

Cisco 9500: IOS-XE/Firmware Upgrade (Install Mode)

NOTE:

- This procedure is aimed at Cisco 9500 ("vanilla" and high-performance) switch ONLY.
- IOS-XE Bundle Mode is not covered.
- 3850, 9300 (vanilla & high-performance), ISR 1k, ISR 4k and ASR is not covered.
- Router(s) & switch(es) running "classic" IOS is not covered.

A Word from our Sponsors:

There is a very fine line between writing something short-and-sweet and writing something comprehensive while losing the target "market" in the process. I have done all I can to make this document as "digestible" as possible without losing much of the important content but still maintaining some forward momentum.

Introduction:

Switch and/or router firmware had (past tense) a simple procedure, however, for IOS-XE each platform has different commands, process & procedures, and "gotchas". Because of this, I have broken up the process into different sections: 3850, 9300 and routers.

Section 1: General Procedure

Section 2: Install SMU

~~Section 3: Emergency-Install~~

NOTE: 9500 do NOT support Emergency-Install

Section 1: General Procedure

1. Read the Release Notes very carefully.
2. Usually, IOS-XE firmware & SMU have a filename extension of "bin".
3. Clean the flash: `install remove inactive`
4. Copy the file into the switch/stack master. Make sure the boot-variable string is pointing to "packages.conf" file.

```
C9500-24Y4C#sh boot
BOOT variable = bootflash:packages.conf;
MANUAL BOOT variable = no
BAUD variable = 9600
ENABLE_BREAK variable does not exist
BOOTMODE variable does not exist
IPXE_TIMEOUT variable does not exist
CONFIG_FILE variable does not exist
```

5. Initiate Install Mode (**DISRUPTIVE**):

WARNING: The following below command will cause the switch/stack/VSS pair to reboot. F**k!

```
install add file bootflash:filename.bin activate commit
```

NOTE: Same command for VSS – The firmware will be copied to the secondary switch automatically.

```
C9500-24Y4C#> file bootflash:cat9k_iosxe.16.12.05b.SPA.bin activate commit
-----
-- activate_commit: START Fri Jun 25 06:49:42 UTC 2021

System configuration has been modified.
Press Yes(y) to save the configuration and proceed.
Press No(n) for proceeding without saving the configuration.
Press Quit(q) to exit, you may save configuration and re-enter the command. [y/n/q]y

[OK]Modified configuration has been saved
install_add_activate_commit: Adding PACKAGE
install_add_activate_commit: Checking whether new add is allowed ....

--- Starting Add ---
Performing Add on Active/Standby
[R0] Add package(s) on R0
[R0] Finished Add on R0
Checking status of Add on [R0]
Add: Passed on [R0]
Finished Add

Image added. Version: 16.12.05b.0.7
install_add_activate_commit: Activating PACKAGE
/usr/binos/conf/install_util.sh: fork: retry: No child processes
Following packages shall be activated:
/bootflash/cat9k-wlc.16.12.05b.SPA.pkg
/bootflash/cat9k-webui.16.12.05b.SPA.pkg
/bootflash/cat9k-srdriver.16.12.05b.SPA.pkg
/bootflash/cat9k-sipspace.16.12.05b.SPA.pkg
/bootflash/cat9k-sipbase.16.12.05b.SPA.pkg
/bootflash/cat9k-rpboot.16.12.05b.SPA.pkg
/bootflash/cat9k-rpbase.16.12.05b.SPA.pkg
/bootflash/cat9k-guestshell.16.12.05b.SPA.pkg
/bootflash/cat9k-espbase.16.12.05b.SPA.pkg
/bootflash/cat9k-cc_srdriver.16.12.05b.SPA.pkg

This operation may require a reload of the system. Do you want to proceed? [y/n]
```



WARNING: The following above command will cause the switch/stack/VSS pair to reboot. F**k!

6. [RECOMMENDED][OPTIONAL] Clean the flash: `install remove inactive`
7. DONE.

Section 2: Install SMU

Software Maintenance Update (aka “patch”)

WARNING:

- Only routers and switches running IOS-XE support SMU.
- Router(s) & switch(es) running “classic” IOS do not support SMU.
- **IMPORTANT:** Always treat SMU update as disruptive (reboots the switch/stack).
- **IMPORTANT:** SMU file is platform-specific.
- **IMPORTANT:** SMU file is version-specific.

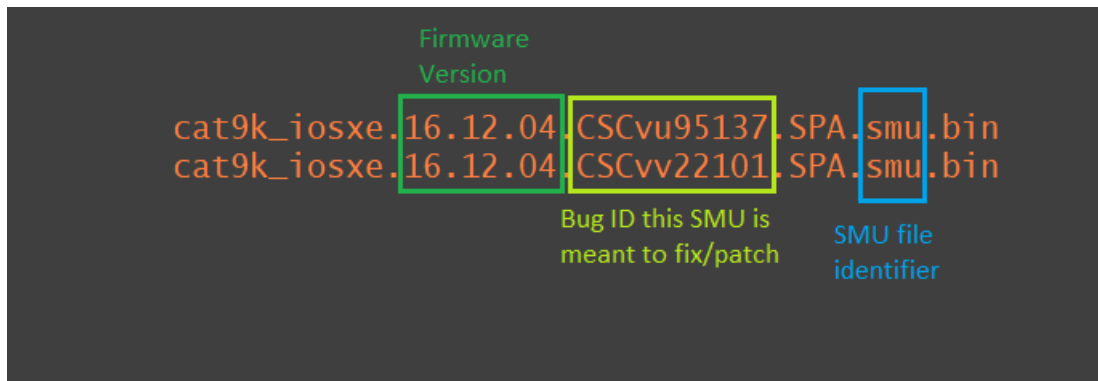


Image (above): Sample SMU filename

```
Switch#
Jun 25 04:55:02.635: %INSTALL-5-INSTALL_START_INFO: Switch 1 R0/0: install_engine: Started install one-shot flash:cat3k-caa-universalk9.16.12.04.CSCv28324.SPA.smu.bin
Jun 25 04:55:03.124: %INSTALL-3-OPERATION_ERROR_MESSAGE: Switch 1 R0/0: install_engine: failed to install_add_activate_commit package flash:cat3k-caa-universalk9.16.12.04.CSCv28324.SPA.smu.bin, Error: File
flash:cat3k-caa-universalk9.16.12.04.CSCv28324.SPA.smu.bin is corrupt or is not a valid package.
Jun 25 04:55:03.156: %INSTALL-5-OPERATION_ERROR_MESSAGE: Switch 1 R0/0: install_engine: failed to install_add_activate_commit package flash:cat3k-caa-universalk9.16.12.04.CSCv28324.SPA.smu.bin, Error: insta
ll_add_activate_commit : flash:cat3k-caa-universalk9.16.12.04.CSCv28324.SPA.smu.bin is not valid file or cannot be handled by install CLI.
```

Image (above): Sample of a failed SMU install due to hardware mismatch.

```
Switch#sh:cat9k_iosxe.16.12.04.CSCvu95137.SPA.smu.bin activate commit
install_add_activate_commit: START Fri Jun 25 04:57:43 UTC 2021
install_add_activate_commit: Adding SMU
install_add_activate_commit: Checking whether new add is allowed ....
--- Starting initial file syncing ---
Info: Finished copying flash:cat9k_iosxe.16.12.04.CSCvu95137.SPA.smu.bin to the selected switch(es)
Finished initial file syncing
--- Starting SMU Add operation ---
Performing SMU_ADD on all members
Jun 25 04:57:44.719: %INSTALL-5-INSTALL_START_INFO: Switch 1 R0/0: install_engine: Started install one-shot flash:cat9k_iosxe.16.12.04.CSCvu95137.SPA.smu.bin [1] SMU ADD package(s) on switch 1
FAILED: install_add /flash/cat9k_iosxe.16.12.04.CSCvu95137.SPA.smu.bin: Invalid installation package.
[1] Version 16.12.4 does not match with 16.12.05b.0.7.
[1] FINISHED SMU_ADD on SWITCH 1
Checking status of SMU_ADD on [1]
SMU_ADD: Passed on [1]. Failed on [1]
Finished SMU Add operation
[INFO: install_add_activate_commit exit(1) Fri Jun 25 04:57:51 UTC 2021
```

Image (above): Sample of a failed SMU install due to incompatible version

Procedure

1. Read the Release Notes very carefully.
2. Usually, SMU firmware have a filename extension of “bin”.
3. Copy the SMU file into the switch.
4. Install the SMU:

```
install add file flash:SMU_filename.bin activate commit
```

WARNING: Immediately after entering “y” may/will cause the router &/or switch to reboot.

5. Verify the SMU has been successfully installed.
 - Fast Method: `sh version | begin Active SMU`

```
sh version | begin Active SMU
Active SMU Information:
State (St): C - Committed, U - Uncommitted
-----
Type Defect_ID Version St Filename
-----
SMU CSCvu95137 16.12.4.0 C cat9k_iosxe.16.12.04.CSCvu95137.SPA.smu.bin
SMU CSCvv22101 16.12.4.0 C cat9k_iosxe.16.12.04.CSCvv22101.SPA.smu.bin
-----
```

- Slow Method: sh install summary

```
[ Switch 1 2 3 ] Installed Package(s) Information:
State (St): I - Inactive, U - Activated & Uncommitted,
C - Activated & Committed, D - Deactivated & Uncommitted
-----
Type St Filename/Version
-----
SMU C flash:cat9k_iosxe.16.12.04.CSCvu95137.SPA.smu.bin
SMU C flash:cat9k_iosxe.16.12.04.CSCvv22101.SPA.smu.bin
IMG C 16.12.4.0.4480
-----
Auto abort timer: inactive
-----
```

6. DONE.