Cisco MDS 9000 Software Upgrade and Downgrade Guide, Release 7.3(x)

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This document describes how to upgrade to Cisco NX-OS Release 7.3(x) from Release 6.2(x), and how to downgrade from Cisco NX-OS Release 7.3(x) to Release 6.2(x).

This guide includes the following sections:

Note All command-line interface (CLI) session examples provided in this document are only intended for reference. The actual switch output differs based on your switch model.

About Software Images

Each switch is shipped with the Cisco MDS NX-OS operating system for Cisco MDS 9000 Family switches. The Cisco MDS NX-OS software consists of two images: the kickstart image and the system image.

- To select the kickstart image, use the KICKSTART variable.
- To select the system image, use the SYSTEM variable.

The images and variables are important factors in any install procedure. You must specify the variable and the respective image to upgrade or downgrade your switch. Both images are not always required for each install.

Note To download new Cisco MDS 9000 Family software including Cisco NX-OS and Cisco DCNM management software, refer to the Storage Networking Software download site at: http://www.cisco.com/cisco/software/navigator.html

Dependent Factors for Software Installation

The software image install procedure is dependent on the following factors:

- Software images—The kickstart and system image files reside in directories or folders that can be accessed from the Cisco MDS 9000 Family switch prompt.
- Image version—Each image file has a version.
- Flash disks on the switch—The bootflash: resides on the supervisor module and the CompactFlash disk is inserted into the slot0: device.
- Supervisor modules—There are single or dual supervisor modules.

Note On switches with dual supervisor modules, both supervisor modules must have Ethernet connections on the management interfaces (mgmt 0) to maintain connectivity when switchovers occur during upgrades and downgrades. Refer to the *Cisco MDS 9500 Series Hardware Installation Guide*.

Supported Components

For information on supported software and hardware components, see the Cisco MDS 9000 Series Compatibility Matrix.

Determining the Software Version

To determine the version of Cisco MDS NX-OS software currently running on a Cisco MDS 9000 Family switch using the CLI, log in to the switch and enter the **show version** EXEC command.

To determine the version of Cisco MDS NX-OS software currently running on a Cisco MDS 9000 Family switch using Cisco DCNM for SAN, view the Switches tab in the Information pane, locate the switch using the IP address, logical name, or WWN, and check its version in the Release column.

Determining Software Version Compatibility

Table 1 lists the software versions that are compatible in a mixed SAN environment, the minimum software versions that are supported, and the versions that have been tested. We recommend that you use the latest software release supported by your vendor for all Cisco MDS 9000 Family products.

Table 1   Software Release Compatibility

Cisco MDS NX-OS Software	Minimum MDS NX-OS	Tested MDS NX-OS Release
MDS NX-OS Release 7.3(1)D1(1)	MDS NX-OS Release 7.3(1)D1(1) and later	MDS NX-OS Release 7.3(1)D1(1) and later
	MDS NX-OS Release 6.2(1) and later	MDS NX-OS Release 6.2(1) and later
	MDS NX-OS Release 5.2(1) and later	MDS NX-OS Release 5.2(1) and later
	MDS NX-OS Release 5.0(1a) and later	MDS NX-OS Release 5.0(1a) and later
	MDS NX-OS Release 4.2(3) and later	MDS NX-OS Release 4.2(3) and later

Downloading Software

The Cisco MDS NX-OS software is designed for mission-critical high-availability environments. To realize the benefits of nondisruptive upgrades on the Cisco MDS 9700 Directors, Cisco MDS 9500 Directors, we highly recommend that you install dual supervisor modules.

To download the latest Cisco MDS NX-OS software, access the Software Center at this URL:

http://www.cisco.com/cisco/software/navigator.html?a=a&i=rpm

The **show incompatibility-all system**:system image filename command determines which additional features need to be disabled.

```
switch(config)# show incompatibility-all system m9700-sf3ek9-mz.6.2.13a.bin
Checking incompatible configuration(s)
The following configurations on active are incompatible with  the system image
1) Service : ips , Capability : CAP_FEATURE_IPS_FCIP_CONFIGURED
Description : FCIP feature enabled
Capability requirement : STRICT
Enable/Disable command : Do 'no feature fcip' to proceed


Checking dynamic incompatibilities:
----------------------------------
No incompatible configurations
switch(config)#
```

If you would like to request a copy of the source code under the terms of either GPL or LGPL, please send an e-mail to mds-software-disclosure@cisco.com.

Selecting the Software Image for a Cisco MDS 9148S Switch

The system and kickstart image that you use for a Cisco MDS 9148S switch is shown in Table 2.

Table 2   Software Images for Cisco MDS 9148S Switches

Cisco MDS 9148S Switch	Naming Convention
Cisco MDS 9148S	Filename begins with m9100-s5ek9

Selecting the Software Image for a Cisco MDS 9250i Switch

The system and kickstart image that you use for a Cisco MDS 9250i switch is shown in Table 3.

Table 3   Software Images for a Cisco MDS 9250i Switch

Cisco MDS 9250i Switch	Naming Convention
Cisco MDS 9250i	Filename begins with m9250-s5ek9

Selecting the Software Image for a Cisco MDS 9396S Switch

The system and kickstart image that you use for a Cisco MDS 9396S switch is shown in Table 4.

Table 4   Software Images for a Cisco MDS 9396S Switch

Cisco MDS 9396S Switch	Naming Convention
MDS 9396S	Filename begins with m9300-s1ek9

Selecting the Software Image for a Cisco MDS 9500 Series Switch

The system and kickstart image that you use for a Cisco MDS 9500 Series switch with a Supervisor-2A module is shown in Table 5.

Table 5   Software Images for Cisco MDS 9500 Series Switches

Cisco MDS 9500 Series Switch Type	Naming Convention
Cisco MDS 9513, 9509, and 9506	Filename begins with m9500-sf2ek9

Use the **show module** command to display the type of supervisor module in the switch. The following is sample output from the **show module** command on a Supervisor-2A module:

```
switch# show module
Mod   Ports  Module-Type                       Model              Status
---   -----  --------------------------------  ------------------ ------------
7     0      Supervisor/Fabric-2a              DS-X9530-SF2AK9    ha-standby
8     0      Supervisor/Fabric-2a              DS-X9530-SF2AK9    active *
```

Selecting the Software Image for a Cisco MDS 9700 Series Switch

The system and kickstart image that you use for a Cisco MDS 9700 Series switch is shown in Table 6.

Table 6   Software Images for Cisco MDS 9700 Series Switch

Cisco MDS 9700 Switch	Naming Convention
Cisco MDS 9718, 9710, and 9706	Filename begins with m9700-sf3ek9

NPE Software Images

No payload encryption (NPE) images are available with Cisco MDS NX-OS Release 7.3(1)D1(1) software. The NPE images are intended for countries who have import restrictions on products that encrypt payload data.

To differentiate an NPE image from the standard software image, the letters npe are included in the image name as follows:

- m9100-s5ek9-kickstart-mz-npe.7.3.1.D1.1.bin
- m9100-s5ek9-mz-npe.7.3.1.D1.1.bin
- m9250-s5ek9-kickstart-mz-npe.7.3.1.D1.1.bin
- m9250-s5ek9-mz-npe.7.3.1.D1.1.bin
- m9300-s1ek9-kickstart-mz-npe.7.3.1.D1.1.bin
- m9300-s1ek9-mz-npe.7.3.1.D1.1.bin
- m9500-sf2ek9-kickstart-mz-npe.7.3.1.D1.1.bin
- m9500-sf2ek9-mz-npe.7.3.1.D1.1.bin
- m9700-sf3ek9-kickstart-mz-npe.7.3.1.D1.1.bin
- m9700-sf3ek9-mz-npe.7.3.1.D1.1.bin

When downloading software, ensure that you select the correct software images for you Cisco MDS 9000 Series switch. Nondisruptive software upgrades or downgrades between NPE images and non-NPE images are not supported.

Installing Cisco NX-OS Release 7.3(x) Software on a New Cisco MDS Switch

Note   If the management 10/100/1000 Ethernet port (mgmt0) interface of the Cisco MDS 9700 Series switches has a preconfigured "/0" IPv6 address that cannot be removed, use the **write erase boot** command to clear the complete configuration of the device and reload the device using the **reload** command. Perform this process before commissioning the device into production as this process is disruptive to user traffic if it is applied to the active supervisor of a system. Ensure an active console connection to the supervisor as this process will remove the IPv4 address of the mgmt0 interface.

To install the latest Cisco NX-OS Release 7.3(x) software images on a new Cisco MDS 9000 Family switch, follow these steps:

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 username and password.

> **Note** Use your registered Cisco Systems username and password to access the links provided in this document.

Step 2 Verify the following physical connections for the new Cisco MDS 9000 Family 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.

Information on physical connections can be found in the *Cisco MDS 9000 Series Hardware Installation Guides*.

> **Note** On switches with dual supervisor modules, both supervisor modules must have Ethernet connections on the management interfaces (mgmt 0) to maintain connectivity when switchovers occur during upgrades and downgrades. Refer to the *Cisco MDS 9500 Series Hardware Installation Guide*.

> **Tip** Save the host ID information for future use (for example, to enable licensed features). The host ID information is provided in the Proof of Purchase document that accompanies the switch.

Step 3 Verify that the default console port parameters are identical to the parameters of the computer terminal (or terminal server) attached to the switch console port:

- 9600 baud
- 8 data bits
- 1 stop bit
- No parity

Refer to the "ConfiguringTerminal Settings and Sessions" chapter in the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

Step 4 Power up the Cisco MDS 9000 Family switch. The switch boots automatically.

Step 5 Obtain the IP address, subnet mask, and default gateway information that is required for the Cisco MDS 9000 Family switch to communicate over the supervisor module Ethernet interface. This information is required to configure and manage the switch.

Refer to the "Using the Cisco NX-OS Setup Utility" chapter in the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

> **Tip** You have the option to change the default password during the initial setup process. All Cisco MDS 9000 Family switches have the network administrator as a default user (admin) and a default password (admin). You cannot change the default user at any time.

Step 6 Complete the System Admin Account Setup.

🔍
Tip If you create a short, easy-to-decipher password, your password is rejected. Be sure to configure a strong password as shown in the sample configuration. Passwords are case sensitive. You must explicitly create a password that meets the requirements listed in the "Characteristics of Strong Passwords" section in the "Configuring Users and Common Roles" chapter in the *Cisco MDS 9000 Family NX-OS Security Configuration Guide*.

```
---- System Admin Account Setup ----

Do you want to enforce secure password standard (yes/no) [y]: y

Enter the password for "admin":

Confirm the password for "admin":
```

Step 7 Enter **yes** to enter the setup mode and assign the information obtained in Step 5.

Refer to the "Using the Cisco NX-OS Setup Utility" chapter in the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

✏️
Note Press **Ctrl-C** at any prompt to skip the remaining configuration options and proceed with what is configured until that point.

🔍
Tip If you do not want to answer a previously configured question, or if you want to skip answers to any questions, press **Enter**. If a default answer is not available (for example, a switch name), the switch uses the previously configured settings and skips to the next question.

The CLI configuration steps (using factory defaults) are as follows:

```
---- Basic System Configuration Dialog ----

This setup utility will guide you through the basic configuration of
the system. Setup configures only enough connectivity for management
of the system.

Press Enter incase you want to skip any dialog. Use ctrl-c at anytime
to skip remaining dialogs.

Would you like to enter the basic configuration dialog (yes/no): yes
```

By default, two roles exist in all switches:

- Network operator (network-operator)—Has permission to view the configuration only. The operator cannot make any configuration changes.

- Network administrator (network-admin)—Has permission to execute all commands and make configuration changes. The administrator can also create and customize up to 64 additional roles. One (of these 64 additional roles) can be configured during the initial setup process.

```
Create another login account (yes/no) [n]: yes
```

Note While configuring your initial setup, you can create an additional user account (in the network-admin role) besides the administrator's account. The user name must contain non-numeric characters. Refer to the "Configuring User Accounts" section in the "Configuring Users and Common Roles" chapter in the *Cisco MDS 9000 Family NX-OS Security Configuration Guide*.

```
Enter the user login ID: test

Enter the password for "test":
Confirm the password for "test":
Enter the user role [network-operator]:
```

Tip If you use SNMPv3, then do not configure the SNMPv2 community string. Refer to the "Configuring SMNP" chapter in the *Cisco MDS 9000 Family NX-OS System Management Configuration Guide*.

```
Configure read-only SNMP community string (yes/no) [n]: yes

SNMP community string: admin
```

Note The switch name is limited to 32 alphanumeric characters.

```
Enter the switch name: switch

Continue with Out-of-band (mgmt0) management configuration? [yes/no]: yes
```

IP version 6 (IPv6) is supported in Cisco MDS NX-OS Release 4.1(x) and later. However, the setup script only supports IP version 4 (IPv4) for the management interface. For information on configuring IPv6 on the management interface, refer the *Cisco MDS 9000 Family NX-OS IP Services Configuration Guide,* or the *IP Services Configuration Guide, Cisco DCNM for SAN*.

```
Mgmt0 IPv4 address: ip_address

Mgmt0 IPv4 netmask: subnet_mask

Configure the default gateway? (yes/no) [y]: yes

IPv4 address of the default gateway : 209.165.200.225

Configure advanced IP options? (yes/no) [n]: yes

Continue with In-band (vsan1) management configuration? (yes/no) [n]: n

Enable IP routing? (yes/no) [n]: yes

Configure static route? (yes/no) [n]: n
```

Note Be sure to configure the IP route, the IP default network address, and the IP default gateway address to enable SNMP access. If IP routing is enabled, the switch uses the IP route and the default network IP address. If IP routing is disabled, the switch uses the default gateway IP address.

```
Configure the default-network: (yes/no) [y]: yes
```

✎

Note   The default network address is the `Destination prefix: dest_prefix` provided above in `Mgmt 0`
`IPv4 netmask: subnet_mask`.

```
Default network IPv4 address: dest_prefix


Configure the DNS IPv4 address? (yes/no) [y]: yes

DNS IP address: name_server_ip_address

Configure the default domain name? (yes/no) [n]: yes

Default domain name: domain_name
```

✎

Note   Refer to the "Configuring Users and Common Roles" chapter in the *Cisco MDS 9000 Family*
NX-OS Security Configuration Guide.

```
Enable the ssh service? (yes/no) [y]:

Type of ssh key you would like to generate (dsa/rsa) [rsa]:

Number of rsa key bits <768-2048> [1024]:

Enable the telnet service? (yes/no) [n]: y

Enable the http-server? (yes/no) [y]:

Configure clock? (yes/no) [n]: yes

Clock config format [HH:MM:SS Day Mon YYYY] :

Enter clock config :10:10:10 1 July 2013

Configure timezone? (yes/no) [n]: y

Enter timezone config :pst

Configure summertime? (yes/no) [n]: yes

summer-time config :PDT 2 sunday march 02:00 1 sunday november 02:00 59

Configure NTP server? (yes/no) [n]: yes

NTP server IP address: ntp_server_IP_address

Configure default switchport interface state (shut/noshut) [shut]: shut
```

✎

Note   The mgmt0 interface is not shutdown at this point. Only the Fibre Channel, iSCSI, FCIP, and
Gigabit Ethernet interfaces are shut down.

```
Configure default switchport trunk mode (on/off/auto) [on]: on

Configure default switchport port mode F (yes/no) [n]: yes
```

```
Configure default zone policy (permit/deny) [deny]: deny

Enable full zoneset distribution (yes/no) [n]: yes

Configure default zone mode (basic/enhanced) [basic]: basic
```

✎

Note Refer to the "Configuring and Managing Zones" chapter in the *Cisco MDS 9000 Family NX-OS Fabric Configuration Guide*.

```
The following configuration will be applied:
username admin password admin_pass role network-admin
  username user_name password user_pass role network-admin
  snmp-server community snmp_community ro
  switchname switch
  interface mgmt0
    ip address ip_address subnet_mask
    no shutdown
  ip routing
  ip route dest_prefix dest_mask dest_address
  ip default-network dest_prefix
  ip default-gateway default_gateway
  ip name-server name_server
  ip domain-name domain_name
  telnet server disable
  ssh key rsa 2048 force
  ssh server enable
  ntp server ipaddr ntp_server
  system default switchport shutdown
  system default switchport trunk mode on
  system default switchport mode F
  system default port-channel auto-create
  zone default-zone permit vsan 1-4093
  zoneset distribute full vsan 1-4093
  system default zone mode enhanced

Would you like to edit the configuration? (yes/no) [n]: no

Would you like to edit the configuration? (yes/no) [n]: no

Use this configuration and save it? (yes/no) [y]: yes
```

⚠

Caution If you do not save the configuration at this point, your changes will not be updated the next time that the switch is rebooted. Type **yes** in order to save the new configuration. This process ensures that the kickstart and system boot images are also automatically configured.

🔎

Tip Up to this point, you can only configure the switch using the CLI. After this step, you can continue configuring the switch using the CLI or switch over to using the Cisco DCNM application. Refer to the *Cisco DCNM Fundamentals Configuration Guide*.

If you continue to use the CLI, the login prompt automatically appears in your terminal window.

Step 8 Log in to the switch using the new user name and password.

Step 9 Verify that the required licenses are installed in the switch using the **show license** 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. Refer to the *Cisco MDS 9000 Family NX-OS Licensing Guide*.

The example CLI output for a valid license follows:

```
switch# show license
license.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT ENTERPRISE_PKG cisco 1.0 permanent uncounted \
        VENDOR_STRING=MDS HOSTID=VDH=REG070201 \
        NOTICE="<LicFileID>ent_ips_main_fm.lic</LicFileID><LicLineID>0</LicLineI
D> \
        <PAK>dummyPak</PAK>" SIGN=FB454F0A0D40
INCREMENT MAINFRAME_PKG cisco 1.0 permanent uncounted \
        VENDOR_STRING=MDS HOSTID=VDH=REG070201 \
        NOTICE="<LicFileID>ent_ips_main_fm.lic</LicFileID><LicLineID>1</LicLineI
D> \
        <PAK>dummyPak</PAK>" SIGN=0DAE1B086D9E
INCREMENT SAN_EXTN_OVER_IP cisco 1.0 permanent 7 VENDOR_STRING=MDS \
        HOSTID=VDH=REG070201 \
        NOTICE="<LicFileID>ent_ips_main_fm.lic</LicFileID><LicLineID>2</LicLineI
D> \
        <PAK>dummyPak</PAK>" SIGN=D336330C76A6
INCREMENT FM_SERVER_PKG cisco 1.0 permanent uncounted \
        VENDOR_STRING=MDS HOSTID=VDH=REG070201 \
        NOTICE="<LicFileID>ent_ips_main_fm.lic</LicFileID><LicLineID>3</LicLineI
D> \
        <PAK>dummyPak</PAK>" SIGN=AEAEA04629E8
```

Step 10 Verify that the switch is running the latest Cisco NX-OS 7.3(x) software, depending on which you installed, by issuing 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) 2002-2013, 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 1.0.10
  loader:    version N/A
  kickstart: version 7.3(1)D1(1)
  system:    version 7.3(1)D1(!)
  BIOS compile time:       01/08/09
  kickstart image file is: bootflash:///m9500-sf2ek9-kickstart-mz.7.3.1.D1.1.bin
  kickstart compile time:  11/08/2016 9:00:00 [01/30/2014 05:33:20]
  system image file is:    bootflash:///m9500-sf2ek9-mz.7.3.1.D1.1.bin
  system compile time:     11/08/2016 9:00:00 [01/30/2014 07:10:42]


Hardware
  cisco MDS 9509 (9 Slot) Chassis ("Supervisor/Fabric-2a")
  Motorola, 7447A, altivec  with 2071288 kB of memory.
```

```
  Processor Board ID JAF1625BAES

  Device name: switch
  bootflash:    1000944 kB
  slot0:              0 kB (expansion flash)

Kernel uptime is 20 day(s), 12 hour(s), 6 minute(s), 27 second(s)

---
switch#
```

If the latest Cisco NX-OS 7.3(x) software version is displayed, you can continue configuring the switch using one of the following options:

- Refer to the *Cisco MDS 9000 NX-OS and SAN-OS Configuration Guides* for information on configuring further Cisco NX-OS features using the CLI.

- Refer to the *Cisco DCNM for SAN Configuration Guides* for more information on using Cisco DCNM-SAN to configure your switch.

If the latest Cisco NX-OS 7.3(x) software is not displayed, continue with upgrading or downgrading the switch as required to install the correct version. Refer to the appropriate section in this guide for upgrading or downgrading to specific versions.

Step 11 Verify the status of the modules on the switch using the **show module** command.

```
switch# show module
Mod  Ports  Module-Type                      Model              Status
---  -----  -------------------------------- ------------------ ------------
1    48     1/2/4/8 Gbps 48-Port FC Module    DS-X9248-96K9      ok
2    24     1/2/4/8 Gbps 24-Port FC Module    DS-X9224-96K9      ok
3    48     1/2/4/8 Gbps 48-Port FC Module    DS-X9248-96       ok
4    48     1/2/4/8 Gbps 4/44-Port FC Module DS-X9248-48K9      ok
5    48     1/2/4 Gbps FC Module              DS-X9148          ok
7    0      Supervisor/Fabric-2               DS-X9530-SF2-K9    active *
8    0      Supervisor/Fabric-2               DS-X9530-SF2-K9    ha-standby
11   4      10 Gbps FC Module                 DS-X9704          ok
12   22     4x1GE IPS, 18x1/2/4Gbps FC Modul DS-X9304-18K9     ok


Mod  Sw             Hw     World-Wide-Name(s)  (WWN)
---  -------------  ------  -------------------------------------------------
1    7.3(x)         1.0     20:01:00:0d:ec:24:e8:40 to 20:30:00:0d:ec:24:e8:40
2    7.3(x)         0.6     20:41:00:0d:ec:24:e8:40 to 20:58:00:0d:ec:24:e8:40
3    7.3(x)         0.55    20:81:00:0d:ec:24:e8:40 to 20:b0:00:0d:ec:24:e8:40
4    7.3(x)         0.65    20:c1:00:0d:ec:24:e8:40 to 20:f0:00:0d:ec:24:e8:40
5    7.3(x)         1.5     21:01:00:0d:ec:24:e8:40 to 21:30:00:0d:ec:24:e8:40
7    7.3(x)         0.3     --
8    7.3(x)         1.6     --
11   7.3(x)         0.522   22:81:00:0d:ec:24:e8:40 to 22:84:00:0d:ec:24:e8:40
12   7.3(x)         1.1     22:c1:00:0d:ec:24:e8:40 to 22:d2:00:0d:ec:24:e8:40


Mod  MAC-Address(es)                       Serial-Num
---  ------------------------------------  ----------
1    00-0d-ec-75-3c-d8 to 00-0d-ec-75-3c-dc  XXXXXXXXXX
2    00-0d-ec-75-3c-d0 to 00-0d-ec-75-3c-d4  XXXXXXXXXX
3    00-50-30-02-19-7e to 00-50-30-02-19-82  XXXXXXXXXX
4    00-0d-ec-75-33-dc to 00-0d-ec-75-33-e0  XXXXXXXXXX
5    00-19-56-3e-76-5c to 00-19-56-3e-76-60  XXXXXXXXXX
7    00-05-30-01-d5-e2 to 00-05-30-01-d5-e6  XXXXXXXXXX
8    00-23-5e-99-9f-e8 to 00-23-5e-99-9f-ec  XXXXXXXXXX
11   00-13-1a-e5-f5-66 to 00-13-1a-e5-f5-6a  XXXXXXXXXX
12   00-1b-54-02-e5-08 to 00-1b-54-02-e5-10  XXXXXXXXXX
```

```
Xbar Ports  Module-Type                       Model              Status
---  -----  --------------------------------  -----------------  -----------
1    0       Fabric Module 2                   DS-13SLT-FAB2      ok
2    0       Fabric Module 2                   DS-13SLT-FAB2      ok

Xbar Sw               Hw      World-Wide-Name(s) (WWN)
---  --------------   ------  -------------------------------------------------
1    NA               2.0     --
2    NA               2.0     --

Xbar MAC-Address(es)                          Serial-Num
---  ------------------------------------     ----------
1    NA                                       XXXXXXXXXXX
2    NA                                       XXXXXXXXXXX

* this terminal session
switch#
```

Upgrading to Cisco NX-OS Release 7.3(x) on an Existing Cisco MDS Switch

This section provides information on upgrading your Cisco NS-OS software to Cisco NX-OS Release 7.3(x). It includes the following sections:

If your switch is running software that is earlier than Cisco NX-OS Release 6.2(x), you must upgrade to Release 7.3(x). Follow this upgrade path:

- Release 5.0(x): upgrade to 5.2(x), and then upgrade to 6.2(x).
- Release 4.1(x) or release 4.2(x): upgrade to Release 5.0(x), upgrade to Release 5.2(x), upgrade to 6.2(x), and then upgrade to Release 7.3(x).
- Release 3.3(2), Release 3.3(3), Release 3.3(4x), and Release 3.3(5x), upgrade to release 4.1(x) or Release 4.2(x), upgrade to Release 5.0(x), upgrade to Release 5.2(x), and then upgrade to 6.2(x).
- Release 3.3(1c), all Release 3.2(x), all Release 3.1(x), and all Release 3.0(x), upgrade to release 3.3(5b), upgrade to release 4.1(x) or release 4.2(x), upgrade to Release 5.0(x), upgrade to Release 5.2(x), upgrade to 6.2(x), and then upgrade to 7.3(x).

> ✎ **Note** For a nondisruptive upgrade, the switch must be running Cisco SAN-OS Release 3.3(5b) or later. A disruptive upgrade requires a switch reload.

Upgrading Guidelines

Observe these guidelines when upgrading software on a MDS 9500 Series Director switch:

- Follow the upgrade path to Cisco NX-OS Release 7.3(x) specified in the Cisco MDS 9000 Series Release Notes for the particular release you intend to install.

- When you replace a line card with a different generation of line card on a switch, the ports revert to VSAN 1 and all the port configurations are lost on the switch.

> ✎ **Note** Performing In-Service Software Upgrade (ISSU) simultaneously is not recommended on MDS 9148S, MDS 9250i, and MDS 9396S fabric switches when these category of fabric switches are peers to each other.

Upgrade Process for an MDS 9700 Series Director

On the MDS 9710 Director, the high-level process to upgrade to Cisco NX-OS Release 7.3(x) and is as follows:

Step 1 Upgrade to Cisco MDS NX-OS Release 6.2(x) as described in "Upgrading to Cisco NX-OS Release 7.3(x) on an MDS 9700 Series Switch".

Step 2 Install Cisco MDS 48-Port 16-Gbps Fibre Channel Switching Module in the MDS 9710 chassis. For additional information, see the *Cisco MDS 9700 Series Hardware Installation Guide.*

Step 3 Install Cisco MDS 48-Port 10-Gigabit Ethernet module modules in the MDS 9710 chassis. For additional information, see the *Cisco MDS 9700 Series Hardware Installation Guide.*

Step 4 If needed, reload the switch.

Upgrade Process for MDS 9500 Series Director with the 8-Port 10-Gigabit Fibre Channel over Ethernet (FCoE) Module

To upgrade from NX-OS Release 6.2(x) with 8-Port 10-Gigabit FCoE module (DS-X9708-K9) to Cisco MDS NX-OS Release, 7.3(x), follow these steps:

Step 1 Use the **poweroff module** *number* command on all the FCoE modules in the switch to power off the FCoE modules.

Step 2 Use the **purge module** *slot* **running-config** command on all the FCoE modules in the switch to remove the configurations for the modules from the running configurations.

Step 3 Removal all Ethernet port-channels and vFC port-channels, if exists.

Step 4 Remove all user defined VLANs.

Step 5 Upgrade to Cisco MDS NX-OS Release 7.3(x) as described in "Upgrading to Cisco NX-OS Release 7.3(x) on an MDS 9500 Series Switch".

Upgrade Process for the MDS 9513 Director Switch

On the MDS 9513 switch, the high-level process to upgrade to Cisco NX-OS Release 7.3(x) and enable the increased bandwidth capabilities of the 48-port 8-Gbps Advanced Fibre Channel switching module and 32-port 8-Gbps Advanced Fibre Channel switching module is as follows:

Step 1 Upgrade to Cisco MDS NX-OS Release 7.3(x) as described in "Upgrading to Cisco NX-OS Release 7.3(x) on an MDS 9500 Series Switch".

Step 2 Install Cisco MDS 9513 Fabric 3 modules in the MDS 9513 chassis. For additional information, see the "Migrating to Generation 4 8-Gbps Advanced Fibre Channel Switching Modules" section in the *Cisco MDS 9500 Series Switch Hardware Installation Guide.*

Step 3 If needed, reload the switch to enable increased bandwidth capabilities.

Step 4 Install 48-port 8-Gbps Advanced Fibre Channel switching module and 32-port 8-Gbps Advanced Fibre Channel switching module.

Upgrade Process for the MDS 9506 and MDS 9509 Director Switches

On the MDS 9506 and 9509 Director switches, the high-level process to upgrade to Cisco NX-OS Release 7.3(x) is as follows:

Step 1 Upgrade to a Supervisor-2A module.

Step 2 Upgrade to Cisco MDS NX-OS Release 7.3(x) as described in "Upgrading to Cisco NX-OS Release 7.3(x) on an MDS 9500 Series Switch".

Step 3 Install a 8-Gbps Advanced Fiber Channel module.

Upgrading to Cisco NX-OS Release 7.3(x) on an MDS 9700 Series Switch

Note • 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.

• MDS 9718 Series Switch supports only Cisco MDS NX-OS Release 7.3(0)D1(1) and later.

To upgrade your switch to use the latest Cisco MDS NX-OS software on your Cisco MDS 9700 Series switch, follow these steps:

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 new Cisco MDS 9700 Series:

- 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.

These procedures are specified in the hardware installation guide for the required product. For more information, see the *Cisco MDS 9710 Director Hardware Installation Guide*.

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. Refer to the "Using the Cisco NX-OS Setup Utility" chapter in the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

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. Refer to the *Cisco MDS 9000 Family NX-OS Licensing Guide*. 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 e-mail. The license key file is digitally signed to only authorize use 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.

    Refer to the *Cisco MDS 9000 Family NX-OS Licensing Guide*.

Step 7   Install the license key file when you receive it by e-mail. Perform the following steps:

    a. Copy the license file to bootflash using TFTP or SCP.

    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.

    Refer to the *Cisco MDS 9000 Family NX-OS Licensing Guide*.

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 at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html.

```
switch# dir bootflash:
4096     May 14 13:29:55 2014  lost+found/
    6442141     Oct 09 14:25:48 2013  m9700-s3-epld.6.2.7.BF.0.9.gimg
   37011968     Apr 30 16:10:28 2014  m9700-sf3ek9-kickstart-mzg.6.2.7.bin
   36423680     Apr 16 16:17:50 2014  m9700-sf3ek9-kickstart-mzg.6.2.9.FM.0.48.bin
   36427264     May 22 11:27:11 2014 m9700-sf3ek9-kickstart-mzg.6.2.9.FM.0.68.bin
  195875124     Apr 30 12:55:14 2014  m9700-sf3ek9-mzg.6.2.7.bin

Usage for bootflash://sup-local
 2468593664 bytes used
 1272250368 bytes free
 3740844032 bytes total
```

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

```
switch# delete bootflash: m9700-sf3ek9-kickstart-mzg.6.2.17.bin
switch# delete bootflash: m9700-sf3ek9-mzg.6.2.17.bin
```

Step 10   Verify that there is space available on the standby supervisor module bootflash on a Cisco MDS 9700 Series switch.

```
switch# attach mod 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 m9500-sf2ek9-kickstart-mz.6.2.5.bin
  16604160      Jul 01 10:20:07 2011 m9500-sf2ek9-kickstart-mz.6.2.5c.bin
  78337129      Jul 01 10:33:52 2011 m9500-sf2ek9-mz.6.2.1.bin
  78718938      Jul 01 10:18:09 2011 m9500-sf2ek9-mz.6.2.1c.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   If you need more space on the standby supervisor module bootflash on a Cisco MDS 9500 Series switch, delete unnecessary files to make space available.

```
switch(standby)# delete bootflash: m9700-sf2ek9-kickstart-mz.6.2.5.bin.S68
switch(standby)# delete bootflash: m9700-sf3ek9-mz.6.2.5.bin.S68
```

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 required Cisco MDS NX-OS Release 7.3(x) image file, depending on which you are installing.

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-sf3ek9-kickstart-mzg.7.3.1.D1.1.bin
bootflash:m9700-sf3ek9-kickstart-mzg.7.3.1.D1.1.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf3ek9-mzg.7.3.1.D1.1.bin
bootflash:m9700-sf3ek9-mzg.7.3.1.D1.1.bin
```

Step 17   Verify that the switch is running the required software version by issuing 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) 2002-2016, 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 3.1.0
  kickstart: version 7.3(1)D1(1)
  system:    version 7.3(1)D1(1)
  BIOS compile time:       02/27/2013
  kickstart image file is: bootflash:///m9700-sf3ek9-kickstart-mz.7.3.1.D1.1.bin
  kickstart compile time:  10/15/2016 23:00:00 [08/25/2016 05:42:59]
  system image file is:    bootflash:///m9700-sf3ek9-mz.7.3.1.D1.1.bin
  system compile time:     10/15/2016 23:00:00 [08/25/2016 07:22:09]


Hardware
  cisco MDS 9710 (10 Slot) Chassis ("Supervisor Module-3")
  Intel(R) Xeon(R) CPU        with 8168716 kB of memory.
  Processor Board ID JAE16440AG9

  Device name: apex-core1
  bootflash:    3915776 kB
  slot0:              0 kB (expansion flash)

Kernel uptime is 0 day(s), 3 hour(s), 32 minute(s), 32 second(s)

Last reset
  Reason: Unknown
  System version: 6.2(17)
  Service:

plugin
  Core Plugin, Ethernet Plugin

Active Package(s)
```

Step 18   Verify that your switch is running compatible hardware. Refer to the specific version of the *Cisco MDS 9000 Family Release Notes*.

Step 19   Perform the upgrade by issuing 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 an MDS 9700 Series switch.

```
switch# install all kickstart m9700-sf3ek9-kickstart-mz.7.3.1.D1.1.bin system
m9700-sf3ek9-mz.7.3.1.D1.1.bin
Installer will perform compatibility check first. Please wait.

Verifying image bootflash:/m9700-sf3ek9-kickstart-mz.7.3.1.D1.1.bin for boot variable
"kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/m9700-sf3ek9-mz.7.3.1.D1.1.bin for boot variable "system".
[####################] 100% -- SUCCESS

Performing module support checks.
[####################] 100% -- SUCCESS

Verifying image type.
[####################] 100% -- SUCCESS

Extracting "slc4xb" version from image bootflash:/m9700-sf3ek9-mz.7.3.1.D1.1.bin.
[####################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/m9700-sf3ek9-mz.7.3.1.D1.1.bin.
[####################] 100% -- SUCCESS
```

```
Extracting "system" version from image bootflash:/m9700-sf3ek9-mz.7.3.1.D1.1.bin.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:/m9700-sf3ek9-kickstart-mz.7.3.1.D1.1.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
     5       yes  non-disruptive         reset
     6       yes  non-disruptive         reset
    10       yes  non-disruptive       rolling



Images will be upgraded according to following table:
Module      Image                   Running-Version(pri:alt)          New-Version
Upg-Required
------  ----------  ---------------------------------------  --------------------
------------
     2      slc4xb                                  6.2(17)          7.3(1)D1(1)
yes
     2        bios  v1.10.21(11/26/12):v1.10.21(11/26/12)   v1.10.21(11/26/12)
no
     5      system                                  6.2(17)          7.3(1)D1(1)
yes
     5    kickstart                                 6.2(17)          7.3(1)D1(1)
yes
     5        bios  v3.1.0(02/27/2013):v3.1.0(02/27/2013)   v3.1.0(02/27/2013)
no
     6      system                                  6.2(17)          7.3(1)D1(1)
yes
     6    kickstart                                 6.2(17)          7.3(1)D1(1)
yes
     6        bios  v3.1.0(02/27/2013):v3.1.0(02/27/2013)   v3.1.0(02/27/2013)
no
    10      slc4xb                                  6.2(17)          7.3(1)D1(1)
yes
    10        bios  v1.10.21(11/26/12):v1.10.21(11/26/12)   v1.10.21(11/26/12)
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-sf3ek9-kickstart-mz.7.3.1.D1.1.bin to standby.
[####################] 100% -- SUCCESS

Syncing image bootflash:/m9700-sf3ek9-mz.7.3.1.D1.1.bin to standby.
[####################] 100% -- SUCCESS

Setting boot variables.
```

```
[####################] 100% -- SUCCESS

Performing configuration copy.
[####################] 100% -- SUCCESS

Module 2:  Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 5:  Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 6:  Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 10:  Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
2016 Aug 31 12:10:39 apex-core1 %PLATFORM-2-MOD_REMOVE: Module 5 removed (Serial number
JAE16440AG9)
2016 Aug 31 12:10:39 apex-core1 %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on
sup in slot 6
2016 Aug 31 12:12:26 apex-core1 %USBHSD-STANDBY-2-MOUNT: logflash: online
2016 Aug 31 12:13:16 apex-core1 %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on
sup in slot 5

Module 5: Waiting for module online.
 -- SUCCESS
2016 Aug 31 12:13:32 apex-core1 %PLATFORM-1-PFM_ALERT: Enabling ejector based shutdown on
sup in slot 6

Notifying services about the switchover.
[####################] 100% -- SUCCESS


"Switching over onto standby".
```

✎

Note   At this point, the standby supervisor reboots.

```
NX7k SUP BIOS version ( 3.01 ) : Build - 02/26/2013 14:16:20
PM FPGA Version : 0x000000BA
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 : 0x00000002
  Memory - 8192 MB : Frequency - 1067 MHZ
  Loading Bootloader: Done
  IO FPGA Version   : 0xabcd0001
  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-sf3ek9-kickstart-mz.7.3.1.D1.1.bin bootflash:/m970
0-sf3ek9-mz.7.3.1.D1.1.bin...
 Filesystem type is ext2fs, partition type 0x83
Booting kickstart image: bootflash:/m9700-sf3ek9-kickstart-mz.7.3.1.D1.1.bin...
.
.........................................................................
.......................................................................
Kickstart digital signature verification Successful
Image verification OK

INIT:
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.. done.
Mounting Log Dir /logflash
mounting Log 0
Starting mcelog daemon
Creating logflash directories
Loading system software
/bootflash//m9700-sf3ek9-mz.7.3.1.D1.1.bin read done
System image digital signature verification successful.
Uncompressing system image: bootflash:/m9700-sf3ek9-mz.7.3.1.D1.1.bin Wed Aug 31 12:12:04
IST 2016
blogger: nothing to do.
C
..done Wed Aug 31 12:12:06 IST 2016
INIT: Entering runlevel: 3
Starting portmap daemon...
creating NFS state directory: done

2016 Aug 31 12:12:26 apex-core1 %USBHSD-2-MOUNT: logflash: online

Continuing with installation, please wait
2016 Aug 31 12:12:39 apex-core1 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.

Module 5: Waiting for module online.
 -- SUCCESS
2016 Aug 31 12:13:38 apex-core1 %KERN-2-SYSTEM_MSG: [  147.962763] Switchover started by
redundancy driver - kernel
2016 Aug 31 12:13:38 apex-core1 %SYSMGR-2-HASWITCHOVER_PRE_START: This supervisor is
becoming active (pre-start phase).
2016 Aug 31 12:13:38 apex-core1 %SYSMGR-2-HASWITCHOVER_START: Supervisor 5 is becoming
active.
2016 Aug 31 12:13:39 apex-core1 %SYSMGR-2-SWITCHOVER_OVER: Switchover completed.
2016 Aug 31 12:13:39 apex-core1 %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on
sup in slot 5
2016 Aug 31 12:13:44 apex-core1 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 12:13:44 apex-core1 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature MAINFRAME_PKG. Application(s) shut down in 118 days.
2016 Aug 31 12:13:44 apex-core1 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Fabric Binding
running without MAINFRAME_PKG license, shutdown in 118 days
2016 Aug 31 12:13:44 apex-core1 %CALLHOME-2-EVENT: LICENSE_ALERT
2016 Aug 31 12:15:34 apex-core1 %USBHSD-STANDBY-2-MOUNT: logflash: online
2016 Aug 31 12:16:24 apex-core1 %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on
sup in slot 6

Module 2: Non-disruptive upgrading.
[#                 ]   0%2016 Aug 31 12:16:46 apex-core1 %PLATFORM-1-PFM_ALERT: Enabling
ejector based shutdown on sup in slot 5
```

```
2016 Aug 31 12:17:41 apex-core1 %PMON-SLOT2-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
[####################] 100% -- SUCCESS

Module 10: Non-disruptive upgrading.
[#                    ]   0%2016 Aug 31 12:19:47 apex-core1 %PMON-SLOT10-2-PMON_CRIT_INFO:
Port Monitor Critical Information: Config download success .
[####################] 100% -- SUCCESS

Install has been successful.

User Access Verification
switch login:
```

Once installation is successful, all modules (supervisor and switching) are upgraded.

Open a new terminal session to view the upgraded supervisor module using the **show module** command. Refer to the "Managing Modules" chapter in the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

```
switch# show module
Mod  Ports  Module-Type                          Model               Status
---  -----  -----------------------------------  ------------------  ----------
2    48     2/4/8/10/16 Gbps Advanced FC Module  DS-X9448-768K9      ok
5    0      Supervisor Module-3                  DS-X97-SF1-K9       active *
6    0      Supervisor Module-3                  DS-X97-SF1-K9       ha-standby
10   48     2/4/8/10/16 Gbps Advanced FC Module  DS-X9448-768K9      ok

Mod  Sw             Hw
---  -------------- ------
2    7.3(1)D1(1)    1.1
5    7.3(1)D1(1)    0.302
6    7.3(1)D1(1)    0.302
10   7.3(1)D1(1)    0.302
Mod  MAC-Address(es)                        Serial-Num
---  -------------------------------------  ----------
2    e8-ed-f3-e5-f2-00 to e8-ed-f3-e5-f2-03 JAE1747063U
5    1c-df-0f-78-7f-6d to 1c-df-0f-78-7f-7f JAE16440AG9
6    1c-df-0f-78-80-2b to 1c-df-0f-78-80-3d JAE16440AGX
10   54-7f-ee-d7-bc-f8 to 54-7f-ee-d7-bc-fb JAE164404NO
Mod  Online Diag Status
---  ------------------
2    Pass
5    Pass
6    Pass
10   Pass
Xbar Ports  Module-Type                          Model               Status
---  -----  -----------------------------------  ------------------  ----------
1    0      Fabric module                        DS-X9710-FAB        ok
2    0      Fabric module                        DS-X9710-FAB        ok
Xbar Sw             Hw
---  -------------- ------
1    NA             0.3
2    NA             0.3
Xbar MAC-Address(es)                        Serial-Num
---  -------------------------------------  ----------
1    NA                                     JAE164205OP
2    NA                                     JAE164205N9

* this terminal session
switch#
```

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

Upgrading to Cisco NX-OS Release 7.3(x) on an MDS 9500 Series Switch

Note
- To upgrade from Release 5.2(x) to Release 7.3(x), first upgrade to Release 6.2(x) and then upgrade to Release 7.3(x).

- 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

To upgrade your switch to use the latest Cisco MDS NX-OS software on your Cisco MDS 9500 Series switch, follow these steps:

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 new Cisco MDS 9500 Family 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.

These procedures are specified in the hardware installation guide for the required product. Refer to the *Cisco MDS 9000 Family Hardware Installation Guides* to obtain more information.

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. Refer to the "Using the Cisco NX-OS Setup Utility" chapter in the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

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. Refer to the *Cisco MDS 9000 Family NX-OS Licensing Guide*. 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             Insta License Status Expiry Date Comments
                    lled  Count
--------------------------------------------------------------------------------
FM_SERVER_PKG       Yes     -   Unused never      -
MAINFRAME_PKG       Yes     -   Unused never      -
ENTERPRISE_PKG      Yes     -   In use never      -
SAN_EXTN_OVER_IP    Yes     1   Unused never      -
--------------------------------------------------------------------------------
```

The example CLI output for licenses with expiring grace periods follows:

```
switch# show license usage
Feature             Insta License Status Expiry Date Comments
                    lled  Count
--------------------------------------------------------------------------------
FM_SERVER_PKG        No     -    In use               Grace Period 78days 5hrs
MAINFRAME_PKG        No     -    Unused               -
ENTERPRISE_PKG       No     -    In use               Grace Period 88days 5hrs
SAN_EXTN_OVER_IP     No     0    Unused               -
--------------------------------------------------------------------------------
```

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=FOX064317SQ
```

Tip   Use the entire ID that appears after the colon (:) sign. In this example, the host ID is VDH=FOX064317SQ

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 e-mail. The license key file is digitally signed to only authorize use 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.

Refer to the *Cisco MDS 9000 Family NX-OS Licensing Guide*.

Step 7   Install the license key file when you receive it by e-mail. Perform the following steps:

a. Copy the license file to bootflash using TFTP or SCP.

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.

Refer to the *Cisco MDS 9000 Family NX-OS Licensing Guide*.

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 at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html.

```
switch# dir bootflash:
49152    Feb 03 06:50:00 2014  lost+found/
1912246    Sep 02 10:40:58 2013  m9500-sf2ek9-dplug-mzg.6.2.5.bin
21049344    Jan 31 07:53:54 2014  m9500-sf2ek9-kickstart-mz.6.2.5.bin
   20973056    Feb 03 05:13:24 2014  m9500-sf2ek9-kickstart-mz.6.2.6.27.bin
   20972032    Feb 03 06:45:38 2014  m9500-sf2ek9-kickstart-mz.6.2.6.32.bin
171301634    Jan 31 07:55:25 2014  m9500-sf2ek9-mz.6.2.5.bin
  172971570    Feb 03 05:18:23 2014  m9500-sf2ek9-mz.6.2.6.27.bin


Usage for bootflash://sup-local

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

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

```
switch# delete bootflash: m9500-sf2ek9-kickstart-mz.6.2.6.27.bin
switch# delete bootflash: m9500-sf2ek9-mz-npe.6.2.5.bin
```

Step 10 Verify that there is space available on the standby supervisor module bootflash on a Cisco MDS 9500 Series switch.

```
switch# attach mod 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 m9500-sf2ek9-kickstart-mz.6.2.5.bin
  16604160      Jul 01 10:20:07 2011 m9500-sf2ek9-kickstart-mz.6.2.5c.bin
  78337129      Jul 01 10:33:52 2011 m9500-sf2ek9-mz.6.2.1.bin
  78718938      Jul 01 10:18:09 2011 m9500-sf2ek9-mz.6.2.1c.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 If you need more space on the standby supervisor module bootflash on a Cisco MDS 9500 Series switch, delete unnecessary files to make space available.

```
switch(standby)# delete bootflash: m9500-sf2ek9-kickstart-mz.6.2.5.bin
switch(standby)# delete bootflash: m9500-sf2ek9-mz.6.2.5.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 required Cisco MDS NX-OS Release 7.3(x) image file, depending on which you are installing.

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/m9500-sf2ek9-kickstart-mzg.7.3.1.D1.1.bin
bootflash:m9700-sf3ek9-kickstart-mzg.7.3.1.D1.1.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9500-sf2ek9-mzg.7.3.1.D1.1.bin
bootflash:m9700-sf3ek9-mzg.7.3.1.D1.1.bin
```

Step 17 Verify that the switch is running the required software version by issuing 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) 2002-2013, 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 1.0.10
  loader:    version N/A
  kickstart: version 7.3(1)D1(1)
  system:    version 7.3(1)D1(1)
  BIOS compile time:      01/08/09
  kickstart image file is: bootflash:///m9500-sf2ek9-kickstart-mz.7.3.1.D1.1.bin
  kickstart compile time: 11/25/2013 9:00:00 [01/30/2014 05:33:20]
  system image file is:    bootflash:///m9500-sf2ek9-mz.7.3.1.D1.1.bin
  system compile time:     11/25/2013 9:00:00 [01/30/2014 07:10:42]


Hardware
  cisco MDS 9509 (9 Slot) Chassis ("Supervisor/Fabric-2a")
  Motorola, 7447A, altivec  with 2071288 kB of memory.
  Processor Board ID JAF1625BAES

  Device name: switch
  bootflash:    1000944 kB
  slot0:             0 kB (expansion flash)
......
```

Step 18 Verify that your switch is running compatible hardware. Refer to the specific version of the *Cisco MDS 9000 Family Release Notes*.

Step 19 Perform the upgrade by issuing 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 an MDS 9500 Series switch.

```
switch# install all kickstart bootflash:m9500-sf2ek9-kickstart-mz.7.3.1.D1.1.bin_S8 system
bootflash:m9500-sf2ek9-mz.7.3.1.D1.1.bin_S8
Installer will perform compatibility check first. Please wait.
Y
Verifying image bootflash:/m9500-sf2ek9-kickstart-mz.7.3.1.D1.1.bin_S8 for boot variable
"kickstart".
[#                  ]   0%
[###################] 100% -- SUCCESS

Verifying image bootflash:/m9500-sf2ek9-mz.7.3.1.D1.1.bin_S8 for boot variable "system".
[###################] 100% -- SUCCESS

Performing module support checks.
[###################] 100% -- SUCCESS

Verifying image type.
[###################] 100% -- SUCCESS

Extracting "slc2" version from image bootflash:/m9500-sf2ek9-mz.7.3.1.D1.1.bin_S8.
[###################] 100% -- SUCCESS

Extracting "ips16" version from image bootflash:/m9500-sf2ek9-mz.7.3.1.D1.1.bin_S8.
[###################] 100% -- SUCCESS

Extracting "ssi" version from image bootflash:/m9500-sf2ek9-mz.7.3.1.D1.1.bin_S8.
[###################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/m9500-sf2ek9-mz.7.3.1.D1.1.bin_S8.
[###################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/m9500-sf2ek9-mz.7.3.1.D1.1.bin_S8.
[###################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:/m9500-sf2ek9-kickstart-mz.7.3.1.D1.1.bin_S8.
[###################] 100% -- SUCCESS

Extracting "18_4" version from image bootflash:/m9500-sf2ek9-mz.7.3.1.D1.1.bin_S8.
[###################] 100% -- SUCCESS

Extracting "slc4" version from image bootflash:/m9500-sf2ek9-mz.7.3.1.D1.1.bin_S8.
[###################] 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       disruptive       rolling  Hitless upgrade is not supported
     7       yes   non-disruptive         reset
     8       yes   non-disruptive         reset
    10       yes   non-disruptive       rolling
    12       yes   non-disruptive       rolling
    13       yes   non-disruptive       rolling


Other miscellaneous information for installation:
Module  info
```

```
------  ----------------------------------
    1  Hitless upgrade is not supported
    10  FC ports 1-18 are hitless, GigE 1-4 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
------  ----------  ------------------------------------  --------------------
------------
    1       slc2                                 7.3(0)D1(1)        7.3(1)D1(1)
yes
    1       ips16                                7.3(0)D1(1)        7.3(1)D1(1)
yes
    1        ssi                                 7.3(0)D1(1)        7.3(1)D1(1)
yes
    1       bios     v1.0.19(02/01/10):v1.0.19(02/01/10)   v1.0.19(02/01/10)
no
    7      system                                7.3(0)D1(1)        7.3(1)D1(1)
yes
    7     kickstart                              7.3(0)D1(1)        7.3(1)D1(1)
yes
    7       bios     v1.0.10(01/08/09):v1.0.10(01/08/09)   v1.0.10(01/08/09)
no
    8      system                                7.3(0)D1(1)        7.3(1)D1(1)
yes
    8     kickstart                              7.3(0)D1(1)        7.3(1)D1(1)
yes
    8       bios     v1.0.10(01/08/09):v1.0.10(01/08/09)   v1.0.10(01/08/09)
no
    10      slc2                                 7.3(0)D1(1)        7.3(1)D1(1)
yes
    10      18_4                                 7.3(0)D1(1)        7.3(1)D1(1)
yes
    10       ssi                                 7.3(0)D1(1)        7.3(1)D1(1)
yes
    10      bios     v1.0.19(02/01/10):v1.0.19(02/01/10)   v1.0.19(02/01/10)
no
    12      slc4                                 7.3(0)D1(1)        7.3(1)D1(1)
yes
    12      bios     v1.10.21(11/26/12):v1.10.21(11/26/12)  v1.10.21(11/26/12)
no
    13      slc2                                 7.3(0)D1(1)        7.3(1)D1(1)
yes
    13      bios     v1.0.19(02/01/10):v1.0.19(02/01/10)   v1.0.19(02/01/10)
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:/m9500-sf2ek9-kickstart-mz.7.3.1.D1.1.bin_S8 to standby.
[####################] 100% -- SUCCESS

Syncing image bootflash:/m9500-sf2ek9-mz.7.3.1.D1.1.bin_S8 to standby.
[####################] 100% -- SUCCESS

Setting boot variables.
[####################] 100% -- SUCCESS
```

```
Performing configuration copy.
[####################] 100% -- SUCCESS

Module 1: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 7: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 8: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 10: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 12: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 13: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
2016 Aug 31 17:13:28 sw-9513-195 %PLATFORM-2-MOD_REMOVE: Module 7 removed (Serial number
JAF1626AKNF)

Module 7: Waiting for module online.
 -- SUCCESS

Notifying services about the switchover.
[####################] 100% -- SUCCESS


"Switching over onto standby".
```

✎

Note   At this point, the standby supervisor reboots.

```
---------------
is_module_netboot returned 0
Continuing with installation, please wait
2016 Aug 31 17:17:25 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature IOA_SSN16. Application(s) shut down in 76 days.
2016 Aug 31 17:17:25 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature MAINFRAME_PKG. Application(s) shut down in 92 days.
2016 Aug 31 17:17:25 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 17:17:25 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature SME_FOR_SSN16_PKG. Application(s) shut down in 82 days.

Module 7: Waiting for module online.
 -- SUCCESS
2016 Aug 31 17:18:56 sw-9513-195 %SYSMGR-2-HASWITCHOVER_PRE_START: This supervisor is
becoming active (pre-start phase).
2016 Aug 31 17:18:56 sw-9513-195 %SYSMGR-2-HASWITCHOVER_START: Supervisor 7 is becoming
active.
2016 Aug 31 17:18:58 sw-9513-195 %SYSMGR-2-SWITCHOVER_OVER: Switchover completed.
```

```
2016 Aug 31 17:19:02 sw-9513-195 %IOA-2-LOG_LIBBASE_SVC_LICENSE_ON_GRACE_PERIOD:
(pid=3838) No license. Feature will be shut down after a grace period of approximately 76
days
2016 Aug 31 17:19:02 sw-9513-195 %SME_CPP-2-LOG_WARN_SME_LICENSE_GRACE: No SME License.
Feature will be shut down after a grace period of approximately 82 days
2016 Aug 31 17:19:04 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 17:19:04 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature IOA_SSN16. Application(s) shut down in 76 days.
2016 Aug 31 17:19:04 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature SME_FOR_SSN16_PKG. Application(s) shut down in 82 days.
2016 Aug 31 17:19:04 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature MAINFRAME_PKG. Application(s) shut down in 92 days.
2016 Aug 31 17:19:04 sw-9513-195 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Port Security
running without ENTERPRISE_PKG license, shutdown in 92 days
2016 Aug 31 17:19:04 sw-9513-195 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Fabric Binding
running without MAINFRAME_PKG license, shutdown in 92 days
2016 Aug 31 17:19:09 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature MAINFRAME_PKG. Application(s) shut down in 92 days.
2016 Aug 31 17:19:14 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 17:19:14 sw-9513-195 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Port Security
running without ENTERPRISE_PKG license, shutdown in 92 days
2016 Aug 31 17:19:15 sw-9513-195 %CALLHOME-2-EVENT: LICENSE_ALERT

Module 10: Non-disruptive upgrading.
[#                  ]   0%2016 Aug 31 17:24:14 sw-9513-195
%IMAGE_DNLD-SLOT10-2-IMG_DNLD_STARTED:  Module image download process. Please wait until
completion...
2016 Aug 31 17:24:34 sw-9513-195 %IMAGE_DNLD-SLOT10-2-IMG_DNLD_COMPLETE:  Module image
download process. Download successful.
2016 Aug 31 17:26:45 sw-9513-195 %PMON-SLOT10-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
[###################] 100% -- SUCCESS

Module 12: Non-disruptive upgrading.
[#                  ]   0%2016 Aug 31 17:28:02 sw-9513-195 %PMON-SLOT12-2-PMON_CRIT_INFO:
Port Monitor Critical Information: Config download success .
[###################] 100% -- SUCCESS

Module 13: Non-disruptive upgrading.
[#                  ]   0%2016 Aug 31 17:28:31 sw-9513-195
%IMAGE_DNLD-SLOT13-2-IMG_DNLD_STARTED:  Module image download process. Please wait until
completion...
2016 Aug 31 17:28:51 sw-9513-195 %IMAGE_DNLD-SLOT13-2-IMG_DNLD_COMPLETE:  Module image
download process. Download successful.
2016 Aug 31 17:29:51 sw-9513-195 %PMON-SLOT13-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
[###################] 100% -- SUCCESS

Module 1: Disruptive upgrading.
[#                  ]   0%2016 Aug 31 17:31:49 sw-9513-195 %PLATFORM-2-MOD_DETECT: Module
1 detected (Serial number JAF1637BDJS) Module-Type 16x1GE, Storage Services Node Model
DS-X9316-SSNK9
2016 Aug 31 17:31:49 sw-9513-195 %PLATFORM-2-MOD_PWRUP: Module 1 powered up (Serial number
JAF1637BDJS)
2016 Aug 31 17:32:36 sw-9513-195 %IMAGE_DNLD-SLOT1-2-IMG_DNLD_STARTED:  Module image
download process. Please wait until completion...
2016 Aug 31 17:33:04 sw-9513-195 %IMAGE_DNLD-SLOT1-2-IMG_DNLD_COMPLETE:  Module image
download process. Download successful.
2016 Aug 31 17:34:50 sw-9513-195 %SME_CPP-2-LOG_WARN_SME_LICENSE_GRACE: No SME License.
Feature will be shut down after a grace period of approximately 82 days
```

```
2016 Aug 31 17:34:50 sw-9513-195 %IOA-2-LOG_LIBBASE_SVC_LICENSE_ON_GRACE_PERIOD:
(pid=3838) No license. Feature will be shut down after a grace period of approximately 76
days
2016 Aug 31 17:34:51 sw-9513-195 %PMON-SLOT1-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
[####################] 100% -- SUCCESS

Install has been successful.
```

Once installation is successful, all modules (supervisor and switching) are upgraded.

Open a new terminal session to view the upgraded supervisor module using the **show module** command. Refer to the "Managing Modules" chapter in the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

```
switch# show module
Mod   Ports   Module-Type                        Model              Status
---   -----   --------------------------------   ----------------   ----------
1     32      1/2/4/8/10 Gbps Advanced FC Module  DS-X9232-256K9     ok
2     24      1/2/4/8 Gbps FC Module              DS-X9224-96K9      ok
3     22      4x1GE IPS, 18x1/2/4Gbps FC Module   DS-X9304-18K9      ok
5     0       Supervisor/Fabric-2a               DS-X9530-SF2AK9    active *
6     0       Supervisor/Fabric-2a               DS-X9530-SF2AK9    ha-standby
7     48      1/2/4/8 Gbps FC Module              DS-X9248-96K9      ok
8     48      1/2/4/8 Gbps FC Module              DS-X9248-48K9      ok
9     8       10 Gbps FCoE Module                 DS-X9708-K9        ok


Mod   Sw             Hw       World-Wide-Name(s)  (WWN)
---   -------------  ------   -------------------------------------------------
1     6.2(9)         1.1      20:01:54:7f:ee:18:66:00 to 20:20:54:7f:ee:18:66:00
2     6.2(9)         1.6      20:41:54:7f:ee:18:66:00 to 20:58:54:7f:ee:18:66:00
3     6.2(9)         1.7      20:81:54:7f:ee:18:66:00 to 20:92:54:7f:ee:18:66:00
5     6.2(9)         1.4      --
6     6.2(9)         1.4      --
7     6.2(9)         1.6      21:81:54:7f:ee:18:66:00 to 21:b0:54:7f:ee:18:66:00
8     6.2(9)         1.6      21:c1:54:7f:ee:18:66:00 to 21:f0:54:7f:ee:18:66:00
9     6.2(9)         0.109    --


Mod   MAC-Address(es)                        Serial-Num
---   ------------------------------------   ----------
1     50-3d-e5-9e-f2-f8 to 50-3d-e5-9e-f2-fb  JAF1539CEQS
2     c8-4c-75-b1-64-04 to c8-4c-75-b1-64-07  JAF1550CCHS
3     00-0d-ec-77-54-dc to 00-0d-ec-77-54-e3  JAF1625BDKN
5     c8-9c-1d-41-a1-ec to c8-9c-1d-41-a1-ef  JAF1625BAES
6     d0-d0-fd-1d-e0-58 to d0-d0-fd-1d-e0-5b  JAF1625BAET
7     00-0d-ec-77-4c-d8 to 00-0d-ec-77-4c-db  JAF1624ASAS
8     c8-4c-75-b1-3d-98 to c8-4c-75-b1-3d-9b  JAF1549BMSF
9     68-ef-bd-a8-39-0c to 68-ef-bd-a8-39-1f  JAF1444AGNQ
```

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

Upgrading to Cisco NX-OS Release 7.3(x) on the MDS 9250i Switch

To upgrade to Cisco NX-OS Release 7.3(x) on an Cisco MDS 9250i switch, follow these steps:

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

```
switch# dir bootflash:
20090368    Apr 06 05:25:31 2001  m9250-s5ek9-kickstart-mz.7.3.1.D1.1.bin
  20044800    Mar 30 15:42:05 2014  m9250-s5ek9-kickstart-mz.7.3.1.D1.1.bin
  107197681   Apr 06 05:26:53 2001  m9250-s5ek9-mz.7.3.1.D1.1.bin
  107587249   Mar 30 15:42:52 2014  m9250-s5ek9-mz.7.3.1.D1.1.bin
Usage for bootflash://sup-local
  236338292 bytes used
  142984076 bytes free
  379322368 bytes total
```

Step 2   If the software image file is not present, download it from an FTP or TFTP server to the active supervisor module bootflash:. You can obtain the software image file from the Cisco.com software download center at the following URL: http://www.cisco.com/cisco/software/navigator.html

- If you need more space on the active supervisor module bootflash:, use the **delete** command to remove unnecessary files and follow Step 3 and Step 4.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9250-s5ek9-kickstart-mzg.7.3.1.D1.1.bin
bootflash:m9700-sf3ek9-kickstart-mzg.7.3.1.D1.1.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9250-s5ek9-mzg.7.3.1.D1.1.bin
bootflash:m9700-sf3ek9-mzg.7.3.1.D1.1.bin
```

Step 3   Ensure that the required space is available on the active supervisor.

```
switch# dir bootflash:
     20090368    Apr 06 05:25:31 2001  m9250-s5ek9-kickstart-mz.7.3.0.D1.1.bin
       20044800    Mar 30 15:42:05 2014  m9250-s5ek9-kickstart-mz.7.3.0.D1.1.bin.bin
       107197681   Apr 06 05:26:53 2001  m9250-s5ek9-mz.6.2.5.bin
       107587249   Mar 30 15:42:52 2014  m9250-s5ek9-mz.6.2.7.bin
Usage for bootflash://sup-local
  120695976 bytes used
    63863640 bytes free
  184559616 bytes total
```

Step 4   If you need more space on the active supervisor module bootflash, delete unnecessary files to make space available.

```
switch# delete bootflash: m9250-s5ek9-kickstart-mz.6.2.5.bin.S60
switch# delete bootflash: m9250-s5ek9-kickstart-mz.6.2.5.bin.S16
```

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

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

You can also create a backup of your existing configuration to a file by issuing the **copy running-config bootflash:backup_config.txt** command. You might want to add a date reference to the .txt file name to identify the file at a later date.

Step 6   Perform the upgrade by issuing the **install all** command.

```
switch# install all kickstart m9250-s5ek9-kickstart-mz.7.3.1.D1.1.bin system
m9250-s5ek9-mz.7.3.1.D1.1.bin
Installer will perform compatibility check first. Please wait.

Verifying image bootflash:/m9250-s5ek9-kickstart-mz.7.3.1.D1.1.bin for boot
variable "kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/m9250-s5ek9-mz.7.3.1.D1.1.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.7.3.1.D1.1.bin.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:/m9250-s5ek9-kickstart-mz.7.3.1.D1.1.bin.
[####################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/m9250-s5ek9-mz.7.3.1.D1.1.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(pri:alt)          New-Version
Upg-Required
------  ----------  ----------------------------------------  --------------------
-----------
    1     system                     7.3(0)D1(1)         7.3(1)D1(1)
yes
    1   kickstart                    7.3(0)D1(1)         7.3(1)D1(1)
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.
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

Rebooting the switch to proceed with the upgrade.
All telnet and ssh connections will now be temporarily terminated.


>> NX7--LC-loader-02.01.17 (Jan  8 2014 - 16:30:41), Build: 02.01.17

CPU0:  8572E, Version: 2.1, (0x80e80021)
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: 0x00000015, 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: f0:f7:55:29:50:60
 eTSEC2 board phy 3
INFO: Net boot mode = 1
eTSEC2
IDE:   Bus 0: OK
  Device 0: Model: SILICONSYSTEMS UDMA 4GB-4676 Firm: 3.38 Ser#:
CC395593055000066G01
            Type: Hard Disk
            Capacity: 3919.7 MB = 3.8 GB (8027712 x 512)

Booting image bootflash://m9250-s5ek9-kickstart-mz.7.3.1.D1.1.bin
20925952 bytes read
 NBI at 08000000 size 134217728
```

```
Booting image at addr 0x00800000 ...
Memory <- <0x0 0x0 0x1 0x0> (4096MB)
ethernet0: local-mac-address <- f0:f7:55:29:50:60
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)

zImage starting: loaded at 0x00800000 (sp: 0x7fedc4d0)
Allocating 0x4de424 bytes for kernel ...
gunzipping (0x00000000 <- 0x0080f000:0x00ca9cb0)...done 0x480794 bytes
Using loader supplied ramdisk at 0x2700000-0x38e6e00
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.7.3.1.D1.1.bin
isanimg=/m9250-s5ek9-mz.7.3.1.D1.1.bin
Finalizing device tree... flat tree at 0x80be70
Jumping to kernel at 0
setup_arch: bootmem
mpc85xx_ds_setup_arch()
arch: exit

[    1.532900]  Host controller irq 26
[    1.574106] pci 0000:00:00.0: ignoring class b20 (doesn't match header type 01)
[    1.692213] Assign root port irq 26 for 0000:00:00.0
[    2.024032] Enabling all PCI devices
INIT: Checking all filesystems.....retval=[0]
 done.
Setting kernel variables done.
Setting the System Clock using the Hardware Clock as reference...System Clock set.
Local time: Wed Aug 31 10:12:07 UTC 2016
Loading system software
Uncompressing system image: bootflash:///m9250-s5ek9-mz.7.3.1.D1.1.bin
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
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

2016 Aug 31 10:13:30 alishan-dr %SYSLOG-2-SYSTEM_MSG : Syslogs wont be logged into
logflash until logflash is online
[  111.199224] clpk_hw_init_1:Post ISSU instance 0 status 0x00000736 GOOD
[  111.277824] clpk_hw_init_1:Post ISSU instance 1 status 0x00000536 GOOD
2016 Aug 31 10:13:33 alishan-dr %KERN-0-SYSTEM_MSG: [    2.024032] Enabling all
PCI devices - kernel
2016 Aug 31 10:13:33 alishan-dr %KERN-0-SYSTEM_MSG: [  111.199224]
clpk_hw_init_1:Post ISSU instance 0 status 0x00000736 GOOD - kernel
2016 Aug 31 10:13:33 alishan-dr %KERN-0-SYSTEM_MSG: [  111.277824]
clpk_hw_init_1:Post ISSU instance 1 status 0x00000536 GOOD - kernel
2016 Aug 31 10:14:06 alishan-dr %CARDCLIENT-2-REG: OK
2016 Aug 31 10:14:21 alishan-dr %PMON-SLOT1-2-PMON_CRIT_INFO: Port Monitor
Critical Information: Config download success .
```

```
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 ...
2016 Aug 31 10:15:16 alishan-dr %NTP-2-NTP_SYSLOG_NO_RESP_FROM_LC: from LC1 for
Timestamp Disable
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.
2016 Aug 31 10:15:40 alishan-dr %PLATFORM-2-PS_OK: Power supply 1 ok(Serial number
QCS1544V0F7)
2016 Aug 31 10:15:40 alishan-dr %PLATFORM-2-PS_FANOK: Fan in Power supply 1 ok
2016 Aug 31 10:15:40 alishan-dr %PLATFORM-2-PS_FAIL: Power supply 2 failed or shut
down(Serial number QCS1544V061)
2016 Aug 31 10:15:40 alishan-dr %PLATFORM-2-PS_OK: Power supply 3 ok(Serial number
QCS1544V19H)
2016 Aug 31 10:15:40 alishan-dr %PLATFORM-2-PS_FANOK: Fan in Power supply 3 ok
[####################] 100% -- SUCCESS

Install has been successful.

User Access Verification
switch#
```

Step 7   Log in to the switch.

```
MDS Switch
209.165.200.226 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 8   Issue 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) 2002-2016, 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 7.3(1)D1(1)
  system:    version 7.3(1)D1(1)
  BIOS compile time:       01/08/14
  kickstart image file is: bootflash:///m9250-s5ek9-kickstart-mz.7.3.1.D1.1.bin
  kickstart compile time:  10/15/2016 23:00:00 [08/25/2016 00:04:06]
  system image file is:    bootflash:///m9250-s5ek9-mz.7.3.1.D1.1.bin
  system compile time:     10/15/2016 23:00:00 [08/25/2016 01:52:36]


Hardware
  cisco MDS 9250i 40 FC 2 IPS 8 FCoE (2 RU) Chassis ("40FC+8FCoE+2IPS Supervisor
")
  Motorola, e500v2, core 0 with 4155752 kB of memory.
  Processor Board ID JAF1626BCQH

  Device name: alishan-dr
  bootflash:    4013856 kB

Kernel uptime is 0 day(s), 0 hour(s), 17 minute(s), 25 second(s)

Last reset at 211193 usecs after  Wed Aug 31 10:11:17 2016

  Reason: Reset due to upgrade
  System version: 7.3(0)D1(1)
  Service:

plugin
  Core Plugin
switch#
```

Step 9 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-22PK9-SUP active *

Mod  Sw              Hw      World-Wide-Name(s) (WWN)
---  --------------- ------  --------------------------------------------------
1    7.3(1)D1(1)     0.9     20:01:54:7f:ee:1b:14:a0 to 20:28:54:7f:ee:1b:14:a0


Mod  MAC-Address(es)                       Serial-Num
---  ------------------------------------- ----------
1    f0-f7-55-29-50-60 to f0-f7-55-29-50-6f  JAF1626BCQH

* this terminal session
switch#
```

Downgrading from Cisco NX-OS Release 7.3(x)

Note • To downgrade from Release 7.3(x) to Release 5.2(x) on a Cisco MDS 9500 Series Switch, first downgrade to Release 6.2(x) and then downgrade to Release 5.2(x).

• To downgrade from Release 7.3(x) to Release 6.2(x) on a Cisco MDS 9396S Series Switch, you must first disable the extended rx b2b credit configuration using the **no feature fcrxbbcredit extended** command. Once the downgrade process is complete, enable the extended rx b2b credit configuration using the **feature fcrxbbcredit extended** command.

The following section describes how to downgrade from NX-OS Release 7.3(x)to NX-OS Release 6.2(x) or 5.2(x).

Note Parallel In-Service Software Downgrade (ISSD) is not recommended on MDS 9148S, MDS 9250i and MDS 9396S fabric switches when these category of fabric switches are peers to each other.

Downgrading from Cisco MDS NX-OS Release 7.3(x) to Cisco MDS NX-OS Release 6.2(x)

You must follow these general guidelines before performing a software downgrade from MDS NX-OS Release 7.3(x) to MDS NX-OS Release 6.2(x).

MDS 9700 Series Director with the 48-Port 10-Gigabit FCoE Module and VLAN Configurations

Note You must not perform the Step 2 before Step 1. If you perform Step 2 before Step 1, unexpected events might occur in the switch.

To downgrade from NX-OS Release 7.3(x) to Cisco MDS NX-OS Release, 6.2(9)and above, follow these steps:

Step 1 You must remove all 48-Port 10-Gigabit FCoE modules from the Cisco MDS 9710 chassis.

Step 2 Use the **purge module running-config** command to remove any FCoE-related configuration from each 48-Port 10-Gigabit FCoE module that is removed.

Step 3 You must remove all VLANs that you have created and verify that no VLAN or VSAN mapping exist on the switch by using the **show vlan** and **show vlan fcoe** command.

Step 4 You must remove all Ethernet Port Channels and verify that no Ethernet Port Channel exists on the switch by using the **show interface brief** and **show ethernet-port-channel database** command.

Step 5 You must remove all virtual Fiber Channels (vFCs) and verify that no vFC exists on the switch by using the **show interface brief** command.

MDS 9700 Series Director with the 24-Port 40-Gigabit FCoE Module and VLAN Configurations

To downgrade from NX-OS Release 7.3(x) to Cisco MDS NX-OS Release, 6.2(9)and above, follow these steps:

Step 1 You must remove all 24-Port 40-Gigabit FCoE modules from the Cisco MDS 9710 chassis.

Step 2 Use the **purge module running-config** command to remove any FCoE-related configuration from each 24-Port 40-Gigabit FCoE module that is removed.

Step 3 You must remove all VLANs that you have created and verify that no VLAN or VSAN mapping exist on the switch by using the **show vlan** and **show vlan fcoe** command.

> ✎
> **Note** If switch has 48-Port 10-Gigabit FCoE modules and ISSD is done to a version above 6.2.7 then Step 3 can be skipped. This is because 10-Gigabit FCoE module is supported from 6.2.7 and will require the VLANs for FCoE traffic to work over 10-Gigabit FCoE ports.

Step 4 You must remove all Ethernet Port Channels and verify that no Ethernet Port Channel exists on the switch by using the **show interface brief** and **show ethernet-port-channel database** command.

Step 5 You must remove all virtual Fibre Channels (vFCs) and verify that no vFC exists on the switch by using the **show interface brief** command.

MDS 9700 Series Director with MDS 24/10-Port SAN Extension Module

To downgrade from NX-OS Release 7.3(x) with MDS 24/10-Port SAN extension module to Cisco MDS NX-OS Release, 6.2(9)and above, follow these steps:

Step 1 Use the **poweroff module** *number* command to power off the module.

Step 2 Use the **purge module** *slot* **running-config** command for MDS 24/10-Port SAN extension module to remove the configuration for the module from the running configuration.

Step 3 Use the **no feature fcip** command to disable FCIP on the switch.

Step 4 Remove the module and verify that the module does not exist on the switch by using the **show module** command.

Downgrading from NX-OS Release 6.2(9) to NX-OS Release 6.2(7), 6.2(5a), 6.2(5), 6.2(3), or 6.2(1) on an MDS 9700 Series Director

> ✎
> **Note** MDS 9718 Series Switch supports only Cisco MDS NX-OS Release 7.3(0)D1(1) and later.

Use the **install all** command to downgrade the switch and handle configuration conversions. When downgrading any switch in the Cisco MDS 9000 Family, avoid using the **reload** command.

To downgrade from NX-OS Release 6.2(x) from NX-OS Release 6.2(9), follow these steps:

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

```
switch# dir bootflash:
4096    Mar 30 12:50:24 2014  lost+found/
36729856    Mar 22 05:53:53 2014  m9700-sf3ek9-kickstart-mz.6.2.5.bin
  36819968    Mar 30 10:24:55 2014  m9700-sf3ek9-kickstart-mz.6.2.9.bin
185116340    Mar 22 05:55:29 2014  m9700-sf3ek9-mz.6.2.5.bin
  191473732    Mar 30 10:27:44 2014  m9700-sf3ek9-mz.6.2.9.bin
Usage for bootflash://sup-local
```

```
2178080768 bytes used
1562763264 bytes free
3740844032 bytes total
```

Step 2   If the software image file is not present, download it from an FTP or TFTP server to the active supervisor module bootflash:. You can obtain the software image file from the Cisco.com software download center at the following URL:

http://www.cisco.com/cisco/software/navigator.html

✎

Note   If you need more space on the active supervisor module bootflash:, use the **delete** command to remove unnecessary files and follow Step 3 through Step 6.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf3ek9-mz.6.2.5.bin
bootflash:m9700-sf3ek9-kickstart-mz.6.2.7.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf3ek9-mz.6.2.5.bin
bootflash:m9700-sf3ek9-mz.6.2.5.bin
```

Step 3   Ensure that the required space is available on the active supervisor.

```
switch# dir bootflash:
36701184    Mar 22 07:14:26 2014  m9700-sf3ek9-kickstart-mz.6.2.1.bin
   36726272     Mar 31 08:16:08 2014  m9700-sf3ek9-kickstart-mz.6.2.3.bin
   36729856     Mar 22 05:53:53 2014  m9700-sf3ek9-kickstart-mz.6.2.5.bin
180230838    Mar 22 07:19:31 2014  m9700-sf3ek9-mz.6.2.1.bin
  184361989     Mar 31 08:17:24 2014  m9700-sf3ek9-mz.6.2.3.bin
  185116340     Mar 22 05:55:29 2014  m9700-sf3ek9-mz.6.2.5.bin

Usage for bootflash://sup-local
 2178080768 bytes used
 1562763264 bytes free
 3740844032 bytes total
```

Step 4   If you need more space on the active supervisor module bootflash, delete unnecessary files to make space available.

```
switch# delete bootflash: m9700-sf3ek9-mz.6.2.1.bin.S60
switch# delete bootflash: m9700-sf3ek9-mz.6.2.3.bin.S16
```

Step 5   Verify that there is enough space available for the standby supervisor.

```
switch(standby)# dir bootflash
   3382868     Mar 28 20:56:38 2014  m9700-sf3ek9-dplug-mzg.6.2.7.bin
36819968    Mar 30 07:26:27 2014  m9700-sf3ek9-kickstart-mz.6.2.7.bin

Usage for bootflash://sup-local
  116188794 bytes used
    68370822 bytes free
  184559616 bytes total
```

Step 6   If you need more space on the standby supervisor module bootflash, delete unnecessary files to make space available.

```
switch(standby)# delete bootflash: m9700-sf3ek9-kickstart-mz.6.2.3.bin
switch(standby)# delete bootflash: m9700-sf3ek9-kickstart-mz.6.2.3.bin
```

Step 7   Issue the **show incompatibility system** *image-filename c*ommand to determine if you need to disable any features not supported by the earlier release.

```
switch# show incompatibility system bootflash:m9700-sf3ek9-dplug-mzg.6.2.7.bin
No incompatible configuration
switch#
```

Step 8   Save the configuration using the **copy running-config startup-config** command.

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

Step 9   Issue the **install all** command to downgrade the software.

```
switch# install all kickstart m9700-sf3ek9-kickstart-mz.6.2.17.bin system
m9700-sf3ek9-mz.6.2.17.bin
Installer will perform compatibility check first. Please wait.

Verifying image bootflash:/m9700-sf3ek9-kickstart-mz.6.2.17.bin.S17 for boot variable
"kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/m9700-sf3ek9-mz.6.2.17.bin.S17 for boot variable "system".
[####################] 100% -- SUCCESS

Performing module support checks.
[####################] 100% -- SUCCESS

Verifying image type.
[####################] 100% -- SUCCESS

Extracting "slc4xb" version from image bootflash:/m9700-sf3ek9-mz.6.2.17.bin.S17.
[####################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/m9700-sf3ek9-mz.6.2.17.bin.S17.
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/m9700-sf3ek9-mz.6.2.17.bin.S17.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:/m9700-sf3ek9-kickstart-mz.6.2.17.bin.S17.
[####################] 100% -- SUCCESS

Notifying services about system upgrade.
[####################] 100% -- SUCCESS
Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     2       yes  non-disruptive       rolling
     5       yes  non-disruptive         reset
     6       yes  non-disruptive         reset
    10       yes  non-disruptive       rolling

Images will be upgraded according to following table:
Module      Image            Running-Version(pri:alt)           New-Version
Upg-Required
------  ----------  -------------------------------------  --------------------
-----------
     2     slc4xb                          7.3(1)D1(1)            6.2(17)
yes
     2       bios  v1.10.21(11/26/12):v1.10.21(11/26/12)  v1.10.21(11/26/12)
no
     5     system                          7.3(1)D1(1)            6.2(17)
yes
     5   kickstart                         7.3(1)D1(1)            6.2(17)
yes
     5       bios  v3.1.0(02/27/2013):v3.1.0(02/27/2013)  v3.1.0(02/27/2013)
no
     6     system                          7.3(1)D1(1)            6.2(17)
yes
```

```
     6    kickstart                                  7.3(1)D1(1)                  6.2(17)
yes
     6       bios     v3.1.0(02/27/2013):v3.1.0(02/27/2013)    v3.1.0(02/27/2013)
no
    10      slc4xb                                   7.3(1)D1(1)                  6.2(17)
yes
    10      bios     v1.10.21(11/26/12):v1.10.21(11/26/12)    v1.10.21(11/26/12)
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-sf3ek9-kickstart-mz.6.2.17.bin.S17 to standby.
[####################] 100% -- SUCCESS

Syncing image bootflash:/m9700-sf3ek9-mz.6.2.17.bin.S17 to standby.
[####################] 100% -- SUCCESS

Setting boot variables.
[####################] 100% -- SUCCESS

Performing configuration copy.
[####################] 100% -- SUCCESS

Module 2:  Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 5:  Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 6:  Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 10:  Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
2016 Aug 31 11:43:15 apex-core1 %PLATFORM-2-MOD_REMOVE: Module 6 removed (Serial number
JAE16440AGX)
2016 Aug 31 11:45:29 apex-core1 %USBHSD-STANDBY-2-MOUNT: logflash: online
2016 Aug 31 11:46:18 apex-core1 %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on
sup in slot 6

Module 6: Waiting for module online.
 -- SUCCESS
2016 Aug 31 11:46:40 apex-core1 %PLATFORM-1-PFM_ALERT: Enabling ejector based shutdown on
sup in slot 5

Notifying services about the switchover.
[####################] 100% -- SUCCESS


"Switching over onto standby".
apex-core1(standby)#
```

Note
- At this point, the previously active supervisor module is rebooting after a nondisruptive switchover has taken place. Refer to the *Cisco MDS 9000 Family NX-OS High Availability and Redundancy Configuration Guide*.

- At this point, a switchover occurs to the new active supervisor module.

```
NX7k SUP BIOS version ( 3.01 ) : Build - 02/26/2013 14:16:20
PM FPGA Version : 0x000000BA
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 : 0x00000002
  Memory - 8192 MB : Frequency - 1067 MHZ
  Loading Bootloader: Done
  IO FPGA Version   : 0xabcd0001
  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-sf3ek9-kickstart-mz.6.2.17.bin.S17 bootflash:/m970
0-sf3ek9-mz.6.2.17.bin.S17...
 Filesystem type is ext2fs, partition type 0x83
Booting kickstart image: bootflash:/m9700-sf3ek9-kickstart-mz.6.2.17.bin.S17...
.
.........................................................................
.......................................
Kickstart digital signature verification Successful
Image verification OK

INIT: version 2
boot device node /dev/sdb
obfl flash device node /dev/sda
log flash device node /dev/sdc
Checking obfl filesystem.
Checking all filesystems..r.r.r..r done.
Mounting Log Dir /logflash
mounting Log 0
rrLoading system software
/bootflash//m9700-sf3ek9-mz.6.2.17.bin.S17 read done
System image digital signature verification successful.
Uncompressing system image: bootflash:/m9700-sf3ek9-mz.6.2.17.bin.S17 Wed Aug 31 11:45:03
IST 2016
blogger: nothing to do.
C
..done Wed Aug 31 11:45:05 IST 2016
Load plugins that defined in image conf: /isan/plugin_img/img.conf
Loading plugin 0: core_plugin...
Enter pboot_chk_compatibility
num srgs 1
0: swid-core-sup3dc3mds, swid-core-sup3dc3mds
num srgs 1
0: swid-sup3dc3mds-ks, swid-sup3dc3mds-ks
INIT: Entering runlevel: 3
```

```
2016 Aug 31 11:45:29 apex-core1 %USBHSD-2-MOUNT: logflash: online

Continuing with installation, please wait
2016 Aug 31 11:45:48 apex-core1 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.


Module 6: Waiting for module online.
 -- SUCCESS
2016 Aug 31 11:46:44 apex-core1 Aug 31 11:46:44 %KERN-2-SYSTEM_MSG: [  178.958620]
Switchover started by redundancy driver - kernel
2016 Aug 31 11:46:44 apex-core1 %SYSMGR-2-HASWITCHOVER_PRE_START: This supervisor is
becoming active (pre-start phase).
2016 Aug 31 11:46:44 apex-core1 %SYSMGR-2-HASWITCHOVER_START: Supervisor 6 is becoming
active.
2016 Aug 31 11:46:45 apex-core1 %SYSMGR-2-SWITCHOVER_OVER: Switchover completed.
2016 Aug 31 11:46:45 apex-core1 %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on
sup in slot 6
2016 Aug 31 11:46:50 apex-core1 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 11:46:50 apex-core1 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature MAINFRAME_PKG. Application(s) shut down in 118 days.
2016 Aug 31 11:46:50 apex-core1 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Fabric Binding
running without MAINFRAME_PKG license, shutdown in 118 days
2016 Aug 31 11:46:50 apex-core1 %CALLHOME-2-EVENT: LICENSE_ALERT
2016 Aug 31 11:50:12 apex-core1 %USBHSD-STANDBY-2-MOUNT: logflash: online
2016 Aug 31 11:51:00 apex-core1 %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on
sup in slot 5


Module 2: Non-disruptive upgrading.
[#                  ]   0%2016 Aug 31 11:51:18 apex-core1 %PLATFORM-1-PFM_ALERT: Enabling
ejector based shutdown on sup in slot 6
2016 Aug 31 11:52:14 apex-core1 %PMON-SLOT2-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
[###################] 100% -- SUCCESS

Module 10: Non-disruptive upgrading.
[#                  ]   0%2016 Aug 31 11:53:43 apex-core1 %PMON-SLOT10-2-PMON_CRIT_INFO:
Port Monitor Critical Information: Config download success .
[###################] 100% -- SUCCESS

Install has been successful.

User Access Verification
apex-core1 login: admin
Password:
```

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
---   -----  -----------------------------------  ------------------  ----------
2     48     2/4/8/10/16 Gbps Advanced FC Module  DS-X9448-768K9      ok
5     0      Supervisor Module-3                  DS-X97-SF1-K9       ha-standby
6     0      Supervisor Module-3                  DS-X97-SF1-K9       active *
10    48     2/4/8/10/16 Gbps Advanced FC Module  DS-X9448-768K9      ok


Mod   Sw             Hw
---   -------------  ------
2     6.2(17)        1.1
5     6.2(17)        0.302
6     6.2(17)        0.302
10    6.2(17)        0.302
```

```
Mod   MAC-Address(es)                       Serial-Num
---   ------------------------------------  ----------
2     e8-ed-f3-e5-f2-00 to e8-ed-f3-e5-f2-03  JAE1747063U
5     1c-df-0f-78-7f-6d to 1c-df-0f-78-7f-7f  JAE16440AG9
6     1c-df-0f-78-80-2b to 1c-df-0f-78-80-3d  JAE16440AGX
10    54-7f-ee-d7-bc-f8 to 54-7f-ee-d7-bc-fb  JAE164404NO


Mod   Online Diag Status

switch#
```

Downgrading from NX-OS Release 7.3(x) to NX-OS Release 6.2(x)

The following sections describe how to perform downgrades on an MDS 9513 switch:.

- Downgrading from NX-OS Release 7.3(x) to NX-OS Release 6.2(x) on an MDS 9513 Multilayer Director, page 46.

To determine whether high bandwidth capability is enabled, issue the **show hardware fabric-mode** command. The following example shows that the higher bandwidth capability has not been activated:

```
switch# show hardware fabric-mode
Fabric mode supports only one configuration of 8G FC modules - 4/44 Host-Optimized 8G FC
module.
switch#
```

The following example shows that the higher bandwidth capability has been activated:

```
switch# show hardware fabric-mode
fabric mode supports FCoE, Gen2 and above linecards
switch#
```

The following sections describe how to perform downgrades on an MDS 9509 and MDS 9506 switch:

- Downgrading from NX-OS Release 7.3(x) to NX-OS Release 6.2(x) on an MDS 9509 or MDS 9506 Switch, page 54.
- , page 63.

The following section describes how to perform a downgrade on an MDS 9250i switch:

- Downgrading from NX-OS Release 7.3(x) to NX-OS Release 6.2(x) on an MDS 9250i Switch, page 63.

For information on supported chassis and modules, refer to the Cisco MDS 9000 Series Compatibility Matrix. For information on the procedures for installing and upgrading software for Intelligent Storage Services on the Cisco MDS 9000 Family Storage Services Module (SSM), refer to the *Cisco MDS 9000 Family Storage Services Module Software Installation and Upgrade Guide*.

Downgrading from NX-OS Release 7.3(x) to NX-OS Release 6.2(x) on an MDS 9513 Multilayer Director

Use the **install all** command to downgrade the switch and handle configuration conversions. When downgrading any switch in the Cisco MDS 9000 Family, avoid using the **reload** command.

To downgrade from NX-OS Release 7.3(x) from NX-OS Release 6.2(x), follow these steps:

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

```
switch# dir bootflash:
     12288      Aug 26 19:06:14 2011  lost+found/
  22001152      Jul 01 10:54:49 2011  m9500-sf2ek9-kickstart-mz.5.2.x.bin
  16604160      Jul 01 10:20:07 2011  m9500-sf2ek9-kickstart-mz.5.0.1a.bin
  94175354      Jul 01 10:33:52 2011  m9500-sf2ek9-mz.5.2.x.bin
  78718938      Jul 01 10:18:09 2011  m9500-sf2ek9-mz.5.0.1a.bin

Usage for bootflash://sup-local
  211411892 bytes used
  167810476 bytes free
  379322368 bytes total
```

Step 2   If the software image file is not present, download it from an FTP or TFTP server to the active supervisor module bootflash:. You can obtain the software image file from the Cisco.com software download center at the following URL:

http://www.cisco.com/cisco/software/navigator.html

✎
Note   If you need more space on the active supervisor module bootflash:, use the **delete** command to remove unnecessary files and follow Step 3 through Step 6.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9500-sf2ek9-kickstart-mz.5.2.1.bin
bootflash:m9500-sf2ek9-kickstart-mz.5.2.1a.bin

switch# copy tftp://tftpserver.cisco.com/MDS/m9500-sf2ek9-mz.5.2.1.bin
bootflash:m9500-sf2ek9-mz.5.2.1.bin
```

Step 3   Ensure that the required space is available on the active supervisor.

```
switch# dir bootflash:
     12288      Aug 26 19:06:14 2011  lost+found/
  22001152      Jul 01 10:54:49 2011  m9500-sf2ek9-kickstart-mz.5.2.x.bin
  94175354      Jul 01 10:33:52 2011  m9500-sf2ek9-mz.5.2.x.bin

Usage for bootflash://sup-local
  116188794 bytes used
  68370822 bytes free
  184559616 bytes total
```

Step 4   If you need more space on the active supervisor module bootflash, delete unnecessary files to make space available.

```
switch# delete bootflash: m9500-sf2ek9-kickstart-mz.5.0.x.bin
switch# delete bootflash: m9500-sf2ek9-mz.5.0.x.bin
```

Step 5   Verify that there is enough space available for the standby supervisor.

```
switch(standby)# dir bootflash:
     12288      Aug 26 19:06:14 2011  lost+found/
  22001152      Jul 01 10:54:49 2011  m9500-sf2ek9-kickstart-mz.5.2.1.bin
  94175354      Jul 01 10:33:52 2011  m9500-sf2ek9-mz.5.2.1.bin

Usage for bootflash://sup-local
  116188794 bytes used
  68370822 bytes free
  184559616 bytes total
```

Step 6   If you need more space on the standby supervisor module bootflash, delete unnecessary files to make space available.

```
switch(standby)# delete bootflash: m9500-sf2ek9-kickstart-mz.5.2.x.bin
switch(standby)# delete bootflash: m9500-sf2ek9-mz.5.2.x.bin
```

Step 7   Issue the **show incompatibility system** *image-filename c*ommand to determine if you need to disable any features not supported by the earlier release.

```
switch# show incompatibility system bootflash:m9500-sf2ek9-mz.5.2.1.bin
The following configurations on active are incompatible with the system image
1) Service : port-channel , Capability : CAP_FEATURE_AUTO_CREATED_41_PORT_CHANNEL
Description : auto create enabled ports or auto created port-channels are present
Capability requirement : STRICT
Disable command :
1.Disable autocreate on interfaces (no channel-group auto).
2.Convert autocreated port channels to be persistent (port-channel 1 persistent)
...
```

Step 8   Disable any features that are incompatible with the downgrade system image.

```
switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface fcip 31
switch(config-if)# no channel-group auto
switch(config-if)# end
switch# port-channel 127 persistent
switch#
```

Step 9   Save the configuration using the **copy running-config startup-config** command.

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

Step 10   Issue the **install all** command to downgrade the software.

```
switch# install all kickstart bootflash:m9500-sf2ek9-kickstart-mz.7.3.0.D1.1.bin.S21
system bootflash:m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21
Installer will perform compatibility check first. Please wait.
Verifying image bootflash:/m9500-sf2ek9-kickstart-mz.7.3.0.D1.1.bin.S21 for boot variable
"kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21 for boot variable "system".
[####################] 100% -- SUCCESS

Performing module support checks.
[####################] 100% -- SUCCESS

Verifying image type.
[####################] 100% -- SUCCESS

Extracting "slc2" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "ips16" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "ssi" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS
```

```
Extracting "kickstart" version from image
bootflash:/m9500-sf2ek9-kickstart-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "18_4" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "slc4" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 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      disruptive       rolling  Hitless upgrade is not supported
     7       yes  non-disruptive         reset
     8       yes  non-disruptive         reset
    10       yes  non-disruptive       rolling
    12       yes  non-disruptive       rolling
    13       yes  non-disruptive       rolling


Other miscellaneous information for installation:
Module  info
------  ----------------------------------
     1  Hitless upgrade is not supported
    10  FC ports 1-18 are hitless, GigE 1-4 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
------  ----------  --------------------------------------  --------------------
-----------
     1        slc2                            7.3(1)D1(1)          7.3(0)D1(1)
yes
     1       ips16                            7.3(1)D1(1)          7.3(0)D1(1)
yes
     1         ssi                            7.3(1)D1(1)          7.3(0)D1(1)
yes
     1        bios     v1.0.19(02/01/10):v1.0.19(02/01/10)     v1.0.19(02/01/10)
no
     7      system                            7.3(1)D1(1)          7.3(0)D1(1)
yes
     7   kickstart                            7.3(1)D1(1)          7.3(0)D1(1)
yes
     7        bios     v1.0.10(01/08/09):v1.0.10(01/08/09)     v1.0.10(01/08/09)
no
     8      system                            7.3(1)D1(1)          7.3(0)D1(1)
yes
     8   kickstart                            7.3(1)D1(1)          7.3(0)D1(1)
yes
     8        bios     v1.0.10(01/08/09):v1.0.10(01/08/09)     v1.0.10(01/08/09)
no
```

```
    10       slc2                                7.3(1)D1(1)          7.3(0)D1(1)
yes
    10       18_4                                7.3(1)D1(1)          7.3(0)D1(1)
yes
    10        ssi                                7.3(1)D1(1)          7.3(0)D1(1)
yes
    10       bios     v1.0.19(02/01/10):v1.0.19(02/01/10)     v1.0.19(02/01/10)
no
    12       slc4                                7.3(1)D1(1)          7.3(0)D1(1)
yes
    12       bios     v1.10.21(11/26/12):v1.10.21(11/26/12)    v1.10.21(11/26/12)
no
    13       slc2                                7.3(1)D1(1)          7.3(0)D1(1)
yes
    13       bios     v1.0.19(02/01/10):v1.0.19(02/01/10)     v1.0.19(02/01/10)
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:/m9500-sf2ek9-kickstart-mz.7.3.0.D1.1.bin.S21 to standby.
[####################] 100% -- SUCCESS

Syncing image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21 to standby.
[####################] 100% -- SUCCESS

Setting boot variables.
[####################] 100% -- SUCCESS

Performing configuration copy.
[####################] 100% -- SUCCESS

Module 1: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 7: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 8: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 10: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 12: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 13: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
2016 Aug 31 16:23:59 sw-9513-195 %PLATFORM-2-MOD_REMOVE: Module 8 removed (Serial number
JAF1626AKML)

Module 8: Waiting for module online.
```

```
  -- SUCCESS


Notifying services about the switchover.
[####################] 100% -- SUCCESS



"Switching over onto standby".



-------------------------------


is_module_netboot returned 0
Continuing with installation, please wait
2016 Aug 31 16:27:28 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature IOA_SSN16. Application(s) shut down in 76 days.
2016 Aug 31 16:27:28 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature MAINFRAME_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:27:28 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:27:28 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature SME_FOR_SSN16_PKG. Application(s) shut down in 82 days.

Module 8: Waiting for module online.
  -- SUCCESS
```

✎

Note   At this point, the previously active supervisor module is rebooting after a nondisruptive switchover has taken place. Refer to the *Cisco MDS 9000 Family NX-OS High Availability and Redundancy Configuration Guide*.

```
2016 Aug 31 16:28:57 sw-9513-195 %SYSMGR-2-HASWITCHOVER_PRE_START: This supervisor is
becoming active (pre-start phase).
2016 Aug 31 16:28:57 sw-9513-195 %SYSMGR-2-HASWITCHOVER_START: Supervisor 8 is becoming
active.
2016 Aug 31 16:28:59 sw-9513-195 %SYSMGR-2-SWITCHOVER_OVER: Switchover completed.
2016 Aug 31 16:29:08 sw-9513-195 %IOA-2-LOG_LIBBASE_SVC_LICENSE_ON_GRACE_PERIOD:
(pid=3723) No license. Feature will be shut down after a grace period of approximately 76
days
2016 Aug 31 16:29:08 sw-9513-195 %SME_CPP-2-LOG_WARN_SME_LICENSE_GRACE: No SME License.
Feature will be shut down after a grace period of approximately 82 days
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature IOA_SSN16. Application(s) shut down in 76 days.
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature SME_FOR_SSN16_PKG. Application(s) shut down in 82 days.
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Port Security
running without ENTERPRISE_PKG license, shutdown in 92 days
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature MAINFRAME_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Port Security
running without ENTERPRISE_PKG license, shutdown in 92 days
2016 Aug 31 16:29:16 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:29:16 sw-9513-195 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Port Security
running without ENTERPRISE_PKG license, shutdown in 92 days
2016 Aug 31 16:29:18 sw-9513-195 %CALLHOME-2-EVENT: LICENSE_ALERT

Module 10: Non-disruptive upgrading.
```

```
[#                     ]   0%2016 Aug 31 16:33:52 sw-9513-195
%IMAGE_DNLD-SLOT10-2-IMG_DNLD_STARTED:  Module image download process. Please wait until
completion...
2016 Aug 31 16:34:12 sw-9513-195 %IMAGE_DNLD-SLOT10-2-IMG_DNLD_COMPLETE:  Module image
download process. Download successful.
2016 Aug 31 16:36:19 sw-9513-195 %PMON-SLOT10-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
[####################] 100% -- SUCCESS

Module 12: Non-disruptive upgrading.
[#                    ]   0%2016 Aug 31 16:37:37 sw-9513-195 %PMON-SLOT12-2-PMON_CRIT_INFO:
Port Monitor Critical Information: Config download success .
[####################] 100% -- SUCCESS

Module 13: Non-disruptive upgrading.
[#                    ]   0%2016 Aug 31 16:38:06 sw-9513-195
%IMAGE_DNLD-SLOT13-2-IMG_DNLD_STARTED:  Module image download process. Please wait until
completion...
2016 Aug 31 16:38:26 sw-9513-195 %IMAGE_DNLD-SLOT13-2-IMG_DNLD_COMPLETE:  Module image
download process. Download successful.
2016 Aug 31 16:39:26 sw-9513-195 %PMON-SLOT13-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
[####################] 100% -- SUCCESS

Module 1: Disruptive upgrading.
[#                    ]   0%2016 Aug 31 16:39:55 sw-9513-195
%SYSTEMHEALTH-2-OHMS_FREE_DISK_FAILED: Free Disk Space on partition / is below warning
threshold for module 13.
2016 Aug 31 16:39:55 sw-9513-195 %CALLHOME-2-EVENT: FREEDISK_FAILURE
2016 Aug 31 16:41:25 sw-9513-195 %PLATFORM-2-MOD_DETECT: Module 1 detected (Serial number
JAF1637BDJS) Module-Type 16x1GE, Storage Services Node Model DS-X9316-SSNK9
2016 Aug 31 16:41:25 sw-9513-195 %PLATFORM-2-MOD_PWRUP: Module 1 powered up (Serial number
JAF1637BDJS)
2016 Aug 31 16:42:13 sw-9513-195 %IMAGE_DNLD-SLOT1-2-IMG_DNLD_STARTED:  Module image
download process. Please wait until completion...
2016 Aug 31 16:42:40 sw-9513-195 %IMAGE_DNLD-SLOT1-2-IMG_DNLD_COMPLETE:  Module image
download process. Download successful.
[####################] 100% -- SUCCESS
2016 Aug 31 16:44:27 sw-9513-195 %SME_CPP-2-LOG_WARN_SME_LICENSE_GRACE: No SME License.
Feature will be shut down after a grace period of approximately 82 days

Install has been successful.
2016 Aug 31 16:44:27 sw-9513-195 %IOA-2-LOG_LIBBASE_SVC_LICENSE_ON_GRACE_PERIOD:
(pid=3723) No license. Feature will be shut down after a grace period of approximately 76
days
2016 Aug 31 16:44:28 sw-9513-195 %PMON-SLOT1-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
2016 Aug 31 16:44:32 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature
User Access Verification
sw-9513-195 login: 2016 Aug 31 16:44:32 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No
license(s) present for feature IOA_SSN16. Application(s) shut down in 76 days.
2016 Aug 31 16:44:32 sw-9513-195 %CALLHOME-2-EVENT: LICENSE_ALERT
2016 Aug 31 16:44:39 sw-9513-195 %PLATFORM-2-MOD_DETECT: Module 2 detected (Serial number
JAB093301LC) Module-Type 1/2/4 Gbps FC Module Model DS-X9148
2016 Aug 31 16:44:39 sw-9513-195 %MODULE-2-MOD_UNKNOWN: Module type [34] in slot 2 is not
supported
2016 Aug 31 16:44:39 sw-9513-195 %MODULE-2-MOD_FAIL: Initialization of module 2 (Serial
number: ) failed
2016 Aug 31 16:44:39 sw-9513-195 %PLATFORM-2-MOD_PWRDN: Module 2 powered down (Serial
number JAB093301LC)
2016 Aug 31 16:44:39 sw-9513-195 %CALLHOME-2-EVENT: HARDWARE_INSERTION
2016 Aug 31 16:44:40 sw-9513-195 %PLATFORM-2-MOD_DETECT: Module 9 detected (Serial number
JAF1632ASCJ) Module-Type 10 Gbps FCoE Module Model DS-X9708-K9
```

```
2016 Aug 31 16:44:40 sw-9513-195 %MODULE-2-MOD_UNKNOWN: Module type [123] in slot 9 is not
supported
2016 Aug 31 16:44:40 sw-9513-195 %MODULE-2-MOD_FAIL: Initialization of module 9 (Serial
number: ) failed
2016 Aug 31 16:44:40 sw-9513-195 %PLATFORM-2-MOD_PWRDN: Module 9 powered down (Serial
number JAF1632ASCJ)
2016 Aug 31 16:44:40 sw-9513-195 %CALLHOME-2-EVENT: HARDWARE_INSERTION

209.165.200.226 login: admin
Password:
********************************************************************
Cisco Nexus Operating System (NX-OS) Software
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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 11 Verify the status of the modules on the switch using the **show module** command.

```
switch# show module
Mod   Ports  Module-Type                        Model              Status
---   -----  ---------------------------------- ------------------ ----------
1     16     16x1GE, Storage Services Node      DS-X9316-SSNK9     ok
2     48     1/2/4 Gbps FC Module                                  powered-dn
5     48     1/2/4 Gbps FC Module                                  powered-dn
7     0      Supervisor/Fabric-2a               DS-X9530-SF2AK9    ha-standby
8     0      Supervisor/Fabric-2a               DS-X9530-SF2AK9    active *
9     8      10 Gbps FCoE Module                                   powered-dn
10    22     4x1GE IPS, 18x1/2/4Gbps FC Module  DS-X9304-18K9      ok
12    32     1/2/4/8/10 Gbps Advanced FC Module DS-X9232-256K9     ok
13    24     1/2/4/8 Gbps FC Module             DS-X9224-96K9      ok

Mod   Power-Status  Reason
---   ------------  --------------------------
2     powered-dn    Unsupported/Unknown Module
5     powered-dn    Configured Power down
9     powered-dn    Unsupported/Unknown Module

Mod   Sw               Hw      World-Wide-Name(s) (WWN)
---   ---------------  ------  -------------------------------------------------
1     7.3(0)D1(1)      1.4     --
7     7.3(0)D1(1)      1.4     --
8     7.3(0)D1(1)      1.4     --
10    7.3(0)D1(1)      1.0     22:41:54:7f:ee:7a:24:40 to 22:52:54:7f:ee:7a:24:40
12    7.3(0)D1(1)      1.1     22:c1:54:7f:ee:7a:24:40 to 22:e0:54:7f:ee:7a:24:40
13    7.3(0)D1(1)      1.6     23:01:54:7f:ee:7a:24:40 to 23:18:54:7f:ee:7a:24:40

Mod   MAC-Address(es)                       Serial-Num
---   ------------------------------------- ----------
1     00-0d-ec-77-79-00 to 00-0d-ec-77-79-13 JAF1637BDJS
2     00-00-00-00-00-00 to 00-00-00-00-00-00 JAB093301LC
5     00-00-00-00-00-00 to 00-00-00-00-00-00 JAB093301LZ
7     d0-d0-fd-1d-e1-cc to d0-d0-fd-1d-e1-cf JAF1626AKNF
8     c8-9c-1d-41-a2-9c to c8-9c-1d-41-a2-9f JAF1626AKML
9     00-00-00-00-00-00 to 00-00-00-00-00-00 JAF1632ASCJ
10    00-0d-ec-77-1f-e8 to 00-0d-ec-77-1f-ef JAF1607AAQN
12    50-3d-e5-9f-41-3c to 50-3d-e5-9f-41-3f JAF1635ABHR
```

```
13   00-0d-ec-77-7c-b4 to 00-0d-ec-77-7c-b7  JAF1638BKDN

Xbar Ports  Module-Type                          Model              Status
---  -----  ------------------------------------ ------------------ ----------
1    0      Fabric Module 3                      DS-13SLT-FAB3      ok
2    0      Fabric Module 3                      DS-13SLT-FAB3      ok

Xbar Sw               Hw      World-Wide-Name(s) (WWN)
---  ---------------  ------  -------------------------------------------------
1    NA               1.3     --
2    NA               1.3     --

Xbar MAC-Address(es)                      Serial-Num
---  ------------------------------------ ----------
1    NA                                   JAF1624AAQM
2    NA                                   JAF1624AAQP

* this terminal session
```

Downgrading from NX-OS Release 7.3(x) to NX-OS Release 6.2(x) on an MDS 9509 or MDS 9506 Switch

To downgrade to Cisco NX-OS Release 6.2(x) from Cisco NX-OS Release 7.3(x), on an MDS 9509 or MDS 9506 switch, follow these steps:

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

```
switch# dir bootflash:
     12288      Aug 26 19:06:14 2011  lost+found/
  22001152      Jul 01 10:54:49 2011  m9500-sf2ek9-kickstart-mz.5.2.x.bin
  16604160      Jul 01 10:20:07 2011  m9500-sf2ek9-kickstart-mz.5.0.1a.bin
  94175354      Jul 01 10:33:52 2011  m9500-sf2ek9-mz.5.2.x.bin
  78718938      Jul 01 10:18:09 2011  m9500-sf2ek9-mz.5.0.1a.bin

Usage for bootflash://sup-local
  211411892 bytes used
  167810476 bytes free
  379322368 bytes total
```

Step 2   If the software image file is not present, download it from an FTP or TFTP server to the active supervisor module bootflash:. You can obtain the software image file from the Cisco.com software download center at the following URL:

http://www.cisco.com/cisco/software/navigator.html

✎

Note   If you need more space on the active supervisor module bootflash:, use the **delete** command to remove unnecessary files and follow Step 3 through Step 6.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9500-sf2ek9-kickstart-mz.5.2.x.bin
bootflash:m9500-sf2ek9-kickstart-mz.5.2.x.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9500-sf2ek9-mz.5.2.x.bin
bootflash:m9500-sf2ek9-mz.5.2.x.bin
```

Step 3   Ensure that the required space is available on the active supervisor.

```
switch# dir bootflash:
     12288      Aug 26 19:06:14 2011  lost+found/
  22001152      Jul 01 10:54:49 2011  m9500-sf2ek9-kickstart-mz.5.2.x.bin
  94175354      Jul 01 10:33:52 2011  m9500-sf2ek9-mz.5.2.x.bin

Usage for bootflash://sup-local
  116188794 bytes used
   68370822 bytes free
  184559616 bytes total
```

Step 4   If you need more space on the active supervisor module bootflash, delete unnecessary files to make space
available.

```
switch# delete bootflash: m9500-sf2ek9-kickstart-mz.5.0.1a.bin
switch# delete bootflash: m9500-sf2ek9-mz.5.0.1a.bin
```

Step 5   Verify that there is enough space available for the standby supervisor.

```
switch(standby)# dir bootflash:
     12288      Aug 26 19:06:14 2011  lost+found/
  22001152      Jul 01 10:54:49 2011  m9500-sf2ek9-kickstart-mz.5.2.x.bin
  94175354      Jul 01 10:33:52 2011  m9500-sf2ek9-mz.5.2.x.bin

Usage for bootflash://sup-local
  116188794 bytes used
   68370822 bytes free
  184559616 bytes total
```

Step 6   If you need more space on the standby supervisor module bootflash, delete unnecessary files to make
space available.

```
switch(standby)# delete bootflash: m9500-sf2ek9-kickstart-mz.5.2.x.bin
switch(standby)# delete bootflash: m9500-sf2ek9-mz.5.2.x.bin
```

Step 7   Issue the **show incompatibility system** *image-filename* command to determine if you need to disable
any features not supported by the earlier release.

```
switch# show incompatibility system bootflash:m9500-sf2ek9-mz.5.2.x.bin
The following configurations on active are incompatible with the system image
1) Service : port-channel , Capability : CAP_FEATURE_AUTO_CREATED_41_PORT_CHANNEL
Description : auto create enabled ports or auto created port-channels are present
Capability requirement : STRICT
Disable command :
1.Disable autocreate on interfaces (no channel-group auto).
2.Convert autocreated port channels to be persistent (port-channel 1 persistent)
...
```

Step 8   Disable any features that are incompatible with the downgrade system image.

```
switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface fcip 31
switch(config-if)# no channel-group auto
switch(config-if)# end
switch# port-channel 127 persistent
switch#
```

Step 9   Save the configuration using the **copy running-config startup-config** command.

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

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    16     16x1GE, Storage Services Node          DS-X9316-SSNK9     ok
2    48     1/2/4 Gbps FC Module                                      powered-dn
5    48     1/2/4 Gbps FC Module                                      powered-dn
7    0      Supervisor/Fabric-2a                   DS-X9530-SF2AK9    ha-standby
8    0      Supervisor/Fabric-2a                   DS-X9530-SF2AK9    active *
9    8      10 Gbps FCoE Module                                       powered-dn
10   22     4x1GE IPS, 18x1/2/4Gbps FC Module      DS-X9304-18K9      ok
12   32     1/2/4/8/10 Gbps Advanced FC Module     DS-X9232-256K9     ok
13   24     1/2/4/8 Gbps FC Module                 DS-X9224-96K9      ok

Mod  Power-Status  Reason
---  ------------  ---------------------------
2    powered-dn    Unsupported/Unknown Module
5    powered-dn    Configured Power down
9    powered-dn    Unsupported/Unknown Module

Mod  Sw             Hw      World-Wide-Name(s) (WWN)
---  -------------- ------  -------------------------------------------------
1    7.3(0)D1(1)    1.4     --
7    7.3(0)D1(1)    1.4     --
8    7.3(0)D1(1)    1.4     --
10   7.3(0)D1(1)    1.0     22:41:54:7f:ee:7a:24:40 to 22:52:54:7f:ee:7a:24:40
12   7.3(0)D1(1)    1.1     22:c1:54:7f:ee:7a:24:40 to 22:e0:54:7f:ee:7a:24:40
13   7.3(0)D1(1)    1.6     23:01:54:7f:ee:7a:24:40 to 23:18:54:7f:ee:7a:24:40


Mod  MAC-Address(es)                        Serial-Num
---  -------------------------------------- ----------
1    00-0d-ec-77-79-00 to 00-0d-ec-77-79-13 JAF1637BDJS
2    00-00-00-00-00-00 to 00-00-00-00-00-00 JAB093301LC
5    00-00-00-00-00-00 to 00-00-00-00-00-00 JAB093301LZ
7    d0-d0-fd-1d-e1-cc to d0-d0-fd-1d-e1-cf JAF1626AKNF
8    c8-9c-1d-41-a2-9c to c8-9c-1d-41-a2-9f JAF1626AKML
9    00-00-00-00-00-00 to 00-00-00-00-00-00 JAF1632ASCJ
10   00-0d-ec-77-1f-e8 to 00-0d-ec-77-1f-ef JAF1607AAQN
12   50-3d-e5-9f-41-3c to 50-3d-e5-9f-41-3f JAF1635ABHR
13   00-0d-ec-77-7c-b4 to 00-0d-ec-77-7c-b7 JAF1638BKDN

Xbar Ports  Module-Type                            Model              Status
---  -----  -------------------------------------- ------------------ ----------
1    0      Fabric Module 3                        DS-13SLT-FAB3      ok
2    0      Fabric Module 3                        DS-13SLT-FAB3      ok

Xbar Sw             Hw      World-Wide-Name(s) (WWN)
---  -------------- ------  -------------------------------------------------
1    NA             1.3     --
2    NA             1.3     --


Xbar MAC-Address(es)                        Serial-Num
---  -------------------------------------- ----------
1    NA                                     JAF1624AAQM
2    NA                                     JAF1624AAQP

* this terminal session
```

Step 11 Verify that the switch is running the required software version by issuing 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
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other third parties and are used and distributed under license.
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http://www.gnu.org/licenses/gpl.html.

Software
  BIOS:      version 1.0.10
  loader:    version N/A
  kickstart: version 7.3(0)D1(1)
  system:    version 7.3(0)D1(1)
  BIOS compile time:       01/08/09
  kickstart image file is: bootflash:///m9500-sf2ek9-kickstart-mz.7.3.0.D1.1.bin
.S21
  kickstart compile time:  1/11/2016 16:00:00 [02/11/2016 16:10:59]
  system image file is:    bootflash:///m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21
  system compile time:     1/11/2016 16:00:00 [02/11/2016 18:38:33]


Hardware
  cisco MDS 9513 (13 Slot) Chassis ("Supervisor/Fabric-2a")
  Motorola, 7447A, altivec supported with 2071288 kB of memory.
  Processor Board ID JAF1626AKML

  Device name: sw-9513-195
  bootflash:    1000944 kB
  slot0:              0 kB (expansion flash)

Kernel uptime is 0 day(s), 0 hour(s), 32 minute(s), 28 second(s)

Last reset
  Reason: Unknown
  System version: 7.3(1)D1(1)
  Service:

plugin
  Core Plugin
```

Step 12 Issue the **install all** command to downgrade the software.

```
switch# install all kickstart bootflash:m9500-sf2ek9-kickstart-mz.7.3.0.D1.1.bin.S21
system bootflash:m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21
Installer will perform compatibility check first. Please wait.
Verifying image bootflash:/m9500-sf2ek9-kickstart-mz.7.3.0.D1.1.bin.S21 for boot variable
"kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21 for boot variable "system".
[####################] 100% -- SUCCESS

Performing module support checks.
[####################] 100% -- SUCCESS

Verifying image type.
[####################] 100% -- SUCCESS

Extracting "slc2" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "ips16" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
```

```
[####################] 100% -- SUCCESS

Extracting "ssi" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:/m9500-sf2ek9-kickstart-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "18_4" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "slc4" version from image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 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       disruptive       rolling  Hitless upgrade is not supported
     7       yes  non-disruptive         reset
     8       yes  non-disruptive         reset
    10       yes  non-disruptive       rolling
    12       yes  non-disruptive       rolling
    13       yes  non-disruptive       rolling


Other miscellaneous information for installation:
Module  info
------  ----------------------------------
     1  Hitless upgrade is not supported
    10  FC ports 1-18 are hitless, GigE 1-4 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
------  ----------  --------------------------------------  --------------------
------------
     1       slc2                                7.3(1)D1(1)         7.3(0)D1(1)
yes
     1       ips16                               7.3(1)D1(1)         7.3(0)D1(1)
yes
     1        ssi                                7.3(1)D1(1)         7.3(0)D1(1)
yes
     1       bios     v1.0.19(02/01/10):v1.0.19(02/01/10)     v1.0.19(02/01/10)
no
     7       system                             7.3(1)D1(1)         7.3(0)D1(1)
yes
```

```
    7    kickstart                               7.3(1)D1(1)           7.3(0)D1(1)
yes
    7      bios       v1.0.10(01/08/09):v1.0.10(01/08/09)     v1.0.10(01/08/09)
no
    8     system                                7.3(1)D1(1)           7.3(0)D1(1)
yes
    8    kickstart                               7.3(1)D1(1)           7.3(0)D1(1)
yes
    8      bios       v1.0.10(01/08/09):v1.0.10(01/08/09)     v1.0.10(01/08/09)
no
   10      slc2                                  7.3(1)D1(1)           7.3(0)D1(1)
yes
   10      18_4                                  7.3(1)D1(1)           7.3(0)D1(1)
yes
   10       ssi                                  7.3(1)D1(1)           7.3(0)D1(1)
yes
   10      bios       v1.0.19(02/01/10):v1.0.19(02/01/10)     v1.0.19(02/01/10)
no
   12      slc4                                  7.3(1)D1(1)           7.3(0)D1(1)
yes
   12      bios       v1.10.21(11/26/12):v1.10.21(11/26/12)   v1.10.21(11/26/12)
no
   13      slc2                                  7.3(1)D1(1)           7.3(0)D1(1)
yes
   13      bios       v1.0.19(02/01/10):v1.0.19(02/01/10)     v1.0.19(02/01/10)
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:/m9500-sf2ek9-kickstart-mz.7.3.0.D1.1.bin.S21 to standby.
[####################] 100% -- SUCCESS

Syncing image bootflash:/m9500-sf2ek9-mz.7.3.0.D1.1.bin.S21 to standby.
[####################] 100% -- SUCCESS

Setting boot variables.
[####################] 100% -- SUCCESS

Performing configuration copy.
[####################] 100% -- SUCCESS

Module 1: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 7: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 8: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 10: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 12: Refreshing compact flash and Upgrading bios/loader/bootrom.
```

```
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Module 13: Refreshing compact flash and Upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
2016 Aug 31 16:23:59 sw-9513-195 %PLATFORM-2-MOD_REMOVE: Module 8 removed (Serial number
JAF1626AKML)

Module 8: Waiting for module online.
 -- SUCCESS

Notifying services about the switchover.
[###################] 100% -- SUCCESS


"Switching over onto standby".


-------------------------------

is_module_netboot returned 0
Continuing with installation, please wait
2016 Aug 31 16:27:28 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature IOA_SSN16. Application(s) shut down in 76 days.
2016 Aug 31 16:27:28 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature MAINFRAME_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:27:28 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:27:28 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature SME_FOR_SSN16_PKG. Application(s) shut down in 82 days.

Module 8: Waiting for module online.
 -- SUCCESS
```

Note At this point, the previously active supervisor module is rebooting after a nondisruptive switchover has taken place. Refer to the *Cisco MDS 9000 Family NX-OS High Availability and Redundancy Configuration Guide*.

```
2016 Aug 31 16:28:57 sw-9513-195 %SYSMGR-2-HASWITCHOVER_PRE_START: This supervisor is
becoming active (pre-start phase).
2016 Aug 31 16:28:57 sw-9513-195 %SYSMGR-2-HASWITCHOVER_START: Supervisor 8 is becoming
active.
2016 Aug 31 16:28:59 sw-9513-195 %SYSMGR-2-SWITCHOVER_OVER: Switchover completed.
2016 Aug 31 16:29:08 sw-9513-195 %IOA-2-LOG_LIBBASE_SVC_LICENSE_ON_GRACE_PERIOD:
(pid=3723) No license. Feature will be shut down after a grace period of approximately 76
days
2016 Aug 31 16:29:08 sw-9513-195 %SME_CPP-2-LOG_WARN_SME_LICENSE_GRACE: No SME License.
Feature will be shut down after a grace period of approximately 82 days
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature IOA_SSN16. Application(s) shut down in 76 days.
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature SME_FOR_SSN16_PKG. Application(s) shut down in 82 days.
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Port Security
running without ENTERPRISE_PKG license, shutdown in 92 days
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature MAINFRAME_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
```

```
2016 Aug 31 16:29:11 sw-9513-195 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Port Security
running without ENTERPRISE_PKG license, shutdown in 92 days
2016 Aug 31 16:29:16 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature ENTERPRISE_PKG. Application(s) shut down in 92 days.
2016 Aug 31 16:29:16 sw-9513-195 %LICMGR-2-LOG_LICAPP_NO_LIC: Application Port Security
running without ENTERPRISE_PKG license, shutdown in 92 days
2016 Aug 31 16:29:18 sw-9513-195 %CALLHOME-2-EVENT: LICENSE_ALERT

Module 10: Non-disruptive upgrading.
[#                    ]   0%2016 Aug 31 16:33:52 sw-9513-195
%IMAGE_DNLD-SLOT10-2-IMG_DNLD_STARTED:  Module image download process. Please wait until
completion...
2016 Aug 31 16:34:12 sw-9513-195 %IMAGE_DNLD-SLOT10-2-IMG_DNLD_COMPLETE:  Module image
download process. Download successful.
2016 Aug 31 16:36:19 sw-9513-195 %PMON-SLOT10-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
[####################] 100% -- SUCCESS

Module 12: Non-disruptive upgrading.
[#                    ]   0%2016 Aug 31 16:37:37 sw-9513-195 %PMON-SLOT12-2-PMON_CRIT_INFO:
Port Monitor Critical Information: Config download success .
[####################] 100% -- SUCCESS

Module 13: Non-disruptive upgrading.
[#                    ]   0%2016 Aug 31 16:38:06 sw-9513-195
%IMAGE_DNLD-SLOT13-2-IMG_DNLD_STARTED:  Module image download process. Please wait until
completion...
2016 Aug 31 16:38:26 sw-9513-195 %IMAGE_DNLD-SLOT13-2-IMG_DNLD_COMPLETE:  Module image
download process. Download successful.
2016 Aug 31 16:39:26 sw-9513-195 %PMON-SLOT13-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
[####################] 100% -- SUCCESS

Module 1: Disruptive upgrading.
[#                    ]   0%2016 Aug 31 16:39:55 sw-9513-195
%SYSTEMHEALTH-2-OHMS_FREE_DISK_FAILED: Free Disk Space on partition / is below warning
threshold for module 13.
2016 Aug 31 16:39:55 sw-9513-195 %CALLHOME-2-EVENT: FREEDISK_FAILURE
2016 Aug 31 16:41:25 sw-9513-195 %PLATFORM-2-MOD_DETECT: Module 1 detected (Serial number
JAF1637BDJS) Module-Type 16x1GE, Storage Services Node Model DS-X9316-SSNK9
2016 Aug 31 16:41:25 sw-9513-195 %PLATFORM-2-MOD_PWRUP: Module 1 powered up (Serial number
JAF1637BDJS)
2016 Aug 31 16:42:13 sw-9513-195 %IMAGE_DNLD-SLOT1-2-IMG_DNLD_STARTED:  Module image
download process. Please wait until completion...
2016 Aug 31 16:42:40 sw-9513-195 %IMAGE_DNLD-SLOT1-2-IMG_DNLD_COMPLETE:  Module image
download process. Download successful.
[####################] 100% -- SUCCESS
2016 Aug 31 16:44:27 sw-9513-195 %SME_CPP-2-LOG_WARN_SME_LICENSE_GRACE: No SME License.
Feature will be shut down after a grace period of approximately 82 days

Install has been successful.
2016 Aug 31 16:44:27 sw-9513-195 %IOA-2-LOG_LIBBASE_SVC_LICENSE_ON_GRACE_PERIOD:
(pid=3723) No license. Feature will be shut down after a grace period of approximately 76
days
2016 Aug 31 16:44:28 sw-9513-195 %PMON-SLOT1-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
2016 Aug 31 16:44:32 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for
feature
User Access Verification
sw-9513-195 login: 2016 Aug 31 16:44:32 sw-9513-195 %LICMGR-2-LOG_LIC_NO_LIC: No
license(s) present for feature IOA_SSN16. Application(s) shut down in 76 days.
2016 Aug 31 16:44:32 sw-9513-195 %CALLHOME-2-EVENT: LICENSE_ALERT
2016 Aug 31 16:44:39 sw-9513-195 %PLATFORM-2-MOD_DETECT: Module 2 detected (Serial number
JAB093301LC) Module-Type 1/2/4 Gbps FC Module Model DS-X9148
```

```
2016 Aug 31 16:44:39 sw-9513-195 %MODULE-2-MOD_UNKNOWN: Module type [34] in slot 2 is not
supported
2016 Aug 31 16:44:39 sw-9513-195 %MODULE-2-MOD_FAIL: Initialization of module 2 (Serial
number: ) failed
2016 Aug 31 16:44:39 sw-9513-195 %PLATFORM-2-MOD_PWRDN: Module 2 powered down (Serial
number JAB093301LC)
2016 Aug 31 16:44:39 sw-9513-195 %CALLHOME-2-EVENT: HARDWARE_INSERTION
2016 Aug 31 16:44:40 sw-9513-195 %PLATFORM-2-MOD_DETECT: Module 9 detected (Serial number
JAF1632ASCJ) Module-Type 10 Gbps FCoE Module Model DS-X9708-K9
2016 Aug 31 16:44:40 sw-9513-195 %MODULE-2-MOD_UNKNOWN: Module type [123] in slot 9 is not
supported
2016 Aug 31 16:44:40 sw-9513-195 %MODULE-2-MOD_FAIL: Initialization of module 9 (Serial
number: ) failed
2016 Aug 31 16:44:40 sw-9513-195 %PLATFORM-2-MOD_PWRDN: Module 9 powered down (Serial
number JAF1632ASCJ)
2016 Aug 31 16:44:40 sw-9513-195 %CALLHOME-2-EVENT: HARDWARE_INSERTION

209.165.200.226 login: admin
Password:
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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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 13   Verify the status of the modules on the switch using the **show module** command.

```
switch# show module
Mod   Ports   Module-Type                          Model              Status
---   -----   ------------------------------------ ------------------ ----------
1     16      16x1GE, Storage Services Node        DS-X9316-SSNK9     ok
2     48      1/2/4 Gbps FC Module                                    powered-dn
5     48      1/2/4 Gbps FC Module                                    powered-dn
7     0       Supervisor/Fabric-2a                 DS-X9530-SF2AK9    ha-standby
8     0       Supervisor/Fabric-2a                 DS-X9530-SF2AK9    active *
9     8       10 Gbps FCoE Module                                     powered-dn
10    22      4x1GE IPS, 18x1/2/4Gbps FC Module    DS-X9304-18K9      ok
12    32      1/2/4/8/10 Gbps Advanced FC Module   DS-X9232-256K9     ok
13    24      1/2/4/8 Gbps FC Module               DS-X9224-96K9      ok


Mod   Power-Status   Reason
---   ------------   ---------------------------
2     powered-dn     Unsupported/Unknown Module
5     powered-dn     Configured Power down
9     powered-dn     Unsupported/Unknown Module


Mod   Sw              Hw      World-Wide-Name(s) (WWN)
---   --------------  ------  -------------------------------------------------
1     7.3(0)D1(1)     1.4     --
7     7.3(0)D1(1)     1.4     --
8     7.3(0)D1(1)     1.4     --
10    7.3(0)D1(1)     1.0     22:41:54:7f:ee:7a:24:40 to 22:52:54:7f:ee:7a:24:40
12    7.3(0)D1(1)     1.1     22:c1:54:7f:ee:7a:24:40 to 22:e0:54:7f:ee:7a:24:40
13    7.3(0)D1(1)     1.6     23:01:54:7f:ee:7a:24:40 to 23:18:54:7f:ee:7a:24:40


Mod   MAC-Address(es)                          Serial-Num
```

```
---   --------------------------------------   ----------
1     00-0d-ec-77-79-00 to 00-0d-ec-77-79-13   JAF1637BDJS
2     00-00-00-00-00-00 to 00-00-00-00-00-00   JAB093301LC
5     00-00-00-00-00-00 to 00-00-00-00-00-00   JAB093301LZ
7     d0-d0-fd-1d-e1-cc to d0-d0-fd-1d-e1-cf   JAF1626AKNF
8     c8-9c-1d-41-a2-9c to c8-9c-1d-41-a2-9f   JAF1626AKML
9     00-00-00-00-00-00 to 00-00-00-00-00-00   JAF1632ASCJ
10    00-0d-ec-77-1f-e8 to 00-0d-ec-77-1f-ef   JAF1607AAQN
12    50-3d-e5-9f-41-3c to 50-3d-e5-9f-41-3f   JAF1635ABHR
13    00-0d-ec-77-7c-b4 to 00-0d-ec-77-7c-b7   JAF1638BKDN


Xbar Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    0      Fabric Module 3                    DS-13SLT-FAB3      ok
2    0      Fabric Module 3                    DS-13SLT-FAB3      ok


Xbar Sw              Hw      World-Wide-Name(s) (WWN)
---  --------------- ------  -------------------------------------------------
1    NA              1.3     --
2    NA              1.3     --


Xbar MAC-Address(es)                      Serial-Num
---  ----------------------------------   ----------
1    NA                                   JAF1624AAQM
2    NA                                   JAF1624AAQP

* this terminal session
```

Downgrading from NX-OS Release 7.3(x) to NX-OS Release 6.2(x) on an MDS 9250i Switch

To downgrade from Cisco NX-OS Release 6.2(9) to Cisco NX-OS Release 5.2(x) or lower on an MDS 9250i switch, follow these steps:

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

```
switch# dir bootflash:
20090368    Apr 06 05:25:31 2001  m9250-s5ek9-kickstart-mz.6.2.5.bin
   20044800    Mar 30 15:42:05 2014  m9250-s5ek9-kickstart-mz.6.2.7.bin
  107197681    Apr 06 05:26:53 2001  m9250-s5ek9-mz.6.2.5.bin.S68
  107587249    Mar 30 15:42:52 2014  m9250-s5ek9-mz.6.2.7.bin
```

Step 2 If the software image file is not present, download it from an FTP or TFTP server to the active supervisor module bootflash:. You can obtain the software image file from the Cisco.com software download center at the following URL:

http://www.cisco.com/cisco/software/navigator.html

✎

Note If you need more space on the active supervisor module bootflash:, use the **delete** command to remove unnecessary files and follow Step 3 and Step 4.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9250-s5ek9-kickstart-mz.6.2.5.bin.S68
bootflash:m9250-s5ek9-kickstart-mz.6.2.5.bin.S68
```

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9250-s5ek9-mz.6.2.5.bin.S68
bootflash:m9250-s5ek9-mz.6.2.5.bin.S68
```

Step 3 Ensure that the required space is available on the active supervisor.

```
switch# dir bootflash:
     12288      Aug 26 19:06:14 2011  lost+found/
   18939904     Jul 01 10:54:49 2011  m9250-sf2ek9-kickstart-mz.6.2.5.bin
  101756072     Jul 01 10:33:52 2011  m9250-sf2ek9-mz.6.2.5.bin

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

Step 4 If you need more space on the active supervisor module bootflash, delete unnecessary files to make space available.

```
switch# delete bootflash: m9250-sf2ek9-kickstart-mz.6.2.5.bin
switch# delete bootflash: m9250-sf2ek9-kickstart-mz.6.2.5.bin
```

Step 5 Issue the **show incompatibility system** *image-filename* command to determine if you need to disable any features not supported by the earlier release.

```
switch# show incompatibility system bootflash:m9200-sf2ek9-mz.5.2.x.bin
no incompatible configuration
```

Step 6 Save the configuration using the **copy running-config startup-config** command.

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

Step 7 Issue the **install all** command to downgrade the software.

```
switch# install all kickstart m9250-s5ek9-kickstart-mz.7.3.0.D1.1.bin.S21 system
m9250-s5ek9-mz.7.3.0.D1.1.bin.S21
Installer will perform compatibility check first. Please wait.

Verifying image bootflash:/m9250-s5ek9-kickstart-mz.7.3.0.D1.1.bin.S21 for boot variable
"kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/m9250-s5ek9-mz.7.3.0.D1.1.bin.S21 for boot variable "system".
[####################] 100% -- SUCCESS

Performing module support checks.
[####################] 100% -- SUCCESS

Verifying image type.
[#                   ]   0%y
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/m9250-s5ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image
bootflash:/m9250-s5ek9-kickstart-mz.7.3.0.D1.1.bin.S21.
[####################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/m9250-s5ek9-mz.7.3.0.D1.1.bin.S21.
[####################] 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(pri:alt)        New-Version
Upg-Required
------  ----------  --------------------------------------  --------------------
-----------
     1      system                          7.3(1)D1(1)        7.3(0)D1(1)
yes
     1    kickstart                          7.3(1)D1(1)        7.3(0)D1(1)
yes
     1        bios     v2.1.17(01/08/14):v2.1.17(01/08/14)    v2.1.17(01/08/14)
no


Additional info for this installation:
-------------------------------------

Service "Platform Manager" in vdc 1: ISSU/ ISSD can be performed, but N:N redundancy will
be lost.


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.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS

Converting startup config.
[####################] 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

Rebooting the switch to proceed with the upgrade.
All telnet and ssh connections will now be temporarily terminated.


>> NX7--LC-loader-02.01.17 (Jan  8 2014 - 16:30:41), Build: 02.01.17

CPU0:  8572E, Version: 2.1, (0x80e80021)
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: 0x00000015, 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: f0:f7:55:29:50:60
 eTSEC2 board phy 3
INFO: Net boot mode = 1
eTSEC2
IDE:   Bus 0: OK
  Device 0: Model: SILICONSYSTEMS UDMA 4GB-4676 Firm: 3.38 Ser#: CC395593055000066G01
            Type: Hard Disk
            Capacity: 3919.7 MB = 3.8 GB (8027712 x 512)

Booting image bootflash://m9250-s5ek9-kickstart-mz.7.3.0.D1.1.bin.S21
20825088 bytes read
 NBI at 08000000 size 134217728

Booting image at addr 0x00800000 ...
Memory <- <0x0 0x0 0x1 0x0> (4096MB)
ethernet0: local-mac-address <- f0:f7:55:29:50:60
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)
```

```
zImage starting: loaded at 0x00800000 (sp: 0x7fedc4d0)
Allocating 0x4dec44 bytes for kernel ...
gunzipping (0x00000000 <- 0x0080f000:0x00ca9cb0)...done 0x480794 bytes
Using loader supplied ramdisk at 0x2700000-0x38ce800
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.7.3.0.D1.1.bin.S21
isanimg=/m9250-s5ek9-mz.7.3.0.D1.1.bin.S21
Finalizing device tree... flat tree at 0x80be70
Jumping to kernel at 0
                     ?setup_arch: bootmem
mpc85xx_ds_setup_arch()
arch: exit

[    1.532883]  Host controller irq 26
[    1.574080] pci 0000:00:00.0: ignoring class b20 (doesn't match header type 01)
[    1.692324] Assign root port irq 26 for 0000:00:00.0
[    2.024029] Enabling all PCI devices
INIT: Checking all filesystems.....retval=[0]
 done.
Setting kernel variables done.
Setting the System Clock using the Hardware Clock as reference...System Clock set. Local
time: Wed Aug 31 10:59:32 UTC 2016
Loading system software
Uncompressing system image: bootflash:///m9250-s5ek9-mz.7.3.0.D1.1.bin.S21
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
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

2016 Aug 31 11:00:35 alishan-dr %SYSLOG-2-SYSTEM_MSG : Syslogs wont be logged into
logflash until logflash is online
[   92.010660] clpk_hw_init_1:Post ISSU instance 0 status 0x00000736 GOOD
[   92.089641] clpk_hw_init_1:Post ISSU instance 1 status 0x00000536 GOOD
2016 Aug 31 11:00:38 alishan-dr %KERN-0-SYSTEM_MSG: [    2.024029] Enabling all PCI
devices - kernel
2016 Aug 31 11:00:38 alishan-dr %KERN-0-SYSTEM_MSG: [   92.010660] clpk_hw_init_1:Post
ISSU instance 0 status 0x00000736 GOOD - kernel
2016 Aug 31 11:00:38 alishan-dr %KERN-0-SYSTEM_MSG: [   92.089641] clpk_hw_init_1:Post
ISSU instance 1 status 0x00000536 GOOD - kernel
2016 Aug 31 11:01:10 alishan-dr %CARDCLIENT-2-REG: OK
2016 Aug 31 11:01:24 alishan-dr %PMON-SLOT1-2-PMON_CRIT_INFO: Port Monitor Critical
Information: Config download success .
System is coming up ... Please wait ...
System is coming up ... Please wait ...
System is coming up ... Please wait ...
System is coming up ... Please wait ...
2016 Aug 31 11:02:02 alishan-dr %NTP-2-NTP_SYSLOG_NO_RESP_FROM_LC: from LC1 for Timestamp
Disable
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.
2016 Aug 31 11:02:41 alishan-dr %PLATFORM-2-PS_OK: Power supply 1 ok(Serial number
QCS1544V0F7)
2016 Aug 31 11:02:41 alishan-dr %PLATFORM-2-PS_FANOK: Fan in Power supply 1 ok
2016 Aug 31 11:02:41 alishan-dr %PLATFORM-2-PS_FAIL: Power supply 2 failed or shut
down(Serial number QCS1544V061)
2016 Aug 31 11:02:41 alishan-dr %PLATFORM-2-PS_OK: Power supply 3 ok(Serial number
QCS1544V19H)
2016 Aug 31 11:02:41 alishan-dr %PLATFORM-2-PS_FANOK: Fan in Power supply 3 ok
2016 Aug 31 11:02:42 alishan-dr %PLATFORM-2-PS_ALI_TWO_POWERSUPPLY: Only two Power supply
are functional, please connect third Power Supply for redundancy
[####################] 100% -- SUCCESS

Install has been successful.

User Access Verification
switch login:
```

Step 8 Issue the **show version** command to verify the successful downgrade.

```
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
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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 7.3(0)D1(1)
  system:    version 7.3(0)D1(1)
  BIOS compile time:      01/08/14
  kickstart image file is: bootflash:///m9250-s5ek9-kickstart-mz.7.3.0.D1.1.bin.
S21
  kickstart compile time: 1/11/2016 16:00:00 [02/11/2016 10:35:42]
  system image file is:    bootflash:///m9250-s5ek9-mz.7.3.0.D1.1.bin.S21
  system compile time:     1/11/2016 16:00:00 [02/11/2016 13:08:53]


Hardware
  cisco MDS 9250i 40 FC 2 IPS 8 FCoE (2 RU) Chassis ("40FC+8FCoE+2IPS Supervisor
")
  Motorola, e500v2, core 0 with 4155752 kB of memory.
  Processor Board ID JAF1626BCQH

  Device name: alishan-dr
  bootflash:    4013856 kB

Kernel uptime is 0 day(s), 17 hour(s), 18 minute(s), 58 second(s)
```

```
Last reset at 443194 usecs after  Wed Aug 31 10:58:41 2016

  Reason: Reset due to upgrade
  System version: 7.3(1)D1(1)
  Service:

plugin
  Core Plugin
switch#
```

Step 9 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-22PK9-SUP active *

Mod  Sw             Hw     World-Wide-Name(s) (WWN)
---  -------------- ------ --------------------------------------------------
1    7.3(0)D1(1)    0.9    20:01:54:7f:ee:1b:14:a0 to 20:28:54:7f:ee:1b:14:a0


Mod  MAC-Address(es)                      Serial-Num
---  ------------------------------------ ----------
1    f0-f7-55-29-50-60 to f0-f7-55-29-50-6f  JAF1626BCQH

* this terminal session

switch#
```

Nondisruptive Upgrades on Fabric and Modular Switches

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

- Cisco MDS 9148 Multilayer Fabric Switch
- Cisco MDS 9250i Multiservice Modular Switch
- Cisco MDS 9396S Multilayer Fabric Switch

This section includes the following topics:

Preparing for a Nondisruptive Upgrade on Fabric and Modular Switches

You can upgrade software on the following switches without any disruptions by using the **install all** command for the system software images:

- Cisco MDS 9148 Multilayer Fabric Switch

- Cisco MDS 9148S Multilayer Fabric Switch
- Cisco MDS 9250i Multiservice Modular Switch

When the installation is completed, the supervisor kickstart image, supervisor system image, line card image, and the system BIOS are all updated.

Nondisruptive upgrades on these fabric switches disrupts the control plane for not more than 80 seconds. The software upgrade might be disruptive if the upgrade progresses beyond when it can be stopped gracefully or if a failure occurs.

Note During the upgrade the control plane is down, but the data plane remains up. New devices are not able to log in to the fabric through the control plane, but existing devices do not experience any disruption of traffic through the data plane.

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

- During the upgrade, the fabric must be stable. Do not perform these configuration activities during the upgrade:
  - Zoning changes
  - Telnet sessions
  - Schedule changes
  - Switch cabling
  - Addition or removal of physical devices
- Configure the FSPF timers to the default value of 20 seconds.
- If any CFS 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 the upgrade, you are prompted to enter the **show install all failure-reason** command to identify the reason.
- If the system has insufficient space to load the new images, then you will be notified through the compatibility table. At this point, you need to either abort the upgrade or proceed with a disruptive upgrade.
- Check whether sufficient space is available in the system to load the new images by using the Software Install Wizard. Depending on the available space, you need to either abort the upgrade or proceed with a disruptive upgrade.
- Enter the **no logging level all** command before beginning the upgrade. If you do not enter this command, a failure might occur due to the debug system log messages being printed, which potentially can result in the control plane downtime to exceed 80 seconds.
- If VRRP is running on the mgmt0 interface, and the switch being upgraded is the master, then 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, upgrades of the 4-Gigabit Ethernet ports for the hybrid Supervisor 18/4 line card will be disruptive.

To ensure that you can view the entire upgrade process, you should perform the upgrade by using the console port. By performing the upgrade this way, you can log your session to a file (in case you need it later for troubleshooting). Telnet sessions are lost when the switch is rebooted, so if you want to view the process in its entirety, be sure to use the console port.

The following section shows an example of the failed nondisruptive upgrade due to insufficient resources.

Example 1-1   Failed Nondisruptive Upgrade Due to Insufficient Resources

```
switch# install all kickstart bootflash:boot-fs9148 system bootflash:isan-164

Verifying image bootflash:/boot-fs9148 for boot variable "kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/isan-164 for boot variable "system".
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/isan-164.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image bootflash:/boot-fs9148.
[####################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/isan-164.
[####################] 100% -- SUCCESS

Compatibility check is done:
Module  bootable    Impact         Install-type  Reason
------  --------  --------------  ------------  ------
     1      yes   disruptive      reset  insufficient resources<----Reason for failure


Images will be upgraded according to following table:
Module  Image       Running-Version(pri:alt)            New-Version  Upg-Required
------  ----------  ----------------------             -----------  --------------------
     1      system  6.2(x)                              7.3(x)            yes
     1   kickstart  6.2(x)                              7.3(x)            yes
     1        bios  v1.0.0(10/04/06):v1.0.0(10/04/06) v1.0.0(10/04/06) no

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

Before performing an upgrade, you may wish to use the **show install all impact** command to view the effect of updating the system from the running image to another specified image.

```
switch# show install all impact kickstart bootflash:boot-fs9148 system bootflash:isan-164

Verifying image bootflash:/boot-fs9148 for boot variable "kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/isan-164 for boot variable "system".
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/isan-164.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image bootflash:/boot-fs9148.
[####################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/isan-164.
[####################] 100% -- SUCCESS



Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1      yes   non-disruptive         reset
```

```
Images will be upgraded according to following table:
Module       Image  Running-Version(pri:alt)            New-Version      Upg-Required
------  ----------  ------------------------            -----------      -------------
     1      system  6.2(x)                              7.3(x)           yes
     1   kickstart  6.2(x)                              7.3(x)           yes
     1        bios  v1.0.0(10/04/06): v1.0.0(10/04/06) v1.0.0(10/04/06) no

switch#
```

Performing a Nondisruptive Upgrade on a Fabric Switch

You can perform a nondisruptive software upgrade on any of the following switches by entering the **install all kickstart** command using the console port:

- Cisco MDS 9148 Multilayer Fabric Switch
- Cisco MDS 9148S Multilayer Fabric Switch
- Cisco MDS 9250i Multiservice Modular Switch
- Cisco MDS 9396S Multilayer Fabric Switch

The following is an example of the nondisruptive upgrade on a fabric switch:

```
switch# install all kickstart bootflash:boot-fs9148 system bootflash:isan-164u

Verifying image bootflash:/boot-fs9148 for boot variable "kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/isan-164u for boot variable "system".
[####################] 100% -- SUCCESS

Extracting "system" version from image bootflash:/isan-164u.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image bootflash:/boot-fs9148.
[####################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/isan-164u.
[####################] 100% -- SUCCESS

Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes  non-disruptive         reset

Images will be upgraded according to following table:
Module       Image  Running-Version(pri:alt)            New-Version         Upg-Required
------  ----------  ------------------------            -------------------  ------------
     1      system  6.2(x)                              7.3(x)               yes
     1   kickstart  6.2(x)                              7.3(x)               yes
     1        bios  v1.0.0(10/04/06): v1.0.0(10/04/06) v1.0.0(10/04/06)       no

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

Install is in progress, please wait.

Notifying services about the upgrade.
[####################] 100% -- SUCCESS
```

```
Setting boot variables.
[####################] 100% -- SUCCESS

Performing configuration copy.
[####################] 100% -- SUCCESS

Converting startup config.
[####################] 100% -- SUCCESS

Upgrade can no longer be aborted, any failure will result in a disruptive upgrade.
<---Note that after this point you cannot abort the 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

Rebooting the switch to proceed with the upgrade.


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

Install has been successful.
```

You can use the Software Install Wizard to perform nondisruptive upgrades on Cisco MDS 9148 Fabric Switches.

⚠️

Caution   We recommend that you enable PortFast on the Ethernet interface of the Catalyst switch to which the management interface of the fabric switch is connected. This step action avoids spanning tree convergence time on the Catalyst switch, and immediately forwards packets from the fabric switch during the nondisruptive upgrade.

✎

Note   ASM-SFN and SSI images are not supported for upgrades on the Cisco MDS 9148 Multilayer Fabric Switch.

Displaying the Status of a Nondisruptive Upgrade on a Fabric Switch

You can display the status of a nondisruptive upgrade by using the **show install all status** command. The output displays the status only after the switch has rebooted with the new image. All 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 can reconnect to the switch through a Telnet session, the upgrade might already be complete, in which case, the output will display 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 services that an upgrade is about to start, and finds out whether or not the upgrade can proceed. If a service cannot allow the upgrade to proceed at this time (for example, FSPF timers are not configured to the default value, or a CFS operation is in progress), then the service aborts the upgrade. If this 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.
switch#
```

Once the upgrade is already in progress if any failures occur for whatever reason (for example, a save runtime state failure or line card upgrade failure), then 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; entering it will not yield any useful information.

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

Related Documentation

The documentation set for the Cisco MDS 9000 Family includes the documents listed in this section. To find a document online, access the following URL:

http://www.cisco.com/en/US/products/ps5989/tsd_products_support_series_home.html

The documentation set for Cisco Prime Data Center Network Manager is available from the following URL:

http://www.cisco.com/en/US/products/ps9369/tsd_products_support_series_home.html

Release Notes

http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-release-notes-list.html

Regulatory Compliance and Safety Information

http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/hw/regulatory/compliance/RCSI.html

Compatibility Information

http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-device-support-tables-list.html

Installation and Upgrade

http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-guides-list.html

Configuration Guides

http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-and-configuration-guides-list.html

Command-Line Interface

http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-command-reference-list.html

Troubleshooting and Reference

http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/tsd-products-support-troubleshoot-and-alerts.html

Command-Line Interface

- Cisco MDS 9000 Family Command Reference

Intelligent Storage Networking Services Configuration Guides

- Cisco MDS 9000 Family I/O Acceleration Configuration Guide
- Cisco MDS 9000 Family SANTap Deployment Guide
- Cisco MDS 9000 Family Data Mobility Manager Configuration Guide
- Cisco MDS 9000 Family Storage Media Encryption Configuration Guide

Troubleshooting and Reference

- Cisco MDS 9000 Family and Nexus 7000 Series System Messages Reference
- Cisco MDS 9000 Family SAN-OS Troubleshooting Guide
- Cisco MDS 9000 Family NX-OS MIB Quick Reference
- Cisco DCNM for SAN Database Schema Reference

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

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