

When your upgrade is complete, perform the following steps to verify that the controller is functioning as expected.

1. Log in to the CLI to verify that all your controllers are up after the reboot.
2. Execute the **show ap active** command to determine if your APs are up and ready to accept clients.
3. Execute the **show ap database** command to verify that the number of access points and clients are what you expected.
4. Test a different type of client for each access method that you use and in different locations when possible.
5. Complete a backup of all critical configuration data and files on the compact flash file system to an external server or mass storage facility. See Backing up Critical Data on page 20 for information on creating a backup.

Downgrading

If necessary, you can return to your previous version of ArubaOS.

If you upgraded from ArubaOS 3.3.x to ArubaOS 5.0, the upgrade script encrypts the internal database. New entries created in ArubaOS 6.4.4.1 are lost after the downgrade (this warning does not apply to upgrades from ArubaOS 3.4.x to ArubaOS 6.1).

If you downgrade to a pre-6.1 configuration that was not previously saved, some parts of your deployment may not work as they previously did. For example, when downgrading from ArubaOS 6.4.4.1 to 5.0.3.2, changes made to WIPS in ArubaOS 6.x prevent the new predefined IDS profile assigned to an AP group from being recognized by the older version of ArubaOS. This unrecognized profile can prevent associated APs from coming up, and can trigger a profile error.

These new IDS profiles begin with *ids-transitional* while older IDS profiles do not include *transitional*. If you have encountered this issue, execute the **show profile-errors** and **show ap-group** commands to view the IDS profile associated with the AP group.

When reverting the controller software, whenever possible, use the previous version of software known to be used on the system. Loading a release not previously confirmed to operate in your environment could result in an improper configuration.

Before You Begin

Before you reboot the controller with the preupgrade software version, you must perform the following steps:

1. Back up your controller. For details, see Backing up Critical Data on page 20.
2. Verify that the control plane security is disabled.
3. Set the controller to boot with the previously saved pre-ArubaOS 6.4.4.1 configuration file.
4. Set the controller to boot from the system partition that contains the previously running ArubaOS image.

   When you specify a boot partition (or copy an image file to a system partition), the software checks to ensure that the image is compatible with the configuration file used on the next controller reload. An error message is displayed if system boot parameters are set for incompatible image and configuration files.
5. After downgrading the software on the controller, perform the following steps:
   - Restore pre-ArubaOS 6.4.4.1 flash backup from the file stored on the controller. Do not restore the ArubaOS 6.4.4.1 flash backup file.

- You do not need to reimport the WMS database or RF Plan data. However, if you have added changes to RF Plan in ArubaOS 6.4.4.1, the changes do not appear in RF Plan in the downgraded ArubaOS version.
- If you installed any certificates while running ArubaOS 6.4.4.1, you need to reinstall the certificates in the downgraded ArubaOS version.

Downgrading Using the WebUI

The following section describes how to use the WebUI to downgrade the software on the controller.

1. If the saved preupgrade configuration file is on an external FTP/TFTP server, copy the file to the controller by navigating to the **Maintenance > File > Copy Files** page.
   a. For **Source Selection**, select FTP/TFTP server, and enter the IP address of the FTP/TFTP server and the name of the preupgrade configuration file.
   b. For **Destination Selection**, enter a file name (other than default.cfg) for Flash File System.
2. Set the controller to boot with your preupgrade configuration file by navigating to the **Maintenance > Controller > Boot Parameters** page.
   a. Select the saved preupgrade configuration file from the **Configuration File** drop-down list.
   b. Click **Apply**.
3. Determine the partition on which your previous software image is stored by navigating to the **Maintenance > Controller > Image Management** page. If there is no previous software image stored on your system partition, load it into the backup system partition (you cannot load a new image into the active system partition) by performing the following steps:
   a. Enter the FTP/TFTP server address and image file name.
   b. Select the backup system partition.
   c. Click **Upgrade**.
4. Navigate to the **Maintenance > Controller > Boot Parameters** page.
   a. Select the system partition that contains the preupgrade image file as the boot partition.
   b. Click **Apply**.
5. Navigate to the **Maintenance > Controller > Reboot Controller** page. Click **Continue**. The controller reboots after the countdown period.
6. When the boot process is complete, verify that the controller is using the correct software by navigating to the **Maintenance > Controller > Image Management** page.

Downgrading Using the CLI

The following section describes how to use the CLI to downgrade the software on the controller.

1. If the saved preupgrade configuration file is on an external FTP/TFTP server, use the following command to copy it to the controller:

   ```
   (host) # copy ftp: <ftphost> <ftpusername> <image filename> system: partition 1
   ```

   or

   ```
   (host) # copy tftp: <tftphost> <image filename> system: partition 1
   ```

2. Set the controller to boot with your preupgrade configuration file.

   ```
   (host) # boot config-file <backup configuration filename>
   ```

3. Execute the **show image version** command to view the partition on which your previous software image is stored. You cannot load a new image into the active system partition (the default boot).

   In the following example, partition 1, the backup system partition, contains the backup release ArubaOS 6.1.3.2. Partition 0, the default boot partition, contains the ArubaOS 6.4.4.1 image.

```
#show image version
----------------------------------
Partition               : 0:0 (/dev/hda1) **Default boot**
Software Version        : ArubaOS 6.4.4.1 (Digitally Signed - Production Build)
Build number            : 52172
Label                   : 52172
Built on                : Wed Oct 21 02:00:40 PDT 2015
----------------------------------
Partition               : 0:1 (/dev/hda2)
Software Version        : ArubaOS 6.1.3.2 (Digitally Signed - Production Build)
Build number            : 38319
Label                   : 38319
Built on                : Fri June 07 00:03:14 2013
```

4. Set the backup system partition as the new boot partition.
   ```
   (host) # boot system partition 1
   ```
5. Reboot the controller.
   ```
   (host) # reload
   ```
6. When the boot process is complete, verify that the controller is using the correct software.
   ```
   (host) # show image version
   ```

Before You Call Technical Support

Before you place a call to Technical Support, follow these steps:

1. Provide a detailed network topology (including all the devices in the network between the user and the Aruba controller with IP addresses and Interface numbers if possible).
2. Provide the wireless device's make and model number, OS version (including any service packs or patches), wireless Network Interface Card (NIC) make and model number, wireless NIC's driver date and version, and the wireless NIC's configuration.
3. Provide the controller logs and output of the **show tech-support** command via the WebUI Maintenance tab or via the CLI (**tar logs tech-support**).
4. Provide the syslog file of the controller at the time of the problem. Aruba strongly recommends that you consider adding a syslog server if you do not already have one to capture logs from the controller.
5. Let the support person know if this is a new or existing installation. This helps the support team to determine the troubleshooting approach, depending on whether you have an outage in a network that worked in the past, a network configuration that has never worked, or a brand new installation.
6. Let the support person know if there are any recent changes in your network (external to the Aruba controller) or any recent changes to your controller and/or AP configuration. If there was a configuration change, list the exact configuration steps and commands used.
7. Provide the date and time (if possible) of when the problem first occurred. If the problem is reproducible, list the exact steps taken to recreate the problem.
8. Provide any wired or wireless sniffer traces taken during the time of the problem.
9. Provide the controller site access information, if possible.