

Software Maintenance Upgrades

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Overview

A software maintenance upgrade (SMU) is a package file that contains fixes for a specific defect. SMUs are created to respond to immediate issues and do not include new features. Typically, SMUs do not have a large impact on device operations. SMU versions are synchronized to the package major, minor, and maintenance versions they upgrade.

The effect of an SMU depends on its type:

- Process restart SMU-Causes a process or group of processes to restart on activation.
- Reload SMU-Causes a parallel reload of supervisors and line cards.

SMUs are not an alternative to maintenance releases. They provide a quick resolution of critical issues. All defects fixed by SMUs are integrated into the next maintenance releases of upcoming software trains, as applicable. SMUs also have the following considerations:

- SMUs are created for the following:
    - Critical SIR PSIRTs without a workaround or fix

- Severity1 and Severity2 issues without a workaround or fix

- If a fix is already available in a maintenance release of the same software train or already released on a later long-lived release, no SMU is provided. You are encouraged to acquire the fix from the maintenance release.

Note Depending on the fix, in some cases it may not be possible to provide an SMU. In such cases, the only option is to upgrade to the next maintenance release when available.

For information on upgrading your device to a new feature or maintenance release, see the Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide .

For information on Cisco NX-OS optionality feature, see the Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide .

Note Activating an SMU does not cause any earlier SMUs, or the package to which the SMU applies, to be automatically deactivated.

Impact of Package Activation and Deactivation

The activation or deactivation of an SMU package can have an immediate impact on the system. The system can be affected in the following ways:

- New processes might be started.
- Running processes might be stopped or restarted.
- All processes in the line cards might be restarted. Restarting processes in the line cards is equivalent to a soft reset.
- The line cards might reload.
- No processes in the line cards might be affected.

Note You must address any issues that result from the revised configuration and reapply the configuration, if necessary.

Tip After the activation process completes, enter the **show install log** command to display the process results.

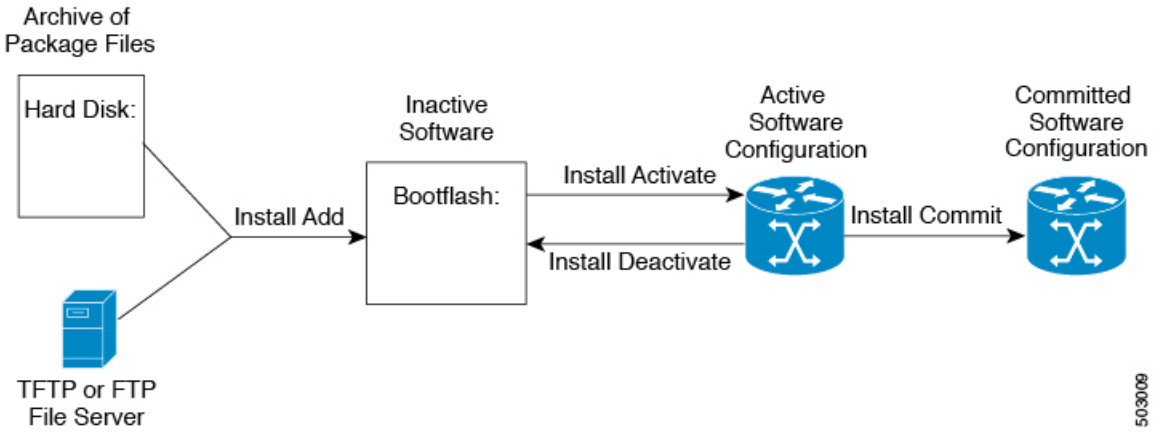
Package Management

The general procedure for adding and activating SMU packages on the device is as follows:

1. Copy the package file or files to a local storage device or file server.
2. Add the package or packages on the device using the **install add** command.
3. Activate the package or packages on the device using the **install activate** command.
4. Commit the current set of packages using the **install commit** command.
5. (Optional) Deactivate and remove the package.

The following figure illustrates the key steps in the package management process.

Figure 1: Process to Add, Activate, and Commit SMU Packages



Guidelines and Limitations

Prerequisites

These prerequisites must be met for a package to be activated or deactivated:

- You must be in a user group associated with a task group that includes the proper task IDs. If you suspect a user group assignment is preventing you from using a command, contact your AAA administrator for assistance.
- Verify that all line cards are installed and operating properly. For example, do not activate or deactivate packages while line cards are booting, while line cards are being upgraded or replaced, or when you anticipate an automatic switchover activity.

Release Specific Guidelines

- Beginning with Cisco NX-OS Release 9.3(9), you can apply a reload SMU along with (ND) ISSU to the same image version (currently running an image on the switch) without a disruptive reload of the switch. You can apply a reload SMU by upgrading to the same image version using ND-ISSU along with the reload SMU using the **install all nxos** <*same image*> **package** <*smu*> **non-disruptive** command.
- Beginning with Cisco NX-OS Release 10.3(4a)M, a new option is added to the **install all nxos** command, **keep-committed-smu** ,to retain the previously installed SMU after upgrade to the same image version when the SMU is compatible with the target image. Execute the command as follows:

install all nxos <*image*> **package** <*smu*> **keep-committed-smu**

Example: `switch# install all nxos nxos64-cs.10.4.3.M.bin package nxos64-cs.CSCxy11111-1.0.0-10.4.3.lib32_64_n9000.rpm keep-committed-smu non-disruptive`

General Guidelines

- No-reload options are supported in Cisco NX-OS Release 9.3(9) for the SMU installation. The **no-immediate-reload** option is used for activating or deactivating the SMU feature.
- Some packages require the activation or deactivation of other packages. If the SMUs have dependencies on each other, you cannot activate them without first activating the previous ones. SMU packages being activated must be compatible with the image version running in the switch.
- Activation is performed only after the package compatibility checks have been passed. If a conflict is found, an error message is displayed.
- You can install multiple SMU packages by creating a tar bundle. See the Advanced SMU Installation Methods, on page 19 section for more details.
- While a software package is being activated, other requests are not allowed to run on any of the impacted nodes. Package activation is completed when a message similar to this one appears:

  ```
  Install operation 1 completed successfully at Thu Jan 9 01:19:24 2014
  ```

- Each CLI install request is assigned a request ID, which can be used later to review the events.

Prepare for Package Installation

Before you begin

Determine if a software change is required. Verify that the new package is supported on your system. Some software packages require that other packages or package versions be activated, and some packages support only specific line cards.

Review the release notes for important information related to that release and to help determine the package compatibility with your device configuration.

Verify that the system is up, stable, and prepared for the software changes.

You should use several **show** commands to gather information in preparation for the SMU package installation.

Procedure

Step 1 Use this command to verify that the system is ready for SMU package installation, **show logging logfile | grep -i "System ready"**

Example:

```
switch# show logging logfile | grep -i "System ready"
```

Displays if your system is up. Configuring install commands before the system is ready, may result with an "Install operation 11 failed because cannot lock config" error message.

Step 2 Use this command to determine what software should be added on the device and to compare to the active software report after installation operations are complete, **show install active**

Example:

```
switch# show install active
```

Displays the active software on the device.

Step 3 Confirm that all modules are in the stable state using the command **show module**

Example:

```
switch# show module
```

Step 4 Verify that the system clock is correct using the command **show clock**

Example:

```
switch# show clock
```

Software operations use certificates based on device clock times.

This example shows how to verify that the system is up. A "System ready" response indicates that the system is ready for SMU package installation.

```
switch#
    show logging logfile | grep -i "System ready"
2018 Feb 19 11:13:04 switch %ASCII-CFG-2-CONF_CONTROL: System ready
```

This example shows how to display the active packages for the entire system. Use this information to determine if a software change is required.

```
switch#
 show install active
Boot Image:
NXOS Image: bootflash:///nxos.7.0.3.I7.3.1.bin
Active Packages:
switch#
```

This example shows how to display the current system clock setting:

```
switch#
   show clock
02:14:51.474 PST Wed Jan 04 2014
```

Download SMU Package File from Cisco.com

Follow these steps to download the SMU package file:

Procedure

Step 1 Log in to Cisco.com.

Step 2 Go to the Download Software page at this URL: http://software.cisco.com/download/navigator.html

Step 3 In the Select a Product list, choose **Switches** > **Data Center Switches** > **Cisco Nexus 9000 Series Switches** > *model* .

Step 4 Choose the appropriate SMU file for your device and click **Download** .

Copy Package File to Local Storage Device or Network Server

You must copy the SMU package file to a local storage device or a network file server to which the device has access. After this task is done, the package can be added and activated on the device.

If you need to store package files on the device, we recommend that you store the files on the hard disk. The boot device is the local disk from which the package is added and activated. The default boot device is bootflash:.

After the SMU package file has been transferred to a network file server or the local storage device, you are ready to add and activate the file.

Server Protocol Types

Tip Before you copy package files to a local storage device, use the **dir** command to determine if the required package files are already on the device.

If the SMU package files are located on a remote TFTP, FTP, or SFTP server, you can copy the files to a local storage device. After the files are located on the local storage device, the package can be added and activated on the device from that storage device. The following server protocols are supported:

- Trivial File Transfer Protocol—TFTP allows files to be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password). It is a simplified version of FTP.

Note Some package files might be larger than 32 MB, and the TFTP services provided by some vendors might not support a file this large. If you do not have access to a TFTP server that supports files larger than 32 MB, download the file using FTP.

- File Transfer Protocol—FTP is part of the TCP/IP protocol stack and requires a username and password.
- SSH File Transfer Protocol—SFTP is part of the SSHv2 feature in the security package and provides for secure file transfers. For more information, see the Cisco Nexus 9000 Series NX-OS Security Configuration Guide.

Note Consult your system administrator for the location and availability of your network server.

Use the commands in the following table to copy the SMU package file from the server to your device using the file transfer protocols.

Table 1: Commands for Copying SMU Package Files to the Device

Command	Purpose
copy tftp://*hostname-or-ipaddress*/*directory-path*/*filename* **bootflash:**	Copies the package file from the TFTP server to the bootflash:. • *hostname-or-ipaddress*—The hostname or IP address of the network file server. • *directory-path*—The network file server path that leads to the package file to be added. • *filename*—The name of the package file that you want to add.

Command	Purpose
copy ftp://*username*:*password*@*hostname-or-ipaddress*/*directory-path*/*filename* **bootflash:**	Copies the package file from the FTP server to the bootflash:. • *username*—The username of the user who has access privileges to the directory in which the package file is stored. • *password*—The password associated with the username of the user who has access privileges to the directory in which the package file is stored. If a password is not provided, the networking device accepts anonymous FTP. • *hostname-or-ipaddress*—The hostname or IP address of the network file server. • *directory-path*—The network file server path that leads to the package file to be added. The specified directory should be a directory under the home directory of the user. In this example, the file being downloaded is in a subdirectory called "images" in the home directory of the user "john." **Note** For FTP services, *directory-path* is the directory relative to the *username* home directory. If you want to specify an absolute path for the directory, you must add a "/" following the server address. •

Add and Activate Package

Add and activate SMU package files on your device using the Cisco NX-OS CLI.

You can add SMU package files that are stored on a local storage device or on a remote TFTP, FTP, or SFTP server to your device.

Note The SMU package being activated must be compatible with the currently active software to operate. When an activation is attempted, the system runs an automatic compatibility check to ensure that the package is compatible with the other active software on the device. If a conflict is found, an error message displays. The activation is performed only after all compatibility checks have been passed.

Note Activating an SMU does not cause any earlier SMUs or the package to which the SMU applies to be automatically deactivated.

Before you begin

Make sure that all packages to be added are present on a local storage device or a network file server.

Make sure that you meet all of the prerequisites for the activation of packages.

Complete the procedure described in Copy Package File to Local Storage Device or Network Server, on page 6 .

Procedure

Step 1 Connect to the console port and log in.

Establishes a CLI management session to the console port.

Step 2 (Optional) Display the package files that are available to be added using the command **dir bootflash:**

Step 3 **install add** *filename* [**activate**]

Example:

Unpacks the package software files from the local storage device or network server and adds them to the bootflash: and all active and standby supervisors installed on the device.

Note Only SMU package files can be added and activated using this procedure.

The *filename* argument can take any of these formats:

- **bootflash:** *filename*
- **tftp://** *hostname-or-ipaddress* / *directory-path* / *filename*
- **ftp://** *username* **:** *password* **@** *hostname-or-ipaddress* / *directory-path* / *filename*
- **usb1:** *filename*
- **usb2:** *filename*

For all SMU packages except the CSCur02700 SMU package, you can use the optional **activate** keyword to automatically activate the package after it is added successfully.

Note For the CSCur02700 SMU package, use the **install activate** command in Step 5 to activate the package. Do not use the optional **activate** keyword with the **install add** command as the package might fail and require a reboot.

Multiple versions of an SMU package can be added to the storage device without impacting the running configuration, but only one version of a package can be activated for a line card.

Note Press **?** after a partial package name to display all possible matches available for activation. If there is only one match, press the **Tab** key to fill in the rest of the package name.

Step 4 (Optional) Display the inactive packages on the device using the package using the command **show install inactive**

Example:

```
switch# show install inactive
```

This is an optional step. Verify that the package added in the previous step appears in the display.

Step 5 Required: **install activate** *filename*

Example:

Example:

Activates a package that was added to the device. SMU packages remain inactive until activated. (Skip this step if the package was activated earlier with the **install add activate** command.)

Tip After the activation process finishes, enter the **show install log** command to display the process results.

Step 6 Repeat Step 5 until all packages are activated.

Activates additional packages as required.

Step 7 (Optional) Use this command to determine if the correct packages are active, **show install active**

Example:

```
switch# show install active
```

Displays all active packages. This is an optional step.

Commit Active Package Set

Committing the active package set ensures that the activated SMU packages remain persistent across system reloads.

When an SMU package is activated on the device, it becomes part of the current running configuration. To make the package activation persistent across system-wide reloads, you must commit the package on the device.



Note On startup, the device loads the committed package set. If the system is reloaded before the current active package is committed, the previously committed package set is used.

Before you begin

Before you commit a package set, verify that the device is operating correctly and is forwarding packets as expected.

Complete the procedure described in Add and Activate Package, on page 8 .

Procedure

Step 1 Commit the current set of packages so that these packages are used if the device is restarted using the command **install commit** *filename*

Example:

Step 2 (Optional) Display which packages are committed using the command **show install committed**

Example:

```
switch# show install committed
```

This is an optional step.

This example shows how to commit active SMU packages on the device and then verify the committed packages:

Deactivate and Remove Packages

Use this procedure to deactivate and remove software packages (SMUs) from the device.

When a package is deactivated, it is no longer active on the device, but the package files remain on the boot disk. The package files can be reactivated later, or they can be removed from the disk.

The Cisco NX-OS software also provides the flexibility to roll back the selected package set to a previously saved package set. If you find that you prefer a previous package set over the currently active package set,

you can use the **install deactivate** and **install commit** commands to make a previously active package set active again.

Before you begin

You cannot deactivate a package if it is required by another active package. When you attempt to deactivate a package, the system runs an automatic check to ensure that the package is not required by other active packages. The deactivation is performed only after all compatibility checks have been passed.

You cannot delete a package if it is part of the running or committed software of the device.

Procedure

Step 1 Connect to the console port and log in.

Establishes a CLI management session to the console port.

Step 2 Deactivate a package that was added to the device and turns off the package features for the line card using the command **install deactivate** *filename*

Example:



Note You must run **install commit** after **install deactivate** to deactivate the package completely, otherwise the package gets activated again after reload. For reload SMU, run **install commit** after the device reloads.

Step 3 (Optional) Display the inactive packages on the device using the command **show install inactive**

Example:

```
switch# show install inactive
```

This is an optional step.

Step 4 Commit the current set of packages so that these packages are used if the device is restarted using the command **install commit**

Example:

```
switch# install commit
```

This is an optional step.



Note Packages can be removed only if the deactivation operation is committed.

Step 5 **install remove** { *filename* | **inactive** }

Example:

Example:

```
switch# install remove inactive
 Proceed with removing? (y/n)? [n] y
```

Removes the inactive package.

- Only inactive packages can be removed.
- Packages can be removed only if they are deactivated from all line cards in the device.
- The package deactivation must be committed.
- To remove a specific inactive package from a storage device, use the **install remove** command with the *filename* argument.
- To remove all inactive packages from all nodes in the system, use the **install remove** command with the **inactive** keyword.

No-Reload Options for SMU Installation

The following are the no-reload options for SMU installation:

Method 1: CLI Install Add/Activate

```
switch#

    show version internal build-identifier

nxos image file: bootflash:///nxos64.10.2.0.184.bin :  S184
switch#
    show install inactive
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
Inactive Packages:
Inactive Base Packages:
        tahusd_common-1.0.0.0-10.2.0.184.lib32_64_n9000
        tor-2.0.0.0-10.2.0.184.lib32_n9000
        tor_n9k-2.0.0.0-10.2.0.184.lib32_n9000
switch#
switch#
    install add nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000.rpm
[####################] 100%
Install operation 3 completed successfully at Mon Jul 12 11:32:28 2021
switch#
    show install inactive
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
Inactive Packages:
        nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 available
Inactive Base Packages:
        tahusd_common-1.0.0.0-10.2.0.184.lib32_64_n9000
        tor-2.0.0.0-10.2.0.184.lib32_n9000
        tor_n9k-2.0.0.0-10.2.0.184.lib32_n9000
switch#
switch#
```

```
               show install pkg-info nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000
Request timedout:: Success
Name          :  nxos64.CSCaa12345-n9k_ALL
Version       :  1.0.0
Release       :  10.2.1
License       :  Cisco proprietary
Patch Type    :  reload
Requires      :  core
Provides      :  nxos64.CSCaa12345-n9k_ALL
Conflicts     :
Description   :  This is a patch for CSCaa12345-n9k_ALL
switch#
```

CLI Install Activate PATCH with no-immediate-reload option

```
               switch#
               install activate nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 ?
  <CR>
  WORD                Package Name
  forced              Non-interactive
  no-immediate-reload  Skip immediate reload for reload type patches.
switch# install activate nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000
no-immediate-reload
[####################] 100%
Install operation 4 !!WARNING!! This patch will get activated only after
a reload of the switch. at Mon Jul 12 11:33:50 2021
switch#
switch#
               show install inactive
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
Inactive Packages:
        nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 activate_pending_reload
Inactive Base Packages:
        tahusd_common-1.0.0.0-10.2.0.184.lib32_64_n9000
        tor-2.0.0.0-10.2.0.184.lib32_n9000
        tor_n9k-2.0.0.0-10.2.0.184.lib32_n9000
switch#
switch#
               show install patch
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
------------------------------------------------------
nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 Inactive Committed
(activate_pending_reload)
------------------------------------------------------
switch##
switch#
               reload
This command will reboot the system. (y/n)?  [n] y
CISCO SWITCH Ver7.69
Switch G2
Device detected on 0:1:2 after 0 msecs
Device detected on 0:1:1 after 0 msecs
Device detected on 0:1:0 after 0 msecs
…..
```

After switch reload, wait for system in ready state

```
               :///nxos64.10.2.0.184.bin :  S184
switch#
```

```
switch#
                show logging logfile | include ready
2021 Jul 12 11:40:34 N93180-1 %ASCII-CFG-2-CONF_CONTROL: System ready
switch#
switch#
                show install patch
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
--------------------------------------------------
nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 Active
--------------------------------------------------
switch#
switch#
                show install active
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
Active Packages:
        nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 active
Active Base Packages:
…..
```

CLI Install Deactivate PATCH with no-immediate-reload option

```
                switch#
                install deactivate nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 ?
  <CR>
  WORD                 Package Name[Note: startup configuration may get affected]
  forced               Non-interactive
  no-immediate-reload  Skip immediate reload for reload type patches.
switch#
                install deactivate nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000
no-immediate-reload
[####################] 100%
Install operation 5 !!WARNING!! This patch will get deactivated only after
a reload of the switch. at Mon Jul 12 11:42:24 2021
switch#
switch#
                show install patch
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
--------------------------------------------------
nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 Active (deactivate_pending_reload)
--------------------------------------------------
switch#
switch#
                show install active
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
Active Packages:
        nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 active
Active Base Packages:
…..
switch#
                reload
WARNING: Uncommitted patches present
This command will reboot the system. (y/n)?  [n] y
CISCO SWITCH Ver7.69
Switch G2
Device detected on 0:1:2 after 0 msecs
Device detected on 0:1:1 after 0 msecs
Device detected on 0:1:0 after 0 msecs
```

…..

After switch reload, wait for system in ready state

```
               switch#
               show logging logfile | include ready
2021 Jul 12 11:52:28 N93180-1 %ASCII-CFG-2-CONF_CONTROL: System ready
switch#
switch#
               show install patch
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
--------------------------------------------------
nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 Inactive Committed
--------------------------------------------------
switch#
               show install inactive
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
Inactive Packages:
        nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000 available
Inactive Base Packages:
        tahusd_common-1.0.0.0-10.2.0.184.lib32_64_n9000
        tor-2.0.0.0-10.2.0.184.lib32_n9000
        tor_n9k-2.0.0.0-10.2.0.184.lib32_n9000
switch#
switch#
               install remove nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000
Proceed with removing nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000? (y/n)?  [n] y
[####################] 100%
Install operation 6 completed successfully at Mon Jul 12 11:57:06 2021
switch#
               show install patch
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
--------------------------------------------------
--------------------------------------------------
switch#
               show install inactive
Boot Image:
        NXOS Image: bootflash:///nxos64.10.2.0.184.bin
Inactive Packages:
Inactive Base Packages:
        tahusd_common-1.0.0.0-10.2.0.184.lib32_64_n9000
        tor-2.0.0.0-10.2.0.184.lib32_n9000
        tor_n9k-2.0.0.0-10.2.0.184.lib32_n9000
switch#
```

CLI Install ADD ACTIVATE via bootflash: with no-immediate-reload

```
               switch#
               install add nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000.rpm
activate ?
  <CR>
  downgrade            Downgrade package
  forced               Non-interactive
  no-immediate-reload  Skip immediate reload for reload type patches.
  upgrade              Upgrade package
switch#
               install add nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000.rpm
activate no-immediate-reload
```

```
Adding the patch (/nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000.rpm)
[####################] 100%
Install operation 7 completed successfully at Mon Jul 12 12:03:02 2021
Activating the patch (/nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000.rpm)
[####################] 100%
Install operation 8 !!WARNING!! This patch will get activated only after
a reload of the switch. at Mon Jul 12 12:03:10 2021
switch#
```

CLI Install ADD ACTIVATE via tftp with no-immediate-reload

```
               switch#
               install add
tftp://172.27.250.42/auto/tftp-sjc-users1/shuojiun/nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000.rpm
 vrf management activate ?
  <CR>
  downgrade            Downgrade package
  forced               Non-interactive
  no-immediate-reload  Skip immediate reload for reload type patches.
  upgrade              Upgrade package
switch#
               install add
tftp://172.27.250.42/auto/tftp-sjc-user1/tester/nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000.rpm
 vrf management activate no-immediate-reload
[####################] 100%
Install operation 11 !!WARNING!! This patch will get activated only after
a reload of the switch. at Mon Jul 12 12:06:49 2021
switch#
```

Method 2: VIA DME REST Action/Exec payload

Note In the payload below, "reloadFlag": "noreload", you need to set “reloadFlag” as “noreload”. “reloadFlag” is not new in the Action/Exec items.

```
POST URL:
http://172.27.250.239//api/mo/sys/action.json
{
    "actionLCont": {
        "children": [
            {
                "actionLSubj": {
                    "attributes": {
                        "dn": "sys/action/lsubj-[sys]"
                    },
                    "children" : [
                        {
                            "topSystemSwpkgsInstallLTask": {
                                "attributes": {
                                    "dn":
"sys/action/lsubj-[sys]/topSystemSwpkgsInstallLTask",
                                    "pkgAction": "add-activate",
                                    "reloadFlag": "noreload",
                                    "adminSt": "start",
                                    "url":
"nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000.rpm"
                                }
                            }
                        }
```

```
                    ]
                }
            }
        ]
    }
}
{
    "actionLCont": {
        "children": [
            {
                "actionLSubj": {
                    "attributes": {
                        "dn": "sys/action/lsubj-[sys]"
                    },
                    "children" : [
                        {
                            "topSystemSwpkgsInstallLTask": {
                                "attributes": {
                                    "dn":
"sys/action/lsubj-[sys]/topSystemSwpkgsInstallLTask",
                                    "pkgAction": "activate",
                                    "reloadFlag": "noreload",
                                    "adminSt": "start",
                                    "url":
"nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000"
                                }
                            }
                        }
                    ]
                }
            }
        ]
    }
}
{
    "actionLCont": {
        "children": [
            {
                "actionLSubj": {
                    "attributes": {
                        "dn": "sys/action/lsubj-[sys]"
                    },
                    "children" : [
                        {
                            "topSystemSwpkgsInstallLTask": {
                                "attributes": {
                                    "dn":
"sys/action/lsubj-[sys]/topSystemSwpkgsInstallLTask",
                                    "pkgAction": "deactivate",
                                    "reloadFlag": "noreload",
                                    "adminSt": "start",
                                    "url":
"nxos64.CSCaa12345-n9k_ALL-1.0.0-10.2.1.lib32_64_n9000"
                                }
                            }
                        }
                    ]
                }
            }
        ]
    }
}
```

Advanced SMU Installation Methods

Install Multiple SMU Packages Using a Single TAR File

If you want to install multiple SMU packages, you can create a single TAR bundle file and use it across the switches in the Data Center.

Follow these steps to generate a TAR file from a given list of SMU packages downloaded from a software download center.



Note The file name mentioned in the following examples is for illustration purposes only, and the actual file name will depend on the appropriate release.

- Step 1 - Create a new folder in the user computer or virtual machine.

```
bash#
mkdir nx1043
```

- Step 2 - Download the required SMU packages from the Cisco Software Download Center portal and copy the SMU packages to the new folder.

```
bash#
cp nxos64-cs.CSCxy11111-1.0.0-10.4.3.lib32_64_n9000.rpm  nx1043/

bash#
cp nxos64-cs.CSCxy22222-1.0.0-10.4.3.lib32_64_n9000.rpm  nx1043/
```

- Step 3 - Create a tar bundle file.

```
bash#
cd nx1043
bash#
tar cf nxos64-cs.10.4.3.smu.bundle.tar *.rpm
```

- Step 4 - Use the existing **install add** *filename* **activate** command to install the SMU packages from the TAR bundle.

```
switch#
install add nxos64-cs.10.4.3.smu.bundle.tar activate
```

Install SMU Packages as Part of the New NX-OS Software Image Installation

On Cisco Nexus switches, the NX-OS software image can be upgraded to a newer version using the **install all** command. This command has been enhanced to include SMU packages separate from the NX-OS switch software image, which benefits the software maintenance by reducing the number of reload required during the installation process for both the software image and SMU packages.

On Cisco Nexus switches, the NX-OS software image can be upgraded to a newer version using the install all command. This command has been enhanced to include SMU packages seperate from the NX-OS switch software image, which benefits software maintenance by reducing the number of reloads required during the installation process for both the software image and SMU packages.

The **install all** command can be initiated with a single .tar bundle file containing either:

- One NX-OS software image and a single SMU.rpm file
- One NX-OS software image and a tar bundle of multiple SMU.rpm files

When the **install all** command is initiated with one or more SMU .rpm files, the switch will automatically commit the SMU files after the upgrade.

If the switch is reloaded during bootup, the SMUs will not be applied and will remain in an inactive state. The SMUs can be installed using the **install all** or **install activate** commands.

The following section describes all the supported scenarios when SMU packages are included in the **install all** command.

Note The child tar bundle must not contain a mix of SMU .rpm files and another tar bundle of SMU .rpm files.

Note The filename mentioned in the following examples is for illustration purposes only, and the actual filename will depend on the appropriate release.

Example-1 : In this scenario, a new software image and a single SMU package is used.

```
switch#
install all nxos nxos64-cs.10.4.3.M.bin package
nxos64-cs.CSCxy11111-1.0.0-10.4.3.lib32_64_n9000.rpm
```

Example-2 : In this scenario, a set of SMU packages are created as a TAR bundle following the TAR file method mentioned above and installed along with the NX-OS software image.

```
switch#
install all nxos nxos64-cs.10.4.3.M.bin package
nxos64-cs.10.4.3.smu.bundle.tar
```

Example-3 : In this scenario, a single SMU package and the NX-OS software image can be bundled into one single tar file and installed using the **install all** command.

```
switch#
install all nxos nxos64-cs.10.4.3.M.SMU.plus.IMAGE.tar
```

1. Download the SMU package from the Cisco Download center. For example: nxos64-cs.CSCxy11111-1.0.0-10.4.3.lib32_64_n9000.rpm
2. Download **nxos64-cs.10.4.3.M.bin** and place it in the same folder.

3. Create a tar bundle **nxos64-cs.10.4.3.M.SMU.plus.IMAGE.tar** consisting of the NX-OS image and SMU package.

```
                              bash#
                              tar cf nxos64-cs.10.4.3.M.SMU.plus.IMAGE.tar
nxos64-cs.10.4.3.M.bin nxos64-cs.CSCxy11111-1.0.0-10.4.3.lib32_64_n9000.rpm
```

Example-4 : When there are multiple SMU packages must be installed along with the NX-OS image, the SMU packages must be built into a SMU tar bundle file first as explained in the Install Multiple SMU Packages Using a Single TAR File section. Subsequently, this SMU tar bundle can be further bundled together with the NX-OS image and a single tar file could be used in the **install all** command.

```
                    Switch#
                    install all nxos nxos64-cs.10.4.3.M.SMU.BUNDLE.plus.IMAGE.tar
```

1. Create a SMU tar bundle image with the list of SMU packages as explained in the Install Multiple SMU Packages Using a Single TAR File section.

```
                              bash#
                              mkdir nx1043
bash#
                              cp nxos64-cs.CSCxy11111-1.0.0-10.4.3.lib32_64_n9000.rpm
nx1043/
bash#
                              cp nxos64-cs.CSCxy22222-1.0.0-10.4.3.lib32_64_n9000.rpm
nx1043/
bash#
                              cd nx1043
bash#
                              tar cf nxos64-cs.10.4.3.smu.bundle.tar *.rpm
```

2. Download **nxos64-cs.10.4.3.M.bin** and place it in the same folder.
3. Create another tar bundle **nxos64-cs.10.4.3.M.SMU.BUNDLE.plus.IMAGE.tar** .

```
                              bash#
                              tar cf nxos64-cs.10.4.3.M.SMU.BUNDLE.plus.IMAGE.tar
nxos64-cs.10.4.3.M.bin nxos64-cs.10.4.3.smu.bundle.tar
```

Downgrade Feature RPMs

Follow this procedure to downgrade an installed feature RPM to the base feature RPM.

Procedure

Step 1 Display the feature RPM packages on the device using the command **show install packages**

Example:

```
switch# show install packages
                        ntp.lib32_n9000     1.0.1-7.0.3.I2.2e      installed
```

This is an optional step.

Step 2 Load Bash using the command **run bash**

Example:

```
switch# run bash
                        bash-4.2$
```

Step 3 Change to the RPMs folder in Bash using the command **cd /rpms**

Example:

```
bash-4.2$ cd /rpms
```

Step 4 List the RPM for the specified feature using the command **ls *** *feature* ***

Example:

```
bash-4.2$ ls *ntp*
                        ntp-1.0.0-7.0.3.I2.2e.lib32_n9000.rpm
```

Step 5 Copy the base feature RPM to the bootflash using the command **cp** *filename* **/bootflash**

Example:

```
bash-4.2$ cp ntp-1.0.0-7.0.3.I2.2e.lib32_n9000.rpm /bootflash
```

Step 6 Exit Bash using the command **exit**

Example:

```
bash-4.2$ exit
```

Step 7 Required: Downgrade the feature RPM using the command **install add bootflash:** *filename* **activate downgrade**

Example:

```
switch# install add bootflash:ntp-1.0.0-7.0.3.I2.2e.lib32_n9000.rpm activate downgrade
                        Adding the patch (/ntp-1.0.0-7.0.3.I2.2e.lib32_n9000.rpm)
                        [##############      ]  60%
                        Adding the patch (/ntp-1.0.0-7.0.3.I2.2e.lib32_n9000.rpm)
                        [####################] 100%
                        Install operation 11 completed successfully at Thu Sep  8 15:35:35
 2015
                        Activating the patch (/ntp-1.0.0-7.0.3.I2.2e.lib32_n9000.rpm)
                        This install operation requires system reload. Do you wish to
continue (y/n)?: [n] y
                       [  217.975959] [1473348971]  writing reset reason 132, System reset
 due to reload patch(es) activation
                        [  217.991166] [1473348971]□□
                        CISCO SWITCH Ver7.51
                        Device detected on 0:6:0 after 0 msecs
                        Device detected on 0:1:1 after 0 msecs
                        Device detected on 0:1:0 after 0 msecs
                        MCFrequency 1333Mhz
                        Relocated to memory
```

Note If you are prompted to reload the device, enter `Y` . A reload is required only when downgrading the NTP and SNMP feature RPMs.

Step 8 Display the base feature RPM on the device using the command **show install packages | i** *feature*

Example:

```
switch# show install packages | i ntp
                        ntp.lib32_n9000    1.0.0-7.0.3.I2.2e   installed
```

This is an optional step.

Display Installation Log Information

The installation log provides information on the history of the installation operations. Each time an installation operation is run, a number is assigned to that operation.

- Use the **show install log** command to display information about both successful and failed installation operations.
- Use the **show install log** command with no arguments to display a summary of all installation operations. Specify the *request-id* argument to display information specific to an operation. Use the **detail** keyword to display details for a specific operation, including file changes, nodes that could not be reloaded, and any impact to processes.

Configuration Examples

This example shows how to display information for all installation requests:

This example shows how to display additional information, including any impact to nodes and processes:

This example shows the output after an SMU package has been activated but before the switch has been reloaded:

Perform Software Maintenance Upgrade for Guest Shell Bash

You can perform a software maintenance upgrade for Bash in the Guest Shell.

Procedure

Step 1 Download the SMU package file for Guest Shell Bash from Cisco.com.

Obtains the package file from Cisco.com. For instructions, see Download SMU Package File from Cisco.com, on page 5 .

Step 2 Copy the SMU package file to the bootflash: of the switch.

Copies the package file to the device. For instructions, see Copy Package File to Local Storage Device or Network Server, on page 6 .

Step 3 Access the Guest Shell using the command **guestshell**

Example:

```
switch# guestshell
 guestshell:~$
```

Step 4 Upgrade the existing Bash file in the Guest Shell using the command **sudo rpm -Uvh** / bootflash / *filename*

Example:

```
guestshell:~$ sudo rpm -Uvh /bootflash/bash-4.2-r8.x86_64.rpm
 Preparing...                ########################################### [100%]
 1:bash                   ########################################### [100%]
 update-alternatives: Linking //bin/sh to /bin/bash
```

Step 5 Verify that the new version of the Bash file was installed successfully using the command **rpm -qa** | **grep bash**

Example:

```
guestshell:~$ rpm -qa | grep bash
 bash-4.2-r8.x86_64
```

Step 6 **guestshell sync**

Example:

```
switch# guestshell sync
 Access to the guest shell will be temporarily disabled while it synchronizes contents to
standby.
 Are you sure you want to continue? (y/n) [n] y
 dt-n9k3-1# 2014 Oct  7 05:00:01 dt-n9k3-1 %$ VDC-1 %$ %VMAN-2-INSTALL_STATE: Deactivating
 virtual service 'guestshell+'
 dt-n9k3-1# 2014 Oct  7 05:00:06 dt-n9k3-1 %$ VDC-1 %$ %VMAN-2-ACTIVATION_STATE: Successfully
 deactivated virtual
 service 'guestshell+'
 2014 Oct  7 05:00:12 dt-n9k3-1 %$ VDC-1 %$ %VMAN-2-ACTIVATION_STATE: Successfully deactivated
 virtual service
 'guestshell+' ; Starting sync to standby sup
 2014 Oct  7 05:00:32 dt-n9k3-1 %$ VDC-1 %$ %VMAN-2-MOVE_STATE: Successfully synced virtual
 service 'guestshell+' ;
 Activating
 2014 Oct  7 05:00:32 dt-n9k3-1 %$ VDC-1 %$ %VMAN-2-ACTIVATION_STATE: Activating virtual
service 'guestshell+'
 2014 Oct  7 05:00:56 dt-n9k3-1 %$ VDC-1 %$ %VMAN-2-ACTIVATION_STATE: Successfully activated
 virtual service
 'guestshell+'
```

On a dual-supervisor system, synchronizes the rootfs with the Bash SMU version to the standby supervisor before doing a switchover. If you do not run this command, you will need to repeat this procedure after a supervisor switchover.

Note The new Bash file is preserved after a Guest Shell reboot or Guest Shell disable+enable. However, you need to reinstall the Guest Shell Bash SMU package file after a Guest Shell destroy+enable.

Related Documents

This reference provides information about related documents for software upgrades.

Related Topic	Document Title
Software upgrades	*Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide*

History

This table lists the release history for SMU package files.

Table 2: SMU Package File Release History

SMU Package File	Releases	Description
bash-4.2-r8.x86_64.rpm	6.1(2)I3(1)	Guest Shell Bash SMU for Bash vulnerabilities CVE-2014-6277, CVE-2014-6278, CVE-2014-7186, and CVE-2014-7187
n9000-dk9.6.1.2.I3.1.CSCur02700.bin	6.1(2)I3(1) and all 6.1(2)I2(x) releases	Cisco NX-OS SMU for CSCur02700 (Bash vulnerabilities CVE-2014-6277, CVE-2014-6278, CVE-2014-7186, and CVE-2014-7187)
n9000-dk9.6.1.2.I2.1.CSCup81353.bin	6.1(2)I2(1), 6.1(2)I2(2), 6.1(2)I2(2a), and 6.1(2)I2(3)	Cisco NX-OS SMU for CSCup81353