



Managing Device Software Images

Cisco DNA Center 1.1.2 Training

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Managing Device Software Images

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What Should I Know Before I Start?

Why This Process is Important

It Helps Ensure Device Behaviors, Consistency, and Security

For device security and optimal device performance, you can standardize device software images and validate that device images comply with those standards proactively. Image standardization helps you to ensure that devices have the features, technologies, and security or other critical updates, that you expect.

Cisco DNA Center provides a software image standardization process that includes:

- Flexible and granular organization of software images and image updates based on business intent.
- Automated device auditing to determine compliance with defined image standards.
- An upgrade process that comprises distribution of all image files based on the standards.



Note: You can perform software image and [software maintenance update \(SMU\)](#) upgrades on devices that Cisco DNA Center manages only.

This training addresses the tasks that you perform to standardize images, evaluate audit results to determine device compliance with image standards, and upgrade non-compliant devices.

Standardized Device Image Concepts

Determining the Business Intent

You standardize an image based on the key characteristics that address business intent.

- Are there devices in specific enterprise locations that require unique image standards from their counterparts in other locations?
- [What role does the device have](#) on the network?
- Which software image is optimal for the device based on its role and location?
- Is there a specific SMU associated with the image that also needs to be distributed to ensure that the device has the features it needs and runs as expected?

With this information, you can:

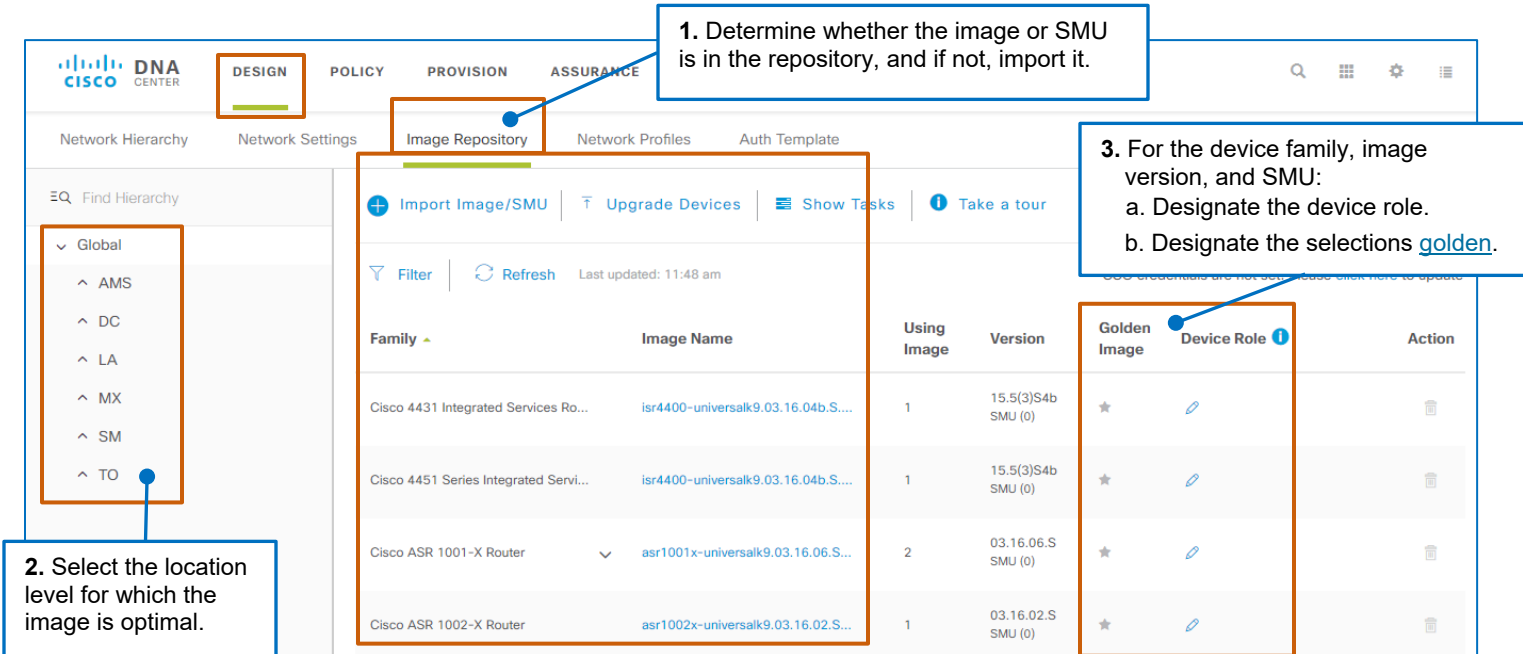
1. Determine whether you have the software images and SMUs that you need and import them as needed.
2. Based on device roles and locations, designate the image and any applicable SMU as optimal, [referred to as a golden image in the system](#).

The system then references the golden image designations, referred to as tags, in its automated image auditing and compliance process, allowing it to identify, and notify you of, devices that do not have the optimal images or updates proactively.

In non-compliant situations, you can upgrade devices to the standardized image.

As device images, versions, and SMUs are updated, you can redefine image standards, as needed.

You standardize images in **Design** on the **Image Repository** tab, which lists all of the images that are available in the system.



1. Determine whether the image or SMU is in the repository, and if not, import it.

2. Select the location level for which the image is optimal.

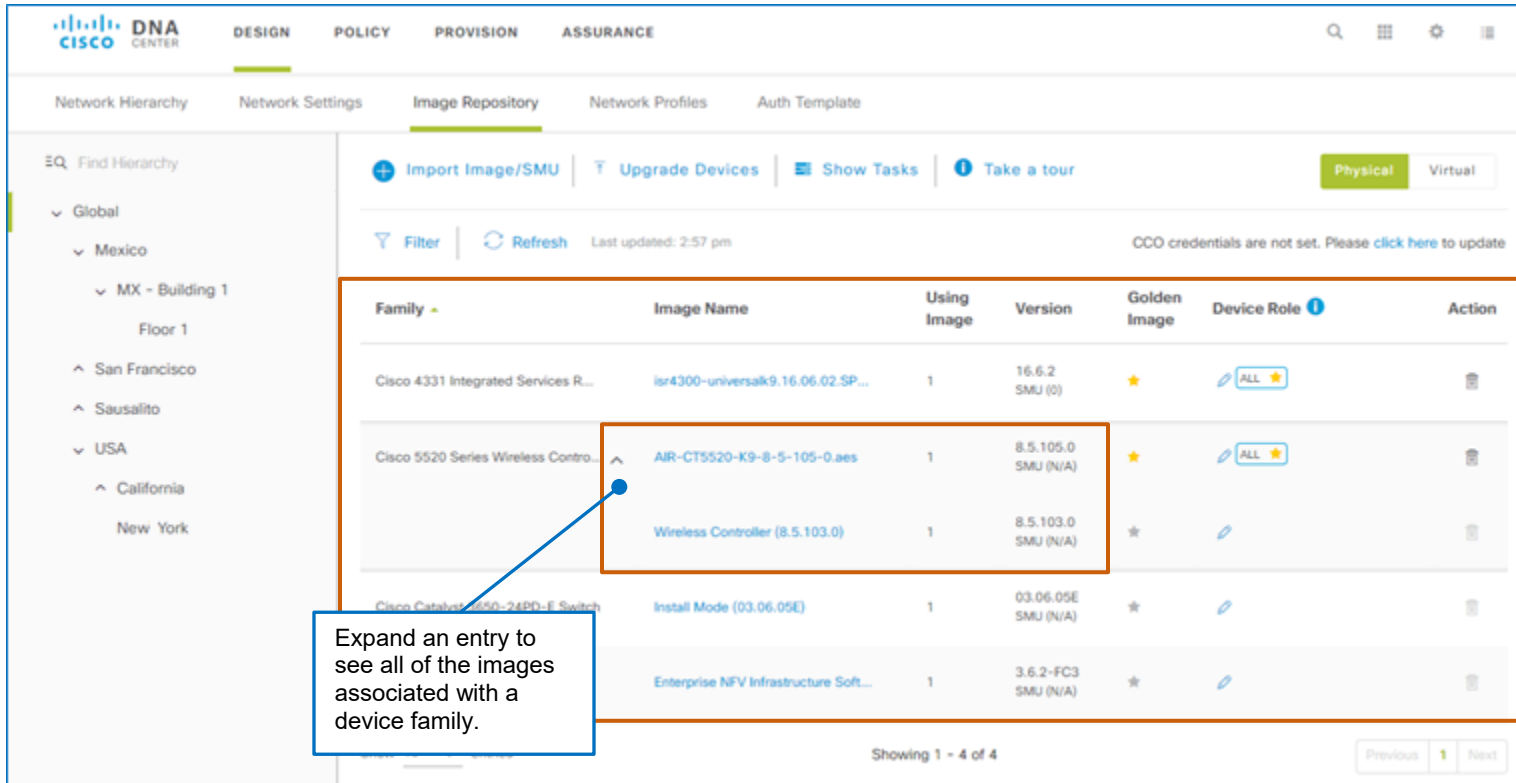
3. For the device family, image version, and SMU:
a. Designate the device role.
b. Designate the selections golden.

Family	Image Name	Using Image	Version	Golden Image	Device Role	Action
Cisco 4431 Integrated Services Ro...	isr4400-universalk9.03.16.04b.S...	1	15.5(3)S4b SMU (0)	★		
Cisco 4451 Series Integrated Servi...	isr4400-universalk9.03.16.04b.S...	1	15.5(3)S4b SMU (0)	★		
Cisco ASR 1001-X Router	asr1001x-universalk9.03.16.06.S...	2	03.16.06.S SMU (0)	★		
Cisco ASR 1002-X Router	asr1002x-universalk9.03.16.02.S...	1	03.16.02.S SMU (0)	★		

Image Repository Concepts

The image repository houses images and SMUs. When a device family has several images or SMUs, the repository groups them accordingly.

The **Version** column indicates the base image version number and, when SMUs are available, the number of SMUs that are associated with the image and version.



Expand an entry to see all of the images associated with a device family.

Family	Image Name	Using Image	Version	Golden Image	Device Role	Action
Cisco 4331 Integrated Services R...	lsw4300-universalk9.16.06.02.SP...	1	16.6.2 SMU (0)	★	ALL ★	
Cisco 5520 Series Wireless Contro...	AIR-CT5520-K9-8-5-105-0.aes	1	8.5.105.0 SMU (N/A)	★	ALL ★	
	Wireless Controller (8.5.103.0)	1	8.5.103.0 SMU (N/A)	★	ALL ★	
Cisco Catalyst 6500-24BD-E Switch	Install Mode (03.06.05E)	1	03.06.05E SMU (N/A)	★	ALL ★	
	Enterprise NFV Infrastructure Soft...	1	3.6.2-FC3 SMU (N/A)	★	ALL ★	

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This way, you can determine whether the repository contains the image or SMU that a device requires. If the image or SMU is not available, you can import it to the repository.



Note: When the system is not managing a specific device family type or when images are significantly older versions, the system indicates that the image name is unknown.

You also can import image or SMU files from:

- Your local drive.
- An SFTP or external file server to which Cisco DNA Center has access.
- When system credentials are configured, Cisco.com.

When an image or SMU is running on a device or devices that Cisco DNA Center is managing, and a system user designates it as golden, Cisco DNA Center uploads it to the repository automatically.

Inheriting Image Standards

During network design, system users configure a network hierarchy, which organizes network devices by their locations.

When you [standardize images](#), which is also a network design function, you can define the image characteristics at any location level based on operational requirements.

When you standardize images, the system applies them to the active location level that you select in the hierarchy, and to all of the dependent locations organized below it, in a parent/child relationship.

Under **Design**, when you open the **Image Repository** tab, the system selects the **Global** level in the hierarchy by default. The page lists the running images on devices that Cisco DNA Center has discovered and is managing. When system users organize other sites below the **Global** level, they initially have a child relationship and inherit the **Global** level characteristics.

Then, you can define standardized images with varying characteristics and apply them at any level in the hierarchy based on operational requirements for the devices at that location.

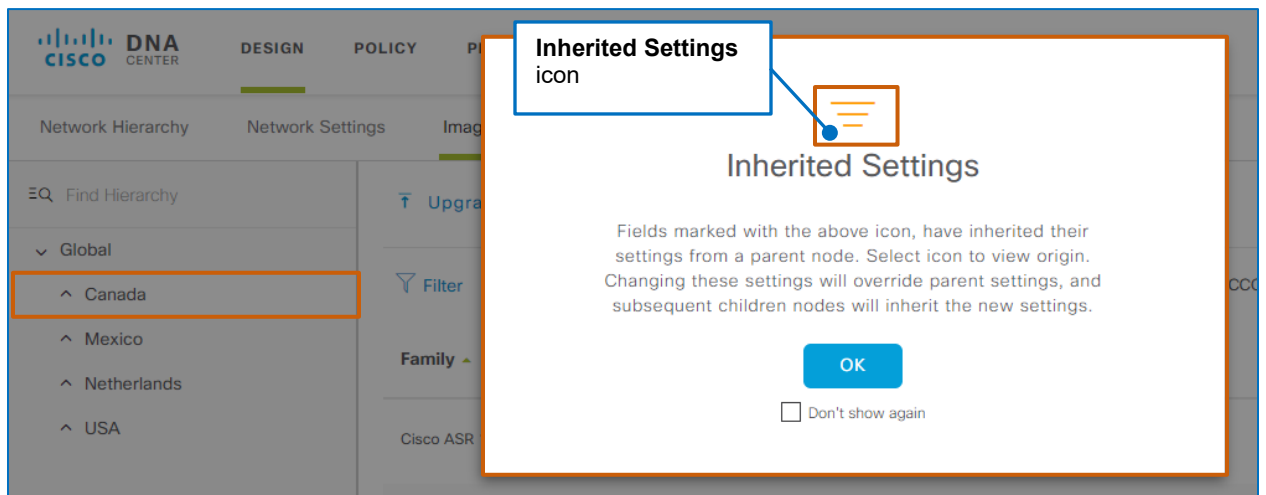
When you click a dependent location that has inherited standards from a parent level, a system message opens indicating the inherited standards. As a visual indicator, the icon above the **Inherited Settings** heading also appears beside images with settings inherited from a parent location.



Caution: When child sites have inherited global standard settings and a system user changes standards at a global level, the system applies the global level changes to those dependent child sites.

Use caution when changing global settings to help ensure that you do not overwrite standards that a child level needs to retain.

If you need to change a global standard, take note of any inherited standards at the child levels in case you need to reapply them.



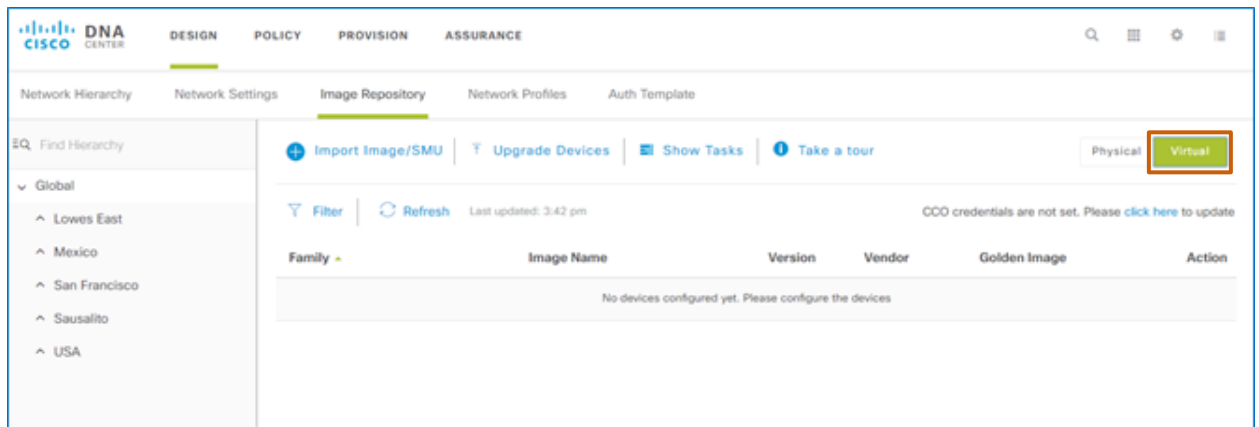
Managing Virtual Images

You also can import and standardize virtual device images to support, for example, virtual branch deployments.

You complete the same tasks to import, standardize, and upgrade images for virtual devices as you do when standardizing images for physical devices. Site parent/child level relationships and standards inheritance in the hierarchy are the same, also.

To standardize virtual images:

- To the right of the toolbar, click **Virtual**. The page toggles to the virtual image repository.



The Use of the Image Repository under Tools on the Home Page

Cisco DNA Center also provides an **Image Repository** page, which you can access on the home page using the **Image Repository** link under **Tools**.

While you can take many of the same steps to standardize and manage software images on this page, we recommend that you use the **Design | Image Repository** tab, which provides [access to the network hierarchy](#).




Important Note: If you take steps to standardize an image and designate it golden on the **Image Repository** page, the system will apply the standard at the global level and present the automated audit results based on that hierarchical level.




Note: If you import an image or SMU on this page, it will be available for use on the **Design | Image Repository** tab.

Tools




Discovery

Automate addition of devices to controller inventory



Inventory

Add, update or delete devices that are managed by the controller



Topology

Visualize how devices are interconnected and how they communicate




Image Repository

Download and manage physical and virtual software images automatically




Image Repository

Import Image/SMU

Upgrade Devices



Show Tasks

Take a tour

Filter

Refresh

Last updated: 8:49 am

Family	Image Name	Using Image	Version	Golden Image	Device Role
Cisco 4431 Integrated Services Router	isr4400-universalk9.03.16.04b.S.155-3.S4b-ext.S...	1	15.5(3)S4b SMU (0)	★	
Cisco 4451 Series Integrated Services Router	isr4400-universalk9.03.16.04b.S.155-3.S4b-ext.S...	1	15.5(3)S4b SMU (0)	★	

Skills

To manage software images, you need the following experience.

Proficient

- Cisco DNA Center user interface navigation and behaviors
- Knowledge of network operations
- For the devices that you are upgrading, those devices' roles, relationships, and importance to network operations
- For the devices that you are upgrading, knowledge of the services and technologies that those devices manage

Terms

Device Role

The device's function in the network, for example, a router can have an access, border, core, or distribution function on the network

Golden Image

A tag that indicates to the system that an image is optimal for running on a device family, device type, or device role, or at an enterprise site

Software Maintenance Update (SMU)

A software image update that contains specific corrections for an existing base image.

Upgrading software images with SMUs might or might not require a device reboot. The system notifies you of the reboot status before you initiate the upgrade process.

The Device Software Image Management Process

Process Overview

To upgrade device software images:

1. In **Design**, on the **Image Repository** tab, identify or import the software image or SMU, as needed.
2. Standardize an image and, if applicable, the associated SMU.
3. On the **Device Inventory** page, evaluate automated audit results.
4. Upgrade network device images, as needed.
5. Monitor the upgrade task and review results.

Process Steps

Task 1: Identify or Import a Software Image or SMU

When an image or SMU is running on a device or devices that Cisco DNA Center is managing, and a system user designates it as golden, Cisco DNA Center uploads it to the repository automatically.

When an image or SMU that you need is not available in the repository, you can import it.



Note: For more information, [refer to the Image Repository Concepts topic](#).

To identify or import a software image or SMU, follow these steps:

1. On the Cisco **DNA Center** home page, under **Design**, click **Designate golden images for device families**.



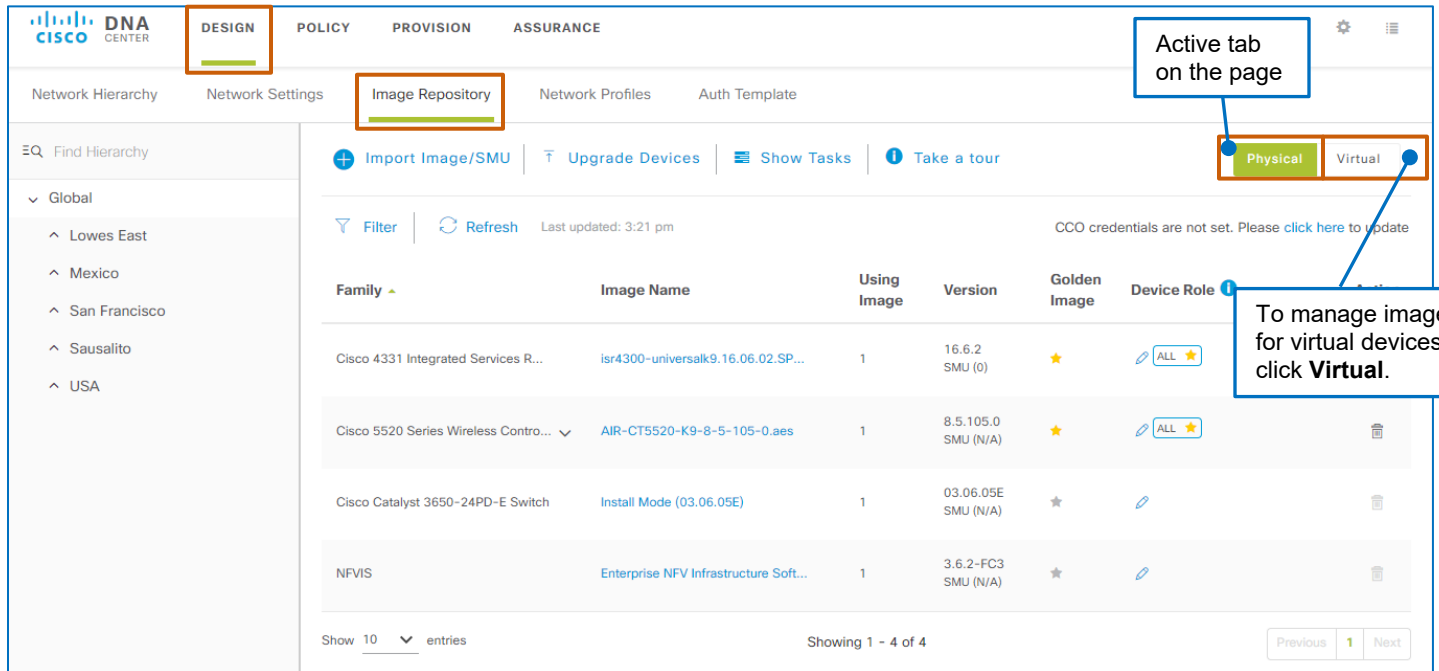
The system navigates to the **Design | Image Repository** tab. The tab lists the images that are available for physical devices by default.



Note: The steps that you take to identify and import images are the same for physical or virtual devices.

To manage images for virtual devices:

- Click **Virtual**.



Active tab on the page

Physical Virtual

To manage images for virtual devices, click **Virtual**.

Family	Image Name	Using Image	Version	Golden Image	Device Role
Cisco 4331 Integrated Services R...	isr4300-universalk9,16.06.02.SP...	1	16.6.2 SMU (0)	★	ALL ★
Cisco 5520 Series Wireless Contro...	AIR-CT5520-K9-8-5-105-0.aes	1	8.5.105.0 SMU (N/A)	★	ALL ★
Cisco Catalyst 3650-24PD-E Switch	Install Mode (03.06.05E)	1	03.06.05E SMU (N/A)	★	
NFVIS	Enterprise NFV Infrastructure Soft...	1	3.6.2-FC3 SMU (N/A)	★	

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2. To determine whether the image that you need to standardize is available in Cisco DNA Center, review the list of images and associated SMUs.

Cisco 4431 Integrated Services Ro...	isr4400-universalk9.03.16.02.S.1...	0	3.16.1 SMU (0)	★	ALL ★	
Cisco 4451 Series Integrated Servi...	isr4400-universalk9.03.16.02.S.1...	2	3.16.1 SMU (0)	★	ALL ★	
Cisco Catalyst 36xx stack-able eth...	cat3k_caa-universalk9.16.03.03....	1	16.3.3 SMU (N/A)	★	ALL ★	
Cisco Catalyst 9300 Switch	cat9k_iosxe.16.06.02.SPA.bin	1	16.6.2 SMU (1)	★	ALL ★	
Cisco Catalyst38xx stack-able eth...	Install Mode (16.6.2)	3	16.6.2 SMU (N/A)	★		
NFVIS	Enterprise NFV Infrastructure Soft...	1	3.6.2-FC3 SMU (N/A)	★		



Tip: An arrow indicates that there is more than one image available for a device family.

Cisco Catalyst 36xx stack-able eth...	cat3k_caa-universalk9.16.03.03....	1	16.3.3 SMU (N/A)	★	ALL ★	
Cisco Catalyst 9300 Switch	cat9k_iosxe.16.06.02.SPA.bin	1	16.6.2 SMU (1)	★	ALL ★	

Device family with arrow to expand the list of related images, and their SMUs, when applicable

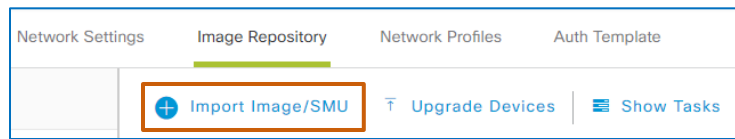
To review the complete list of image files:

- Expand the device family row.

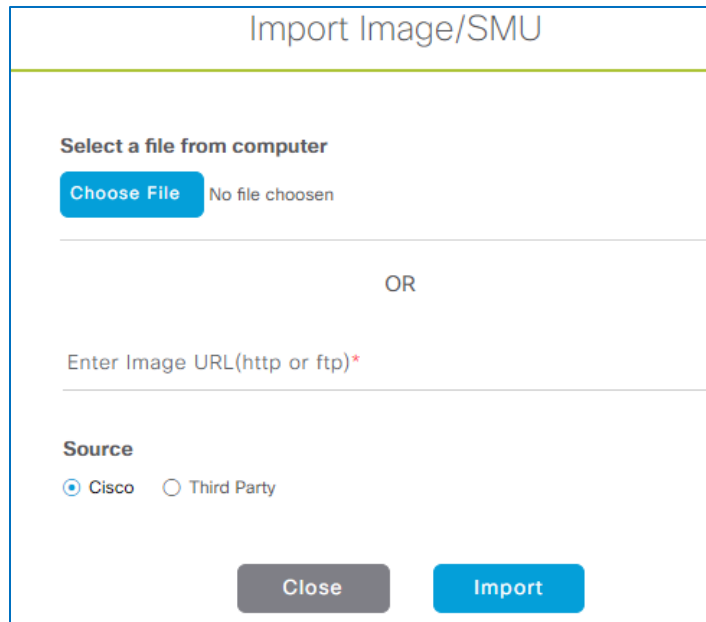
Cisco Catalyst 36xx stack-able eth...	cat3k_caa-universalk9.16.03.03....	1	16.3.3 SMU (N/A)	★	ALL ★	
	Install Mode (16.6.2)	0	16.6.2 SMU (N/A)	★		
	Install Mode (03.06.05E)	0	03.06.05E SMU (N/A)	★		
	cat3k_caa-universalk9.16.03.05b...	0	16.3.5b SMU (N/A)	★		

- If the image or SMU that you need is available in the repository, [go to task 2 and standardize it](#).
- If the image or SMU that you need is not available in the repository, go to step 3.

3. To import an image or SMU file into the repository:
 - a. On the toolbar, click **Import Image/SMU**.

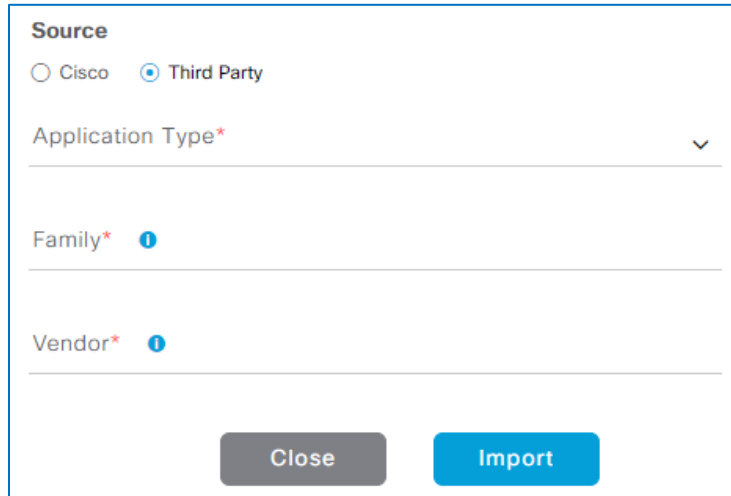


The **Import Image/SMU** dialog box opens.


 A screenshot of the 'Import Image/SMU' dialog box. The title bar at the top says 'Import Image/SMU'. The main content area is divided into three sections. The first section is titled 'Select a file from computer' and contains a blue 'Choose File' button and the text 'No file chosen'. The second section is separated by a horizontal line and contains the word 'OR' in the center. The third section is titled 'Enter Image URL(http or ftp)*' and contains a text input field. Below the input field is a 'Source' section with two radio buttons: 'Cisco' (which is selected) and 'Third Party'. At the bottom of the dialog box are two buttons: 'Close' (grey) and 'Import' (blue).

- To import a file that is stored on your local machine's drive, under **Select a file from computer**, click **Choose File**, and then browse to and select the file.
- To import a file that is on a Web or ftp site, under **Enter Image URL**, type the Web address.

- To import a virtual image file from a third party vendor, indicate the file location by browsing to the file location or typing the IP address, and then:
 - i. Under **Source**, select **Third Party**. The section expands to display required import information fields.



- ii. To select the application that is running the image that you need, in the **Application Type** drop-down list, select the application type.
- iii. To identify the image family, such as Windows or Linux, in the **Family** field, type the family name.
- iv. To identify the company that produces the software image, in the **Vendor** field, type the company name.

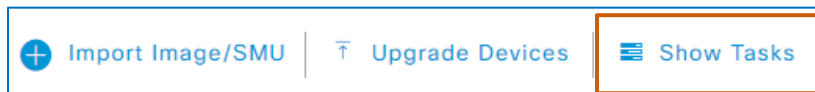


Note: The system does not validate the family name or vendor name that you type.

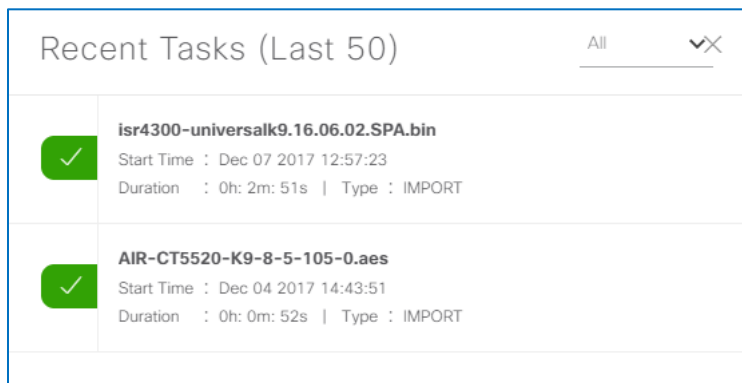
- b. Click **Import**.

The dialog box closes and the system starts the task to import the image.

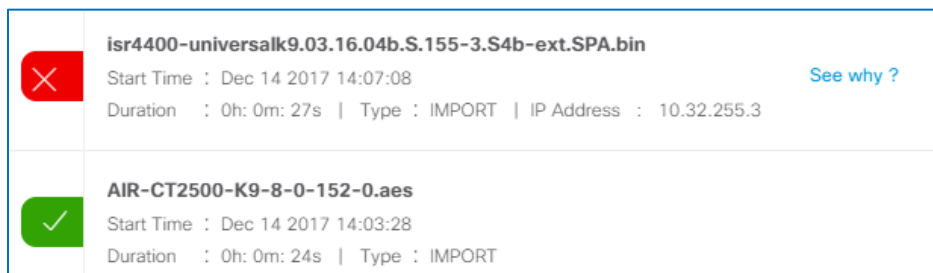
- To monitor the progress and results of the import task, on the toolbar, click **Show Tasks**.



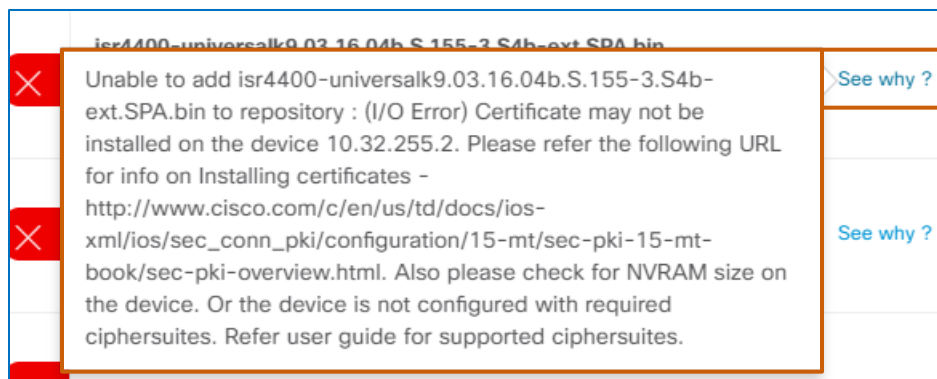
The **Recent Tasks** panel opens and lists the ongoing task.



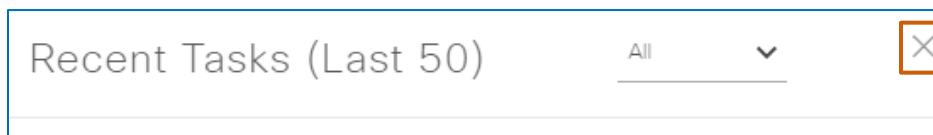
When the import is complete, the panel indicates success with green indicator or failure with a red indicator.



Tip: If an import fails, you can click **See why?** to open a tooltip that describes the problem and suggests ways to correct it.



- On the **Recent Tasks** panel, click close.



Beside the applicable device family, the repository lists the image or SMU that you imported.

+

Import Image/SMU

↑

Upgrade Devices

☰

Show Tasks

i

Take a tour

PhysicalVirtual

⌵

Filter

↺

Refresh

Last updated: 4:10 pm

CCO credentials are not set. Please [click here](#) to update

Family ▲	Image Name	Using Image	Version	Golden Image	Device Role ⓘ	Action
Cisco 4431 Integrated Services Ro...	isr4400-universalk9.03.16.04b.S....	1	15.5(3)S4b SMU (0)	★	✎	🗑
Cisco 4451 Series Integrated Servi...	isr4400-universalk9.03.16.04b.S....	1	15.5(3)S4b SMU (0)	★	✎	🗑

To standardize the image, [go to task 2.](#)

Task 2: Standardize a Device Software Image or SMU

You can [standardize base software images and SMUs](#) to help ensure that devices have the features, security, and updates that you expect.



Important Note: The system associates a SMU to the base image that it updates automatically.

When you standardize a SMU by designating it golden, you first must designate that its associated base image is golden.

After standardizing a base software image and designating it golden, the steps that you take to designate an applicable image SMU as golden are the same as those for a base image.

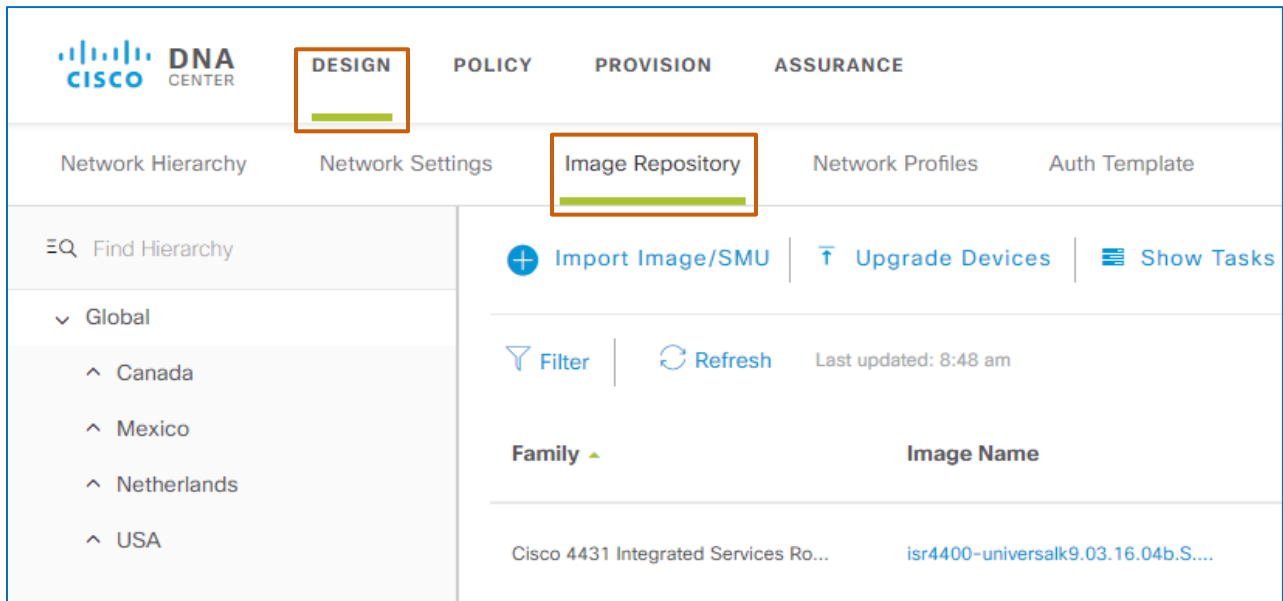


Note: Only one SMU can be designated as golden for a base image.

When you standardize an image and its optimal SMU, the system deploys both the image and SMU when upgrading devices.

When a device has the base golden image but not the associated golden SMU, the system upgrades the SMU only.

You standardize images and SMUs in **Design**, on the **Image Repository** tab.




Important Note: Although you can take many of the steps in this task on the **Image Repository** page, we recommend that you standardize images by using this area of the application because it provides access to define standards at specific location levels.

For more information, [refer to The Image Repository Page topic](#).

To standardize a device image or SMU, follow these steps:

1. To select the location level for which you need to standardize image characteristics, in the **Design | Image Repository** tab, in the network hierarchy list, select the location.



Important Note: Dependent locations in the hierarchy inherit the standards characteristics that you apply at a parent location level.

For more information, [refer to the Inheriting Image Standards topic](#).

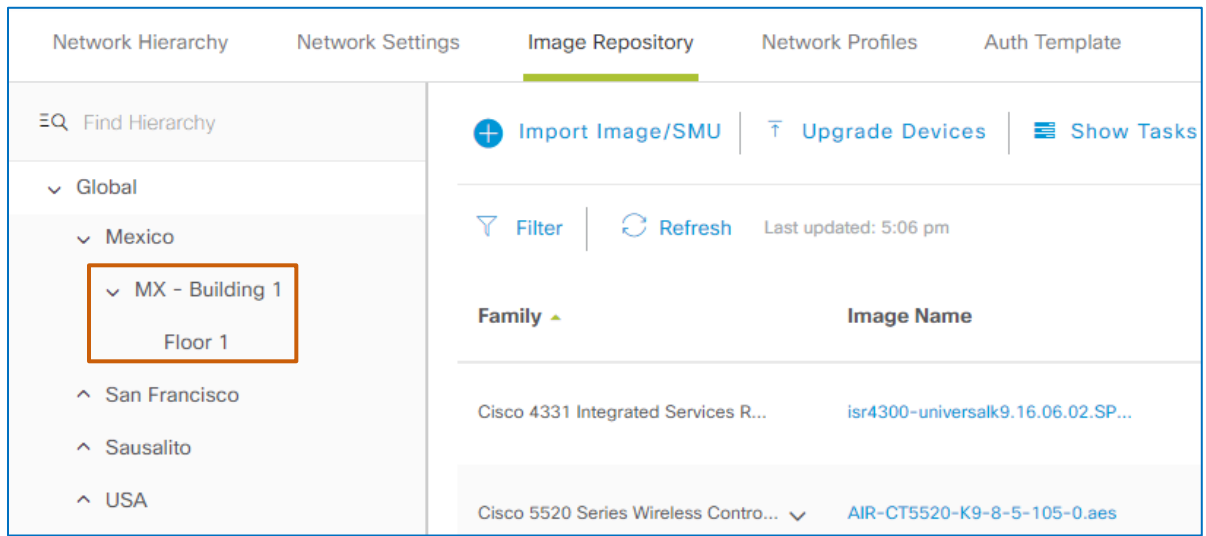


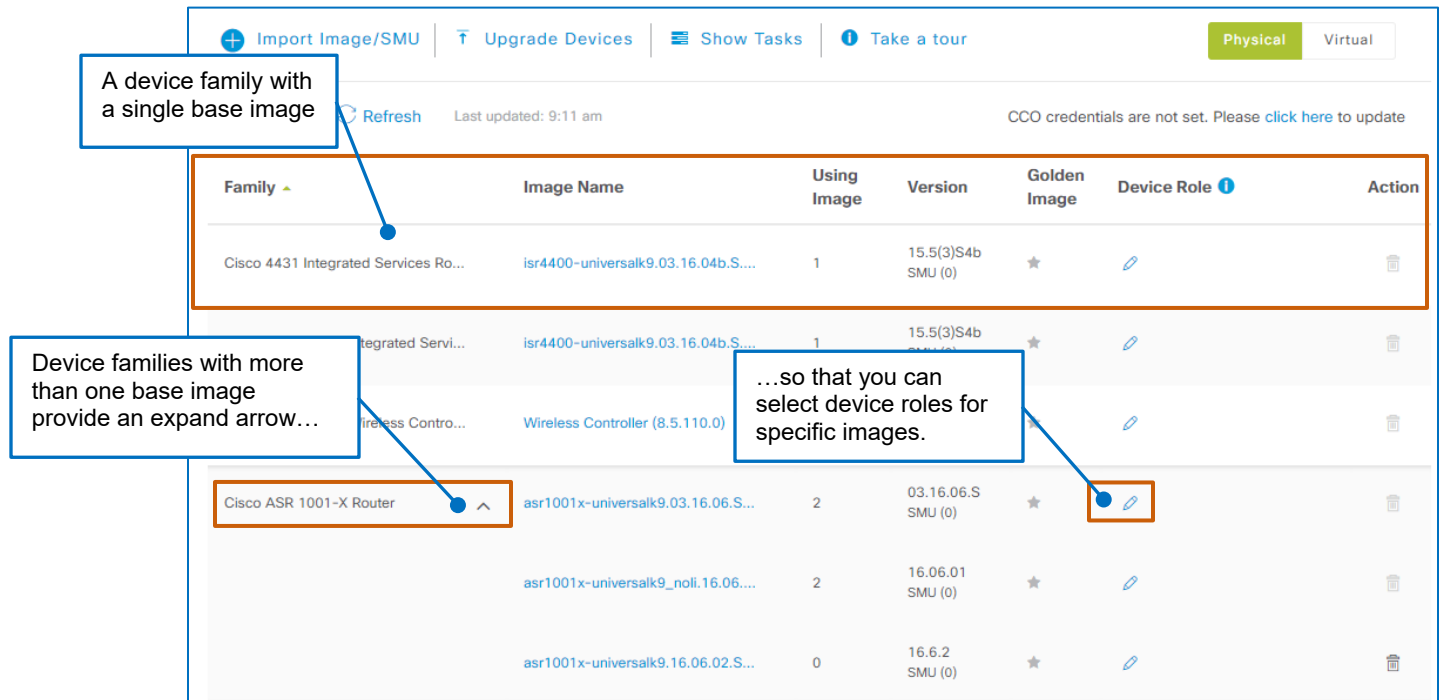


Image Repository							
<div>Find Hierarchy</div> <ul style="list-style-type: none"> Global <ul style="list-style-type: none"> Mexico <ul style="list-style-type: none"> MX - Building 1 <ul style="list-style-type: none"> Floor 1 San Francisco Sausalito USA 	<div> <div>Import Image/SMU</div> <div>Upgrade Devices</div> <div>Show Tasks</div> </div> <div> <div>Filter</div> <div>Refresh</div> <div>Last updated: 5:06 pm</div> </div> <table> <thead> <tr> <th>Family</th> <th>Image Name</th> </tr> </thead> <tbody> <tr> <td>Cisco 4331 Integrated Services R...</td> <td>isr4300-universalk9.16.06.02.SP...</td> </tr> <tr> <td>Cisco 5520 Series Wireless Contro...</td> <td>AIR-CT5520-K9-8-5-105-0.aes</td> </tr> </tbody> </table>	Family	Image Name	Cisco 4331 Integrated Services R...	isr4300-universalk9.16.06.02.SP...	Cisco 5520 Series Wireless Contro...	AIR-CT5520-K9-8-5-105-0.aes
Family	Image Name						
Cisco 4331 Integrated Services R...	isr4300-universalk9.16.06.02.SP...						
Cisco 5520 Series Wireless Contro...	AIR-CT5520-K9-8-5-105-0.aes						

2. To define the device's function in the network at the location level that you selected in step 1:
 - When the role applies to all of the devices in the device family, in the device family row, in the **Device Role** field, click the pencil icon , and then go to step 2a.
 - When the role applies to a specific base image/SMU running on specific devices in the device family, expand the device's **Family** row, beside the applicable base image/SMU, in the **Device Role** field, click the pencil icon , and then go to step 2a.















The screenshot shows the Cisco Device Software Image Management interface. At the top, there are tabs for 'Physical' and 'Virtual'. Below the tabs, there are buttons for 'Import Image/SMU', 'Upgrade Devices', 'Show Tasks', and 'Take a tour'. A 'Refresh' button and 'Last updated: 9:11 am' are also present. A message states 'CCO credentials are not set. Please [click here](#) to update'.

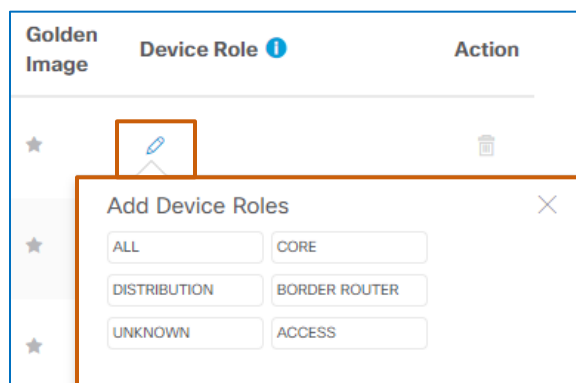
The main table has the following columns: Family, Image Name, Using Image, Version, Golden Image, Device Role, and Action. The table lists several device families and their associated images.

Annotations highlight specific features:

- A callout box points to the 'Cisco 4431 Integrated Services Router' row, stating: 'A device family with a single base image'.
- A callout box points to the 'Cisco ASR 1001-X Router' row, stating: 'Device families with more than one base image provide an expand arrow...'.
- A callout box points to the 'Device Role' field for the 'Cisco ASR 1001-X Router' row, stating: '...so that you can select device roles for specific images.'

Family	Image Name	Using Image	Version	Golden Image	Device Role	Action
Cisco 4431 Integrated Services Router	isr4400-universalk9.03.16.04b.S...	1	15.5(3)S4b SMU (0)	★		
Integrated Servi...	isr4400-universalk9.03.16.04b.S...	1	15.5(3)S4b SMU (0)	★		
Wireless Contro...	Wireless Controller (8.5.110.0)					
Cisco ASR 1001-X Router	asr1001x-universalk9.03.16.06.S...	2	03.16.06.S SMU (0)	★		
	asr1001x-universalk9_noli.16.06....	2	16.06.01 SMU (0)	★		
	asr1001x-universalk9.16.06.02.S...	0	16.6.2 SMU (0)	★		

The **Add Device Roles** pop-up window opens.

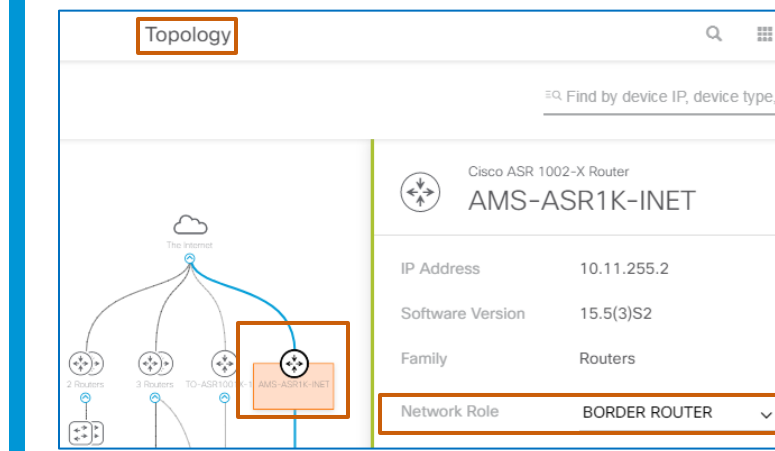


- a. To indicate the device's function in the network topology, in the **Add Device Roles** pop-up window, select the function.



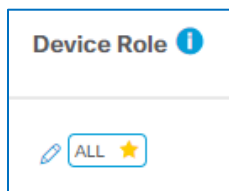
Important Note: During device discovery, the system automatically assigns a network role to the device, which indicates the device's function, and indicates it in the topology.

To best align the device's network role with its device role, review the network topology to determine the role of the device or devices that belong to the device family, and indicate that role as the device role in the image repository.



- b. Close the pop-up window.

The role that you assigned appears beside the pencil icon, and the star icon displays a yellow color code, which indicates that the role is standardized as part of the golden image.



3. To designate the optimal base software image that should run on devices at the location and with the role that you selected, in the applicable row, in the **Golden Image** field, click the star icon.

The star icon displays a yellow color code and the system automatically downloads the image to the repository.

Filter

Refresh

Last updated: 10:21 am






CCO credentials are not set.

Family ▲	Image Name	Using Image	Version	Golden Image	Device Role ⓘ
Cisco 4331 Integrated Services R...	isr4300-universalk9.16.06.02.SP...	1	16.6.2 SMU (0)	★	ALL ★

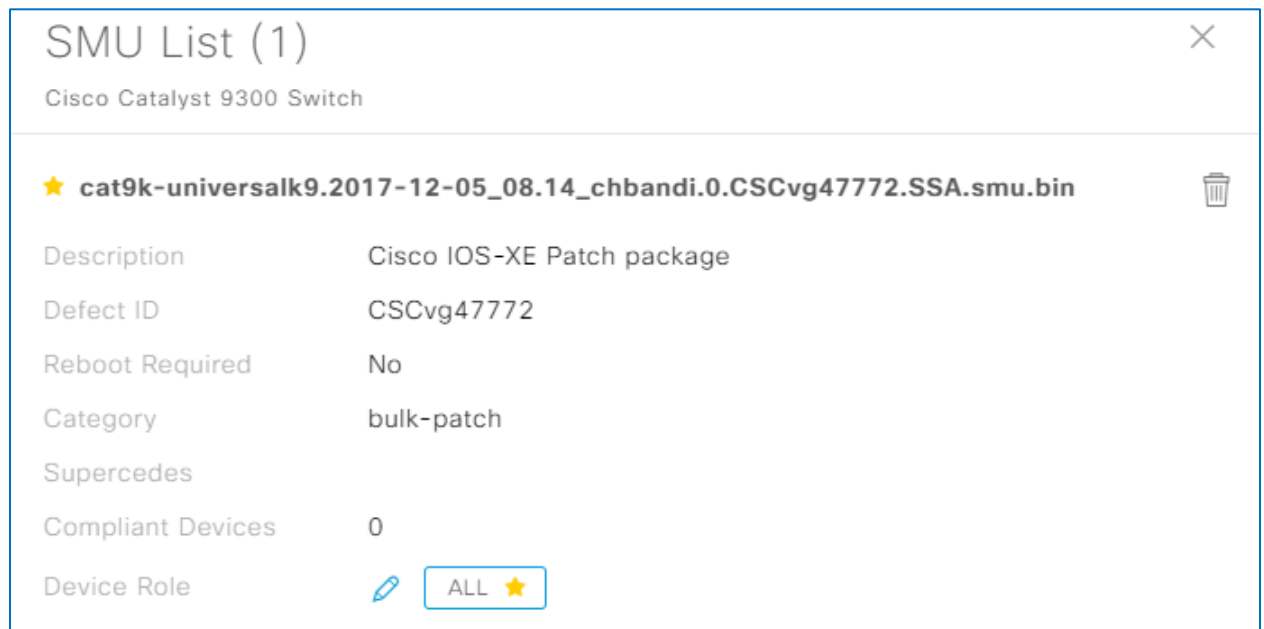


Note: When you indicate that an image is golden, it automatically attempts to import that image so that it is available for use.

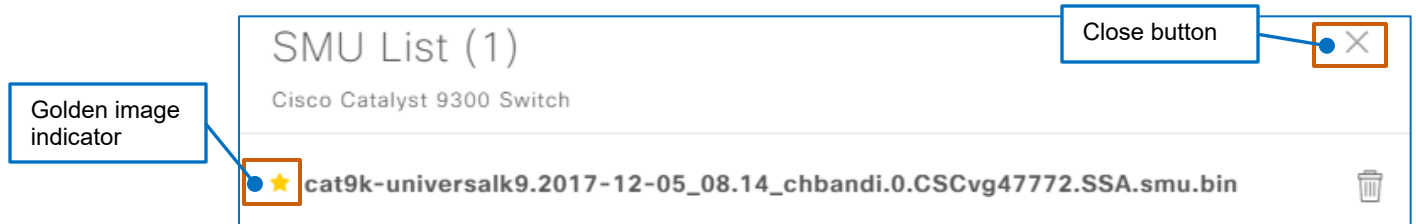
4. When applicable, to designate a SMU related to the image as optimal:
 - a. Under **Version**, below the version number, click the SMU (#) link.

Family ▲	Image Name	Using Image	Version	Golden Image	Device Role ⓘ	Action
Cisco Catalyst 9300 Switch	cat9k_iosxe.16.06.02.SPA.bin	1	16.6.2 		 ALL 	

The **SMU List** panel opens and lists all of the SMUs that are available in the system for the software image.



- b. In the panel, beside the optimal SMU name, click the golden image indicator, and then close the panel.



This action prompts the system to audit devices for the base image and SMU combination and apply them during image upgrades.

5. To continue:

- To standardize another image, [return to step 1](#).
- To evaluate the audit results based on the standardized images that you defined, [go to task 3](#).

Task 3: Evaluate Automated Audit Results

When system users define standardized images and SMUs, the system automatically audits devices for compliance.

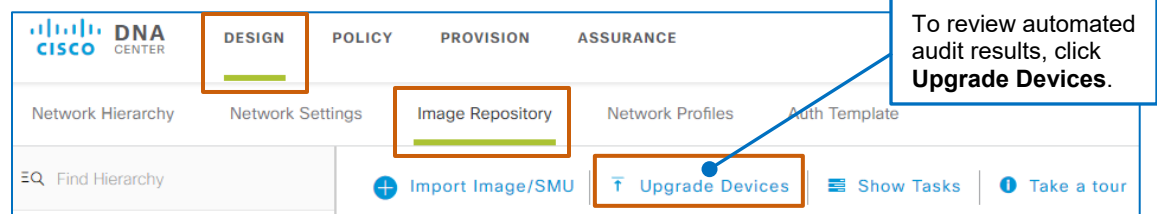
During the audit, the system compares the standards for the golden base image and SMU with those that are running on each device, including its location and role to determine compliance.



Note: The system runs audits on device families only when system users designate golden image standards for them.

To evaluate automated audit results, follow these steps:

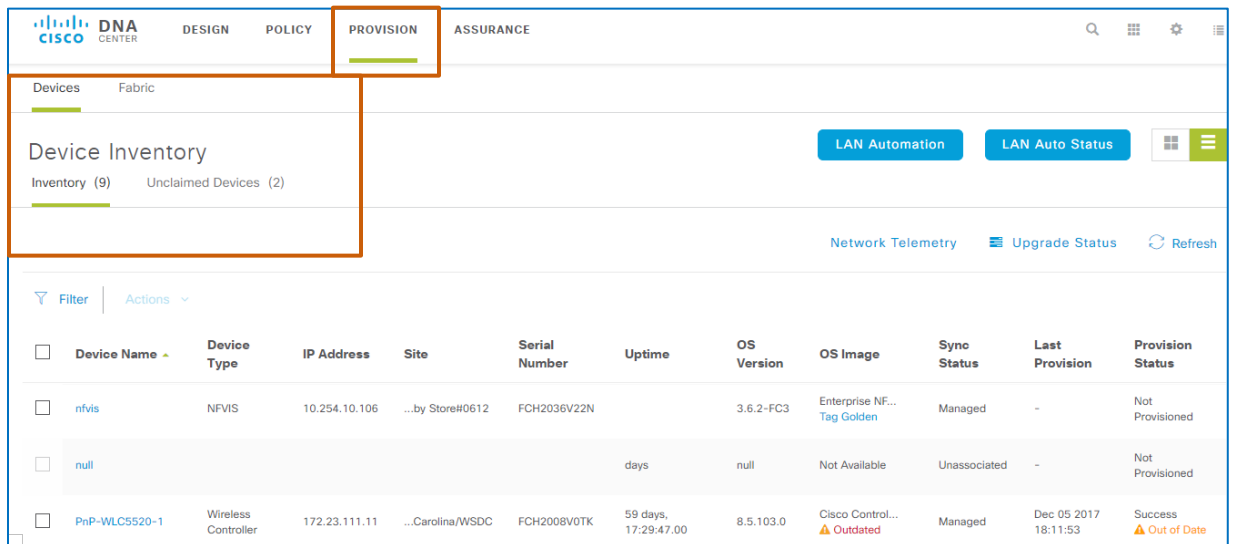
1. In **Design**, on the **Image Repository** tab, on the toolbar, click **Upgrade Devices**.



The system navigates to **Provision**, and the **Devices** tab, **Device Inventory | Inventory** subtab is active by default.

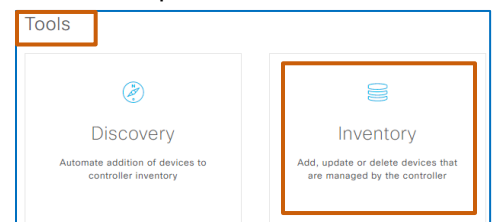


Note: The inventory also includes the **Unclaimed Devices** tab, which lists devices that are available for the Plug and Play device deployment and configuration process.



Note: Because you might need to upgrade images on non-compliant devices, the system navigates to the area of the application that supports running the upgrade task.

This page differs from the device inventory that you can access on the home page under **Tools**. That page does not provide audit results or support upgrade tasks.



- On the **Device Inventory** page, on the **Inventory** tab, in the **OS Image** column, below the image name, review the image audit results.



Note: The system does not support access point images.

In those cases, under **OS Image**, the system indicates **Not Available**.

Device Inventory

LAN Automation

Inventory (31)

Unclaimed Devices (1)

Network Telemetry

Filter

Actions

<input type="checkbox"/>	Device Name	Device Type	IP Address	Site	Serial Number	Uptime	OS Version	OS Image	Sync Status
<input type="checkbox"/>	AP80e0.1d52.ce98	Unified AP	10.254.12.101	...ing 4/Floor 1	FCW1924N2RD	47days 23:29:44.810	8.5.103.0	Not Available	Managed
<input type="checkbox"/>	Egypt-A_1	Switches and Hubs	10.203.250.97	...Egypt/Egypt-1	FDO2008Q0JY	18:14:01.40	16.6.2	CAT3K_CAA[16.... ⚠ Outdated	Managed
<input type="checkbox"/>	Egypt-A_2	Switches and Hubs	10.203.250.98	...Egypt/Egypt-1	FDO2008E1AN	7:11:34.22	16.6.2	CAT3K_CAA[16.... ⚠ Outdated	Managed
<input type="checkbox"/>	Egypt-B3850-1	Switches and Hubs	10.203.255.11	...Egypt/Egypt-1	FCW2005D0AR	8 days, 19:24:02.93	16.6.2	packages.conf Tag Golden	Managed
<input type="checkbox"/>	Egypt-B3850-2	Switches and Hubs	10.203.255.12	...Egypt/Egypt-1	FCW2005F0AX	8 days, 19:23:57.41	16.6.2	packages.conf Tag Golden	Managed

OS Image

Not Available

CAT3K_CAA[16....
⚠ Outdated

CAT3K_CAA[16....
⚠ Outdated

packages.conf
Tag Golden

packages.conf
Tag Golden



Important Note: Below the list, ensure you are seeing all of the images that are available in the inventory during your compliance review.

<input type="checkbox"/>	Router	Routers	10.254.3.12	...by Store#0612	FLM2040W2FE	9 days, 20:09:41.75	16.6.2	isr4300-unive...	Managed
<input type="checkbox"/>	TEST-SW3650	Switches and Hubs	10.8.19.1	...sco/SF-BLDG-1	FDO1852E25Z	129 days, 7:06:16.25	03.06.05E	packages.conf Tag Golden	Managed
<div> <div>9 of 9</div> <div>Show More</div> </div>									

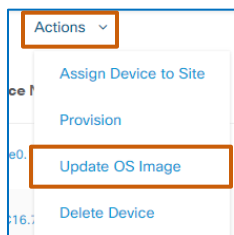
Audit results include:

- Tag Golden**
Indicates that a standardized image has not been defined for the device.
- Outdated**
Indicates that there is a standardized image available for the device and that the device is not running the standardized image.
- No result**
The device is using the applicable standardized image.

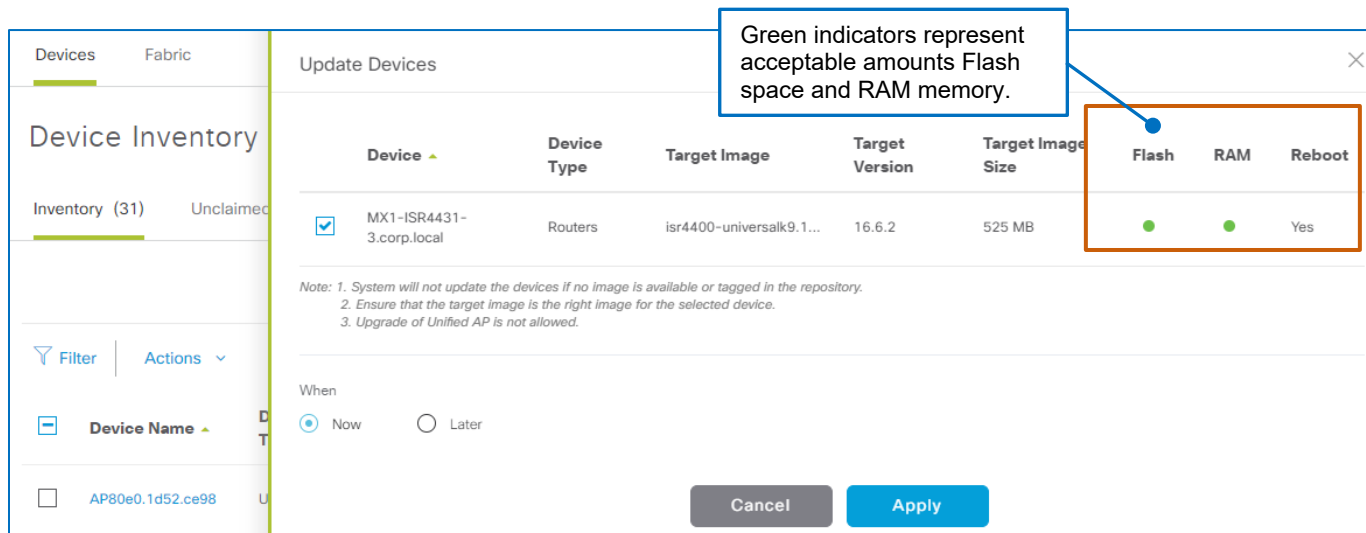
- To address the audit results:

- For devices with images that indicate **Tag Golden**, to define standardized image characteristics for the family that contains the device, [you can perform the steps to standardize an image](#), and then, to evaluate audit results, [return to step 1](#).
- To upgrade non-compliant devices, [go to task 4](#).

- In the **Actions** drop-down list, select **Update OS Image**.



The **Update Devices** panel opens. The panel lists each device that you selected and indicates whether each device has enough Flash space and RAM to support the upgrade, and whether the device will reboot to complete the upgrade process.



- On the **Updated Devices** panel, in the list, to determine whether each device contains enough Flash space and RAM to support the upgrade, review the **Flash** and **RAM** columns, and:
 - When green color code appears for both items, which indicate enough Flash space and RAM, the system can upgrade those devices.
 - When a red indicator appears for either item, and you proceed with the upgrade, the system does not attempt to upgrade those devices.
- Determine whether you want to continue initiating the upgrade process.
 - To continue, go to step 6.
 - To cancel the upgrade, go to step 5.

5. To cancel an upgrade on a device:

- For a single device, in the **Panel**, click **Cancel**.
- In a series of devices, beside each device that you determine not to upgrade, clear the check box beside the device name.

Device	Device Type	Target Image	Target Version
<input checked="" type="checkbox"/> PnP-WLC5520-1	Wireless Controller	AIR-CT5520-K9-8-5-105-0.a...	8.5.105.0

*Note: 1. System will not update the devices if no image is available or tagged in the repository.
2. Ensure that the target image is the right image for the selected device.
3. Upgrade of Unified AP is not allowed.*

☒ Run Now
 ☐ Schedule Later

6. To schedule the upgrade task:

- To run the upgrade immediately, accept the default selection of **Run Now**, and then go to step 8.
- To schedule the upgrade to occur at a specific time, click **Schedule Later**, and then go to step 7.

The **Create OS Update** section expands.

☐ Run Now
 ☒ Schedule Later

Task Name *

Create OS Update - Task 1

12 / 19 / 2017

01 : 23 : PM

Time Zone

☒ Site Settings


Note: The task will run based on site time zone. Un-check to select a specific time zone from the list below.

Currently using site time zone.

7. To define the upgrade schedule:

- a. In the date and time fields, type or select the date and time that you want the system to perform the upgrade based on the time zone that you select in step 7b.

Create OS Update - Task 1

12 / 19 / 2017


01 : 23 : PM
▼

b. To indicate the time zone that the system applies to the time and date:

- To accept the time zone that a system user applied to the device's location when designing the network, accept the default selection of the **Site Settings** check box, and then go to step 8.
- To select a different time zone, clear the **Site Settings** check box, in the drop-down list, select the time zone, and then go to step 8.

Time Zone

☐ Site Settings

America/New_York (EST)
▼

America/New_York (EST)

America/Nipigon (EST)

America/Nome (AKST)

America/Noronha (-02)

America/North_Dakota/Beulah (CST)

8. To continue the upgrade process, click **Apply**. The **Updated Devices** panel closes automatically.

When you run the task immediately, the system initiates it when you click **Apply**.

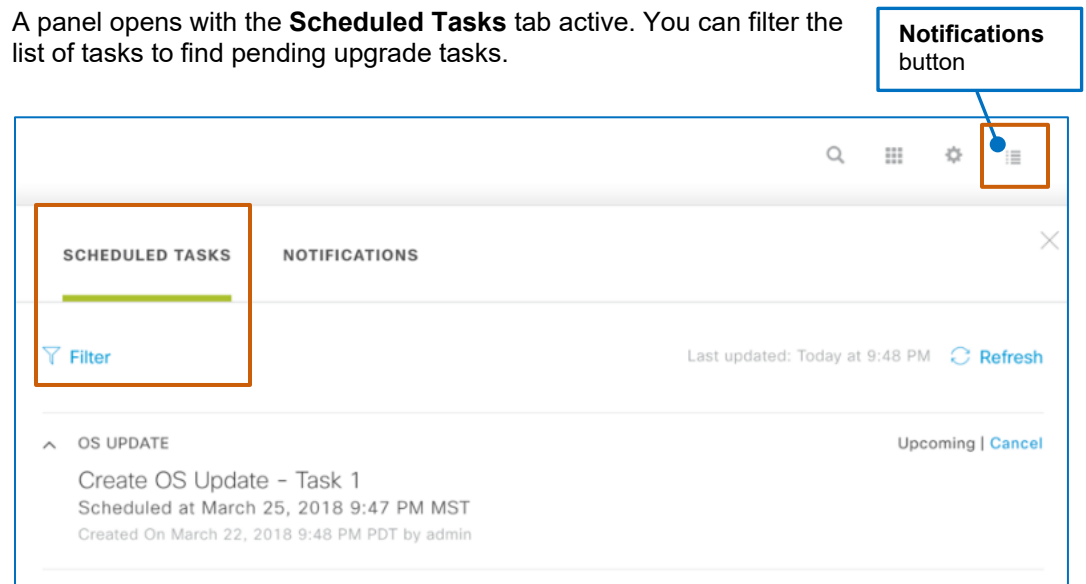
When you schedule upgrades to occur at a later time, for example, during a maintenance window, the system adds the task to the **Scheduled Tasks** list.



Tip: To see the list of scheduled tasks:

- On the application toolbar, click **Notifications**.

A panel opens with the **Scheduled Tasks** tab active. You can filter the list of tasks to find pending upgrade tasks.



9. To monitor the progress of the upgrade task and review the upgrade results, on the toolbar, [go to task 5](#).

Task 5: Monitor the Upgrade Task and Review Results

You can monitor upgrades while they are running and review the results to determine whether the upgrade process is successful, in progress, experiencing issues, or failing.

To monitor an upgrade task and review its results, follow these steps:

- On the **Inventory** subtab:
 - To determine whether the **Outdated** status appears or has been removed from the devices receiving the upgrade, on the **Inventory** tab, review the device list.

When the **Outdated** status no longer appears in the **OS Image** column below the image name of the upgraded device, the upgrade is complete and successful.

You have completed the software image management process.

Device Inventory										LAN Automation	LAN Auto Status
Inventory (9) Unclaimed Devices (2)											
										Network Telemetry	Upgrade Status
Filter	Actions										
Device Name	Device Type	IP Address	Site	Serial Number	Uptime	OS Version	OS Image	Sync Status	Last Provision		
<input type="checkbox"/> AP80e0.1d52.ce98	Unified AP	10.254.12.101		FCW1924N2RD	17days 19:29:21.590	8.5.103.0	Not Available	Managed	Dec 01 2017 18:09:54		
<input type="checkbox"/> APCC16.7EDC.0C1E	Unified AP	10.254.12.105		FDW2044D0FP	19:38:05.540	8.5.103.0	Not Available	Unassociated	Dec 05 2017 18:11:53		
<input type="checkbox"/> APCC16.7EDC.0C60	Unified AP	10.254.12.104	...Store#0595/F1	FDW2044D0FS	18days 17:25:30.590	8.5.103.0	Not Available	Managed	Nov 30 2017 20:06:04		
<input type="checkbox"/> Cisco_1f:91:58	Wireless Controller	10.32.200.1	... - Building 1	FCH2133V08Y	14 days, 16:53:39.00	8.5.105.0	AIR-CT5520-K9..	Managed	Dec 05 2017 14:54:56		

OR

- On the toolbar, click **Upgrade Status**, and then go to step 2.

Devices	Fabric										
Device Inventory										LAN Automation	LAN Auto Status
Inventory (9) Unclaimed Devices (2)											
										Network Telemetry	Upgrade Status
										Refresh	

The **Recent Tasks** panel opens and lists each device on which an upgrade task is running or has been run.



Note: When more than one device is included in an upgrade task, the system updates each device's status when its upgrade process is complete.

Devices Fabric

Device Inventory

Inventory (9) Unclaimed Devices (2)

Filter Actions

Device Name	Device Type	IP Address	Site	Serial Number
AP80e0.1d52.ce98	Unified AP	10.254.12.101		FCW1924N2RD
APCC16.7EDC.0C1E	Unified AP	10.254.12.105		FDW2044D0FP
APCC16.7EDC.0C60	Unified AP	10.254.12.104	...Store#0595/F1	FDW2044D0FS

Recent Tasks (Last 50)

All

Image Upgrade for 10.32.200.1

AIR-CT5520-K9-8-5-105-0.aes

Duration : 0h: 0m: 10s Start Time : Dec04 2017 16:53:00 Failed [See why ?](#)

Image Upgrade for 10.32.200.1

AIR-CT5520-K9-8-5-105-0.aes

Duration : 0h: 0m: 7s Start Time : Dec04 2017 16:48:41 Failed [See why ?](#)

Image Upgrade for 172.23.111.11

AIR-CT5520-K9-8-5-105-0.aes

Duration : 0h: 0m: 7s Start Time : Dec04 2017 14:47:06 Failed [See why ?](#)

Image Upgrade for 10.32.200.1

AIR-CT5520-K9-8-5-105-0.aes

Duration : 0h: 0m: 8s Start Time : Dec04 2017 14:45:53 Failed [See why ?](#)

2. In the panel, review the list of devices and their upgrade statuses, including:

- Successful**
 Indicates that the upgrade is complete and the device is running the golden image or SMU
- In-Progress**
 Indicates that the system is in the process of upgrading the device
- Failed**
 Indicates that during the upgrade process, an issue has occurred and the upgrade is not completed



Tip: You can filter the list to see only those tasks that are currently running.

To filter the list:

- In the **All** drop-down list, select **In-Progress**.

Recent Tasks (Last 50)

All

Image Upgrade for 172.23.111.11

AIR-CT5520-K9-8-5-110-0.aes

All

Failed

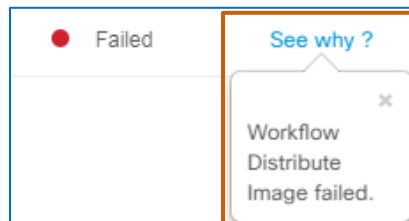
In-Progress

Successful

3. To review task details:

- For **Successful** statuses, go to step 4.
- For **In-Progress** statuses, go to step 4.
- For **Failed** statuses, click the **See why ?** link.

A pop-up window opens with a synopsis of the issue.

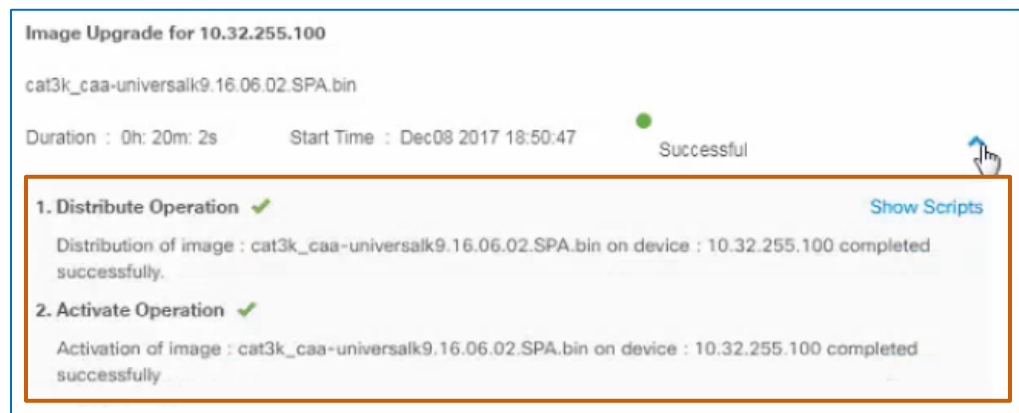


4. To see more information on a status or to review the scripts that the task ran, or review the commands that the task ran, to the right of the row, click the down arrow.



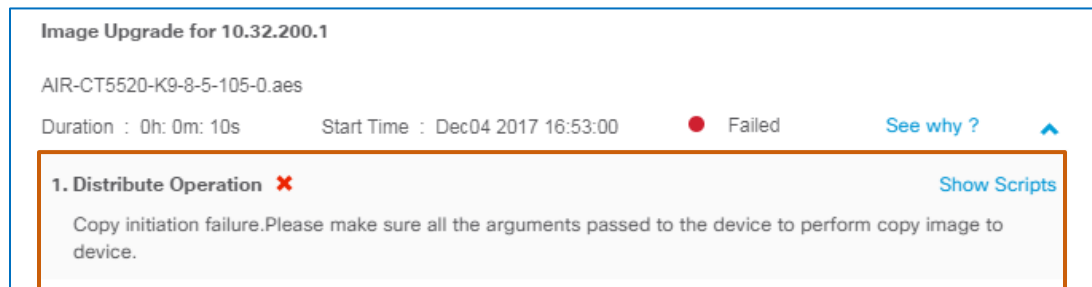
The panel expands to display more information.

In successful upgrades, the details indicate the results of the distribution and activation operations that the task runs.



For upgrades that are in progress, beside each device, the details indicate the operations that are pending or complete on the device as part of the upgrade process.

In failure situations, the details indicate the point at which the failure occurred and suggestions that might correct the issue.



a. To see the scripts that the system ran during the upgrade process, click **Show Scripts**.



Note: Scripts are available for image and SMU upgrade distribution tasks and for SMU upgrade activation tasks.

The section expands to display the script information.

Image Upgrade for 10.32.255.100

cat3k_caa-universalk9.16.06.02.SPA.bin

Duration : 0h: 20m: 2s Start Time : Dec08 2017 18:50:47 Successful

1. Distribute Operation ✓

Distribution of image : cat3k_caa-universalk9.16.06.02.SPA.bin on device : 10.32.255.100 completed successfully.

Script Name

Type

Log Details

✓ Verifying Disk Space

Pre Check

[View](#)

2. Activate Operation ✓

Activation of image : cat3k_caa-universalk9.16.06.02.SPA.bin on device : 10.32.255.100 completed successfully

- To see detailed information, below **Log Details**, click **View**.

1. Distribute Operation ✓

Distribution of image : cat3k_caa-universalk9.16.06.02.SPA.bin on device : 10.32.255.100 completed successfully.

Script Name

Type

Log Details

✓ Verifying Disk Space

Pre Check

[View](#)

The panel toggles to display **Log Details**.

Log Details

Script Name

Verifying Disk Space

Details

Validated Device Memory

MX1-3850-CSW-1#

MX1-3850-CSW-1#dir flash:

Directory of flash:/

77602 -rw-

2097152

Dec 8 2017 18:24:02 +00:00

nvram_config

15524 -rw-

4753

Oct 26 2017 08:02:35 +00:00

packages.conf

77610 drwx

4096

Oct 11 2017 10:19:53 +00:00

virtual-instance

15521 drwx

4096

Oct 11 2017 10:19:53 +00:00

vman_fdb

31041 drwx

4096

Oct 26 2017 08:06:15 +00:00

dc_profile_dir

31043 drwx

4096

Oct 11 2017 10:21:03 +00:00

wnweb_store

77611 -rw-

616

Oct 26 2017 06:04:05 +00:00

vlan.dat

77612 -rw-

408979686

Oct 26 2017 08:00:16 +00:00

cat3k_caa-universalk9.16.06.01

15523 -rw-

1236

Oct 11 2017 10:07:22 +00:00

packages.conf.00-

46562 drwx

4096

Oct 26 2017 08:05:36 +00:00

.installer

23286 -rw-

19167872

Oct 26 2017 08:02:15 +00:00

cat3k_caa-guestshell.16.06.01.

23287 -rw-

27722412

Oct 26 2017 08:02:15 +00:00

cat3k_caa-rpbase.16.06.01.SPA.

23288 -rw-

331174520

Oct 26 2017 08:02:29 +00:00

cat3k_caa-rpcore.16.06.01.SPA.

23289 -rw-

14783104

Oct 26 2017 08:02:31 +00:00

cat3k_caa-srdriver.16.06.01.SP

23290 -rw-

16126588

Oct 26 2017 08:02:33 +00:00

cat3k_caa-webui.16.06.01.SPA.p

15522 -rw-

37

Oct 26 2017 08:06:02 +00:00

bootloader_evt_handle.log

46563 drwx

4096

Oct 26 2017 08:12:27 +00:00

core

54322 drwx

4096

Oct 26 2017 08:06:06 +00:00

.prst_sync

62084 drwx

4096

Oct 26 2017 08:06:09 +00:00

.rollback_timer

62085 drwx

4096

Oct 26 2017 08:06:15 +00:00

gs_script

15527 -rw-

91870

Oct 26 2017 08:06:31 +00:00

memleak.tcl

15528 -rw-

2097152

Dec 8 2017 18:24:02 +00:00

nvram_config_bkup

15529 -rw-

448

Oct 26 2017 22:55:17 +00:00

private-KS1

1624104960 bytes total (715587584 bytes free)

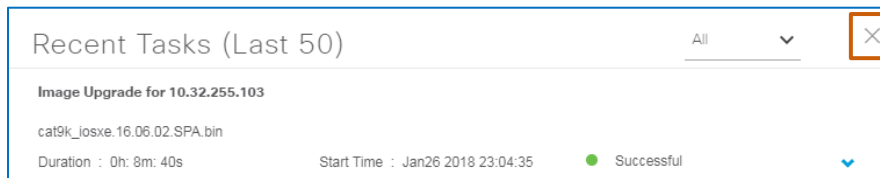
MX1-3850-CSW-1#

MX1-3850-CSW-1#

- ii. To close the log details, click the arrow icon.



- b. On the **Recent Tasks** panel, click close.



You have completed the process to manage device software images in Cisco DNA Center.

Links

To Product Information

[Visit the Cisco Web site to learn more about Cisco DNA Center.](#)

[Visit the Cisco Web site to review or download the **Cisco Digital Network Architecture Center User Guide, Release 1.1.**](#)

To Training

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

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

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[Send us a message with questions or comments about this training.](#)



Note: Please send messages that address the training content only.
Follow your regular business process to request technical support or address technical or application-related questions.