Upgrading Cisco MDS NX-OS Release 9.x

This section provides information on upgrading your Cisco MDS NX-OS software to Cisco MDS NX-OS Release 9.x. It includes the following topics:

Upgrading Guidelines

- We recommend that you do not perform an In-Service Software Upgrade (ISSU) concurrently on switches that are connected via FCIP ISLs. Rather perform the ISSU on one switch and after the ISSU is complete perform the ISSU on the adjacent switch. However, you can perform ISSUs concurrently on switches that are connected via Fibre Channel ISLs.
- To upgrade or downgrade to a Cisco MDS NX-OS release version, the same release version of the kickstart and system images in the **install all** command must be used.
- If you copy firmware using the SFTP or SCP clients after enabling the **feature scp-server** or **feature sftp-server** command on your switch, ensure that you close the SFTP or SCP connection using the **no feature scp-server** or **no feature sftp-server** command before performing ISSU. Otherwise, ISSU will be disruptive. To avoid this issue, we recommend that you transfer files to the switch using the **copy** command instead or using the DCNM client.
- If you are upgrading from a release prior to Cisco MDS NX-OS Release 9.2(1), ensure that you use the **clear logging onboard txwait** command after upgrading. Otherwise, the file will be automatically deleted and recreated at the new file size when the file size exceeds 512 KB. For more information, see the Cisco MDS 9000 Series Interfaces Configuration Guide, Release 9.x.
- If you are upgrading from Cisco MDS NX-OS Release 8.5(1) to Release 9.2(1) or later, ensure that you disable the Fabric Performance Monitor (FPM) feature using the **no feature fpm** command before

upgrading. After the switch is upgraded to Release 9.2(1) or later, FPM can be enabled again via the **feature fpm** command.

- FCIP traffic will be affected when you upgrade Cisco MDS 24/10-Port SAN Extension Module from Cisco MDS NX-OS Release 8.5(1) to Release 9.2(1). To recover from this situation, reload the module.
- You will be unable to upgrade to Cisco MDS NX-OS Release 9.2(2) or later releases if you have configured any device-alias names using 64 alphanumeric characters. The following system message will be displayed:

```
ISSU blocked because device-alias names > 63 characters exist.They
can be displayed using 'show file upg_blocking_dev_al_cfg.txt'. Reduce  the size of the
device-alias names to 63 characters or less and try  again.
```

- As part of the fix for CSCvz09012, the *cardclient* service is deliberately stopped during the upgrade and the following syslog message is displayed. No action is required.

```
%SYSMGR-2-SERVICE_CRASHED: Service "cardclient" (PID 4941) hasn't
caught signal 9 (no core)
```

- We recommend that if all of the following conditions are true that the Cisco MDS 48-Port 64-Gbps Fibre Channel Switching Module (DS-X9748-3072K9) NOT be inserted in the chassis:
  - Cisco MDS 9706, MDS 9710, or MDS 9718
  - Cisco MDS NX-OS Release 9.2(1)
  - Non-default FCoE FCMAP is configured. This can be checked by issuing the **show fcoe | i FC-MAP** command. The default value of FCMAP is 0x0e:fc:00.
- For the switches running Release 9.2(1) and equipped with Cisco MDS 48-Port 64-Gbps Fibre Channel Switching Module (DS-X9748-3072K9), the FCMAP should NOT be changed to non-default value. However, after the switch has been upgraded to Release 9.2(2) or later, the FCoE FCMAP can be configured to a non-default value. For more information, see CSCwa34016.

Upgrade MDS NX-OS in Cisco MDS 9700 Series Multilayer Director Switches

On a Cisco MDS 9700 Series Multilayer Director, the high-level process to upgrade to Cisco MDS NX-OS Release 9.x is as follows:

Step 1 Upgrade to Cisco MDS NX-OS Release 9.x, as described in Upgrading to Cisco MDS NX-OS Release 9.x on a Cisco MDS 9700 Series Multilayer Director, on page 3.

Step 2 Install the Cisco MDS 48-port 16-Gbps Fibre Channel Switching module in the Cisco MDS 9700 chassis or install the Cisco MDS 48-port 10-Gigabit Ethernet module in the Cisco MDS 9700 chassis.

For additional information, see the Cisco MDS 9700 Series Hardware Installation Guide.

Step 3 If needed, reload the switch.

Upgrading to Cisco MDS NX-OS Release 9.x on a Cisco MDS 9700 Series Multilayer Director

Note Use the console connection for firmware upgrades. If you are upgrading through the management interface, you must have a working connection to both supervisors because this process causes a switchover and the current standby supervisor will be active after the upgrade. To determine the status of the mgmt0 interface on the standby supervisor issue the **show interface mgmt0 standby** command.

Note When the **system auto-collect tech-support** command is enabled, there is a delay of 600 seconds for the standby switch to reload and become HA-Standby in Cisco MDS 9700 Series Multilayer Directors.

To upgrade your switch to use the latest Cisco MDS NX-OS software on your Cisco MDS 9700 Series Multilayer Directors, perform the following steps:

Step 1 Go to http://www.cisco.com/ and click **Log In** at the top of the page. Enter your Cisco Systems username and password.

Note Unregistered Cisco.com users cannot access secure links that are provided in this document.

Step 2 Verify the following physical connections for the new Cisco MDS 9700 Series Multilayer switch:

- The console port is physically connected to a computer terminal (or terminal server).
- The management 10/100/1000 Ethernet port (mgmt0) is connected to an external hub, switch, or router.

To verify the physical connections, see the hardware installation guide for your product. For more information, see the Cisco MDS 9700 Director Hardware Installation Guide.

Step 3 Log in to the switch.

Step 4 Run the **copy running-config startup-config** command to store your current running configuration.

You can also create a backup of your existing configuration in a file by running the **copy running-config bootflash:backup_config.txt** command. See the Using the Cisco NX-OS Setup Utility chapter in the *Cisco MDS 9000 Series NX-OS Fundamentals Configuration Guide*.

Step 5 Save a copy of the **show tech-support** command output of the switch.

For more information, see the Collecting Logs from Cisco MDS 9000 Switches and DCNM.

Step 6 Verify that the requested license files installed in the switch are displayed, using the **show license usage** command.

Note The switch is initially shipped with the required licenses installed in the system. However, the initial license file does not cover the unlicensed features that may be used during the grace period. See the Cisco MDS 9000 Series NX-OS Licensing Guide.

If no license is displayed at this point, go to Step 7 and Step 8 to install the required licenses.

If the required licenses are displayed at this point, skip Step 7 and Step 8. Go to Step 9.

The following is a sample CLI output for a valid license:

```
switch# show license usage
Feature Ins Lic Status Expiry Date Comments
Count
--------------------------------------------------------------------------------
FM_SERVER_PKG No - Unused -
MAINFRAME_PKG No - Unused -
ENTERPRISE_PKG Yes - Unused never -
--------------------------------------------------------------------------------
```

Step 7 Install licenses, if necessary, to ensure that the required features are available on the switch.

Perform the following steps:

a) Use the **show license host-id** command to obtain the serial number of your switch. The host ID is also referred to as the switch serial number.

```
switch# show license host-id
License hostid: VDH=JAF1721AEQG
```

Tip Use the entire ID that appears after the colon (:). In this example, the host ID is VDH=JAF1721AEQG.

b) Obtain your Claim Certificate or Proof of Purchase document. This document accompanies every Cisco MDS switch.
c) Locate the Product Authorization Key (PAK) from the Claim Certificate or Proof of Purchase document.
d) A URL is provided in the Claim Certificate or Proof of Purchase document for your product.
e) Locate and access the specified URL that applies to your switch's and enter the switch serial number and PAK.

The license key file is sent to you by email. The license key file is digitally signed to be used only on the switch for which it was requested. The requested features are also enabled after the Cisco MDS NX-OS software on the specified switch accesses the license key file.

Note Install the license file in the specified Cisco MDS 9000 Series Multilayer switch without modifying the key.

For more information on licensing, see the Cisco MDS 9000 Series NX-OS Licensing Guide.

Step 8 Install the license key file when you receive it by email.

Perform the following steps:

a) Copy the license file to bootflash using TFTP or SCP.
b) Install the license file by running the **install license** command on the active supervisor module, from the switch console.

```
switch# install license bootflash:license_file.lic
Installing license..done
```

Note If you provide a target name for the license key file, the file is installed with the specified name. Otherwise, the filename specified in the license key file is used to install the license.

c) Exit the switch console.

For more information on licensing, see the Cisco MDS 9000 Series NX-OS Licensing Guide.

Step 9 Ensure that the required space is available in the bootflash: directory for the image files to be copied using the **dir bootflash:** command.

Use the **delete bootflash:** filename command to remove unnecessary files.

```
switch# dir bootflash:

4096 Nov 23 10:47:46 2018.patch/
68230 Dec 10 11:27:20 2018 backup_10_12_2018
4096 Dec 12 10:23:54 2018 bootflash/
52692992 Aug 24 06:18:35 2018 diag-bz-npu-F26
82725888 Aug 24 06:18:24 2018 diag-sup3dc3-bz-F26.bin
1048576 Aug 24 05:47:10 2018 diag_test_file
34646 Jan 28 14:45:50 2019 ethpm_act_logs.log
270463 Jan 28 14:47:51 2019 ethpm_im_tech.log
30627 Jan 28 14:46:50 2019 ethpm_mts_details.log
73 Jan 28 14:46:50 2019 ethpm_syslogs.log
1935271 Jan 28 14:47:50 2019 ethpm_tech.log
12831 Dec 07 15:57:20 2018 log1
4096 Feb 07 13:13:47 2019 lost+found/
4421896 May 02 19:32:22 2019 m9700-sf4ek9-dplug-mz.9.2.1.bin
4421857 May 07 12:18:16 2019 m9700-sf4ek9-dplug-mz.9.2.1.bin
60380672 Apr 29 16:15:25 2019 m9700-sf4ek9-kickstart-mz.9.2.1.bin
60380672 May 02 19:32:34 2019 m9700-sf4ek9-kickstart-mz.9.2.1.bin
60380672 May 07 12:19:05 2019 m9700-sf4ek9-kickstart-mz.9.2.1.bin
433279746 Apr 29 16:32:42 2019 m9700-sf4ek9-mz.9.2.1.bin
433304076 May 02 19:47:52 2019 m9700-sf4ek9-mz.9.2.1.bin
1548886 May 02 19:47:58 2019 m9700-sf4ek9-mz.9.2.1.tar.gz
433423429 May 07 12:33:27 2019 m9700-sf4ek9-mz.9.2.1.bin
1548937 May 07 12:33:35 2019 m9700-sf4ek9-mz.9.2.1.tar.gz
4096 Mar 26 09:54:14 2019 scripts/
1286622 Mar 21 15:53:25 2019 sysmgrconfig
11082 Aug 24 06:14:41 2018 temp.log
Usage for bootflash://sup-local
3213733888 bytes used
500277248 bytes free
3714011136 bytes total
```

Note Before downloading and installing Cisco MDS NX-OS software, verify that the release is supported by your Cisco MDS reseller. If you purchased support from a Cisco reseller, contact them directly for more information. Otherwise, contact Cisco Technical support.

Step 10 If you need more space on the active supervisor module bootflash, delete the files that are not required to make space available:

```
switch# delete bootflash: m9700-sf3ek9-kickstart-mz.8.3.1.bin
switch# delete bootflash: m9700-sf3ek9-mz.8.3.1.bin
```

Step 11 Verify that there is space available on the standby supervisor module bootflash on a Cisco MDS 9700 Series Multilayer switch:

```
switch# attach mod x    /*where x is the module number of the standby supervisor*/
switch(standby)# dir bootflash:

4096 Nov 23 10:47:46 2018.patch/
68230 Dec 10 11:27:20 2018 backup_10_12_2018
4096 Dec 12 10:23:54 2018 bootflash/
52692992 Aug 24 06:18:35 2018 diag-bz-npu-F26
82725888 Aug 24 06:18:24 2018 diag-sup3dc3-bz-F26.bin
1048576 Aug 24 05:47:10 2018 diag_test_file
34646 Jan 28 14:45:50 2019 ethpm_act_logs.log
270463 Jan 28 14:47:51 2019 ethpm_im_tech.log
30627 Jan 28 14:46:50 2019 ethpm_mts_details.log
73 Jan 28 14:46:50 2019 ethpm_syslogs.log
1935271 Jan 28 14:47:50 2019 ethpm_tech.log
12831 Dec 07 15:57:20 2018 log1
```

```
4096 Feb 07 13:13:47 2019 lost+found/
4421896 May 02 19:32:22 2019 m9700-sf4ek9-dplug-mz.9.2.1.bin
4421857 May 07 12:18:16 2019 m9700-sf4ek9-dplug-mz.9.2.1.bin
60380672 Apr 29 16:15:25 2019 m9700-sf4ek9-kickstart-mz.9.2.1.bin
60380672 May 02 19:32:34 2019 m9700-sf4ek9-kickstart-mz.9.2.1.bin
60380672 May 07 12:19:05 2019 m9700-sf4ek9-kickstart-mz.9.2.1.bin
433279746 Apr 29 16:32:42 2019 m9700-sf4ek9-mz.9.2.1.bin
433304076 May 02 19:47:52 2019 m9700-sf4ek9-mz.9.2.1.bin
1548886 May 02 19:47:58 2019 m9700-sf4ek9-mz.9.2.1.tar.gz
433423429 May 07 12:33:27 2019 m9700-sf4ek9-mz.9.2.1.bin
1548937 May 07 12:33:35 2019 m9700-sf4ek9-mz.9.2.1.tar.gz
4096 Mar 26 09:54:14 2019 scripts/
1286622 Mar 21 15:53:25 2019 sysmgrconfig
11082 Aug 24 06:14:41 2018 temp.log
Usage for bootflash://sup-local
3213733888 bytes used
500277248 bytes free
3714011136 bytes total
switch(standby)# exit  /*to return to the active supervisor*/
```

Step 12 If you need more space on the standby supervisor module bootflash on a Cisco MDS 9700 Series Multilayer switch, delete the files that are not required to make space available:

```
switch(standby)# delete bootflash: m9700-sf3ek9-kickstart-mz.8.3.1.bin
switch(standby)# delete bootflash: m9700-sf3ek9-mz.8.3.1.bin
```

Step 13 Access the Software Download Center using this URL: http://www.cisco.com/cisco/software/navigator.html

You are prompted to log in, use your Cisco username and password.

Step 14 Select the required Cisco MDS NX-OS Release 8.x image file, depending on the release you are installing.

The Technical Support Encryption Software Export Distribution Authorization form is displayed.

Step 15 Enter the relevant details in this form, to obtain authorization.

Step 16 After obtaining the authorization, download the files to an FTP or TFTP server.

Note Ensure that you have configured an FTP or TFTP server where the files can be downloaded.

Step 17 Copy the Cisco MDS NX-OS kickstart and system images from the FTP or TFTP server to the active supervisor module bootflash.

When you download an image file, change your TFTP environment's IP address or Domain Name System (DNS) name to the path where the files are located.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-kickstart-mz.9.2.1.bin
bootflash:m9700-sf4ek9-kickstart-mz.9.2.1.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-mz.9.2.1.bin
bootflash:m9700-sf4ek9-mz.9.2.1.bin
```

Step 18 Verify that the switch is running the required software version, using the show version command:

```
switch# show version

Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Documents: http://www.cisco.com/en/US/products/ps9372/tsd_products_support_serie
s_home.html
Copyright (c) 2002-2018, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
```

```
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php
Software
BIOS: version 3.2.0
kickstart: version 9.2(1)
system: version 9.2(1)
BIOS compile time: 08/9/2021
kickstart image file is: bootflash:///m9700-sf3ek9-kickstart-mz.9.2.1.bin
kickstart compile time: 11/30/2018 12:00:00 [11/30/2018 23:18:49]
system image file is: bootflash:///m9700-sf3ek9-mz.9.2.1.bin
system compile time: 11/30/2018 12:00:00 [12/01/2018 00:45:13]
Hardware
cisco MDS 9706 (6 Slot) Chassis ("Supervisor Module-3")
Intel(R) Xeon(R) CPU with 8167760 kB of memory.
Processor Board ID JAE17440HVW
Device name: sw-9706-213
bootflash: 3915776 kB
slot0: 0 kB (expansion flash)
Kernel uptime is 0 day(s), 0 hour(s), 57 minute(s), 19 second(s)
Last reset at 818200 usecs after Mon Aug 9 13:49:17 2021
Reason: Reset triggered due to Switchover
************************************************************
```

Step 19 Verify that your switch is running compatible hardware. For more information, see the corresponding version of the Cisco MDS 9000 Series Release Notes.

Step 20 Use the **show interface mgmt** *number* **standby** command to verify that the standby supervisor's mgmt0 link is up.

Step 21 Perform the upgrade by running the install all command.

The following example displays the result of the **install all** command if the system and kickstart files are specified locally. The example shows the command issued on a Cisco MDS 9700 Series Multilayer switch.

```
switch# install all kickstart m9700-sf4ek9-kickstart-mz.9.2.1.bin system m9700-sf4ek9-mz.9.2.1.bin
Installer will perform compatibility check first. Please wait.
Verifying image bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin for boot variable "kickstart".
[####################] 100% -- SUCCESS
Verifying image bootflash:/m9700-sf4ek9-mz.9.2.1.bin for boot variable "system".
[####################] 100% -- SUCCESS
Performing module support checks.
[####################] 100% -- SUCCESS
Verifying image type.
[####################] 100% -- SUCCESS
Extracting "lctsh" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "bios" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "lc2dce-mds" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "slc4xb" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "system" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "kickstart" version from image bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "slcf32" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Notifying services about system upgrade.
[####################] 100% -- SUCCESS
Compatibility check is done:
Module bootable Impact Install-type Reason
------ -------- -------------- ------------ ------
```

```
2 yes non-disruptive rolling
3 yes non-disruptive rolling
4 yes non-disruptive rolling
5 yes non-disruptive reset
6 yes non-disruptive reset
10 yes non-disruptive rolling
Other miscellaneous information for installation:
Module info
------ ---------------------------------
2 FC ports 1-24 are hitless, IPS 1-8 are hitful, and Intelligent Applications running are hitful
Images will be upgraded according to following table:
Module Image Running-Version (pri:alt) New-Version Upg-Required
------ ---------- ---------------------------------------- --------------------
2 lctsh 8.3(2) 8.4(1) yes
2 bios v4.2.14(03/30/2018):v4.2.14(03/30/2018) no
3 lc2dce-mds 8.3(2) 8.4(1) yes
3 bios v2.0.32(12/16/13) v2.0.32(12/16/13) no
4 slc4xb 8.3(2) 8.4(1) yes
4 bios v1.10.21(11/26/12) v1.10.21(11/26/12) no
5 system 8.3(2) 8.4(1) yes
5 kickstart 8.3(2) 8.4(1) yes
5 bios v3.1.0(02/27/2013) v3.2.0(09/27/2018) yes
6 system 8.3(2) 8.4(1) yes
6 kickstart 8.3(2) 8.4(1) yes
6 bios v3.1.0(02/27/2013) v3.2.0(09/27/2018) yes
10 slcf32 8.3(2) 8.4(1) yes
10 bios v4.1.49(01/29/2017)v4.1.49(01/29/2017) no

Do you want to continue with the installation (y/n)? [n] y
Install is in progress, please wait.
Performing runtime checks.
[####################] 100% -- SUCCESS
Syncing image bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin to standby.
[####################] 100% -- SUCCESS
Syncing image bootflash:/m9700-sf4ek9-mz.9.2.1.bin to standby.
[####################] 100% -- SUCCESS
Setting boot variables.
[####################] 100% -- SUCCESS
Performing configuration copy.
[####################] 100% -- SUCCESS
Module 2: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Module 3: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Module 4: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Module 5: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Module 6: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Module 10: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
2019 Mar 23 15:38:37 switch %PLATFORM-2-MOD_REMOVE: Module 6 removed (Serial number JAE17480AL1)
2019 Mar 23 15:40:58 switch %USBHSD-STANDBY-2-MOUNT: logflash: online
2019 Mar 23 15:42:06 switch %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on sup in slot
 6
Module 6: Waiting for module online.
-- SUCCESS
```

```
2019 Mar 23 15:42:30 switch %PLATFORM-1-PFM_ALERT: Enabling ejector based shutdown on sup in slot
5
Notifying services about the switchover.
[####################] 100% -- SUCCESS
"Switching over onto standby".
>>>
>>>
>>>
NX7k SUP BIOS version ( 3.02) : Build - 03/23/2019 02:38:22
PM FPGA Version : 0x00000014
Power sequence microcode revision - 0x00000001 : card type - f10156EEA0
Booting Spi Flash : Primary
CPU Signature - 0x000106e4: Version - 0x000106e0
CPU - 1 : Cores - 4 : HTEn - 1 : HT - 2 : Features - 0xbfebfbff
FSB Clk - 532 Mhz : Freq - 2152 Mhz - 2128 Mhz
MicroCode Version : 0x00000005
Memory - 8192 MB : Frequency - 1067 MHZ
Loading Bootloader: Done
IO FPGA Version : 0x10001
PLX Version : 861910b5
Bios digital signature verification - Passed
Reset Reason Registers: 0x1 0x0
Filesystem type is ext2fs, partition type 0x83
GNU GRUB version 0.97
Autobooting bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin bootflash:/m9700-
sf4ek9-mz.9.2.1.bin..
Filesystem type is ext2fs, partition type 0x83
Booting kickstart image: bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin...
.....................................................................................
.....................................................................................
.....................................................................
Kickstart digital signature verification Successful
Image verification OK
INIT: version 2
boot device node /dev/sda
obfl flash device node /dev/sdb
USB log flash device not found...
Checking obfl filesystem.
Checking all filesystems..r.r.r.R. done.
fdisk: cannot open /dev/hd-log: No such file or directory
No partition found for LOG
LOG partition is less than 1G, size found = 0
mounting Log 1
Starting mcelog daemon
cat: /var/log/log_flash_node: No such file or directory
Initializing the LOG flash
LOG Partitioning result code = 0
rrCreating logflash directories
Loading system software
/bootflash//m9700-sf3ek9-mz.9.2.1.bin read done
System image digital signature verification successful.
Uncompressing system image: bootflash:/m9700-sf4ek9-mz.9.2.1.bin Fri Mar 23 15:46:29 IST 2019
blogger: nothing to do.
C
..done Fri Mar 23 15:46:34 IST 2019
INIT: Entering runlevel: 3
Starting portmap daemon...
starting statd: done
starting 8 nfsd kernel threads: done
starting mountd: done
System is coming up... Please wait...
2019 Mar 23 15:48:10 switch %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for feature
ENTERPRISE_PKG. Application(s) shut down in 96 days.
>>>
```

```
>>>
NX7k SUP BIOS version ( 3.02) : Build - 03/23/2019 02:38:22
PM FPGA Version : 0x00000014
Power sequence microcode revision - 0x00000001 : card type - f10156EEA0
Booting Spi Flash : Primary
CPU Signature - 0x000106e4: Version - 0x000106e0
CPU - 1 : Cores - 4 : HTEn - 1 : HT - 2 : Features - 0xbfebfbff
FSB Clk - 532 Mhz : Freq - 2153 Mhz - 2128 Mhz
MicroCode Version : 0x00000005
Memory - 8192 MB : Frequency - 1067 MHZ
Loading Bootloader: Done
IO FPGA Version : 0x10001
PLX Version : 861910b5
Bios digital signature verification - Passed
Reset Reason Registers: 0x0 0x8
Filesystem type is ext2fs, partition type 0x83
GNU GRUB version 0.97
Autobooting bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin bootflash:/m9700-
sf3ek9-mz.9.2.1.bin..
Filesystem type is ext2fs, partition type 0x83
Booting kickstart image: bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin...
.....................................................................
.....................................................................
.....................................................
Kickstart digital signature verification Successful
Image verification OK
INIT: version 2
boot device node /dev/sda
obfl flash device node /dev/sdb
log flash device node /dev/sdc
Checking obfl filesystem.
Checking all filesystems..r.r.r..r done.
Mounting Log Dir /logflash
mounting Log 0
Starting mcelog daemon
reCreating logflash directories
Loading system software
/bootflash//m9700-sf4ek9-mz.9.2.1.bin read done
System image digital signature verification successful.
Uncompressing system image: bootflash:/m9700-sf4ek9-mz.9.2.1.bin Fri Mar 23 15:40:22 IST 2019
blogger: nothing to do.
C
..done Fri Mar 23 15:40:27 IST 2019
INIT: Entering runlevel: 3
Starting portmap daemon...
starting statd: done
starting 8 nfsd kernel threads: done
starting mountd: done
2019 Mar 23 15:40:58 switch %USBHSD-2-MOUNT: logflash: online
2019 Mar 23 15:41:12 switch %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for feature
ENTERPRISE_PKG. Application(s) shut down in 96 days.
Continuing with installation, please wait
Module 6: Waiting for module online.
-- SUCCESS
2019 Mar 23 15:42:35 switch %KERN-2-SYSTEM_MSG: [ 203.622504] Switchover started by redundancy
driver - kernel
2019 Mar 23 15:42:36 switch %SYSMGR-2-HASWITCHOVER_PRE_START: This supervisor is becoming active
(pre-start phase).
2019 Mar 23 15:42:36 switch %SYSMGR-2-HASWITCHOVER_START: Supervisor 6 is becoming active.
2019 Mar 23 15:42:36 switch %SYSMGR-2-SWITCHOVER_OVER: Switchover completed.
2019 Mar 23 15:42:37 switch %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on sup in slot
 6
2019 Mar 23 15:42:41 switch %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for feature
ENTERPRISE_PKG. Application(s) shut down in 96 days.
```

```
2019 Mar 23 15:42:41 switch %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for feature MAINFRAME_PKG.
 Application(s) shut down in 120 days.
2019 Mar 23 15:42:41 switch %LICMGR-2-LOG_LICAPP_NO_LIC: Application Fabric Binding running without
 MAINFRAME_PKG license, shutdown in 120 days
2019 Mar 23 15:42:42 switch %CALLHOME-2-EVENT: LICENSE_ALERT
Module 2: Non-disruptive upgrading.
[# ] 0%2019 Mar 23 15:49:27 switch %PLATFORM-1-PFM_ALERT: Enabling ejector based shutdown on sup
in slot 6
2019 Mar 23 15:52:05 switch %PMON-SLOT2-2-PMON_CRIT_INFO: Port Monitor Critical Information: Config
 download success.
[####################] 100% -- SUCCESS
Module 3: Non-disruptive upgrading.
[####################] 100% -- SUCCESS
Module 4: Non-disruptive upgrading.
[# ] 0%2019 Mar 23 15:57:44 switch %PMON-SLOT4-2-PMON_CRIT_INFO: Port Monitor Critical Information:
 Config download success.
[####################] 100% -- SUCCESS
Module 10: Non-disruptive upgrading.
[# ] 0%2019 Mar 23 16:00:00 switch %PMON-SLOT10-2-PMON_CRIT_INFO: Port Monitor Critical Information:
 Config download success.
[####################] 100% -- SUCCESS
Install has been successful.
You have now upgraded the Cisco NX-OS software in your switch.
switch#
```

Upgrading Cisco MDS NX-OS on Cisco MDS Fabric Switches

This section describes how to perform nondisruptive upgrades on the following Cisco MDS fabric switches:

- Cisco MDS 9124V Fibre Channel Switch
- Cisco MDS 9132T Multilayer Fabric Switch
- Cisco MDS 9148T Multilayer Fabric Switch
- Cisco MDS 9148S Multilayer Fabric Switch
- Cisco MDS 9148V Fibre Channel Switch
- Cisco MDS 9220i Multilayer Fabric Switch
- Cisco MDS 9250i Multiservice Fabric Switch
- Cisco MDS 9396S Multilayer Fabric Switch
- Cisco MDS 9396T Multilayer Fabric Switch
- Cisco MDS 9396V Fibre Channel Switch

This section contains the following topics:

Guidelines and Limitations for a Nondisruptive Upgrade on a Cisco MDS Fabric Switch

Before attempting to upgrade software images on the fabric switches, follow these guidelines:

- During the upgrade, the fabric must be stable.
- Do not perform the following configuration activities during an upgrade:
  - Zoning changes
  - Telnet sessions
  - Schedule changes
  - Switch cabling
  - Addition or removal of physical devices
- Configure the Fabric Shortest Path First (FSPF) timers to the default value of 20 seconds.
- If Cisco Fabric Services commits are pending in the fabric, the upgrade is aborted.
- If a zone server merge is in progress, the upgrade is aborted.
- If the upgrade is aborted due to a service not being ready for an upgrade, you are prompted to enter the **show install all failure-reason** command to identify the reason.
- Use the Software Install wizard to check whether sufficient space is available in the system to load the new images. Depending on the available space, you must either terminate the upgrade or proceed with a disruptive upgrade.
- Prior to upgrade or downgrade, reset the switch's logging levels to the system defaults via the **no logging level all** configuration command. If this is not done, the upgrade or downgrade may be disruptive due to excessive logging causing control plane downtime exceeding 80 seconds.

  Before entering the **no logging level all** command, ensure that the switch's current logging configuration is saved. This will need to restored after the upgrade or downgrade.

  Follow these steps:

  1. Enter the **show running-config | i “logging level”** command and save the output. These are the switch's current settings.
  2. Enter the **no logging level all** command in configuration mode.
  3. Perform upgrade or downgrade.
  4. Restore logging level configuration using the output that was saved from Step 1.
- When the installation is completed, the supervisor kickstart image, supervisor system image, module image, and the system BIOS are all updated.
- Nondisruptive upgrade on fabric switches disrupt the control plane for about 80 seconds. The software upgrade can be disruptive, if the upgrade process goes beyond the period it can be stopped gracefully, or if a failure occurs.

- If Virtual Router Redundancy Protocol (VRRP) is running on the mgmt0 interface, and the switch being upgraded is the master, a new master is selected. This situation cannot be avoided because the mgmt0 interface goes down when the control plane goes down.
- On the Cisco MDS 18/4-port Multiservice Module, upgrading the 4-Gigabit Ethernet ports for the hybrid Supervisor 18/4 module is disruptive.
- Perform the upgrade process by using the console port. This method enables you to log your session to a file (in case you need it later for troubleshooting). Telnet sessions are lost when the switch is rebooted. Therefore, if you want to view the process in its entirety, ensure that you use the console port.
- Before performing an upgrade, use the **show install all impact** command to view the effect of updating the system from the running image to another specified image.

Upgrading to Cisco MDS NX-OS Release 9.x on a Cisco MDS Fabric Switch

To upgrade to Cisco MDS NX-OS Release 9.2(2) from an earlier 9.x release, on a Cisco MDS fabric switch, perform the following steps:

Step 1 Verify that the system image files for the upgrade are present on the active supervisor module bootflash:

```
switch# dir bootflash:

25863680 Sep 23 12:02:16 2021 m9250-s5ek9-kickstart-mz.9.2.1.bin
25864704 Jan 05 12:21:26 2022 m9250-s5ek9-kickstart-mz.9.2.2.bin

Usage for bootflash://sup-local

2838728704 bytes used
520916992 bytes free
3359645696 bytes total
```

Step 2 If the software image file is not present, download it from an FTP or TFTP server to bootflash.

You can obtain the software image file from the Cisco.com Software Download Center at http://www.cisco.com/cisco/software/navigator.html.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9250-s5ek9-kickstart-mz.9.2.2.bin
bootflash:m9250-s5ek9-kickstart-mz.9.2.2.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9250-s5ek9-mz.9.2.2.bin
bootflash:m9250-s5ek9-mz.9.2.2.bin
```

Step 3 Ensure that the required space is available on the switch:

```
switch# dir bootflash:
25863680 Sep 23 12:02:16 2017 m9250-s5ek9-kickstart-mz.9.2.1.bin
25864704 Sep 05 12:21:26 2018 m9250-s5ek9-kickstart-mz.9.2.2.bin
25864704 Sep 05 12:21:50 2018 m9250-s5ek9-mz.9.2.2.bin

Usage for bootflash://sup-local
120695976 bytes used
63863640 bytes free
184559616 bytes total
```

Step 4 If you need more space on the switch, delete the files that are not required:

```
switch# delete bootflash: m9250-s5ek9-kickstart-mz.9.2.1.bin
```

Step 5 Save the configuration using the **copy running-config startup-config** command:

```
switch# copy running-config startup-config
```

You can also back up your existing configuration to a file, using the **copy running-config bootflash:backup_config.txt** command. You can add a date reference to the.txt filename to identify the file later.

Step 6 Save a copy of the **show tech-support** command output of the switch. For more information, see https://www.cisco.com/c/en/us/td/docs/dcn/whitepapers/how-to-collect-logs-cisco-mds.html#Theshowtechsupportcommand.

Step 7 Perform the upgrade by running the **install all** command:

```
switch# install all kickstart m9250-s5ek9-kickstart-mz.9.2.2.bin system m9250-s5ek9-mz.9.2.2.bin
Installer will perform compatibility check first. Please wait.
y
Verifying image bootflash:/m9250-s5ek9-kickstart-mz.9.2.2.bin for boot variable "kickstart".
[# ] 0%
[####################] 100% -- SUCCESS
Verifying image bootflash:/m9250-s5ek9-mz.9.2.2.bin for boot variable "system".
[####################] 100% -- SUCCESS
Performing module support checks.
[####################] 100% -- SUCCESS
Verifying image type.
[####################] 100% -- SUCCESS
Extracting "system" version from image bootflash:/m9250-s5ek9-mz.9.2.2.bin
[####################] 100% -- SUCCESS
Extracting "kickstart" version from image bootflash:/m9250-s5ek9-kickstart-mz.9.2.2.bin
[####################] 100% -- SUCCESS
Extracting "bios" version from image bootflash:/m9250-s5ek9-mz.9.2.2.bin
[####################] 100% -- SUCCESS
Performing Compact Flash and TCAM sanity test.
[####################] 100% -- SUCCESS
Notifying services about system upgrade.
[####################] 100% -- SUCCESS
Compatibility check is done:
Module bootable Impact Install-type Reason
------ -------- -------------- ------------ ------
1 yes non-disruptive reset
Other miscellaneous information for installation:
Module info
------ --------------------------------
1 FC ports 1-40 and FCoE ports 1-8 are hitless, IPS 1-2 are hitful, and Intelligent Applications
running are hitful
Images will be upgraded according to following table:
Module Image Running-Version New-Version Upg-Required
------ ---------- ---------------------------------------- -------------------- -----
1 system 9.2(1) 9.2(2) yes
1 kickstart 9.2(1) 9.2(2) yes
1 bios v2.1.17(01/08/14):v2.1.17(01/08/14) v2.1.17(01/08/14) no
Do you want to continue with the installation (y/n)? [n] y
Install is in progress, please wait.
Performing runtime checks.
[####################] 100% -- SUCCESS
Notifying services about the upgrade.
[####################] 100% -- SUCCESS
Setting boot variables.
[####################] 100% -- SUCCESS
Performing configuration copy.
[####################] 100% -- SUCCESS
Module 1: Refreshing compact flash and Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Upgrade can no longer be aborted, any failure will result in a disruptive upgrade.
```

```
Freeing memory in the file system.
[####################] 100% -- SUCCESS
Loading images into memory.
[####################] 100% -- SUCCESS
Saving linecard runtime state.
[####################] 100% -- SUCCESS
Saving supervisor runtime state.
[####################] 100% -- SUCCESS
Saving mts state.
[####################] 100% -- SUCCESS
Reloading the kernel to proceed with the upgrade.
All telnet and ssh connections will now be temporarily terminated.
>> NX7--LC-loader-02.01.17 (June 8 2019 - 16:30:41), Build: 02.01.17
CPU0: 8572E, Version: 2.2, (0x80e80022)
Core: E500, Version: 3.0, (0x80210030)
Clock Configuration:
CPU:1066.672 MHz, CCB:533.336 MHz,
DDR:266.668 MHz (533.336 MT/s data rate), LBC:33.334 MHz
L1: D-cache 32 kB enabled
I-cache 32 kB enabled
Board: 9044, IOFPGA: 0x0000001A, SPROM: 0xAB
Boot flash : Primary
I2C: ready
DRAM: Initializing
DDR: dimm type 10, registered 1
DDR: dimm type 10, registered 1
DDR: 4 GB
L2: 1024 KB enabled
Using default environment
In: serial
Out: serial
Err: serial
Net: INFO: Net boot mode = 1
INFO: Net boot mode = 1
INFO: Board will come up MGMT interface
INFO: MAC address is: b8:38:61:4a:24:40
eTSEC2 board phy 3
INFO: Net boot mode = 1
eTSEC2
IDE: Bus 0: OK
Device 0: Model: UGB30STC4000Z4-EBY-ASD Firm: FW100511 Ser#: UNIGEN3 30021309
Type: Hard Disk
Capacity: 3907.9 MB = 3.8 GB (8003520 x 512)
Booting image bootflash://m9250-s5ek9-kickstart-mz.9.2.2.bin
25968640 bytes read
NBI at 08000000 size 134217728
Booting image at addr 0x00800000...
Memory <- <0x0 0x0 0x1 0x0> (4096MB)
ethernet0: local-mac-address <- b8:38:61:4a:24:40
ethernet1: local-mac-address <- 00:e0:0c:00:01:fd
ethernet2: local-mac-address <- 00:e0:0c:00:02:fd
CPU clock-frequency <- 0x3f941f80 (1067MHz)
CPU timebase-frequency <- 0x3f941f8 (67MHz)
CPU bus-frequency <- 0x1fca0fc0 (533MHz)
Image starting: loaded at 0x00800000 (sp: 0x7fedc4c0)
Allocating 0x620d88 bytes for kernel...
unzipping (0x00000000 <- 0x00817000:0x00de3838)...done 0x5bc060 bytes
Using loader supplied ramdisk at 0x2800000-0x3ddaa00
initrd head: 0x1f8b0808
Linux/PowerPC load: rw root=/dev/ram0 rdbase=0x7000000 card_index=9044 maxcpus=2 ip=off
ramdisk_size=262144 noquiet obfl_type_ide=1 kgdboc=ttyS0,9600,B isanimg_loc=0x6000000
isanimg_size=0x400 console=ttyS0,9600n8nn loader_ver="02.01.17" card_index=9044 quiet bootdev=ide0
 server_ip=171.69.21.28 ksimg=/m9250-s5ek9-kickstart-mz.9.2.2.bin isanimg=/m9700-sf4ek9-mz.9.2.1.bin
 Finalizing device tree... flat tree at 0xdf0140
```

```
ï¿½setup_arch: bootmem
mpc85xx_ds_setup_arch()
arch: exit
[ 0.060041] Host controller irq 26
[ 0.134631] Assign root port irq 26
[ 0.755227] physmap-flash physmap-flash.0: Could not reserve memory region
[ 1.032812] Enabling all PCI devices
INIT: Checking all filesystems.....retval=[0]
done.
Loading system software
Uncompressing system image: bootflash:///m9250-s5ek9-kickstart-mz.9.2.2.bin
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Load plugins that defined in image conf: /isan/plugin_img/img.conf
No Patching support on this platform
Loading plugin 0: core_plugin...
No Patching support on this platform
Enter pboot_chk_compatibility
num srgs 1
0: swid-core-s5ek9, swid-core-s5ek9
num srgs 1
0: swid-sup-ali-ks, swid-sup-ali-ks
INIT: Entering runlevel: 3
[ 127.215099] clpk_hw_init_1:Post ISSU instance 0 status 0x00000736 GOOD
[ 127.293946] clpk_hw_init_1:Post ISSU instance 1 status 0x00000536 GOOD
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
Continuing with installation process, please wait.
The login will be disabled until the installation is completed.
Status for linecard upgrade.
[####################] 100% -- SUCCESS
Performing supervisor state verification.
[####################] 100% -- SUCCESS
Supervisor non-disruptive upgrade successful.
Install has been successful.
```

Step 8 Log in to the switch:

```
MDS Switch
x.x.x.x login: admin
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2014, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php
```

Step 9 Run the **show version** command:

```
switch# show version

Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Documents: http://www.cisco.com/en/US/products/ps9372/tsd_products_support_serie
s_home.html
Copyright (c) 2002-2019, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained herein are owned by
other third parties and are used and distributed under license.
Some parts of this software are covered under the GNU Public
License. A copy of the license is available at
http://www.gnu.org/licenses/gpl.html.
Software
BIOS: version 2.1.17
loader: version N/A
kickstart: version 9.2(2) [build 9.2(2)]
system: version 9.2(2) [build 9.2(2)]
BIOS compile time: 01/08/14
kickstart image file is: bootflash:///m9250-s5ek9-kickstart-mz.9.2.2.bin
kickstart compile time: 8/9/2021 23:00:00 [08/09/2021 04:18:10]
system image file is: bootflash:///m9250-s5ek9-kickstart-mz.9.2.2.bin
system compile time: 8/9/2019 23:00:00 [08/09/2021 07:09:57]
Hardware
cisco MDS 9250i 40 FC 2 IPS 8 FCoE (2 RU) Chassis ("40FC+8FCoE+2IPS Supervisor
")
Motorola, e500v2 with 4088636 kB of memory.
Processor Board ID JAF1804AAFG
Device name: MDS9250i
bootflash: 4001760 kB
Kernel uptime is 0 day(s), 0 hour(s), 7 minute(s), 42 second(s)
Last reset at 288238 usecs after Mon Aug 9 11:40:56 2021
Reason: Reset due to upgrade
System version: 9.2(1)
Service:
plugin
Core Plugin
```

Step 10 Verify the status of the modules on the switch, using the **show module** command:

```
switch# show module

Mod Ports Module-Type Model Status
--- ----- -------------------------------- ------------------ ----------
1 50 40FC+8FCoE+2IPS Supervisor DS-C9250I-K9-SUP active *
Mod Sw Hw World-Wide-Name(s) (WWN)
--- --------------- ------ --------------------------------------------------
1 8.4(1) 1.0 20:01:00:2a:6a:1b:64:d0 to 20:28:00:2a:6a:1b:64:d0
Mod MAC-Address(es) Serial-Num
--- -------------------------------------- ----------
1 b8-38-61-4a-25-c0 to b8-38-61-4a-25-cf JAF1804AAFG
```

Step 11 To display the status of a nondisruptive upgrade on a fabric switch, use the **show install all status** command.

The command output displays the status only after the switch has rebooted with the new image. All the actions preceding the reboot are not captured in this output because when you enter the **install all** command using a Telnet session, the session is disconnected when the switch reboots. When you reconnect to the switch through a Telnet session, the upgrade may already be complete, in which case, the output displays the status of the upgrade.

```
switch# show install all status

This is the log of last installation.

Continuing with installation process, please wait.
The login will be disabled until the installation is completed.
```

```
Status for linecard upgrade.
-- SUCCESS

Performing supervisor state verification.
-- SUCCESS

Install has been successful
```

Troubleshooting a Nondisruptive Upgrade on a Fabric Switch

When a nondisruptive upgrade begins, the system notifies all the services that an upgrade is about to start, and finds out whether the upgrade can proceed. If a service cannot allow the upgrade to proceed immediately, for example, if Fabric Shortest Path First (FSPF) timers are not configured to the default value, or a Cisco Fabric Services operation is in progress, the service terminates the upgrade. If such a situation occurs, you are prompted to enter the **show install all failure-reason** command to determine the reason why the upgrade cannot proceed.

```
Do you want to continue with the installation (y/n)? [n] y

Install is in progress, please wait.

Notifying services about the upgrade.
[# ] 0% -- FAIL. Return code 0x401E0066 (request timed out).

Please issue "show install all failure-reason" to find the cause of the failure.<---system
 prompt to enter the show all failure-reason command.

Install has failed. Return code 0x401E0066 (request timed out).
Please identify the cause of the failure, and try 'install all' again.

switch# show install all failure-reason
Service: "cfs" failed to respond within the given time period.
```

When the upgrade is in progress, if any failures occur, for example, if a save runtime state failure or module upgrade failure occurs, the switch is rebooted disruptively because the changes cannot be rolled back. In this case, the upgrade fails, but you are not prompted to enter the **show install all failure-reason** command because the command does not yield any useful information.

If you need additional information to determine why an upgrade is unsuccessful, you can obtain the details by using the **show tech-support** command output, and from the console output from the installation, if available.

Moving From an NPE Image to a non-NPE Image and Vice Versa

The following section describes how to upgrade from a no payload encryption (NPE) image to a non-NPE image and vice versa.

Note

- If the image file name includes *npe* text, the image is an NPE image. If the image file name does not include *npe* text, the image is a non-NPE image.
- If you are moving from using an NPE image to a non-NPE image, we recommend that you use the corresponding non-NPE Cisco MDS NX-OS release image and vice versa. If you are upgrading from one release of Cisco MDS NX-OS to a newer release, and as part of this activity, you are moving from using an NPE image to a non-NPE image, we recommended that you first upgrade the existing NPE Cisco MDS NX-OS release image and then upgrade to the respective non-NPE Cisco MDS NX-OS release image and vice versa.
- Use the console connection for firmware upgrades. Be aware that if you are upgrading through the management interface, you must have a working connection to both supervisors, as this process causes a switchover and the current standby supervisor will be active after the upgrade.

Step 1 Log in to Cisco.com to access the links provided in this document. To log in to Cisco.com, go to the URL http://www.cisco.com/ and click Log In at the top of the page. Enter your Cisco Systems user name and password.

Note Unregistered Cisco.com users cannot access the links provided in this document.

Step 2 Verify the following physical connections for the switch:

- The console port is physically connected to a computer terminal (or terminal server).
- The management 10/100/1000 Ethernet port (mgmt0) is connected to an external hub, switch, or router.
- On switches with dual supervisor modules, both supervisor modules must have the management 10/100/1000 Ethernet ports (mgmt0) connected to an external hub, switch, or router.

These procedures are specified in the hardware installation guide for the required product.

Step 3 Log in to the switch.

Step 4 Issue the **copy running-config startup-config** command to store your current running configuration.

You can also create a backup of your existing configuration to a file by issuing the **copy running-config bootflash:backup_config.txt** command.

Step 5 Verify that the requested license files installed in the switch are displayed in response to the **show license usage** command.

Note The switch is initially shipped with the required licenses installed in the system; however, the initial license file will not cover unlicensed features that may be used during the grace period. If no license is displayed at this point, perform Step 6 and Step 7 to install the required licenses. If the required licenses are displayed at this point, skip Step 6 and Step 7 and move to Step 8.

The example CLI output for a valid license follows:

```
switch# show license usage
Feature Ins Lic Status Expiry Date Comments
Count
--------------------------------------------------------------------------------
FM_SERVER_PKG No - Unused -
MAINFRAME_PKG No - Unused -
```

```
ENTERPRISE_PKG Yes - Unused never -
--------------------------------------------------------------------------------
```

Step 6 Install licenses (if necessary) to ensure that the required features are available on the switch.

Perform the following steps:

a) Use the **show license host-id** command to obtain the serial number for your switch. The host ID is also referred to as the switch serial number.

```
switch# show license host-id
License hostid: VDH=JAF1721AEQG
```

Tip Use the entire ID that appears after the colon (:) sign. In this example, the host ID is VDH=JAF1721AEQG.

b) Obtain your Claim Certificate or the Proof of Purchase document. This document accompanies every Cisco MDS switch.

c) Locate the Product Authorization Key (PAK) from the Claim Certificate or Proof of Purchase document.

d) Locate the website URL from the Claim Certificate or Proof of Purchase document.

e) Access the specified URL that applies to your switch and enter the switch serial number and the PAK.

The license key file is sent to you by email. The license key file is digitally signed to authorize its use only on the switch for which it was requested. The requested features are also enabled once the NX-OS software on the specified switch accesses the license key file.

Caution Install the license file in the specified Cisco MDS 9000 Family switch without making any modifications.

Step 7 Install the license key file when you receive it by email.

Perform the following steps:

a) Install the license key file when you receive it by email.

b) Perform the installation by issuing the **install license** command on the active supervisor module from the switch console.

```
switch# install license bootflash:license_file.lic
Installing license..done
```

Note If you provide a target name for the license key file, the file is installed with the specified name. Otherwise, the file name specified in the license key file is used to install the license.

c) Exit the switch console.

Step 8 Ensure that the required space is available in the bootflash: directory for the image file(s) to be copied using the **dir bootflash:** command.

Use the **delete bootflash:** *filename* command to remove unnecessary files.

Note Before downloading and installing Cisco NX-OS software, verify that the release is supported by your Cisco System MDS reseller. If you purchased support through a Cisco Systems reseller, contact them directly for more information. Otherwise, contact Cisco Technical support.

```
switch# dir bootflash:
37011968 Apr 30 16:10:28 2014 m9700-sf4ek9-kickstart-mz-npe.8.4.2a.bin
195875124 Apr 30 12:55:14 2014 m9700-sf4ek9-mz-npe.8.4.2a.bin
Usage for bootflash://sup-local
819736576 bytes used
75313152 bytes free
895049728 bytes total
```

Step 9 If you need more space on the active supervisor module bootflash, delete unnecessary files to make space available.

```
switch# delete m9700-sf4ek9-kickstart-mz-npe.8.4.2a.bin
switch# delete m9700-sf4ek9-mz-npe.8.4.2a.bin
```

Step 10 For switches with dual supervisor modules, verify that there is space available on the standby supervisor module bootflash on a switch.

```
switch# attach module x /*where x is the module number of the standby supervisor*/
switch(standby)# dir bootflash:
12288 Aug 26 19:06:14 2011 lost+found/
16206848 Jul 01 10:54:49 2011 m9700-sf4ek9-kickstart-mz-npe.8.4.2a.bin
78337129 Jul 01 10:33:52 2011 m9700-sf4ek9-mz-npe.8.4.2a.bin

Usage for bootflash://sup-local
122811392 bytes used
61748224 bytes free
184559616 bytes total

switch(standby)# exit /*to return to the active supervisor*/
```

Step 11 For switches with dual supervisor modules, if you need more space on the standby supervisor module bootflash on a switch, delete unnecessary files to make space available.

```
switch(standby)# delete bootflash:m9700-sf4ek9-kickstart-mz-npe.8.4.2a.bin
switch(standby)# delete m9700-sf4ek9-mz-npe.8.4.2a.bin
```

Step 12 Access the Software Download Center using this URL: http://www.cisco.com/cisco/software/navigator.html.

If prompted to log in, use your Cisco system user ID and password.

Step 13 Select the same version of the NPE image file or non-NPE image file that the switch is currently running.

You see the Technical Support Encryption Software Export Distribution Authorization form.

Step 14 Complete the required forms to obtain authorization.

Step 15 Download the files to an FTP or TFTP server.

Step 16 Copy the Cisco MDS NX-OS kickstart and system images to the active supervisor module bootflash using FTP or TFTP.

Note When you download an image file, change to your FTP environment IP address or DNS name and the path where the files are located.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-kickstart-mz.9.2.1.bin
bootflash:m9700-sf4ek9-kickstart-mz.9.2.1.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-mz-npe.9.2.1.bin
bootflash:m9700-sf4ek9-mz-npe.9.2.1.bin
```

Step 17 Issue the **boot kickstart bootflash** : *filename* and **boot system bootflash** : *filename* commands to change the boot variables to point to the new image.

```
switch# configure terminal
switch(config)# boot kickstart bootflash:m9700-sf4ek9-kickstart-mz.9.2.1.bin
Performing image verification and compatibility check, please wait....
switch(config)# boot system bootflash:m9700-sf4ek9-mz-npe.9.2.1.bin
Performing image verification and compatibility check, please wait....
```

Step 18 Issue the **show incompatibility-all system** *filename* command to verify any incompatible hardware.

```
switch(config-if)# show incompatibility-all system m9700-sf4ek9-mz-npe.9.2.1.bin
Checking incompatible configuration(s)
No incompatible configurations

Checking dynamic incompatibilities:
```

```
----------------------------------
No incompatible configurations
```

Step 19 Save the current running configuration to the startup configuration by issuing the **copy running-config startup-config** command.

```
switch(config)# copy running-config startup-config
[########################################] 100%
Copy complete.
```

Step 20 Issue the **show boot** command to check the current boot variable.

```
switch(config)# show boot

Current Boot Variables:

sup-1
kickstart variable = bootflash:/ m9700-sf4ek9-kickstart-mz.9.2.1.bin
system variable = bootflash:/ m9700-sf4ek9-mz-npe.9.2.1.bin
sup-2
kickstart variable = bootflash:/ m9700-sf4ek9-kickstart-mz.9.2.1.bin
system variable = bootflash:/ m9700-sf4ek9-mz-npe.9.2.1.bin
No module boot variable set

Boot Variables on next reload:

sup-1
kickstart variable = bootflash:/ m9700-sf4ek9-kickstart-mz.9.2.1.bin
system variable = bootflash:/ m9700-sf4ek9-mz-npe.9.2.1.bin
sup-2
kickstart variable = bootflash:/ m9700-sf4ek9-kickstart-mz.9.2.1.bin
system variable = bootflash:/ m9700-sf4ek9-mz-npe.9.2.1.bin
No module boot variable set
```

Step 21 Reload the switch by issuing the **reload** command.

```
switch(config)# reload
This command will reboot the system. (y/n)? [n]
```

You have now upgraded the Cisco MDS NX-OS software in your existing switch.