Predownloading an Image to an Access Point

Information About Predownloading an Image to an Access Point

To minimize network outages, download an upgrade image to an access point from the device without resetting the access point or losing network connectivity. Previously, you could download an upgrade image to the device and reset it, causing the access point to go into discovery mode. After the access point discovered the controller with the new image, the access point would download the new image, reset it, go into discovery mode, and rejoin the device.

You can now download the upgrade image to the controller. When the controller is up with the upgrade image, the AP joins the controller and moves to Registered state, because the AP image has been predownloaded to the AP.

Restrictions for Predownloading an Image to an Access Point

The following are the restrictions for predownloading an image to an access point:

- The maximum number of concurrent predownloads are limited to 100 per wncd instance (25 for 9800-L) in the controller. However, the predownloads are triggered in sets of 16 per wncd instance at the start, and is repeated every 60 seconds.

- Access points with 16-MB total available memory may not have enough free memory to download an upgrade image and may automatically delete crash information files, radio files, and backup images, if any, to free up space. However, this limitation does not affect the predownload process because the predownload image replaces backup image, if any, on the access point.

- All of the primary, secondary, and tertiary controllers should run the same images. Otherwise, the feature will not be effective.

- At the time of reset, you must make sure that all of the access points have downloaded the image.

- An access point can store only 2 software images.

- The Cisco Wave 1 APs may download the image twice while moving from Cisco AireOS Release 8.3 to Cisco IOS XE Gibraltar 16.10.1. This increases the AP downtime during migration.

- The **show ap image** command displays cumulative statistics regarding the AP images in the controller. We recommend that you clear the statistics using the **clear ap predownload statistics** command, before using the show ap image command, to ensure that correct data is displayed.

- AP image predownload will not work if you upgrade the controller from the web UI

- Cisco Catalyst 9800-CL Wireless Controller supports only self-signed certificates and does not support Cisco certificates. When you move the access points between Cisco Catalyst 9800-CL Wireless Controllers, and if the AP join failure occurs on the Cisco Catalyst 9800-CL controller, execute the **capwap ap erase all** command to remove the hash string stored on the APs.

- During AP image pre-download, the WNCD CPU may rise to 99 percent, which is normal and doesn't cause a crash or client or AP disconnect problems.

Predownloading an Image to Access Points (CLI)

Before you begin

There are some prerequisites that you must keep in mind while predownloading an image to an access point:

- Predownloading can be done only when the device is booted in the install mode.

- You can copy the new image either from the TFTP server, flash image, or USB.

- If the latest upgrade image is already present in the AP, predownload will not be triggered. Check whether the primary and backup image versions are the same as the upgrade image, using the **show ap image** command.

- The **show ap image** command displays cumulative statistics regarding the AP images in the controller. We recommend that you clear the statistics using the **clear ap predownload statistics** command, before using the **show ap image** command, to ensure that correct data is displayed.

- AP continues to be in predownloading state, if AP flaps post SSO during AP predownload. We recommended that you issue the **ap image predownload abort** command and then the **clear ap predownload stats** command only then the predownload can be intiated again.

Procedure

	Command or Action	Purpose

Step 1	**install add file bootflash:**_file-name_
	
	Example:
	
	`Device# install add file`
	`bootflash:image.bin`
		The controller software image is added to the flash and expanded.

Step 2	**ap image predownload** or **ap name** _ap-name_ **image predownload** **Example:**	Downloads the new image to all the access points or a specific access point connected to the device.

	Command or Action	Purpose
	`Device# ap image predownload` `Device# ap name ap1 image predownload`	
Step 3	**show ap image** **Example:** `Device# show ap image`	Verifies the access point's predownload status. This command initially displays the status as Predownloading and then moves to Completed, when download is complete.
Step 4	**show ap name** *ap-name* **image** **Example:** `Device# show ap name ap1 image`	Provides image details of a particular AP.
Step 5	**ap image swap** or**ap name** *ap-name* **image swap** or**ap image swap completed** **Example:** `Device# ap image swap`	Swaps the images of the APs that have completed predownload. **Note** You can swap the AP images using **ap image swap** command even without pre-downloading a new image to the AP and there are no restrictions or prerequisites to swap the image.
Step 6	**install activate** **Example:** `Device# `**`install activate`**	Runs compatibility checks, installs the package, and updates the package status details. For a restartable package, the command triggers the appropriate post-install scripts to restart the necessary processes, and for non-restartable packages it triggers a reload. **Note** This step reloads the complete controller stack (both primary and secondary controllers, if HA is used).
Step 7	**install commit** **Example:** `Device# `**`install commit`**	Commits the activation changes to be persistent across reloads. The commit can be done after activation while the system is up, or after the first reload. If the package is activated but not committed, it remains active after the first reload, but not after the second reload.

Monitoring the Access Point Predownload Process

This section describes the commands that you can use to monitor the access point predownload process.

While downloading an access point predownload image, enter the **show ap image** command to verify the predownload progress on the corresponding access point:

```
Device# show ap image
Total number of APs  : 1

Number of APs
      Initiated               : 1
      Predownloading          : 1
      Completed predownloading : 0
      Not Supported           : 0
      Failed to Predownload   : 0

AP Name                               Primary Image   Backup Image    Predownload Status
Predownload Ver... Next Retry Time    Retry Count
————————————————————————————————————————————————————————————————————————————————————————
AP1                                   10.0.1.66       10.0.1.66       Predownloading
10.0.1.67          NA                              0


Device# show ap image

Total number of APs  : 1

Number of APs
      Initiated               : 1
      Predownloading          : 0
      Completed predownloading : 1
      Not Supported           : 0
      Failed to Predownload   : 0

AP Name                               Primary Image   Backup Image    Predownload Status
Predownload Ver... Next Retry Time    Retry Count
————————————————————————————————————————————————————————————————————————————————————————
AP1                                   10.0.1.66       10.0.1.67       Complete
10.0.1.67          NA
                        0
```

Use the following command to view the image details of a particular AP:

```
Device# show ap name APe4aa.5dd1.99b0 image

AP Name : APe4aa.5dd1.99b0
Primary Image : 16.6.230.46
Backup Image : 3.0.51.0
Predownload Status : None
Predownload Version : 000.000.000.000
Next Retry Time : N/A
Retry Count : 0
```