

Installing, Removing, and Verifying Field Replaceable Units

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Installing a Supervisor Module

To install a supervisor module on a Cisco MDS 9700 Series chassis, follow these steps:

Before you begin

- You must follow the ESD protocols, including the following:
  - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
  - You must carry electronic modules only by their covered edges or handles. Do not touch their electronic components.
  - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything, or place anything else on top of the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:

- ESD wrist strap (or other personal grounding device)
- Number 1 Phillips torque screwdriver
- Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.

- Replacement supervisor module.

Procedure

Step 1 Before installing any modules in the chassis, we recommend that you install the chassis in the rack. See the Installing the Cisco MDS 9700 Series Switch on a Four-Post Rack or Cabinet.

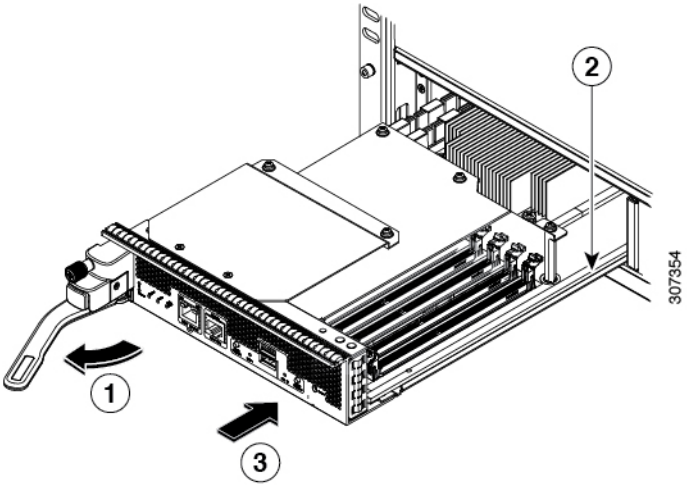
Step 2 Verify that there is enough clearance to accommodate any cables or interface equipment that you want to connect to the module.

Step 3 Verify that the captive screws are tightened to 8 in-lb on all modules already installed in the chassis. This ensures that the EMI gaskets are fully compressed and maximizes the opening space for the module being installed.

Step 4 If a filler panel is installed, remove the Phillips pan-head screw from the filler panel and remove the panel. To remove a currently installed module, see the Removing a Switching Module.

Step 5 Open the ejector lever on the new or replacement module by pressing on the ejector button. Allow the ejector to open fully (see Callout 1 in the following figure).

Figure 1: Positioning a Half-width Supervisor Module to its Slot



1	Rotate the handle fully away from the front of the module.	**3**	Push the module all the way into the slot (until it stops and the front is about 1/4 inch in front of the chassis).
2	Align the bottom of the module to the module guides in the slot.		

Step 6 Rotate the end of the handle away from the front of the module until it stops (see Callout 1 in the previous figure).

Step 7 With one hand under the supervisor module and the other hand holding the module by its front, align the rear of the module to the open supervisor slot.

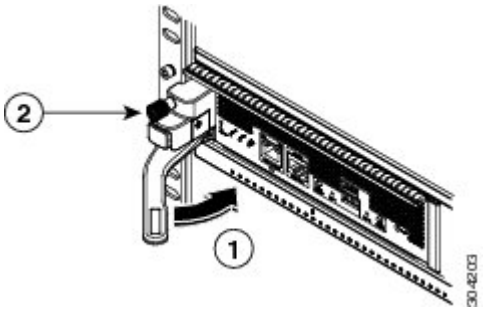
Step 8 Slide the module onto the guides inside the slot and push the module fully into the slot until you cannot push the module further.

The front of the module should be about 1/4 inch (0.6 cm) in front of the chassis.

Step 9 Rotate the handle to the front of the module (see Callout 1 in the following figure) until it clicks when it reaches the front of the module.

The module should be fully inserted in the slot and the front of the module should be even with the fronts of all the other installed modules. The captive screw by the ejector button on the module should be aligned to a screw hole on the chassis.

Figure 2: Securing a Supervisor Module to its Slot



1	Rotate the handle all the way to the front of the module.	**2**	Tighten the captive screw to 8 in-lb (0.9 N·m) of torque.

Step 10 Screw in the captive screw to secure the module to the chassis (see Callout 2 in the previous figure). Tighten the screw to 8 in-lb (0.9 N·m) of torque.

Step 11 Verify that the supervisor module LEDs turn on and appear as follows:

- STATUS LED is green.
- SYSTEM LED is green.
- ACTIVE LED is amber or green.

Step 12 Attach the management cable to the MGMT ETH port.

Removing a Supervisor Module

To remove a supervisor module from the chassis, follow these steps:

Before you begin

Note You need a flat-blade or number 2 Phillips-head screwdriver to loosen or tighten the captive screws on the supervisor module.

Procedure

Step 1 Failover the standby supervisor if the switch has two supervisor modules and the supervisor you are removing is currently active.

For information on how to failover a supervisor module, see the Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide.

Step 2 Put the standby supervisor module to out of service before removing the standby supervisor module, using the **out-of-service module***slot* command.

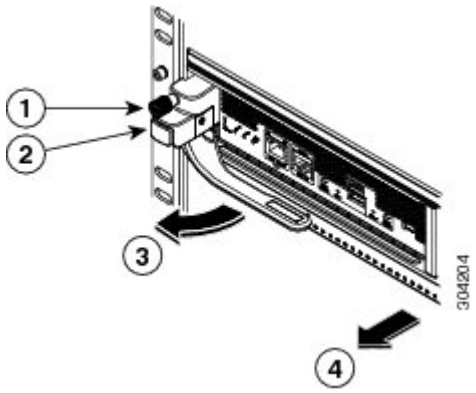
Where *slot* indicates the chassis slot number in which the standby supervisor module resides.

```
switch(config)# out-of-service module 5
```

Step 3 Disconnect any network interface cables attached to the module.

Step 4 Unscrew the captive screw on the left side of the module until the screw is no longer connected to the chassis (see Callout 1 in the following figure).

Figure 3: Removing a Half-width Supervisor Module



1	Unscrew the captive screw until it is free of the chassis.	**3**	The handle springs open.
2	Press the ejector button.	**4**	Pull the handle to remove the module part way from the slot. Place your other hand under the module and fully remove it from the slot.

Step 5 Press the ejector release button on the left of the module (see Step 2 in the above figure) to push out the ejector lever. The ejector springs out part way from the front of the module.

Step 6 Fully rotate the handle from the front of the module and pull the handle to move the module part way out of its slot.

Step 7 Place your other hand under the module to support its weight and pull the module fully out of its slot. Do not touch the module circuitry.

Step 8 Place the module on an antistatic mat or antistatic foam.

Step 9 Install a filler panel on an empty slot to keep the chassis dust-free and to maintain proper airflow through the chassis.

Warning
Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statement 1029

Step 10 Insert a new supervisor module in the empty slot and power on the standby supervisor module. To see how to install a supervisor module, see the Installing a Supervisor Module, on page 1.

Installing Fibre Channel Switching Modules (Line cards)

Before you begin

- You must follow the ESD protocols, including the following:
  - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
  - You must carry electronic modules only by their covered edges or handles. Do not touch their electronic components.
  - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything, or place anything else on top of the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:
  - ESD wrist strap (or other personal grounding device)
  - Number 1 Phillips torque screwdriver
- Replacement line card module.

Note Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.

Cisco MDS 9700 directors support Online Insertion and Removal (OIR) of Fibre Channel switching modules (line cards). Newly inserted line cards are automatically recognized and initialized by the active supervisor module without requiring a chassis reboot. The module becomes operational when its status displays *OK* in the **show module** command output.

Procedure

Step 1 Before installing any modules in the chassis, we recommend that you install the chassis in the rack. See the Installing the Cisco MDS 9700 Series Switch on a Four-Post Rack or Cabinet.

Step 2 Verify that there is enough clearance to accommodate any cables or interface equipment that you want to connect to the module.

Step 3 Verify that the captive screws are tightened to 8 in-lb on all modules already installed in the chassis. This ensures that the EMI gaskets are fully compressed and maximizes the opening space for the module being installed.

Step 4 If a filler panel is installed, remove the Phillips pan-head screw from the filler panel and remove the panel. To remove a currently installed module, see the Removing Fibre Channel Switching Modules (Line cards), on page 7.

Note
If you need to remove a blank filler plate from the slot, unscrew the captive screws on either side of the module and pull the handle on the plate to remove it from the slot.

Step 5 Install the new line card module in a open slot as follows:

a) Unpack the new line card module, set it right side up on an antistatic surface (so that you can see the electrical components from above the module), and inspect the module for damage.

   If anything is damaged, contact your customer representative immediately.

b) Press the two eject buttons (one on each side of the module front) and rotate the handles away from the front of the module.

c) Without touching any electronic circuitry, grasp the front of the line card module with one hand, place your other hand under the module to support its weight, and lift the module to the slot.

d) Align the back of the module to the guides inside the slot, and slide the module fully into the slot by pushing on the front of the module.

   If you push the module fully into the slot, you seat it onto its connectors inside the slot and the handles move part way toward the front of the module. The front of the module should be 1/4 inch (0.6 cm) out of the slot.

e) Simultaneously rotate each of the two handles to the front of the module until they click.

   As you rotate the handles to the front of the module, the module should move fully into the slot.

f) Verify that the front of the module is even with the fronts of the other installed line card modules. If not, press both ejector buttons, pull on the handles to partly remove the module, and repeat Steps 5d and 5e to reseat the module in the slot.

g) Screw in the two captive screws (one on each side of the module) to secure the module to the chassis. Tighten the screws to 8 in-lb (0.9 N·m) of torque.

   The Module Status LED should be green. Module status LED will turn green once the module is booted up and operational.

Removing Fibre Channel Switching Modules (Line cards)

Before you begin

- You must follow ESD protocols, including the following:
  - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
  - You must carry electronic modules by only their covered edges or handles. Do not touch their electronic components.
  - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything nor place anything else on top of the module nor lean anything on the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:
  - Number 1 Phillips torque screwdriver

Note Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.

Cisco MDS 9706 directors support Online Insertion and Removal (OIR) of Fibre Channel switching modules (line cards). Line cards can be safely removed from a chassis that is functioning in production once the line card has been placed out of service via the **out-of-service module x** command.

Procedure

Step 1 Put the line card module to out of service before removing it, using the **out-of-service module** *slot* command.

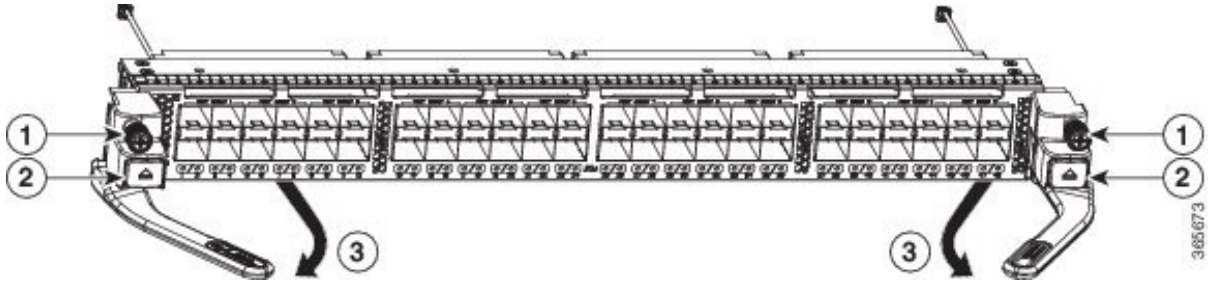
Where *slot* indicates the chassis slot number in which the standby line card module resides.

```
switch# out-of-service module 5
```

Step 2 Disconnect all of the cables attached to the front of the line card module to be removed.

Step 3 Unscrew the captive screw on each side of the module until the screws are loose and no longer connected to the chassis (see Callout 1 in the following figure).

Figure 4: Removing an line card Module



1	Loosen the two captive screws	3	Two handles spring out part way from the front of the module
2	Press the two ejector buttons		

Step 4 Press the two ejector buttons on the each side of the module (see Callout 2 in the above figure).

The two handles spring out part way from the front of the module.

Step 5 Fully rotate the two handles away from the front of the module and pull on them to move the module part way out of its slot.

Step 6 Place one hand under the module to support its weight, grasp the front of the module with the other hand, pull the module fully out of its slot, and set the module on an antistatic surface.

Caution
Do not touch any electrical circuitry on the removed line card module. Handle the module only by its covered surfaces (front and bottom of the module) and always set the module on an antistatic surface when it is not inside the chassis.

Step 7 Install a filler panel on an empty slot to keep the chassis dust-free and to maintain proper airflow through the chassis.

Warning
Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statement 1029

Step 8 Insert a new line card module in the empty slot and power on the line card module. To see how to install a line card module, see the Installing Fibre Channel Switching Modules (Line cards), on page 5.

Upgrading Fibre Channel Switching Modules (Line cards)

You can migrate the line card configuration of one type of line card to another type of line card. This enables no loss of line card configurations while upgrading line card models.

Note

- Ensure the line cards are FC line cards with the same number of ports. For example, replace an old 16G 48 port line card with a new 32G 48 port line card.
- Few of the configurations migrated are VSAN on ports, port descriptions, buffer credits, port speed and so on.

Cisco MDS 9700 directors support Online Insertion and Removal (OIR) of Fibre Channel switching modules (line cards). Newly inserted line cards are automatically recognized and initialized by the active supervisor module without requiring a chassis reboot. The module becomes operational when its status displays *OK* in the **show module** command output.

Procedure

Step 1 switch# **migrate configuration linecard** *module*

Displays the valid linecard modules

```
migrate configuration linecard

Valid modules are as shown below
+-----+-------+-------------------------------------+-----------------+--------+
| Mod | Ports | Module-Type                         | Model           | Status |
+-----+-------+-------------------------------------+-----------------+--------+
| 1   | 48    | 2/4/8/10/16 Gbps Advanced FC Module | DS-X9448-768K9 | ok     |
| 5   | 48    | 2/4/8/10/16 Gbps Advanced FC Module | DS-X9448-768K9 | ok     |
+-----+-------+-------------------------------------+-----------------+--------+
```

Step 2 Enter the module number for the migrated or replaced linecard and press Enter.

```
Enter module number which needs to be migrated/replaced: 1

Collecting configuration details of module 1 (DS-X9448-768K9). Please wait...

Successfully collected the configuration details of module 1 (DS-X9448-768K9) in file
bootflash:module_config.cfg.
```

Step 3 Remove the switching module and replace with a new switching module and press Enter.

```
Remove module 1 (DS-X9448-768K9) , replace it with the new module and press enter
```

Step 4 Type y to confirm the replacement of the new switching module and press Enter.

```
Have you inserted the new module in slot 1? (y/n): y

Booting up the new module in slot 1 . Please wait...

The new module in slot 1 (DS-X9648-1536K9) is up.
Applying the configs to the new module. Please wait..

Successfully applied the config bootflash:module_config.cfg to running config.

Elapsed time: 0 hours, 3 minutes, 55 seconds
```

Nondisruptive Migration from Supervisor-1/1E to Supervisor-4 Modules

This topic describes the steps that are required to migrate Supervisor-1 Modules (DS-X97-SF1-K9) to Supervisor-4 Modules (DS-X97-SF4-K9) for the Cisco MDS Multilayer Director 9706 or 9710, and Supervisor-1E Modules (DS-X97-SF1E-K9) to Supervisor-4 Modules (DS-X97-SF4-K9) for the Cisco MDS 9718 Multilayer Director.

This topic includes the following sections:

Note Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family* for important safety information.

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol indicates danger. You are in a situation that could cause physical injury. Before you work on any equipment, be aware of the hazards that are involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Warning This unit is intended for an installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017

Warning Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

Warning A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022

Warning Ensure that there is no loose debris (such as paper, ties, dust) around the back of the chassis since when the crossbar switching modules are being removed. The vacuum created can be strong enough to pull the loose debris into the chassis.

Nondisruptive Migration for Dual Supervisor Modules

Note Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family* for important safety information.

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol indicates danger. You are in a situation that could cause physical injury. Before you work on any equipment, be aware of the hazards that are involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

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Warning Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

Warning A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022

Warning Ensure that there is no loose debris (such as paper, ties, dust) around the back of the chassis since when the crossbar switching modules are being removed. The vacuum created can be strong enough to pull the loose debris into the chassis.

Requirements

We recommend that you have knowledge of the Cisco NX-OS operating system CLI.

Components Used

The information in this document is applies to the following hardware components:

- Cisco MDS 9718 Multilayer Director (DS-C9718)
- Cisco MDS 9710 Multilayer Director (DS-C9710)
- Cisco MDS 9706 Multilayer Director (DS-C9706)

- Cisco MDS 9700 Series Supervisor-4 Module (DS-X97-SF4-K9)
- Cisco MDS 9700 Series Supervisor-1E Module (DS-X97-SF1E-K9)
- Cisco MDS 9700 Series Supervisor-1 Module (DS-X97-SF1-K9)

Guidelines and Limitations

This section has the guidelines and limitations for nondisruptive migration of MDS 9700 chassis with Supervisor-1/1E Modules to Supervisor-4 Modules.

- Ensure that the Supervisor-4 Module is not inserted in the standby slot before initiating the supervisor migration command. If the Supervisor-4 Module is already inserted in the standby slot, the migration procedure will be aborted and the Supervisor-4 Module will be powered down.
- Insert the standby Supervisor-4 Module into the chassis only when you are prompted to insert the Supervisor-4 Module during the migration.
- After the Supervisor-4 Module has been inserted during the migration procedure, do not remove or manually reload the standby Supervisor-4 Module.
- If you are using an NX-OS release prior to NX-OS 9.2(2), backup any installed PAK-type licenses before starting the migration procedure. After the migration procedure is completed, licenses must be applied or installed again. For more information on how to back up licenses, see the Prerequisites section.
- Back up the switch configuration and all important bootflash files on both the supervisor modules before starting the migration procedure. In case of any failure or loss of configuration in the Supervisor-4 Module, disruptive migration has to be done to upgrade to Supervisor-4 Module. In such a scenario, the entire switch configuration has to be applied again. For more information on how to back up the switch configurations, see the Prerequisites section.
- Use the **show environment power** command to display the actual power usage information for the entire switch.
- Ensure that the running Supervisor-1/1E Cisco MDS NX-OS and the target Supervisor-4 Cisco MDS NX-OS release versions used in the supervisor migration command are the same. Use the **show version** command to view the version of the Cisco MDS NX-OS software running on the switch.
- The supervisor migration command is supported on Cisco MDS NX-OS Release 8.4(1) or later on Cisco MDS 9710 and Cisco MDS 9706 Director switches. On Cisco MDS 9718 Director switch, the migration command is supported from Cisco MDS NX-OS Release 8.4(2a) or later. **Invalid command** message is displayed if this command is executed on the other versions of Cisco MDS NX-OS. Initiate the migration process on the active supervisor-1 module using the following command in exec mode.

Table 1: Migration command

Platform and Release	Command
MDS 9706 MDS 9710 NX-OS releases 8.4(1) to 9.4(1)	Configuration mode: **migrate sup kickstart** *supervisor4-kickstart-image* **system** *supervisor4-system-image*

Platform and Release	Command
MDS 9718 NX-OS releases 8.4(2a) to 9.4(1)	Configuration mode: **migrate sup kickstart** *supervisor4-kickstart-image* **system** *supervisor4-system-image*
MDS 9706 MDS 9710 MDS 9718 NX-OS release 9.4(3) and later	Exec mode: **migrate hardware sup kickstart** *supervisor4-kickstart-image* **system** *supervisor4-system-image*

- The migration procedure must be performed during a schedule maintenance period only.
- Nondisruptive backward migration (migrating from a Supervisor-4 Module to a Supervisor-1E or Supervisor-1 Module) is not supported. Backward migration is disruptive (this requires powering off and then powering on the switch).
- After the migration procedure, the current active supervisor module will be in standby state and the current standby supervisor module will be in active state.
- Do not reload or manually insert or remove any I/O or crossbar fabric switching modules after initiating the supervisor migration command. Any removal or insertion of I/O or Crossbar Fabric-1 Switching Modules must be done before initiating the migration procedure or after the migration is completed.
- Perform the Fabric-1 to Fabric-3 module migration immediately after the Supervisor-1/Supervisor-1E to Supervisor-4 Module migration is completed. A mix of Fabric-1 with Supervisor-4 Modules or Fabric-3 with Supervisor-1/Supervisor-1E Modules is not supported.
- Configuration mode is blocked during the migration procedure to prevent any changes from affecting the migration process..
- You can use **Control+C** to cancel the migration procedure but only after 45 minutes have elapsed after executing the supervisor migration command.
- Use the **show logging onboard migration status** command on any management session to display the status of the migration. You can use this command during the migration or after the migration is complete.
- In the system messages and the **show module** command output, Supervisor-1 Module (DS-X97-SF1-K9) and Supervisor-1E Module (DS-X97-SF1E-K9) are displayed as *Supervisor-3 Module*.
- If you are using a Supervisor-4 Module for migration that has been already used in a previous MDS chassis ensure that the Supervisor-4 Module has sufficient space on bootflash for copying both the system and kickstart images before the migration.
- The following table lists the supported combinations for supervisor modules with crossbar fabric modules on the Cisco MDS 9700 Series of Multilayer Directors in a production environment.

  In the following table:

  - The term, “Yes” indicates the supported combinations.
  - The “—” symbol indicates the unsupported combinations.

Combination	Supervisor-1 Module	Supervisor-1E Module	Supervisor-4 Module	Crossbar Fabric-1 Switching Module	Crossbar Fabric-3 Switching Module
Supervisor-1 Module	Yes	—	—	Yes	—
Supervisor-1E Module	—	Yes	—	Yes	—
Supervisor-4 Module	—	—	Yes	—	Yes
Crossbar Fabric-1 Switching Module	Yes	Yes	—	Yes	—
Crossbar Fabric-3 Switching Module	—	—	Yes	—	Yes

Prerequisites

- Ensure that you have network-admin role privileges to migrate the supervisor modules.

```
switch# show user-account admin
user:admin
this user account has no expiry date
roles:network-admin
```

- Ensure the switch is running a release that supports supervisor migration.

  It is recommended the switch run a Cisco recommended release of MDS NX-OS before proceeding with the supervisor migration. For the list of Cisco recommended releases, Recommended Releases for Cisco MDS 9000 Series Switches.

  The following table lists the supported release versions for migrating to Supervisor-4 Modules on the Cisco MDS 9700 Series of Multilayer Directors.

Product Name	Supported MDS NX-OS Release Versions
Cisco MDS 9718 Director	Cisco MDS NX-OS Release 8.4(2a) and later
Cisco MDS 9710 Director	Cisco MDS NX-OS Release 8.4(1) and later
Cisco MDS 9706 Director	Cisco MDS NX-OS Release 8.4(1) and later

  To upgrade an image version on the switch, refer the Cisco MDS 9000 NX-OS Software Upgrade and Downgrade Guide, Release 8.x guide.

- If it is planned to upgrade the Cisco MDS NX-OS version from the current version then upgrade Cisco MDS NX-OS first and then execute the supervisor migration.
- During the Supervisor-1 to Supervisor-4 Module migration procedure, do not:
  - insert or remove any transceivers from any modules.
  - alter any connections.
  - remove any power supply modules or fan modules.
  - attempt any configuration changes or network changes.

- copy any configuration using the **copy running-config startup-config** command.
- overlap with any EPLD or BIOS upgrades.
- trigger any ISSU.

- We recommend that you use a console connection to perform the migration procedure. In case you do not have a console connection and are using an SSH/Telnet connection, use the **terminal monitor** command to display the syslogs mentioned in the below procedures.
- Back up the running configuration from the current active supervisor module (DS-X97-SF1-K9) to an FTP, SFTP, TFTP, SCP server, or a USB flash drive.

```
switch# copy running-config sftp://192.0.2.1/$(SWITCHNAME)_runningconfiguration.txt
Enter username: test
Connected to 192.0.2.1.
Uploading /var/tmp/vsh/switch-running-config to /switch_runningconfiguration.txt
Copy complete.


switch(config)# copy running-config usb1:runningconfiguration.txt
Copy complete, now saving to disk (please wait)..
```

Note `runningconfiguration.txt` is a filename.

$(SWITCHNAME) adds the switch's switchname to the filename.

- Back up any important files from the bootflash of the current active and standby supervisor modules (DS-X97-SF1-K9) to an FTP, SFTP, TFTP, SCP server, or a USB flash drive.

```
switch# copy bootflash:userfile.txt scp://test@192.0.2.1/test/$(SWITCHNAME)_userfile.txt
```

Note `userfile.txt` is a filename.

$(SWITCHNAME) adds the switch's switchname to the filename.

- If on a NX-OS release prior to NX-OS 9.2(2), backup any installed PAK-type licenses from the switch to an FTP, SFTP, TFTP, SCP server or USB drive by using the **copy licenses** command. To view the current licenses installed on the switch, use the **show license** command.

```
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

switch# copy licenses usb1:$(SWITCHNAME)/:licenses_archive_file_name.tar
```

Note You must use the tar extension for the archive file. This file contains all the license files that are installed on the Supervisor-1 Module.

$(SWITCHNAME) adds the switch's switchname to the filename.

- Starting with NX-OS version 9.2(2), Smart Licensing with Policy is introduced. With Smart Licensing, the switch synchronizes with CSSM after booting up, automatically installing the licenses. For more information. see Cisco MDS 9000 Series Licensing Guide.
- Back up the output of the **show tech-support details** command to a remote server using an FTP, TFTP, SFTP, SCP server, or a USB flash drive.

  ```
  switch# show tech-support details  >
  scp://test@192.0.2.1/test/$(SWITCHNAME)_showtechsupport.txt
  ```

  or

  ```
  switch# show tech-support details  > usb1:$(SWITCHNAME)_showtechsupport.txt
  ```

  $(SWITCHNAME) adds the switch's switchname to the filename.
- Ensure the following parts are available
  - Supervisor-4 Module (DS-X97-SF4-K9). Two Supervisor-4 Modules for the dual supervisor migration.

Nondisruptive Supervisor-4 Migration on Dual Supervisor Switch

To perform a nondisruptive migration from both Supervisor-1/Supervisor-1E Modules to Supervisor-4 Modules in a switch that has both the Active and Standby supervisor modules installed, follow these steps:

Before starting the migration procedure in a dual supervisor module scenario, ensure that the standby supervisor module is in the HA-standby state. If the standby supervisor does not come up in the HA-standby state then physically remove the standby supervisor module and initiate the migration on the active supervisor module. Use the **show module** command to view the state of the supervisor modules.

Note In the following procedure, all show outputs, system messages, and image file names are displayed for the Cisco MDS 9710 Multilayer Director Switch. The show outputs, system messages, and image file names will vary based on the Cisco MDS 9700 Series Multilayer Director Switch being upgraded. In this procedure, Cisco MDS 9710 chassis is used and the active supervisor module is in slot 6, and the standby supervisor module is in slot 5.

Procedure

Step 1 Log in to the switch and use the **show module** command to view the Active and Standby supervisor modules.

Note
In the following **show module** command output, Supervisor-1 Module (DS-X97-SF1-K9) is listed as Supervisor Module-3.

```
switch# show module

Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    48     1/10 Gbps Ethernet Module          DS-X9848-480K9     ok
2    48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok
3    24     40 Gbps FCoE Module                DS-X9824-960K9     ok
4    48     4/8/16/32 Gbps Advanced FC Module  DS-X9648-1536K9    ok
5    0      Supervisor Module-3                DS-X97-SF1-K9      ha-standby
6    0      Supervisor Module-3                DS-X97-SF1-K9      active *
7    34     1/10/40G IPS,2/4/8/10/16G FC Module DS-X9334-K9        ok
8    48     4/8/16/32 Gbps Advanced FC Module  DS-X9648-1536K9    ok
10   48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok

Mod  Sw               Hw
---  ---------------  ------
1    8.4(1)           1.1
2    8.4(1)           1.3
3    8.4(1)           1.0
4    8.4(1)           1.0
...
Xbar Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    0      Fabric Module 1                    DS-X9710-FAB1      ok
2    0      Fabric Module 1                    DS-X9710-FAB1      ok
3    0      Fabric Module 1                    DS-X9710-FAB1      ok
4    0      Fabric Module 1                    DS-X9710-FAB1      ok
5    0      Fabric Module 1                    DS-X9710-FAB1      ok
6    0      Fabric Module 1                    DS-X9710-FAB1      ok

...
```

Step 2 Ensure the supervisor that is in Active status is in the following slot (mod column in show module output):

- MDS 9706 - slot 4
- MDS 9710 - slot 6
- MDS 9718 - slot 10

If the active supervisor is not in the above even numbered slot, execute the **system switchover** command. After this is complete, the supervisor that was active will reboot and become the standby. Run the **show module** command to view the updated status of the supervisors. The supervisor in active status should now be in the even numbered slot and the supervisor in the odd numbered slot should now be in standby-ha status.

Step 3 Ensure that the required space is available in the bootflash: directory for the Supervisor-4 image files to be copied using the **dir bootflash:** command. Use the **delete bootflash:***filename* command to remove individual files.

Step 4 Copy the Supervisor-4 Module Cisco NX-OS kickstart and system images to the active Supervisor-1 Module bootflash, using an FTP, TFTP, SCP, SFTP server, or a USB flash drive.

Note
The running Supervisor-1 Cisco MDS NX-OS release version and the target Supervisor-4 Cisco MDS NX-OS release version must be same. If there is a mismatch in the release versions, the following error is displayed when the actual migration is performed:

```
ERROR!!! Running system version: 8.4(1), version of system image provided:8.4(2b) <Fri Oct 23
16:08:44 2020> ERROR!!! Version of system image provided('m9700-sf4ek9-mz.8.4.2b.bin') does not
match running version, aborting migration.
```

The Supervisor-4 images contain the string **sf4** to identify them. Do not rename the images; use the standard image names.

```
switch# copy tftp://tftpserver.example.com/MDS/m9700-sf4ek9-kickstart-mz.8.4.1.bin
bootflash:m9700-sf4ek9-kickstart-mz.8.4.1.bin
switch# copy tftp://tftpserver.example.com/MDS/m9700-sf4ek9-mz.8.4.1.bin
bootflash:m9700-sf4ek9-mz.8.4.1.bin
```

Step 5 Verify the images by using the below commands:

The following example shows the MD5 checksum value of the image, which can be compared with the MD5 checksum value listed on the software download page

```
switch# show file m9700-sf4ek9-kickstart-mz.8.4.1.bin md5sum
c41f7bd29b561610d766c89e12851a4f

switch# show file m9700-sf4ek9-mz.8.4.1.bin md5sum
28f65c79ba6bc9418960b384cdab2fb7
```

The following example confirms that the MD5 verification was successful.

```
switch# show version image m9700-sf4ek9-kickstart-mz.8.4.1.bin
MD5 Verification Passed
  image name: m9700-sf4ek9-kickstart-mz.8.4.1.bin
  kickstart:  version 8.4(1)
  compiled:   6/30/2019 23:00:00 [06/15/2019 05:19:08]

switch# show version image m9700-sf4ek9-mz.8.4.1.bin
MD5 Verification Passed
  image name: m9700-sf4ek9-mz.8.4.1.bin
  bios:      v2.6.0(05/17/2019)
  system:     version 8.4(1)
  compiled:   6/30/2019 23:00:00 [06/15/2019 06:45:18]
```

Step 6 If you are not logged in to the switch on the console port then enable syslog monitoring by using the **terminal monitor** command.

```
switch# terminal monitor
```

Step 7 Initiate the migration process on the active Supervisor-1 module using the release-dependent supervisor migration command. For information about supervisor migration commands see the Guidelines and Limitations section.

```
switch# configure terminal
```

Execute the supervisor migration command:

```
swithc# configure terminal
switch(config)# migrate sup kickstart m9700-sf4ek9-kickstart-mz.8.4.1.bin
system m9700-sf4ek9-mz.8.4.1.bin
Kickstart image file is /bootflash/m9700-sf4ek9-kickstart-mz.8.4.1.bin
System image file is /bootflash/m9700-sf4ek9-kickstart-mz.8.4.1.bin
```

Step 8 During the migration, enter **y** when prompted to do so.

Note
After this point, the migration process will be locked and you cannot cancel the migration process. The migration command checks if it has to initiate a single supervisor or dual supervisor migration process by checking if there is a standby Supervisor-1 Module installed in the switch.

Note
In the following system message, Supervisor-1 Module (DS-X97-SF1-K9) is listed as Supervisor-3.

```
This will start the Supervisor-3 to Supervisor-4 migration. Configuration will be locked until
migration is complete.
Do you wish to continue (y/n) [n] y
```

The following messages are displayed:

```
<Tue Jun 25 15:06:56 2019> Starting migration, Please do not remove any linecards or fabric cards
until migration is complete
2019 Jun 25 15:06:56 switch %PLATFORM-2-MOD_PWRDN: Module 5 powered down (Serial number JAE194005JC)
2019 Jun 25 15:06:56 switch %PLATFORM-5-MOD_STATUS: Module 5 current-status is
MOD_STATUS_CONFIGPOWERED_DOWN
2019 Jun 25 15:06:56 switch %PLATFORM-5-MOD_STATUS: Module 5 current-status is MOD_STATUS_POWERED_DOWN
```

Step 9 The standby Supervisor-1 Module will be powered down and its Status LED will be blinking red. Use the **show module** command to display the status of the modules installed in the switch.

```
switch# show module
Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    48     1/10 Gbps Ethernet Module          DS-X9848-480K9     ok
2    48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok
3    24     40 Gbps FCoE Module                DS-X9824-960K9     ok
4    48     4/8/16/32 Gbps Advanced FC Module  DS-X9648-1536K9    ok
5    0      Supervisor Module-3                DS-X97-SF1-K9      powered-dn
6    0      Supervisor Module-3                DS-X97-SF1-K9      active *
7    34     1/10/40G IPS,2/4/8/10/16G FC Module DS-X9334-K9        ok
8    48     4/8/16/32 Gbps Advanced FC Module  DS-X9648-1536K9    ok
10   48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok

Mod  Power-Status  Reason
---  ------------  --------------------------
5    powered-dn     Out of service
...
```

If the standby Supervisor-1 Module is not in the **powered-dn** state then manually power it down with the **out-of-service module 5** *slot* command where *slot* indicates the chassis slot number in which the standby supervisor module is located.

```
switch(config)# out-of-service module 5
```

After the execution of **out-of-service module** command, verify that the module is in the **powered-dn** state with the **show module** command.

If the **out-of-service module** command fails then check the migration status using the **show logging onboard migration status** command on any management session.

Warning
If the supervisor is not in the powered-dn state before removal, then traffic switching may be disrupted when the supervisor is physically removed. The switch must be reloaded if traffic disruption occurs after removal.

Step 10 After the standby supervisor module is powered down, replace it with a Supervisor-4 Module, as explained in the "Removing a Supervisor Module" section and the "Installing a Supervisor Module" section. When the Supervisor-4 Module is detected in the standby supervisor slot it is booted with the NX-OS software specified in the migration command.

```
<Tue Jun 25 15:06:57 2019> Manual-boot is enabled for Standby Supervisor
<Tue Jun 25 15:06:57 2019> Please remove Supervisor-3 (DS-X97-SF1-K9) module from slot 5 and insert
 Supervisor-4 (DS-X97-SF4-K9) module within 30 minutes
2019 Jun 25 15:06:57 switch %PLATFORM-2-MOD_REMOVE: Module 5 removed (Serial number JAE194005JC)

2019 Jun 25 15:07:33 switch %PLATFORM-2-SINGLE_EJECTOR_STAT_CHANGED: Ejector's status in slot 5 has
 changed, Ejector is OPEN
2019 Jun 25 15:07:34 switch %PLATFORM-2-MOD_REMOVE: Module 5 removed (Serial number JAE194005JC)
```

Note
Insert the Supervisor-4 Module into the switch within a period of 30 minutes after initiating the migration command. If the Supervisor-4 Module is not inserted within 30 minutes after executing the migration command the standby Supervisor-1 will be powered up again, if present, and the migration aborted. Perform Step 4 to Step 6 again and continue the migration process.

Once the supervisor module is physically replaced, the following syslog messages are displayed on the active

Supervisor-1 Module:

```
2019 Jun 25 15:07:57 switch %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors closed for
module 5. Ejector based shutdown enabled
2019 Jun 25 15:07:57 switch %PLATFORM-2-MOD_DETECT: Module 5 detected (Serial number :unavailable)
 Module-Type Supervisor Module-4 Model :unavailable
<Tue Jun 25 15:08:07 2019> Supervisor-4 (DS-X97-SF4-K9) is detected in slot 5
<Tue Jun 25 15:08:12 2019> Reloading standby. This might take up to 15 minutes. Please wait...
2019 Jun 25 15:08:13 sw9710-SUP3-101 %PLATFORM-2-PFM_STANDBY_MODULE_RESET_MIGRATION: Reloading
Standby Supervisor as part of Supervisor migration
```

Step 11 Wait for approximately 20 minutes for the new Supervisor-4 Module to come up in the HA-standby state.

The following messages are displayed on the active Supervisor-1 Module:

```
<Tue Jun 25 15:10:13 2019> Standby supervisor not yet online. This might take some time, Please
wait...
<Tue Jun 25 15:12:13 2019> Standby supervisor not yet online. This might take some time, Please
wait...
2019 Jun 25 15:12:18 switch %SYSMGR-2-ACTIVE_LOWER_MEM_THAN_STANDBY: Active supervisor in slot 6
is running with less memory than standby supervisor in slot 5.
2019 Jun 25 15:12:27 switch %USBHSD-STANDBY-2-MOUNT: logflash: online
2019 Jun 25 15:12:27 switch %USBHSD-STANDBY-2-MOUNT: USB1: online
2019 Jun 25 15:12:32 switch %BOOTVAR-5-NEIGHBOR_UPDATE_AUTOCOPY: auto-copy supported by neighbor
supervisor, starting...
2019 Jun 25 15:14:05 switch %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on sup in slot
 5
<Tue Jun 25 15:14:13 2019> Standby supervisor not yet online. This might take some time, Please
wait...
```

Note
If you see the following failure message, ignore it as the active Supervisor-1 Module will pause the standby Supervisor-4 Module initialization process for a while and then automatically restart the standby initialization process.

```
Tue Jun 25 15:14:13 2019 switch %SYSMGR-2-STANDBY_BOOT_FAILED: Standby supervisor failed to boot
up.
```

Note
After the Supervisor-4 Module is inserted in the standby supervisor slot, a timer is started for the Supervisor-4 Module to power up and come online. If the Supervisor-4 Module fails to power up and come online at the first attempt, a retry is initiated every 15 minutes. If the Supervisor-4 Module fails to come online after three retries or 45 minutes, you have to remove the Supervisor-4 Module and restart the migration process.

The following messages are displayed when the standby module (Supervisor-4 Module in slot 5) is online:

```
2019 Jun 25 15:15:06 switch %MODULE-5-STANDBY_SUP_OK: Supervisor 5 is standby
2019 Jun 25 15:15:07 switch %PLATFORM-1-PFM_ALERT: Enabling ejector based shutdown on sup in slot
6
<Tue Jun 25 15:15:33 2019> Standby Supervisor-4 (DS-X97-SF4-K9) has come online, configs will be
copied
```

Step 12 The current configuration will be synchronized to the new standby supervisor by automatically executing **copy running-config startup-config**. After this a supervisor switchover is initiated. Any SSH/Telnet sessions to the switch will be terminated at this point.

The following messages are displayed:

```
<Tue Jun 25 15:15:33 2019> Saving configuration now. Please wait...
[########################################] 100%
Copy complete.
/mnt/plog/migration.log:                                2.78 kB   71.36 kB/s
<Tue Jun 25 15:15:46 2019> Supervisor-3 (DS-X97-SF1-K9) will switchover to Supervisor-4
(DS-X97-SF4-K9) now
<Tue Jun 25 15:15:46 2019> Switchover is successful, Supervisor-4 (DS-X97-SF4-K9) is now active
```

Step 13 The supervisor switchover changes the new Supervisor-4 Module from HA standby to Active state. If using SSH/Telnet reconnect several seconds after the switchover. Ensure that the console link and the management link are connected to the Supervisor-4 Module.

The following syslog messages are displayed on the active Supervisor-4 Module:

```
switch(standby) login: 2019 Jun 25 15:15:47 switch %KERN-2-SYSTEM_MSG: [  377.107557] Switchover
started by redundancy driver - kernel
2019 Jun 25 15:15:47 switch %SYSMGR-2-HASWITCHOVER_PRE_START: This supervisor is becoming active
(pre-start phase).

2019 Jun 25 15:15:47 switch %SYSMGR-2-HASWITCHOVER_START: Supervisor 5 is becoming active.
User Access Verification
switch login: 2019 Jun 25 15:15:48 switch %SYSMGR-2-SWITCHOVER_OVER: Switchover completed.
2019 Jun 25 15:15:48 switch %ASCII-CFG-6-INFORMATION: Reading ACFG Runtime information
2019 Jun 25 15:15:48 switch %IM-5-IM_MGMT_INTF_STATE: mgmt0 is DOWN
2019 Jun 25 15:15:48 switch %FC-REDIRECT-5-IVR_SUPPORT_ENABLED: IVR Support Enabled in FC_Redirect.
 Source: Local Switch - 20:00:84:78:ac:09:35:00
2019 Jun 25 15:15:50 switch %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on sup in slot
 5
2019 Jun 25 15:15:52 switch %BOOTVAR-2-SUP_MIGRATION_CONFIG_STARTED: Setting boot parameters for
supervisor migration process. It might take some time. Please do not set any config parameters
during this time or do not replace standby.
2019 Jun 25 15:15:56 switch %IM-5-IM_MGMT_INTF_STATE: mgmt0 is UP
```

Step 14 After the switchover to the first Supervisor-4 Module is completed, the following messages are displayed:

```
User Access Verification
switch login: 2019 Jun 25 15:16:39 switch %BOOTVAR-2-SUP_MIGRATION_CONFIG_COMPLETE: Migration process
```

```
 is complete now. Supervisor-3 (DS-X97-SF1-K9) in standby slot can now be replaced with Supervisor-4
 (DS-X97-SF4-K9).
2019 Jun 25 15:18:00 switch %SYSMGR-2-SBY_SUP_LESS_MEMORY_SLOT: Supervisor in slot 6 is running
with less memory than active supervisor in slot 5
2019 Jun 25 15:18:00 switch %SYSMGR-2-CONVERT_STARTUP_ABORTED: Conversion of startup-config failed.
2019 Jun 25 15:18:00 switch %PLATFORM-2-MOD_PWRDN: Module 6 powered down (Serial number JAE17440HVB)
2019 Jun 25 15:18:00 switch %PLATFORM-5-MOD_STATUS: Module 6 current-status is
MOD_STATUS_CONFIGPOWERED_DOWN
2019 Jun 25 15:18:00 switch %PLATFORM-5-MOD_STATUS: Module 6 current-status is MOD_STATUS_POWERED_DOWN
2019 Jun 25 15:18:00 switch %PLATFORM-2-MOD_REMOVE: Module 6 removed (Serial number JAE17440HVB)

2019 Jun 25 15:18:0 switch %BOOTVAR-2-SUP_MIGRATION_CONFIG_COMPLETE:
Migration process is complete now.
Supervisor-3 (DS-X97-SF1-K9) in standby slot can now be replaced with Supervisor-4 (DS-X97-SF4-K9).
```

Warning
A mix of different Supervisor-4 Modules and Supervisor-1/Supervisor 1E Modules outside a migration process is not supported. This mix of modules is supported only while you are migrating from a Supervisor-1/Supervisor 1E Module to a Supervisor-4 Module.

Use the **show boot** command to display the current boot variables.

```
switch# show boot
kickstart variable = bootflash:/m9700-sf4ek9-kickstart-mz.8.4.1.bin
system variable = bootflash:/m9700-sf4ek9-mz.8.4.1.bin
Boot POAP Disabled
```

Step 15 The old active Supervisor-1 Module will be powered down and its Status LED will be blinking red. Use the **show module** command to display the status of the modules installed in the switch.

```
switch# show module
Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    48     1/10 Gbps Ethernet Module          DS-X9848-480K9     ok
2    48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok
3    24     40 Gbps FCoE Module                DS-X9824-960K9     ok
4    48     4/8/16/32 Gbps Advanced FC Module  DS-X9648-1536K9    ok
5    0      Supervisor Module-4                DS-X97-SF4-K9      active *
6    0      Supervisor Module-3                DS-X97-SF1-K9      powered-dn
7    34     1/10/40G IPS,2/4/8/10/16G FC Module DS-X9334-K9        ok
8    48     4/8/16/32 Gbps Advanced FC Module  DS-X9648-1536K9    ok
10   48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok

Mod  Power-Status  Reason
---  ------------  --------------------------
6    powered-dn     Policy trigger initiated reset: Stdby has lower mem than active
...
```

If the standby Supervisor-1 Module is not in the **powered-dn** state, then manually power it down with the **out-of-service module** *slot* command where *slot* indicates the chassis slot number in which the standby supervisor module is located.

```
switch(config)# out-of-service module 6
```

After executing the **out-of-service module** command, verify that the Module is in the powered-down state by running the **show module** command.

After the execution of **out-of-service module** command, verify that the module is in the **powered-dn** state with the **show module** command.

If the **out-of-service module** command fails then check the migration status using the **show logging onboard migration status** command on any management session.

Step 16 Physically replace the powered down Supervisor-1 Module (slot 6) with the second Supervisor-4 Module. To replace the supervisor module, follow the steps explained in the "Removing a Supervisor Module" section and the "Installing a Supervisor Module" section .

The following messages are displayed when the Supervisor-1 Module is removed:

```
2019 Jun 25 15:21:13 switch %PLATFORM-2-SINGLE_EJECTOR_STAT_CHANGED: Ejector's status in slot 6 has
 changed, Ejector is OPEN
2019 Jun 25 15:21:15 switch %PLATFORM-2-MOD_REMOVE: Module 6 removed (Serial number JAE17440HVB)
```

After inserting the new standby Supervisor-4 Module, the following messages are displayed:

```
2019 Jun 25 15:21:27 switch %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors closed for
module 6. Ejector based shutdown enabled
2019 Jun 25 15:21:27 switch %PLATFORM-2-MOD_DETECT: Module 6 detected (Serial number :unavailable)
 Module-Type Supervisor Module-4 Model :unavailable
```

Step 17 Wait for approximately 20 minutes for the new Supervisor-4 Module to come up in the HA-standby state. Once the standby supervisor module is in the HA-standby state and the supervisor hardware migration process is complete. The supervisor migration command lock is removed and configuration changes may be made. The supervisor Status LED will be green.

The following messages are displayed on the active Supervisor-4 Module:

```
2019 Jun 25 15:36:45 switch %USBHSD-STANDBY-2-MOUNT: logflash: online
2019 Jun 25 15:36:49 switch %BOOTVAR-5-NEIGHBOR_UPDATE_AUTOCOPY: auto-copy supported by neighbor
supervisor, starting...
2019 Jun 25 15:38:30 switch %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on sup in slot
 6
2019 Jun 25 15:39:38 switch %MODULE-5-STANDBY_SUP_OK: Supervisor 6 is standby
2019 Jun 25 15:39:39 switch %PLATFORM-1-PFM_ALERT: Enabling ejector based shutdown on sup in slot
5
```

If you see the following failure message, ignore it as the active Supervisor-4 Module will pause the standby Supervisor-4 Module initialization process for a while and then automatically restart the standby initialization process.

```
2019 Jun 25 15:36:45 switch %SYSMGR-2-STANDBY_BOOT_FAILED: Standby supervisor failed to boot up.
```

Step 18 If running NX-OS prior to NX-OS 9.2(2), reinstall any previously backed up PAK license files on the new Supervisor-4 Modules.

Ignore this step if you are using NX-OS version 9.2(2) or later. Smart Licensing with Policy is introduced for NX-OS version 9.2(2). With Smart Licensing, the switch synchronizes with CSSM after booting up, automatically installing the licenses.

```
switch(config)# copy usb1:$(SWITCHNAME)_licenses_archive_file_name.tar bootflash:switch_license.tar
Copy progress 100% 10KB
Copy complete, now saving to disk (please wait)...

switch(config)# tar extract bootflash:switch_license.tar
switch(config)# install license bootflash:<license_file>.lic
Installing license.........................done

switch# show license usage
Feature                      Ins  Lic   Status Expiry Date Comments
                                 Count
--------------------------------------------------------------------------------
IOA_X9334                     No    0   In use             Grace 115D 2H
FM_SERVER_PKG                 No    -   Unused             -
MAINFRAME_PKG                 No    -   Unused             -
ENTERPRISE_PKG                Yes   -   Unused never       -
SAN_ANALYTICS_PKG             No    -   In use             Grace 119D 20H
SAN_TELEMETRY_PKG             No    -   Unused             Grace 109D 1H
--------------------------------------------------------------------------------
```

Note
$(SWITCHNAME) adds the switch's switchname to the filename.

Note
If you are using NX-OS versions earlier than 9.2(2), after the supervisor module migration, all license expiry dates will be set to the same dates as before the migration. After a license grace period has expired, all features using the license will be disabled and the configurations will be removed. If a license (of any term) has expired, it will remain enabled after the supervisor migration until a switch reboot.

Refer the "Verification" section to verify that the Supervisor-1 Module configuration has been successfully applied to the Supervisor-4 Module.

To view the inventory information for modules from the Cisco DCNM Web UI, Choose **Inventory > View > Modules**. The **Modules** window is displayed with a list of all the switches and its details for a selected scope.

For more information, see the *Cisco DCNM SAN Management Configuration Guide*.

What to do next

Migrate the Crossbar Fabric-1 Switching Modules to Crossbar Fabric-3 Switching Modules. For more information, see the "Nondisruptive Migration from Crossbar Fabric-1 Switching Modules to Crossbar Fabric-3 Switching Modules" section.

Nondisruptive Supervisor-4 Migration on Single Supervisor Switch

To perform a nondisruptive migration from a Supervisor-1/Supervisor-1E Module to a Supervisor-4 Module in a switch that has only the active supervisor module installed and there is no standby supervisor module, or the standby module is not in the HA-standby state, follow these steps.

Note In the following procedure, all show outputs, system messages, and image file names are displayed for the Cisco MDS 9710 Multilayer Director Switch. The show outputs, system messages, and image file names will vary based on the Cisco MDS 9700 Series Multilayer Director Switch selected.

Procedure

Step 1 Use the **show module** command to view the Active and Standby supervisor modules.

Note
In the following system messages, Supervisor-1 Module (DS-X97-SF1-K9) is listed as Supervisor Module-3.

```
switch# show module

Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    48     1/10 Gbps Ethernet Module          DS-X9848-480K9     ok
2    48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok
3    24     40 Gbps FCoE Module                DS-X9824-960K9     ok
4    48     4/8/16/32 Gbps Advanced FC Module  DS-X9648-1536K9    ok
```

```
5    0      Supervisor Module-3                 DS-X97-SF1-K9      active *
7    34     1/10/40G IPS,2/4/8/10/16G FC Module DS-X9334-K9        ok
8    48     4/8/16/32 Gbps Advanced FC Module   DS-X9648-1536K9    ok
10   48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok

Mod  Sw               Hw
---  ---------------  ------
1    8.4(1)           1.1
2    8.4(1)           1.3
3    8.4(1)           1.0
4    8.4(1)           1.0
5    8.4(1)           1.3
6    8.4(1)           1.1
7    8.4(1)           1.0
8    8.4(1)           1.0
10   8.4(1)           1.1


Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    84-78-ac-1b-3d-58 to 84-78-ac-1b-3d-8b  JAF1718AAAD
2    f4-cf-e2-7c-cd-30 to f4-cf-e2-7c-cd-33  JAE1847038X
3    04-6c-9d-32-36-aa to 04-6c-9d-32-37-1b  JAE19330ASN
4    00-76-86-bf-58-23 to 00-76-86-bf-58-57  JAE203901ZG
5    9c-57-ad-fd-0d-cb to 9c-57-ad-fd-0d-dd  JAE194005JC
6    e8-ed-f3-e5-9a-4d to e8-ed-f3-e5-9a-5f  JAE17440HVB
7    00-da-55-a2-25-00 to 00-da-55-a2-25-0f  JAE195004XM
8    74-86-0b-33-c6-70 to 74-86-0b-33-c6-a4  JAE213101Q3
10   3c-0e-23-c5-53-d0 to 3c-0e-23-c5-53-d3  JAE180605X3

Mod  Online Diag Status
---  ------------------
1    Pass
2    Pass
3    Pass
4    Pass
5    Pass
6    Pass
7    Pass
8    Pass
10   Pass

Xbar Ports  Module-Type                          Model              Status
---  -----  ----------------------------------- ------------------ ----------
1    0      Fabric Module 1                     DS-X9710-FAB1      ok
2    0      Fabric Module 1                     DS-X9710-FAB1      ok
3    0      Fabric Module 1                     DS-X9710-FAB1      ok
4    0      Fabric Module 1                     DS-X9710-FAB1      ok
5    0      Fabric Module 1                     DS-X9710-FAB1      ok
6    0      Fabric Module 1                     DS-X9710-FAB1      ok

Xbar Sw               Hw
---  ---------------  ------
1    NA               1.0
2    NA               1.0
3    NA               1.0
4    NA               1.0
5    NA               1.0
6    NA               1.0


Xbar MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    NA                                      JAE222305VS
```

```
2     NA                                        JAE2217096X
3     NA                                        JAE222305V5
4     NA                                        JAE2217096L
5     NA                                        JAE2217096J
6     NA                                        JAE222305V8
```

Step 2 Ensure that the required space is available in the bootflash: directory for the image files to be copied using the **dir bootflash:** command. Use the **delete bootflash:***filename* command to remove any individual files.

Step 3 Copy the Supervisor-4 Module Cisco NX-OS kickstart and system images to the active supervisor module bootflash using an FTP, TFTP, SCP, SFTP server, or a USB flash drive.

The Supervisor-4 images contain the string **sf4** to identify them. Do not rename the images; use the standard image names.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-kickstart-mz.8.4.1.bin
bootflash:m9700-sf4ek9-kickstart-mz.8.4.1.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-mz.8.4.1.bin
bootflash:m9700-sf4ek9-mz.8.4.1.bin
```

Note
Ensure that the running Supervisor-1 Cisco MDS NX-OS and the target Supervisor-4 Cisco MDS NX-OS release versions are the same. Use the show version command to view the version of the Cisco MDS NX-OS software running on the switch.

Step 4 Execute the supervisor migration command:

```
swithc# configure terminal
switch(config)# migrate sup kickstart m9700-sf4ek9-kickstart-mz.8.4.1.bin
system m9700-sf4ek9-mz.8.4.1.bin
Kickstart image file is /bootflash/m9700-sf4ek9-kickstart-mz.8.4.1.bin
System image file is /bootflash/m9700-sf4ek9-kickstart-mz.8.4.1.bin
```

Step 5 During the migration, enter " **y** " when prompted to do so.

Note
After this point, the migration process will be locked and you cannot cancel the migration process. The migration command will then check if it has to initiate a single supervisor or dual supervisor migration process by checking if there a standby Supervisor-1 Module is installed in the switch.

Note
In the following system messages, Supervisor-1 Module (DS-X97-SF1-K9) is listed as Supervisor Module-3.

```
This will start the Supervisor-3 to Supervisor-4 migration. Configuration will be locked until
migration is complete.
Do you wish to continue (y/n) [n] y
```

The following syslog is displayed:

```
<Tue Jun 25 15:06:56 2019> Starting migration,
Please do not remove any linecards or fabric cards until migration is complete
```

Step 6 Insert the new Supervisor-4 Module, as explained in Removing a Supervisor Module, on page 3 and Installing a Supervisor Module, on page 1. When the Supervisor-4 Module is detected in the standby supervisor slot, a boot from a network (TFTP) server is initiated with the image that is provided by using the migration command.

Note
You have to insert the Supervisor-4 Module into the switch within a period of 30 minutes after initiating the migration command. In case you have not inserted the Supervisor-4 Module within the 30 minutes after executing the command, you have to execute the command again and re-initiate the migration process.

```
<Tue Jun 25 15:06:57 2019> Manual-boot is enabled for Standby Supervisor
<Tue Jun 25 15:06:57 2019> Please insert Supervisor-4 (DS-X97-SF4-K9) in slot
number: 6 within 30 minutes
```

Note
After the Supervisor-4 Module is inserted in the slot, a timer is started for the Supervisor-4 Module to power up and come online. If the Supervisor-4 Module fails to power up and come online at the first attempt, a retry is initiated every 15 minutes. In case the Supervisor-4 Module fails to come online after three retries or 45 minutes, you have to remove the Supervisor-4 Module and restart the migration process.

The following system messages are displayed:

```
<Tue Jun 25 15:08:07 2019> Supervisor-4(DS-X97-SF4-K9) detected in slot 6.
<Tue Jun 25 15:08:12 2019> Reloading standby. This might take up to 15 minutes. Please wait
..
2019 Jun 25 15:08:13 switch %PLATFORM-2-PFM_STANDBY_MODULE_RESET_MIGRATION: Reloading
Standby Supervisor as part of Supervisor migration
```

Step 7 Wait for approximately 20 minutes for the new Supervisor-4 Module to come up in HA-standby state.

The following messages are displayed on the active Supervisor-1 Module:

```
<Tue Jun 25 15:10:13 2019> Standby supervisor not yet online. This will take some time.
Please wait...
<Tue Jun 25 15:12:13 2019> Standby supervisor not yet online. This will take some time.
Please wait...

2019 Jun 25 15:12:18 switch %SYSMGR-2-ACTIVE_LOWER_MEM_THAN_STANDBY: Active supervisor in
slot 5 is running with less memory than standby supervisor in slot 6.
2019 Jun 25 15:12:18 switch %USBHSD-STANDBY-2-MOUNT: logflash: online
2019 Jun 25 15:12:18 switch %BOOTVAR-5-NEIGHBOR_UPDATE_AUTOCOPY: auto-copy supported by
neighbor supervisor, starting...
<Tue Jun 25 15:14:13 2019> Standby supervisor not yet online. This will take some time.
Please wait...
2019 Jun 25 15:14:05 switch %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on sup
in slot 6
<Tue Jun 25 15:14:13 2019> Standby supervisor not yet online. This will take some time.
Please wait...
```

Note
If you see the following failure message, ignore it as, the active Supervisor-1 Module will bring up the standby Supervisor-4 Module to HA-standby supervisor state in some time.

```
2019 Jun 25 15:15:06 switch %SYSMGR-2-STANDBY_BOOT_FAILED: Standby supervisor failed to boot up.
```

The following messages are displayed when the standby module is online:

```
2019 Jun 25 15:15:06 switch %CARDCLIENT-2-SSE: MOD:6 SUP ONLINE
2019 Jun 25 15:15:07 switch %MODULE-5-STANDBY_SUP_OK: Supervisor 6 is standby
2019 Jun 25 15:15:08 switch %PLATFORM-1-PFM_ALERT: Enabling ejector based shutdown on sup
in slot 6
<Tue Jun 25 15:15:33 2019> Standby Supervisor-4 (DS-X97-SF4-K9) has come online, configs will be
copied
```

Step 8 The current configuration will be synchronized to the new standby supervisor by automatically executing **copy running-config startup-config**. After this a supervisor switchover is initiated. Any SSH/Telnet sessions to the switch will be terminated at this point.

The following messages are displayed:

```
<Tue Jun 25 15:15:33 2019> Saving configuration now. Please wait...
[########################################] 100%
Copy complete.
```

```
/mnt/plog/migration.log:                                2.91 kB   74.67 kB/s
<Tue Jun 25 15:15:46 2019> Supervisor-3 (DS-X97-SF1-K9) will switchover to Supervisor-4
(DS-X97-SF4-K9) now
<Tue Jun 25 15:15:47 2019> Switchover is successful, Supervisor-4 (DS-X97-SF4-K9) is now active
```

Step 9 The supervisor switchover changes the new Supervisor-4 Module from HA standby to Active state. If using SSH/Telnet reconnect several seconds after the switchover. Ensure that the console link and the management link are connected to the Supervisor-4 Module. The old active Supervisor-1 Module will be powered down. The supervisor Status LED will be blinking red when the supervisor module is powered down by the migration command. If the Status LED is not blinking red, then check the migration status using the **show logging onboard migration status** command on any management session.

The following syslog message is displayed on the active Supervisor-4 Module:

```
2019 Jun 25 15:15:47 switch %SYSMGR-2-HASWITCHOVER_PRE_START: This supervisor is becoming active
(pre-start phase).
2019 Jun 25 15:15:48 switch %SYSMGR-2-HASWITCHOVER_START: Supervisor 6 is becoming active.
2019 Jun 25 15:15:48 switch %IPS-5-IPS_MGR_FEATURE_ENABLE: Restore cond runtime ips:0 iscsi:0 fcip:0
 iscsi-intf-vsan:0 ips-lc:1
2019 Jun 25 15:15:48 switch %ASCII-CFG-6-INFORMATION: Reading ACFG Runtime information
2019 Jun 25 15:15:48 switch %SYSMGR-2-SWITCHOVER_OVER: Switchover completed.
2019 Jun 25 15:15:48 switch %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on sup in slot
 6

2019 Jun 25 15:15:50 switch %BOOTVAR-2-SUP_MIGRATION_CONFIG_STARTED: Setting boot parameters for
supervisor migration process. It might take some time. Please do not set any config parameters
during this time.


2019 Jun 25 15:15:52 switch %PLATFORM-2-SUP_UNSUPPORTED: Unsupported card detected in supervisor
slot 5 powered down
2019 Jun 25 15:15:52 switch %PLATFORM-2-MOD_PWRDN: Module 5 powered down (Serial number)
2019 Jun 25 15:15:52 switch %PLATFORM-5-MOD_STATUS: Module 5 current-status is
MOD_STATUS_CONFIGPOWERED_DOWN
2019 Jun 25 15:15:53 switch %PLATFORM-5-MOD_STATUS: Module 5 current-status is MOD_STATUS_POWERED_DOWN
```

Step 10 After the successful completion of the system switchover, the following syslog message is displayed:

```
2019 Jun 25 15:16:39 switch %BOOTVAR-2-SUP_MIGRATION_CONFIG_COMPLETE: Migration process is complete
 now. Supervisor-3 (DS-X97-SF1-K9) in standby slot can now be replaced with Supervisor-4
(DS-X97-SF4-K9).
2019 Jun 25 15:18:00 switch %SYSMGR-2-SBY_SUP_LESS_MEMORY_SLOT: Supervisor in slot 6 is running
with less memory than active supervisor in slot 5
2019 Jun 25 15:18:00 switch %SYSMGR-2-CONVERT_STARTUP_ABORTED: Conversion of startup-config failed.
2019 Jun 25 15:18:00 switch %PLATFORM-2-MOD_PWRDN: Module 6 powered down (Serial number JAE17440HVB)
2019 Jun 25 15:18:00 switch %PLATFORM-5-MOD_STATUS: Module 6 current-status is
MOD_STATUS_CONFIGPOWERED_DOWN
2019 Jun 25 15:18:00 switch %PLATFORM-5-MOD_STATUS: Module 6 current-status is MOD_STATUS_POWERED_DOWN
2019 Jun 25 15:18:00 switch %PLATFORM-2-MOD_REMOVE: Module 6 removed (Serial number JAE17440HVB)
```

Warning

A mix of different Supervisor-4 Modules and Supervisor-1/Supervisor-1E Modules outside the migration process is not supported. This mix of modules is supported only while you are migrating from a Supervisor-1/Supervisor-1E Module to a Supervisor-4 Module. If there is mix of Supervisor-1 and Supervisor-4 module, the chassis will power down the standby supervisor module, and the first supervisor module that comes up will become the active supervisor.

Step 11 (Optional) The system will automatically start the boot parameter setup for the supervisor migration process. Do not set any configuration parameters until the boot parameters are set. After the boot parameters are set, the migration

process is completed for the first supervisor module. Use the **show boot** command to verify the current boot variables and the **show module** command to display the modules installed in the switch.

Supervisor-4 Module outputs

```
switch# show boot
kickstart variable = bootflash:/m9700-sf4ek9-kickstart-mz.8.4.1.bin
system variable = bootflash:/m9700-sf4ek9-mz.8.4.1.bin
Boot POAP Disabled


switch# show module
Mod  Ports  Module-Type                          Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    48     4/8/16/32 Gbps Advanced FC Module   DS-X9648-1536K9    ok
2    48     4/8/16/32 Gbps Advanced FC Module   DS-X9648-1536K9    ok
3    48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok
4    48     4/8/16/32 Gbps Advanced FC Module   DS-X9648-1536K9    ok
5    0      Supervisor Module-3                 DS-X97-SF1-K9      powered-dn
6    0      Supervisor Module-4                 DS-X97-SF4-K9      active *
7    48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok
8    48     1/10 Gbps Ethernet Module           DS-X9848-480K9     ok
10   34     1/10/40G IPS,2/4/8/10/16G FC Module DS-X9334-K9        ok

Mod  Power-Status  Reason
---  ------------  --------------------------
6    powered-dn     Policy trigger initiated reset: Stdby has lower mem than act
ive

Mod  Sw               Hw
---  ---------------  ------
1    8.4(1)           1.1
2    8.4(1)           1.3
3    8.4(1)           1.0
4    8.4(1)           1.0
5    8.4(1)           1.0
6    8.4(1)           1.1
7    8.4(1)           1.0
8    8.4(1)           1.0
10   8.4(1)           1.1

Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    84-78-ac-1b-3d-58 to 84-78-ac-1b-3d-8b  JAF1718AAAD
2    f4-cf-e2-7c-cd-30 to f4-cf-e2-7c-cd-33  JAE1847038X
3    04-6c-9d-32-36-aa to 04-6c-9d-32-37-1b  JAE19330ASN
4    00-76-86-bf-58-23 to 00-76-86-bf-58-57  JAE203901ZG
5    00-2f-5c-fc-54-0a to 00-2f-5c-fc-54-1d  JAE22440CB1
6    00-00-00-00-00-00 to 00-00-00-00-00-00  NA
7    00-da-55-a2-25-00 to 00-da-55-a2-25-0f  JAE195004XM
8    74-86-0b-33-c6-70 to 74-86-0b-33-c6-a4  JAE213101Q3
10   3c-0e-23-c5-53-d0 to 3c-0e-23-c5-53-d3  JAE180605X3

Mod  Online Diag Status
---  ------------------
1    Pass
2    Pass
3    Pass
4    Pass
5    Pass
7    Pass
8    Pass
10   Pass
```

```
Xbar Ports  Module-Type                          Model              Status
---  -----  ------------------------------------ ------------------ ----------
1    0      Fabric Module 1                      DS-X9710-FAB1      ok
2    0      Fabric Module 1                      DS-X9710-FAB1      ok
3    0      Fabric Module 1                      DS-X9710-FAB1      ok
4    0      Fabric Module 1                      DS-X9710-FAB1      ok
5    0      Fabric Module 1                      DS-X9710-FAB1      ok
6    0      Fabric Module 1                      DS-X9710-FAB1      ok

Xbar Sw               Hw
---  ---------------  ------
1    NA               1.0
2    NA               1.0
3    NA               1.0
4    NA               1.0
5    NA               1.0
6    NA               1.0


Xbar MAC-Address(es)                          Serial-Num
---  ---------------------------------------  ----------
1    NA                                       JAE222305VS
2    NA                                       JAE2217096X
3    NA                                       JAE222305V5
4    NA                                       JAE2217096L
5    NA                                       JAE2217096J
6    NA                                       JAE222305V8
```

Step 12 If you are using NX-OS versions earlier than 9.2(2), reinstall the license files on the new Supervisor-4 Module.

```
switch(config)# copy usb1:licenses_archive_file_name.tar bootflash:switch_license.tar

Copy progress 100% 10KB
Copy complete, now saving to disk (please wait)...

switch(config)# tar extract bootflash:switch_license.tar
switch(config)# install license bootflash:<license_file>.lic
Installing license.....................done

switch# show license usage
Feature                      Ins  Lic   Status Expiry Date Comments
                                Count
--------------------------------------------------------------------------------
IOA_X9334                     No    0   In use             Grace 115D 2H
FM_SERVER_PKG                 No    -   Unused             -
MAINFRAME_PKG                 No    -   Unused             -
ENTERPRISE_PKG                Yes   -   Unused never       -
SAN_ANALYTICS_PKG             No    -   In use             Grace 119D 20H
SAN_TELEMETRY_PKG             No    -   Unused             Grace 109D 1H
```

Ignore this step if you are using NX-OS version 9.2(2) or later. Smart Licensing with Policy is introduced for NX-OS version 9.2(2). With Smart Licensing, the switch synchronizes with CSSM after booting up, automatically installing the licenses.

Step 13 If the standby Supervisor-1 Module is not in the powered down state, then put the standby Supervisor-1 Module to out of service, using the **out-of-service module** slot command.

Where a *slot* indicates the chassis slot number in which the standby supervisor module resides.

```
switch(config)# out-of-service module 5
```

Step 14 Remove the Supervisor -1 Module from the chassis.

Refer the "Verification" section to verify that the Supervisor-1 Module configurations are successfully applied to the Supervisor-4 Module.

To view the inventory information for modules from the Cisco DCNM Web UI, Choose **Inventory > View > Modules**. The **Modules** window is displayed with a list of all the switches and its details for a selected scope.

For more information, see the *Cisco DCNM SAN Management Configuration Guide*.

What to do next

Migrate the Crossbar Fabric-1 Switching Modules to Crossbar Fabric-3 Switching Modules. For more information, see the "Nondisruptive Migration from Crossbar Fabric-1 Switching Modules to Crossbar Fabric-3 Switching Modules" section

Supervisor-4 Migration Verification

Use the following **show** commands to verify the migration procedure for the Supervisor-4 Module:

- **show version**
- **show module**
- **show interface brief**
- **show interface status**
- **show system redundancy status**

Sample output for the show version command on the Supervisor-4 Module

In the following procedure, all show outputs, system messages, and image file names are displayed for the Cisco MDS 9710 Multilayer Director Switch. The show outputs, system messages, and image file names will vary based on the Cisco MDS 9700 Series Multilayer Director Switch selected.

```
switch# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Documents: http://www.cisco.com/en/US/products/ps9372/tsd_products_support_serie
s_home.html
Copyright (c) 2002-2019, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained 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 2.6.0
  kickstart: version 8.4(1)
  system:    version 8.4(1)
  BIOS compile time:       05/17/2019
  kickstart image file is: bootflash:///m9700-sf4ek9-kickstart-mz.8.4.1.bin
  kickstart compile time:  6/30/2019 23:00:00 [06/15/2019 14:49:08]
```

```
  system image file is:    bootflash:///m9700-sf4ek9-mz.8.4.1.bin
  system compile time:     6/30/2019 23:00:00 [06/15/2019 16:15:18]


Hardware
  cisco MDS 9710 (10 Slot) Chassis ("Supervisor Module-4")
  Intel(R) Xeon(R) CPU D-1548  with 14270332 kB of memory.
  Processor Board ID JAE22440CB1

  Device name: switch
  bootflash:    3932160 kB
  slot0:              0 kB (expansion flash)

Kernel uptime is 0 day(s), 0 hour(s), 36 minute(s), 9 second(s)

Last reset
  Reason: Unknown
  System version: 8.4(1)
  Service:

plugin
  Core Plugin, Ethernet Plugin

Active Package(s)
```

Sample output for the show module command on the Supervisor-4 Module for a dual supervisor migration

```
switch# show module

Mod  Ports  Module-Type                          Model              Status
---  -----  ----------------------------------- ------------------ ----------
1    48     1/10 Gbps Ethernet Module           DS-X9848-480K9     ok
2    48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok
3    24     40 Gbps FCoE Module                 DS-X9824-960K9     ok
4    48     4/8/16/32 Gbps Advanced FC Module   DS-X9648-1536K9    ok
5    0      Supervisor Module-4                 DS-X97-SF4-K9      active *
6    0      Supervisor Module-4                 DS-X97-SF4-K9      ha-standby
7    34     1/10/40G IPS,2/4/8/10/16G FC Module DS-X9334-K9        ok
8    48     4/8/16/32 Gbps Advanced FC Module   DS-X9648-1536K9    ok
10   48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok

Mod  Sw               Hw
---  ---------------  ------
1    8.4(1)           1.1
2    8.4(1)           1.3
3    8.4(1)           1.0
4    8.4(1)           1.0
5    8.4(1)           1.0
6    8.4(1)           1.0
7    8.4(1)           1.0
8    8.4(1)           1.0
10   8.4(1)           1.1


Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    84-78-ac-1b-3d-58 to 84-78-ac-1b-3d-8b  JAF1718AAAD
2    f4-cf-e2-7c-cd-30 to f4-cf-e2-7c-cd-33  JAE1847038X
3    04-6c-9d-32-36-aa to 04-6c-9d-32-37-1b  JAE19330ASN
4    00-76-86-bf-58-23 to 00-76-86-bf-58-57  JAE203901ZG
5    00-2f-5c-fc-54-0a to 00-2f-5c-fc-54-1d  JAE22440CB1
```

```
6    00-2f-5c-fc-81-b4 to 00-2f-5c-fc-81-c7  JAE22490XKJ
7    00-da-55-a2-25-00 to 00-da-55-a2-25-0f  JAE195004XM
8    74-86-0b-33-c6-70 to 74-86-0b-33-c6-a4  JAE213101Q3
10   3c-0e-23-c5-53-d0 to 3c-0e-23-c5-53-d3  JAE180605X3

Mod  Online Diag Status
---  ------------------
1    Pass
2    Pass
3    Pass
4    Pass
5    Pass
6    Pass
7    Pass
8    Pass
10   Pass

Xbar Ports  Module-Type                          Model              Status
---  -----  ----------------------------------- ------------------ ----------
1    0      Fabric Module 1                     DS-X9710-FAB1      ok
2    0      Fabric Module 1                     DS-X9710-FAB1      ok
3    0      Fabric Module 1                     DS-X9710-FAB1      ok
4    0      Fabric Module 1                     DS-X9710-FAB1      ok
5    0      Fabric Module 1                     DS-X9710-FAB1      ok
6    0      Fabric Module 1                     DS-X9710-FAB1      ok

Xbar Sw               Hw
---  ---------------  ------
1    NA               1.0
2    NA               1.0
3    NA               1.0
4    NA               1.0
5    NA               1.0
6    NA               1.0

Xbar MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    NA                                      JAE222305VS
2    NA                                      JAE2217096X
3    NA                                      JAE222305V5
4    NA                                      JAE2217096L
5    NA                                      JAE2217096J
6    NA                                      JAE222305V8
```

Sample output for the show inventory command on the Supervisor-4 Module:

```
switch# show inventory

NAME: "Chassis",  DESCR: "MDS 9710 (10 Slot) Chassis "
PID: DS-C9710           ,  VID: V00,  SN: JAF1647AQTL

NAME: "Slot 1",  DESCR: "1/10 Gbps Ethernet Module"
PID: DS-X9848-480K9     ,  VID: V01,  SN: JAF1718AAAD

NAME: "Slot 2",  DESCR: "2/4/8/10/16 Gbps Advanced FC Module"
PID: DS-X9448-768K9     ,  VID: V02,  SN: JAE1847038X

NAME: "Slot 3",  DESCR: "40 Gbps FCoE Module"
PID: DS-X9824-960K9     ,  VID: V00,  SN: JAE19330ASN

NAME: "Slot 4",  DESCR: "4/8/16/32 Gbps Advanced FC Module"
PID: DS-X9648-1536K9    ,  VID: V01,  SN: JAE203901ZG
```

```
NAME: "Slot 5",  DESCR: "Supervisor Module-3"
PID: DS-X97-SF1-K9      ,  VID: V02,  SN: JAE194005JC

NAME: "Slot 6",  DESCR: "Supervisor Module-3"
PID: DS-X97-SF1-K9      ,  VID: V02,  SN: JAE17440HVB

NAME: "Slot 7",  DESCR: "1/10/40G IPS,2/4/8/10/16G FC Module"
PID: DS-X9334-K9        ,  VID: V00,  SN: JAE195004XM

NAME: "Slot 8",  DESCR: "4/8/16/32 Gbps Advanced FC Module"
PID: DS-X9648-1536K9    ,  VID: V01,  SN: JAE213101Q3

NAME: "Slot 10",  DESCR: "2/4/8/10/16 Gbps Advanced FC Module"
PID: DS-X9448-768K9     ,  VID: V01,  SN: JAE180605X3

NAME: "Slot 11",  DESCR: "Fabric card module"
PID: DS-X9710-FAB1      ,  VID: V00,  SN: JAE222305VS

NAME: "Slot 12",  DESCR: "Fabric card module"
PID: DS-X9710-FAB1      ,  VID: V00,  SN: JAE2217096X

NAME: "Slot 13",  DESCR: "Fabric card module"
PID: DS-X9710-FAB1      ,  VID: V00,  SN: JAE222305V5

NAME: "Slot 14",  DESCR: "Fabric card module"
PID: DS-X9710-FAB1      ,  VID: V00,  SN: JAE2217096L

NAME: "Slot 15",  DESCR: "Fabric card module"
PID: DS-X9710-FAB1      ,  VID: V00,  SN: JAE2217096J

NAME: "Slot 16",  DESCR: "Fabric card module"
PID: DS-X9710-FAB1      ,  VID: V00,  SN: JAE222305V8

NAME: "Slot 35",  DESCR: "MDS 9710 (10 Slot) Chassis Power Supply"
PID: DS-CAC97-3KW        ,  VID: V01,  SN: DTM164602XH

NAME: "Slot 37",  DESCR: "MDS 9710 (10 Slot) Chassis Power Supply"
PID: DS-CAC97-3KW       ,  VID: V01,  SN: DTM1649022W

NAME: "Slot 38",  DESCR: "MDS 9710 (10 Slot) Chassis Power Supply"
PID: DS-CAC97-3KW       ,  VID: V01,  SN: DTM16490239

NAME: "Slot 39",  DESCR: "MDS 9710 (10 Slot) Chassis Power Supply"
PID: DS-CAC97-3KW       ,  VID: V01,  SN: DTM164602ZP

NAME: "Slot 41",  DESCR: "MDS 9710 (10 Slot) Chassis Fan Module"
PID: DS-C9710-FAN       ,  VID: V00,  SN: JAF1647ADCE

NAME: "Slot 42",  DESCR: "MDS 9710 (10 Slot) Chassis Fan Module"
PID: DS-C9710-FAN       ,  VID: V00,  SN: JAF1647ADCN

NAME: "Slot 43",  DESCR: "MDS 9710 (10 Slot) Chassis Fan Module"
PID: DS-C9710-FAN       ,  VID: V00,  SN: JAF1647ACHH
```

Sample output for the show interface brief command on the Supervisor-4 Module:

```
switch# show interface brief
--------------------------------------------------------------------------------

Interface  Vsan   Admin  Admin   Status       SFP    Oper  Oper   Port     Logical
```

```
                  Mode   Trunk                       Mode  Speed  Channel   Type
                         Mode                              (Gbps)
--------------------------------------------------------------------------------

fc1/1       1      E      on      trunking     swl      TE   16     1         core
fc1/2       1      E      on      trunking     swl      TE   16     1         core
fc1/3       1      E      on      trunking     swl      TE   16     1         core
fc1/4       1      E      on      trunking     swl      TE   16     1         core
fc1/5       1      E      on      trunking     swl      TE   16     1         core
fc1/6       1      E      on      notConnected swl      --   --    --         --
fc1/7       20     auto   off     up           swl      F     8    --         edge
fc1/8       20     F      off     up           swl      F     16   --         edge
```

Sample output for the show interface status command on the Supervisor-4 Module:

```
switch# show interface status
fc1/1  is down  (SFP not present)
fc1/2  is down  (Administratively down)
fc1/3  is down  (Error disabled - SFP vendor not supported)
fc1/4  is down  (Error disabled - SFP vendor not supported)
fc1/5  is down  (Administratively down)
fc1/6  is down  (Administratively down)
fc1/7  is down  (SFP not present)
fc1/8  is down  (SFP not present)
fc1/9  is down  (SFP not present)
fc1/10  is down  (SFP not present)
fc1/11  is down  (Administratively down)
fc1/12  is down  (Administratively down)
fc1/13  is down  (SFP not present)
fc1/14  is down  (SFP not present)
fc1/15  is down  (Administratively down)
fc1/16  is down  (Administratively down)
fc1/17  is down  (SFP not present)
fc1/18  is down  (SFP not present)
fc1/19  is down  (SFP not present)
fc1/20  is down  (SFP not present)
```

Sample output for the show system redundancy status command on the Supervisor-4 Module:

```
switch# show system redundancy status

Redundancy mode
---------------
administrative: HA
operational: HA
This supervisor (sup-6)
-----------------------
Redundancy state: Active
Supervisor state: Active
Internal state: Active with HA standby
Other supervisor (sup-5)
-----------------------
Redundancy state: Standby
Supervisor state: HA standby
Internal state: HA standby
```

Troubleshooting

This section lists the error messages that may come up on the console during the migration along with the recommended action to be performed.

Problem Setting boot parameters for supervisor migration process returned error:

```
switch %BOOTVAR-2-SUP_MIGRATION_CONFIG_ERROR: Setting boot parameters for
supervisor migration process returned error.
```

Solution Set the boot variables manually using the **boot kickstart** *kickstart_image* command and **boot system** *system_image* on the Supervisor-4 Module.

Problem The kickstart or system image is not present on the bootflash of the active Supervisor-4 Module. The following syslog message is displayed:

```
 switch %BOOTVAR-2-SUP_MIGRATION_IMAGE_DOES_NOT_EXIST: System image doesn't exist on
bootflash of the supervisor.Please clear some space in bootflash, copy the Supervisor-4
images manually, set the boot variables and save configs before replacing Standby Supervisor-3
 (DS-X97-SF1-K9)
```

Solution Clear space on the bootflash and then copy the Supervisor-4 Module images manually, as shown in Step 3 in the migration procedures given above. Set the boot variables and save the configuration before replacing the standby Supervisor-1 Module. Use the **boot kickstart** *kickstart_image* command and the **boot system** *system_image* command on the active Supervisor-4 Module when it becomes active after the migration is completed.

Problem The newly inserted Supervisor-4 Module cannot take over as the active supervisor. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor-4 (DS-X97-SF4-K9) cannot take over as active
 Supervisor...
```

Solution Wait for the next retry attempt by the switch to bring up the Supervisor-4 Module.

Problem The migration logging file is already present in the Supervisor-1 Module. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> WARNING!!! Migration logging file already exists in Supervisor-3

(DS-X97-SF1-K9), continuing migration...
```

Solution None. The **show logging onboard migration status** command is used to monitor the migration progress. There is no impact on the migration process.

Problem The switch cannot initiate migration logging due to insufficient file permissions. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> WARNING!!! Migration logging cannot be done
due to file permission error, continuing migration...
```

Solution None. The **show logging onboard migration status** command is used to monitor the migration progress. This error message is displayed if the appropriate file permissions have not been provided.

Problem The active Supervisor-1 Module is using the redundant secondary EOBC link instead of the primary EOBC link. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Active Supervisor-3 (DS-X97-SF1-K9) is using Redundant

EOBC link, this indicates some problem with Primary EOBC link, aborting migration...
```

Solution Replace the active Supervisor-1 Module with another Supervisor-1 Module.

Problem Unable to extract the image header from the kickstart or system images. The following syslog messages are displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Image header extraction failed for Kickstart image
<kickstart_image> of
Supervisor-4 (DS-X97-SF4-K9), aborting migration...
<Tue Apr 30 10:02:47 2019> ERROR!!! Image header extraction failed for System image
<system_image> of
Supervisor-4 (DS-X97-SF1-K9), aborting migration...
```

Solution Use the migration command again.

Problem Unable to retrieve the kickstart or system image information. The following syslogs are displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Failed to get Kickstart image info, aborting migration...

<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to get System image info, aborting migration...
```

Solution Use the migration command again.

Problem The kickstart or system images provided are not valid images for the Supervisor-4 Modules. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Kickstart image provided '<kickstart_image>' is not a
valid Supervisor-4
(DS-X97-SF4-K9) image, aborting migration...
<Tue Apr 30 10:02:47 2019> ERROR!!! System image provided '<system_image>' is not a valid
Supervisor-4
(DS-X97-SF4-K9) image, aborting migration...
```

Solution Use a valid Supervisor-4 Module image and use the migration command again.

Problem The release versions of the Supervisor-4 Module kickstart and system images provided are not the same as the existing Supervisor-1 Module kickstart and system images. The following syslog messages are displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Running kickstart version : <running_version>,
version of kickstart image
provided : <Supervisor-3_image_version>
<Tue Apr 30 10:02:47 2019> ERROR!!! Version of kickstart image provided
('<sup3_image_version>') does not match running
version, aborting migration...
<Tue Apr 30 10:02:47 2019> ERROR!!! Running System version: <running_version>, version of
system image provided :
<Supervisor- 3_image_version>
<Tue Apr 30 10:02:47 2019> ERROR!!! Version of system image provided ('<sup3_image_version>')
 does not match
running version, aborting migration...
```

Solution Check the image version. The release versions of the Supervisor-4 Module kickstart and system images provided should be the same as the existing Supervisor-1 Module kickstart and system images.

Problem Unable to retrieve the chassis information. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Chassis information retrieve failed, aborting migration...
```

Solution Use the migration command again.

Problem Unable to retrieve the slot number of the supervisor module. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor slot information retrieve failed, aborting
 migration...
```

Solution Use the migration command again.

Problem The release versions of the Supervisor-4 Module kickstart and system images provided are not the same as the existing Supervisor-1 Module kickstart and system images. The following syslog messages are displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Running kickstart version : <running_version>,
version of kickstart image provided :
<Supervisor-3_image_version>
<Tue Apr 30 10:02:47 2019> ERROR!!! Version of kickstart image provided
('<sup3_image_version>') does not match running version,
aborting migration...
<Tue Apr 30 10:02:47 2019> ERROR!!! Running System version: <running_version>, version of
system image provided :
<Supervisor- 3_image_version>
<Tue Apr 30 10:02:47 2019> ERROR!!! Version of system image provided ('<sup3_image_version>')
 does not match running version,
aborting migration...
```

Solution Check the image version. The release versions of the Supervisor-4 Module kickstart and system images provided should be the same as the existing Supervisor-1 Module kickstart and system images.

Problem Unable to retrieve the chassis information. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Chassis information retrieve failed, aborting
migration...
```

Solution Use the migration command again.

Problem Unable to retrieve the slot number of the supervisor module. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor slot information retrieve failed, aborting
migration...
```

Solution Use the migration command again.

Problem Unable to retrieve the slot number of the standby supervisor module. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Standby Supervisor slot information retrieve failed,
aborting migration...
```

Solution Use the migration command again.

Problem In case the migration command cannot read the stored Supervisor-1 Module image links, the migration process fails. The following syslog messages are displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Kickstart image link for Active
Supervisor-1 (DS-X97-SF1-K9) could not be found, aborting migration...
<Tue Apr 30 10:02:47 2019> Please set the boot parameters using 'boot kickstart
<kickstart_image>' and 'boot system <system_image>'
<Tue Apr 30 10:02:47 2019> ERROR!!! System image link for Active Supervisor-1
(DS-X97-SF1-K9) could not be found, aborting migration...
<Tue Apr 30 10:02:47 2019> Please set the boot parameters using 'boot kickstart
<kickstart_image>' and 'boot system <system_image>'
```

Solution Set the Supervisor-1 Module image links using the **boot kickstart** *kickstart_image* command and the **boot system** *system_image* command before re-inserting the standby Supervisor-4 Module.

Problem The Supervisor-4 Module is already present in the standby slot before initiating the migration procedure. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor-4 is already inserted in
standby slot <slot_number> before starting migration. Please remove Standby supervisor
and start single Supervisor migration, aborting migration...
```

Solution Remove the standby Supervisor-4 Module and start the migration process again.

Problem The standby Supervisor-1 Module is not in the HA-standby state. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Standby Supervisor-3 (DS-X97-SF1-K9)
is not yet in ha-standby state, aborting migration...
<Tue Apr 30 10:02:47 2019> Please wait for Standby supervisor in slot <slot_number>
to become ha-standby or physically remove standby and start migration
```

Solution Wait until the standby Supervisor-1 Module comes up in the HA-standby state or remove the standby Supervisor-1 Module and perform a single supervisor migration.

Problem In case of a dual supervisor migration, the standby Supervisor-1 Module is powered down by using the **out-of-service** < *slot-number* > command. If the standby Supervisor-1 Module does not power down after using this command, the following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Failed to power down Standby
Supervisor-3 in slot <slot_number>, aborting migration...
```

Solution Use the migration command again.

Problem Unable to lock the configuration. The following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to lock config, aborting migration...
```

Solution Use the migration command again.

Problem In case a auto-boot is not disabled before the insertion of the Supervisor-4 Module, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Standby Supervisor config failed, aborting migration...
```

Solution Use the migration command again.

Problem After powering down the Supervisor-1 Module, the switch will check for the presence of a module in the slot from which the Supervisor-1 Module was removed. This check happens every 30 minutes after the Supervisor-1 Module has been removed. In case this check to detect the presence of the supervisor module fails, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Module information retrieve failed
```

Solution None. There is no impact on the migration process.

Problem A Supervisor-1 Module is inserted instead of a Supervisor-4 Module. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor-1 (DS-X97-SF1-K9) is inserted in slot
<slot_number> instead of
Supervisor-4 (DS-X97-SF4-K9), aborting migration...
```

Solution Restart migration and ensure that the newly inserted supervisor module is the Supervisor-4 Module.

Problem In case the Supervisor-4 Module is not inserted into the standby slot within 30 minutes after the Supervisor-1 Module has been powered down, the following syslog message is displayed:

```
module
<Tue Apr 30 10:02:47 2019> ERROR!!! Timeout waiting for Supervisor-4 (DS-X97-SF4-K9)
to be inserted in slot <slot_number>, aborting migration...
```

Solution Use the migration command again and ensure that the Supervisor-4 Module is inserted into the standby slot within 30 minutes after the Supervisor-1 Module has been powered down.

Problem Unable to create image links for the Supervisor-4 Module images. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Supervisor-4 (DS-X97-SF4-K9) image links
could not be created for Standby Supervisor bootup, aborting migration...
```

Solution Use the migration command again.

Problem Unable to reload the Supervisor-4 Module after the Supervisor-4 Module is detected in the switch. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Failed to reload
Standby Supervisor-4 (DS-X97-SF4-K9), aborting migration...
```

Solution Remove the Supervisor-4 Module from the standby slot and restart migration by using the migration command.

Problem The Supervisor-4 Module is stuck in loader prompt due to a boot failure. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Standby Supervisor-4
(DS-X97-SF4-K9) is stuck in loader prompt due to boot-up failure...
```

Solution None. A retry attempt to bring up the Supervisor-4 Module is initiated by the switch every 15 minutes for 3 times.

Problem The Supervisor-4 Module is unable to come online. The following syslog message is displayed:

```
 <Tue Apr 30 10:02:47 2019> ERROR!!! Standby Supervisor-4
(DS-X97-SF4-K9) could not come online...
```

Solution None. A retry attempt to bring up the Supervisor-4 Module is initiated by the switch every 15 minutes.

Problem The supervisor module fails to come online. The following syslogs are displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Timeout waiting for Supervisor-4
(DS-X97-SF4-K9) to come online, aborting migration...
<Tue Apr 30 10:02:47 2019> Powering down Supervisor-4 (DS-X97-SF4-K9) in slot <slot_number>
```

Solution Use the migration command again.

Problem The Supervisor-1 Module image links are not restored on the active Supervisor-1 Module before the switchover to Supervisor-4 Module is initiated. The following syslogs are displayed before saving configuration:

```
<Tue Apr 30 10:02:47 2019> WARNING!!! Error resetting original Supervisor-3 (DS-X97-SF1-K9)

image links, continuing migration...
<Tue Apr 30 10:02:47 2019> WARNING!!! Please set the boot variables manually before inserting
 back
Supervisor-3 (DS-X97-SF1-K9) in standby slot <slot_number>, continuing migration...
```

Solution Use the migration command again.

Problem The **copy r s** command fails on the active Supervisor-1 Module before the switchover to the Supervisor-4 Module is initiated. The following syslog is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR!!! Failed to save configuration, aborting migration...
```

Solution Use the migration command again.

Problem The switchover fails on the active Supervisor-1 Module before the switchover to the Supervisor-4 Module is initiated. The following syslog is displayed:

```
<Tue Apr 30 10:02:47 2019> ERROR !! Switchover failed, aborting migration...
```

Solution Use the migration command again.

Problem In case the Supervisor-4 Module is not inserted within 30 minutes after executing the migration command, the switch will try to power up the powered down Supervisor-1 Module in the standby slot on reaching the timeout of 30 minutes. If the standby Supervisor-1 Module fails to power up, the following syslog message is displayed before aborting migration:

```
<Tue Apr 30 10:02:47 2019> ERROR !!! Failed to power up Standby Supervisor,
Please power up manually using "no poweroff module <slot_num>" from config mode
```

Solution Use the **no poweroff module** *slot_number* configuration command on the active Supervisor-4 Module to bring up the powered down standby Supervisor-1 Module.

Problem Setting of the boot variable parameters fails after migration when the Supervisor-4 Module becomes active supervisor. The following syslog is displayed:

```
BOOTVAR-2-SUP_MIGRATION_CONFIG_ERROR
Setting boot parameters for supervisor migration process returned error.
Please set the boot variables manually using
'boot kickstart <kickstart_image>' and 'boot system <system_image>' and save configs"
```

Solution Use the **boot kickstart** *kickstart_image* and the **boot system** *system_image* configuration commands on the active Supervisor-4 Module when it becomes active after the migration has been completed.

Problem Migration fails on Supervisor-4 Module because of insufficient bootflash file space on the Supervisor-4 Module. The following syslog is displayed:

```
2019 Apr 2 08:47:43 switch %FS-STANDBY-DAEMON-2-FSD_ENOSPC_BOOTFLASH:
Due to insufficient space, system image could not be copied to standby bootflash.
system image is not present on standby. Please copy 'm9700-sf4ek9-mz.8.4.1.bin' manually.
Standby supervisor not yet online. This might take sometime. Please wait...
```

Solution Check the reason behind the insufficient space in the Supervisor-4 Module. After identifying the cause, delete sufficient files to free up enough space for the migration.

Supervisor-4 Migration Clean Up

This section describes how to clean up if the supervisor migration process fails.

In case any migration clean-up errors have been detected on the Supervisor-1 Module, the following syslog message is displayed:

```
<Tue Apr 30 10:02:47 2019> Please run 'migrate clean' before doing any operation.
```

In such a scenario, use the **migrate clean up** command to resolve the errors.

```
 switch# migrate clean up
<Tue May 28 03:34:58 2019> Manual-boot is disabled for Standby Supervisor
<Tue May 28 03:34:58 2019> Migration clean up done
```

In case any migration clean-up errors have been detected on the Supervisor-4 Module, the following syslog message is displayed:

```
 BOOTVAR-2- MIGRATION_CONFIG_CLEAN_ERROR: Please run 'migrate clean' command from active
Supervisor before replacing the standby Supervisor.
```

In such a scenario, use the **migrate clean up** command to resolve the errors.

```
switch# migrate clean up
<Tue May 28 03:34:58 2019> Migration clean up done
```

In case the **migrate clean up** command is used on a Supervisor-1 Module or a Supervisor-4 Module for which migration has not been initiated, the following syslog is displayed:

```
switch# migrate clean up
<Tue May 28 03:34:58 2019> Migration was not done on this Supervisor
```

Disruptive Migration from Supervisor-1/1E to Supervisor-4 Modules

To perform a disruptive migration from Supervisor-1/Supervisor-1E Modules to Supervisor-4 Modules, follow these steps:

Before you begin

Note the following guidelines before migrating from a Supervisor-1/Supervisor-1E Module to a Supervisor-4 Module:

- You cannot mix Supervisor-1/Supervisor-1E Module and Supervisor-4 Module in a production environment.
- Supervisor-4 Modules (DS-X97-SF4-K9=) are spare components and are shipped without pre-installed NX-OS software
- All NX-OS Kickstart and System images for the Supervisor-4 modules begin with m9700-sf4ek9-.
- Ensure the NX-OS Kickstart and System images are available on a TFTP server or copied to a USB drive (usb1:) before proceeding.

Procedure

Step 1 Insert a USB drive in the usb1 or the slot0 USB port on the active Supervisor-1 Module. This USB drive will be used to copy configuration files. The following procedure will use usb1: port.

Step 2 Format the drive by using the **format** command.

```
switch(config)# format usb1:
```

Step 3 Back up the running configuration from the current active supervisor module (DS-X97-SF1-K9 or or DS-X97-SF1E-K9) to the FTP, SFTP, TFTP server, or a USB flash drive.

```
switch# copy running-config sftp://192.0.2.1/$(SWITCHNAME)_runningconfiguration.txt
Enter username: test
Connected to 192.0.2.1.
Uploading /var/tmp/vsh/switch-running-config to /runningconfiguration.txt
Copy complete.
switch(config)# copy running-config usb1:runningconfiguration.txt
Copy complete, now saving to disk (please wait)
```

Note
`runningconfiguration.txt` is a filename variable.

Step 4 Copy the NX-OS Kickstart and System images to the usb1: drive. Or ensure the images are accessible via TFTP.

Note
```
switch# copy bootflash:m9700-sf4ek9-kickstart-mz.8.4.2f.bin usb1:
switch# copy bootflash:m9700-sf4ek9-mz.8.4.2f.bin usb1:
```

You must use the tar extension for the archive file. This file will contain all the license files that were installed on the Supervisor-1 Module.

Ignore this step if you are using NX-OS version 9.2(2) or later. Smart Licensing with Policy is introduced for NX-OS version 9.2(2). With Smart Licensing, the switch synchronizes with CSSM after booting up, automatically installing the licenses.

Step 5 Back up the installed licenses from the switch to a USB drive by using the copy licenses command. To view the current licenses installed on the switch, use the show license command.

```
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
switch# copy licenses usb1:licenses_archive_file_name.tar
```

Note
You must use the tar extension for the archive file. This file contains all the license files that are installed on the Supervisor-1 Module.

Step 6 Back up the output of the show tech-support details command to a remote server using an FTP, TFTP, SFTP, SCP server, or a USB flash drive.

```
switch# show tech-support details > scp://test@192.0.2.1/test/$(SWITCHNAME)_showtechsupport.txt
switch# show tech-support details > usb1:$(SWITCHNAME)_showtechsupport.txt
```

Note
$(SWITCHNAME) adds the switch's switchname to the filename.

Step 7 Power off the switch. Turn off the power to the switch, using the power switch, on each of the power supplies. The Output LED turns off on each power supply and the Status LEDs turn off on all the supervisor and I/O modules.

Caution
If any of the supervisor or I/O module Status LEDs is turned on (showing any color), stop at this step until you are able to turn off those modules.

Step 8 For each Supervisor-1 Module installed in the switch, remove the module and replace it with a Supervisor-4 Module.

Caution
If the switch has two supervisor modules, ensure that both the supervisors are of the same type. Do not mix Supervisor-1 Module with Supervisor-4 Modules.

Step 9 Power on the switch. Turn the power switches on the power supplies to the on position.

Step 10 Connect a console to the active supervisor module as explained in the Connecting to the Console Port.

Step 11 The Supervisor-4 Module will boot to the loader> prompt because it does not have a kickstart or system image loaded. Perform one of the following:

- Boot from USB: If you copied the kickstart and system images to the usb1: drive, proceed to the next step.
- Boot from TFTP:

  Configure network settings:

  ```
  loader> set ip <switch_ip>
  loader> set gateway <gateway_ip>
  loader> set netmask <netmask>
  ```

  Boot the kickstart image:

  ```
  loader> boot tftp://<tftp_server_ip>/m9700-sf4ek9-kickstart-mz.8.4.2f.bin
  ```

Step 12 After booting from the kickstart image, copy the system and kickstart images from the USB drive to the bootflash.

```
switch(boot)# copy usb1:m9700-sf4ek9-kickstart-mz.8.4.2f.bin bootflash:
switch(boot)# copy usb1:m9700-sf4ek9-mz.8.4.2f.bin bootflash:
```

Step 13 Configure the boot variables.

```
switch(boot)# config t
switch(boot)(config)# boot kickstart bootflash:m9700-sf4ek9-kickstart-mz.8.4.2f.bin
switch(boot)(config)# boot system bootflash:m9700-sf4ek9-mz.8.4.2f.bin
switch(boot)(config)# exit
```

Step 14 Save the configuration and reload the switch.

```
switch(boot)# copy running-config startup-config
switch(boot)# reload
```

Step 15 After the switch reloads, verify that the switch is running the required version of the Cisco MDS NX-OS software by using the **show version** command.

Note
If the version of the Cisco MDS NX-OS is not the same as you intended to use, perform an upgrade to the appropriate version. To upgrade an image version on the switch, refer to the respective Upgrade and Downgrade guides.

Step 16 If you are using NX-OS versions earlier than 9.2(2), reinstall the license files on the new Supervisor-4 Module

```
switch(config)# copy usb1:licenses_archive_file_name.tar bootflash:switch_license.tar
Copy progress 100% 10KB
Copy complete, now saving to disk (please wait)...
switch(config)# tar extract bootflash:switch_license.tar
switch(config)# install license bootflash:<license_file>.lic
Copy progress 100% 10KB
Copy complete, now saving to disk (please wait)...
switch(config)# install license bootflash:switch_license.lic
Installing license.....................done
switch# show license usage
Feature                      Ins  Lic   Status     Expiry Date           Comments
                                  Count
--------------------------------------------------------------------------------
IOA_X9334                     No   0       In use     Grace 115D 2H
FM_SERVER_PKG                 No   -       Unused     -
MAINFRAME_PKG                 No   -       Unused     -
ENTERPRISE_PKG                Yes  -       Unused     never
SAN_ANALYTICS_PKG             No   -       In use     Grace 119D 20H
SAN_TELEMETRY_PKG             No   -       Unused     Grace 109D 1H
```

Ignore this step if you are using NX-OS version 9.2(2) or later. Smart Licensing with Policy is introduced for NX-OS version 9.2(2). With Smart Licensing, the switch synchronizes with CSSM after booting up, automatically installing the licenses.

Step 17 Verify that all I/O modules are online and that the standby supervisor is in HA-standby mode by using the show module command.

The following is a sample output for the show module command on the Supervisor-4 Module:

```
switch# show module

Mod Ports Module-Type                          Model              Status
--- ----- ------------------------------------ ------------------ ----------
1   48    4/8/16/32 Gbps Advanced FC Module    DS-X9648-1536K9    ok
2   48    2/4/8/10/16 Gbps Advanced FC Module  DS-X9448-768K9     ok
5   0     Supervisor Module-4                  DS-X97-SF4-K9      ha-standby
6   0     Supervisor Module-4                  DS-X97-SF4-K9      active *
7   24    40 Gbps FCoE Module                  DS-X9824-960K9     ok
8   48    1/10 Gbps Ethernet Module            DS-X9848-480K9     ok
9   48    1/10 Gbps Ethernet Module            DS-X9848-480K9     ok

Mod Sw            Hw
--- --------------- ------
1   8.4(2f)          1.1
2   8.4(2f)          1.3
5   8.4(2f)          1.0
6   8.4(2f)          1.0
7   8.4(2f)          1.0
8   8.4(2f)          1.1
9   8.4(2f)          1.1

Mod MAC-Address(es)                         Serial-Num
--- --------------------------------------- ----------
1   78-ba-f9-c4-c9-88 to 78-ba-f9-c4-c9-8b   JAF1718AAAD
2   f4-cf-e2-7c-cd-30 to f4-cf-e2-7c-cd-33   JAE1847038X
3   04-6c-9d-32-36-aa to 04-6c-9d-32-37-1b   JAE19330ASN
4   00-76-86-bf-58-23 to 00-76-86-bf-58-57   JAE203901ZG
5   00-2f-5c-fc-54-0a to 00-2f-5c-fc-54-1d   JAE22440CB1
6   00-2f-5c-fc-81-b4 to 00-2f-5c-fc-81-c7   JAE22490XKJ
7   00-da-55-a2-25-00 to 00-da-55-a2-25-0f   JAE195004XM
8   74-86-0b-33-c6-70 to 74-86-0b-33-c6-a4   JAE213101Q3
10  3c-0e-23-c5-53-d0 to 3c-0e-23-c5-53-d3   JAE180605X3

Mod Online Diag Status
--- ------------------
1   Pass
2   Pass
3   Pass
4   Pass
5   Pass
6   Pass
7   Pass
8   Pass
10  Pass

Xbar Ports Module-Type                          Model              Status
--- ----- ------------------------------------ ------------------ ----------
1   0     Fabric Module 1                      DS-X9710-FAB1      ok
2   0     Fabric Module 1                      DS-X9710-FAB1      ok
3   0     Fabric Module 1                      DS-X9710-FAB1      ok
4   0     Fabric Module 1                      DS-X9710-FAB1      ok
5   0     Fabric Module 1                      DS-X9710-FAB1      ok
6   0     Fabric Module 1                      DS-X9710-FAB1      ok
```

```
Xbar Sw           Hw
---- ---------------- ------
1    NA               1.0
2    NA               1.0
3    NA               1.0
4    NA               1.0
5    NA               1.0
6    NA               1.0
```

Note The show module command output shows that the standby supervisor is in slot 6.

Step 18 Restore the previously saved configurations by using the **copy** command to copy the configuration file in the USB drive to the running configuration.

```
switch(config)# copy usb1:configuration_file_name running-config
```

Note
If you have not inserted the standby supervisor module until now, do not insert it during this step. Instead, wait until you complete this procedure before installing the standby supervisor module.

Step 19 Save the configuration in the startup configuration by using the **copy running-config startup-config** command.

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

Installing a Switching Module

To install a switching module in the chassis, follow these steps:

Before you begin

Note When inserting a new line card into a slot, ensure the new line card is of the same model as the existing line card. If there is a mismatch in the line card models, the line card configurations are removed from the configuration file.

Procedure

Step 1 Before installing any modules in the chassis, we recommend installing the chassis in the rack. See the "Installing the Cisco MDS 9700 Series Switch on a Four-Post Rack or Cabinet" section.

Step 2 Before installing any switching modules, install at least one supervisor module.

Step 3 Choose a slot for the module and verify that there is enough clearance to accommodate any cables or interface equipment that you want to connect to the module. If possible, place modules between empty slots that contain filler panels.

Step 4 Verify that the captive screws are tightened to 8 in-lb on all modules already installed in the chassis. This ensures that the EMI gaskets are fully compressed and maximizes the opening space for the module being installed.

Step 5 If a filler panel is installed, remove the two Phillips pan-head screws from the filler panel and remove the panel. To remove a currently installed module, see Removing a Switching Module.

Step 6 Press line card ejector buttons to open both side levers to fully open position.

Step 7 Position the module in the chassis as follows:

a. Align the line card into the chassis card cage slots and push it in slowly. We recommend to push the center of line card faceplate to push the line card in.

b. Continue to push in the line card slowly into the chassis until its rear connectors touch the mid-plane surface and both ejector levers swing inward about 25 degrees. This indicates that both the ejector lever jaws are now inside the chassis jaw cutouts and the card is ready to close the ejector levers.

c. Once visually confirmed that both ejector levers are swung inward about 25 degrees, push in both ejector levers simultaneously to fully insert the line card into the chassis until they are in a mechanically locked position. Both ejector levers should be parallel to the line card faceplate when locked.

Note
Ensure that the ejector levers are fully closed before tightening the captive screws. Failure to fully seat the module in the backplane connector can result in error messages.

d. Tighten the two captive screws on the supervisor module or switching module to 8 in-lb.

What to do next

Follow these steps if the installation is for a replacement module, not a new installation:

1. Perform a module confiuration purge if the new module is different from the older module.

   Use the command `purge module x running-config`, replace x with the slot number of replaced module.

2. Bring up (no shut) the ports, if any, that were shut down when the old module was replaced.

Removing a Switching Module

You can remove one of these modules at a time while the switch is operating. To remove a switching module from the chassis, follow these steps:

Before you begin

You need a flat-blade or number 2 Phillips-head screwdriver to loosen or tighten the captive screws on the switching module.

Procedure

Step 1 Shutdown all ports in state up to minimize frame loss.

Step 2 Disconnect any network interface cables attached to the module.

Step 3 Loosen the two captive screws on the module being removed.

Step 4 Press ejector release buttons on the left and right ends of the module to push out the ejector levers and to disconnect the module.

Step 5 Simultaneously rotate the two ejector levers outward to unseat the module from the mid-plane connector.

Step 6 With a hand on each ejector, pull the module part way out of its slot in the chassis.

Step 7 Grasp the front edge of the module and slide the module partially out of the slot. Place your other hand under the module to support the weight of the module. Do not touch the module circuitry.

Step 8 Place the module on an antistatic mat or antistatic foam, or immediately reinstall it in another slot.

Step 9 If the slot will remain empty, install a filler panel to keep the chassis dust-free and to maintain proper airflow through the chassis

Verifying Installation of the Supervisor and Switching Modules

To verify the module installation, follow these steps:

Procedure

Step 1 Verify that the ejector levers of each module are fully closed (parallel to the front of the module) to ensure that the supervisor module and all switching or services modules are fully seated in the backplane connectors.

Step 2 Check the captive screws of each module, the power supply, and the fan module. Tighten any loose captive screws to 8 in-lb.

Step 3 Verify that any empty module slots have filler panels installed and that the screws holding the panels in place are tight.

Step 4 Turn on the power supply switches to power up the system and check the LEDs on the modules.

For information about how to check connectivity of modules, see the *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*.

Crossbar Fabric Switching Modules

Guidelines for Crossbar Fabric Switching Module Installation

The following table lists the recommended slots for the crossbar fabric switching modules in a Cisco MDS 9700 Series chassis, based on the total number of crossbar fabric switching modules in a chassis:

Number of Crossbar Fabric Switching Modules	Slots Number
2	1 and 2
3	1, 3, and 5
4	1, 2, 3, and 5
5	1, 2, 3, 4, and 5
6	1, 2, 3, 4, 5, and 6

Note In a Cisco MDS 9700 chassis with Cisco MDS 9000 24/10-Port SAN Extension Module (DS-X9334-K9), the chassis must have at least one online crossbar fabric switching module in the slots 1 to 5 at any point of time.

Note In a Cisco MDS 9700 chassis with Cisco MDS 9000 24/10-Port SAN Extension Module (DS-X9334-K9), if crossbar (xbar) fabric switching modules 5 and 6 are online, and you want to power down or replace module 6 nondisruptively, you have to power down/out-of-service xbar module 5 first, followed by power down/out-of-service and replace the xbar module 6.

Installing a Crossbar Fabric Switching Module

To install a crossbar fabric switching module in the Cisco MDS 9700 Series switch, follow these steps:

Before you begin

- You must follow ESD protocols, including the following:
  - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
  - You must carry electronic modules by only their covered edges or handles. Do not touch their electronic components.
  - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything nor place anything else on top of the module nor lean anything on the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:
  - ESD wrist strap (or other personal grounding device)
  - Number 1 Phillips torque screwdriver
  - Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.
- Ensure that sufficient quantity of Cisco MDS Crossbar Fabric-3 Switching Modules (6 modules are supported in a Cisco MDS 9000 Series Multilayer Director) are available for replacing the current Cisco MDS Crossbar Fabric Switching Modules in the switch.

Warning It is not supported to mix different crossbar fabric switching modules (Crossbar Fabric-1 Switching Module and Crossbar Fabric-3 Switching Module) outside a maintenance window. This mix of modules is supported only while you are migrating from Fabric-1 modules to Fabric-3 modules. After a reboot of the switch, if there is a mix of Fabric-1 and Fabric-3 modules, only the Fabric-3 modules will be powered on.

Warning Ensure that there is no loose debris (such as paper, ties, dust) around the back of the chassis when the crossbar switching modules are being removed. When the crossbar switching modules are pulled, the vacuum created can be strong enough to pull the loose debris into the chassis.

Procedure

Step 1 Shut down the crossbar fabric switching module to be replaced by using the **out-of-service xbar** *slot* command (where, *slot* refers to the external crossbar fabric switching module slot number).

Step 2 Remove the fan module that is over the crossbar fabric switching module to be removed. For more information on how to remove a fan module, see Installing and Removing Fan Modules or Trays, on page 69. Crossbar fabric switching modules are numbered 1-6, from left to right, when facing the rear of the chassis. If the system is running, remove only one fan module at a time to access the required crossbar fabric switching module.

The positioning of the fan modules and respective crossbar fabric switching modules is as follows:

Fan module 1	Fabric modules 1-2
Fan module 2	Fabric modules 3-4
Fan module 3	Fabric modules 5-6

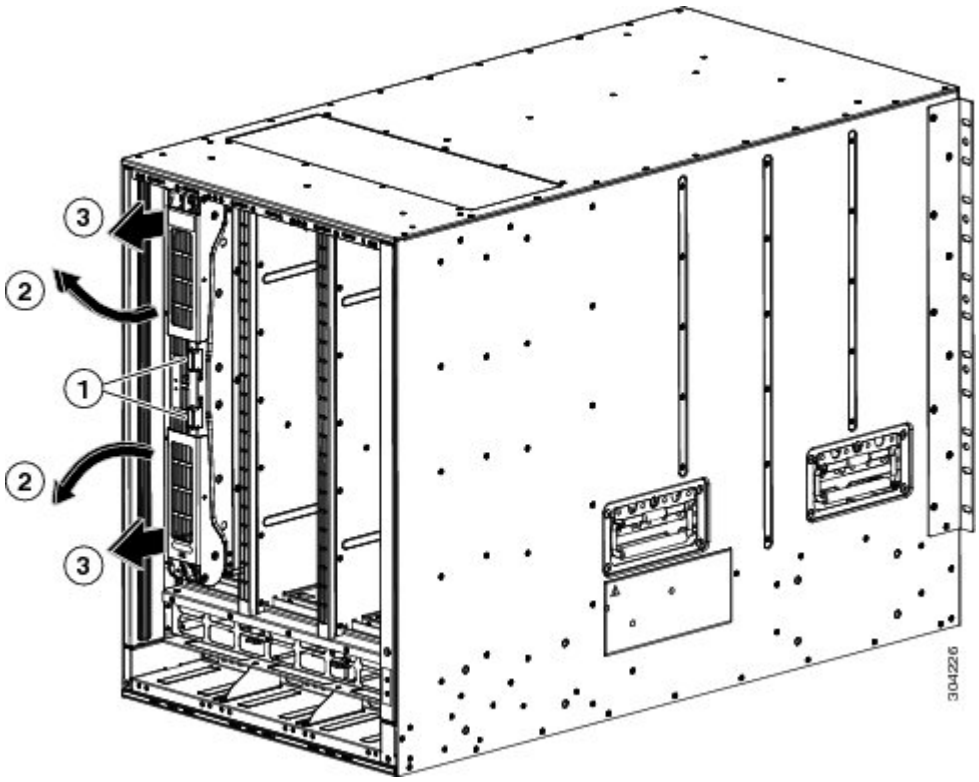
Note
The Crossbar Fabric Switching Modules functions correctly irrespective of the slot configuration. The recommended slots are provided for optimal performance and load balancing. Installing the modules in other slots will not affect the switch functionality or traffic load balancing.

Step 3 To open a fabric slot for the new fabric module, remove a fabric module as follows:

a. With your face at least 12 inches (30 cm) away from the front of the fabric module, press both ejector buttons on the front of the module (see Callout 1 in the following figure).

Caution
Keep your face away from the front of the fabric module so that the levers do not hit your face when they spring out from the front of the module.

Figure 5: Unlocking a Fabric Module from its Slot



1	Press both eject buttons.	2	Handles spring out from the module.
3	Pull the handles to partially remove the module from the slot.		

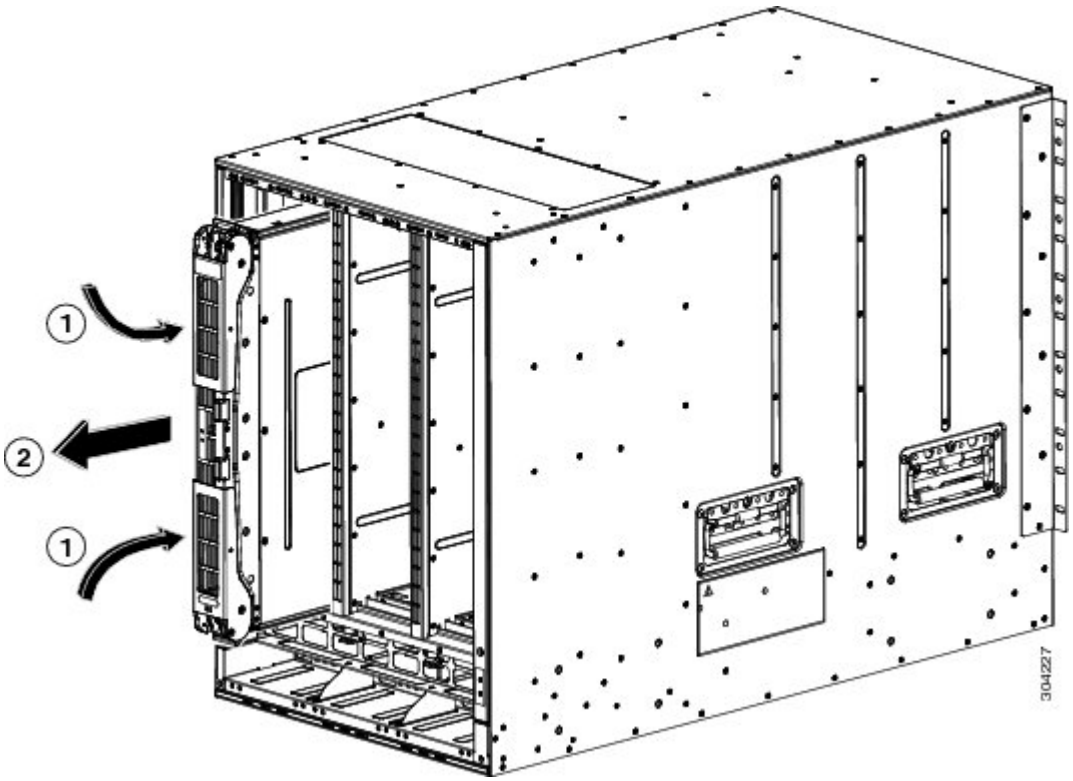
b. Grasp each of the two levers with your two hands and fully rotate the levers out 90 degrees from the fabric module.

c. Pull both levers until the fabric module is about 3 inches (7 cm) out of the chassis (see Callout 3 in the previous figure).

d. Rotate both levers back to the front of the module (see Callout 1 in the following figure).

Each lever clicks when it locks in place at the front of the module.

Figure 6: Removing the Fabric Module from its Slot



1	Rotate both levers to the front of the module until they click.	2	Pull the module out of the slot.

e. Grasp the front of the module with one hand, place the other hand under the module to support its weight, and pull the module out of the slot (see Callout 2 in the previous figure).

Caution
Be careful not to touch any electrical contacts on the back of the module. Handle only covered sides or edges of the module.

f. Place the module on an antistatic surface or inside an antistatic bag.

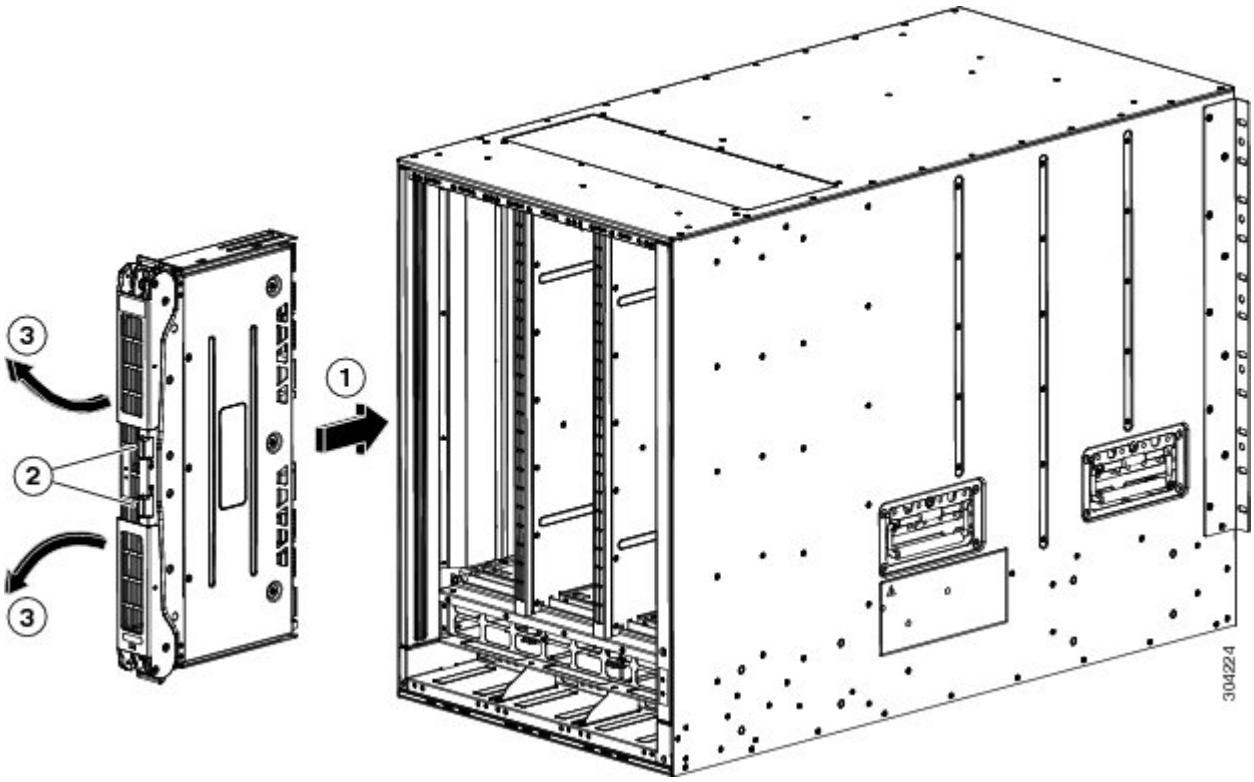
Step 4 Install the new fabric module in the chassis as follows:

a. Hold the front of the new module with one hand and place the other hand under the module.

b. Rotate the module clockwise and align the back of the module to the module guides at the top and bottom of the open fabric slot in the chassis.

c. Push the module half way into the slot (see the following figure).

Figure 7: Inserting the Fabric Module into the Chassis



1	Align the module with the guides in the open slot and push the module half way into the slot.
2	Press both eject buttons.
3	Handles spring out from the module.

d. With your face away from the fabric module, press both ejector buttons on the front of the module.

Caution
Keep your face at least 12 inches (30 cm) from the front of the fabric module so that the ejector handles do not hit your face when they spring out from the front of the module.

Both ejector handles spring out from the front of the module (see Callout 2 in the previous figure).

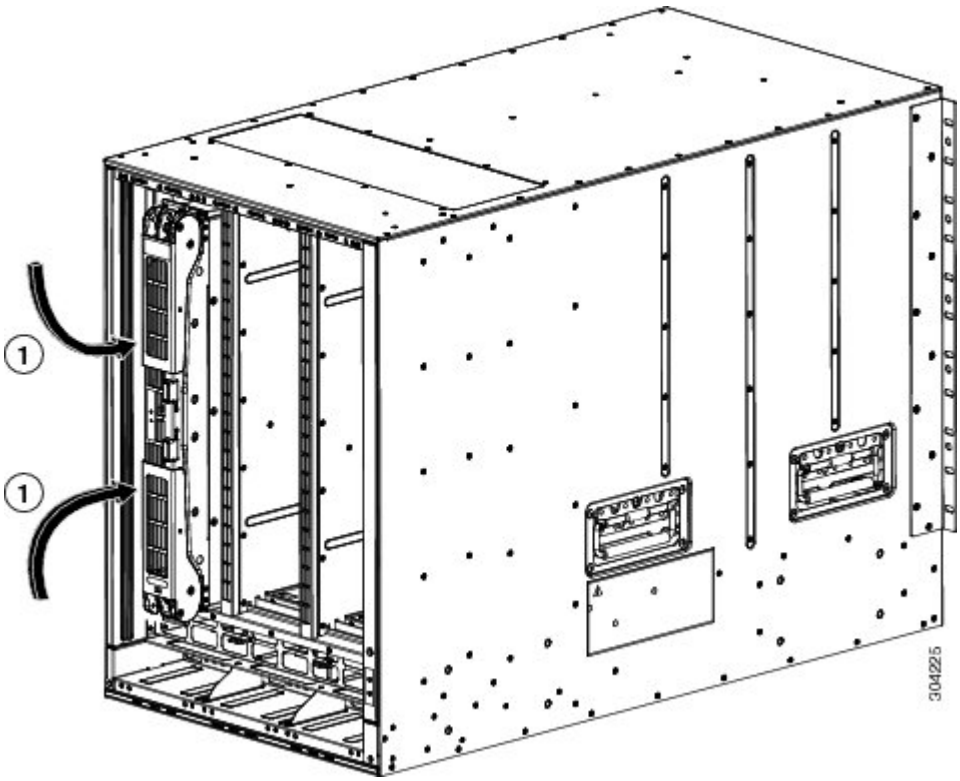
e. Grasp both handles, fully rotate the levers 90 degrees from the front of the module, and push the module all the way into the slot until it seats.

The front of the module will be about 1/4 inch out from the installed fabric modules.

f. Simultaneously rotate both handles to the front of the module while pressing the module further into the slot (see Callout 1 in the following figure).

The handles click when fully rotated to the front of the module.

Figure 8: Securing the Fabric Module to the Slot



1	Rotate the handles to the front of the module until they click.

g. Verify that the module is secured to the chassis and that you cannot remove it without pressing the eject buttons.

Step 5 Reinstall the fan module over the installed fabric module. For more information on how to install a fan module, see Installing and Removing Fan Modules.

Step 6 Verify that the Fan Status LED is green. If the LED is not green, one or more fans are faulty. If this occurs, contact your customer service representative for a replacement part.

Step 7 Wait till the first replaced module is up, follow the same procedure for all the remaining fabric modules. Perform Step 1 to Step 6 for the other modules. The new inserted fabric modules will come up.

Removing a Crossbar Fabric Switching Module

To remove a crossbar module from the Cisco MDS 9700 Series switch without compromising the integrity and availability of SANs, follow these steps:

Procedure

Step 1 Shut down the crossbar fabric module by using the out-of-service xbar slot command (where slot refers to the external crossbar fabric module slot number).

Step 2 Remove the fan module that is over the crossbar fabric module to be removed. For more information on how to remove a fan module, see Installing and Removing Fan Modules or Trays, on page 69.

Step 3 Press ejector release buttons located at the center of the crossbar module to push out the ejector levers and to disconnect the module from the backplane.

Caution
You must be cautious when the ejector levers swing open and stay open during installation and removal process.

Step 4 With a hand on each ejector, pull the module part way out of its slot in the chassis.

Step 5 Grasp the front edge of the module and slide the module partially out of the slot. Place your other hand under the module to support the weight of the module. Do not touch the module circuitry.

Step 6 Place the module on an antistatic mat or antistatic foam, or immediately reinstall it in another slot.

Nondisruptive Migration from Crossbar Fabric-1 Switching Modules to Crossbar Fabric-3 Switching Modules

This section describes the steps required to migrate all the Crossbar (XBAR) Fabric-1 Switching Modules to Crossbar Fabric-3 Switching Modules for the Cisco MDS 9000 Series Multilayer Directors.

This topic includes the following sections:

Note Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family* for important safety information.

Requirements

We recommend that you have knowledge of the Cisco NX-OS operating system CLI.

Components Used

The information in this document is based on the following software and hardware versions:

- Cisco MDS 9718 Multilayer Director (DS-C9718) with Cisco MDS NX-OS Release 8.4(2a). Cisco MDS 9710 Multilayer Director (DS-C9710), or a Cisco MDS 9706 Multilayer Director (DS-C9706) with Cisco MDS NX-OS Release 8.4(1)
- Cisco MDS 9718 Crossbar Fabric-3 Switching Module (DS-X9718-FAB3) and Cisco MDS 9718 Crossbar Fabric-1 Switching Module (DS-X9718-FAB1)

- Cisco MDS 9710 Crossbar Fabric-3 Switching Module (DS-X9710-FAB3). For Cisco MDS 9706 Multilayer Director (DS-C9706), it is Cisco MDS 9706 Crossbar Fabric-3 Switching Module (DS-X9706-FAB3).
- Cisco MDS 9710 Crossbar Fabric-1 Switching Module (DS-X9710-FAB1). For Cisco MDS 9706 Multilayer Director (DS-C9706), it is Cisco MDS 9706 Crossbar Fabric-1 Switching Module (DS-X9706-FAB1)

Prerequisites

- Ensure that the switch (Cisco MDS 9710 and Cisco MDS 9706 Multilayer Director Switch) has software release version Cisco MDS NX-OS Release 8.4(1) or later. On Cisco MDS 9718 Multilayer Director Switch, ensure that the switch is running on Cisco MDS NX-OS Release 8.4(2a) or later.

  To upgrade an image version on the switch, refer the Cisco MDS 9000 NX-OS Software Upgrade and Downgrade Guide, Release 8.x guide.
- When an MDS 9718, 9710, or 9706 chassis has 6 x Crossbar Fabric-1 Switching Modules installed, you must migrate a minimum of 3 x Crossbar Fabric-1 Switching Modules to Crossbar Fabric-3 Switching Modules, and remove the remaining 3 x Crossbar Fabric-1 Switching Modules to support full bandwidth to 32-Gbps fiber channel switching modules.
- You must follow ESD protocols, including the following:
  - You must wear a grounded ESD wristband (or other personal grounding device) whenever you handle the electronic modules outside the grounded chassis.
  - You must carry electronic modules by only their covered edges or handles. Do not touch their electronic components.
  - Whenever a module is outside a grounded chassis, place it flat on an antistatic surface or in an antistatic bag. Never lean the module on anything nor place anything else on top of the module nor lean anything on the module.
- Verify that the chassis is grounded.
- Verify that you have the following tools and equipment:
  - ESD wrist strap (or other personal grounding device)
  - Number 1 Phillips torque screwdriver
  - Manual torque screwdrivers are recommended. Be sure to never exceed the recommended torque setting for the screw that you are working with.
- Ensure that sufficient quantity of Cisco MDS Crossbar Fabric-3 Switching Modules (6 modules are supported in a Cisco MDS 9718,Cisco MDS 9710, or 9706 Multilayer Director) are available for replacing the current Cisco MDS Crossbar Fabric-1 Switching Modules in the switch.
- Perform the Fabric-1 to Fabric-3 module migration after the Supervisor-1/Supervisor-1E to Supervisor-4 Module migration is completed. A mix of Fabric-1 with Supervisor-4 Modules or Fabric-3 with Supervisor-1/Supervisor-1E Modules is supported during migration only.

Warning Mix of different crossbar fabric switching modules (Crossbar Fabric-1 Switching Module and Crossbar Fabric-3 Switching Module) outside a maintenance window, is not supported. This mix of modules is supported only while you are migrating from Crossbar Fabric-1 Switching Modules to Crossbar Fabric-3 Switching Modules. After a reboot of the switch, if there is a mix of Crossbar Fabric-1 Switching Modules and Crossbar Fabric-3 Switching Modules, only the Crossbar Fabric-3 Switching Modules will be powered on.

Performing a Nondisruptive Migration from Crossbar Fabric-1 Switching Modules to Crossbar Fabric-3 Switching Modules

To migrate a Crossbar Fabric-1 Switching Modules to Crossbar Fabric-3 Switching Modules, follow these steps:

Before you begin

The migration process should be performed during schedule maintenance period only.

Note Backward migration procedure (migrating from Cisco MDS 9000 Crossbar Fabric-3 Switching Module to Crossbar Fabric-1 Switching Module) will be disruptive.

Note Perform the Crossbar Fabric-1 Switching Module to Crossbar Fabric-3 Switching Module migration after the Supervisor-1/Supervisor-1E to Supervisor-4 Module migration is completed. A mix mode of Crossbar Fabric-1 Switching Modules with Supervisor-4 Modules and Crossbar Fabric-3 Switching Modules with Supervisor-1/Supervisor-1E Modules is not supported.

Note Once the crossbar fabric switching modules migration process is initiated, wait for the migration process to complete, do not abort the process midway.

Procedure

	Command or Action	Purpose
Step 1	Shut down the crossbar fabric switching module by using the **out-of-service xbar** *slot* command (where slot refers to the external crossbar fabric switching module slot number).	**Note** If the Crossbar Fabric-1 Switching Modules are not installed in the recommended slots, when you migrate to the Crossbar Fabric-3 Switching Modules, install the new modules in the recommended slots as described in the Guidelines for Crossbar Fabric Switching Module Installation, section. For example, if you are migrating the Crossbar Fabric-1 Switching Modules from the slots 1, 2,

	Command or Action	Purpose
		3 and 4, insert the Crossbar Fabric-3 Switching Modules in slots 1, 2, 3, and 5.
Step 2	Remove the fan module that is over the crossbar fabric switching module to be removed. Fan modules 1 to 3 are numbered left to the right. When the fan modules are installed, they cover the crossbar fabric switching modules.	Crossbar fabric switching modules are numbered 1-6, from left to right, when facing the rear of the chassis. If the system is running, remove only one fan module at a time to access the required crossbar fabric switching module. You can use the **locator-led xbar** *xbar-number* command to turn on the locator LED to assist in the fabric module identification. The positioning of the fan modules and respective crossbar fabric switching modules is as follows: For more information on how to remove a fan module, see Removing a Fan Module. Fan module 1 — Fabric modules 1-2 Fan module 2 — Fabric modules 3-4 Fan module 3 — Fabric modules 5-6
Step 3	Remove the Crossbar Fabric-1 Switching Module from the chassis and replace it with the Crossbar Fabric-3 Switching Module. Once the new module is inserted, it will automatically power up.	**Note** Only one crossbar fabric switching module should be removed at a time. Before removing the second crossbar fabric switching module, ensure that the first module is up. For more information on how to remove and install a crossbar fabric switching module, see Crossbar Fabric Switching Modules, on page 48.
Step 4	Reinstall the fan module that you removed in Step 2. For more information on how to install a fan module, see Installing a Fan Module.	
Step 5	Verify the fan status using the command **show environment fan**. Ensure the fan status is '**OK**' before proceeding.	
Step 6	Wait till the first replaced crossbar fabric switching module is up, follow the same procedure for all the remaining crossbar fabric switching modules. Ensure that the temperature of the chassis is normal, after each crossbar fabric module replacement. Use the **show environment temperature** command to view the current temperature. Perform this task sequentially for all the modules (1,2, 3, 4, 5 and 6). Perform Step 1 to Step 4 for the other modules. The latest inserted crossbar fabric switching modules will come up.	**Note** If a Crossbar Fabric-3 Switching Module migration fails, we recommend that you continue the migration process with the remaining other Crossbar Fabric-3 Switching Modules. Ensure to replace the faulty Crossbar Fabric-3 Switching Module immediately with a new one to achieve full line rate bandwidth. The following example lists the sequence to replace the Crossbar Fabric-1 Switching Modules with the Crossbar Fabric-3 Switching Modules, when the existing modules are not in the recommended slots:

	Command or Action	Purpose

		`switch# show module xbar`
		
		`Xbar Ports  Module-Type  Model  Status`
		`---  -----  ----------  ----------`
		`1  0  Fabric Module 1  DS-X9710-FAB1  ok`
		`2  0  Fabric Module 1  DS-X9710-FAB1  ok`
		`3  0  Fabric Module 1  DS-X9710-FAB1  ok`
		`4  0  Fabric Module 1  DS-X9710-FAB1  ok`
		
		a. Shut down the Crossbar Fabric-1 Switching Module in slot 1, using the **out-of-service xbar** *slot* command.
		
		b. Remove the fan module 1 over the Crossbar Fabric-1 Switching Modules in slots 1-2.
		
		c. Physically remove and replace the Crossbar Fabric-1 Switching Module in slot 1 with a Crossbar Fabric-3 Switching Module.
		
		d. Install the fan module 1 over the crossbar fabric switching modules in slots 1-2.
		
		e. Verify the fan status using the command **show environment fan**. Ensure the fan status is '**OK**' before proceeding.
		
		f. Follow Step a. to Step d. to replace the Crossbar Fabric-1 Switching Module in slot 2.
		
		g. Shut down the Crossbar Fabric-1 Switching Module in slot 3, using the **out-of-service xbar** *slot* command.
		
		h. Remove the fan module 2 over the Crossbar Fabric-1 Switching Modules in slots 3-4.
		
		i. Physically remove and replace the Crossbar Fabric-1 Switching Module in slot 3 with a Crossbar Fabric-3 Switching Module.
		
		j. Install the fan module 2 over the crossbar fabric switching modules in slots 3-4.
		
		k. Follow Step f to Step i to replace the Crossbar Fabric-1 Switching Module in slot 4.
		
		l. Shut down the Crossbar Fabric-1 Switching Module in slot 5, using the **out-of-service xbar** *slot* command.
		
		m. Remove the fan module 3 over the Crossbar Fabric-1 Switching Modules in slots 5-6.

	Command or Action	Purpose
		n. Physically remove and replace the Crossbar Fabric-1 Switching Module in slot 5 with a Crossbar Fabric-3 Switching Module. **o.** Install the fan module 3 over the crossbar fabric switching modules in slots 5-6. **p.** Follow Step k to Step n to replace the Crossbar Fabric-1 Switching Module in slot 2.

Verification

Use the **show module xbar** command to verify the module type and module status.

```
switch# show module xbar

Xbar Ports  Module-Type                          Model              Status
---  -----  ----------------------------------- ------------------ ----------
1    0      Fabric Module 3                     DS-X9710-FAB3     ok
2    0      Fabric Module 3                     DS-X9710-FAB3     ok
3    0      Fabric Module 3                     DS-X9710-FAB3      ok
4    0      Fabric Module 3                     DS-X9710-FAB3      ok
5    0      Fabric Module 3                     DS-X9710-FAB3      ok
6    0      Fabric Module 3                     DS-X9710-FAB3      ok

Xbar Sw               Hw
---  ---------------  ------
1    NA               1.0
2    NA               1.0
3    NA               1.0
4    NA               1.0
5    NA               1.0
6    NA               1.0

Xbar MAC-Address(es)                          Serial-Num
---  ---------------------------------------  ----------
1    NA                                       JAE1710088N
2    NA                                       JAE2217096Y
3    NA                                       JAE222305V1
4    NA                                       JAE222305VE
5    NA                                       JAE222305V9
6    NA                                       JAE222305V8
```

To view the inventory information for modules from the Cisco DCNM Web UI, Choose **Inventory > View > Modules**. The **Modules** window is displayed with a list of all the switches and its details for a selected scope.

For more information, see the *Cisco DCNM SAN Management Configuration Guide*.

Recovery Procedure

This section describes the steps needed to downgrade from Crossbar Fabric-3 Switching Modules to Crossbar Fabric-1 Switching Modules if there are issues with the Crossbar Fabric-3 Switching Modules upgrade.

Scenario 1

If a chassis is running in a mixed mode (both Crossbar Fabric-1 Switching Modules and Crossbar Fabric-3 Switching Modules in **OK** state), then reverse the installation process and replace the Crossbar Fabric-3 Switching Modules one-by-one with Crossbar Fabric-1 Switching Modules. As long as at least one Crossbar Fabric-1 Switching Module is online, replacing Crossbar Fabric-3 Switching Modules with Crossbar Fabric-1 Switching Modules can be done nondisruptively. Do not remove any further Crossbar Fabric-1 Switching Modules. If all the Crossbar Fabric-1 Switching Modules are removed or are in powered down state, then the downgrade will be disruptive.

Scenario 2

If a chassis is loaded with all six Crossbar Fabric-3 Switching Modules, then reinstalling the Crossbar Fabric-1 Switching Modules will be disruptive. Power down the switch and manually replace the Crossbar Fabric-3 Switching Modules with Crossbar Fabric-1 Switching Modules, and then power up the switch.

Troubleshooting

If the migration procedure fails, downgrade the Crossbar Fabric-3 Switching Modules to Crossbar Fabric-1 Switching Modules.

Power Supply in a Switch Chassis

You can follow the same steps to install AC and DC power supplies into the switch, but you ground them differently. For an AC power supply, you automatically ground it when you connect its power cable to the power supply and the power source. For a 3-kW DC power supply, you do not directly connect the power supply to the earth ground.

For more information on the supported power modes, power slots and power redundancy for Cisco MDS 9700 Series Switches, see Power Supplies.

Before you begin

- The switch chassis must be installed in a cabinet or rack that is secured to the data center.
- You need the following tools and equipment:
  - Nut driver attachment for Number 1 Phillips-head screwdriver or ratchet wrench with torque capability (used only for DC power supplies)
  - Crimping tool
  - For 3-kW DC power supplies, you need four power cables sized to reach the DC power source or power interface unit (PIU)
  - Grounding wire—Size this wire to meet local and national installation requirements. For U.S. installations, you must use a 6 AWG copper conductor. For installations outside the U.S., consult your local and national electrical codes. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.
  - A flat-blade or number 2 Phillips-head screwdriver is required to perform these procedures.

Warning Voltage is present on the backplane when the system is operating. To reduce risk of an electric shock, keep hands and fingers out of the power supply bays and backplane areas. Statement 166

Warning Power supply captive installation screws must be tight to ensure protective grounding continuity. Statement 289

This section provides the following information:

Installing an AC Power Supply

Caution Use both hands to install and remove power supplies. Each AC power supply weighs up to 6 lb (2.7 kg).

To install an AC power supply in the Cisco MDS 9700 Series switch, follow these steps:

Procedure

Step 1 Ensure that the system (earth) ground connection has been made. See the "Proper Grounding Practices" section.

Step 2 If a filler panel is installed, remove the filler panel from the power supply bay by loosening the captive screw.

Step 3 Ensure that the power switch is in the off (0) position on the power supply you are installing.

Step 4 Grasp the power supply handle with one hand, place your other hand underneath the power supply, and slide the power supply into the power supply bay. Ensure that the power supply is fully seated in the bay.

Step 5 Plug the power cable into the power supply, and place the cable retention device to ensure that the cable cannot be pulled out.

Connecting an AC Power Supply to an AC Power Source

To connect a 3-kW AC power supply directly to an AC power source, follow these steps:

Before you begin

Use one power cord to connect a 3-kW power supply to an AC power source and to ground the power supply. Depending on the software power mode configured on the switch, either connect all of the power supplies to one AC power source (grid) or half of the power supplies to the first independent AC power source (Grid A) and the other half to a second independent AC power source (Grid B). A summary of the grid requirements of each software power mode is shown in the https://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/hw/9700/mds_9700_hig/replace.html#59591.

Table 2: Software Power Mode Grids Required

Combined	Power Supply Redundancy	Input Source Redundancy	Full Redundancy
1	1	2	2

For information about the software power configuration modes, refer to the "Supported Transceivers" section.

For information about the location of Grid A and Grid B power supply slots for each type of MDS 9700 Director chassis, refer to the chassis specific information at:

- Cisco MDS 9718 Chassis Front View
- Cisco MDS 9710 Chassis Front View
- Cisco MDS 9706 Chassis Front View

Before you connect a chassis power supply to an AC power source, ensure all of the following:

- There is a vacant receptacle on the AC power source within reach of the chassis power supply cable.
- The power supply is already installed in the chassis.
- The chassis is connected to an earth ground.



Note In a single phase AC power supply unit, connection of multiple phases from the same three-phase source is supported and direct connection of three-phase is not supported.

Procedure

Step 1 Ensure that the power supply switch located on the front of the power supply is set at standby (labeled as 0).

Step 2 Plug one AC power cable into the power supply, and pull down the retention clip over the plug on the power cable.

Step 3 Plug the other end of the power cable into a AC power source supplied by the data center.

Warning
To reduce risk of electric shock and fire, take care when connecting units to the supply circuit so that wiring is not overloaded. Statement 1018.

Warning
This product relies on the building's installation for short-circuit (over current) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than: 250V, 20 A. Statement 1005.

Step 4 Turn the power supply switch from standby to on (from 0 to 1 as labeled on the power switch).

Step 5 Verify that the power supply is receiving AC power and outputting DC power by making sure that the INPUT and OUTPUT power supply LEDs are lit and the FAULT LED is not lit or flashing. For an explanation of all the power supply LEDs and the conditions that they indicate, see Table 1-15.

Note
When you first activate the power supply, you can verify the functionality of the LEDs by checking that each LED turns on for a couple of seconds.

If the Fault LED is flashing red, turn the power switch to standby (labeled as 0), check the AC power connections on the power supply and the AC power source, and then turn the power switch back on (labeled as 1). The Input and Output LEDs for the connected power supplies should be green and the Fault LED should be off.

Removing an AC Power Supply



Warning Voltage is present on the backplane when the system is operating. To reduce risk of an electric shock, keep hands and fingers out of the power supply bays and backplane areas. Statement 166

To remove an AC power supply from the Cisco MDS 9700 Series switch, follow these steps:

Procedure

Step 1 Turn the power switch on the power supply to the off (0) position.

Step 2 Disconnect the power cable from the power source.

Step 3 Press the release lever latch on the power module.

Step 4 Release the power cable spring latch retainer.

Step 5 Grasp the power supply handle with one hand, and slide the power supply partially out of the chassis. Place your other hand underneath the power supply, and slide the power supply completely out of the chassis.

Note
Each AC power supply weighs between 6 lb (2.7 kg).

Step 6 If the power supply bay is to remain empty, install a power supply filler panel over the opening, and tighten the captive screw to 8 in-lb.

Installing a DC Power Supply

To install a DC power supply in the Cisco MDS 9700 Series switch, follow these steps:

Before you begin

The DC power supply for the Cisco MDS 9700 Series switch is 3000KW. This power supply has two operational modes as a function of number of inputs receiving power. The unit will deliver 1551KW when only 1 input is active and 3051KW when 2 inputs are active.

Nominal input voltage range	-48 VDC or -60v VDC (tolerance range: -40 to -75 VDC
Input current	45A maximum at -40VDC per module

Warning Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing. Statement 1034

Procedure

Step 1 Ensure that all power is off by locating the circuit breaker on the panel board that services the DC circuit. Switch the circuit breaker to the off position, and tape the switch handle of the circuit breaker in the off position.

Ensure that the power switch is in the off (0) position on the power supply you are installing.

Warning
Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003

Step 2 Grasp the power supply unit handle with one hand, and place your other hand underneath the power supply unit to support its weight. Align the back of the power supply unit with the power supply bay and slide the power supply all the way into the power supply bay until the release lever clicks. Make sure that the power supply unit does not pull out of the power supply bay without pressing the release lever.

Connecting a DC Power Supply Directly to DC Power Sources

To connect a 3-kW DC power supply to a DC power source, follow these steps:

Before you begin

Use customer supplied wire to connect a 3 KW power supply to a DC power source. Depending on the software power mode configured on the switch, either connect all of the power supplies to one DC power source (grid) or half of the power supplies to the first independent DC power source (Grid A) and the other half to a second independent DC power source (Grid B). A summary of the grid requirements of each software power mode is shown in the following table.

Table 3: Software Power Mode Grids Required

Combined	Power Supply Redundancy	Input Source Redundancy	Full Redundancy
1	1	2	2

For information about the software power configuration modes, see Supported Transceivers.

For information about the location of Grid A and Grid B power supply slots for each type of MDS 9700 Director chassis, refer to the chassis specific information at:

- Cisco MDS 9718 Chassis Front View
- Cisco MDS 9710 Chassis Front View
- Cisco MDS 9706 Chassis Front View

Procedure

Step 1 Turn the power switch to standby (labeled 0 on the power switch).

Step 2 Turn off the power at the circuit breakers for the portions of the DC grid power that you are connecting to and verify that all the LEDs on the power supplies are off.

Warning
Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003

Warning
Comply with Local and National Electrical Codes: “To reduce risk of electric shock or fire, installation of the equipment must comply with local and national electrical codes.”Statement 1074

Step 3 Prepare enough length power cable, the wire range 6AWG~8AWG. Size the power cables to the distance between the power supply and the DC power grid. If you need to cut the cable, cut it at the end that connects to the DC power grid, remove 0.75 inch (19 mm) of insulation from the cut ends, and attach them to the DC power system. Be sure to connect the negative cables to negative lines and positive cables to positive lines.

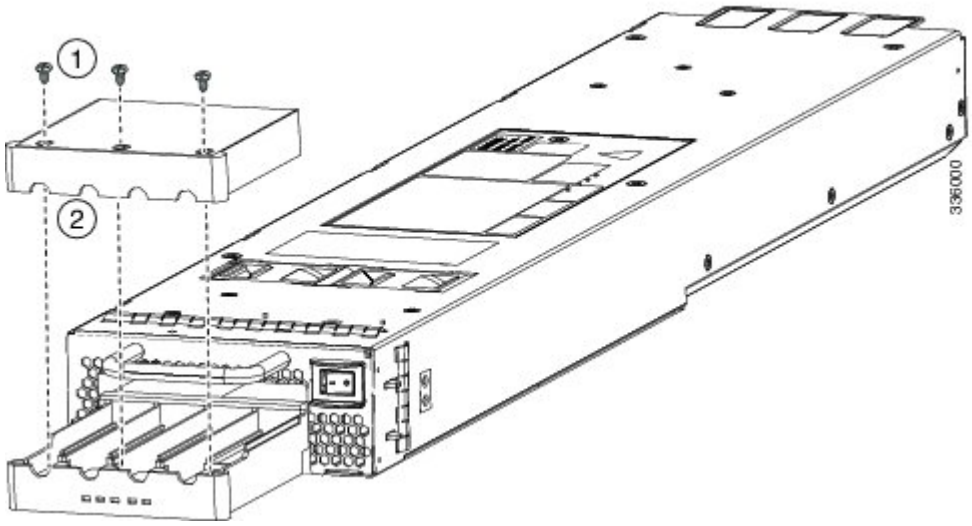
Note
For all your power connections, if you are using cables with two different colors, use one color cable for all positive circuits and the other color for all negative circuits.

Warning
Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place. Statement 1075

Step 4 Remove the three screws that hold down the safety cover for the terminal box on the front of the DC power supply and remove the cover (see the following figure)

Note
The terminal box has four slots for four power terminals (ordered as negative [-], positive [+], positive [+], and negative [-]). Each terminal has two nuts that you use to fasten a power cable to the terminal.

Figure 9: Removing the Safety Cover for the Terminal Box on the 3-kW DC Power Supply



1	Remove screws from cover.
2	Remove the safety cover.

Step 5 Install four cables (two positive and two negative cables) in the four terminal slots as follows:

a. Remove 16mm insulation of the other end of the cables.

b. Unscrew the two nuts in each of the four terminal slots, take out the lug.

c. Attach and crimp each lug to the end of each power cable

d. Attach each cable lug to the two terminal posts in each slot, fasten with two nuts, and tighten to 40 in-lb (4.5 N·m).

Note
For all your power connections, if you are using cables with two different colors, use one color cable for all positive circuits and the other color for all negative circuits.

e. Replace the safety cover on the terminal box and fasten with three screws.

Step 6 Install the four cables from the DC power supply to a DC power source as follows:

a. If the unconnected end of each power cable is not stripped of its insulation for the last 0.75 inches (19 mm), use wire strippers to remove that amount of insulation.

b. Attach the negative cables to the negative terminals of a DC power source, and attach the positive cables to the positive terminals of the same power source.

Step 7 For the powered down circuits connected to the power supplies, turn on the power at the circuit breaker. The Input 1 (IN1) and Input 2 (IN2) LEDs turn on each connected power supply.

Step 8 Turn the power switch on the connected DC power supplies from standby to on (from 0 to 1 as labeled on the power switch for each power supply). The LEDs should flash and then the Output LED should turn on in addition to the Input LEDs.

Note
If the FAULT LED is lit or flashing, call Cisco TAC for assistance.

Removing a DC Power Supply

The DC power supply for the Cisco MDS 9700 Series switch is 3000 W.

To remove a DC power supply from the Cisco MDS 9700 Series switch, follow these steps:

Procedure

Step 1 Turn the power switch on the power supply to the off (0) position.

Step 2 Turn off the DC input power by manually turning off the input circuit at the circuit breaker for this power supply.

Step 3 Verify that the input power is completely off by making sure that all the LEDs on the DC power supply unit are off.

Warning
Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003

Step 4 Disconnect the DC cables from the terminal block in the following order:

a. Positive (+)

b. Negative (-)

c. Ground

Caution
In general, the positive (+) terminal is grounded at the battery and is the low end and that should be isolated from ground to prevent a ground loop. Both terminals should be isolated from ground and the negative terminal to ground should be a short and blow the breaker.

Warning
When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046

Warning
Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place. Statement 1075

Step 5 Press and hold the release latch on the front of the power supply and then pull the power supply part way-out of the chassis by its handle.

Note
Each DC power supply weighs 11 lb (5 kg).

Step 6 If the power supply bay is to remain empty, install a power supply filler panel over the opening, and tighten the captive screw to 8 in-lb.

Installing and Removing Fan Modules or Trays

The fan module or tray is designed to be removed and replaced while the system is operating without presenting an electrical hazard or damage to the system, provided the replacement is performed promptly.

The Cisco MDS 9700 Series switches have three fan modules or trays. Each fan module for the Cisco MDS 9710 Director has four individual fans and each fan module or tray for the Cisco MDS 9706 Director has two individual fans with an abrupt stop-to-fan rotation safety feature after power is disconnected or the fan module or tray is removed from the mid-plane.

The Cisco MDS 9000 Family switches have internal temperature sensors that can shut down the system if the temperature at different points within the chassis exceeds certain safety thresholds. To be effective, the temperature sensors require the presence of airflow; therefore, if a fan module is removed from the chassis, the Cisco MDS 9000 Family switches will be shut down to prevent potentially undetectable overheating. However, the switches will be shut down sooner if the higher-level temperature threshold is exceeded. In normal data center conditions, if one fan module fails or needs to be removed, the other two fan modules can cool the system effectively for up to 72 hours.

This section includes the following topics:

Installing a Fan Module or tray

To install a fan module or tray on the Cisco MDS 9700 Series switch, follow these steps:

Before you begin

If you need to remove the fan module or tray to replace a fabric module, see the Removing a Crossbar Fabric Switching Module, on page 54.

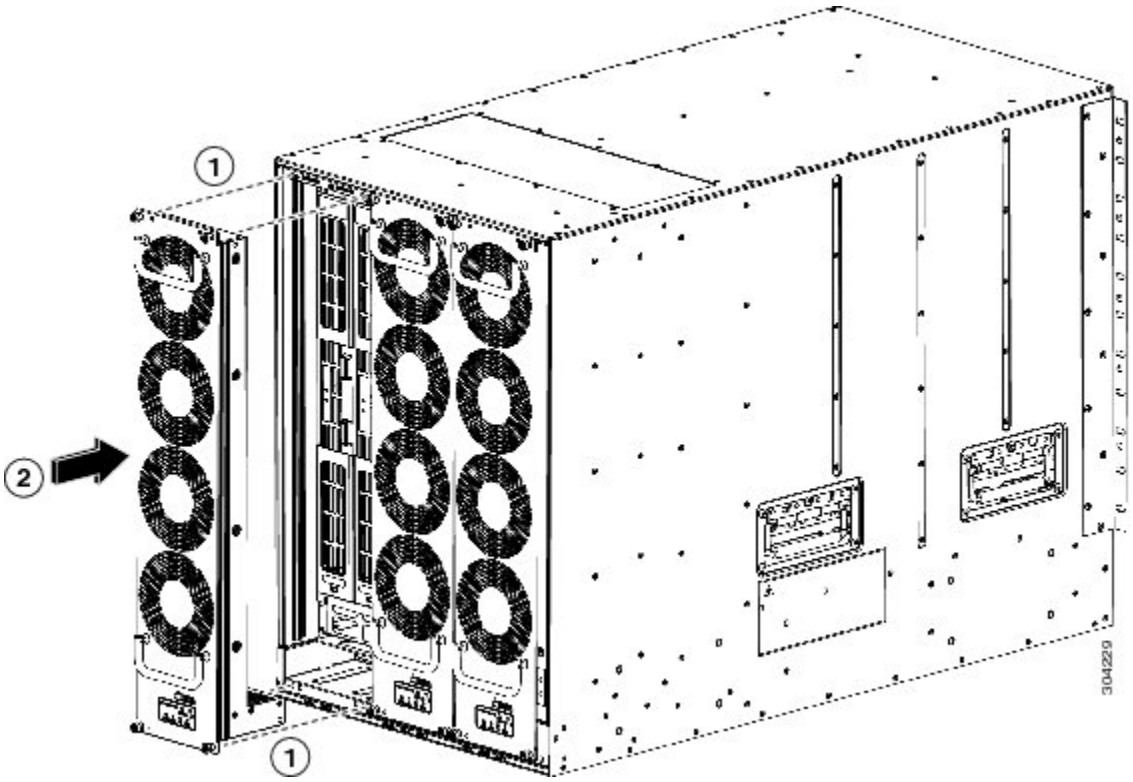
The fan module or tray displays the fabric module LEDs so that you can see the status of the two fabric modules installed behind that fan module or tray.

Procedure

Step 1 Hold the fan module or tray so that the Fan Status LED is at the bottom.

Step 2 Carefully press the whole fan module or tray into the slot so that the four alignment pins go into their holes in the chassis and the electrical connectors at the bottom of the chassis are inserted into the chassis connectors inside the slot. Make sure that the front of the fan module or tray is touching the outer surface of the chassis and that the four captive screws on the fan module or tray are aligned to four screw holes in the chassis.

Figure 10: Installing a Fan Module or tray



1	Align the four pins in the fan module or tray with four holes in the chassis.	**2**	Press the whole fan module or tray into the chassis slot.

Step 3 With the electrical contacts on the fan module aligned to contacts on the backplane, press the fan module fully into the slot.

Step 4 Screw in each of the four captive screws on the front of the fan module or tray to secure the fan module to the chassis. After fully engaged, tighten each screw to 8 in-lb (0.9 N·m) of torque.

Step 5 Listen for the fans; you should immediately hear them operating. If you do not hear them, ensure that the fan module or tray is inserted completely in the chassis and the outside surface of the fan module or tray is flush with the outside surface of the chassis.

Step 6 Verify that the Fan Status LED is green. If the LED is not green, one or more fans are faulty. If this occurs, contact your customer service representative for a replacement part.

Step 7 If the switch is powered on, listen for the fans; you should immediately hear them operating. If you do not hear them, ensure that the fan module or tray is inserted completely in the chassis and the outside surface of the fan module or tray is flush with the outside surface of the chassis.

Step 8 Verify that the Fan Status LED is green. If the LED is not green, one or more fans are faulty. If this occurs, contact your customer service representative for a replacement part. For more information about the LED states, see the System LEDs.

Note

If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco Systems, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html.

Removing a Fan Module or Tray



Warning When removing the fan module or tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you remove the fan module. Statement 258

From Cisco MDS NX-OS Release 9.4(1), in all Cisco MDS 9700 Series director switches, you can shut down unneeded PSUs. This can be used when there are PSUs in the chassis that are not used based on the power requirements of the switch. It prevents unnecessary alarms in system management software, such as NDFC. For more information, see the Cisco MDS 9000 Series Fundamentals Configuration Guide.

To remove the fan module from a Cisco MDS 9700 Series switch, follow these steps:

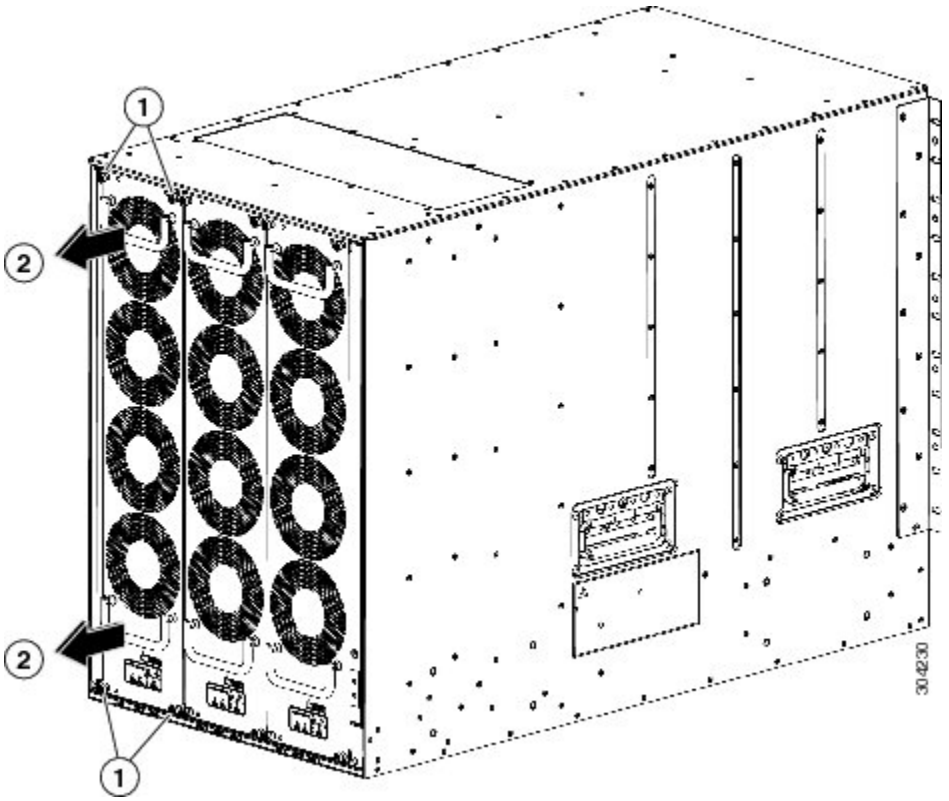
Procedure

Step 1 Use a Phillips torque screwdriver to loosen the four captive screws on the fan module or tray until they are no longer connected to the chassis.

Step 2 Grasp the handles of the fan module or tray with both hands and pull it outward to unseat the power connector from the backplane.

Step 3 Pull the fan module or tray fully out of the chassis.

Figure 11: Removing a Fan Module or tray



1	Unscrew four captive screws until they are no longer attached to the chassis.
2	Pull both handles to remove the module or tray from the chassis.

Step 4 Set the fan module or tray down on one of its covered sides only on an antistatic pad or inside an antistatic bag.

Caution
Keep your face away from the front of the fabric module so that the levers do not hit your face when they spring out from the front of the module.

Note
It is normal for the fan speeds of the remaining fan modules or trays to increase when one fan module is removed. The fan speeds will return to normal once the fan module is reinstalled.

Powering up the Switch and Verifying the Component Installation

To power up the switch and verify hardware operation, follow these steps:

Before you begin

Warning Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.Statement 1034

Caution During this procedure, wear grounding wrist straps to avoid ESD damage to the switch.

Note The 3000-W (DS-CAC-3000W) power supplies provide power according to the input voltage. If they are in redundant rather than combined mode at 110 VAC, they may be unable to provide adequate power to all modules present in the system. See Appendix 6, “Technical Specifications.”

Warning Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statement 1029

Note Do not connect the MGMT 10/100 Ethernet port to the LAN until the initial switch configuration has been performed. For instructions on configuring the switch, see the Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide.

For instructions on connecting to the console port, see the “Connecting to the Console Port” section.

Procedure

Step 1 Verify that the faceplates of all modules are flush with the front of the chassis, and the ejector levers are fully closed and approximately parallel to the faceplate of the module.

Step 2 Verify that any empty module slots have filler panels installed.

Step 3 Verify that power supplies and the fan module are installed.

Step 4 Check the power cable retainer of the power supplies, captive screws of fan module, and all supervisor, switching, or services modules, and tighten any retaining screws to specification.

Step 5 Ensure that the switch is adequately grounded as described in the “System Grounding” section, and that the power cables are connected to outlets that have the required AC or DC power voltages. See Appendix 6, “Technical Specifications,” for the required voltages.

Step 6 Power on the switch by turning the power switches on the power supplies or PEMs to the on (|) position or restoring power to the DC circuit, as required. The switch boots automatically.

Step 7 Listen for the fans; they should begin operating as soon as the switch is powered on.

Caution

Do not operate the switch without a functioning fan module except during the brief fan module replacement procedure. The Cisco MDS 9000 Family switches can operate for only a few minutes without a functioning fan module before they begin to overheat.

Step 8 After the switch has finished booting, verify that the LED operations are as follows:

- Fan module—Status LED is green.
- Power supplies:
  - Input OK LED is IN.
  - Output Fail LED is Fault.
- Supervisor and switching modules:
  - The System LED on the supervisor module is green, indicating that all chassis environmental monitors are reporting that the system is operational. If this LED is orange or red, one or more environmental monitors are reporting a problem.
  - The Status LED on the switching modules flashes orange once, remains orange during diagnostic boot tests, and then turns green when the module is operational (online). If the system software cannot start up, this LED remains orange or turns red.

Note
The LEDs for the Fibre Channel ports remain orange until the ports are enabled, and the LED for the MGMT 10/100 Ethernet port remains off until the port is connected.

If any LEDs other than the Fibre Channel port LEDs remain orange or red after the initial boot processes are complete, see Appendix 6, “Technical Specifications.”

Step 9 If a component is not operating correctly, try removing and reinstalling it. If it still does not operate correctly, contact your customer service representative for a replacement.

Note
If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco Systems, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html.

Step 10 Verify that the system software has booted and the switch has initialized without error messages. If any problems occur, see the Cisco MDS 9000 Family System Messages Reference. If you cannot resolve an issue, contact your customer service representative.

Step 11 Complete the worksheets provided in Appendix 8, “Site Planning and Maintenance Records,” for future reference.

Note
A setup utility automatically launches the first time you access the switch and guides you through the basic configuration. For instructions about how to configure the switch and check module connectivity, see the Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide or the Cisco Fundamentals Configuration Guide for DCNM SAN.