

Software Maintenance Upgrade

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Software Maintenance Upgrade for Cisco IOS XE Catalyst SD-WAN Devices

Table 1: Feature History

Feature Name	Release Information	Description
Support for Software Maintenance Upgrade Package	Cisco IOS XE Catalyst SD-WAN Release 17.9.1a Cisco vManage Release 20.9.1	This feature enables support for a Software Maintenance Upgrade (SMU) package that can be installed on Cisco IOS XE Catalyst SD-WAN devices. The SMU package provides a patch fix or a security resolution to a released Cisco IOS XE image. Developers can build this package that provides a fix for a reported issue without waiting for the fix to become available in the next release.
SMU Support for Cisco ISR1100 and ISR1100X Series Routers	Cisco IOS XE Catalyst SD-WAN Release 17.11.1a Cisco vManage Release 20.11.1	Added support for Cisco ISR 1100 and ISR 1100X Series Integrated Services Routers.

Information About Software Maintenance Upgrade

A software maintenance upgrade (SMU) is a point fix for a critical bug in released software that attempts to minimize disruption to the router, if possible. An SMU is not designed to replace a maintenance release.

Cisco provides SMU fixes as package files, a file for each release and each component of Cisco Catalyst SD-WAN. The package contains metadata that describes the content of the package and the fix for a reported issue.

SMU Image Files

Each SMU image filename in the software repository includes a base image version and the defect ID related to the fix. In the image name:

- *base_image_version* is the Cisco IOS XE image version.
- *defect_id* is the identifier of the defect for which the SMU package has the fix.

SMU Types

An SMU type describes the effect of an installed SMU package on a Cisco IOS XE Catalyst SD-WAN device. The following are the SMU package types:

- Hot SMU (non-reload): Enables an SMU package to take effect after an SMU image activation without rebooting (reloading) the Cisco IOS XE Catalyst SD-WAN device.
- Cold SMU (reload): Enables an SMU package to take effect after rebooting (reloading) the Cisco IOS XE Catalyst SD-WAN device.

Benefits of Software Maintenance Upgrades

- Allow you to address a network issue quickly while reducing the time and scope of the testing required. The Cisco IOS XE Catalyst SD-WAN device internally validates the SMU image compatibility and does not allow you to install non-compatible SMU packages.
- Allow you to install or activate only one SMU package on devices at a time to simplify the initial implementation process.
- Allow you to install an SMU package on multiple Cisco IOS XE Catalyst SD-WAN devices at the same time when installing using Cisco SD-WAN Manager. To install an SMU package on multiple devices using the CLI, ensure that you repeat the install process on multiple devices.

Supported Devices for Software Maintenance Upgrade

Release	Supported Devices
Cisco IOS XE Catalyst SD-WAN Release 17.9.5a and later releases of Cisco IOS XE Catalyst SD-WAN Release 17.9.x Cisco IOS XE Catalyst SD-WAN Release 17.12.3a and later releases of Cisco IOS XE Catalyst SD-WAN Release 17.12.x Cisco IOS XE Catalyst SD-WAN Release 17.15.1a and later	• Cisco ISR 1000 Series Integrated Services Routers • Cisco IR1101 Integrated Services Router Rugged • Cisco ISR 4000 series Integrated Services Routers • Cisco ASR 1000 Series Aggregation Services Routers • Cisco Catalyst 8500 Series Edge Platforms • Cisco Catalyst 8500L Series Edge Platforms • Cisco Catalyst 8000v Series Edge Platforms
Cisco IOS XE Catalyst SD-WAN Release 17.12.3a and later releases of Cisco IOS XE Catalyst SD-WAN Release 17.12.x	• Cisco Catalyst 8300 Series Edge Platforms • Cisco Catalyst 8200L Series Edge Platforms
Cisco IOS XE Catalyst SD-WAN Release 17.12.3a and later releases of Cisco IOS XE Catalyst SD-WAN Release 17.12.x	Cisco ISR 1100 and ISR 1100X Series Integrated Services Routers

Manage Software Maintenance Upgrade Images

Use Cisco SD-WAN Manager to add, upgrade and activate, or deactivate and remove an SMU image.

Note When you activate or deactivate an SMU image, the device may reboot, depending on the SMU image. A non-reload SMU type does not trigger a device reboot; a reload SMU type triggers a device reboot.

Add, View, and Activate an SMU Image

1. Add an SMU image using the Cisco SD-WAN Manager software repository.

   See the Cisco SD-WAN Manager Add Software Images to Repository procedure in the *Cisco Catalyst SD-WAN Monitor and Maintain Configuration Guide*.

2. View SMU images using the Cisco SD-WAN Manager software repository.

   See theCisco SD-WAN Manager View Software Images procedure in the *Cisco Catalyst SD-WAN Monitor and Maintain Configuration Guide*. Note the following points when viewing SMU images:

- The **Available SMU Versions** column displays the number of SMU images available for the current base image version (Cisco IOS XE image version).
- View the defects that are associated with an SMU image by clicking a desired entry in the **Available SMU Versions** column. In the **Available SMU Versions** dialog box, you can view the defect ID, the corresponding SMU version, and the SMU types, such as non-reload or reload.
- In the **Available SMU Versions** dialog box, delete an SMU version by clicking the delete icon next to an SMU version.

3. Upgrade an SMU image using the Cisco SD-WAN Manager software upgrade window.

   See the Cisco SD-WAN Manager Upgrade the Software Image on a Device procedure in the *Cisco Catalyst SD-WAN Monitor and Maintain Configuration Guide*. Note the following points about the SMU image that you choose to upgrade:

   - In the devices table, the **Available SMUs** column displays the number of SMU images that are available for the current base image version.
   - View a list of all available SMU versions and the upgrade images for a device by clicking a desired entry under the **Available SMUs** column. In the **Available SMUs** dialog box, you can view the SMU versions, SMU types, and the state of an SMU version.

     The SMU version is in the format *base_image_version.cdet_id*.
   - In the **Upgrade** dialog box, optionally check **Activate and Reboot** to activate an SMU image and perform a reboot of the Cisco IOS XE Catalyst SD-WAN device automatically.

     After you check the **Activate and Reboot** check box, Cisco SD-WAN Manager installs and activates the SMU image on a device and triggers a reload based on the SMU type. For more Information about activating a software image, see the Cisco SD-WAN Manager Activate a Software Image procedure in the *Cisco Catalyst SD-WAN Monitor and Maintain Configuration Guide*.

   After a successful upgrade of an SMU image, the Cisco IOS XE Catalyst SD-WAN device sends a corresponding success message.

Deactivate or Remove an SMU Image

Deactivate an SMU image and remove the image from a device using the Delete a Software Image procedure in the *Cisco Catalyst SD-WAN Monitor and Maintain Configuration Guide*.

Onboarding ISR1100 to Cisco SD-WAN Manager

1. Do not enable the Cisco IOS XE Catalyst SD-WAN device interface on the ISR1100 device.
2. Add the serial.viptela file to Cisco SD-WAN Manager to add the device.
3. From the Cisco SD-WAN Manager menu, choose **Configuration** > **Devices** > **Migrate Device** to migrate from viptela operating system to Cisco IOS XE operating system.
4. Enable the Cisco IOS XE Catalyst SD-WAN device interface to bring up the control connections.
5. Verify the device sync up in Cisco SD-WAN Manager.

Install and Activate an SMU Image Using the CLI

Device reboot:

When you activate an SMU image, the device may reboot, depending on the SMU image. A non-reload SMU type does not trigger a device reboot; a reload SMU type triggers a device reboot.

Before you begin

- Download an SMU image from Cisco:

  Download an SMU image for your release from the Cisco site, https://software.cisco.com.

- Upload an SMU image:

  Upload an SMU image to make it available for installation.

  - Upload an SMU image by adding the image to the device software repository using Cisco SD-WAN Manager. For more information about adding, viewing, and activate an SMU image, see Manage Software Maintenance Upgrade Images, on page 3.
  - Upload an SMU image by copying the image to the bootflash of your device using the CLI.

Procedure

Step 1 Use the **copy** command to upload the SMU image from the file server to the bootflash of the device.

Step 2 If not already configured, configure the time limit for confirming that an SMU image activation is successful.

The range is 1 to 60 minutes. We recommend a time limit of at least 15 minutes.

```
Device# config-transaction
Device(config)# system
Device(config-system)# upgrade-confirm minutes
```

Step 3 Install an SMU image from the bootflash of your device and perform a compatibility check for the device and SMU package version.

```
Device# request platform software sdwan smu install file-path
```

Step 4 Use the **show install summary** command to confirm that the SMU image is installed.

If the **request platform software sdwan smu install** command was successful, the IMG row of the command output shows the build number. Make note of the version number. Use this as the build number in a subsequent step.

```
Device# show install summary
```

Step 5 Use the **show install package** command with **| include Defect ID** to display the defect ID of the issue addressed by the SMU image.

```
show install package bootflash:filename | include Defect ID
```

The command output shows the defect ID.

Step 6 Activate the SMU image on a Cisco IOS XE Catalyst SD-WAN device. For the build number, use the five-part build number displayed in a previous step. For the SMU defect ID, use the defect ID displayed in a previous step.

```
Device# request platform software sdwan smu activate build-number.smu-defect-id
```

Step 7 Confirm the upgrade of the SMU image within the configured confirmation time limit.

```
Device# request platform software sdwan smu upgrade-confirm
```

Note
If you don't issue this command on the device within the time limit that is specified in the **upgrade-confirm** *minutes* command, the device automatically reverts to the state that it was in before the SMU image activation.

Step 8 Use the **show install summary** command to confirm that the image is activated. For the IMG and SMU rows, the St column shows the letter C to indicate that the image is activated and committed.

Example

The following commands configure an upgrade confirmation time limit of 15 minutes.

```
Device# config-transaction
Device(config)# system
Device(config-system)# upgrade-confirm 15
```

The following commands install and activate an SMU image, and confirm that the image is successfully activated.

```
Device# request platform software sdwan smu install
bootflash:isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin
install_add: START Thu May 30 09:22:47 UTC 2024
install_add: Adding IMG
 [1]  R0 Downloading (null)
 [1]  R0 Downloading (null)
--- Starting initial file syncing ---
Copying bootflash:isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin
from  R0 to  R0
Info: Finished copying to the selected
Finished initial file syncing

--- Starting SMU Add operation ---
Performing SMU_ADD on all members
Checking status of SMU_ADD on [R0]
SMU_ADD: Passed on [R0]
Finished SMU Add operation

SUCCESS: install_add
/bootflash/isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin Thu May
30 09:23:08 UTC 2024


Device# show install summary
[ R0 ] Installed Package(s) Information:
State (St): I - Inactive, U - Activated & Uncommitted,
            C - Activated & Committed, D - Deactivated & Uncommitted
--------------------------------------------------------------------------------
Type  St   Filename/Version
--------------------------------------------------------------------------------
IMG   C    17.12.03.0.3740
SMU   I   bootflash:isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin
```

```
--------------------------------------------------------------------------------
Auto abort timer: inactive
--------------------------------------------------------------------------------


Device# show install package
bootflash:isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin | include
 Defect ID
include Defect ID: CSCwj48209


Device# request platform software sdwan smu activate 17.12.03.0.3740.CSCwj48209
install_activate: START Thu May 30 09:23:40 UTC 2024
install_activate: Activating SMU
--- Starting SMU Activate operation ---
Performing SMU_ACTIVATE on all members
 [1] SMU_ACTIVATE package(s) on  R0
 [1] Finished SMU_ACTIVATE on  R0
Checking status of SMU_ACTIVATE on [R0]
SMU_ACTIVATE: Passed on [R0]
Finished SMU Activate operation

SUCCESS: install_activate Thu May 30 09:24:20 UTC 2024


Device# request platform software sdwan smu upgrade-confirm
install_commit: START Thu May 30 09:24:33 UTC 2024
--- Starting Commit ---
Performing Commit on all members
 [1] SMU_COMMIT packages(s) on  R0
 [1] Finished SMU_COMMIT packages(s) on  R0
Checking status of Commit on [R0]
Commit: Passed on [R0]
Finished Commit operation

SUCCESS: install_commit Thu May 30 09:24:51 UTC 2024


Device# show install summary
[ R0 ] Installed Package(s) Information:
State (St): I - Inactive, U - Activated & Uncommitted,
            C - Activated & Committed, D - Deactivated & Uncommitted
--------------------------------------------------------------------------------
Type  St   Filename/Version
--------------------------------------------------------------------------------
IMG   C    17.12.03.0.3740
SMU   C   bootflash:isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin

--------------------------------------------------------------------------------
Auto abort timer: inactive
--------------------------------------------------------------------------------
```

What to do next

If the SMU image is compatible with the Cisco IOS XE software image on the device, the upgrade task is successful and the SMU image is installed and activated on the device. If the upgrade task is not successful, the device automatically reverts to the state that it was in before the SMU image activation.

Deactivate and Remove an SMU Image Using the CLI

- Device reboot:

  When you deactivate an SMU image, the device may reboot, depending on the SMU image. A non-reload SMU type does not trigger a device reboot; a reload SMU type triggers a device reboot.

- Failed deactivation:

  If the SMU image deactivation on a device fails, the device automatically reverts to the state that it was in before the image deactivation.

Before you begin

Deactivate an image before removing:

Ensure that you deactivate the SMU image before you remove it.

Procedure

Step 1 If not already configured, configure the time limit for confirming that a SMU image deactivation is successful.

The range is 1 to 60 minutes. We recommend a time limit of at least 15 minutes.

```
Device# config-transaction
Device(config)# system
Device(config-system)# upgrade-confirm minutes
```

Step 2 Deactivate an SMU image on a Cisco IOS XE Catalyst SD-WAN device.

```
Device# request platform software sdwan smu deactivate build-number.smu-defect-id
```

Step 3 Verify that the SMU image is deactivated. In the SMU line of the command output, in the St column, the letter D indicates deactivated.

```
Device# show install summary
```

Step 4 Complete the SMU image deactivation.

```
Device# request platform software sdwan smu upgrade-confirm
```

If you do not issue this command on the device within the time limit specified in the **upgrade-confirm** *minutes* command, the image deactivation fails and the device automatically reverts to the state that it was in before the SMU image deactivation.

Step 5 Verify that the SMU image is inactive. In the SMU line of the command output, in the St column, the letter I indicates inactive.

```
Device# show install summary
```

Step 6 Get the version number of the image.

a) Use the **show install package** command to display the version number.

```
show install package bootflash:filename | include Version
```

b) The Version line of the output shows several numbers separated by periods. Copy the first five numbers of the version.

For example, if the output shows 17.12.03.0.27.1717035922..Dublin, copy 17.12.03.0.27. Use this as the build number in a subsequent step.

Step 7 Use the **show install package** command with **| include Defect ID** to display the defect ID of the issue addressed by the SMU image.

```
show install package bootflash:filename | include Defect ID
```

The command output shows the defect ID.

Step 8 Remove the SMU image from the device.

```
Device# request platform software sdwan smu remove build-number.smu-defect-id
```

Step 9 Verify that the SMU image has been removed. If successful, the command output does not have an SMU line for the removed SMU image.

```
Device# show install summary
```

Example

The following commands configure an upgrade confirmation time limit of 15 minutes.

```
Device# config-transaction
Device(config)# system
Device(config-system)# upgrade-confirm 15
```

The following commands inactivate and uninstall an SMU image, and confirm that the image is removed.

```
Device# request platform software sdwan smu deactivate 17.12.03.0.3740.CSCwj48209
install_deactivate: START Thu May 30 09:25:28 UTC 2024
install_deactivate: Deactivating
--- Starting SMU Deactivate operation ---
Performing SMU_DEACTIVATE on all members
Checking status of SMU_DEACTIVATE on [R0]
SMU_DEACTIVATE: Passed on [R0]
Finished SMU Deactivate operation

SUCCESS: install_deactivate Thu May 30 09:26:08 UTC 2024


Device# show install summary
[ R0 ] Installed Package(s) Information:
State (St): I - Inactive, U - Activated & Uncommitted,
            C - Activated & Committed, D - Deactivated & Uncommitted
--------------------------------------------------------------------------------
Type  St   Filename/Version
--------------------------------------------------------------------------------
IMG   C    17.12.03.0.3740
SMU   D   bootflash:isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin

--------------------------------------------------------------------------------
Auto abort timer: active , time before rollback - 00:29:52
--------------------------------------------------------------------------------
```

```
Device# request platform software sdwan smu upgrade-confirm
install_commit: START Thu May 30 09:26:21 UTC 2024
--- Starting Commit ---
Performing Commit on all members
 [1] SMU_COMMIT packages(s) on  R0
 [1] Finished SMU_COMMIT packages(s) on  R0
Checking status of Commit on [R0]
Commit: Passed on [R0]
Finished Commit operation

SUCCESS: install_commit Thu May 30 09:26:38 UTC 2024


Device# show install summary
[ R0 ] Installed Package(s) Information:
State (St): I - Inactive, U - Activated & Uncommitted,
            C - Activated & Committed, D - Deactivated & Uncommitted
--------------------------------------------------------------------------------
Type  St   Filename/Version
--------------------------------------------------------------------------------
IMG   C    17.12.03.0.3740
SMU   I    bootflash:isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin

--------------------------------------------------------------------------------
Auto abort timer: inactive
--------------------------------------------------------------------------------

Device# show install package
bootflash:isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin | include
 Version
Version: 17.12.03.0.27.1717035922..Dublin


Device# show install package
bootflash:isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin | include
 Defect ID
include Defect ID: CSCwj48209


Device# request platform software sdwan smu remove 17.12.03.0.27.CSCwj48209
install_remove: START Thu May 30 09:27:39 UTC 2024
install_remove: Removing SMU
Preparing packages list to remove ...
 prepare_rm_pkg_list
/bootflash/isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin

The following files will be deleted:
   [R0]: /bootflash/isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin
Deleting file
/bootflash/isr1100be-universalk9.2024-05-29_19.25_smudev.0.CSCwj48209.SSA.smu.bin ... done.
SUCCESS: Files deleted.
SUCCESS: install_remove Thu May 30 09:27:47 UTC 2024


Device# show install summary
[ R0 ] Installed Package(s) Information:
State (St): I - Inactive, U - Activated & Uncommitted,
            C - Activated & Committed, D - Deactivated & Uncommitted
--------------------------------------------------------------------------------
Type  St   Filename/Version
--------------------------------------------------------------------------------
IMG   C    17.12.03.0.3740

--------------------------------------------------------------------------------
```

```
Auto abort timer: inactive
--------------------------------------------------------------------------------
```