



Upgrading Device Software Images

Cisco® Prime Infrastructure 3.1

Job Aid

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Upgrading Device Software Images Job Aid

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Basics

Overview

Introduction

Various events can require you to perform device software image upgrades, such as:

- ❖ Security updates
- ❖ Critical fixes
- ❖ Device updates to support new features or technologies
- ❖ Device updates that standardize device configurations

Keeping device software images current helps you to ensure that devices on the network are running optimally, securely, and as expected.



Note: You cannot perform software upgrades on devices that Prime Infrastructure does not manage.

Cisco® Prime Infrastructure provides functionality to upgrade devices in bulk on the **Software Images** page.

Inventory / Device Management / Software Images

Software Image Summary

Show
All

Image	Count
C2960	1
CAT3K_CAA	2
X86_64_LINUX_IOSD	2
PPC_LINUX_IOSD	1

Add/Import

Add software images to the repository from various sources, such as devices, Cisco, URLs, protocols, or files.

Distribute

Perform Distribution and activation of software image to devices.

Commit

Applicable only for IOS-XR image type

Activate

Perform activation of software image already available in device.

Settings

Image Management Settings | [Edit](#)

Current Protocol Order

[Edit](#)

☒ SCP
☒ SFTP
☒ FTP
☒ TFTP

Useful Links

[Software Image Repository](#) | [Link](#)
[Upgrade Analysis](#) | [Link](#)
[Sync Device Inventory](#) | [Link](#)
[Archive Device Configuration](#) | [Link](#)

Last 10 Swim Job | [All Jobs](#)

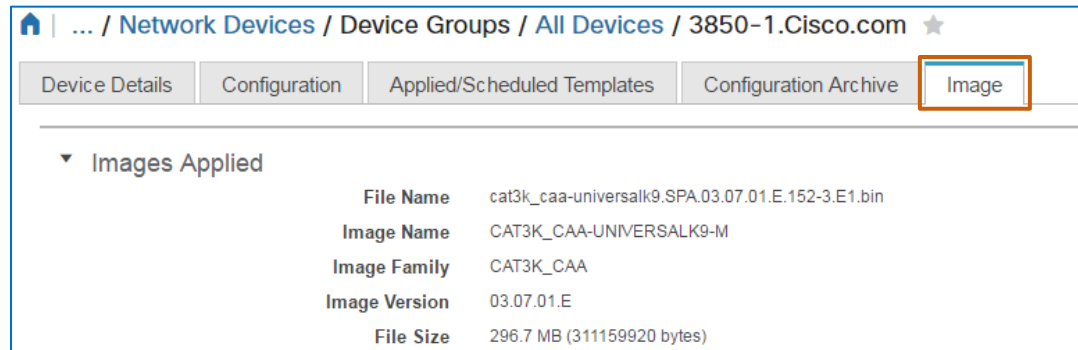
Total 7

Run ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp
12758473	SWIM Collection	Job_PROTOCOL_Image_Collection_3_08_36_...	NA	Success	2016-04-19 15:10:09.19	2016-04-19 15:10:18.333
780649	SWIM Collection	Job_URL_Image_Collection_8_50_50_232_PM..	NA	Success	2016-04-12 20:50:59.377	2016-04-12 20:57:32.252



Note: To upgrade or manage an image on a single device, you can access the device image directly.

To access a single device image, navigate to the **Network Devices** page, click the device name link, and then click the **Image** tab.



Home | ... / Network Devices / Device Groups / All Devices / 3850-1.Cisco.com ★

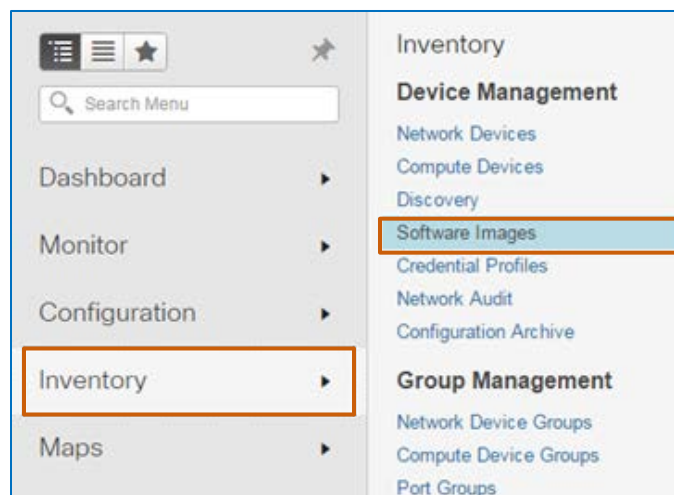
Device Details Configuration Applied/Scheduled Templates Configuration Archive **Image**

▼ Images Applied

File Name	cat3k_caa-universalk9.SPA.03.07.01.E.152-3.E1.bin
Image Name	CAT3K_CAA-UNIVERSALK9-M
Image Family	CAT3K_CAA
Image Version	03.07.01.E
File Size	296.7 MB (311159920 bytes)

To open the Software Images page:

- ❖ In the left navigation, on the **Inventory** menu, click **Software Images**.



Inventory

Device Management

- Network Devices
- Compute Devices
- Discovery
- Software Images**
- Credential Profiles
- Network Audit
- Configuration Archive

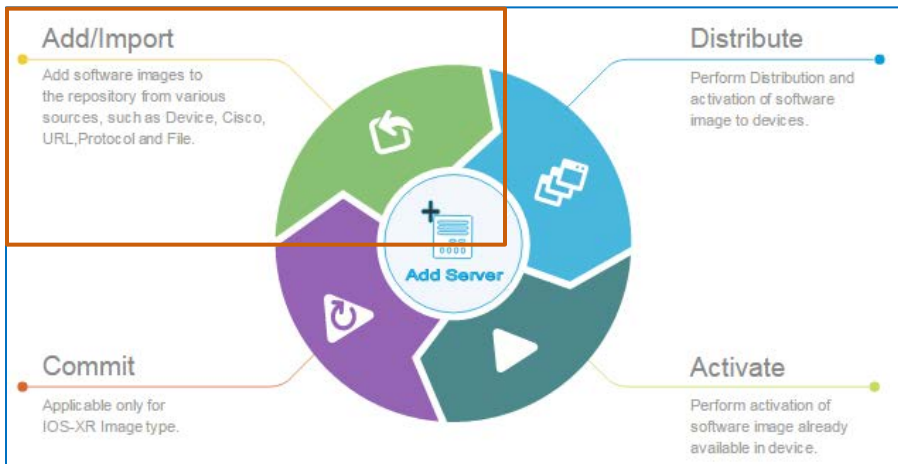
Group Management

- Network Device Groups
- Compute Device Groups
- Port Groups

Key Upgrade Tasks

Importing Images

Images must be available in Prime Infrastructure before you can use Prime Infrastructure to distribute them to devices. You can import images from various locations, such as a file on a user's computer, a file that is accessible on a server by using a URL, or a file on a network device, among others.



When you import images, Prime Infrastructure stores them in the software image repository. You can continue to distribute and activate these images without importing them again.

Inventory / Device Management / Software Images / Software Image Summary ★

Image Dashboard | ? | [Refresh] | [Settings]

Software Images

ALL

Selected 0 / Total 10 [Refresh] [Filter] [Y]

Delete Show Quick Filter

<input type="checkbox"/>	File Name	Image Family	Image Type	Version	Size	Updated On
<input type="checkbox"/>	asr1000rp1-adventerprise9.03.13.00.S.154-3.S...	PPC_LINUX_IO...	SYSTEM_SW	3.13.00S	352.7 MB (369805908 byt...	April 12, 2016 8:55:58 PM
<input type="checkbox"/>	asr1000rp2-ipbase.03.09.02.S.153-2.S2.bin	X86_64_LINUX_...	SYSTEM_SW	3.09.02S	534.4 MB (560319476 byt...	April 12, 2016 8:50:19 PM
<input type="checkbox"/>	asr1000rp2-ipbase.03.13.00.S.154-3.S-ext.bin	X86_64_LINUX_...	SYSTEM_SW	3.13.00S	553.5 MB (580383732 byt...	April 12, 2016 8:53:21 PM
<input type="checkbox"/>	c2960-lanbase9-mz.122-55.SE.bin	C2960	SYSTEM_SW	12.2(55)SE	9.319 MB (9771439 bytes)	April 19, 2016 3:10:11 PM
<input type="checkbox"/>	cat3k_caa-universalk9.SPA.03.06.00.E.152-2.E...	CAT3K_CAA	SYSTEM_SW	03.06.00E	276.5 MB (289970248 byt...	April 12, 2016 8:45:41 PM
<input type="checkbox"/>	cat3k_caa-universalk9.SPA.03.06.03.E.152-2.E...	CAT3K_CAA	SYSTEM_SW	03.06.03E	288.9 MB (302890264 byt...	April 12, 2016 8:47:16 PM

Software Images Summary Sidebar:

- Software Images
- Search All
- ALL
- SYSTEM_SW
 - cat3k_caa-universalk9.SPA.03.06.00
 - cat3k_caa-universalk9.SPA.03.06.03
 - asr1000rp2-ipbase.03.09.02.S.153-2...
 - asr1000rp2-ipbase.03.13.00.S.154-3...
 - asr1000rp1-adventerprise9.03.13.00
 - C2960-LANBASEK9-M
 - cat3k_caa-universalk9.SPA.03.07.03

Configuring Image Software Minimum Requirements

Software image minimum requirements define the minimum RAM and flash memory sizes that a device must have to accept a distributed image.

In some cases, the image header contains this information. During the image import process, the system populates the requirements by using the header information and applying embedded logic.

When minimum requirements are not available in the image header, you can define image requirements manually. Configuring minimum requirements is a one-time task that supports:

- ❖ Performing upgrade analyses to determine whether devices can accept the image.
- ❖ Helping ensure that image distribution is successful.

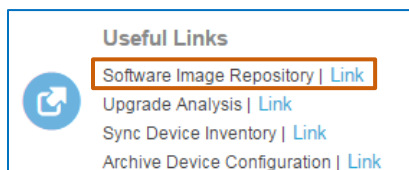


Important Note: As a best practice, Cisco recommends that you ensure that software image minimum requirements are configured after importing images in the repository.

When these requirements are not configured, you can have unexpected results or, in some cases, distribution failures.

For example, a distribution can be successful without meeting minimum requirements, but the image might not run optimally if the minimum RAM is not available on the device.

Before you begin image distribution, you can validate or configure minimum requirements.



To obtain the specific information that you need to configure an image's minimum requirements manually:

- ❖ Refer to the technical documentation that accompanies the image
- Or
- ❖ Perform an upgrade analysis on the devices that require the upgrade and review the analysis report.

Distributing and Activating Software Images

Depending on the situation, you can distribute and activate software images on devices in a single task or distribute and activate images separately.

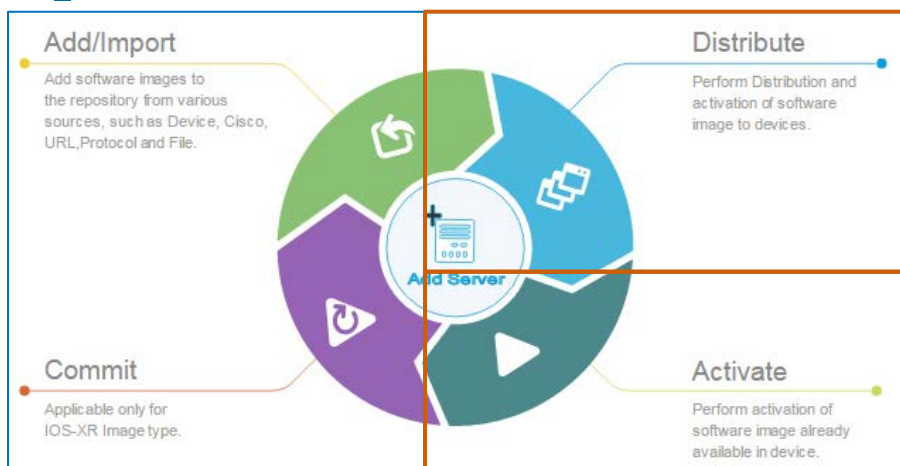
Separating image distribution and activation tasks helps you to reduce your maintenance window timelines significantly.



Note: The system supports upgrading all device types when you distribute and activate images in a single task.

When you activate images as a separate task following distribution, the system supports the activation task only on specific device types.

For more information on the device types on which you can activate images separately, visit the Cisco.com Web site to review the current list of device types.



Distributing images to devices can occur while devices remain operational.

Activating images requires rebooting devices in most cases, causing a period of operational downtime.



Note: Devices that support modular software images or Cisco In-Service Software Upgrades (ISSU), for example, do not require rebooting after image activation.

Optional Upgrade Task


Performing Upgrade Analyses

Upgrade analyses can supply key information to prepare for software image upgrades.

The process can indicate the list of software images that are compatible with devices when you are considering an upgrade.

You also can use the process to determine whether a device or devices are capable of accepting an image before you start distribution.

Useful Links


[Software Image Repository | Link](#)
[Upgrade Analysis | Link](#)
[Sync Device Inventory | Link](#)
[Archive Device Configuration | Link](#)

During this process, the system evaluates the image or images that you select and the devices that you indicate for distribution to determine image and device compatibility and readiness, including:

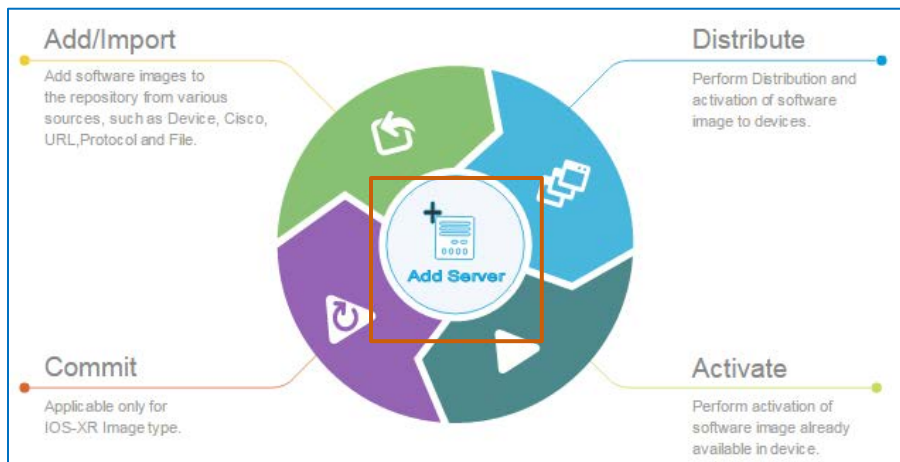
- ❖ The amount of available RAM and flash memory on each device.
- ❖ The required RAM and flash space compared to the space available on the device.

						Show	Quick Filter	
	IP Address	Image Name	Device Information	RAM Requirements	FLASH Requirements			
1	172.26.165.49	cat3k_caa-universalk9.SPA.03.0...	Image Not Applicable for this Device					
2	172.26.165.49	cat4500e-universal.SPA.03.06.02...	Image Not Applicable for this Device					
3	172.26.165.49	cat4500es8-universal.SPA.03.06....	Running Image Name: cat4500es8-UNIVERSALK9-M Version: 03.07.01E Device Family: cat4500es8	Required: 186 MB Current: 4096MB	Required: 186 MB Total: 63 MB			
4	172.26.165.49	cat4500es8-universal.SPA.03.08....	Running Image Name: cat4500es8-UNIVERSALK9-M Version: 03.07.01E Device Family: cat4500es8	Required: 212 MB Current: 4096MB	Required: 212 MB Total: 63 MB			
5	172.26.165.49	cat4500es8-universalk9.SPA.03....	Running Image Name: cat4500es8-UNIVERSALK9-M Version: 03.07.01E Device Family: cat4500es8	Required: 475 MB Current: 4096MB	Required: 475 MB Total: 63 MB			
6	172.26.165.49	cat4500es8-universalk9npe.SPA....	Running Image Name: cat4500es8-UNIVERSALK9-M Version: 03.07.01E Device Family: cat4500es8	Required: 177 MB Current: 4096MB	Required: 177 MB Total: 63 MB			

Specialized Upgrade Tasks

Adding Software Image Management (SWIM) Servers

You can distribute images from servers other than the one that hosts Prime Infrastructure. When you add SWIM servers in Prime Infrastructure, they remain available for image distribution, when needed.



This approach improves response times among the servers and devices and reduces the workload and traffic on the Prime Infrastructure server.

SWIM servers are intended for use when you are:

- ❖ Supporting a large network.
- ❖ Supporting devices in geographically distributed locations.
- ❖ Upgrading devices at numerous sites concurrently.
- ❖ Upgrading large numbers (approximately 50 or more) of devices concurrently.



Important Note: When you are upgrading a minimal number of devices at a single site, it is more efficient to distribute images by using the Prime Infrastructure server.



Important Note: The use of SWIM servers, which are external to Prime Infrastructure, for image distribution is unavailable for certain device types and image families. When SWIM server functionality is unavailable, the system only supports using Prime Infrastructure (Local File Server) as the distribution server.

For more information, [refer to the Software Image Management Processes and Supported Devices table](#).

To help ensure that SWIM servers can support current device types, install device packs as they become available.

Upgrading IOS-XR Devices

When upgrading a device that is using the IOS-XR operating system, after you activate the image, you need to send a commit command to the device, which performs two key functions.

- ❖ Allows the active software image to persist, or remain, the active image, when a device reboot occurs

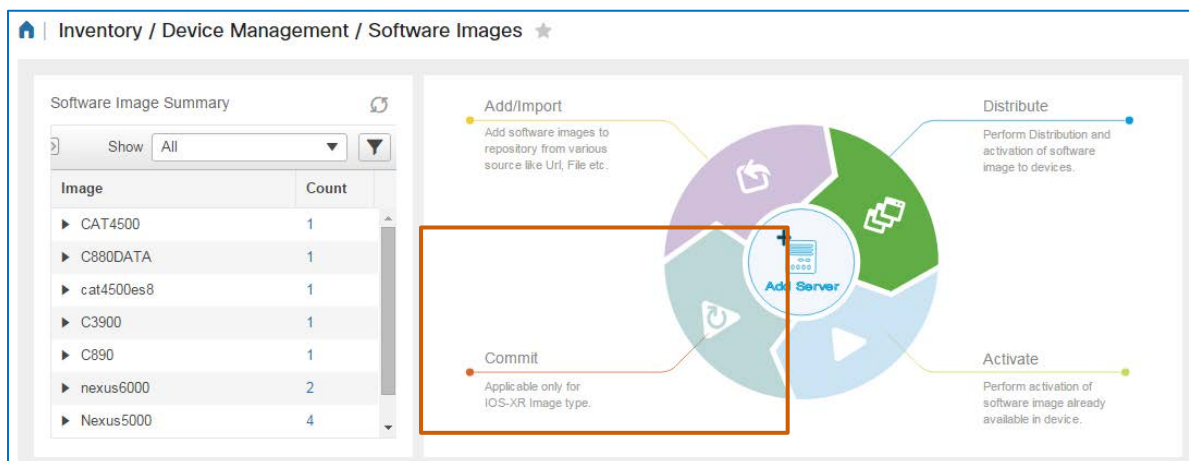
If the commit command is not delivered and a device reboot occurs, the device will revert to using its previously active software image version.

- ❖ Captures an archive record, or snapshot, of the active software image at the point of activation

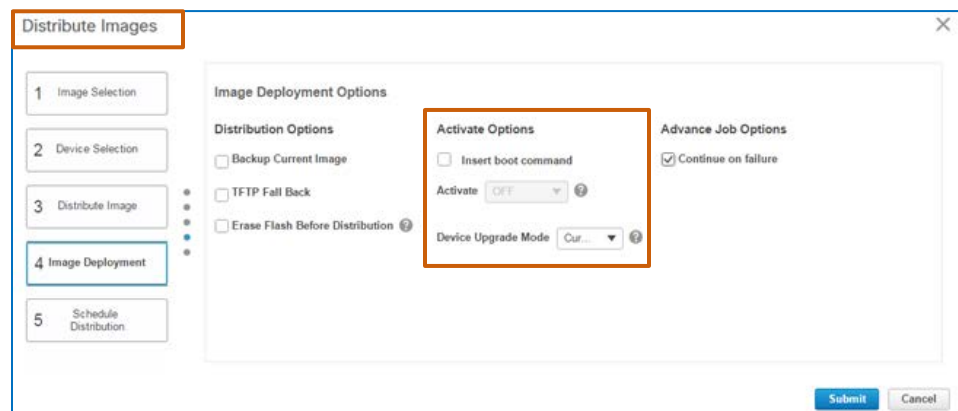
When a device is exhibiting unexpected behavior with the currently running image, you can perform the image rollback process to the previous working snapshot.

When upgrading IOS-XR devices, you need to:

1. Ensure that the image is available in the software image repository or import it.
2. Distribute the image to the applicable devices.
3. Activate the image on the applicable devices.
4. Use the Commit function to send the commit command to the upgraded devices or schedule the commit command action to occur during an optimal time period.



Tip: You also can distribute, activate, and commit an image in a single, combined task by using the **Distribute** function.



The 'Distribute Images' window shows the configuration options for distributing software images. The 'Distribute Images' tab is selected. The 'Image Deployment Options' section includes 'Distribution Options' and 'Activate Options'.

Image Deployment Options:

- Distribution Options:**
 - ☐ Backup Current Image
 - ☐ TFTP Fall Back
 - ☐ Erase Flash Before Distribution
- Activate Options:**
 - ☐ Insert boot command
 - Activate: **OFF**
 - Device Upgrade Mode: **Cur...**
- Advance Job Options:**
 - ☒ Continue on failure

Buttons: **Submit**, **Cancel**

Skills

Network administrators primarily perform software image management and upgrade tasks and need to have the following experience.

Proficient

- ❖ Prime Infrastructure user interface navigation and behaviors
- ❖ Knowledge of network operations
- ❖ For devices being upgraded, those devices' roles, relationships, and importance to network operations
- ❖ For devices being upgraded, knowledge of the services and technologies that those devices manage

Terms

Commit Command Function

A process required when upgrading software images on routers with IOS-XR operating systems

For more information, [refer to Upgrading IOS-XR Devices](#).

SWIM Activation Job

The type of job that the system performs when activating software images that system users have distributed to those devices previously

SWIM Collection Job

The type of job that the system performs when importing software image files into Prime Infrastructure. Images must be available in the repository before users can distribute them to devices by using Prime Infrastructure

SWIM Distribution Job

The type of job that the system performs when distributing software images to devices in preparation for image activation or when performing a combined distribution and activation task

Use Case 1: Upgrading Devices on Distributed Networks

Use Case Scenario

As an administrator, you receive notification that the software image currently running on the Catalyst 3850 switches in the network is reaching an end-of-life status. The notification also includes information on the image that replaces the obsolete image and access to download the replacement image. You decide to perform a software upgrade before the date on which the Cisco Technical Assistance Center (TAC) will no longer support the software image.

The enterprise comprises its primary data center, located in San Francisco, and a number of remote sites, including sites in Los Angeles and New York, that have a large number of switches requiring the upgrade.

Because of the large number of switches and their remote locations, you plan to optimize image distribution by using locally positioned servers, which will improve distribution timelines and reduce load on the Prime Infrastructure server.

You also plan to distribute the image during the maintenance windows in each region and, after the distribution is complete, you plan to activate the images in a separate maintenance window.

When activation is complete, the system validates that the image is running on each switch. You also manually validate successful image activation.

To start this use case:

- ❖ Navigate to the **Software Images** page.



Software Image Summary

Image	Count
C2960	1
CAT3K_CAA	2
X86_64_LINUX_IOSD	2
PPC_LINUX_IOSD	1

Software Image Process Diagram:

- Add/Import:** Add software images to the repository from various sources, such as devices, Cisco, URLs, protocols, or files.
- Distribute:** Perform Distribution and activation of software image to devices.
- Activate:** Perform activation of software image already available in device.
- Commit:** Applicable only for IOS-XR image type.

Settings
Image Management Settings | [Edit](#)

Current Protocol Order | [Edit](#)
SCP ▶ SFTP ▶ FTP ▶ TFTP

Useful Links
[Software Image Repository](#) | [Link](#)
[Upgrade Analysis](#) | [Link](#)
[Sync Device Inventory](#) | [Link](#)
[Archive Device Configuration](#) | [Link](#)

Last 10 Swim Job | [All Jobs](#)

Run ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp
12758473	SWIM Collection	Job_PROTOCOL_Image_Collection_3_08_36_...	NA	Success	2016-04-19 15:10:09.19	2016-04-19 15:10:18.333
780649	SWIM Collection	Job_URL_Image_Collection_8_50_50_232_PM...	NA	Success	2016-04-12 20:50:59.377	2016-04-12 20:57:32.252

Process Overview

To complete this use case, follow the steps to:

1. Add software image management (SWIM) servers to Prime Infrastructure.
2. Import the software image into Prime Infrastructure.
3. Distribute the image.
4. Activate the image.
5. Validate that the devices are running the image that you activated.

Process Steps

Task 1: Add Software Image Management (SWIM) Servers

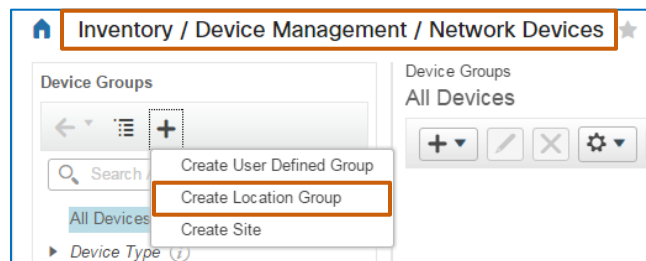
Because you plan to optimize image distribution by using locally positioned servers in San Francisco, Los Angeles, and New York, you need to configure the servers in Prime Infrastructure so that you can distribute the software image to them.



Important Note: When adding SWIM servers, you must assign at least one location group to each server. You or other system users can configure location groups, to organize network devices based on geographical location.

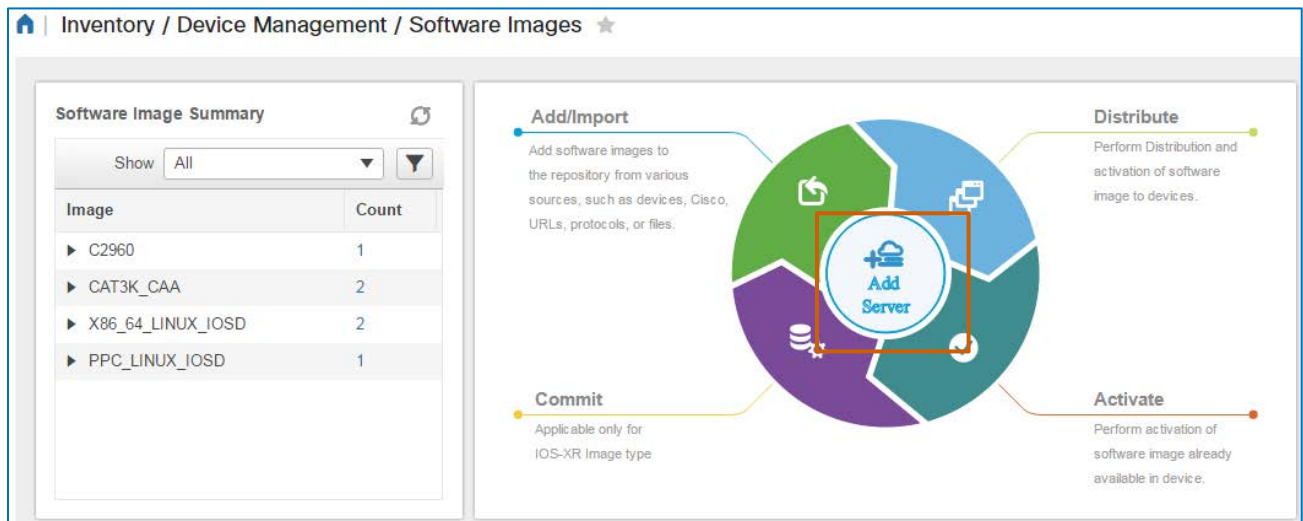
To ensure that the distribution function works as intended, it is optimal to assign the applicable network devices to each location group in preparation for adding SWIM servers.

During the distribution process, the system selects the applicable SWIM server associated with the devices that you indicate, which you can change manually, when necessary.

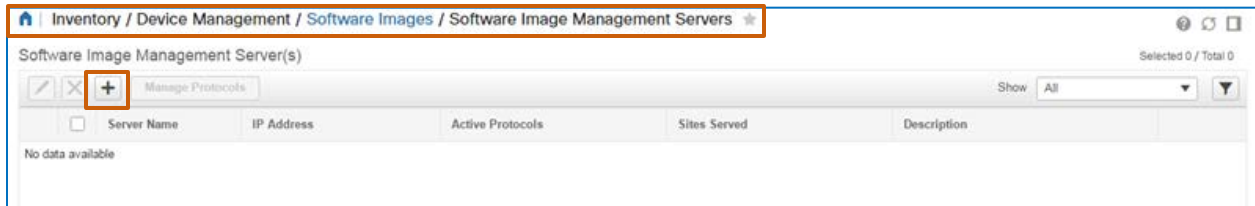


To add software image management (SWIM) servers, follow these steps:

1. On the **Software Images** page, click **Add Server**.



The **Software Image Management Servers** page opens.



2. On the **Software Image Management Servers**, on the toolbar, click **Add Row** .

In the list, the system adds a blank, editable row.

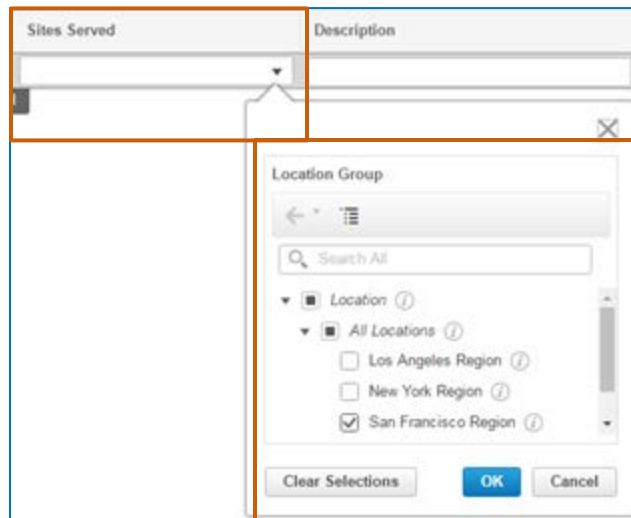


3. In the row:
 - a. In the **Server Name** field, type a descriptive server name as you want it to appear when a user sees it when configuring a distribution job.
 - b. In the **IP Address** field, type the SWIM server's IP address.



Note: The **Active Protocols** field is not available for editing when you initially configure a SWIM server. You configure the protocol in step 5.

- c. In the **Sites Served** drop-down list, select each location group that contains the devices to which you want the server to distribute the image.



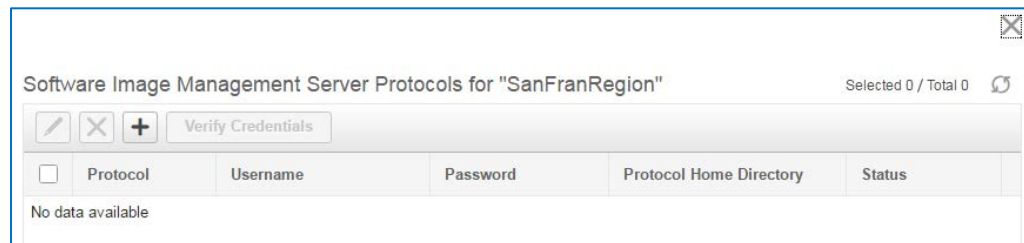
- d. To add an optional explanation of the server's use, type it in the **Description** field.
4. Below the row, click **Save**. The system adds the server in the list and selects the server row automatically.


This action makes the **Manage Protocols** button available on the toolbar.

5. On the toolbar, click **Manage Protocols**.

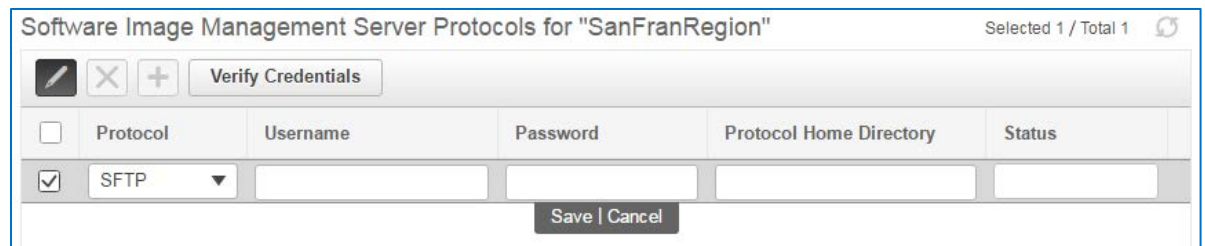


The **Software Image Management Server Protocols** dialog box opens.



- a. In the **Software Image Management Server Protocols** dialog box, on the toolbar, click **Add Row** .

A row becomes editable in the list and indicates an available protocol in the **Protocol** field.



- b. In the **Protocol** drop down list, select the applicable protocol for the server.



Important Note: For better reliability and security when distributing software images by using SWIM servers, use the SFTP or SCP secure protocol. Avoid using the FTP protocol unless necessary because of the device type.

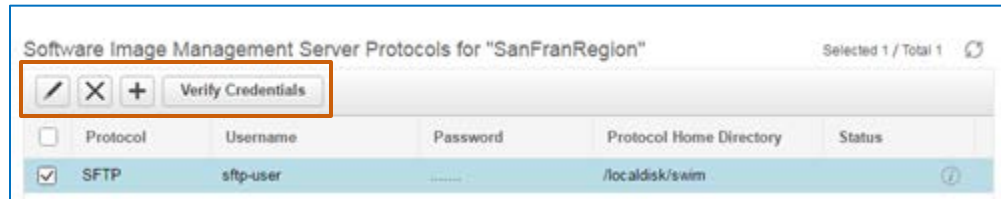
The system does not support using the TFTP protocol when distributing images by using SWIM servers.

Future releases of Prime Infrastructure will support the TFTP protocol.

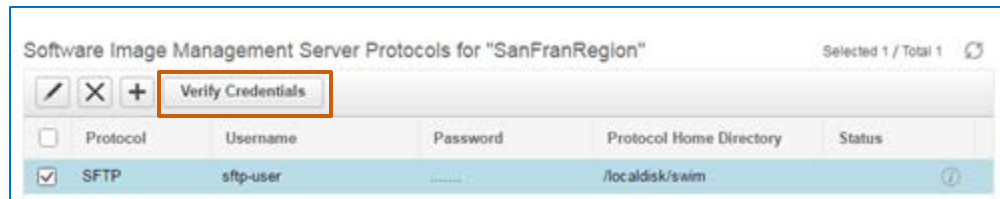
For information on managing protocol settings, [refer to the FAQ](#).

- c. In the **Username** and **Password** fields, type the credentials to access the server.
- d. In the **Protocol Home Directory** field, type the location of the home directory on the server.
- e. Click **Save**. The system saves the entry and selects the row automatically.

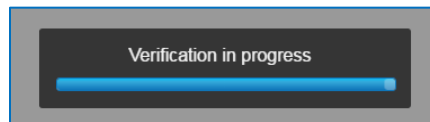
This action makes the toolbar buttons available.



- f. To test whether the server credentials are valid, on the toolbar, click **Verify Credentials**.



The system runs the verification....



...and reports the verification results in the **Status** field.



Tip: To review result details, click the information button beside the result. A pop-up window opens with details about the credential verification results.

This information also can be helpful when addressing a verification failure.

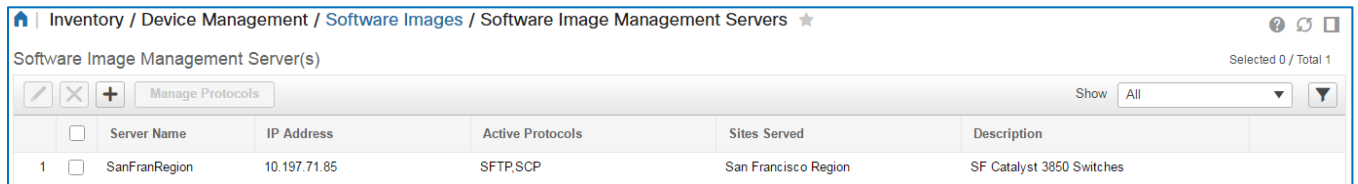
- g. To add another protocol, repeat steps 5a to 5f, then go to step 5h.



h. Close the dialog box.



The system saves the protocol for the server.



6. To add additional servers, repeat steps 1 through 5.



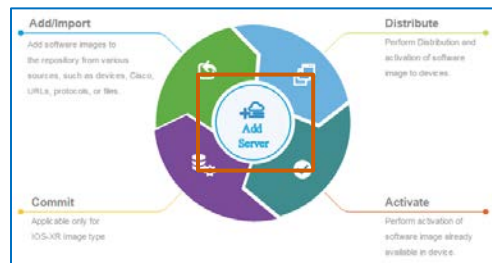
Note: Prime Infrastructure 3.1 supports up to three SWIM servers. Future releases will support additional servers. For more information, refer to the administrator guide for your release.



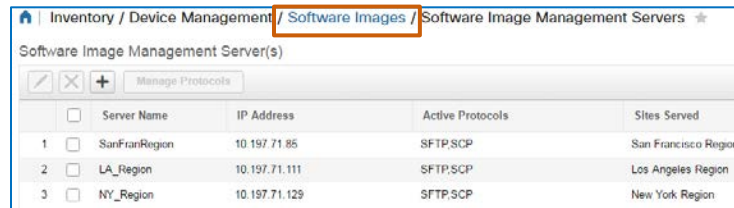
With the SWIM servers available, you can continue by importing the software image.



Tip: When you open the **Software Image Management Servers** page by clicking the icon on the **Software Images** page...



...you can return to the **Software Images** page by clicking the page name link in the page title.



	Server Name	IP Address	Active Protocols	Sites Served
1	SanFranRegion	10.197.71.86	SFTP:SCP	San Francisco Region
2	LA_Region	10.197.71.111	SFTP:SCP	Los Angeles Region
3	NY_Region	10.197.71.129	SFTP:SCP	New York Region

Task 2: Import the Software Image

With the SWIM servers available, you now need to import the replacement image into the software image repository in Prime Infrastructure.



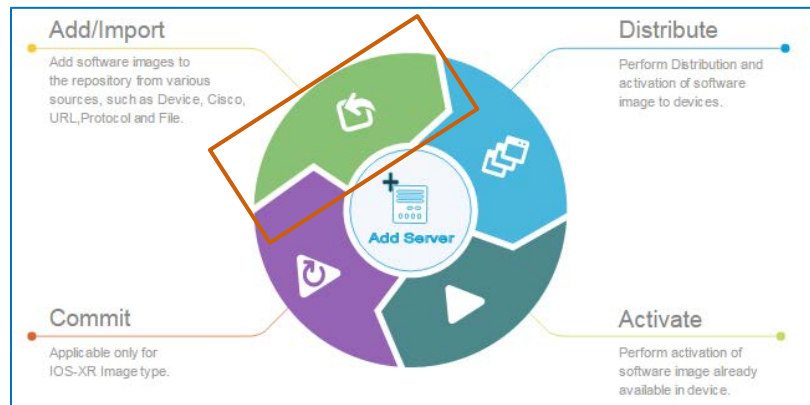
Important Note: Images must be available in Prime Infrastructure before you can distribute them to devices or to SWIM servers by using Prime Infrastructure.

Because the end-of-life notification included a link to download the new software image, you previously downloaded the image file, in this case, a package file, to an enterprise server that you can access from Prime Infrastructure.

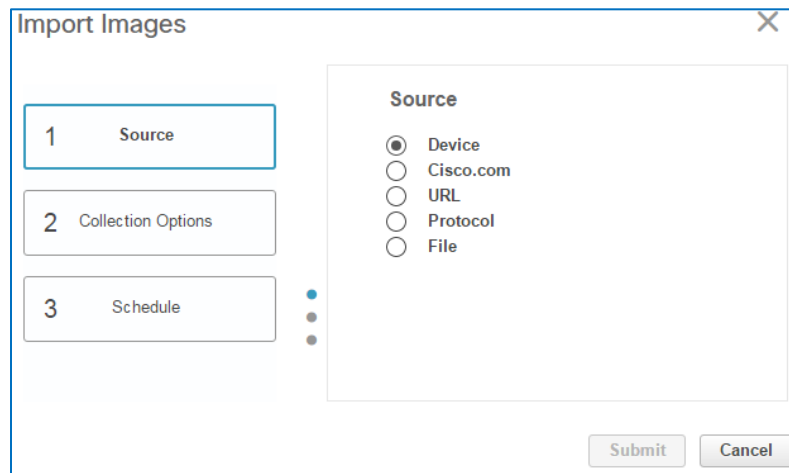
You have the **Software Images** page open and are ready to begin.

To import a software image, follow these steps:

1. On the **Software Images** page, click the **Add/Import** icon.



The **Import Images** dialog box opens and provides a wizard to step you through the task. The **Source** page is active by default.



2. In the **Import Images** dialog box, on the **Source** page, select the location that houses the image file that you need.



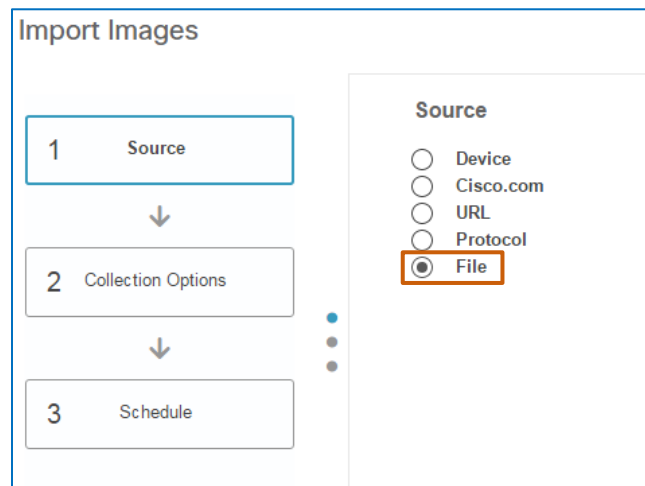
Important Note: When importing images from devices, the system uses different protocols based on each specific device's capabilities.

For better reliability and security when importing or distributing software images, use SFTP or SCP secure protocols only. Avoid using the TFTP or FTP protocols unless necessary based on the device type.

For information on managing protocol settings, [refer to the FAQ](#).

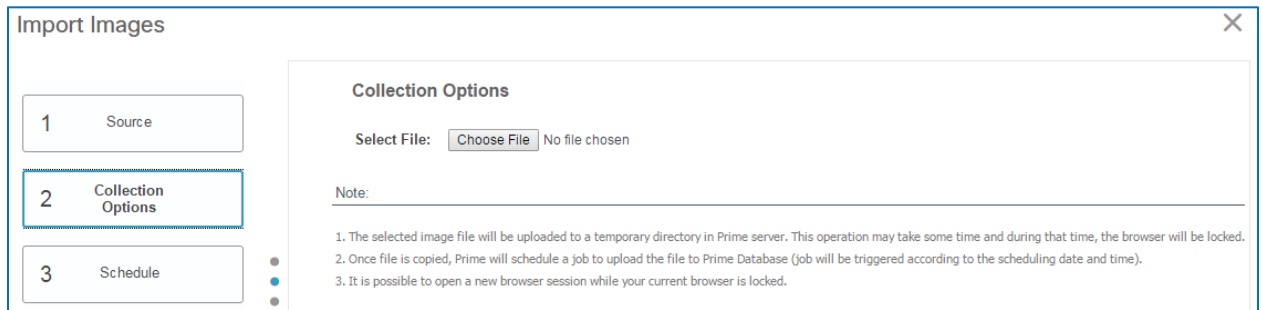


Note: For more information on sources for importing images, [refer to the Importing Software Images topic in the Maintaining Software Images chapter of the Prime Infrastructure 3.1 User Guide](#).

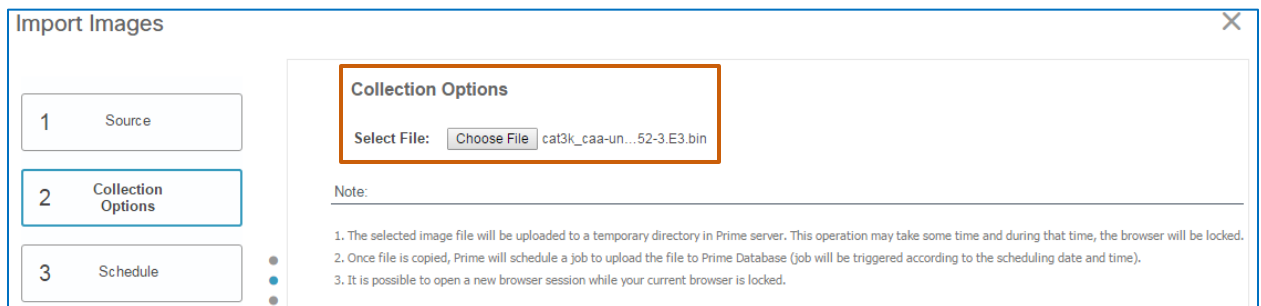


3. Click **2 Collection Options**.

The **Collection Options** page opens and, based on the source location that you select, provides the applicable navigation to the file location.

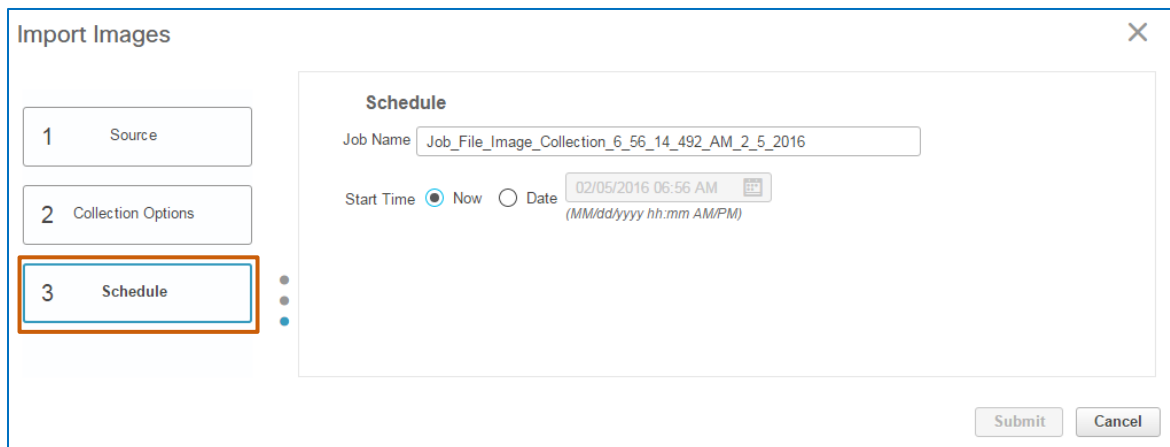


4. On the **Collection Options** page, browse to or select the location that houses the software image file.

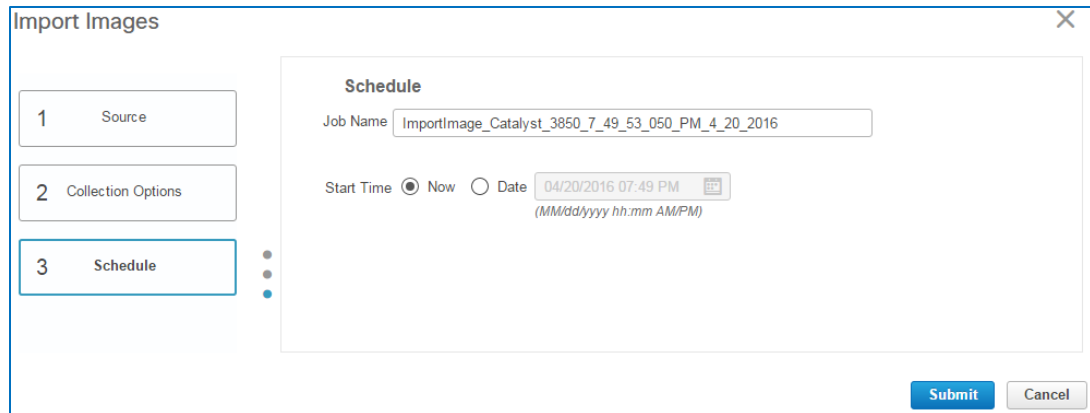


5. Click **3 Schedule**.

The **Schedule** page opens.



- On the **Schedule** page, in the **Job Name** field, you optionally can type a descriptive name for the **SWIM Collection** job so that users can recognize its use when reviewing or scheduling jobs.



- In the **Start Time** row, indicate when you want the image import to occur.

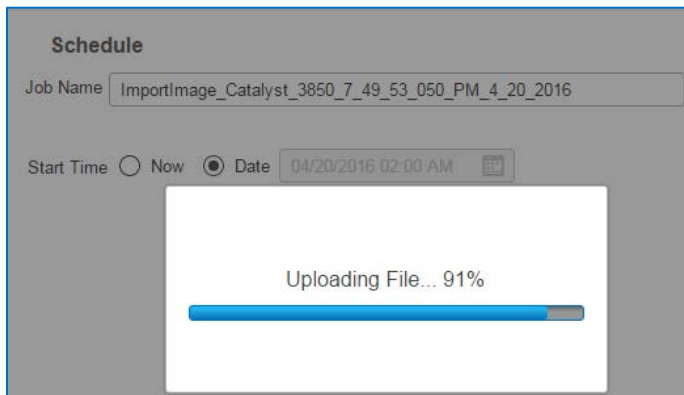
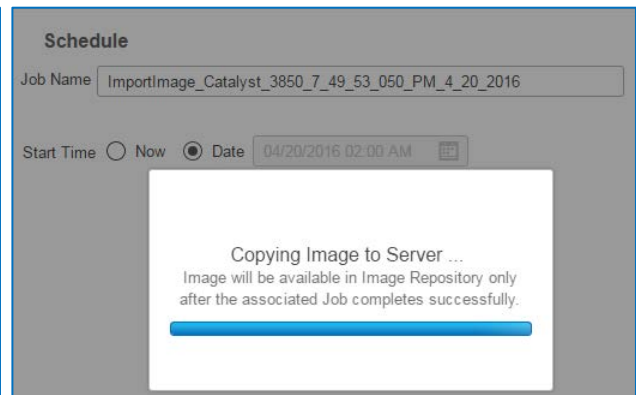


Tip: When you schedule the import of a large number of images, or determine that the system is experiencing significant activity, you can schedule the import to occur at a less busy time, such as a maintenance window.

- Click **Submit**.

The system starts or schedules the SWIM collection job based on the schedule that you select.

When you start the job immediately, the system uploads the image and then copies it to the Prime Infrastructure server. A progress indicator reports the job status during this process.

The progress indicator closes when the job completes, and the system reports the results in the list of SWIM jobs.

Last 10 Swim Job All Jobs							Total 8
Run ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp	
15640984	SWIM Collection	ImportImage_Catalyst_3850_7_49_53_050_P...	NA	Success	2016-04-20 02:00:15.011	2016-04-20 02:00:54.306	
12758473	SWIM Collection	Job_PROTOCOL_Image_Collection_3_08_36_...	NA	Success	2016-04-19 15:10:09.19	2016-04-19 15:10:18.333	
780649	SWIM Collection	Job_URL_Image_Collection_8_50_50_232_PM..	NA	Success	2016-04-12 20:50:59.377	2016-04-12 20:57:32.252	
780489	SWIM Collection	Job_URL_Image_Collection_8_43_45_485_PM..	NA	Success	2016-04-12 20:43:53.086	2016-04-12 20:47:15.977	
780483	SWIM Collection	Job_URL_Image_Collection_8_43_23_645_PM..	NA	Success	2016-04-12 20:43:35.285	2016-04-12 20:48:00.235	



Tip: To ensure that you are seeing current information in the list, you can refresh the data manually.

Last 10 Swim Job All Jobs							Total 8
-----------------------------	--	--	--	--	--	--	---------

When you schedule a job to occur later, the dialog box closes. A system message indicates that the system has scheduled the job. It then runs the job at the scheduled time and reports the results in the jobs list.

Note: The system can return a job status of **Success** or **Failure**. When the job status indicates a failure, an error message provides insight into the failure, so that you can take corrective action.

When the import is successful...

Last 10 Swim Job All Jobs							Total 8
Run ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp	
15640984	SWIM Collection	ImportImage_Catalyst_3850_7_49_53_050_P...	NA	Success	2016-04-20 02:00:15.011	2016-04-20 02:00:54.306	

...the software image file is available in the software image repository.

Inventory / Device Management / Software Images / Software Image Summary							Image Dashboard
Software Images							Selected 0 / Total 12
ALL							Show Quick Filter
File Name	Image Family	Image Type	Version	Size	Updated On		
asr1000rp1-adventerprise9.03.13.00.S.154-3.S...	PPC_LINUX_IO...	SYSTEM_SW	3.13.00S	352.7 MB (369805908 byt...	April 12, 2016 8:55:58 PM		
asr1000rp1-adventerprise9.03.13.05.S.154-3.S...	PPC_LINUX_IO...	SYSTEM_SW	3.13.05S	353.8 MB (370973308 byt...	April 28, 2016 7:38:02 PM		
asr1000rp1-adventerprise9.03.16.02.S.155-3.S...	PPC_LINUX_IO...	SYSTEM_SW	3.16.02S	374.6 MB (392772220 byt...	April 28, 2016 7:37:10 PM		
asr1000rp2-ipbase.03.09.02.S.153-2.S2.bin	X86_64_LINUX_...	SYSTEM_SW	3.09.02S	534.4 MB (560319476 byt...	April 12, 2016 8:50:19 PM		
asr1000rp2-ipbase.03.13.00.S.154-3.S-ext.bin	X86_64_LINUX_...	SYSTEM_SW	3.13.00S	553.5 MB (580383732 byt...	April 12, 2016 8:53:21 PM		
c2960-lanbasek9-mz.122-55.SE.bin	C2960	SYSTEM_SW	12.2(55)SE	9.319 MB (9771439 bytes)	April 19, 2016 3:10:11 PM		
cat3k_caa-universalk9.SPA.03.06.00.E.152-2.E...	CAT3K_CAA	SYSTEM_SW	03.06.00E	276.5 MB (289970248 byt...	April 12, 2016 8:45:41 PM		
cat3k_caa-universalk9.SPA.03.06.03.E.152-2.E...	CAT3K_CAA	SYSTEM_SW	03.06.03E	288.9 MB (302890264 byt...	April 12, 2016 8:47:16 PM		
cat3k_caa-universalk9.SPA.03.07.00.E.152-3.E...	CAT3K_CAA	SYSTEM_SW	03.07.00E	296.0 MB (310347344 byt...	April 21, 2016 12:09:29 AM		
cat3k_caa-universalk9.SPA.03.07.01.E.152-3.E...	CAT3K_CAA	SYSTEM_SW	03.07.01E	296.7 MB (311159920 byt...	April 22, 2016 12:50:37 PM		
cat3k_caa-universalk9.SPA.03.07.03.E.152-3.E...	CAT3K_CAA	SYSTEM_SW	03.07.03E	308.0 MB (322991728 byt...	April 20, 2016 8:47:18 PM		
cat4500-entservicesk9-mz.122-54.SG1.bin	CAT4500	SYSTEM_SW	12.2(54)SG1	18.16 MB (19038240 bytes)	April 22, 2016 4:48:53 PM		



Tip: In the list of jobs, you can click a **Job ID** link...

Last 10 Swim Job All Jobs		
Run ID	Job Type	Job Name
15640984	SWIM Collection	ImportImage_Catalyst_3850_7_49_53_050_P...

...to see job details.

For **SWIM Collection** jobs, this information indicates the image or images that the system imported.

Inventory / Device Management / Software Images / ImportImage_Catalyst_3850_7_49_53_050_PM_4_20_2016

Recurrence None

Description Collecting the image fromFILE

Log file [Download](#)

Showing latest 5 Job instances

[Show All](#)

Total 1

Run ID

Status

Duration (hh:mm:ss)

Start Time

Completion Time

15640984

Success

00:00:39

2016-04-20 20:47

2016-04-20 20:47

Image Management Job Results

[Detach](#)

Total 1

Device IP

Device Name

Image Name

Status

N/A

N/A

cat3k_caa-universalk9.SPA.03.07.03.E.152-3.E3.bin

Success

- When the **SWIM Collection** job indicates that it is successful, [follow the steps to verify that the software image minimum requirements are available or configure them](#), as needed.

When the image is imported and available in the repository, you are ready to distribute the image to the SWIM servers.

Task 3: Distribute the Software Image

With the software image available in the repository, you can schedule its distribution to the remote SWIM servers that will distribute the image to the devices in their location groups.

In this use case, the location group assigned to each SWIM server includes all of the Catalyst 3850 switches at each site that require the upgrade.

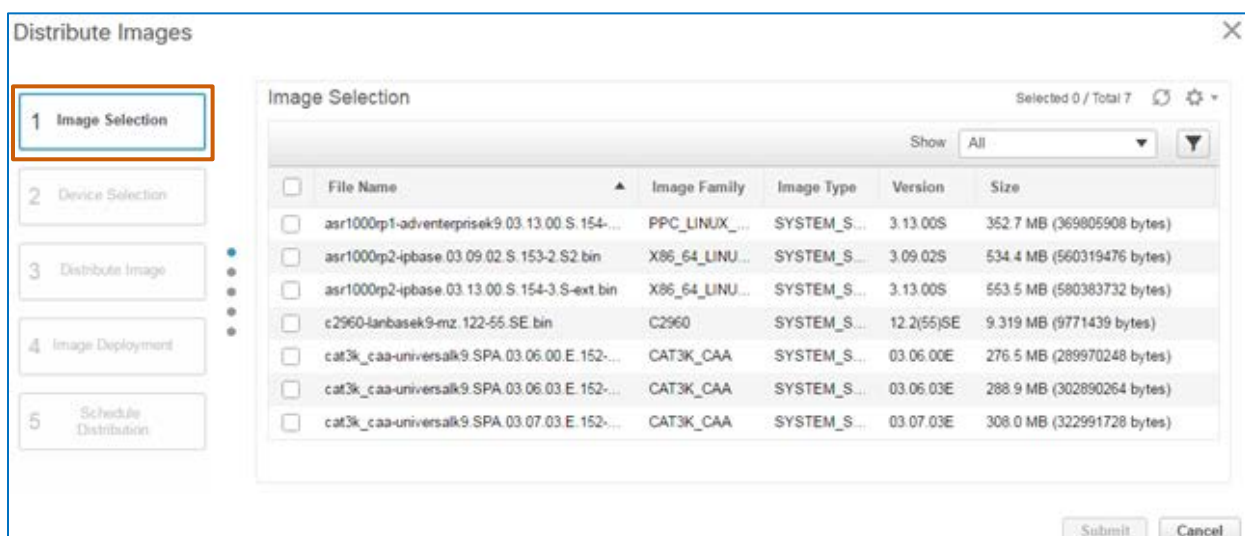
To distribute the software image, follow these steps:

1. On the **Software Images** page, click the **Distribute** icon.

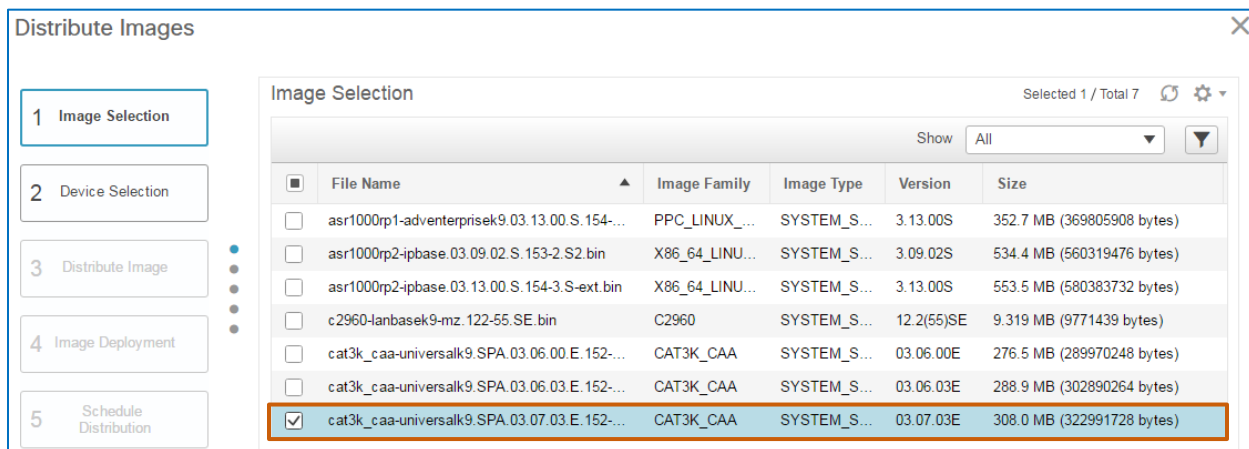


The **Distribute Images** dialog box opens and provides a wizard to step you through the task. The **Image Selection** page is active.

The **Image Selection** page lists all of the images that are available in the repository.



- On the **Image Selection** page, select the image that you need to distribute.



Distribute Images

1 Image Selection

2 Device Selection

3 Distribute Image

4 Image Deployment

5 Schedule Distribution

Image Selection

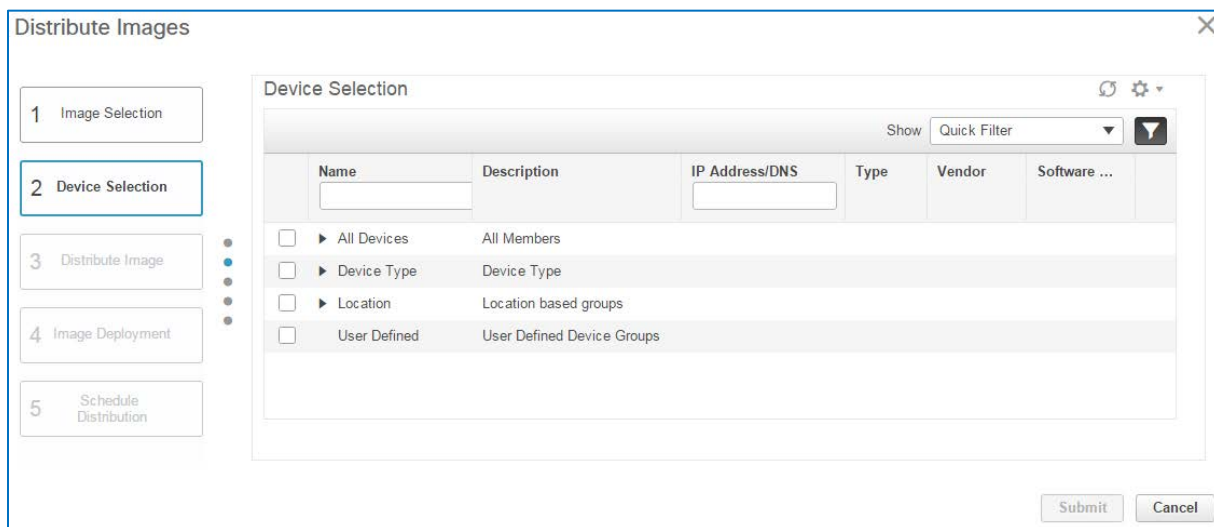
Selected 1 / Total 7

Show All

	File Name	Image Family	Image Type	Version	Size
<input type="checkbox"/>	asr1000rp1-adventerprisek9.03.13.00.S.154-...	PPC_LINUX_...	SYSTEM_S...	3.13.00S	352.7 MB (369805908 bytes)
<input type="checkbox"/>	asr1000rp2-ipbase.03.09.02.S.153-2.S2.bin	X86_64_LINU...	SYSTEM_S...	3.09.02S	534.4 MB (560319476 bytes)
<input type="checkbox"/>	asr1000rp2-ipbase.03.13.00.S.154-3.S-ext.bin	X86_64_LINU...	SYSTEM_S...	3.13.00S	553.5 MB (580383732 bytes)
<input type="checkbox"/>	c2960-lanbasek9-mz.122-55.SE.bin	C2960	SYSTEM_S...	12.2(55)SE	9.319 MB (9771439 bytes)
<input type="checkbox"/>	cat3k_caa-universalk9.SPA.03.06.00.E.152-...	CAT3K_CAA	SYSTEM_S...	03.06.00E	276.5 MB (289970248 bytes)
<input type="checkbox"/>	cat3k_caa-universalk9.SPA.03.06.03.E.152-...	CAT3K_CAA	SYSTEM_S...	03.06.03E	288.9 MB (302890264 bytes)
<input checked="" type="checkbox"/>	cat3k_caa-universalk9.SPA.03.07.03.E.152-...	CAT3K_CAA	SYSTEM_S...	03.07.03E	308.0 MB (322991728 bytes)

- Click **2 Device Selection**.

The **Device Selection** page opens and lists the network devices that are eligible to receive the image.



Distribute Images

1 Image Selection

2 Device Selection

3 Distribute Image

4 Image Deployment

5 Schedule Distribution

Device Selection

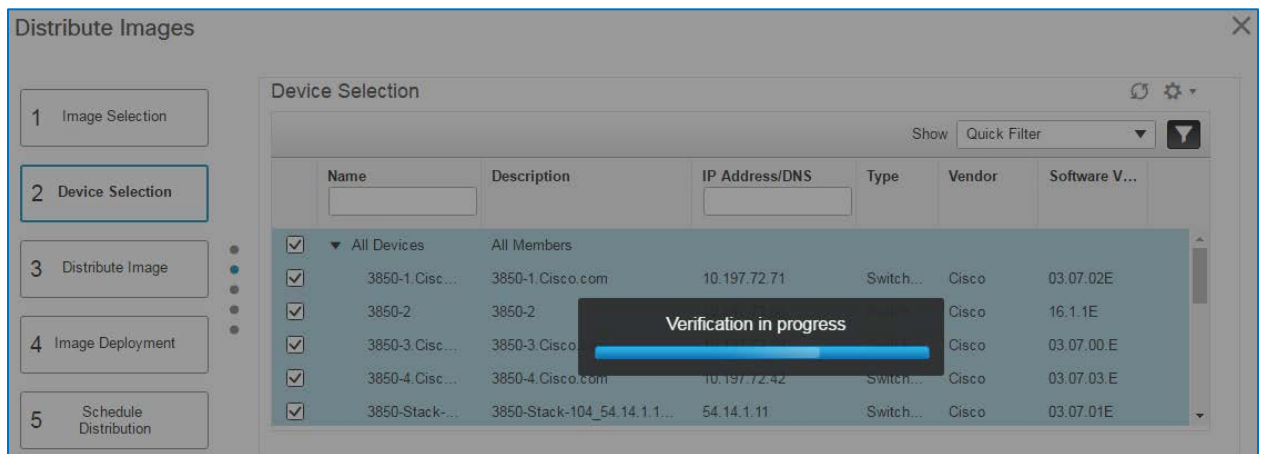
Show Quick Filter

	Name	Description	IP Address/DNS	Type	Vendor	Software ...
<input type="checkbox"/>	► All Devices	All Members				
<input type="checkbox"/>	► Device Type	Device Type				
<input type="checkbox"/>	► Location	Location based groups				
<input type="checkbox"/>	► User Defined	User Defined Device Groups				

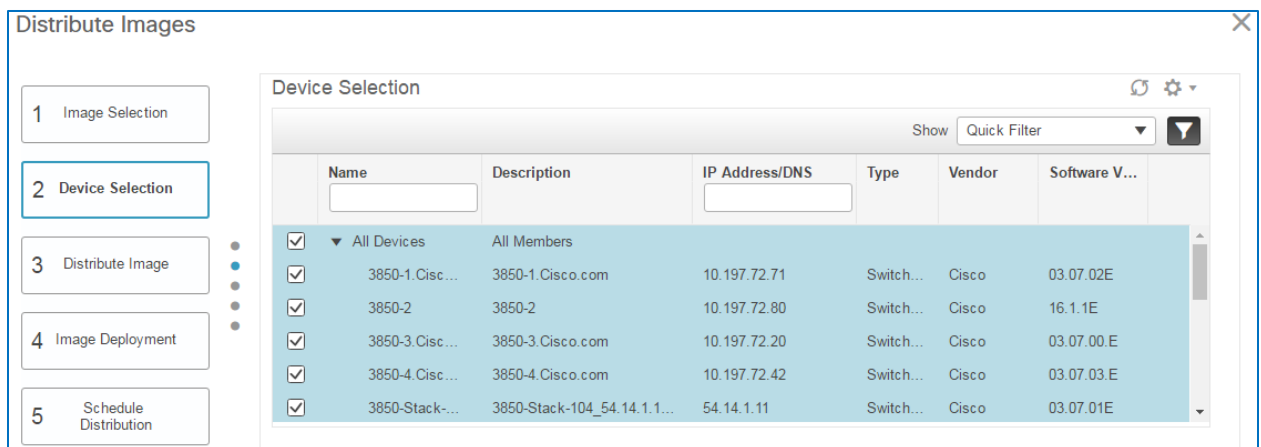
Submit Cancel

- In the **Device Selection** list, expand a category and select the device or devices to which you need the system to distribute the software image.

As you select each device, the system automatically verifies that the device can accept the distribution...



...and selects each device check box.



Note: When device verification fails, the system displays a message on the **Distribute Image and Location Selection** page to notify you of the failure.

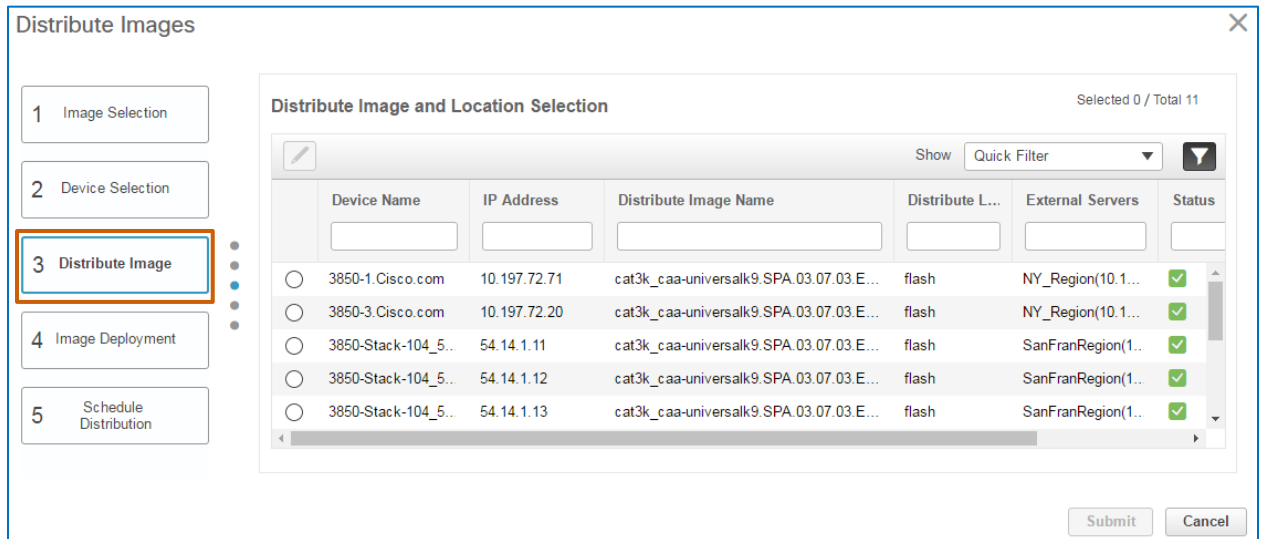
When you run the job, it will not include devices that have failed the automated verification.

- Click **3 Distribute Image**.

The **Distribute Image and Location Selection** page opens and lists the devices that you selected, the image storage location, such as flash or bootflash, on each device, and indicates the file server that will be used distribute the image.

Note: The wizard provides this page so that you can review the details of the upgrade before deployment.

Reviewing the distribution details before starting the job helps ensure that image distribution occurs as expected.



Device Name	IP Address	Distribute Image Name	Distribute L...	External Servers	Status
3850-1.Cisco.com	10.197.72.71	cat3k_caa-universalk9.SPA.03.07.03.E...	flash	NY_Region(10.1...	Success
3850-3.Cisco.com	10.197.72.20	cat3k_caa-universalk9.SPA.03.07.03.E...	flash	NY_Region(10.1...	Success
3850-Stack-104_5...	54.14.1.11	cat3k_caa-universalk9.SPA.03.07.03.E...	flash	SanFranRegion(1...	Success
3850-Stack-104_5...	54.14.1.12	cat3k_caa-universalk9.SPA.03.07.03.E...	flash	SanFranRegion(1...	Success
3850-Stack-104_5...	54.14.1.13	cat3k_caa-universalk9.SPA.03.07.03.E...	flash	SanFranRegion(1...	Success

6. For all of the devices that are listed, in the **External Servers** column, during your review, validate whether:

- ❖ The **Device Name** column lists the devices that you want to upgrade.
- ❖ The **Distribute Image Name** field indicates the image that you want the system to distribute to devices.
- ❖ The **Distribute Location** field indicates the correct location on the device where the distribution process will store the image.
- ❖ The **External Servers** field indicates the file server that will be used distribute the image.



Important Note: The use of SWIM servers for image distribution is unavailable for certain device types and image families. When SWIM server functionality is unavailable, the system only supports using Prime Infrastructure (Local File Server) as the distribution server.

For more information, refer to the **Software Image Management Processes and Supported Devices** table.

- ❖ **If you need to change any of the information, go to step 7.**
- ❖ **If the information is correct, go to step 8.**



Note: When the system distributes images to SWIM servers, the distribution action to each SWIM server occurs only once. The system determines distribution to each SWIM server based on the first device in the list that the system identifies as associated to that SWIM server by using the location group.

Then, the system prompts the devices to copy the image from the designated SWIM server to the designated storage location.



Tip: As mentioned previously, distributing images by using SWIM servers is useful primarily when you have large groups of devices associated to each SWIM server that require the same image upgrade.

7. Click the row of the device with the incorrect data, and, in the field that requires the change, select the applicable data, and then click **Save**.

Device Name	IP Address	Distribute Image Name	Distribute L...	External Servers	Status	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
<input type="radio"/>	3850-1.Cisco.com	10.197.72.71	cat3k_caa-universalk9.SPA.03.07.0	flash	NY_Region(1)	SUCCESS

8. Click **4 Image Deployment**. The **Image Deployment Options** page opens.



Important Note: An administrator can configure global settings that define image deployment options based on the enterprise business policy, which the system applies to the image deployment options automatically.

The settings that you change here override the global settings that administrators have defined.

For more information, [refer to the Cisco Prime Infrastructure 3.1 Administrator Guide](#).

Distribute Images

1 Image Selection

2 Device Selection

3 Distribute Image

4 Image Deployment

Image Deployment Options

Distribution Options

☐ Backup Current Image
 ☐ TFTP Fall Back
 ☐ Erase Flash Before Distribution

Activate Options

☐ Insert boot command

Activate

OFF

Advance Job Options

☒ Continue on failure

Device Upgrade Mode

Cur...

- ❖ To configure **Distribution Options** and **Advance Job Options**:

- ♦ To archive the current running image, select the **Backup Current Image** check box.



Important Note: The system will back up the image before distributing it, which can prolong the length of the distribution process significantly.

- ♦ To insert the TFTP fallback command in each device's running configuration, select the **TFTP Fall Back** check box.



Note: An administrator must enable the TFTP server setting in Administration to support using the TFTP fallback option.

For more information on the **TFTP Fall Back** process, [refer to the FAQ](#).

- ♦ To erase temporary or unused files to make Flash space available on the device, select **Erase Flash Before Distribution**.



Important Note: When you are upgrading stack devices, such as certain Cisco Catalyst and Cisco ME 3600 switch devices, the system distributes the image to all flash instances.

When you need to use the **Erase Flash Before Distribution** option in this case, the system only erases the main flash memory (Flash 1) on the device.

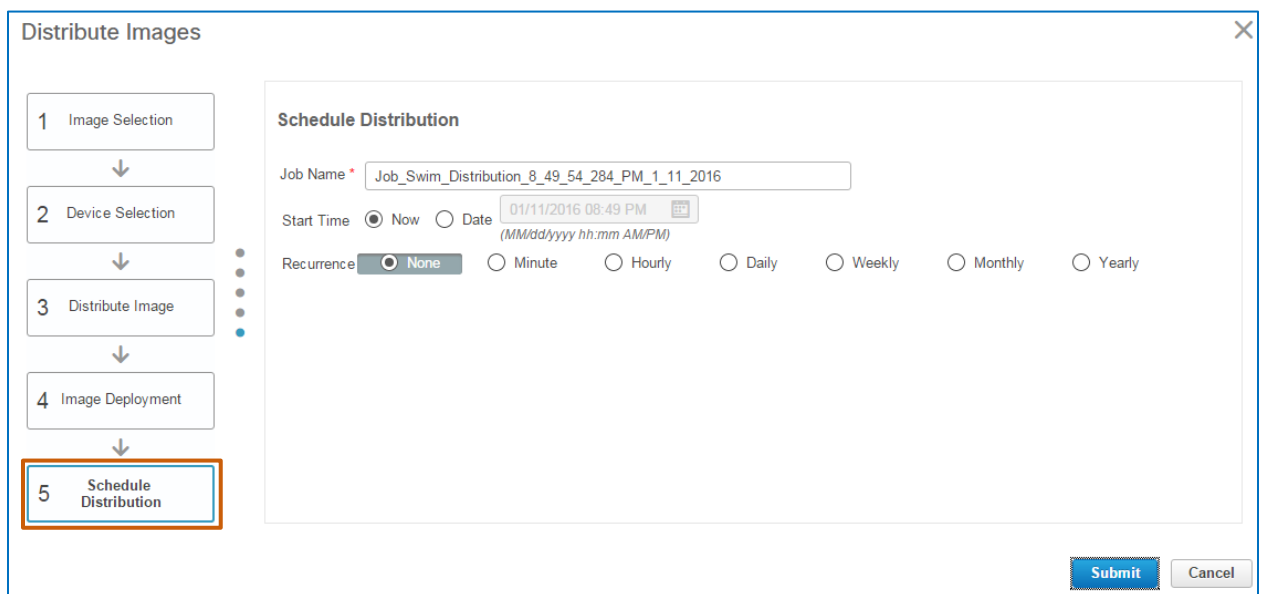
If you need to make space available for the image on Flash 2, you must erase the memory manually. If Flash 2 does not have enough capacity to store the image, distribution to that device will fail.

- ♦ To allow the process to continue when the system fails to distribute the image to a device, accept the default selection of the **Continue on failure** check box.



Note: Options can vary based on specific distribution or activation scenarios. For more information on the job options that the system can provide and their uses, [refer to the FAQ](#).

9. Click **5 Schedule Distribution**. The **Schedule Distribution** page opens.



Distribute Images

1 Image Selection

2 Device Selection

3 Distribute Image

4 Image Deployment

5 Schedule Distribution

Schedule Distribution

Job Name *

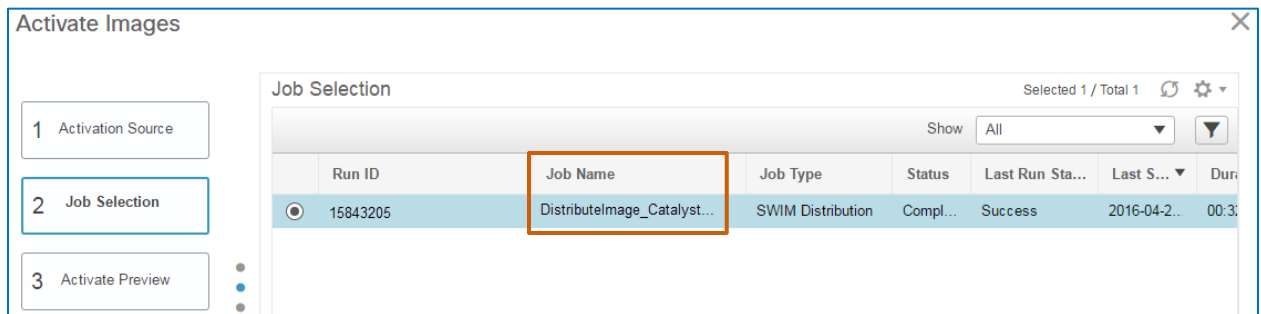
Start Time ☒ Now ☐ Date (MM/dd/yyyy hh:mm AM/PM)

Recurrence ☒ None ☐ Minute ☐ Hourly ☐ Daily ☐ Weekly ☐ Monthly ☐ Yearly

10. On the **Schedule Distribution** page, in the **Job Name** field, optionally type a descriptive name for the **SWIM Distribution** job so that users can recognize its use when reviewing the list of SWIM jobs.



Tip: The job name also appears in the list of SWIM distribution jobs from which users select when activating images as a separate task. It can be helpful to name jobs descriptively so that users can identify the image file that they need to activate more easily.



Run ID	Job Name	Job Type	Status	Last Run Sta...	Last S...	Dur...
15843205	DistributeImage_Catalyst...	SWIM Distribution	Compl...	Success	2016-04-2...	00:3...

11. In the **Start Time** row, indicate when you want the image distribution to occur.
12. Click **Submit**.

The dialog box closes and adds the distribution job to the list of jobs.

The system starts the **SWIM Distribution** job by following the schedule.

When image distribution is complete, the system indicates the job status in the **Status** column.

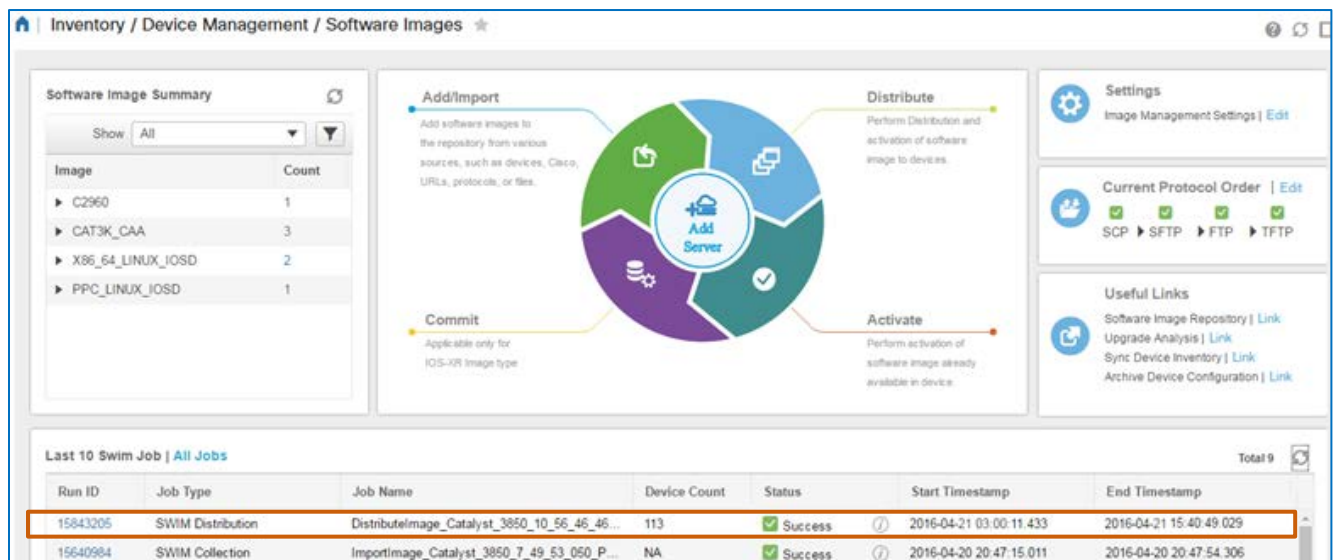


Image	Count
C2960	1
CAT3K_CAA	3
X86_64_LINUX_IOSD	2
PPC_LINUX_IOSD	1

Run ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp
15843205	SWIM Distribution	DistributeImage_Catalyst_3850_10_56_46_46...	113	Success	2016-04-21 03:00:11.433	2016-04-21 15:40:49.029
15640984	SWIM Collection	ImportImage_Catalyst_3850_7_49_53_050_P...	NA	Success	2016-04-20 20:47:15.011	2016-04-20 20:47:54.306

After establishing that the distribution job is successful, you are ready to activate the software image on the devices.



Tip: When you are performing the distribution and activation processes as separate jobs, it is best practice to ensure that the image distribution job is

complete before you start the activation process. That way, you can evaluate the distribution job status and results to identify or address any distribution failures.

You also can initiate the activation process by using the distribution job, as we illustrate in this use case.

If distribution failures have occurred and you activate using the completed distribution job, the system will activate the image only on those devices for which the distribution job was successful.



Note: The system can return a job status of **Success** or **Failure**. When the job status indicates a failure, an error message provides insight into the failure, so that you can take corrective action.

Task 4: Activate the Software Image

The system has successfully distributed the image to all of the devices by using the SWIM servers. You now can schedule image activation, which in this case, will cause the routers to reboot when the activation process completes.

Because the routers are key to ongoing network operations, you plan to reboot them sequentially, so that only one router at a time will be out of operation during the reboot. In sequential rebooting, the system does not start activation on the next device until it validates that the currently rebooted device is up and in a running state.

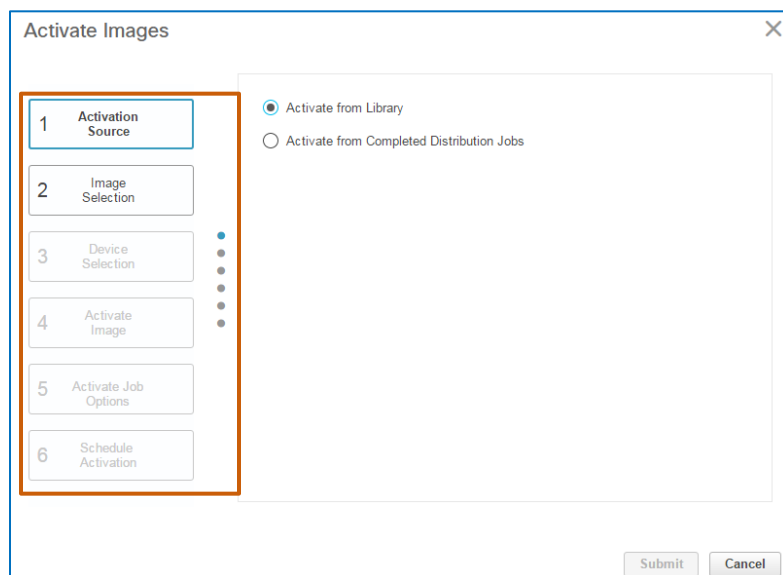
To activate the software image, follow these steps:

1. On the **Software Images** page, click the **Activate** icon.



The **Activate Images** dialog box opens and provides a wizard to step you through the task.

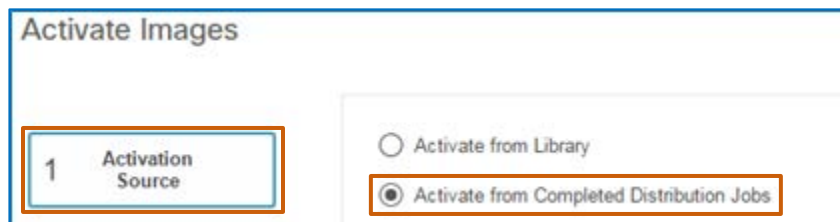
The **Activation Source** page is active and the system selects the **Activate from Library** option by default.



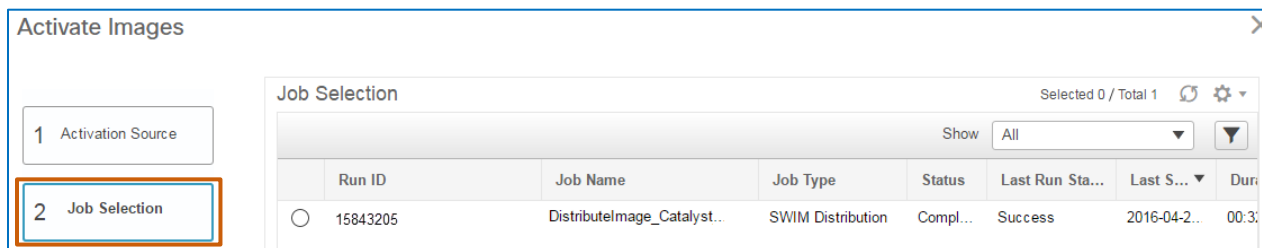
2. On the **Activation Source** page, select whether the image that is stored in flash memory was distributed previously by using Prime Infrastructure or another method, or by using a completed distribution job that is listed on the **Software Images** page.
 - ❖ To activate a previously distributed image, click **Activate from Library**.
 - ❖ To activate an image by using a completed distribution job, click **Activate from Completed Distribution Jobs**.

The wizard steps change to support the activation source that you select.

For example, when you are distributing a library image, you select the image itself and the devices on which you are activating it. When you are activating an image by using a completed distribution job, you need to select the distribution job.



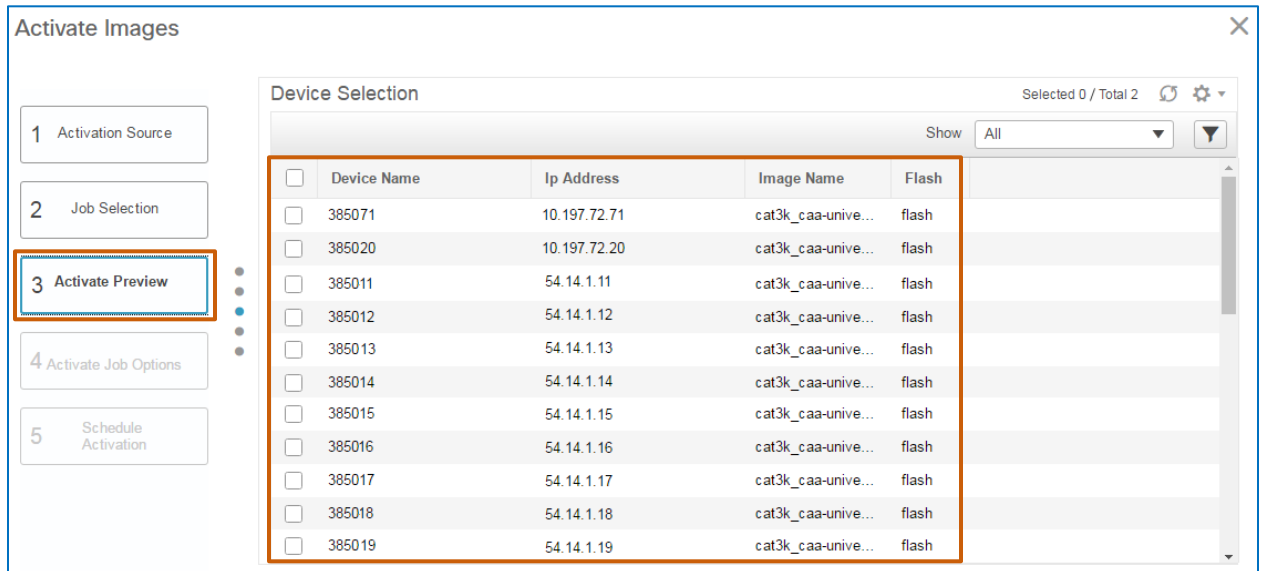
3. Click **2 Job Selection**. The **Job Selection** page opens and lists all of the completed distribution jobs.



Run ID	Job Name	Job Type	Status	Last Run Sta...	Last S...	Dur...
15843205	DistributImage_Catalyst...	SWIM Distribution	Compl...	Success	2016-04-2...	00:3...

4. In the list, select the distribution job that contains the image that you want the system to activate.
5. Click **3 Activate Preview**.

The **Device Selection** page opens and lists the devices on which the system will activate the image.

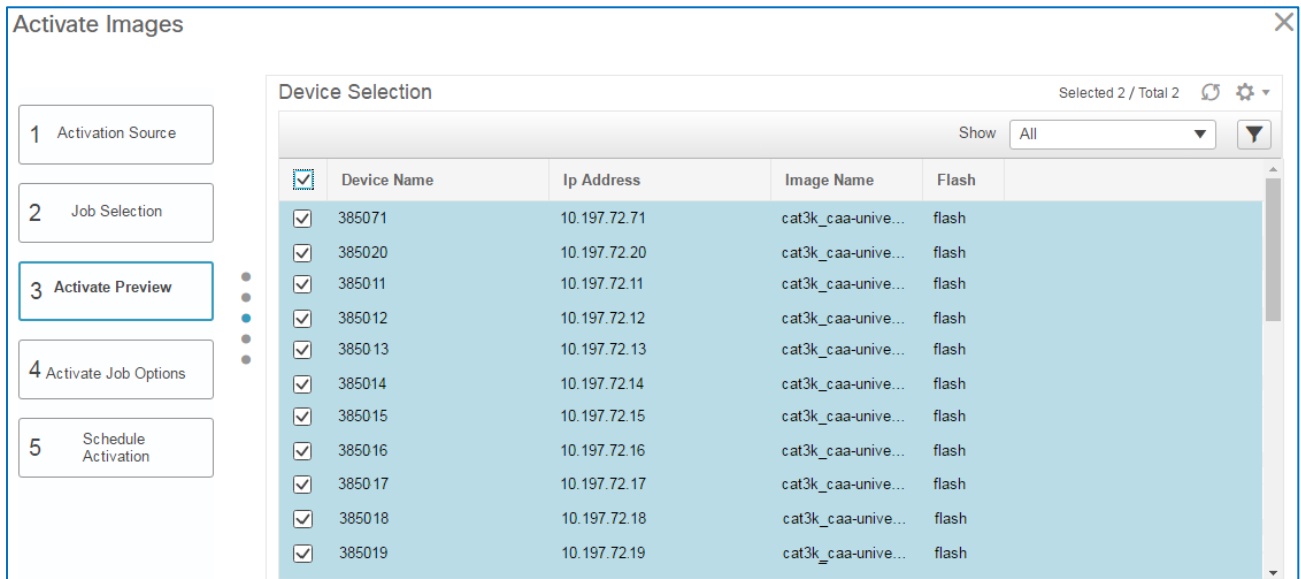


<input type="checkbox"/>	Device Name	Ip Address	Image Name	Flash
<input type="checkbox"/>	385071	10.197.72.71	cat3k_caa-unive...	flash
<input type="checkbox"/>	385020	10.197.72.20	cat3k_caa-unive...	flash
<input type="checkbox"/>	385011	54.14.1.11	cat3k_caa-unive...	flash
<input type="checkbox"/>	385012	54.14.1.12	cat3k_caa-unive...	flash
<input type="checkbox"/>	385013	54.14.1.13	cat3k_caa-unive...	flash
<input type="checkbox"/>	385014	54.14.1.14	cat3k_caa-unive...	flash
<input type="checkbox"/>	385015	54.14.1.15	cat3k_caa-unive...	flash
<input type="checkbox"/>	385016	54.14.1.16	cat3k_caa-unive...	flash
<input type="checkbox"/>	385017	54.14.1.17	cat3k_caa-unive...	flash
<input type="checkbox"/>	385018	54.14.1.18	cat3k_caa-unive...	flash
<input type="checkbox"/>	385019	54.14.1.19	cat3k_caa-unive...	flash

1. In the list, select each device on which you need to activate the image.



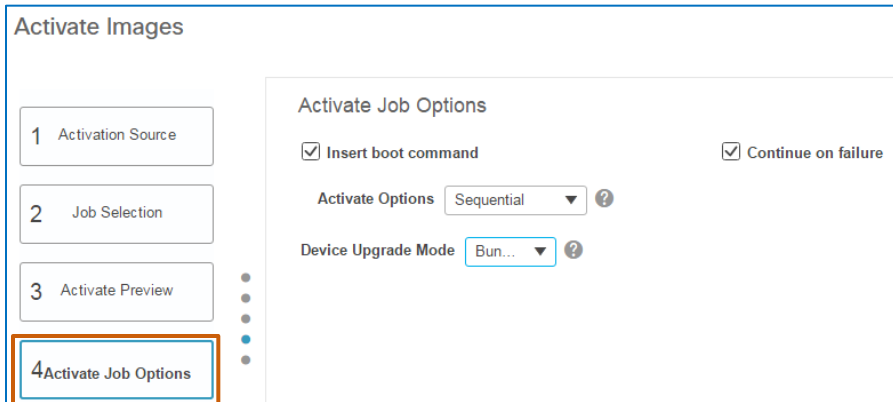
Tip: To include all of the devices in the list, select the check box beside the **Device Name** column heading.



<input checked="" type="checkbox"/>	Device Name	Ip Address	Image Name	Flash
<input checked="" type="checkbox"/>	385071	10.197.72.71	cat3k_caa-unive...	flash
<input checked="" type="checkbox"/>	385020	10.197.72.20	cat3k_caa-unive...	flash
<input checked="" type="checkbox"/>	385011	10.197.72.11	cat3k_caa-unive...	flash
<input checked="" type="checkbox"/>	385012	10.197.72.12	cat3k_caa-unive...	flash
<input checked="" type="checkbox"/>	385013	10.197.72.13	cat3k_caa-unive...	flash
<input checked="" type="checkbox"/>	385014	10.197.72.14	cat3k_caa-unive...	flash
<input checked="" type="checkbox"/>	385015	10.197.72.15	cat3k_caa-unive...	flash
<input checked="" type="checkbox"/>	385016	10.197.72.16	cat3k_caa-unive...	flash
<input checked="" type="checkbox"/>	385017	10.197.72.17	cat3k_caa-unive...	flash
<input checked="" type="checkbox"/>	385018	10.197.72.18	cat3k_caa-unive...	flash
<input checked="" type="checkbox"/>	385019	10.197.72.19	cat3k_caa-unive...	flash

2. Click **4 Activate Job Options**.

The **Activate Job Options** page opens.



3. On the **Activate Job Options** page:

a. Select the **Insert boot command** check box.



Important Note: When you select **Bundle Mode** in step 3c, you must select the **Insert boot command** check box for the activation process to occur successfully.

If you do not select the check box, the device will reboot its current running image rather than the upgraded image.

b. Select whether the image is activated sequentially or in parallel.



Note: In sequential activation, the system reboots one device at a time. When the system determines that the device is up and in a running state, it reboots and monitors each subsequent device individually until the job is complete.

In parallel activation, the system reboots all of the devices at once, and then validates that each is up and in a running state.



Important Note: When a single activation job includes core devices, consider activating those devices sequentially to avoid losing device connectivity.

When devices do not have dependencies for connectivity, such as at devices on the network edge (access services), you can activate those devices in parallel.

c. In the **Device Upgrade Mode** drop-down list, to define the format that the system uses to activate the image file:

- ❖ To use the same mode that the devices are running currently, accept the default selection of **Currently Existing**.
- ❖ To activate the image in the XXX.bin format, select **Bundle Mode**.
- ❖ To activate the image in the package.conf format, select **Install Mode**.

In bundle mode, the components of the image are extracted and loaded in RAM during reboot.

In install mode, the components of the image are extracted during software installation and a **packages.conf** file, which lists the components (packages), is generated.

Then, on reboot, the boot variable reference the packages.conf to upgrade the image.

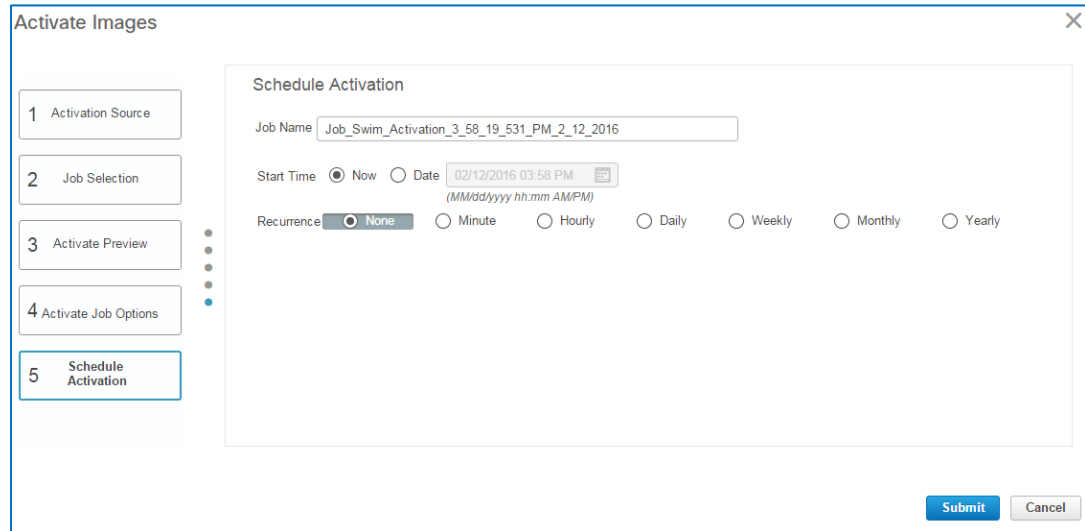


Note: Catalyst 3650 and 3850 Series Switches and Cisco 5700 Series Wireless LAN Controllers support install mode only.

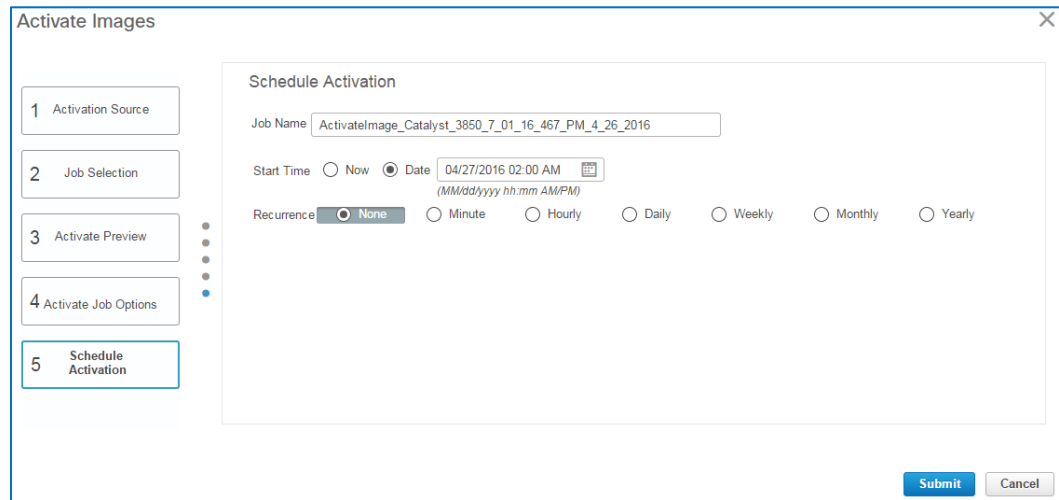
- d. When the system fails to activate the image on one device and you want to continue the activation process despite the failure, accept the default selection of the **Continue on failure** check box.

4. Click **5 Schedule Activation**.

The **Schedule Activation** page opens.



5. On the **Schedule Activation** page, in the **Job Name** field, type a descriptive name for the **SWIM Activation** job so that users can recognize its use when reviewing the list of SWIM jobs.
6. In the **Start Time** row, indicate when you want the image activation to occur.
7. Click **Submit**.



The dialog box closes and adds the activation job to the list of jobs.

The system starts the **SWIM Activation** job by following the schedule.

When image activation is complete, the system indicates the job status in the **Status** column.

Last 10 Swim Job All Jobs							Total 10
Run ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp	
29882333	SWIM Activation	ActivatImage_Catalyst_3850_7_01_16_467_...	113	Success	2016-04-27 02:00:00.755	2016-04-27 05:42:45.479	

In this case, you have configured the activation to occur sequentially to help ensure ongoing device connectivity and scheduled the activation to occur during the appropriate maintenance window in each region.

Task 5: Validate Image Activation

When an activation job completes, the system reports the results in the list on the **Software Images** page.

Based on the use case, follow these steps:

1. On the **Software Images** page, in the **Last 10 Swim Job** list, locate the activation job and in the **Status** column, review the overall result that the system is reporting.



Note: The system can return a job status of **Success** or **Failure**. When the job status indicates a failure, an error message provides insight into the failure, so that you can take corrective action.

- To review job details, in the **Status** column, point to the **information** button beside the status.

Last 10 Swim Job All Jobs							Total 10
Run ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp	
29882333	SWIM Activation	ActivatImage_Catalyst_3850_7_01_16_467...	113	Success	2016-04-27 02:00:00.755	2016-04-27 05:42:45.479	

The **Job Summary** pop-up window opens and provides an overview of the job results.

image

CAT4500	1
C2960	1
CAT3K_CAA	5
X86_64_LINUX_IOSD	2
PPC_LINUX_IOSD	1

URLs, protocols, or files.

Job Summary

Job Name: ActivatImage_Catalyst_3850_7_01_16...

Job Status: completed

Last Run Status: Success

Creation Time: 2016-04-27 02:00

Recurrence: None

Devices in this run

Total	113	Successful	113
Failed	0	In-Progress	0
Not Yet Started	0	Cancelled	0

Actions

Job Detail View

Current Protocol Ord

TFTP SCP FTP

Useful Links

Software Image Repository

Upgrade Analysis | Link

Sync Device Inventory | Link

Archive Device Configuratio

Last 10 Swim Job All Jobs							Total
Run ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp	
29882333	SWIM Activation	Activat...	113	Success	2016-04-27 02:00:00.755	2016-04-27 05:42:45.479	
19833861	SWIM Distribution	3850_EFBD_IBC_Bundle_Swim_Distribution...	2	Success	2016-04-22 15:08:31.987	2016-04-22 15:40:49.029	

- To review the results at a device level, in the **Job Summary** pop-up window, click **Job Detail View**.



Tip: The **Job Detail View** is particularly helpful when evaluating partial success and failure results. The system navigates you to Administration and opens the **Job Dashboard** page that contains job details by device.

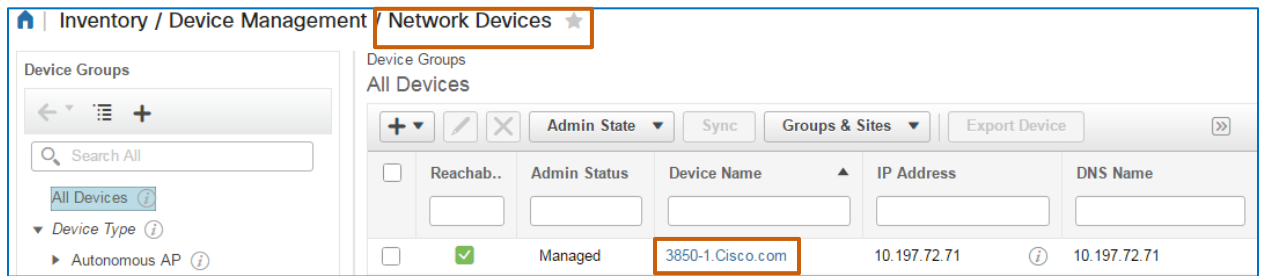
Administration / Dashboards / Job Dashboard / 3850_EFBD_IBC_Act OFF_CE_Bundle_Swim_Distribution_12_40_14_262_PM_4_22_2016					
Recurrence: None					
Description: Distribute the Image to the Device					
Log file Download					
Showing latest 5 Job instances Show All					
Run ID	Status	Duration (h:mm:ss)	Start Time	Completion Time	
19612714	Interrupted	03:39:33	2016-04-22 12:42	2016-04-22 16:22	
Image Management Job Results Detach					
Device IP	Device Name	Image Name	Status		
10.197.72.71	3850-1 Cisco.com	cat3k_caa-universalk9.SPA.03.06.00.E.152-2.E.bin	Failure		
10.197.72.20	3850-3 Cisco.com	cat3k_caa-universalk9.SPA.03.06.00.E.152-2.E.bin	Success		
10.197.72.80	3850-2 Cisco.com	cat3k_caa-universalk9.SPA.03.06.00.E.152-2.E.bin	Yet To Start Operation		

Then, you can click the information button beside the status result for a specific device to see the list of operations that occurred during the job and the result of each.

This information can provide insight into the cause of an error.

Image Management Job Results			Total 2
Operation	Status	Message	
Copying image [cat3k_caa-universalk9.SPA.03.06.00...	Success	-	
Distributing image [cat3k_caa-universalk9.SPA.03.06...	Failure	Software Clean Command Execution Success. Checking if HTTP serve..	

- To validate that the image that you activated is running on a specific device, navigate to the **Network Devices** page, and then locate and click an upgraded device's name link.

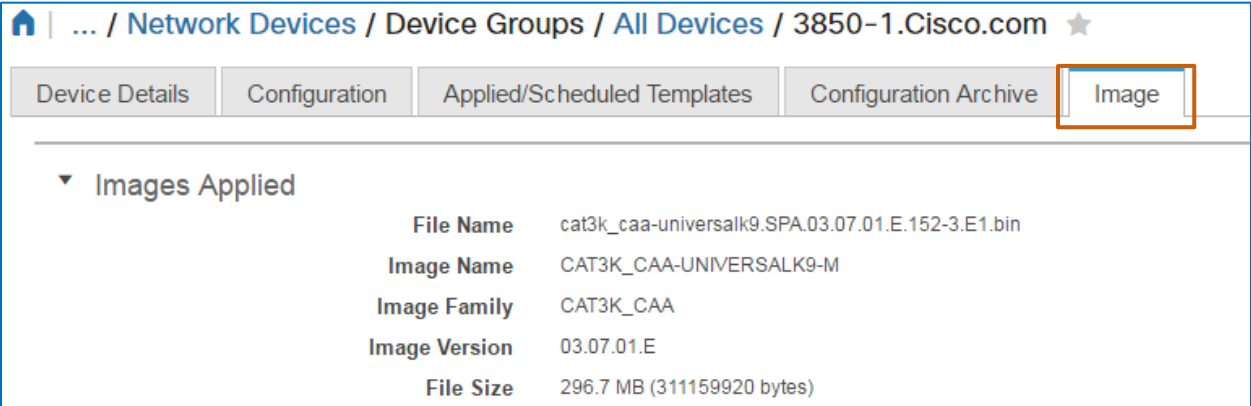


The screenshot shows the Cisco Inventory / Device Management / Network Devices page. The page has a sidebar on the left with 'Device Groups' and a search bar. The main content area shows a table of devices. The table has columns: Reachability, Admin Status, Device Name, IP Address, and DNS Name. The device '3850-1.Cisco.com' is highlighted in the Device Name column.

Reachability	Admin Status	Device Name	IP Address	DNS Name
<input type="checkbox"/>	Managed	3850-1.Cisco.com	10.197.72.71	10.197.72.71

The system opens detailed information about the device.

5. Click the **Image** tab. The page displays the current running image on the device.



You successfully upgraded the software image on geographically distributed devices by using SWIM servers.

Use Case 2: Upgrading Small Numbers of Devices

Use Case Scenario

An administrator has received a notification of a Cisco Product Security Incident Response Team (PSIRT) security advisory that the ASR1000 series router has security vulnerabilities. The advisory indicates that the router requires a software image upgrade to correct the issues.

The enterprise has several ASR1000s running locally.

The administrator has downloaded the new software image to the software image repository in Prime Infrastructure and has tasked you with preparing for and performing the upgrade. Because the PSIRT indicates security issues, you need to distribute and activate the image immediately as a single task.

To prepare, you need to:

- ❖ Determine if the software image requirements are available or configure them, as needed.



Note: Software image requirements define the minimum flash memory, ROM, and software version that needs to be available on the device for it to accept an image.

- ❖ Perform an upgrade analysis, which determines if the devices requiring the upgrade meet the minimum software image requirements by comparing the requirements to what the devices have available.

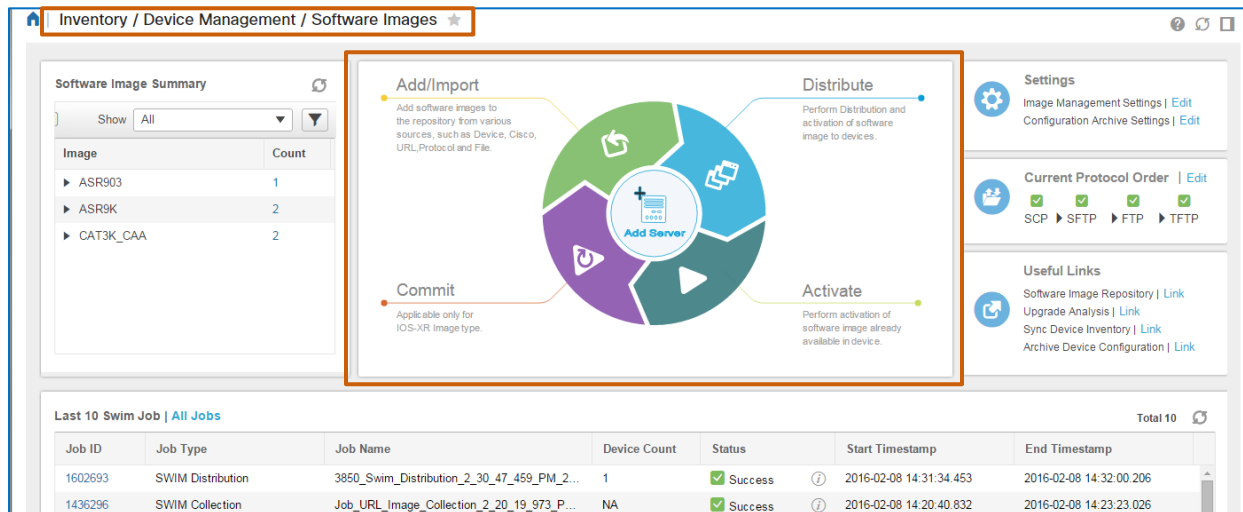
Taking these preparatory steps can help to ensure that the system will be able to distribute the image successfully.

Then, you can configure the system to distribute and activate the image as a combined task during the maintenance window.

When activation is complete, the system validates that the image is running on each router. You also manually validate successful image activation.

To start this use case:

- ❖ Navigate to the **Software Images** page.



Software Image Summary

Image	Count
ASR903	1
ASR9K	2
CAT3K_CAA	2

Workflow Diagram:

- Add/Import:** Add software images to the repository from various sources, such as Device, Cisco, URL, Protocol and File.
- Distribute:** Perform Distribution and activation of software image to devices.
- Activate:** Perform activation of software image already available in device.
- Commit:** Applicable only for IOS-XR image type.

Settings: Image Management Settings | [Edit](#)
Configuration Archive Settings | [Edit](#)

Current Protocol Order: [Edit](#)
SCP ▶ SFTP ▶ FTP ▶ TFTP

Useful Links:
Software Image Repository | [Link](#)
Upgrade Analysis | [Link](#)
Sync Device Inventory | [Link](#)
Archive Device Configuration | [Link](#)

Last 10 Swim Job | All Jobs Total 10

Job ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp
1602693	SWIM Distribution	3850_Swim_Distribution_2_30_47_459_PM_2...	1	Success	2016-02-08 14:31:34.453	2016-02-08 14:32:00.206
1436296	SWIM Collection	Job_URL_Image_Collection_2_20_19_973_P...	NA	Success	2016-02-08 14:20:40.832	2016-02-08 14:23:23.026

Process Overview

To complete this use case, follow the steps:

1. In preparation for upgrade analysis, configure the software image minimum requirements.
2. To determine image and device compatibility, perform an upgrade analysis.
3. As a single task, distribute and activate the image.
4. Validate that the devices are running the image that you expect.

Process Steps

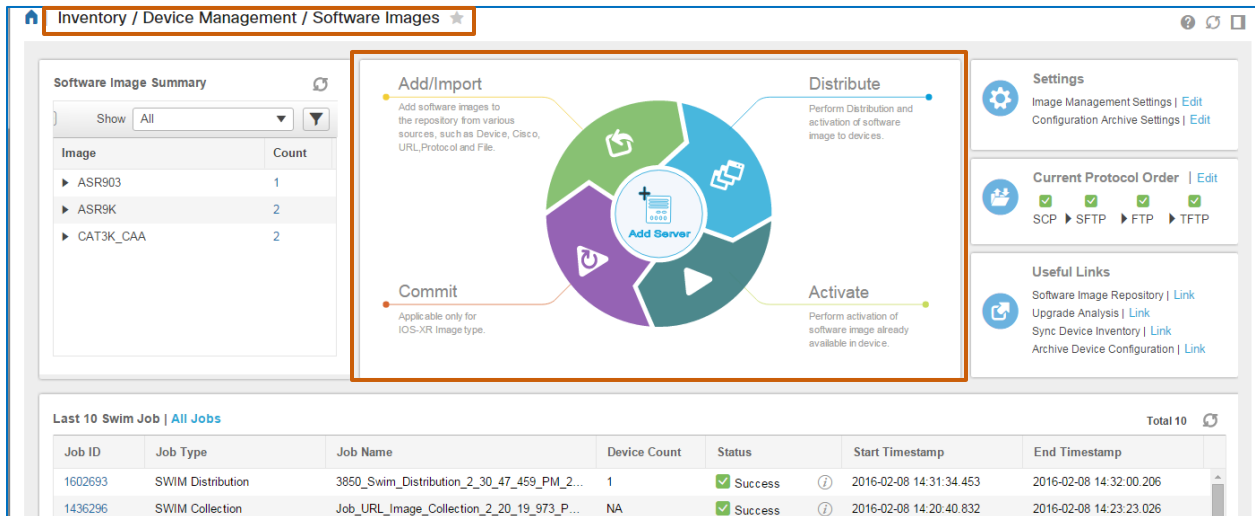
Because the security upgrade is critical, you want to ensure that the configurations of the devices receiving the upgrade have enough space to accept the image during distribution.

To make this determination, you plan to run an upgrade analysis, which compares the minimum distribution requirements of the software image to the device configuration and reports compatibility results.

When the administrator requested that you complete this task, you also received the associated documentation, which indicates the name of the image that you are using for the device upgrade and its minimum configuration requirements, so you are ready to begin.

To complete this use case:

- ❖ Navigate to the **Software Images** page.



Software Image Summary

Show: All

Image	Count
ASR903	1
ASR9K	2
CAT3K_CAA	2

Workflow Diagram:

- Add/Import:** Add software images to the repository from various sources, such as Device, Cisco, URL, Protocol and File.
- Distribute:** Perform Distribution and activation of software image to devices.
- Activate:** Perform activation of software image already available in device.
- Commit:** Applicable only for IOS-XR Image type.

Settings:

- Image Management Settings | [Edit](#)
- Configuration Archive Settings | [Edit](#)

Current Protocol Order: SCP, SFTP, FTP, TFTP

Useful Links:

- Software Image Repository | [Link](#)
- Upgrade Analysis | [Link](#)
- Sync Device Inventory | [Link](#)
- Archive Device Configuration | [Link](#)

Last 10 Swim Job

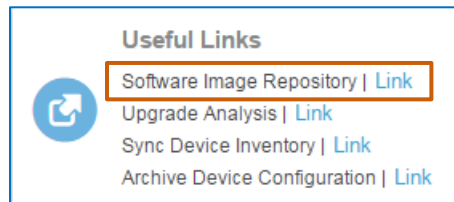
Job ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp
1602693	SWIM Distribution	3850_Swim_Distribution_2_30_47_459_PM_2...	1	Success	2016-02-08 14:31:34.453	2016-02-08 14:32:00.206
1436296	SWIM Collection	Job_URL_Image_Collection_2_20_19_973_P...	NA	Success	2016-02-08 14:20:40.832	2016-02-08 14:23:23.026

Task 1: Validate or Configure the Software Image Minimum Requirements

First, you need to validate whether the image's header populated the minimum requirements or you need to configure them by referring to the image's associated documentation.

To validate or configure software image minimum requirements, follow these steps:

- On the **Software Images** page, under **Useful Links**, click the **Software Image Repository** link.



Useful Links

- [Software Image Repository | Link](#)
- [Upgrade Analysis | Link](#)
- [Sync Device Inventory | Link](#)
- [Archive Device Configuration | Link](#)

The **Software Images Summary** page opens and lists all of the images that are available.

Inventory / Device Management / Software Images / Software Image Summary

Software Images

ALL

Selected 0 / Total 12

Show Quick Filter

File Name	Image Family	Image Type	Version	Size	Updated On
asr1000p1-adventerprisek9 03.13.00 S.154-3 S...	PPC_LINUX_IO...	SYSTEM_SW	3.13.00S	352.7 MB (369805908 byt...	April 12, 2016 8:55:58 PM
asr1000p1-adventerprisek9 03.13.05 S.154-3 S...	PPC_LINUX_IO...	SYSTEM_SW	3.13.05S	353.8 MB (370973308 byt...	April 28, 2016 7:38:02 PM
asr1000p1-adventerprisek9 03.16.02 S.155-3 S...	PPC_LINUX_IO...	SYSTEM_SW	3.16.02S	374.6 MB (392772220 byt...	April 28, 2016 7:37:10 PM
asr1000p2-ipbase 03.09.02 S.153-2 S2 bin	X86_64_LINUX...	SYSTEM_SW	3.09.02S	534.4 MB (560319476 byt...	April 12, 2016 8:50:19 PM
asr1000p2-ipbase 03.13.00 S.154-3 S-ext bin	X86_64_LINUX...	SYSTEM_SW	3.13.00S	553.5 MB (580383732 byt...	April 12, 2016 8:53:21 PM
c2960-lanbasek9-mz-122-55 SE bin	C2960	SYSTEM_SW	12.2(55)SE	9.319 MB (9771439 bytes)	April 19, 2016 3:10:11 PM
cat3k_caa-universalk9 SPA 03.06.00 E.152-2 E...	CAT3K_CAA	SYSTEM_SW	03.06.00E	276.5 MB (289970248 byt...	April 12, 2016 8:45:41 PM
cat3k_caa-universalk9 SPA 03.06.03 E.152-2 E...	CAT3K_CAA	SYSTEM_SW	03.06.03E	288.9 MB (302890264 byt...	April 12, 2016 8:47:16 PM
cat3k_caa-universalk9 SPA 03.07.00 E.152-3 E...	CAT3K_CAA	SYSTEM_SW	03.07.00E	296.0 MB (310347344 byt...	April 21, 2016 12:09:29 AM
cat3k_caa-universalk9 SPA 03.07.01 E.152-3 E...	CAT3K_CAA	SYSTEM_SW	03.07.01E	296.7 MB (311159920 byt...	April 22, 2016 12:50:37 PM
cat3k_caa-universalk9 SPA 03.07.03 E.152-3 E...	CAT3K_CAA	SYSTEM_SW	03.07.03E	308.0 MB (322991728 byt...	April 20, 2016 8:47:18 PM
cat4500-entservicesk9-mz-122-54 SG1 bin	CAT4500	SYSTEM_SW	12.2(54)SG1	18.16 MB (19038240 bytes)	April 22, 2016 4:48:53 PM

- To open the image details, click the image's **File Name** link.

Inventory / Device Management / Software Images / Software Image Summary

Software Images

ALL

Selected 0 / Total 12

Show Quick Filter

File Name	Image Family	Image Type	Version	Size	Updated On
asr1000p1-adventerprisek9 03.13.00 S.154-3 S...	PPC_LINUX_IO...	SYSTEM_SW	3.13.00S	352.7 MB (369805908 byt...	April 12, 2016 8:55:58 PM
asr1000p1-adventerprisek9 03.13.05 S.154-3 S...	PPC_LINUX_IO...	SYSTEM_SW	3.13.05S	353.8 MB (370973308 byt...	April 28, 2016 7:38:02 PM

The **Image Information** page opens.

Inventory / Device Management / Software Image Summary

All

Image Information

Image Details

File Name: asr1000p1-adventerprisek9 03.13.00 S.154-3 S-ext

Image Name: asr1000p1-adventerprisek9 03.13.00 S.154-3 S-ext

Image Family: PPC_LINUX_IOSD

Image Version: 3.13.00S

File Size: 352.7 MB (369805908 bytes)

Checksum: 414809b0e541a73e94eed409dcd0d3

Features: UNKNOWN

Minimum RAM (MB): 352

Minimum FLASH (MB): 353

Minimum Boot ROM Version:

Save Reset

- Determine whether the header populated the minimum requirements or you need to configure them.



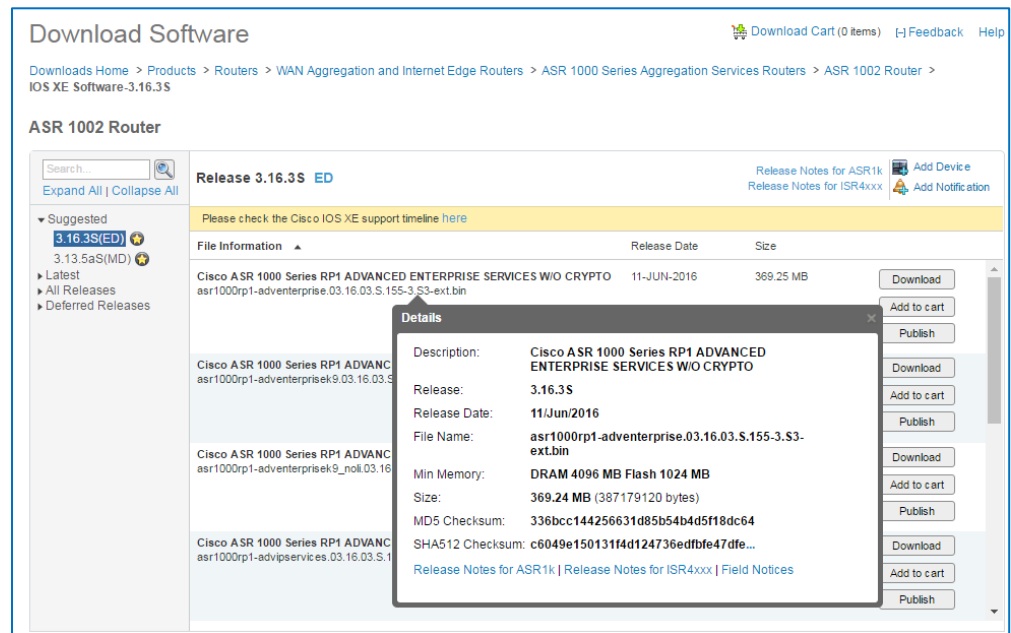
Note: When the minimum requirement data is available in the image file header, the system populates the requirements in the **Image Details** fields during the import process.



When the information is not populated automatically, refer to the technical documentation that accompanies the image to obtain minimum requirements.

Tip: To determine image minimums, you also can:

1. [Visit the Cisco Web site](#), and select the software image that you need to download.
2. On the software page, point to the software image file name to open a tooltip and find the image requirements.



Download Software

Downloads Home > Products > Routers > WAN Aggregation and Internet Edge Routers > ASR 1000 Series Aggregation Services Routers > ASR 1002 Router > IOS XE Software-3.16.3S

ASR 1002 Router

Search... Expand All | Collapse All

Release 3.16.3S ED

Please check the Cisco IOS XE support timeline [here](#)

File Information	Release Date	Size
Cisco ASR 1000 Series RP1 ADVANCED ENTERPRISE SERVICES W/O CRYPTO asr1000rp1-adventerprise.03.16.03.S.155-3.S3-ext.bin	11-JUN-2016	369.25 MB
Cisco ASR 1000 Series RP1 ADVANCED ENTERPRISE SERVICES W/O CRYPTO asr1000rp1-adventerprise.03.16.03.S.155-3.S3-ext.bin		
Cisco ASR 1000 Series RP1 ADVANCED ENTERPRISE SERVICES W/O CRYPTO asr1000rp1-adventerprise.03.16.03.S.155-3.S3-ext.bin		
Cisco ASR 1000 Series RP1 ADVANCED ENTERPRISE SERVICES W/O CRYPTO asr1000rp1-adventerprise.03.16.03.S.155-3.S3-ext.bin		

Details

Description: Cisco ASR 1000 Series RP1 ADVANCED ENTERPRISE SERVICES W/O CRYPTO

Release: 3.16.3S

Release Date: 11/Jun/2016

File Name: asr1000rp1-adventerprise.03.16.03.S.155-3.S3-ext.bin

Min Memory: DRAM 4096 MB Flash 1024 MB

Size: 369.24 MB (387179120 bytes)

MD5 Checksum: 336bcc144256631d85b54b4d5f18dc64

SHA512 Checksum: c6049e150131f4d124736edfbfe47dfe...

[Release Notes for ASR1k](#) | [Release Notes for ISR4xxx](#) | [Field Notices](#)

❖ **When the minimum requirements are populated**, you have completed this task. Go to Task 2 and perform the upgrade analysis.

❖ **When the minimum requirements are not populated**, refer to minimum requirements for the image in the applicable documentation, and go to step 4.

4. In the **Image Details**:

- ❖ To define the minimum RAM size, in the **Minimum RAM (MB)** field, type the size in megabytes.
- ❖ To define the minimum flash size, in the **Minimum Flash (MB)** field, type the size in megabytes.



Tip: When you add the minimum flash memory size, use a size approximately 10% less than the flash memory size requirement that documentation indicates.

This way, you can accommodate percentage values that might be rounded for easier reporting, which helps avoid a distribution/activation job failure.

5. Click **Save**. The system saves the data that you entered, which remains editable, as needed.



Note: When you configure the minimum settings, they will remain valid for the image for future use.

With requirement minimums defined, you can perform the upgrade analysis.

Task 2: Perform the Upgrade Analysis

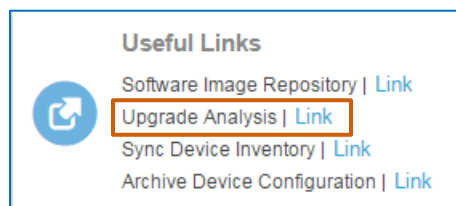
You are performing an upgrade analysis to help ensure that image distribution will occur successfully. In this case, you are evaluating the comparison of the software image minimum requirements to the device configurations to determine whether all of the devices requiring the upgrade meet the requirements for distribution.



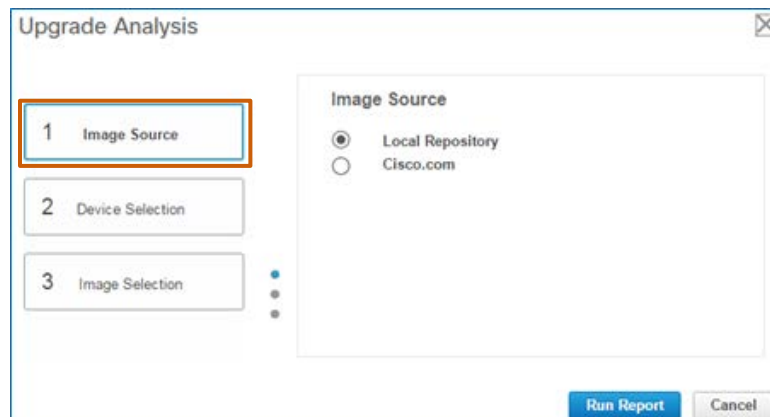
Note: For more information, [refer to the description of the optional upgrade analysis task](#).

To perform the upgrade analysis, follow these steps:

1. On the **Software Images** page, under **Useful Links**, click the **Upgrade Analysis** link.

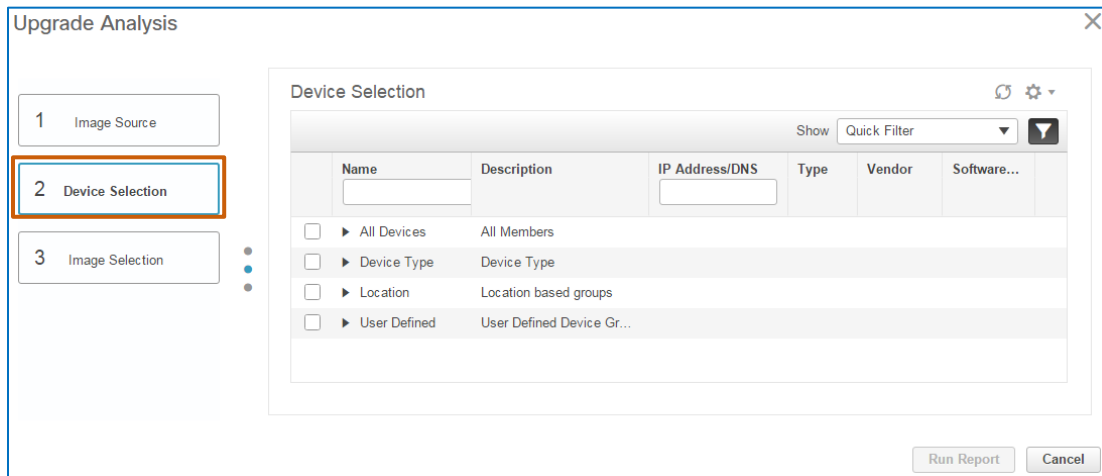


The **Upgrade Analysis** dialog box opens and provides a wizard to step you through the task. The **Image Source** page is active by default.



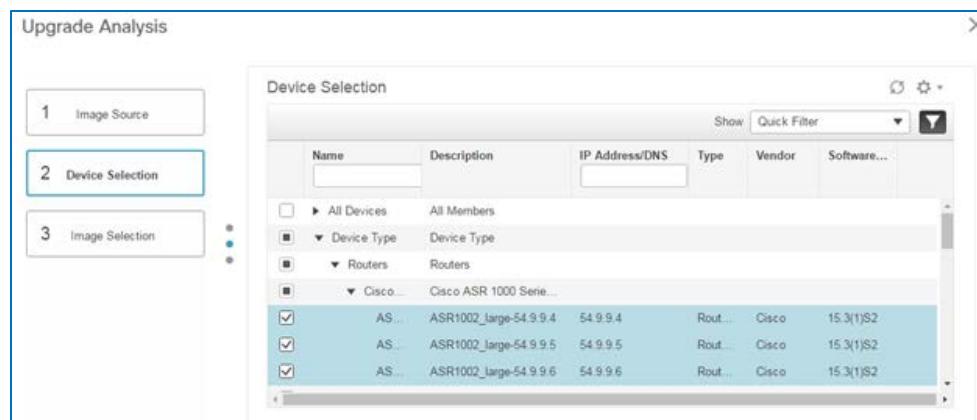
2. On the **Image Source** page, select the image's current location.
3. Click **2 Device Selection**.

The **Device Selection** page opens and lists the managed network devices.



The screenshot shows the 'Upgrade Analysis' window with three steps: 1 Image Source, 2 Device Selection (highlighted with an orange border), and 3 Image Selection. The 'Device Selection' panel is open, showing a table of managed network devices. The table has columns: Name, Description, IP Address/DNS, Type, Vendor, and Software... The table is currently empty, and the 'All Devices' category is selected.

4. In the **Device Selection** list, expand the category and select the device or devices that you plan to upgrade.

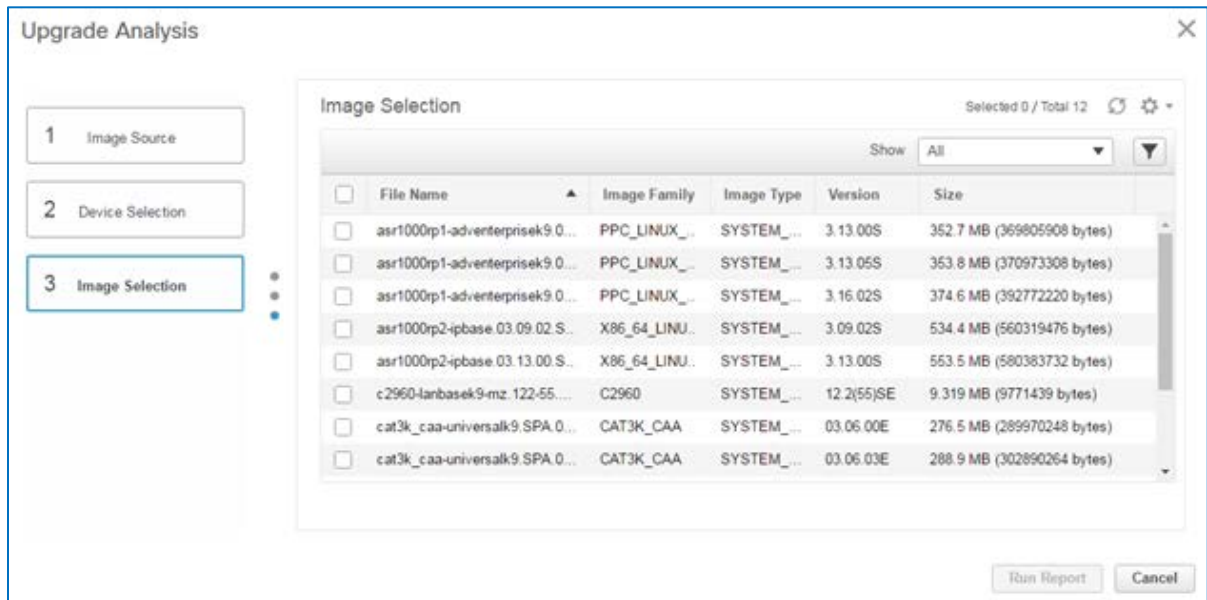


The screenshot shows the 'Upgrade Analysis' window with three steps: 1 Image Source, 2 Device Selection (highlighted with a blue border), and 3 Image Selection. The 'Device Selection' panel is open, showing a table of managed network devices. The table has columns: Name, Description, IP Address/DNS, Type, Vendor, and Software... The table is populated with three rows of devices, all of which are selected (checked).

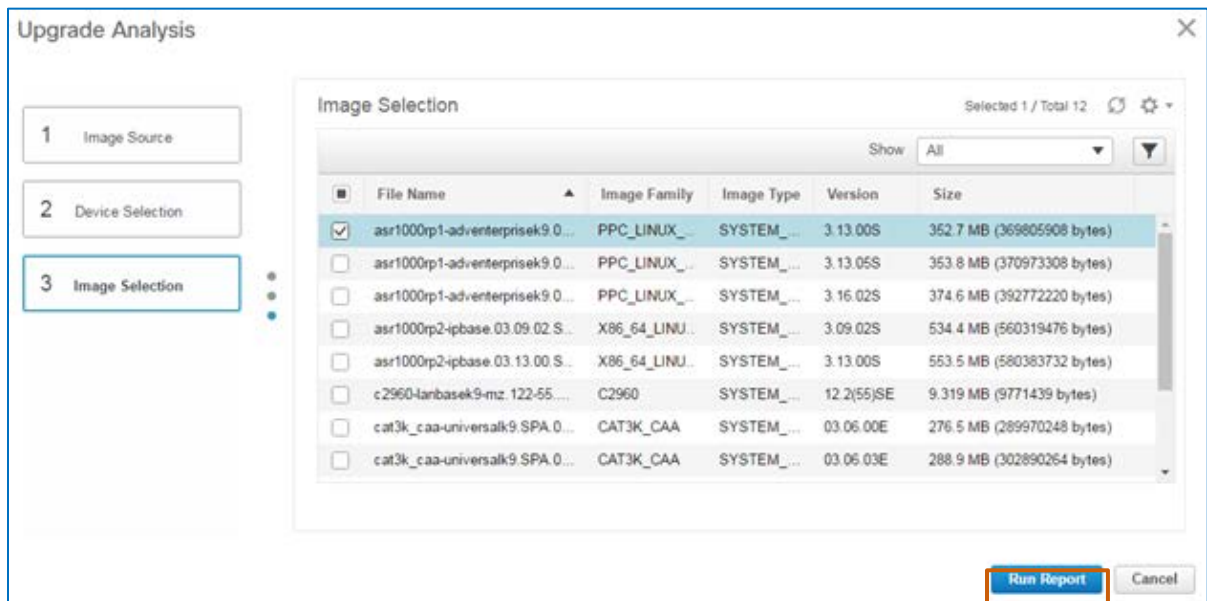
Name	Description	IP Address/DNS	Type	Vendor	Software...
AS...	ASR1002_large-54.9.9.4	54.9.9.4	Rout...	Cisco	15.3(1)S2
AS...	ASR1002_large-54.9.9.5	54.9.9.5	Rout...	Cisco	15.3(1)S2
AS...	ASR1002_large-54.9.9.6	54.9.9.6	Rout...	Cisco	15.3(1)S2

5. Click **3 Image Selection**.

The **Image Selection** page opens and lists the images that are available in the location that you selected.



6. In the **Image Selection** list, select the image that you need to distribute and activate, and then click **Run Report**.



The system generates the report and opens the results in the **Upgrade Analysis Report** dialog box.

The report indicates each device's current running image, the RAM and flash memory space that is required for distribution and the amount of space that is available on each device.

Upgrade Analysis Report

IP Address	Image Name	Device Information	RAM Requirements	FLASH Requirements
1 54.9.9.4	asr1000rp1-adventerprisek9.03.13...	Running Image Name: PPC_LINUX_IOSD-ADVIPSERVICESK9-M Running Image Version: 15.3(1)S2 BootROM Version: IOS-XE ROMMON Running Image Feature: IP1Pv6(BGP)IS- IS(FIREWALL/VOICE)PLUS(QoS)HA/NA Device Family: PPC_LINUX_IOSD	Required: 352 MB Current: 1,652 MB	Required: 353 MB Available: 1,230 MB Total: 3,400 MB
2 54.9.9.5	asr1000rp1-adventerprisek9.03.13...	Running Image Name: PPC_LINUX_IOSD-ADVIPSERVICESK9-M Running Image Version: 15.3(1)S2 BootROM Version: IOS-XE ROMMON Running Image Feature: IP1Pv6(BGP)IS- IS(FIREWALL/VOICE)PLUS(QoS)HA/NA Device Family: PPC_LINUX_IOSD	Required: 352 MB Current: 1,652 MB	Required: 353 MB Available: 1,230 MB Total: 3,400 MB

Close

7. Click **Close** and, in the **Upgrade Analysis Report** dialog box, click **Cancel**.

Upgrade Analysis

1 Image Source

2 Device Selection

3 Image Selection

Image Selection

File Name	Image Family	Image Type	Version	Size
<input checked="" type="checkbox"/> asr1000rp1-adventerprisek9.0...	PPC_LINUX_...	SYSTEM_...	3.13.00S	352.7 MB (369805908 bytes)
<input type="checkbox"/> asr1000rp1-adventerprisek9.0...	PPC_LINUX_...	SYSTEM_...	3.13.05S	353.8 MB (370973308 bytes)
<input type="checkbox"/> asr1000rp1-adventerprisek9.0...	PPC_LINUX_...	SYSTEM_...	3.16.02S	374.6 MB (392772220 bytes)
<input type="checkbox"/> asr1000rp2-ipbase.03.09.02.S...	X86_64_LINU...	SYSTEM_...	3.09.02S	534.4 MB (560319476 bytes)
<input type="checkbox"/> asr1000rp2-ipbase.03.13.00.S...	X86_64_LINU...	SYSTEM_...	3.13.00S	553.5 MB (580383732 bytes)
<input type="checkbox"/> c2960-lanbasek9-mz.122-55...	C2960	SYSTEM_...	12.2(55)SE	9.319 MB (9771439 bytes)
<input type="checkbox"/> cat3k_caa-universalk9.SPA.0...	CAT3K_CAA	SYSTEM_...	03.06.00E	276.5 MB (289970248 bytes)
<input type="checkbox"/> cat3k_caa-universalk9.SPA.0...	CAT3K_CAA	SYSTEM_...	03.06.03E	288.9 MB (302890264 bytes)

Run Report Cancel

The **Upgrade Analysis** dialog box closes.



Note: An upgrade analysis report that indicates that the image is compatible with the devices and that the devices meet the minimum requirements does not guarantee successful distribution.

For example, distribution failures can occur due to such factors as the inability to remove temporary or junk files or a network failure.

With the upgrade analysis completed and the maintenance window open, you are prepared to distribute and activate the image immediately.

Task 3: Distribute and Activate the Image

To distribute and activate an image in a single task, you use the **Distribute** function.

In this scenario, the routers that you are upgrading have no dependency on each other to maintain network connectivity. This relationship means that you can have the activation process occur in parallel, so that image activation occurs on all of the devices receiving the upgrade at the same time.



Important Note: When determining the type of activation process that the system will use, ensure that you understand the relationships among the devices that you are upgrading to avoid an activation failure.



To distribute and activate the image, follow these steps:

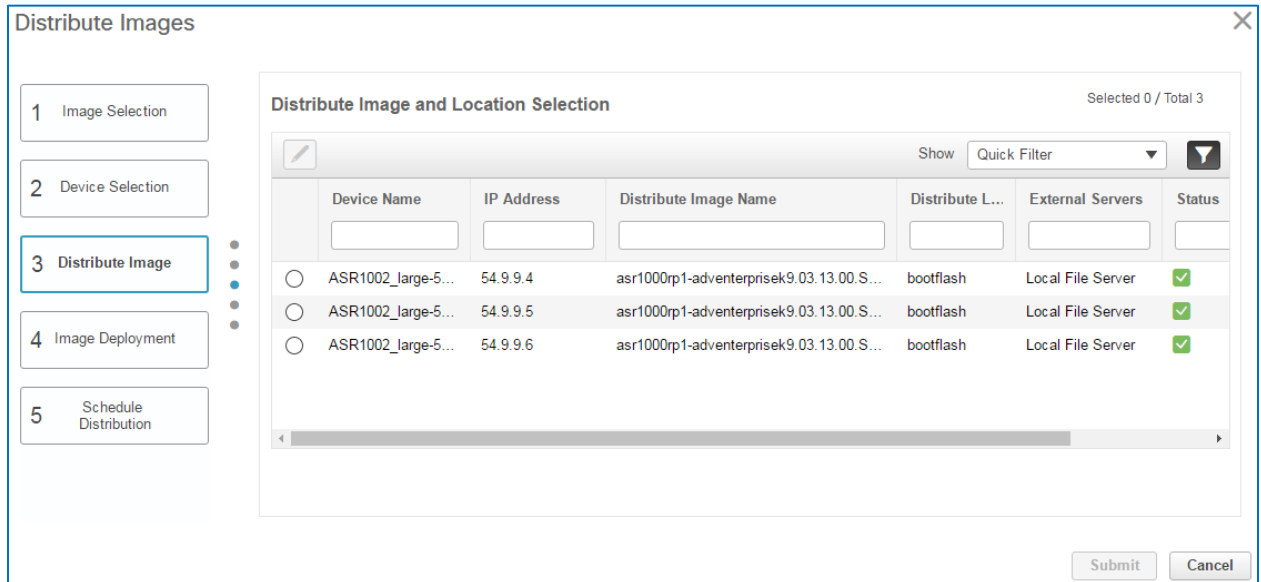
1. [Follow steps 1 through 4 to select the image for distribution and the devices to which you are distributing and activating.](#) Then, go to step 2.
2. After selecting the image and devices, click **3 Distribute Image**.

Because you select the image that you need the system to distribute on the **Image Selection** page, and the devices that require the upgrade on the **Device Selection** page, the system indicates that image in the **Distribution Image Name** field of each device in the list.

Because you are distributing the image by using Prime Infrastructure, the list indicates **Local File Server** in the **External Servers** column.



Tip: You can change the directory to which you want to distribute the image, when necessary.



Distribute Images

1 Image Selection

2 Device Selection

3 **Distribute Image**

4 Image Deployment

5 Schedule Distribution

Distribute Image and Location Selection Selected 0 / Total 3

Show Quick Filter

	Device Name	IP Address	Distribute Image Name	Distribute L...	External Servers	Status
<input type="radio"/>	ASR1002_large-5...	54.9.9.4	asr1000rp1-adventerprisek9.03.13.00.S...	bootflash	Local File Server	✓
<input type="radio"/>	ASR1002_large-5...	54.9.9.5	asr1000rp1-adventerprisek9.03.13.00.S...	bootflash	Local File Server	✓
<input type="radio"/>	ASR1002_large-5...	54.9.9.6	asr1000rp1-adventerprisek9.03.13.00.S...	bootflash	Local File Server	✓

Submit Cancel

3. Click **4 Image Deployment**. The **Image Deployment Options** page opens.

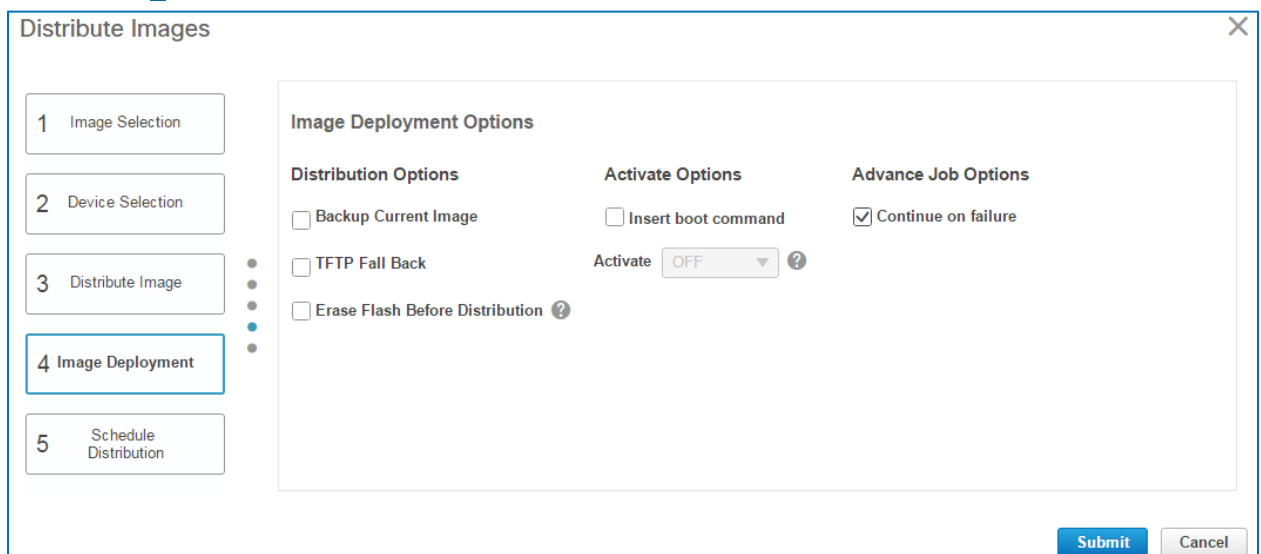


Important Note: An administrator can configure global settings that define enterprise preferences for device upgrades, which the system applies to the image deployment options automatically.

The settings that you change here override the global settings that administrators have defined.

When you make changes, they apply to this job only.

For more information, [refer to the Cisco Prime Infrastructure 3.1 Administrator Guide](#).



Distribute Images

1 Image Selection

2 Device Selection

3 Distribute Image

4 **Image Deployment**

5 Schedule Distribution

Image Deployment Options

Distribution Options

☐ Backup Current Image

☐ TFTP Fall Back

☐ Erase Flash Before Distribution ?

Activate Options

☐ Insert boot command

Activate OFF ?

Advance Job Options

☒ Continue on failure

Submit Cancel

4. To configure **Distribution Options** and **Advance Job Options**:
 - ❖ To archive the current running image before the upgrade, select the **Backup Current Image** check box.
 - ❖ To insert the TFTP fallback command in each device's running configuration, select the **TFTP Fall Back** check box.
 - ❖ When there is not enough space available in the flash memory on a device to distribute the image, select the **Erase Flash Before Distribution** check box to erase unused or temporary files to reclaim space and allow distribution.



Note: When there is enough space available, the system does not erase files.

- ❖ When the system fails to distribute the image to one device and you want to continue the distribution process despite the failure, click the **Continue on failure** check box.
5. To activate the image after distribution, select the **Insert boot command** check box.

The **Activate** drop-down list becomes available.

6. In the **Activate** drop-down list, select whether device activation occurs in sequence, which reboots each device in the job in a linear order, or in parallel, which reboots all of the devices in the job in groups based on internal processes (thread count).



Important Note: Activating images on most devices requires the devices to reboot, which causes operational downtime.

When determining the type of activation process that the system will use, ensure that you understand the relationships among the devices that you are upgrading to avoid an activation failure.

When the activation job is occurring on devices that depend on other devices to maintain network connectivity, such as core devices, Cisco recommends that you configure the system to activate those images sequentially to avoid losing network connectivity.

When devices do not have dependencies for connectivity, such as at the network edge, you can activate those devices in parallel.



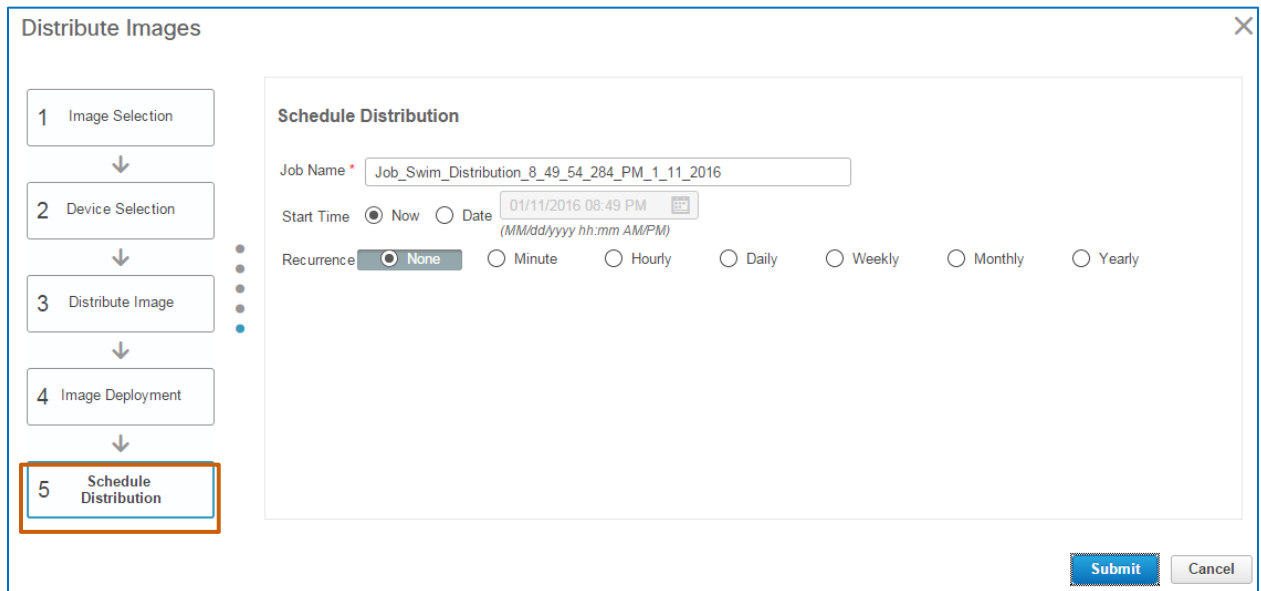
Tip: When you are activating images on a mix of core and edge devices, you can configure multiple activation jobs to manage reboot activities.



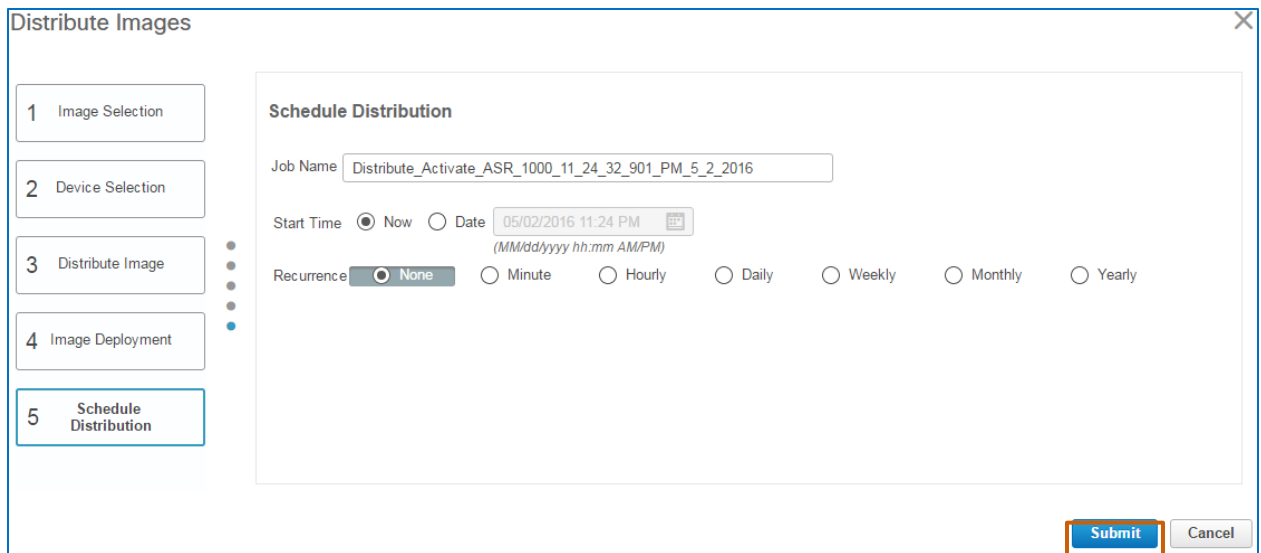
Note: Options can vary based on specific distribution or activation scenarios. For more information on the job options that the system can provide and their uses, [refer to the FAQ](#).

7. To allow the activation process to continue when an image fails to activate on a single device, accept the default selection of the **Continue on failure** check box.

8. Click **5 Schedule Distribution**.



9. On the **Schedule Distribution** page, in the **Job Name** field, type a descriptive name for the **SWIM Distribution** job so that users can recognize its use when reviewing the list of SWIM jobs.
10. In the **Start Time** row, indicate when you want image activation to occur.
11. Click **Submit**.



The dialog box closes and a system message opens, confirming that you have scheduled the **SWIM Distribution** job.

The system starts the **SWIM Distribution** job by following the schedule.

You can refresh the list to display the job.

To monitor the job as it progresses, in the **Status** column, point to the **information** icon beside the status...

Last 10 Swim Job All Jobs							Total 10
Run ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp	
44205436	SWIM Distribution	Distribute_Activate_ASR_1000_11_24_32_901...	3	Running	2016-05-02 23:56:23.234	Unknown	
34571791	SWIM Collection	Job_URL_Image_Collection_7_36_16_354_PM..	NA	Success	2016-04-28 19:36:24.41	2016-04-28 19:38:54.805	

...which opens the **Job Summary** pop-up window.

Job Summary

Job Name Distribute_Activate_ASR_1000_11_24_32_901_PM_5_2_2016

Job Status Running

Last Run Status Running

Creation Time 2016-05-02 23:56

Recurrence None

Devices in this run

Total	3	Successful	1
Failed	0	In-Progress	2
Not Yet Started	0	Cancelled	0

Actions

[Job Detail View](#)

When the job completes image distribution, it immediately starts the activation process.

When the **SWIM Distribution** job is complete, including activating the images, the system indicates the job result in the **Status** column.

Last 10 Swim Job All Jobs							Total 10
Run ID	Job Type	Job Name	Device Count	Status	Start Timestamp	End Timestamp	
44205436	SWIM Distribution	Distribute_Activate_ASR_1000_11_24_32_901...	3	Success	2016-05-02 23:56:23.234	2016-05-03 00:35:39.512	

On successful job completion, the new software image is now the running image on the device.

Task 4: Validate Image Activation

To distribute and activate the image:

- ❖ [Follow the steps to validate an image.](#)

You successfully upgraded the software image on a small number of devices by using Prime Infrastructure.

Video Demonstrations

Watching Demonstrations

To watch a demonstration:

- ❖ Click a link, which opens an MP4 file.

Based on your system and configuration, you might need to start the video manually.



Notes: Video download and streaming times can vary.
Demonstrations do not include narration.

Performing Device Upgrades on Large Networks

Watch the Demonstration



To review the process to upgrade software images on large numbers of distributed devices by using SWIM servers, [watch the **Upgrading Devices on Distributed Networks** video](#).

Approximate runtime: 17:00

Upgrading Small Numbers of Devices

Watch the Demonstration



To review the process to upgrade software images on a minimal number of local devices, [watch the **Upgrading Small Numbers of Devices** video](#).

Approximate runtime: 8:00

Frequently Asked Questions

Preparing for Upgrades

[How can I ensure that the system references current device inventory data when performing upgrade analysis or distribution tasks?](#)

Importing Images

[How can I manage the protocols that the system uses when importing or distributing images?](#)

[What factors should I consider when importing images?](#)

Distributing and Activating Images

[How do I determine the activation option to choose?](#)

[Is it possible to upgrade a Catalyst 3850 that is running in bundle mode to running in install mode after the upgrade?](#)

[What job options can I configure when distributing or activating images?](#)

[When is using software image management \(SWIM\) servers most effective for image distribution?](#)

[When activating images as a separate task after distribution is complete, what key factor do I need to consider?](#)

[Why should I perform an upgrade analysis before upgrading devices?](#)

Administrative Settings

[What key settings can administrators configure to manage software image management processes?](#)

Have Another Question?

For more information, [visit the Cisco Web site to review or download technical documentation.](#)

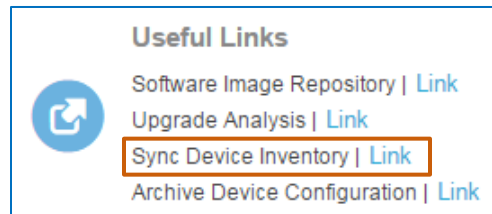
How can I ensure that the system references current device inventory data when performing upgrade analysis or distribution tasks?

Before performing a software upgrade, synchronizing the device inventory helps ensure that the system is referencing the data related to the current configuration running on the device during the upgrade analysis and image distribution processes.

Referencing accurate configuration information helps avoid inaccurate upgrade analysis results or image distribution failures.

To access the device inventory:

- ❖ On the **Software Images** page, under **Useful Links**, click the **Sync Device Inventory** link.



[Return to questions](#)

How can I manage the protocols that the system uses when importing or distributing images?

Prime Infrastructure provides a series of protocols for use when importing or distributing images and enables all of the protocols by default.

You can configure the types of protocols that the system will use and the order in which the system attempts to use each protocol to import or distribute images. The protocol that the system uses varies based on the device type involved.



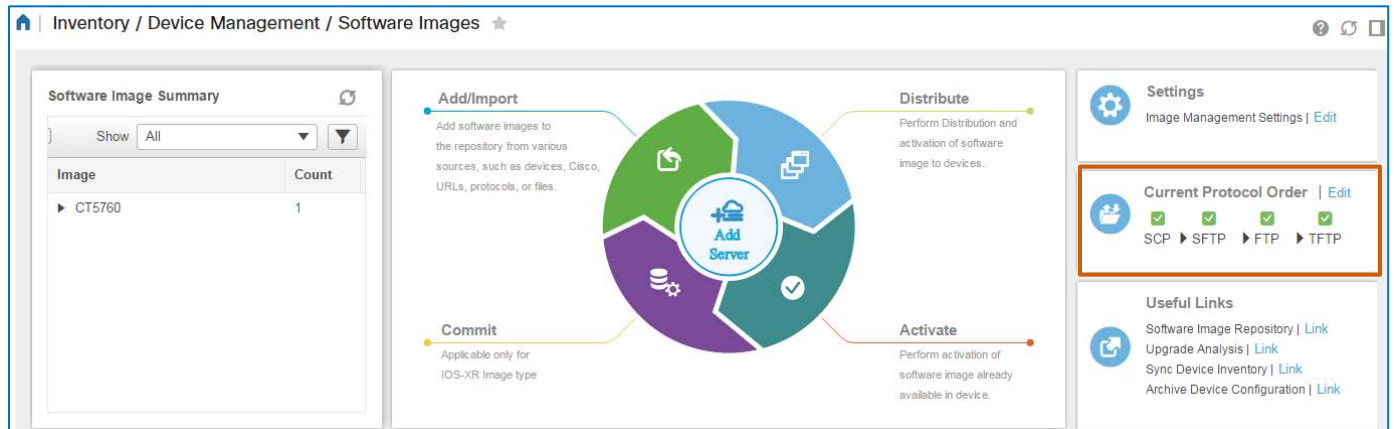
Tip: For more information on device types and the protocols that they support, [refer to the Cisco Prime Infrastructure 3.1 User Guide](#).

The current protocol order appears on the **Software Images** page under **Current Protocol Order**.

When importing or distributing images, the system begins by using the protocol listed on the far left and continues to change protocols until it determines the protocol that the device supports.



Important Note: For better reliability and security when importing or distributing software images, use SFTP or SCP secure protocols only. Avoid using the TFTP or FTP protocols unless necessary based on the device type.



Software Image Summary

Image	Count
CT5760	1

Add/Import
Add software images to the repository from various sources, such as devices, Cisco, URLs, protocols, or files.

Distribute
Perform Distribution and activation of software image to devices.

Commit
Applicable only for IOS-XR image type

Activate
Perform activation of software image already available in device.

Settings
Image Management Settings | [Edit](#)

Current Protocol Order | [Edit](#)

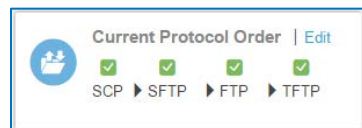
SCP SFTP FTP TFTP

Useful Links

- Software Image Repository | [Link](#)
- Upgrade Analysis | [Link](#)
- Sync Device Inventory | [Link](#)
- Archive Device Configuration | [Link](#)

To change the protocol order:

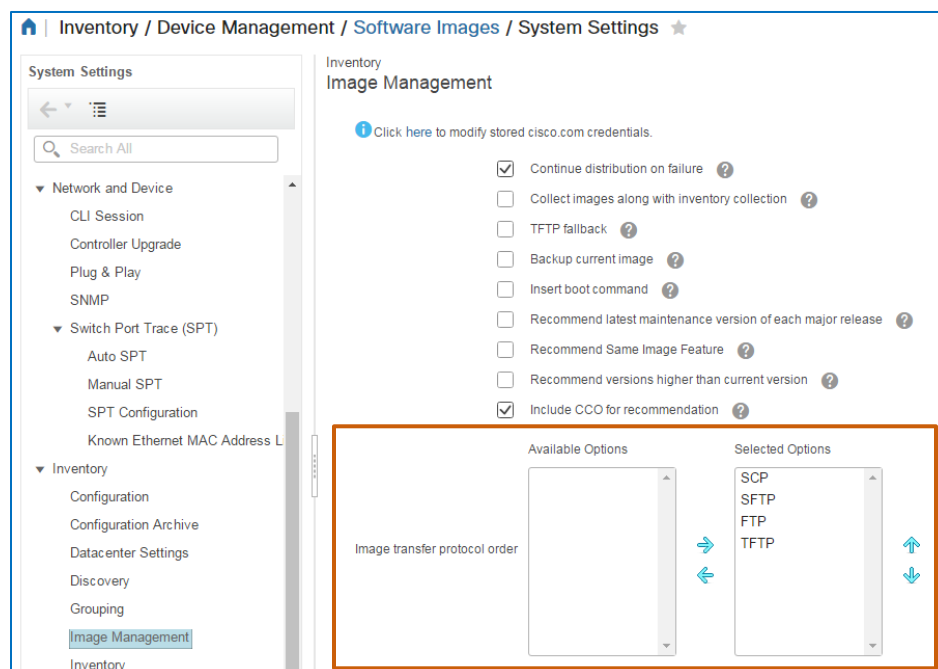
- ❖ Beside the **Current Protocol Order** heading, click **Edit**.



Current Protocol Order | [Edit](#)

SCP SFTP FTP TFTP

The system navigates you to the Administration area and opens the **System Settings | Image Management** page.



Inventory / Device Management / Software Images / System Settings

System Settings

Inventory Image Management

Click here to modify stored cisco.com credentials.

- ☒ Continue distribution on failure
- ☐ Collect images along with inventory collection
- ☐ TFTP fallback
- ☐ Backup current image
- ☐ Insert boot command
- ☐ Recommend latest maintenance version of each major release
- ☐ Recommend Same Image Feature
- ☐ Recommend versions higher than current version
- ☒ Include CCO for recommendation

Image transfer protocol order

Available Options

Selected Options

SCP
SFTP
FTP
TFTP

The **Available Options** list includes all of the protocols that the system is not using currently.

The **Selected Options** list includes of the protocols that is using currently and indicates the order in which the system attempts to use each priority from the top down.

To include a protocol in the list of protocols that the system will use:

- ❖ In the **Available Options** list, select the protocol, and then click the right arrow.

To exclude a protocol from the list of protocols that the system will use:

- ❖ In the **Selected Options** list, select the protocol, and then click the left arrow.

To move a protocol to a higher priority:

- ❖ In the **Selected Options** list, select the protocol, and then click the up arrow.

To move a protocol to a lower priority:

- ❖ In the **Selected Options** list, select the protocol, and then click the down arrow.

[Return to questions](#)

What factors should I consider when importing images?

First, determine the number of unique images that you have running based on the device families in the network. This way, you can import only those images that you need.

When you import an image, you can continue to deploy that image from the repository to compatible devices, as needed.

Also, consider the timing of when the system performs image import (SWIM Collection) jobs.

You can schedule SWIM Collection jobs during maintenance windows or during operational down or quiet times to accommodate job sizes and reduce server load.

[Return to questions](#)

When is using software image management (SWIM) servers most effective for image distribution?

The process of managing image distribution by using SWIM servers is intended for situations in which you are upgrading:

- ❖ Large numbers of devices.
- ❖ Devices that are geographically distributed over a large area
- ❖ Devices on networks with topologies or security policies that restrict distribution from a centralized source.

The process allows Prime Infrastructure to distribute images to SWIM servers, which then distribute the images to the devices that are associated with them. This way, when upgrading large numbers of devices, the devices are communicating with the SWIM server rather than the Prime Infrastructure server, which helps avoid latency and unnecessary server load.



Tip: When determining whether to use SWIM servers to distribute images, consider these factors.

When distributing images to small numbers of devices, Prime Infrastructure must perform two tasks: distributing the image to SWIM servers, and triggering the SWIM servers to distribute the image to associated devices.

If the device number is limited and there are no other operational factors involved in the decision, you might want to use the Prime Infrastructure server for distribution directly to the devices, which reduces server workload.

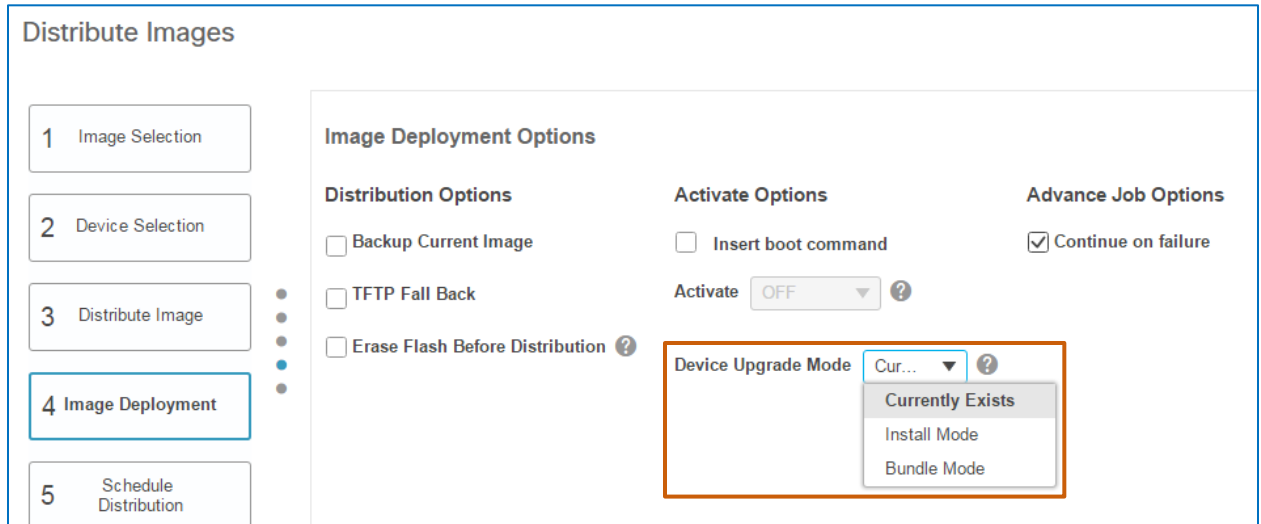
Other operational factors might prompt you to use SWIM servers for distribution to a small number of devices. For example, to avoid latency due to low bandwidth connectivity between the Prime Infrastructure server and the devices, you can use a SWIM server that is geographically closer to, or has better connectivity with, those devices.

[Return to questions](#)

Is it possible to upgrade a Catalyst 3850 switch that is running in bundle mode to running in install mode after the upgrade?

Yes! You also can upgrade a Catalyst 3850 series switch that is running in install mode to running in bundle mode after the upgrade.

When you upgrade Catalyst 3850s, the system provides device upgrade modes so that you can select the mode that you prefer the upgraded image to run.



[Return to questions](#)

Why should I perform an upgrade analysis before upgrading devices?

When determining whether to apply a software upgrade, you can perform an upgrade analysis on images that are available on the Cisco Web site to determine compatibility.

And, before distributing a software image to devices, performing an upgrade analysis helps you to determine whether the devices are able to receive the image upgrade by evaluating the memory size and flash size.

Performing upgrade analyses in preparation for image distribution can help to ensure successful image distributions and avoid network disruption.

[Return to questions](#)

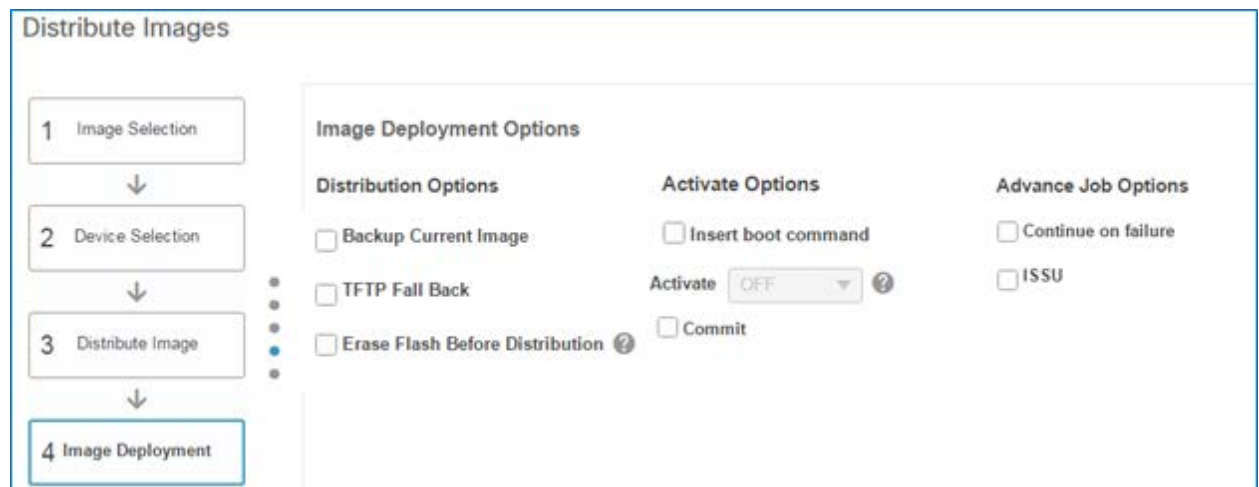
What job options can I configure when distributing or activating images?

Job options vary based on several factors, including:

- ❖ Whether you are configuring distribution and activation jobs as a combined single task or as separate tasks.
- ❖ The types of devices that you are upgrading.
- ❖ The types of operating systems on the devices that you are upgrading



Important Note: The settings that you configure in this process override the global settings that an administrator can configure.



When you are configuring an image distribution job, job options can include both distribution and activation operations.

When configuring a separate activation job, the system provides a subset of the same settings.

Distribution Options

- ❖ **Backup Current Image**
When selected, the system archives the current running image before overwriting it with the image that you are distributing.

This action helps ensure that you have an image available in the archive to support the rollback process, which can be necessary in the event of distribution or activation issues or failures.

- ❖ **TFTP Fall Back**
The TFTP fallback command supports a distribution failure scenario. The Prime Infrastructure server also includes a TFTP server, and when importing images, the system retains them on its TFTP server in addition to adding them to the repository.

When selected, the **TFTP Fall Back** option prompts the system to reload the current running image from the TFTP server location in the event of distribution failure.

This function is particularly useful, for example, when you are upgrading devices that have minimal flash memory capacity, and can only retain a single image at a time. If a device fails to reboot with the upgraded image, you can return the device to its previous running image by using this method, which helps avoid device downtime.

❖ Erase Flash Before Distribution

When there is not enough space available in the flash memory on a device to distribute the image, select the **Erase Flash Before Distribution** check box to erase unused or temporary files to reclaim space and allow distribution.



Important Note: When you are upgrading stack devices, such as certain Cisco Catalyst and Cisco ME 3600 switch devices, for example, the system distributes the image to all flash instances.

When you need to use the **Erase Flash Before Distribution** option in this case, the system only erases the main flash memory (Flash 1) on the device.

If you need to make space available for the image on Flash 2, you must erase the memory manually. If Flash 2 does not have enough capacity to store the image, distribution to that device will fail.



Note: When there is enough space available, the system does not erase files.

Because many devices can retain more than one image, or can contain other key data files, avoid using the function to erase flash before distribution, if possible.

Activate Options

❖ Insert Boot Command

When selected, the system will activate and reboot the devices. This action supports combining distribution and activation tasks in a single workflow.

This action also makes the **Activate** drop-down list available.

❖ **Activate** drop-down list



Important Note: When determining the type of activation process that the system will use, ensure that you understand the relationships among the devices that you are upgrading to avoid an activation failure.

◆ Sequential

When selected, the system reboots one device at a time. When the system determines that the device is up and in a running state, it reboots and monitors each subsequent device individually until the job is complete.



Important Note: When devices that have dependencies on each other to maintain network connectivity, such as core devices, require rebooting after activation, activate those devices sequentially to avoid losing connectivity.

◆ Parallel

When selected, the system reboots all of the devices at once, and then validates that each is up and in a running state.

This approach is helpful when you are upgrading devices that have no dependency on each other to maintain network connectivity, such as at the network edge.

❖ Commit

When selected, sends the commit command to devices that use the IOS-XR operating system after image activation

For more information, refer to the [Upgrading IOS-XR Devices](#) subtopic.

Advance Job Options

❖ **Continue on failure**

When selected, if the system fails to distribute the image to one device, it will continue the distribution process despite the failure.

❖ **ISSU**

When upgrading certain devices that allow in-service software upgrades, such as Catalyst 4000 and Catalyst 6000 devices, select **ISSU** (In-Service Software Upgrade) to perform a software upgrade without service interruption.

[Return to questions](#)

How do I determine the activation option to choose?

When determining the type of activation process that the system will use, ensure that you understand the relationships among the devices that you are upgrading to avoid an activation failure.

When the activation job is occurring on devices that depend on other devices to maintain network connectivity, such as core devices, Cisco recommends that you configure the system to activate those images sequentially to avoid losing network connectivity. This recommendation also applies when the activation job includes a mix of core and edge (access) devices.

When the activation job is occurring on edge (access) devices only, you can configure the system to activate those images in parallel.

[Return to questions](#)

When activating images as a separate task after distribution is complete, what key factor do I need to consider?

When you activate images as a separate task following distribution, the system supports the activation task only on specific device types.

For more information on the device types on which you can activate images separately, visit the Cisco.com Web site to review the current list of device types.

[Return to questions](#)

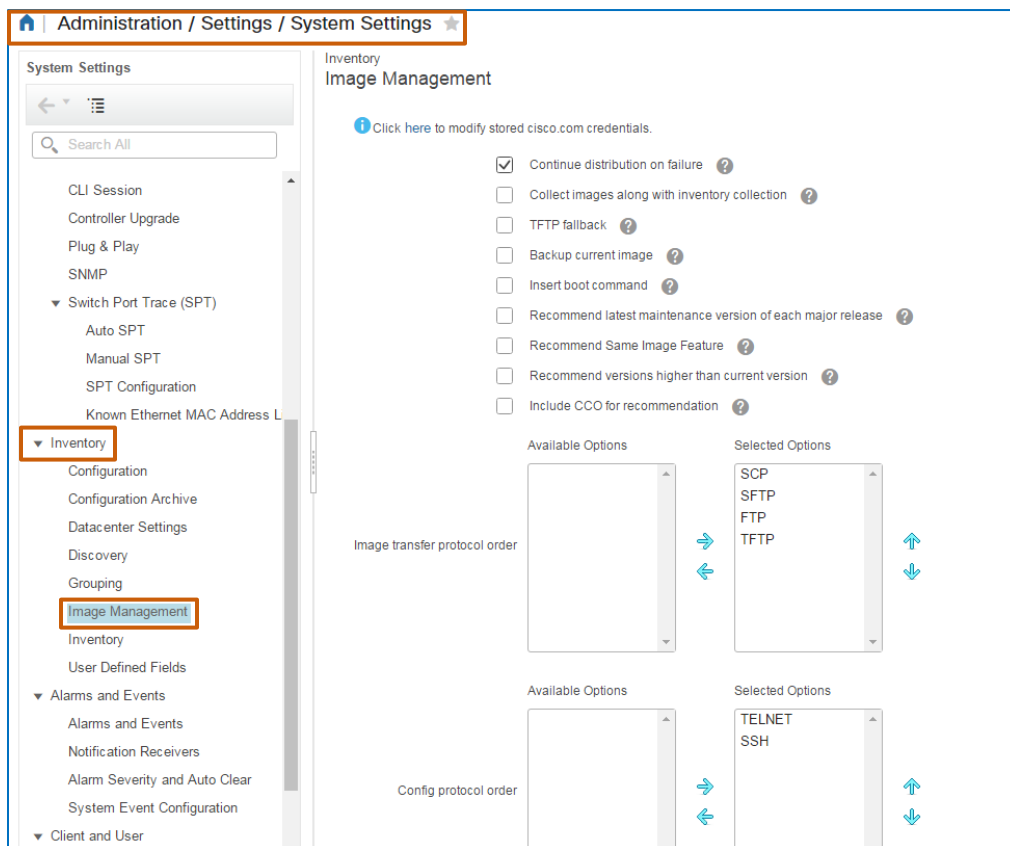
What key settings can administrators configure to manage software image management processes?

Administrators can configure global settings that define system behaviors during image distribution and activation processes

By configuring these settings, administrators can define environment preferences to help ensure that image distribution and activation adhere to authorized protocols.



Note: For more information, [refer to the Cisco Prime Infrastructure 3.1 Administrator Guide.](#)



[Return to questions](#)

Links

To Product Information

[Visit the Cisco Web site to learn more about Cisco® Prime Infrastructure.](#)

[Visit the Cisco Web site to review or download technical documentation.](#)

To Training

[Visit the Cisco Web site to access other Cisco® Prime Infrastructure learning opportunities.](#)

[Visit the Cisco Web site to access learning opportunities for other Cisco products.](#)

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