



Managing Software

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Upgrading the Controller Software

When you upgrade the controller software, the software on the access points associated with the controller is also automatically upgraded. When an access point is loading software, each of its LEDs blinks in succession.



Caution

Do not power down the controller or any access point during this process; otherwise, you might corrupt the software image. Upgrading a controller with a large number of access points can take as long as 30 minutes, depending on the size of your network. However, with the increased number of concurrent access point upgrades supported in the controller software release, the upgrade time should be significantly reduced. The access points must remain powered, and the controller must not be reset during this time.

Restrictions for Upgrading Cisco WLC Software

The following are some of the general restrictions that are applicable when upgrading the Cisco WLC software. For any release-specific restrictions, see the relevant [release notes](#).

- Before upgrading or downgrading the controller image, you must close all open web pages and clear the browser cache.
- If you require a downgrade from one release to another, you might lose the configuration from your current release. The workaround is to reload the previous controller configuration files saved on the backup server or to reconfigure the controller.
- You can upgrade or downgrade the controller software only between certain releases. In some instances, you must first install an intermediate release prior to upgrading to the latest software release.
- When you upgrade the controller to an intermediate software release, you must wait until all of the access points that are associated with the controller are upgraded to the intermediate release before you install the latest controller software. In large networks, it can take some time to download the software on each access point.

- When you upgrade to the latest software release, the software on the access points associated with the controller is also automatically upgraded. When an access point is loading software, each of its LEDs blinks in succession.
- We recommend that you access the Cisco WLC GUI using Microsoft Internet Explorer 11 or a later version, or Mozilla Firefox 32 or a later version.
- Cisco WLCs support standard SNMP Management Information Base (MIB) files. MIBs can be downloaded from the Download Software area in Cisco.com.
- The Cisco WLC software is factory installed on your Cisco WLC and automatically downloaded to the access points after a release upgrade and whenever an access point joins a Cisco WLC. We recommend that you install the latest software version available for maximum operational benefit.
- We recommend that you install Wireless LAN Controller Field Upgrade Software for Release 1.7.0.0-FUS, which is a special AES package that contains several system-related component upgrades. These include the bootloader, field recovery image, and FPGA/MCU firmware. Installing the FUS image requires special attention because it installs some critical firmware. The FUS image is independent of the runtime image. For more information, see http://www.cisco.com/c/en/us/td/docs/wireless/controller/release/notes/fus_rn_1_7_0_0.html.
- Ensure that you have a TFTP or FTP server available for the software upgrade. Follow these guidelines when setting up a TFTP or FTP server:
 - Ensure that your TFTP server supports files that are larger than the size of the controller software release. Some TFTP servers that support files of this size are tftpd32 and the TFTP server within the Cisco Prime Infrastructure. If you attempt to download the controller software and your TFTP server does not support files of this size, the following error message appears: “TFTP failure while storing in flash.”
 - If you are upgrading through the distribution system network port, the TFTP or FTP server can be on the same or a different subnet because the distribution system port is routable
- When you plug a Cisco WLC into an AC power source, the bootup script and power-on self-test run to initialize the system. During this time, you can press Esc to display the bootloader Boot Options Menu. The menu options for the Cisco 5508 and Flex 7510 WLCs are different than for other controller platforms.

Bootloader menu for Cisco 5508 WLC:

```
Boot Options
Please choose an option from below:
 1. Run primary image
 2. Run backup image
 3. Change active boot image
 4. Clear Configuration
 5. Format FLASH Drive
 6. Manually update images
Please enter your choice:
```

Bootloader menu for other controller platforms:

```
Boot Options
Please choose an option from below:
 1. Run primary image
 2. Run backup image
 3. Manually update images
 4. Change active boot image
 5. Clear Configuration
Please enter your choice:
```

Enter **1** to run the current software, enter **2** to run the previous software, enter **4** (on a Cisco 5508 WLC), or enter **5** (on another controller platform) to run the current software and set the controller configuration to factory defaults. Do not choose the other options unless directed to do so.



Note See the Installation Guide or the Quick Start Guide for your controller for more details on running the bootup script and power-on self-test.

- Control which address(es) are sent in CAPWAP discovery responses when NAT is enabled on the Management Interface using the following command:

config network ap-discovery nat-ip-only {enable | disable}

where

- **enable**—Enables use of NAT IP only in Discovery response. This is the default. Use this command if all APs are outside of the NAT gateway.
- **disable**—Enables use of both NAT IP and non-NAT IP in discovery response. Use this command if APs are on the inside and outside of the NAT gateway; for example, Local Mode and OfficeExtend APs on the same controller.



Note To avoid stranding APs, you must disable AP link-latency (if enabled) before you use the disable option for the **config network ap-discovery nat-ip-only** command. To disable AP link-latency, use the **config ap link-latency disable all** command.

- You can configure 802.1p tagging by using the **config qos dot1p-tag {bronze | silver | gold | platinum}** tag. For the 7.2.103.0 and later releases, if you tag 802.1p packets, the tagging has impact only on wired packets. Wireless packets are impacted only by the maximum priority level set for QoS.
- You can reduce the network downtime using the following options:
 - You can predownload the AP image.
 - For FlexConnect access points, use the FlexConnect Efficient AP upgrade feature to reduce traffic between the controller and the AP (main site and the branch).
- Do not power down the controller or any access point during the upgrade process; otherwise, you might corrupt the software image. Upgrading a controller with a large number of access points can take as long as 30 minutes, depending on the size of your network. However, with the increased number of concurrent access point upgrades supported, the upgrade time should be significantly reduced. The access points must remain powered, and the controller must not be reset during this time.
- If you want to downgrade to a previous release, do either of the following:
 - Delete all WLANs that are mapped to interface groups and create new ones.
 - Ensure that all WLANs are mapped to interfaces rather than interface groups.
- After you perform these functions on the controller, you must reboot the controller for the changes to take effect:

- Enable or disable link aggregation (LAG)
 - Enable a feature that is dependent on certificates (such as HTTPS and web authentication)
 - Add new or modify existing SNMP v3 users
 - Modify an existing SNMP v3 engine ID
 - Add a new license or modify an existing license
 - Increase the priority for a license
- The controller bootloader stores a copy of the active primary image and the backup image. If the primary image becomes corrupted, you can use the bootloader to boot with the backup image.
With the backup image stored before rebooting, be sure to choose **Option 2: Run Backup Image** from the boot menu to boot from the backup image. Then, upgrade with a known working image and reboot the controller.
 - The recovery image provides a backup image that can be used if an access point power-cycles during an image upgrade. The best way to avoid the need for access point recovery is to prevent an access point from power-cycling during a system upgrade. If a power-cycle occurs during an upgrade to an oversized access point image, you can recover the access point using the TFTP recovery procedure.
To recover the access point using the TFTP recovery procedure, follow these steps:
 - 1 Download the required recovery image from Cisco.com and install it in the root directory of your TFTP server.
 - 2 Connect the TFTP server to the same subnet as the target access point and power-cycle the access point. The access point boots from the TFTP image and then joins the controller to download the oversized access point image and complete the upgrade procedure.
 - 3 After the access point has been recovered, you can remove the TFTP server.
 - You can upgrade to a new release of the controller software or downgrade to an older release even if Federal Information Processing Standard (FIPS) is enabled.
 - Ensure that the configuration file that you back up does not contain < or > special character. If either of the special characters is present, then the download of the backed up configuration file fails.

Upgrading Controller Software (GUI)

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- Step 1** Upload your controller configuration files to a server to back them up.
- Note** We highly recommend that you back up your configuration files of the controller prior to upgrading the controller software. Otherwise, you must manually reconfigure the controller.
- Step 2** Get the controller software image by following these steps:
- a) Browse to <http://www.cisco.com/cisco/software/navigator.html>.
 - b) Choose **Wireless > Wireless LAN Controller**.
The following options are available: **Integrated Controllers and Controller Modules**, **Mobility Express**, and **Standalone Controllers**.

- c) Depending on your controller platform, click one of the above options.
- d) Click the controller model number or name. The Download Software page is displayed.
- e) Click a controller software release. The software releases are labeled as follows to help you determine which release to download:

Early Deployment (ED)—These software releases provide new features, new hardware platform support, and bug fixes.

Maintenance Deployment (MD)—These software releases provide bug fixes and ongoing software maintenance.

Deferred (DF)—These software releases have been deferred. We recommend that you migrate to an upgraded release.

- f) Choose a software release number.
- g) Click the filename (*filename.aes*).
- h) Click **Download**.
- i) Read Cisco's End User Software License Agreement and then click **Agree**.
- j) Save the file to your hard drive.
- k) Repeat steps *a* through *k* to download the remaining file.

Step 3 Copy the controller software image (*filename.aes*) to the default directory on your TFTP or FTP server.

Note In 8.3, 8.4, and 8.5 releases, for Cisco 2504 WLC, 5508 WLC, and WiSM2, the Cisco WLC software image is split into two images: Base Install Image and Supplementary AP Bundle Image. Therefore, to upgrade to 8.3, 8.4, or 8.5 release, you must repeat Step 2 through Step 14 to complete the installation of both Base Install Image and Supplementary AP Bundle Image.

Download the Supplementary AP Bundle Image only if you are using any of these APs: AP80x, Cisco Aironet 1550 Series AP (with 64-MB memory), Cisco Aironet 1550 Series AP (with 128-MB memory), Cisco Aironet 1570 Series APs, and/or Cisco Aironet 1600 APs.

Step 4 (Optional) Disable the 802.11 networks.

Note For busy networks, controllers on high utilization, or small controller platforms, we recommend that you disable the 802.11 networks as a precautionary measure.

Step 5 Choose **Commands > Download File** to open the **Download File to Controller** page.

Step 6 From the **File Type** drop-down list, choose **Code**.

Step 7 From the **Transfer Mode** drop-down list, choose from the following options:

- **TFTP**
- **FTP**
- **SFTP** (available in 7.4 and later releases)
- **HTTP** (available in 8.1 and later releases)

Step 8 In the **IP Address** text box, enter the IP address of the server.

If you are using a TFTP server, the default values of 10 retries and 6 seconds for the **Maximum Retries** and **Timeout** text boxes should work correctly without any adjustment. However, you can change these values.

Step 9 If you are using a TFTP server, the default values of 10 retries for the **Maximum Retries** text field, and 6 seconds for the **Timeout** text field should work correctly without any adjustment. However, you can change these values if desired. To do so, enter the maximum number of times that the TFTP server attempts to download the software in the **Maximum**

Retries text box and the amount of time (in seconds) that the TFTP server attempts to download the software in the **Timeout** text box.

Step 10 In the **File Path** text box, enter the directory path of the software.

Step 11 In the **File Name** text box, enter the name of the controller software file (*filename.aes*).

Step 12 If you are using an FTP server, follow these steps:

- a) In the **Server Login Username** text box, enter the username to log into the FTP server.
- b) In the **Server Login Password** text box, enter the password to log into the FTP server.
- c) In the **Server Port Number** text box, enter the port number on the FTP server through which the download occurs. The default value is 21.

Step 13 Click **Download** to download the software to the controller. A message appears indicating the status of the download.

Note In 8.3, 8.4, and 8.5 releases, for Cisco 2504 WLC, 5508 WLC, and WiSM2, the Cisco WLC software image is split into two images: Base Install Image and Supplementary AP Bundle Image. Therefore, to upgrade to 8.3, 8.4, or 8.5 release, you must repeat Step 2 through Step 14 to complete the installation of both Base Install Image and Supplementary AP Bundle Image.

Download the Supplementary AP Bundle Image only if you are using any of these APs: AP80x, Cisco Aironet 1550 Series AP (with 64-MB memory), Cisco Aironet 1550 Series AP (with 128-MB memory), Cisco Aironet 1570 Series APs, and/or Cisco Aironet 1600 APs.

Step 14 After the download is complete, click **Reboot**.

Step 15 If prompted to save your changes, click **Save and Reboot**.

Step 16 Click **OK** to confirm.

Step 17 After the controller reboots, repeat step 6 to step 16 to install the remaining file.

Step 18 For Cisco WiSM2, reenable the controller port channel on the Catalyst switch.

Step 19 If you have disabled the 802.11 networks, reenable them.

Step 20 To verify the controller software version, choose **Monitor** on the controller GUI and see **Software Version** in the Controller Summary area.

Upgrading Controller Software (CLI)

Step 1 Upload your controller configuration files to a server to back them up.

Note We highly recommend that you back up your controller's configuration files prior to upgrading the controller software. Otherwise, you must manually reconfigure the controller.

Step 2 Get the controller software image by following these steps:

- a) Browse to <http://www.cisco.com/cisco/software/navigator.html>.
- b) Choose **Wireless > Wireless LAN Controller**.
The following options are available: **Integrated Controllers and Controller Modules**, **Mobility Express**, and **Standalone Controllers**.
- c) Depending on your controller platform, click one of the above options.
- d) Click the controller model number or name. The Download Software page is displayed.
- e) Click a controller software release. The software releases are labeled as follows to help you determine which release to download:

Early Deployment (ED)—These software releases provide new features, new hardware platform support, and bug fixes.

Maintenance Deployment (MD)—These software releases provide bug fixes and ongoing software maintenance.

Deferred (DF)—These software releases have been deferred. We recommend that you migrate to an upgraded release.

- f) Choose a software release number.
- g) Click the filename (*filename.aes*).
- h) Click **Download**.
- i) Read Cisco's End User Software License Agreement and then click **Agree**.
- j) Save the file to your hard drive.
- k) Repeat steps *a* through *k* to download the remaining file.

Step 3 Copy the controller software image (*filename.aes*) to the default directory on your TFTP or FTP server.

Note In Release 8.3, for Cisco 2504 WLC, 5508 WLC, and WiSM2, the Cisco WLC software image is split into two images: Base Install Image and Supplementary AP Bundle Image. Therefore, to upgrade to Release 8.3 or later supported releases, you must repeat Step 2 through Step 11 to complete the installation of both Base Install Image and Supplementary AP Bundle Image.

Download the Supplementary AP Bundle Image only if you are using any of these APs: AP80x, Cisco Aironet 1530 Series AP, Cisco Aironet 1550 Series AP (with 64-MB memory), Cisco Aironet 1550 Series AP (with 128-MB memory), Cisco Aironet 1570 Series APs, and/or Cisco Aironet 1600 Series APs.

Step 4 (Optional) Disable the 802.11 networks.

Note For busy networks, controllers on high utilization, or small controller platforms, we recommend that you disable the 802.11 networks as a precautionary measure.

Step 5 Log onto the controller CLI.

Step 6 Enter the **ping server-ip-address** command to verify that the controller can contact the TFTP or FTP server.

Step 7 View current download settings by entering the transfer download start command. Answer *n* to the prompt to view the current download settings.

Step 8 Change the download settings, if necessary by entering these commands:

- **transfer download mode {tftp | ftp | sftp}**
- **transfer download datatype code**
- **transfer download serverip server-ip-address**
- **transfer download filename filename**
- **transfer download path server-path-to-file**

Note Pathnames on a TFTP or FTP server are relative to the server's default or root directory. For example, in the case of the Solaris TFTP server, the path is *"/*.

If you are using a TFTP server, also enter these commands:

- **transfer download tftpMaxRetries retries**
- **transfer download tftpPktTimeout timeout**

Note The default values of 10 retries and a 6-second timeout should work correctly without any adjustment. However, you can change these values. To do so, enter the maximum number of times that the TFTP server attempts to download the software for the *retries* parameter and the amount of time (in seconds) that the TFTP server attempts to download the software for the *timeout* parameter.

If you are using an FTP server, also enter these commands:

- **transfer download username username**
- **transfer download password password**
- **transfer download port port**

Note The default value for the port parameter is 21.

- Step 9** View the current updated settings by entering the transfer download start command. Answer y to the prompt to confirm the current download settings and start the software download.
- Step 10** Save the code update to nonvolatile NVRAM and reboot the controller by entering this command:
reset system
The controller completes the bootup process.
- Step 11** After the controller reboots, repeat Steps 6 through 11 to install the remaining file.
- Step 12** For Cisco WiSM2, re-enable the controller port channel on the Catalyst switch.
- Step 13** If you have disabled the 802.11 networks in Step 4, reenable them.
- Step 14** To verify the controller software that is installed, enter the **show sysinfo** command and see Product Version.
- Step 15** To verify the Cisco Unified Wireless Network Controller Boot Software file that is installed on the controller, enter the **show sysinfo** command on the controller CLI and see Recovery Image Version or Emergency Image Version.
- Note** If a Cisco Unified Wireless Network Controller Boot Software ER.aes file is not installed, Recovery Image Version or Emergency Image Version show 'N/A.'

Predownloading an Image to an Access Point

To minimize network outages, you can download an upgrade image to the access point from the Cisco WLC without resetting the access point or losing network connectivity. Previously, you would download an upgrade image to the controller and reset it, which causes the access point to go into discovery mode. After the access point discovers the Cisco WLC with the new image, the access point downloads the new image, resets, goes into discovery mode, and rejoins the Cisco WLC.

You can now download the upgrade image to the Cisco WLC and then download the image to the access point while the network is still operational. You can also schedule a reboot of the Cisco WLC and access points, either after a specified amount of time or at a specific date and time. When both devices are up, the access point discovers and rejoins the Cisco WLC.

Concurrent Cisco WLC to AP Image Upgrade

This table lists the Cisco WLCs and their maximum concurrent AP image download support.

Cisco WLC	Maximum Number of Concurrent AP Image Download Supported
Cisco 2504 WLC	75
Cisco 5508 WLC	500

Cisco WLC	Maximum Number of Concurrent AP Image Download Supported
Cisco 5520 WLC	1000
Cisco Flex 7510 WLC	1000
Cisco 8510 WLC	1000
Cisco 8540 WLC	1000
Cisco WiSM2	500
Cisco vWLC	1000

Flash Memory Requirements on Access Points

This table lists the Cisco AP models and the minimum amount of free flash memory required for the predownload process to work:

Cisco AP	Minimum Free Flash Memory Required
3700(I/E)	16 MB
3600(I/E)	14 MB
3502(I/E)	14 MB
2700(I/E)	16 MB
2602(I/E)	14 MB
1700(I/E)	16 MB
1602(I/E)	12 MB
1262	14 MB
1142	12 MB

**Note**

- The required flash memory can vary based on the radio type and the number of antennas used.
- This predownload feature is not supported on 1242 and 1131 Cisco AP models.
- Cisco AP1142 has 32 MB of total flash memory and can support the predownload feature.
- During the predownloading of image to APs, some APs do not have enough memory to keep the current radio firmware available. After the image has been predownloaded, these APs have the image only on flash memory and no other memory is available to host the current image or version radio firmware. The APs that have this limitation are as follows: Cisco Aironet 700, 1140, 1260, 1520, 1530, 1550, 1600, 3500, and 3600 Series APs.

For more information about this limitation, see [CSCvg41698](#).

Access Point Predownload Process

The access point predownload feature works as follows:

- The controller image is downloaded.
 - The primary image becomes the backup image of the controller and the downloaded image becomes the new primary image. Change the current boot image as the backup image by using the **config boot backup** command to ensure that if a system failure occurs, the controller boots with the last working image of the controller.
 - To switch over to the new downloaded image, start predownload of the upgraded image using the **config ap image predownload primary all** command.
 - The upgrade image is downloaded as the backup image on the access points. You can verify this by using the **show ap image all** command.
 - Change the boot image to primary image manually using the **config boot primary** command and reboot the controller for the upgrade image to be activated.
 - or
 - You issue a scheduled reboot with the **swap** keyword. The **swap** keyword has the following importance: The swapping occurs to the primary and backup images on the access point and the currently active image on controller with the backup image.
 - When the controller reboots, the access points are disassociated and eventually come up with an upgraded image. Once the controller responds to the discovery request sent by an access point with its discovery response packet, the access point sends a join request.
- The actual upgrade of the images occur. The following sequence of actions occur:
 - During boot time, the access point sends a join request.
 - The controller responds with the join response with the image version that the controller is running.
 - The access point compares its running image with the running image on the controller. If the versions match, the access point joins the controller.

- If the versions do not match, the access point compares the version of the backup image and if they match, the access point swaps the primary and backup images and reloads and subsequently joins the controller.
- If the primary image of the access point is the same as the controller image, the access point reloads and joins the controller.
- If none of the above conditions are true, the access point sends an image data request to the controller, downloads the latest image, reloads, and joins the controller.

Restrictions for Predownloading an Image to an Access Point

- The 2600, 3500, and 3600 AP models can store only a single image in the flash. When you reboot the AP (without rebooting the controller after a pre-download), it will download the current image from the controller as the current image will be overwritten by the pre-downloaded image in the flash.
- The maximum number of concurrent predownloads is limited to half the number of concurrent normal image downloads. This limitation allows new access points to join the controller during image downloading.

If you reach the predownload limit, then the access points that cannot get an image sleep for a time between 180 to 600 seconds and then reattempt the predownload.

- Before you predownload, you should change the active controller boot image to the backup image to ensure that if the controller reboots for some reason, it comes back up with the earlier running image, not the partially downloaded upgrade image.
- This predownload feature is not supported on 1242 and 1131 Cisco AP models.
- When the system time is changed by using the **config time** command, the time set for a scheduled reset is not valid and the scheduled system reset is canceled. You are given an option either to cancel the scheduled reset before configuring the time or retain the scheduled reset and not configure the time.
- All the primary, secondary, and tertiary controllers should run the same images as the primary and backup images. That is, the primary image of all three controllers should be X and the secondary image of all three controllers should be Y or the feature is not effective.
- At the time of the reset, if any AP is downloading the controller image, the scheduled reset is canceled. The following message appears with the reason why the scheduled reset was canceled:

```
%OSAPI-3-RESETSYSTEM_FAILED: osapi_task.c:4458 System will not reset as software is being upgraded.
```

- Predownloading a 7.2 or later version of image on a Cisco Aironet 1240 access point is not supported when upgrading from a previous controller release. If predownloading is attempted to the Cisco Aironet 1240 access point, the AP gets disconnected.
- There are two images for the 1550 Mesh AP - 1550 with 64 MB memory and 1550 with 128 MB memory. During the controller upgrade to 7.6 and higher versions, the AP images are downloaded and there are two reboots.
- If you upgrade from a release that is prior to Release 7.5 directly to Release 7.6.X or a later release, the predownload process on Cisco AP2600 and AP3600 fails. After the Cisco WLC is upgraded to Release 7.6.X or a later release, the new image is loaded on Cisco AP2600 and AP3600. After the upgrade to a Release 7.6.X image, the predownload functionality works as expected. The predownload failure is only a one-time failure.

- If you upgrade from 8.2 to 8.4 release, the predownload process on Cisco AP1700, AP2700, or AP3700 fails with the following error message:

Not enough free space to download.

After the Cisco WLC is reloaded with 8.4, the backup image version still shows up as 3.0.

Predownloading an Image to Access Points—Global Configuration (GUI)

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- Step 1** Upload your controller configuration files to a server to back them up.
- Note** We highly recommend that you back up your controller's configuration files prior to upgrading the controller software. Otherwise, you must manually reconfigure the controller.
- Step 2** Follow these steps to obtain the controller software:
- Browse to the Cisco Software Center: <http://www.cisco.com/cisco/software/navigator.html>
 - Choose **Wireless** from the center selection window.
 - Click **Wireless LAN Controllers**.
The following options are available: Integrated Controllers and Controller Modules and Standalone Controllers.
 - Depending on your controller platform, click one of the above options.
 - Click the controller model number or name. The Download Software page is displayed.
 - Click a controller software release. The software releases are labeled as follows to help you determine which release to download:
 - Early Deployment (ED)**—These software releases provide new features, new hardware platform support, and bug fixes.
 - Maintenance Deployment (MD)**—These software releases provide bug fixes and ongoing software maintenance.
 - Deferred (DF)**—These software releases have been deferred. We recommend that you migrate to an upgraded release.
 - Choose a software release number.
 - Click the filename (*filename.aes*).
 - Click **Download**.
 - Read Cisco's End User Software License Agreement and then click **Agree**.
 - Save the file to your hard drive.
 - Repeat steps a through k to download the remaining file.
- Step 3** Copy the controller software file (*filename.aes*) to the default directory on your TFTP or FTP server.
- Step 4** (Optional) Disable the controller 802.11X networks.
- Note** For busy networks, controllers on high utilization, or small controller platforms, we recommend that you disable the 802.11X networks as a precautionary measure.
- Step 5** Choose **Commands > Download File** to open the Download File to Controller page.
- Step 6** From the **File Type** drop-down list, choose **Code**.
- Step 7** From the **Transfer Mode** drop-down list, choose from the following options:
- TFTP
 - FTP

- **SFTP** (available in 7.4 and later releases)

- Step 8** In the **IP Address** text box, enter the IP address of the server.
If you are using a TFTP server, the default values of 10 retries and 6 seconds for the Maximum Retries and Timeout text boxes should work correctly without any adjustment. However, you can change these values.
- Step 9** Enter the maximum number of times that the TFTP server attempts to download the software in the **Maximum Retries** text box and the amount of time (in seconds) that the TFTP server attempts to download the software in the **Timeout** text box.
- Step 10** In the **File Path** text box, enter the directory path of the software.
- Step 11** In the **File Name** text box, enter the name of the controller software file (*filename.aes*).
- Step 12** If you are using an FTP server, follow these steps:
- a) In the **Server Login Username** text box, enter the username to log into the FTP server.
 - b) In the **Server Login Password** text box, enter the password to log into the FTP server.
 - c) In the **Server Port Number** text box, enter the port number on the FTP server through which the download occurs. The default value is 21.
- Step 13** Click **Download** to download the software to the controller. A message appears indicating the status of the download.
- Step 14** To configure the predownloading of access point images globally, choose **Wireless > Access Points > Global Configuration** to open the Global Configuration page.
- Step 15** In the AP Image Pre-download section, perform one of the following:
- To instruct all the access points to predownload a primary image from the controller, click **Download Primary** under the AP Image Pre-download.
 - To instruct all the access points to swap their primary and backup images, click **Interchange Image**.
 - To download an image from the controller and store it as a backup image, click **Download Backup**.
 - To abort the predownload operation, click **Abort Predownload**.
- Step 16** Click **OK**.
- Step 17** Click **Apply**.
-

Predownloading an Image to Access Points (CLI)

Using the CLI, you can predownload an image to a specific access point or to all access points.

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- Step 1** Follow these steps to obtain the controller software:
- a) Browse to the Cisco Software Center: <http://www.cisco.com/cisco/software/navigator.html>
 - b) Select **Wireless** from the center selection window.
 - c) Click **Wireless LAN Controllers**.
The following options are available: Integrated Controllers and Controller Modules and Standalone Controllers.
 - d) Depending on your controller platform, click one of the above options.

- e) Click the controller model number or name. The **Download Software** page is displayed.
- f) Click a controller software release. The software releases are labeled as follows to help you determine which release to download:

Early Deployment (ED)—These software releases provide new features, new hardware platform support, and bug fixes.

Maintenance Deployment (MD)—These software releases provide bug fixes and ongoing software maintenance.

Deferred (DF)—These software releases have been deferred. We recommend that you migrate to an upgraded release.

- g) Choose a software release number.
- h) Click the filename (*filename.aes*).
- i) Click **Download**.
- j) Read Cisco's End User Software License Agreement and then click **Agree**.
- k) Save the file to your hard drive.
- l) Repeat steps a through n to download the remaining file.

Step 2 Copy the controller software file (*filename.aes*) to the default directory on your TFTP or FTP server.

Step 3 (Optional) Disable the 802.11 networks.

Note For busy networks, controllers on high utilization, or small controller platforms, we recommend that you disable the 802.11a/n or 802.11b/g/n networks as a precautionary measure.

Step 4 For Cisco WiSM2, shut down the controller port channel on the Catalyst switch to allow the controller to reboot before the access points start downloading the software.

Step 5 Disable any WLANs on the controller using the **config wlan disable wlan_id** command.

Step 6 Specify access points that will receive the predownload image.

Use one of these commands to specify access points for predownload:

- Specify access points for predownload by entering this command:

```
config ap image predownload {primary | backup} {ap_name | all}
```

The primary image is the new image; the backup image is the existing image. Access points always boot with the primary image.

- Swap an access point's primary and backup images by entering this command:

```
config ap image swap {ap_name | all}
```

- Display detailed information on access points specified for predownload by entering this command:

```
show ap image {all | ap-name}
```

The output lists access points that are specified for predownloading and provides for each access point, primary and secondary image versions, the version of the predownload image, the predownload retry time (if necessary), and the number of predownload attempts. The output also includes the predownload status for each device. The status of the access points is as follows:

- None—The access point is not scheduled for predownload.
- Predownloading—The access point is predownloading the image.
- Not supported—The access point (1120, 1230, and 1310) does not support predownloading.
- Initiated—The access point is waiting to get the predownload image because the concurrent download limit has been reached.

- Failed—The access point has failed 64 predownload attempts.
- Complete—The access point has completed predownloading.

Step 7

Set a reboot time for the controller and the access points.

Use one of these commands to schedule a reboot of the controller and access points:

- Specify the amount of time delay before the devices reboot by entering this command:

reset system in *HH:MM:SS* image {swap | no-swap} reset-aps [save-config]

Note The **swap** operand in the **reset** command will result in the swapping of the primary and backup images on both the controller and the access point and sets the default flag on the next Cisco WLC reboot.

The controller sends a reset message to all joined access points, and then the controller resets.

- Specify a date and time for the devices to reboot by entering this command:

reset system at *YYYY-MM-DD HH:MM:SS* image {swap | no-swap} reset-aps [save-config]

The controller sends a reset message to all joined access points, and then the controller resets.

Note The **swap** operand in the **reset** command will result in the swapping of the primary and backup images on both the controller and the access point.

- Set up an SNMP trap message that announces the upcoming reset by entering this command:

reset system notify-time *minutes*

The controller sends the announcement trap *the configured number of minutes* before the reset.

- Cancel the scheduled reboot by entering this command:

reset system cancel

Note If you configure reset times and then use the **config time** command to change the system time on the controller, the controller notifies you that any scheduled reset times will be canceled and must be reconfigured after you set the system time.

Use the **show reset** command to display scheduled resets.

Information similar to the following appears:

```
System reset is scheduled for Apr 08 01:01:01 2010.
Current local time and date is Apr 07 02:57:44 2010.
A trap will be generated 10 minutes before each scheduled system reset.
Use 'reset system cancel' to cancel the reset.
Configuration will be saved before the system reset.
```
