

Software Maintenance Upgrade

The Software Maintenance Upgrade (SMU) is a package that can be installed on a system to provide a fix or a security resolution to a released image.

- Information About Software Maintenance Upgrade, on page 1
- How to Manage Software Maintenance Updates, on page 2
- Configuration Examples for Software Maintenance Upgrade, on page 6

Information About Software Maintenance Upgrade

SMU Overview

The SMU is a package that can be installed on a system to provide a fix or a security resolution to a released image. An SMU package is provided on a per release and per component basis.

An SMU provides a significant benefit over classic Cisco IOS software because it allows you to address network issues quickly while reducing the time and scope of the testing required. The Cisco IOS XE platform internally validates SMU compatibility and does not allow you to install noncompatible SMUs.

All the SMUs are integrated into the subsequent Cisco IOS XE software maintenance releases. An SMU is an independent and self-sufficient package and it does not have any prerequisites or dependencies. You can choose which SMUs to install or uninstall in any order.

SMUs are supported only on Extended Maintenance releases and for the full lifecycle of the underlying software release.

Perform these basic steps to install an SMU:

1. Add the SMU to the filesystem.
2. Activate the SMU on the system.
3. Commit the SMU changes so that it is persistent across reloads.

SMU Workflow

The SMU process is initiated with a request to the Cisco Customer Support. Contact your customer support to raise an SMU request.

At release time, the SMU package is posted to the Cisco Software Download page and can be downloaded and installed.

SMU Package

The SMU package contains a small set of files for patching the release along with metadata that describes the contents of the package, and fix for the reported issue that the SMU is requested for.

SMU Reload

The SMU type describes the effect the installed SMU has on the corresponding system. SMUs might not have an impact on traffic, or might result in device restart, reload, or switchover. Run the **show install package flash**: *filename* command to verify whether a reload is required or not.

Hot patching enables SMU to take effect after activation without the system having to be reloaded. After the SMU is committed, the changes are persistent across reloads. In certain cases, SMUs may require a cold (complete) reload of the operating system. This action affects the traffic flow for the duration of the reload. If a cold reload is required, users will be prompted to confirm the action.

How to Manage Software Maintenance Updates

The following sections provide information about managing SMUs.

You can install, activate, and commit an SMU package using a single command or using separate commands .

Installing an SMU Package

This task shows how to use the **install add file activate commit** command for installing an SMU package.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	**install add file flash:** *filename* [**activate commit**] **Example:** `Device# install add file flash:ess9300_iosxe.BLD_SMU_20180302_085005_TWIG_LATEST_20180306_013805.3.SSA.smu.bin activate commit`	Copies the maintenance update package from flash, performs a compatibility check for the platform and image versions, activates the SMU package, and makes the package persistent across reloads. This command extracts the individual components of the .bin file into the subpackages and packages.conf files. You can also copy the maintenance update package from from a remote location (through FTP, HTTP, HTTPS, or TFTP).

	Command or Action	Purpose
		Note If the SMU file is copied using TFTP, use bootflash to activate the SMU.
Step 3	**exit** **Example:** `Device# exit`	Exits privileged EXEC mode and returns to user EXEC mode.

Managing an SMU Package

SUMMARY STEPS

1. **enable**
2. **install add file flash:** *filename*
3. **install activate file flash:** *filename*
4. **install commit**
5. **install rollback to** {**base** | **committed** | **id** *commit-ID*}
6. **install deactivate file flash:** *filename*
7. **install remove** {**file flash:** *filename* | **inactive**}
8. **show version**
9. **show install summary**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	**install add file flash:** *filename* **Example:** `Device# install add file flash:ess9300_iosxe.BLD_SMU_20180302_085005_ TWIG_LATEST_20180306_013805.3.SSA.smu.bin`	Copies the SMU package from a source location to the device (in case source location is remote), and then performs a compatibility check for the platform and image versions, and adds the SMU package on all member nodes or FRUs, as applicable. This command also runs base compatibility checks on a file to ensure that the SMU package is supported on the platform. It also adds an entry in the `package/SMU.sta` file, so that its status can be monitored and maintained.
Step 3	**install activate file flash:** *filename* **Example:**	Runs compatibility checks, installs the package, and updates the package status details.

	Command or Action	Purpose
	`Device# install activate add file flash:ess9300_iosxe.BLD_SMU_20180302_085005_ TWIG_LATEST_20180306_013805.3.SSA.smu.bin`	
Step 4	**install commit** **Example:** `Device# install commit`	Commits the activation changes to be persistent across reloads. The commit can be done after activation when the system is up, or after the first reload. If a package is activated, but not committed, it remains active after the first reload, but not after the second reload.
Step 5	**install rollback to** {**base** | **committed** | **id** *commit-ID*} **Example:** `Device# install rollback to committed`	Returns the device to the previous installation state.
Step 6	**install deactivate file flash:** *filename* **Example:** `Device# install deactivate file flash:ess9300_iosxe.BLD_SMU_20180302_085005_ TWIG_LATEST_20180306_013805.3.SSA.smu.bin`	Deactivates an active package and updates the package status.
Step 7	**install remove** {**file flash:** *filename* | **inactive**} **Example:** `Device# install remove file flash:ess9300_iosxe.BLD_SMU_20180302_085005_ TWIG_LATEST_20180306_013805.3.SSA.smu.bin`	Verifies if the specified SMU is inactive and if it is, deletes it from the file system. The **inactive** option deletes all the inactive packages from the file system.
Step 8	**show version** **Example:** `Device# show version`	Displays the image version on the device.
Step 9	**show install summary** **Example:** `Device# show install summary`	Displays information about the installation status of packages. The output of this command varies according to the **install** commands that are configured.

Installing an SMU Package: 1-Step Process

This task shows how to use the single **install add file activate commit** command for installing an SMU package.

Before you begin

Check that the SMU you are about to install corresponds to the software image installed on your device. For example, SMU `ess9300_lite_iosxe.`**`17.04.01`**`.CSCvk70181.SPA.smu.bin` is compatible with software image `ess9300_lite_iosxe.`**`17.04.01`**`.SPA.bin`.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	**install add file flash:** *filename* [**activate commit**] **Example:** `Device# install add file flash:ess9300_lite_iosxe.17.04.01.CSCvk70181.SPA.smu.bin activate commit`	Copies the maintenance update package from flash to the device, performs a compatibility check for the platform and image versions, activates the SMU package, and makes the package persistent across reloads. This command extracts the individual components of the .bin file into the subpackages and packages.conf files. You can also copy the SMU package from from a remote location (through FTP, HTTP, HTTPS, or TFTP). **Note** If the SMU file is copied using TFTP, use bootflash to activate the SMU.
Step 3	**exit** **Example:** `Device# exit`	Exits privileged EXEC mode and returns to user EXEC mode.

Managing an SMU

This task shows how to rollback the installation state, deactivate, and remove a previously installed SMU package from the device. This can be used for a SMU that has been installed with the 1-step and 3-step process.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	**install rollback to** {**base** | **committed** | **id** *commit-ID*} **Example:** `Device# install rollback to committed`	Returns the device to the previous installation state. After the rollback, a reload is required.
Step 3	**install deactivate file** *location filename* **Example:** `Device# install deactivate file flash:ess9300_lite_iosxe.17.04.04.CSCvk70181.SPA.smu.bin`	Deactivates an active package, updates the package status, and triggers a process to restart or reload.

	Command or Action	Purpose
Step 4	**install remove** {**file** *location filename* | **inactive**} **Example:** `Device# install remove file flash:ess9300_lite_iosxe.17.04.04.CSCvk70181.SPA.smu.bin`	Checks if the specified SMU is inactive and if it is, deletes it from the file system. The **inactive** option deletes all the inactive packages from the file system.
Step 5	**show version** **Example:** `Device# show version`	Displays the image version on the device.
Step 6	**show install summary** **Example:** `Device# show install summary`	Displays information about the active package. The output of this command varies according to the **install** commands that are configured.

Configuration Examples for Software Maintenance Upgrade

The following is a list of SMU configuration examples.

Example: Managing an SMU

The following example shows how to copy an SMU file to TFTP:

```
Device# copy tftp://192.168.0.1//tftpboot/folder1/cat3k-
universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin

tftp:Destination filename [cat3k-
universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin]?

Accessing tftp://192.168.0.1//auto/tftpboot/folder1/cat3k-
universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin...
Loading /auto/tftpboot/folder1/cat3k-
universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin from
192.168.0.1 (via GigabitEthernet0): !
[OK - 17668 bytes]
17668 bytes copied in 0.058 secs (304621 bytes/sec)
```

The following is a sample output from the **show install summary** command:

```
Device# show install summary

[ Switch 1 ] Installed Package(s) Information:
State (St): I - Inactive, U - Activated & Uncommitted,
C - Activated & Committed, D - Deactivated & Uncommitted
--------------------------------------------------------------------------------
Type St Filename/Version
--------------------------------------------------------------------------------
SMU C flash:cat3k-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin
IMG C 16.6.3.0
```

The following example shows how to add a maintenance update package file:

```
Device# install add file tftp://192.168.0.1//tftpboot/folder1/cat3k-
universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin

install_add: START Sat Feb 26 14:06:04 PST 2017
SUCCESS: install_add tftp://192.168.0.1//tftpboot/folder1/cat3k-
universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin Sat Feb
26 14:06:12 PST 2017
Device#
```

The following is a sample output from the **show install summary** command after adding an SMU package file to the device:

```
Device# show install summary

Active Packages:
No packages
Inactive Packages:
tftp:cat3k-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin
Committed Packages:
No packages
Uncommitted Packages:
No packages
Device#
```

The following example shows how to activate an added SMU package file:

```
Device# install activate file tftp://192.168.0.1//tftpboot/folder1/cat3k-
universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin

install_activate: START Sat Feb 26 14:10:55 PST 2017
The activation step would require a reload. Do you want to proceed? [y/n]y
Regular SMU. Reloading the box to complete activation of the SMU...
Feb 26 14:11:23.873 R0/0: %PMAN-5-EXITACTION: Process manager is exiting:
reload action requested
Initializing Hardware ...
Checking for PCIe device presence...done
System integrity status: 0x610
Rom image verified correctly
<after reload>
Device#
```

The following is a sample output from the **show version** command:

```
Device# show version

Cisco IOS XE Software, Version BLD_POLARIS_DEV_SMU_LATEST_20170110_13.15.1 -
SMU-PATCHED
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT3K_CAA-UNIVERSALK9-M),
Experimental Version 16.6.20170110_13.15.1 [BLD_V166_SMU_LATEST_20170127_13.15.1 SMU-PATCHED]
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Sat 26-Feb-17 16:07 by mcpre
...
```

The following is a sample output from the **show install summary** command displays the status of the model package as active and uncommitted:

```
Device# show install summary

Active Packages:
    tftp:cat3k-universalk9.2017-01-10_13.15.1.CSCxxx.SSA.dmp.bin
Inactive Packages:
```

```
   No packages
Committed Packages:
    tftp:cat3k-universalk9.2017-01-10_13.15.1.CSCxxx.SSA.dmp.bin
Uncommitted Packages:
   No packages
Device#
```

The following is a sample output from the **show install active** command:

```
Device# show install active

Active Packages:
tftp:cat3k-universalk9.2017-01-10_13.15.1.CSCxxx.SSA.dmp.bin
```

The following example shows how to execute the **install commit** command:

```
Device# install commit

install_commit: START Sat Feb 26 06:46:48 UTC 2017
SUCCESS: install_commit Sat Feb 26 06:46:52 UTC 2017
Device#
```

The following is a sample output from the **show install summary** command displays that the update package is now committed, and that it will be persistent across reloads:

```
Device# show install summary

Active Packages:
tftp:cat3k-universalk9.2017-01-10_13.15.1.CSCxxx.SSA.dmp.bin
Inactive Packages:
No packages
Committed Packages:
tftp:cat3k-universalk9.2017-01-10_13.15.1.CSCxxx.SSA.dmp.bin
Uncommitted Packages:
No packages
Device#
```

The following example shows how to rollback an update package to the committed package:

```
Device# install rollback to base

install_rollback: START Sat Feb 26 11:27:41 PST 2017
This rollback would require a reload. Do you want to proceed? [y/n]y
2 install_rollback: Reloading the box to take effect

Initializing Hardware ...
<after reload>
Device#
```

The following is a sample output from the **show install summary** command:

```
Device# show install summary

Active Packages:
tftp:cat3k-universalk9.2017-01-10_13.15.1.CSCxxx.SSA.dmp.bin
Inactive Packages:
No packages
Committed Packages:
tftp:cat3k-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin
Uncommitted Packages:
No packages
```

```
Device#
```

The following is a sample output from the **show install log** command:

```
Device# show install log

[0|install_op_boot]: START Sat Feb 26 19:31:50 Universal 2017
[0|install_op_boot]: END SUCCESS Sat Feb 26 19:31:56 Universal 2017
```

The following example shows how to deactivate an SMU package file:

```
Device# install deactivate file tftp:cat3k-
universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin

install_deactivate: START Sat Feb 26 10:49:07 PST 2017
The activation step would require a reload. Do you want to proceed? [y/n]y
Regular SMU. Reloading the box to complete activation of the SMU...

Initializing Hardware...
...
<after reload>
Device#
```

The following is a sample output from the **show install summary** command:

```
Device# show install summary

Active Packages:
No packages
Inactive Packages:tftp:cat3k-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin
Committed Packages:
No packages
Uncommitted Packages:
No packages
Device#
```

The following example shows how to remove an SMU from the device:

```
Device# install remove file tftp:cat3k-
universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin

install_remove: START Sat Feb 26 12:09:43 PST 2017
SUCCESS: install_remove /tftp/cat3k-universalk9.2017-01-10_13.15.1.
CSCxxxxxxx.SSA.dmp.bin Sat Feb 26 12:09:49 PST 2017
Device#
```

The following is a sample output from the **show install summary** command:

```
Device# show install summary

Active Packages:
No packages
Inactive Packages:
No packages
Committed Packages:
No packages
Uncommitted Packages:
No packages
```