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.

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Restrictions for Software Maintenance Upgrade

- SMU supports patching using install mode only.
- In Service Software Upgrade (ISSU) is not supported.

Information About Software Maintenance Upgrade

SMU Overview

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

An SMU package is provided on a per release and per component basis, and is specific to the platform.

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

All 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.

Starting from Cisco IOS XE Everest 16.6.1, SMUs are supported only on Extended Maintenance releases and for the full lifecycle of the underlying software release.

The following are three basic steps to install an SMU:

- Adding the SMU to the filesystem.
- Activating the SMU on the system.
- Committing the SMU changes so that it is persistent across reloads.

Software Maintenance Upgrade Package

The SMU package contains a small set of files for patching the release along with meta data that describes the contents of the package.

SMU Workflow

The SMU process is initiated with a request to the SMU committee. 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

An SMU package contains the metadata and fix for the reported issue that the SMU is requested for.

SMU Reload

The SMU type describes the effect to a system after installing the SMU. SMUs can be non-traffic affecting or can result in device restart, reload, or switchover.

All SMUs require a cold reload of the system during activation. A cold reload is the complete reload of the operating system. This action affects the traffic flow for the duration of the reload (~5 min currently). This reload ensures that all processes are started with the correct libraries and files that are installed as part of the SMU.

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 .

Managing an SMU Package

SUMMARY STEPS

1. **enable**
2. **install add file** *location filename*
3. **install activate file** *location filename*
4. **install commit file** *location filename*
5. **install rollback to** {**base** | **committed** | **id** *commit-ID*}

6. **install deactivate file** *location filename*
7. **install remove** {**file** *location 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** *location filename* **Example:** `Device# install add file tftp://172.16.0.1//tftpboot/folder1/cat3k-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin`	Copies the maintenance update package from a remote location to the device, and performs a compatibility check for the platform and image versions. • This command 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** *location filename* **Example:** `Device# install activate file tftp://172.16.0.1//tftpboot/folder1/cat3k-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin`	Runs compatibility checks, installs the package, and updates the package status details. • For a restartable package, the command triggers the appropriate post-install scripts to restart the necessary processes, and for non-restartable packages it triggers a reload.
Step 4	**install commit file** *location filename* **Example:** `Device# install commit file tftp://172.16.0.1//tftpboot/folder1/cat3k-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin`	Commits the activation changes to be persistent across reloads. • The commit can be done after activation while 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. • After the rollback, a reload is required.
Step 6	**install deactivate file** *location filename* **Example:** `Device# install deactivate file tftp://172.16.0.1//tftpboot/folder1/cat3k-universalk9.2017-01-10_13.15.1.CSCxxxxxxx.SSA.dmp.bin`	Deactivates an active package, updates the package status, and triggers a process to restart or reload.

	Command or Action	Purpose
Step 7	**install remove** {**file** *location filename* | **inactive**} **Example:** `Device# install remove file tftp://172.16.0.1//tftpboot/folder1/cat3k-universalk9.2017-01-10_13.15.1.CSCxxxxxx.SSA.dmp.bin`	Deletes all or the specified inactive SMU package 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 active package. • The output of this command varies according to the **install** commands that are configured.

Configuration Examples for Software Maintenance Upgrade

Example: Managing an SMU

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

```
Device# copy tftp://172.16.0.1//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://172.16.0.1//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
172.16.0.1 (via GigabitEthernet0): !
[OK - 17668 bytes]
17668 bytes copied in 0.058 secs (304621 bytes/sec)
```

The following is 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://172.16.0.1//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://172.16.0.1//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 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://172.16.0.1//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 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 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 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 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 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 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 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 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
```

Feature Information for Software Maintenance Upgrade

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for Software Maintenance Upgrade

Release	Modification
Cisco IOS XE Fuji 16.8.1a	This feature was introduced The SMU is a package that can be installed on a system in order to provide a patch fix or a security resolution to a released image The following commands were introduced or updated: **install**, **show install**.