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Seamless Software Upgrade for Autonomous Routing Devices

Introduction to Seamless Upgrade of Autonomous Routing Devices

This feature explains how to seamlessly upgrade and onboard an existing Cisco Routing device into the Catalyst Cisco SD-WAN Manager.

If you are using a device that is running a version earlier than Cisco IOS XE 17.12.1a, the system first upgrades your device and then onboards it into the Cisco SD-WAN Manager.

Prerequisites

- The device must be operational.
- To establish an SSH connection with the device, SSH connectivity from the Cisco SD-WAN Manager to the device with valid SSH username and password is needed. This user must have admin 15 privileges.
- Auto-boot needs to be enabled on the device. To know more about the usage of configuration registers, refer to [Configuration Register Values and their Significance](#).
- Ensure that the software image is present on the device or the remote server (with .bin extension).
- You can use the SCP, FTP, and HTTP protocols to copy images from the remote server.
 - If you select SCP as the protocol on the **Remote Server** page, ensure that it is enabled on the device to download images from the remote server. To enable SCP, use the **ip scp server enable** command.
 - If you select HTTP as the protocol on the **Remote Server** page, ensure that you enable the source interface configuration for HTTP on the router. To configure HTTP, use the **ip http client source-interface interface** command.

Limitations

- Seamless Upgrade is applicable only for hardware routing devices.
- You can only use the management VPN (VPN 512) and no other VPN for SSH connectivity. VPN 512 is the management interface on the Cisco SD-WAN Manager. This should be up for it to form a SSH connection.

Add an image to the remote server

If you want to use an image stored on the remote server for the upgrade, you can proceed using the following steps:

Step 1 Go to **Maintenance > Software Repository > Remote Server** and click on **Add Remote Server**.

Step 2 Enter the value for these fields:

- **Server Name:** Add a name for the server.
- **Server IP or DNS Name:** Enter the IP address of the server.
- **Protocol:** Select the protocol (FTP, SCP, HTTP) from the drop-down list over which you want to copy the image.

- **Port:** Enter the port on which the protocol is running.
- **User ID:** (Optional) Enter the user ID.
- **Password:** (Optional) Enter the password.
- **Image Location Prefix:** This is the location to search for images with .bin extension.
- **VPN/VRF:** Enter VPN or VRF which needs to be used to copy the image (This is not applicable for the HTTP protocol).

Step 3 Click **Add** to get the remote server added to the repository.

Step 4 Go to the [Add Software Images to the Repository](#) section and follow the steps to add an image to the remote server.

What's next

Upgrade and add a device by following the steps provided in [Upgrade and Add Devices into the Cisco SD-WAN Manager](#).

Upgrade and add devices into the Cisco SD-WAN Manager

To upgrade the device with a compatible release version, perform the following steps:

Step 1 From the Cisco SD-WAN Manager menu, choose **Tools > Upgrade for SD-Routing Capability > Add Device** to upgrade a device.

Step 2 Add information for all the mandatory parameters:

- **IP Address:** This is the IP address of the device that needs to be upgraded.
- **Username:** Enter the username.
- **Password:** Enter the password.
- **Enable Password:** (Optional) Enter a password only when you are not using a privilege 15 user.
- **WAN Interface:** The WAN interface name is required as a user data field in the bootstrap configuration file.
- **Image on Device:** If an image is stored on the device file system, you need to enter the image path. There are three ways to store images:
 - **Bootflash:** If the image is stored inside the bootflash, enter "image_name.bin" as the image path.
 - **USB:** If the image is stored on a USB, enter "usb0:image_name.bin" as the image path.
 - **Hard disk:** If the image is stored on a harddisk, enter "harddisk:image_name.bin" as the image path.

OR

- **Remote Server:** If an image is stored on the remote server, add the image by following the steps provided in the [Adding an Image to the Remote Server](#) section.
- **Remote Image Name:** Applicable only if you choose the Remote Server option. Select the image from the drop-down list to upgrade.
- **Actions:** Click **Save** for these updates to be recorded.

**Note**

Status: The device upgrade status is displayed here. There are 4 types of status that you see while the upgrade is initiated:

- **Upgrade not scheduled:** This is displayed before starting the activity.
- **In progress:** This appears when the upgrade is in progress.
- **Success:** This denotes that the upgrade is successful.
- **Failure:** This status appears when there is an upgrade failure.

**Note**

If both **Image on Device** and **Remote Server** fields are entered, the **Image on Device** option is used for upgrading the device.

Step 3

Save the device details and click **Upgrade**.

Once you click on **Upgrade**, you are redirected to the **Tasks** pane where you can see the ongoing upgrade status. Click on **Actions** to see the detailed logs.

The following prechecks are performed by the system in the background before upgrading the device:

- Image validity check: Checks the digital signature of the image.
- Image compatibility check: Checks if the image is compatible with the device.
- Image version check: Checks the IOS XE image version of the device.
- ROMMON compatibility: Checks if the ROMMON version is compatible with the image version.

If these prechecks are not fulfilled, the upgrade process fails and the error messages are recorded in the logs.

**Note**

If the upgrade fails due to the pre-check error message "Disk Space Check: Not enough disk space for download and expansion" in the task log, manually delete old image files from the bootflash: directory on each Cisco Catalyst 8000V Edge Software (SD-Routing mode) device before starting the upgrade.

Step 4

View the list of devices that are successfully upgraded and onboarded on the **Monitor > Devices** page. Alternatively, click **Tools > Upgrade for SD-Routing Capability > Export** to download the .csv file that contains the complete list to your local device.

If a device is in the allowed list, then the Cisco SD-WAN Manager checks for the device details in its inventory pool. For instances where the device is not in the allowed list, create a system IP Pool by following the steps mentioned in the [Network Hierarchy](#) section.

Import multiple devices for upgrade

To add and upgrade multiple devices, perform the following steps:

Step 1

Go to **Tools > Upgrade for SD-Routing Capability > Export** to download a sample CSV file.

Step 2

Create a CSV file with the following fields as columns in the same order:

Example:

- **IP Address:** x.x.x.x
- **Username:** test

- **Password:** Test123
- **Enable Password:** Test123
- **WAN Interface:** Gigabitethernet
- **Local Image:** img.bin
- **Remote Server:** demo
- **Remote Image Name:** imgPath

Step 3 Go to **Tools > Upgrade for SD-Routing Capability > Import** and upload the CSV file.

You can see all the devices populated into the interface on the Cisco SD-WAN Manager. You can select the devices to be upgraded by following steps from [Step 3](#).