



CHAPTER 2

Troubleshooting Installs, Upgrades, and Reboots

This chapter describes how to identify and resolve problems that might occur when installing, upgrading, or restarting Cisco MDS 9000 Family products.

It includes the following sections:

- [Overview, page 2-1](#)
- [Guidelines, page 2-2](#)
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- [Troubleshooting a Nondisruptive Upgrade on a Fabric Switch, page 2-4](#)
- [Verifying Cisco SAN-OS Software Installations, page 2-6](#)
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Overview

Each Cisco MDS 9000 switch ships with an operating system (Cisco SAN-OS) that consists of two images—the kickstart image and the system image. There is also a module image if the Storage Services Module (SSM) is present.

Installations, upgrades, and reboots are ongoing parts of SAN maintenance activities. It is important to minimize the risk of disrupting ongoing operations when performing these operations in production environments and to know how to recover quickly when something does go wrong.



Note

For documentation purposes, we use the term upgrade in this document. However, upgrade refers to both upgrading and downgrading your switch, depending on your needs.

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Guidelines

This sections lists general guidelines for performing Cisco SAN-OS software installations, image upgrade and downgrade procedures, and reboots, and it includes the following topics:

- [Guidelines for Installations, page 2-2](#)
- [Guidelines for Upgrading, page 2-2](#)
- [Guidelines for Reboots, page 2-4](#)

Guidelines for Installations

Follow these guidelines when installing Cisco SAN-OS software images:

- Ensure that an FTP or TFTP server is available and can be accessed via the IP address of the default gateway (rather than any other IP address on the defined subnet).
- Use the **show install all impact** CLI command to verify that the new image is healthy and the impact that new load will have on any hardware with regards to compatibility. Check for compatibility.
- Choose **Admin > Show Image Version** in the Device Manager to view information on images in the directories of the MDS file system.

Guidelines for Upgrading

Not all images need to be updated during an upgrade. Use the following checklist to prepare for an upgrade:

Checklist	Check off
Copy the new Cisco SAN-OS image onto your supervisor modules in bootflash: or slot0:.	<input type="checkbox"/>
Save your running configuration to the startup configuration.	<input type="checkbox"/>
Backup a copy of your configuration to a remote TFTP server.	<input type="checkbox"/>
Schedule your upgrade during an appropriate maintenance window for your fabric.	<input type="checkbox"/>
Verify that you have the correct image for your supervisor module type.	<input type="checkbox"/>
Verify that no SSM ports are configured in auto mode.	<input type="checkbox"/>

After you have completed the checklist, you are ready to upgrade the switches in your fabric.



Note

It is normal for the active supervisor to become the standby supervisor during an upgrade.

Follow these guidelines when upgrading or downgrading Cisco SAN-OS software images:

- Read the Cisco SAN-OS Release Notes for the release you are upgrading or downgrading to. Cisco SAN-OS Release Notes are available at the following website:
http://cisco.com/en/US/products/ps5989/prod_release_notes_list.html
- Ensure that an FTP or TFTP server is available.

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- Copy the startup-config to a snapshot config in NVRAM. This step creates a backup copy of the startup-config.
 - In Device Manager, Choose **Admin > Copy Configuration** and select the **startupConfig** radio button for the From: field and the **serverFile** radio button for the To: field. Set the other fields, and click **Apply**.
 - From the CLI, use the **copy nvram:startup-config nvram-snapshot-config** command.
- Where possible, choose to do a nondisruptive upgrade. In general, you can nondisruptively upgrade to Cisco SAN-OS Release 3.x software from any Cisco SAN-OS software Release 2.x or later.
 - Review the upgrade table in the Cisco SAN-OS Release Notes for the version you will be installing.
 - Use the **show install all impact upgrade-image** CLI command to determine if your upgrade will be nondisruptive.
- Establish a PC serial connection to each supervisor console to record upgrade activity to a file. This serial connection catches any error messages or problems during bootup.
- In Fabric Manager, choose **Tools > Other > Software Install** or click the **Software Install** icon on the toolbar to use the Software Install Wizard.
- From the CLI, use the **install all** [{asm-sfn | kickstart | ssi | system} URL] command to run a complete script, test the images, and verify the compatibility with the hardware. See the “[Installing Cisco SAN-OS Software from the CLI](#)” section on page 2-11. Using the **install all** command offers the following advantages:
 - You can upgrade the entire switch using the least disruptive procedure with just one command.
 - You can receive descriptive information on the intended changes to your system before you continue with the command.
 - You have the option to cancel the command. Once the effects of the command are presented, you can continue or cancel when you see this question (the default is no):


```
Do you want to continue (y/n) [n] :y
```
 - You can view the progress of this command on the console, Telnet, and SSH screens.
 - The image integrity is automatically checked, including the running kickstart and system images.
 - The command performs a platform validity check to verify that a wrong image is not used. For example, the command verifies that an MDS 9500 Series image is not used inadvertently to upgrade an MDS 9200 Series switch.
 - After issuing the **install all** command, if any step in the sequence fails, the command completes the step in progress and ends.

For example, if a switching module fails to be updated for any reason (for example, due to an unstable fabric state), then the command sequence disruptively updates that module and ends. In such cases, you can verify the problem on the affected switching module and upgrade the other switching modules.
- If you run the setup script after issuing a write erase CLI command, you must set the default zone policy for VSAN 1 after the setup script completes. In Fabric Manager, choose **Fabricxx > VSAN 1 > Default Zone**, select the **Policies** tab and set the Default Zone Behavior drop-down menu to **permit** or **deny**. In the CLI, use the **zone default-zone** command.

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Guidelines for Reboots

Cisco SAN-OS allows for three different types of system restarts:

- Recoverable—A process restarts and service is not affected.
- Unrecoverable—A process has restarted more than the maximum restart times within a fixed period of time (seconds) and will not be restarted again.
- System hung/crashed—No communications of any kind is possible with the system.

Schedule the reboot to avoid possible disruption of services during critical business hours.



Note

Log messages are not saved across system reboots. However, a maximum of 100 log messages with a severity level of critical and below (levels 0, 1, and 2) are saved in NVRAM. You can view this log at any time with the **show logging nvram** CLI command.

Disruptive Module Upgrades

Software upgrades for the SSM, MPS-14/2, MSM-18/4 module, or the IP Storage (IPS) services modules are disruptive. These modules use a rolling upgrade install mechanism where the modules are upgraded in sequence. After the first module upgrade finishes, and before the next module upgrade begins, Cisco SAN-OS introduces a time delay to ensure that all applications in the module reach a steady state. The IPS modules require a five-minute delay before the next IPS module upgrade can guarantee a stable state.

SSM supports nondisruptive upgrades for the Layer 1 and Layer 2 protocols under the following conditions:

- SSM is running Cisco SAN-OS Release 2.1(2) or later and upgrading to a later release.
- The SSM hardware has the ELPD image for Release 2.1(2) installed. Use the **show version module <module number> epld** CLI command, and verify that the epld version is 0x07 or later.
- You have turned off all Layer 3 services on the SSM by deprovisioning the DPPs for Layer 3 service.

Troubleshooting a Nondisruptive Upgrade on a Fabric Switch

When a nondisruptive upgrade begins, the system notifies all services that an upgrade is about to start, and finds out whether or not the upgrade can proceed. If a service cannot allow the upgrade to proceed at this time (for example, FSPF timers are not configured to the default value, or a CFS operation is in progress), then the service will abort the upgrade. If this occurs, you will be prompted to enter the **show install all failure-reason** command to determine the reason why the upgrade cannot proceed.

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

Install is in progress, please wait.

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

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

Install has failed. Return code 0x401E0066 (request timed out).
```

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Please identify the cause of the failure, and try 'install all' again.

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

If there are any failures for whatever reason (a save runtime state failure or linecard upgrade failure) once the upgrade is already in progress, then the switch will be rebooted disruptively because the changes cannot be rolled back. In such cases the upgrade has failed; you are not prompted to enter the **show install all failure-reason** command, and entering it will not yield any useful information.

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

Troubleshooting Fabric Manager Installations

This section describes possible problems and solutions for a Fabric Manager installation failure. Fabric Manager requires that the appropriate version of Sun JAVA JRE be installed, based on the Fabric Manager release. [Table 2-1](#) shows the recommended JRE for Fabric Manager 2.x and later releases.

Table 2-1 Fabric Manager and Recommended JRE Version

Fabric Manager Release	Recommended JRE Version
2.0(1b) through 2.1(1b)	1.4.2_05
2.1(2) through 3.3(1) ¹	1.5.x

1. Release 3.3(1) includes support for JRE version 1.6.

Fabric Manager and Device Manager do not operate properly with JRE 1.4.2_03 on Windows 2003.

Symptom Fabric Manager or Device Manager will not start.

Table 2-2 Fabric Manager or Device Manager Will Not Start

Symptom	Possible Cause	Solution
Device Manager will not start.	Device Manager proxied through Fabric Manager Server.	Uncheck the Proxy SNMP through FM Server check box in the Device Manager startup dialog box, and restart Device Manager.

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Table 2-2 Fabric Manager or Device Manager Will Not Start

Symptom	Possible Cause	Solution
Fabric Manager will not start.	Using incorrect Fabric Manager Server.	Verify that you are choosing the appropriate Fabric Manager Server from the FMServer pull-down menu. If you have not already done so, download Fabric Manager Server.
	Fabric Manager Server not running.	On a Windows PC, click Start > Control Panel > Administrative Tools > Services to verify that Fabric Manager Server and Fabric Manager database have started. The default setting for the Fabric Manager Server is that the server is automatically started when the PC is rebooted.
	Incompatible JRE version.	Verify that you have the correct JRE version installed for the Fabric Manager release you installed. Refer to the release notes for the software version you installed to determine which JRE version is compatible.
	Improperly installed.	If the problem remains, then remove the application using the Cisco MDS 9000/Uninstall program, then reinstall Fabric Manager.

Verifying Cisco SAN-OS Software Installations

In Fabric Manager you can watch the progress of your software installation using the Software Install Wizard. From the CLI you can use the **show install all status** command to watch the progress of your software installation.

You can also use the **show install all status** CLI command to view the on-going **install all** command or the log of the last installed **install all** command from a console, SSH, or Telnet session.

This command presents the **install all** output on both the active and standby supervisor module even if you are not connected to the console terminal. It only displays the status of an **install all** command that is issued from the CLI (not the GUI). See [Example 2-1](#).

Example 2-1 install all Command Output

```
switch# show install all status
There is an on-going installation... <----- in progress installation
Enter Ctrl-C to go back to the prompt.
Verifying image bootflash:/b-1.3.0.104
-- SUCCESS
Verifying image bootflash:/i-1.3.0.104
-- SUCCESS
Extracting "system" version from image bootflash:/i-1.3.0.104.
-- SUCCESS
Extracting "kickstart" version from image bootflash:/b-1.3.0.104.
-- SUCCESS
Extracting "loader" version from image bootflash:/b-1.3.0.104.
-- SUCCESS
switch# show install all status
This is the log of last installation. <----- log of last install
Verifying image bootflash:/b-1.3.0.104
-- SUCCESS
```

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```
Verifying image bootflash:/i-1.3.0.104
-- SUCCESS
Extracting "system" version from image bootflash:/i-1.3.0.104.
-- SUCCESS
Extracting "kickstart" version from image bootflash:/b-1.3.0.104.
-- SUCCESS
Extracting "loader" version from image bootflash:/b-1.3.0.104.
-- SUCCESS
```

Troubleshooting Cisco SAN-OS Software Upgrades and Downgrades

This section discusses possible causes and solutions for a software installation upgrade or downgrade failure. It includes the following symptoms:

- [Software Installation Reports an Incompatibility, page 2-7](#)
- [Software Installation Ends with Error, page 2-9](#)

Software Installation Reports an Incompatibility

Symptom The software installation reports an incompatibility.

Table 2-3 Software Installation Report Incompatibility

Symptom	Possible Cause	Solution
The software installation reports an incompatibility.	The running image may have a feature enabled that is not compatible with the proposed new image.	Review the incompatibility issues displayed by either the Fabric Manager Software Install Wizard or the install all CLI command. Correct any problems and retry the installation. See the “Diagnosing Compatibility Issues” section on page 2-7 . Verify which features are enabled on your switch and disable any features that may not be compatible with your new image. Refer to the appropriate release notes for both images.

Diagnosing Compatibility Issues

To view the results of a dynamic compatibility check, use the **show incompatibility system bootflash:filename** CLI command.

Use the **show incompatibility** CLI command for diagnosis when the **install all** CLI command warns of compatibility issues.

During an attempted upgrade, the **install all** CLI command may return the following warning:

```
Warning: The startup config contains commands not supported by the system image; as a
result, some resources might become unavailable after an install.
Do you wish to continue? (y/ n) [y]: n
```

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Use the **show incompatibility** CLI command to identify the problem.

Message 1 indicates that the remote SPAN (RSPAN) feature is in use, but it is not supported by the image that was installed. The incompatibility is strict because continuing the upgrade might cause the switch to move into an inconsistent state—that is, configured features might stop working.

```
switch# show incompatibility system bootflash:new-image
The following configurations on active are incompatible with the system image
1) Feature Index : 67 , Capability : CAP_FEATURE_SPAN_FC_TUNNEL_CFG
Description : SPAN - Remote SPAN feature using fc-tunnels
Capability requirement : STRICT
```

Message 2 indicates that the Fibre Channel tunnel feature is not supported in the new image. The RSPAN feature uses Fibre Channel tunnels.

```
2) Feature Index : 119 , Capability : CAP_FEATURE_FC_TUNNEL_CFG
Description : fc-tunnel is enabled
Capability requirement : STRICT
```

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Software Installation Ends with Error

Symptom The software installation ends with an error.

Table 2-4 Software Installation Ends with Error

Problem	Possible Cause	Solution
The installation ends with an error.	The standby supervisor module bootflash: file system does not have sufficient space to accept the updated image.	Remove unnecessary files from the filesystem. In Device Manager, choose Admin > Flash Files and delete unnecessary files. From the CLI, use the delete command.
	The specified system and kickstart images are not compatible.	Check the output of the installation process for details on the incompatibility. Possibly update the kickstart image before updating the system image.
	The install all command is issued on the standby supervisor module.	Issue the command on the active supervisor module only.
	A module was inserted while the upgrade was in progress.	Restart the installation. See the “Installing SAN-OS Software Using Fabric Manager” section on page 2-10 or the “Installing Cisco SAN-OS Software from the CLI” section on page 2-11.
	The fabric or switch was configured while the upgrade was in progress.	Wait until the upgrade is complete before configuring the switch. In Device Manager, choose Admin > CFS or from the CLI, use the show cfs lock command to check that there are no CFS commit operations in progress.
	The switch experienced a power disruption while the upgrade was in progress.	Restart the installation. See the “Installing SAN-OS Software Using Fabric Manager” section on page 2-10 or the “Installing Cisco SAN-OS Software from the CLI” section on page 2-11.
	Incorrect software image path specified.	Specify the entire path for the remote location accurately.
	Another installation is already in progress.	Verify the state of the switch at every stage and restart the installation after 10 seconds. If you restart the installation within the 10-second span, the command is rejected with an error message indicating that an installation is currently in progress.
Module failed to upgrade.	Restart the installation. See the “Installing SAN-OS Software Using Fabric Manager” section on page 2-10 or the “Installing Cisco SAN-OS Software from the CLI” section on page 2-11. Or, use the install module CLI command to upgrade the failed module.	

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Installing SAN-OS Software Using Fabric Manager

To use the Software Install Wizard to install a new software image using Fabric Manager, follow these steps:

- Step 1** Open the Software Install Wizard by clicking its icon in the toolbar (see [Figure 2-1](#)).

Figure 2-1 Software Install Wizard Icon



You see the Software Install Wizard.

- Step 2** Select the switches you want to install images on. You must select at least one switch in order to proceed. Click **Next**.
- Step 3** Optionally, check the **Skip Image Download** check box and click **Next** to use images that are already downloaded (the file is already on the bootflash: file system). Proceed to [Step 7](#).
- Step 4** Click the row under the System, Kickstart, Asm-sfn, or ssi columns to enter image URIs. You must specify at least one image for each switch to proceed.
- Step 5** Check the active (and standby, if applicable) bootflash: file system on each switch to see if there is enough space for the new images. You can see this information in the Flash Space column.
- This screen shows the active (and standby, if applicable) bootflash: memory space on each switch, and shows the status (whether there is enough space for the new images). If any switch has insufficient space, you cannot proceed. Deselect the switch without enough bootflash: memory by going back to the first screen and unchecking the check box for that switch.
- Step 6** Click **Next**. You see the Select Download Image screen.
- Step 7** Double-click the table cell under System, Kickstart, Asm-sfn, or Ssi and select from a drop-down list of images available in the bootflash: file system on each switch. You must select at least one image for each switch to proceed.



Note There is no limit on the number of switches you can upgrade. However, the upgrade is a serial process; that is, only a single switch is upgraded at a time.

- Step 8** Click **Next**. You see the final verification screen.
- Step 9** Click **Finish** to start the installation or click **Cancel** to leave the installation wizard without installing new images.



Note On hosts where the TFTP server cannot be started, a warning is displayed. The TFTP server may not start because an existing TFTP server is running or because access to the TFTP port 69 has been denied for security reasons (the default setting on LINUX). In these cases, you cannot transfer files from the local host to the switch.

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**Note**

Before exiting the session, be sure that the upgrade process is complete. The wizard displays status messages as the upgrade proceeds. Check the lower left-hand corner of the wizard for the status messages. First, the wizard displays the message `Success` followed a few seconds later by `InProgress Polling`. Then the wizard displays a second message `Success` before displaying the final `Upgrade Finished`.

Installing Cisco SAN-OS Software from the CLI

To perform an automated software upgrade on any switch from the CLI, follow these steps:

- Step 1** Log into the switch through the console, Telnet, or SSH port of the active supervisor.
- Step 2** Create a backup of your existing configuration file, if required.
- Step 3** Perform the upgrade by issuing the **install all** command.

The example below demonstrates upgrading from SAN-OS 2.0(2b) to 2.1(1a) using the **install all** command with the source images located on a SCP server.

**Tip**

Always carefully read the output of **install all** compatibility check. This compatibility check tells you exactly what needs to be upgraded (BIOS, loader, firmware) and what modules are not hitless. If there are any questions or concerns about the results of the output, select **n** to stop the installation and contact the next level of support.

```
ca-9506# install all system scp://testuser@dino/tftpboot/rel/qa/2_1_1a/final/m9500-sf1ek9-mz.2.1.1a.bin kickstart scp://testuser@dino/tftpboot/rel/qa/2_1_1a/final/m9500-sf1ek9-kickstart-mz.2.1.1a.bin
For scp://testuser@dino, please enter password:
For scp://testuser@dino, please enter password:

Copying image from scp://testuser@dino/tftpboot/rel/qa/2_1_1a/final/m9500-sf1ek9-kickstart-mz.2.1.1a.bin to bootflash:///m9500-sf1ek9-kickstart-mz.2.1.1a.bin.
[#####] 100% -- SUCCESS

Copying image from scp://testuser@dino/tftpboot/rel/qa/2_1_1a/final/m9500-sf1ek9-mz.2.1.1a.bin to bootflash:///m9500-sf1ek9-mz.2.1.1a.bin.
[#####] 100% -- SUCCESS

Verifying image bootflash:///m9500-sf1ek9-kickstart-mz.2.1.1a.bin
[#####] 100% -- SUCCESS

Verifying image bootflash:///m9500-sf1ek9-mz.2.1.1a.bin
[#####] 100% -- SUCCESS

Extracting "slc" version from image bootflash:///m9500-sf1ek9-mz.2.1.1a.bin.
[#####] 100% -- SUCCESS

Extracting "ips" version from image bootflash:///m9500-sf1ek9-mz.2.1.1a.bin.
[#####] 100% -- SUCCESS

Extracting "svcl" version from image bootflash:///m9500-sf1ek9-mz.2.1.1a.bin.
[#####] 100% -- SUCCESS

Extracting "system" version from image bootflash:///m9500-sf1ek9-mz.2.1.1a.bin.
```

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

Extracting "kickstart" version from image bootflash:///m9500-sflek9-kickstart-mz.2.1.1a.bin.
[#####] 100% -- SUCCESS

Extracting "loader" version from image bootflash:///m9500-sflek9-kickstart-mz.2.1.1a.bin.
[#####] 100% -- SUCCESS
```

Compatibility check is done:

Module	bootable	Impact	Install-type	Reason
1	yes	non-disruptive	rolling	
2	yes	non-disruptive	rolling	
3	yes	disruptive	rolling	Hitless upgrade is not supported
4	yes	disruptive	rolling	Hitless upgrade is not supported
5	yes	non-disruptive	reset	
6	yes	non-disruptive	reset	

Images will be upgraded according to following table:

Module	Image	Running-Version	New-Version	Upg-Required
1	slc	2.0(2b)	2.1(1a)	yes
1	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
2	slc	2.0(2b)	2.1(1a)	yes
2	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
3	ips	2.0(2b)	2.1(1a)	yes
3	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
4	svclc	2.0(2b)	2.1(1a)	yes
4	svcsb	1.3(5m)	1.3(5m)	no
4	svcsb	1.3(5m)	1.3(5m)	no
4	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
5	system	2.0(2b)	2.1(1a)	yes
5	kickstart	2.0(2b)	2.1(1a)	yes
5	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
5	loader	1.2(2)	1.2(2)	no
6	system	2.0(2b)	2.1(1a)	yes
6	kickstart	2.0(2b)	2.1(1a)	yes
6	bios	v1.1.0(10/24/03)	v1.1.0(10/24/03)	no
6	loader	1.2(2)	1.2(2)	no

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

Install is in progress, please wait.

```
Syncing image bootflash:///m9500-sflek9-kickstart-mz.2.1.1a.bin to standby.
[#####] 100% -- SUCCESS
```

```
Syncing image bootflash:///m9500-sflek9-mz.2.1.1a.bin to standby.
[#####] 100% -- SUCCESS
```

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

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

Module 5: Waiting for module online.

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```
2005 May 20 15:46:03 ca-9506 %KERN-2-SYSTEM_MSG: mts: HA communication with standby
terminated. Please check the standby supervisor.
-- SUCCESS
```

"Switching over onto standby".

Step 4 Exit the switch console and open a new terminal session to view the upgraded supervisor module using the **show module** command.

If the configuration meets all guidelines when the **install all** command is issued, all modules (supervisor and switching) are upgraded.

Troubleshooting Cisco SAN-OS Software System Reboots

This section lists possible problems and solutions for software reboots and includes the following topics:

- [Power On or Switch Reboot Hangs, page 2-13](#)
- [Corrupted Bootflash Recovery, page 2-14](#)
- [Recovery Using BIOS Setup for Supervisor-1, page 2-16](#)
- [Recovery from the loader> Prompt on Supervisor-2 Modules, page 2-19](#)
- [Recovery from the loader> Prompt on Supervisor-1 Modules, page 2-20](#)
- [Recovery from the switch\(boot\)# Prompt, page 2-21](#)
- [Recovery for Switches with Dual Supervisor Modules, page 2-22](#)
- [Recognizing Error States, page 2-25](#)

Power On or Switch Reboot Hangs

Symptom Power on or switch reboot hangs.

Table 2-5 Power-on or Switch Reboot Hangs

Problem	Possible Cause	Solution
Power on or switch reboot hangs for dual supervisor configuration.	The bootflash is corrupted.	See the “ Recovery for Switches with Dual Supervisor Modules ” section on page 2-22.
Power on or switch reboot hangs for single supervisor configuration.	The loader is corrupted.	Interrupt the boot process and reconfigure the BIOS through the console port to load a new kickstart image that updates to BIOS image. See the “ Recovery Using BIOS Setup for Supervisor-1 ” section on page 2-16.

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Table 2-5 Power-on or Switch Reboot Hangs (continued)

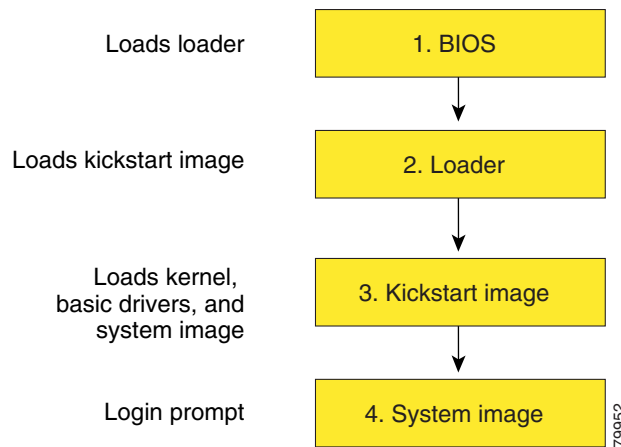
Problem	Possible Cause	Solution
	The BIOS is corrupted.	Replace this module. Contact your customer support representative to return the failed module.
	The kickstart image is corrupted.	Interrupt the boot process at the >loader prompt. Update the kickstart image. See the “ Recovery from the loader> Prompt on Supervisor-2 Modules ” section on page 2-19.
	Boot parameters are incorrect.	Verify and correct the boot parameters and reboot.
	The system image is corrupted.	Interrupt the boot process at the switch#boot prompt. Update the system image. See the “ Recovery from the switch(boot)# Prompt ” section on page 2-21.

Corrupted Bootflash Recovery

All switch configurations reside in the internal bootflash. If you have a corrupted internal bootflash you could potentially lose your configuration. Be sure to save and back up your configuration files periodically. The regular switch boot goes through the following sequence (see [Figure 2-2](#)):

1. The basic input/output system (BIOS) loads the loader.
2. The loader loads the kickstart image into RAM and starts the kickstart image.
3. The kickstart image loads and starts the system image.
4. The system image reads the startup configuration file.

Figure 2-2 Regular Boot Sequence



If the images on your switch are corrupted and you cannot proceed (error state), you can interrupt the switch boot sequence and recover the image by entering the BIOS configuration utility described in the following section. Access this utility only when needed to recover a corrupted internal disk.



Caution

The BIOS changes explained in this section are required only to recover a corrupted bootflash.

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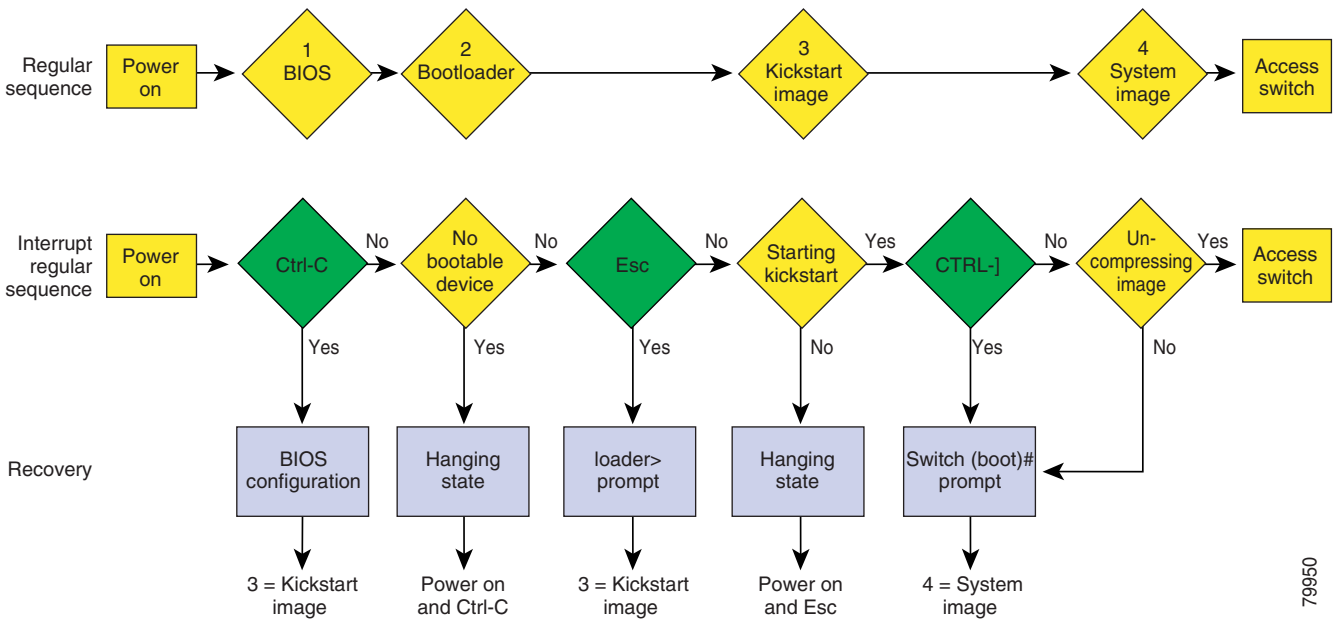
Recovery procedures require the regular sequence to be interrupted. The internal switch sequence goes through four phases between the time you turn on the switch and the time the switch prompt appears on your terminal—BIOS, boot loader, kickstart, and system. (See [Table 2-6](#) and [Figure 2-3](#).)

Table 2-6 Recovery Interruption

Phase	Normal Prompt ¹	Recovery Prompt ²	Description
BIOS	loader>	No bootable device	The BIOS begins the power-on self test, memory test, and other operating system applications. While the test is in progress, press Ctrl-C to enter the BIOS configuration utility and use the netboot option.
Boot loader	Starting kickstart	loader>	The boot loader uncompresses loaded software to boot an image using its file name as reference. These images are made available through bootflash. When the memory test is over, press Esc to enter the boot loader prompt.
Kickstart	Uncompressing system	switch (boot) #	When the boot loader phase is over, press Ctrl-] ³ (Control key plus right bracket key) to enter the <code>switch (boot) #</code> prompt. If the corruption causes the console to stop at this prompt, copy the system image and reboot the switch.
System	Login:	–	The system image loads the configuration file of the last saved running configuration and returns a switch login prompt.

1. This prompt or message appears at the end of each phase.
2. This prompt or message appears when the switch cannot progress to the next phase.
3. Depending on your Telnet client, these keys may be reserved, and you need to remap the keystroke. Refer to the documentation provided by your Telnet client.

Figure 2-3 Regular and Recovery Sequence



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Recovery Using BIOS Setup for Supervisor-1



Note

Supervisor-2 modules do not provide access to the BIOS.



Caution

This procedure uses the **init system** command, which reformats the file system of the device. Be sure that you have made a backup of the configuration files before you begin this procedure.

To recover a corrupted bootflash: device (no bootable device found message) for a switch with a single supervisor-1 module, follow these steps:

- Step 1** Connect to the console port of the required switch.
- Step 2** Boot or reboot the switch.
- Step 3** Press **Ctrl-C** to interrupt the BIOS setup during the BIOS memory test.
You see the netboot BIOS Setup Utility screen. (See [Figure 2-4](#).)

Figure 2-4 BIOS Setup Utility



Note

Your navigating options are provided at the bottom of the screen.

Tab = Jump to next field

Ctrl-E = Down arrow

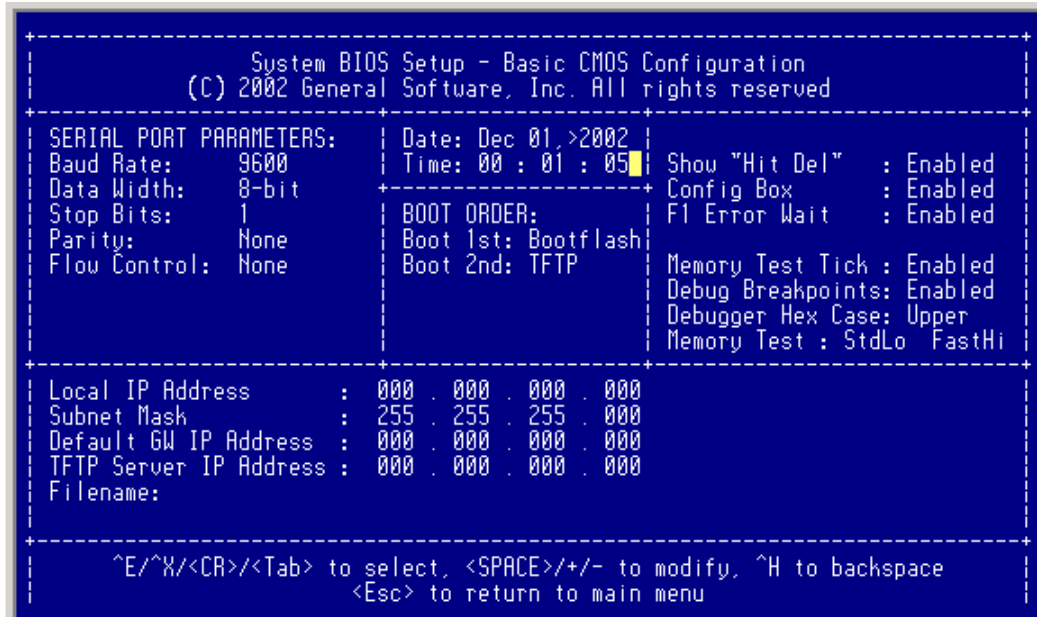
Ctrl-X = Up arrow

Ctrl-H = Erase (Backspace might not work if your terminal is not configured properly.)

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- Step 4** Press the **Tab** key to select the Basic CMOS Configuration.
You see the System BIOS Setup - Basic CMOS Configuration screen. (See [Figure 2-5](#).)

Figure 2-5 BIOS Setup Configuration (CMOS)



- Step 5** Change the Boot 1st: field to TFTP.
- Step 6** Press the **Tab** key until you reach the Local IP Address field.
- Step 7** Enter the local IP address for the switch, and press the **Tab** key.
- Step 8** Enter the subnet mask for the IP address, and press the **Tab** key.
- Step 9** Enter the IP address of the default gateway, and press the **Tab** key.
- Step 10** Enter the IP address of the TFTP server, and press the **Tab** key.
- Step 11** Enter the image name (kickstart), and press the **Tab** key. Use the full directory path from the TFTP server root directory.



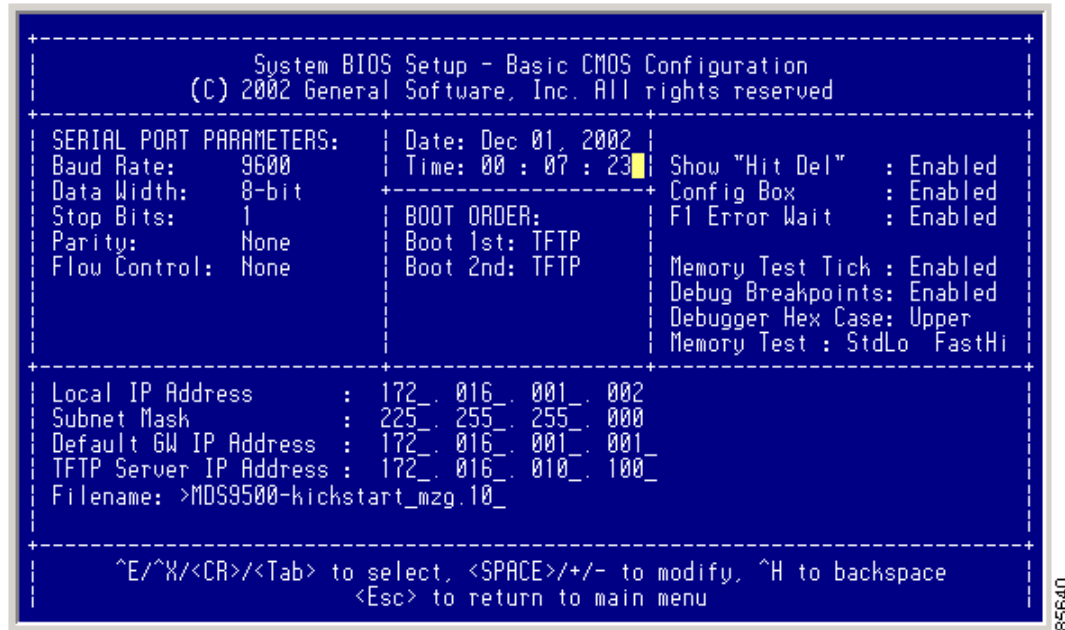
Caution

The file name must be entered exactly as it is displayed on your TFTP server. For example, if you have a file named MDS9500-kickstart_mzg.10, then enter this name using the exact uppercase characters and file extensions as shown on your TFTP server.

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You see the configured changes. (See [Figure 2-6](#).)

Figure 2-6 BIOS Setup Configuration (CMOS) Changes



Step 12 Press the **Esc** key to return to the main menu.

Step 13 Choose **Write to CMOS and Exit** from the main screen to save your changes.



Note These changes are saved in the CMOS.



Caution The switch must have IP connectivity to reboot using the newly configured values.

You see the following prompt:

```
switch (boot) #
```

Step 14 Enter the **init system** command at the `switch (boot) #` prompt, and press **Enter** to reformat the file system.

```
switch (boot) # init system
```



Note The **init system** command also installs a new loader from the existing (running) kickstart image.



Caution Be sure that you have made a backup of the configuration files before you issue this command.

Step 15 Follow the procedure specified in the “[Recovery from the switch \(boot\) # Prompt](#)” section on page 2-21.

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Recovery from the loader> Prompt on Supervisor-2 Modules



Caution

This procedure uses the **init system** command, which reformats the file system of the device. Be sure that you have made a backup of the configuration files before you begin this procedure.

The `loader>` prompt is different from the regular `switch#` prompt.

- The CLI command completion feature does not work at this prompt and may result in undesired errors. You must type the command exactly as you want the command to appear.
- The ICMP stack is not supported, so you cannot ping the TFTP server.
- The TFTP server must be configured with the IP address of the default gateway (rather than any other IP address on the defined subnet).



Tip

Use the **help** command at the `loader>` prompt to display a list of commands available at this prompt or to obtain more information about a specific command in that list.

To recover a corrupted kickstart image (system error state) for a switch with a single supervisor module, follow these steps:

Step 1 Enter the local IP address for the switch at the `loader>` prompt, and press **Enter**.

```
loader> net --ip=172.16.1.2
```

Step 2 Specify the subnet mask.

```
loader> net --nm= 255.255.255.0
```

Step 3 Specify the IP address of the default gateway.

```
loader> net --gw=172.16.1.1
```

Step 4 Boot the kickstart image file from the required server.

```
loader> boot tftp://172.16.10.100/m9500-kickstart-3.0.bin
```

In this example, `172.16.10.100` is the IP address of the TFTP server, and `m9500-kickstart-3.0.bin` is the name of the kickstart image file that exists on that server.

The `switch(boot)#` prompt indicates that you have a usable Kickstart image.

Step 5 Issue the **init system** command at the `switch(boot)#` prompt.

```
switch(boot)# init system
```



Caution

Be sure that you have made a backup of the configuration files before you issue this command.

Step 6 Follow the procedure specified in the [“Recovery from the switch\(boot\)# Prompt”](#) section on page 2-21.

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Recovery from the loader> Prompt on Supervisor-1 Modules



Caution

This procedure uses the **init system** command, which reformats the file system of the device. Be sure that you have made a backup of the configuration files before you begin this procedure.

The `loader>` prompt is different from the regular `switch#` prompt.

- The CLI command completion feature does not work at this prompt and may result in undesired errors. You must type the command exactly as you want the command to appear.
- The ICMP stack is not supported, so you cannot ping the TFTP server.
- The TFTP server must be configured with the IP address of the default gateway (rather than any other IP address on the defined subnet).



Tip

Use the **help** command at the `loader>` prompt to display a list of commands available at this prompt or to obtain more information about a specific command in that list.

To recover a corrupted kickstart image (system error state) for a switch with a single supervisor module, follow these steps:

Step 1 Enter the local IP address and the subnet mask for the switch at the `loader>` prompt, and press **Enter**.

```
loader> ip address 172.16.1.2 255.255.255.0
Found Intel EtherExpressPro100 82559ER at 0xe800, ROM address 0xc000
Probing...[Intel EtherExpressPro100 82559ER]Ethernet addr: 00:05:30:00:52:27
Address: 172.16.1.2
Netmask: 255.255.255.0
Server: 0.0.0.0
Gateway: 0.0.0.0
```

Step 2 Specify the IP address of the default gateway.

```
loader> ip default-gateway 172.16.1.1
Address: 172.16.1.2
Netmask: 255.255.255.0
Server: 0.0.0.0
Gateway: 172.16.1.1
```

Step 3 Boot the kickstart image file from the required server.

```
loader> boot tftp://172.16.10.100/kickstart-image1
Address: 172.16.1.2
Netmask: 255.255.255.0
Server: 172.16.10.100
Gateway: 172.16.1.1
Booting: /kick-282 console=ttyS0,9600n8nm quiet loader_ver= "2.1(2)"....
.....Image verification OK
Starting kernel...
INIT: version 2.78 booting
Checking all filesystems..... done.
Loading system software
INIT: Sending processes the TERM signal
Sending all processes the TERM signal... done.
Sending all processes the KILL signal... done.
Entering single-user mode...
INIT: Going single user
INIT: Sending processes the TERM signal
switch(boot)#
```

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The `switch(boot)#` prompt indicates that you have a usable Kickstart image.

Step 4 Issue the **init system** command at the `switch(boot)#` prompt.

```
switch(boot)# init system
```



Caution Be sure that you have made a backup of the configuration files before you issue this command.

Step 5 Follow the procedure specified in the “[Recovery from the switch\(boot\)# Prompt](#)” section on page 2-21.

Recovery from the switch(boot)# Prompt

To recover a system image using the kickstart image for a switch with a single supervisor module, follow these steps:

Step 1 Change to configuration mode.

```
switch(boot)#config t
switch(boot)(config)#
```

Step 2 Follow this step if you issued an **init system** command. Otherwise, skip to [Step 3](#).

a. Issue the **ip default-gateway** command to configure the IP address of the default gateway.

```
switch(boot)(config)#ip default-gateway 209.165.200.226
```

b. Configure the IP address of the `mgmt0` interface.

```
switch(boot)(config)#interface mgmt 0
switch(boot)(config-if)#ip address 209.165.200.227 255.255.255.0
```

Step 3 Issue the **no shutdown** command to enable the `mgmt0` interface on the switch.

```
switch(boot)(config-mgmt0)# no shutdown
```

Step 4 Enter **end** to exit to EXEC mode.

```
switch(boot)(config-mgmt0)# end
```

Step 5 If you believe there are file system problems, issue the **init system check-filesystem** command. As of Cisco MDS SAN-OS Release 2.1(1a), this command checks all internal file systems and fixes any errors that are encountered. This command takes considerable time to complete.

```
switch(boot)# init system check-filesystem
```

Step 6 Copy the system image from the required TFTP server.

```
switch(boot)# copy tftp://172.16.10.100/system-image1 bootflash:system-image1
```

Step 7 Copy the kickstart image from the required TFTP server.

```
switch(boot)# copy tftp://172.16.10.100/kickstart-image1 bootflash:kickstart-image1
```

Step 8 Verify that the system and kickstart image files are copied to your bootflash: file system.

```
switch(boot)# dir bootflash:
 46080      Nov 11 21:48:55 2008  lost+found/
14753280   Nov 11 21:39:49 2008  kickstart-image1
78473925   Nov 11 21:37:12 2008  system-image1
```

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```
Usage for bootflash://sup-local
107465728 bytes used
 78619648 bytes free
186085376 bytes total
```

Step 9 Load the system image from the bootflash: files system.

```
switch(boot)# load bootflash:system-image1
Uncompressing system image: bootflash:/system-image1
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
```

Would you like to enter the initial configuration mode? (yes/no): **yes**



Note If you enter **no**, you will return to the `switch#` login prompt, and you must manually configure the switch.

Step 10 Log in to the switch using the password configured in [Step 9](#).

```
switch login:admin
Password:
```

```
Cisco Storage Area Networking Operating System (SAN-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2008, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained herein are owned by
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License or the GNU Lesser General Public License. A copy of
each such license is available at
http://www.gnu.org/licenses/gpl.html and
http://www.gnu.org/licenses/lgpl.html
switch#
```

Step 11 Configure the boot variable.

```
switch #config t
switch(config)#boot kickstart bootflash:kickstart-image1
switch(config)#boot system bootflash:system-image1
switch(config)#end
switch#
```

Step 12 Save the configuration.

```
switch# copy running-config startup-config
[#####] 100%
switch#
```

Recovery for Switches with Dual Supervisor Modules

This section describes how to recover when one or both supervisor modules in a dual supervisor switch have corrupted bootflash.

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Recovering One Supervisor Module With Corrupted Bootflash

If one supervisor module has functioning bootflash and the other has corrupted bootflash, follow these steps:

Step 1 Boot the functioning supervisor module and log on to the switch.

Step 2 At the `switch#` prompt on the booted supervisor module, issue the **reload module slot force-dnld** command, where *slot* is the slot number of the supervisor module with the corrupted bootflash.

The supervisor module with the corrupted bootflash performs a netboot and checks the bootflash for corruption. When the bootup scripts discover that the bootflash is corrupted, it generates an **init system** command, which fixes the corrupt bootflash. The supervisor boots as the HA Standby.



Caution

If your system has an active supervisor module currently running, you must issue the **system standby manual-boot** command in EXEC mode on the active supervisor module before issuing the **init system** command on the standby supervisor module to avoid corrupting the internal bootflash. After the **init system** command completes on the standby supervisor module, issue the **system no standby manual-boot** command in EXEC mode on the active supervisor module.

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Recovering Both Supervisor Modules With Corrupted Bootflash

If both supervisor modules have corrupted bootflash, follow these steps:

- Step 1** Boot the switch and press the **Esc** key after the BIOS memory test to interrupt the boot loader.



Note Press **Esc** immediately after you see the following message:

```
00000589K Low Memory Passed
00000000K Ext Memory Passed
Hit ^C if you want to run SETUP....
Wait.....
```

If you wait too long, you will skip the boot loader phase and enter the kickstart phase.

You see the `loader>` prompt.



Caution The `loader>` prompt is different from the regular `switch#` or `switch(boot)#` prompt. The CLI command completion feature does not work at this prompt and may result in undesired errors. You must type the command exactly as you want the command to appear.



Tip Use the **help** command at the `loader>` prompt to display a list of commands available at this prompt or to obtain more information about a specific command in that list.

- Step 2** Specify the local IP address and the subnet mask for the switch.

```
loader> ip address 172.16.1.2 255.255.255.0
Found Intel EtherExpressPro100 82559ER at 0xe800, ROM address 0xc000
Probing...[Intel EtherExpressPro100 82559ER]Ethernet addr: 00:05:30:00:52:27
Address: 172.16.1.2
Netmask: 255.255.255.0
Server: 0.0.0.0
Gateway: 0.0.0.0
```

- Step 3** Specify the IP address of the default gateway.

```
loader> ip default-gateway 172.16.1.1
Address: 172.16.1.2
Netmask: 255.255.255.0
Server: 0.0.0.0
Gateway: 172.16.1.1
```

- Step 4** Boot the kickstart image file from the required server.

```
loader> boot tftp://172.16.10.100/kickstart-latest
Address: 172.16.1.2
Netmask: 255.255.255.0
Server: 172.16.10.100
Gateway: 172.16.1.1
Booting: /kick-282 console=ttyS0,9600n8nm quiet loader_ver= "2.1(2)"....
.....Image verification OK
Starting kernel...
```

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```
INIT: version 2.78 booting
Checking all filesystems..... done.
Loading system software
INIT: Sending processes the TERM signal
Sending all processes the TERM signal... done.
Sending all processes the KILL signal... done.
Entering single-user mode...
INIT: Going single user
INIT: Sending processes the TERM signal
switch(boot)#
```

The `switch(boot)#` prompt indicates that you have a usable Kickstart image.

- Step 5** Issue the **init-system** command to repartition and format the bootflash.
- Step 6** Perform the procedure specified in the “[Recovery from the switch\(boot\)# Prompt](#)” section on page 2-21.
- Step 7** Perform the procedure specified in the “[Recovering One Supervisor Module With Corrupted Bootflash](#)” section on page 2-23 to recover the other supervisor module.



Note

If you do not issue the **reload module** command when a boot failure has occurred, the active supervisor module automatically reloads the standby supervisor module within 3 to 6 minutes after the failure.

Recognizing Error States

If you see one or both of the error messages displayed in [Figure 2-7](#) or [Figure 2-8](#), follow the procedure specified in the “[Recovery Using BIOS Setup for Supervisor-1](#)” section on page 2-16.

Figure 2-7 Error State if Powered On and Ctrl-C Is Entered

```
+-----+
|                System BIOS Configuration, (C) 2002 General Software, Inc.                |
+-----+
| System CPU      : Pentium III      | Low Memory      : 630KB      |
| Coprocessor    : Enabled          | Extended Memory : 957MB      |
| Embedded BIOS  : 09/10/02        | ROM Shadowing  : Enabled    |
+-----+
| Boot network name is EOBC          |
| Local IP address: 127.1.2.1        |
|                                     |
| Bind to network device '/DEV/TCPIP/EOBC/BootNet' |
| SoBindNetName: keOpenFile failed. |
| Cannot bind to the network '/DEV/TCPIP/EOBC/BootNet' |
| Could not get BOOTP response from the server. |
| BOOTNET: Dispatch duration could not be restored, reason=1. |
| Network boot failed, status=317. |
|                                     |
| No bootable device available. |
| R - REBOOT                    |
| S - SETUP                     |
| ESC - BIOS DEBUGGER           |
+-----+
85642
```

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Figure 2-8 Error State if Powered On and Esc Is Pressed

```

+-----+
| System BIOS Configuration, (C) 2002 General Software, Inc. |
+-----+
| System CPU       : Pentium III | Low Memory       : 630KB |
| Coprocessor     : Enabled     | Extended Memory  : 1021MB |
| Embedded BIOS Date : 11/13/02 | ROM Shadowing   : Enabled |
+-----+
Loader Loading stage1.5.

Loader loading, please wait...
Cannot mount partition (ffff) - Error 17
|

```

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Switch or Process Resets

When a recoverable or nonrecoverable error occurs, the switch or a process on the switch may reset.

Symptom The switch or a process on the switch reset.

Table 2-7 Switch or Process Resets

Problem	Possible Cause	Solution
The switch or a process on the switch resets.	A recoverable error occurred on the system or on a process in the system.	Cisco SAN-OS automatically recovered from the problem. See the “Recoverable System Restarts” section on page 2-27 and the “Switch or Process Resets” section on page 2-26.
	A nonrecoverable error occurred on the system.	Cisco SAN-OS cannot recover automatically from the problem. See the “Unrecoverable System Restarts” section on page 2-31 to determine the cause.
	A clock module failed.	Verify that a clock module failed. See the “Troubleshooting Clock Module Issues” section on page 4-12. Replace the failed clock module during the next maintenance window.

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Recoverable System Restarts

Every process restart generates a syslog message and a Call Home event. Even if the event does not affect service, you should identify and resolve the condition immediately because future occurrences could cause service interruption.

To respond to a recoverable system restart, follow these steps:

Step 1 Enter the following command to check the syslog file to see which process restarted and why it restarted:

```
switch# show log logfile | include error
```

For information about the meaning of each message, refer to the *Cisco MDS 9000 Family System Messages Reference*.

The system output looks like the following example:

```
Jan 10 23:31:31 dot-6 % LOG_SYSMGR-3-SERVICE_TERMINATED: Service "sensor" (PID 704) has
finished with error code SYSMGR_EXITCODE_SY.
switch# show logging logfile | include fail
Jan 27 04:08:42 88 %LOG_DAEMON-3-SYSTEM_MSG: bind() fd 4, family 2, port 123, ad
dr 0.0.0.0, in_classd=0 flags=1 fails: Address already in use
Jan 27 04:08:42 88 %LOG_DAEMON-3-SYSTEM_MSG: bind() fd 4, family 2, port 123, ad
dr 127.0.0.1, in_classd=0 flags=0 fails: Address already in use
Jan 27 04:08:42 88 %LOG_DAEMON-3-SYSTEM_MSG: bind() fd 4, family 2, port 123, ad
dr 127.1.1.1, in_classd=0 flags=1 fails: Address already in use
Jan 27 04:08:42 88 %LOG_DAEMON-3-SYSTEM_MSG: bind() fd 4, family 2, port 123, ad
dr 172.22.93.88, in_classd=0 flags=1 fails: Address already in use
Jan 27 23:18:59 88 % LOG_PORT-5-IF_DOWN: Interface fc1/13 is down (Link failure
or not-connected)
Jan 27 23:18:59 88 % LOG_PORT-5-IF_DOWN: Interface fc1/14 is down (Link failure
or not-connected)
Jan 28 00:55:12 88 % LOG_PORT-5-IF_DOWN: Interface fc1/1 is down (Link failure o
r not-connected)
Jan 28 00:58:06 88 % LOG_ZONE-2-ZS_MERGE_FAILED: Zone merge failure, Isolating p
ort fc1/1 (VSAN 100)
Jan 28 00:58:44 88 % LOG_ZONE-2-ZS_MERGE_FAILED: Zone merge failure, Isolating p
ort fc1/1 (VSAN 100)
Jan 28 03:26:38 88 % LOG_ZONE-2-ZS_MERGE_FAILED: Zone merge failure, Isolating p
ort fc1/1 (VSAN 100)
Jan 29 19:01:34 88 % LOG_PORT-5-IF_DOWN: Interface fc1/1 is down (Link failure o
r not-connected)
switch#
```

Step 2 Enter the following command to identify the processes that are running and the status of each process.

```
switch# show processes
```

The following codes are used in the system output for the State (process state):

- D = uninterruptible sleep (usually I/O)
- R = runnable (on run queue)
- S = sleeping
- T = traced or stopped
- Z = defunct (“zombie”) process
- NR = notrunning
- ER = should be running but currently notrunning

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**Note**

ER usually is the state a process enters if it has been restarted too many times and has been detected as faulty by the system and disabled.

The system output looks like the following example. (The output has been abbreviated to be more concise.)

PID	State	PC	Start_cnt	TTY	Process
1	S	2ab8e33e	1	-	init
2	S	0	1	-	keventd
3	S	0	1	-	ksoftirqd_CPU0
4	S	0	1	-	kswapd
5	S	0	1	-	bdflush
6	S	0	1	-	kupdated
71	S	0	1	-	kjournald
136	S	0	1	-	kjournald
140	S	0	1	-	kjournald
431	S	2abe333e	1	-	httpd
443	S	2abfd33e	1	-	xinetd
446	S	2ac1e33e	1	-	sysmgr
452	S	2abe91a2	1	-	httpd
453	S	2abe91a2	1	-	httpd
456	S	2ac73419	1	S0	vsh
469	S	2abe91a2	1	-	httpd
470	S	2abe91a2	1	-	httpd

Step 3 Enter the following command to show the processes that have had abnormal exits and to show if there is a stack-trace or core dump:

```
switch# show process log
Process          PID      Normal-exit  Stack-trace  Core      Log-create-time
-----
ntp              919      N            N            N        Jan 27 04:08
snsm            972      N            Y            N        Jan 24 20:50
```

Step 4 Enter the following command to show detailed information about a specific process that has restarted:

```
switch# show processes log pid 898
Service: idehsd
Description: ide hotswap handler Daemon
Started at Mon Sep 16 14:56:04 2002 (390923 us)
Stopped at Thu Sep 19 14:18:42 2002 (639239 us)
Uptime: 2 days 23 hours 22 minutes 22 seconds
Start type: SRV_OPTION_RESTART_STATELESS (23)
Death reason: SYSMGR_DEATH_REASON_FAILURE_SIGTERM (3)
Exit code: signal 15 (no core)
CWD: /var/sysmgr/work
Virtual Memory:
CODE      08048000 - 0804D660
  DATA   0804E660 - 0804E824
  BRK     0804E9A0 - 08050000
  STACK   7FFFFFFD10
Register Set:
EBX 00000003      ECX 0804E994      EDX 00000008
ESI 00000005      EDI 7FFFFFFC9C    EBP 7FFFFFFCAC
EAX 00000008      XDS 0000002B     XES 0000002B
EAX 00000003 (orig) EIP 2ABF5EF4     XCS 00000023
EFL 00000246      ESP 7FFFFFFC5C   XSS 0000002B
Stack: 128 bytes. ESP 7FFFFFFC5C, TOP 7FFFFFFD10
0x7FFFFFFC5C: 0804F990 0804C416 00000003 0804E994 .....
0x7FFFFFFC6C: 00000008 0804BF95 2AC451E0 2AAC24A4 .....Q.*.*
0x7FFFFFFC7C: 7FFFFFFD14 2AC2C581 0804E6BC 7FFFFFFCA8 .....*.....
```

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```
0x7FFFC8C: 7FFFC94 0000003 0000001 0000003 .....
0x7FFFC9C: 0000001 0000000 0000068 0000000 .....h.....
0x7FFFCAC: 7FFFC8E 2AB4F819 0000001 7FFFD14 .....*.....
0x7FFFCBC: 7FFFD1C 0804C470 0000000 7FFFC8E ....p.....
0x7FFFC8C: 2AB4F7E9 2AAC1F00 0000001 08048A2C ...*...*.....,
PID: 898
SAP: 0
UUID: 0
switch#
```

Step 5 Enter the following command to determine if the restart recently occurred:

```
switch# show system uptime
Start Time: Fri Sep 13 12:38:39 2002
Up Time: 0 days, 1 hours, 16 minutes, 22 seconds
```

To determine if the restart is repetitive or a one-time occurrence, compare the length of time that the system has been up with the timestamp of each restart.

Step 6 Enter the following command to view the core files:

```
switch# show cores
Module-num      Process-name      PID      Core-create-time
-----
5                fspf              1524     Jan 9 03:11
6                fcc                919     Jan 9 03:09
8                acltcam           285     Jan 9 03:09
8                fib                283     Jan 9 03:08
```

The output shows all cores that are presently available for upload from the active supervisor. The module-num column shows the slot number on which the core was generated. In the previous example, an FSPF core was generated on the active supervisor module in slot 5. An FCC core was generated on the standby supervisory module in slot 6. Core dumps generated on the module in slot 8 include ACLTCAM and FIB.

To copy the FSPF core dump in this example to a TFTP server with the IP address 1.1.1.1, enter the following command:

```
switch# copy core://5/1524 tftp://1.1.1.1/abcd
```

The following command displays the file named `zone_server_log.889` in the `log` directory:

```
switch# show pro log pid 1473
=====
Service: ips
Description: IPS Manager

Started at Tue Jan 8 17:07:42 1980 (757583 us)
Stopped at Thu Jan 10 06:16:45 1980 (83451 us)
Uptime: 1 days 13 hours 9 minutes 9 seconds

Start type: SRV_OPTION_RESTART_STATELESS (23)
Death reason: SYSMGR_DEATH_REASON_FAILURE_SIGNAL (2)
Exit code: signal 6 (core dumped)
CWD: /var/sysmgr/work

Virtual Memory:

CODE      08048000 - 080FB060
DATA      080FC060 - 080FCBA8
BRK       081795C0 - 081EC000
STACK     7FFFCF0
TOTAL     20952 KB
```

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Register Set:

```

EBX 000005C1      ECX 00000006      EDX 2AD721E0
ESI 2AD701A8      EDI 08109308      EBP 7FFFFFF2EC
EAX 00000000      XDS 0000002B      XES 0000002B
EAX 00000025 (orig) EIP 2AC8CC71      XCS 00000023
EFL 00000207      ESP 7FFFFFF2C0      XSS 0000002B

```

Stack: 2608 bytes. ESP 7FFFFFF2C0, TOP 7FFFFFFCF0

```

0x7FFFFFF2C0: 2AC8C944 000005C1 00000006 2AC735E2 D..*.....5.*
0x7FFFFFF2D0: 2AC8C92C 2AD721E0 2AAB76F0 00000000 ,..*!.*.v.*...
0x7FFFFFF2E0: 7FFFFFF320 2AC8C920 2AC513F8 7FFFFFF42C ...*.*.*,...
0x7FFFFFF2F0: 2AC8E0BB 00000006 7FFFFFF320 00000000 ...*.....
0x7FFFFFF300: 2AC8DFF8 2AD721E0 08109308 2AC65AFC ...*!.*.....Z.*
0x7FFFFFF310: 00000393 2AC6A49C 2AC621CC 2AC513F8 .....*!.*...*
0x7FFFFFF320: 00000020 00000000 00000000 00000000 .....
0x7FFFFFF330: 00000000 00000000 00000000 00000000 .....
0x7FFFFFF340: 00000000 00000000 00000000 00000000 .....
0x7FFFFFF350: 00000000 00000000 00000000 00000000 .....
0x7FFFFFF360: 00000000 00000000 00000000 00000000 .....
0x7FFFFFF370: 00000000 00000000 00000000 00000000 .....
0x7FFFFFF380: 00000000 00000000 00000000 00000000 .....
0x7FFFFFF390: 00000000 00000000 00000000 00000000 .....
0x7FFFFFF3A0: 00000002 7FFFFFF3F4 2AAB752D 2AC5154C .
... output abbreviated ...

```

Stack: 128 bytes. ESP 7FFFFFF830, TOP 7FFFFFFCD0

- Step 7** Enter the following command to configure the switch to use TFTP to send the core dump to a TFTP server:

```
system cores tftp://[servername]/[path]
```

This command causes the switch to enable the automatic copy of core files to a TFTP server. For example, the following command sends the core files to the TFTP server with the IP address 10.1.1.1:

```
switch(config)# system cores tftp://10.1.1.1/cores
```

The following conditions apply:

- The core files are copied every 4 minutes. This time interval is not configurable.
- The copy of a specific core file to a TFTP server can be manually triggered, using the command **copy core://module#/pid# tftp://tftp_ip_address/file_name**.
- The maximum number of times a process can be restarted is part of the HA policy for any process. (This parameter is not configurable.) If the process restarts more than the maximum number of times, the older core files are overwritten.
- The maximum number of core files that can be saved for any process is part of the HA policy for any process. (This parameter is not configurable, and it is set to three.)

- Step 8** Determine the cause and resolution for the restart condition by contacting your customer support representative and asking the representative to review your core dump.

See also the “[Troubleshooting Supervisor Issues](#)” section on page 4-14 or the “[Troubleshooting Switching and Services Modules](#)” section on page 4-21.

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Unrecoverable System Restarts

An unrecoverable system restart might occur in the following cases:

- A critical process fails and is not restartable.
- A process restarts more times than is allowed by the system configuration.
- A process restarts more frequently than is allowed by the system configuration.

The effect of a process reset is determined by the policy configured for each process. Unrecoverable reset may cause loss of functionality, restart of the active supervisor, a supervisor switchover, or restart of the switch.

To respond to an unrecoverable reset, see the [“Troubleshooting Cisco SAN-OS Software System Reboots” section on page 2-13](#).

The **show system reset-reason** CLI command displays the following information:

- In a Cisco MDS 9500 Series switch, the last four reset-reason codes for the supervisor module in slot 5 and slot 6 are displayed. If either supervisor module is absent, the reset-reason codes for that supervisor module are not displayed.
- In a Cisco MDS 9200 Series switch, the last four reset-reason codes for the supervisor module in slot 1 are displayed.
- The **show system reset-reason module number** command displays the last four reset-reason codes for a specific module in a given slot. If a module is absent, then the reset-reason codes for that module are not displayed.
- Find the overall history of when and why expected and unexpected reloads occur.
- Timestamp of when the reset or reload occurred
- Reason for the reset or reload of a module
- The service that caused the reset or reload (not always available)
- The software version that was running at the time of the reset or reload

Example 2-2 show system reason-reset Command Output

```
switch# show system reset-reason module 5
----- reset reason for module 5 -----
1) At 224801 usecs after Fri Jan 21 16:36:40 2005
Reason: Reset Requested by CLI command reload
Service:
Version: 2.1(2)
2) At 922828 usecs after Fri Jan 21 16:02:48 2005
Reason: Reset Requested by CLI command reload
Service:
Version: 2.1(2)
3) At 318034 usecs after Fri Jan 21 14:03:36 2005
Reason: Reset Requested by CLI command reload
Service:
Version:2.1(2)
4) At 255842 usecs after Wed Jan 19 00:07:49 2005
Reason: Reset Requested by CLI command reload
Service:
Version: 2.1(2)
```

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Recovering the Administrator Password


You can access the switch if you forget the administrator password by following the directions in [Table 2-8](#).

Symptom You forgot the administrator password for accessing a switch.

Table 2-8 *Recovering Administrator Password*

Problem	Solution
You forgot the administrator password for accessing a Cisco MDS 9000 Family switch.	You can recover the password using a local console connection. For the latest instructions on password recovery, refer to the Cisco MDS 9000 CLI Family Configuration Guide at the following website: http://cisco.com/en/US/products/ps5989/products_installation_and_configuration_guides_list.html

If you can access Device Manager, recover the administrator password by following these steps:

-
- Step 1** Create a text file on the TFTP server containing the desired user name and password:
"username admin password 0 admin123"
- Step 2** Click **Admin > Copy Configuration** to copy the file from the TFTP server to the running configuration on the switch.
-  **Note** The clear text password "admin123" will be copied over the existing password and encrypted in the running configuration.
-
- Step 3** Click **Device > Command Line Interface** to log into the switch and verify the new password.
- Step 4** Click **Admin > Save Configuration** to save the running configuration to the startup configuration.
-

Miscellaneous Software Image Issues

This section includes software image issues reported by the relevant release notes and includes the following topics:

- [All Ports Down Because of System Health Failure](#), page 2-33
- [Switch Reboots after FCIP Reload](#), page 2-33
- [FCIP Link Fails to Come Up](#), page 2-33
- [Cannot Create, Modify, or Delete Admin Role](#), page 2-34
- [FC IDs Change after Link Reset](#), page 2-34
- [Switch Displays Wrong User](#), page 2-34

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All Ports Down Because of System Health Failure

Symptom Console reports all ports on a module are down because of a system health failure.

Table 2-9 All Ports are Down Because of a System Health Failure.

Symptom	Possible Cause	Solution
The system console reports that the module's ports are down because of a system health failure.	An incorrect process on the Cisco MDS 9000 modules might have been reinitialized from an error recovery mechanism, leaving the module in an unusable state. In some cases, the module may reboot.	Downgrade to a Cisco SAN-OS Release 2.0(x) version supported by your OSM. Upgrade to Cisco SAN-OS Release 2.1.2 or 2.1(1b). Resetting the module will clear the problem, but the problem could reoccur unless you are using a SAN-OS version with the bug fix.

Switch Reboots after FCIP Reload

Symptom Switch rebooted after FCIP module was reloaded, upgraded, or downgraded.

Table 2-10 Switch Reboot after FCIP Reload

Symptom	Possible Cause	Solution
Switch rebooted after FCIP module was reloaded, upgraded, or downgraded.	If an IPS module with operational FCIP PortChannels is reloaded, upgraded, or downgraded, the supervisor module might reload and cause the system to reboot.	Before reloading, upgrading, or downgrading an IPS module, shut down all FCIP PortChannels on the module.

FCIP Link Fails to Come Up

Symptom A newly configured FCIP link may fail to come up when running on an MPS-14/2 module.

Table 2-11 FCIP Link Fails to Come Up

Symptom	Possible Cause	Solution
A newly configured FCIP link may fail to come up when running on an MPS-14/2 module.	This symptom may occur following an upgrade from Cisco MDS SAN-OS Release 2.0(1b) to Release 2.0(3) and following the configuration of a new FCIP link.	Reload the MPS-14/2 module using the reload module module-number command, where <i>module-number</i> is a specific module.

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Cannot Create, Modify, or Delete Admin Role

Symptom Cannot create, modify, or delete the admin role.

Table 2-12 *Cannot Create, Modify, or Delete Admin Role*

Symptom	Possible Cause	Solution
Cannot create, modify, or delete the admin role.	After upgrading to Cisco SAN-OS Release 2.0, you cannot create, modify, or delete the admin role.	Create the admin role before upgrading to Cisco SAN-OS Release 2.0.

FC IDs Change after Link Reset

Symptom FC IDs change after a link resets.

Table 2-13 *FC IDs Change After a Link Reset*

Symptom	Possible Cause	Solution
FC IDs change after a link resets.	Following an upgrade from Cisco SAN-OS Release 1.1 to Cisco SAN-OS Release 1.3 or later, with persistent FC ID enabled, the FC IDs for the storage arrays might change after a link flap.	Reconfigure the FC IDs as necessary.

Switch Displays Wrong User

Symptom Switch displays the wrong user with the **show running-config** CLI command.

Table 2-14 *Switch Displays Wrong User*

Symptom	Possible Cause	Solution
Switch displays the wrong user with the show running-config CLI command.	When you perform a nondisruptive upgrade from Cisco SAN-OS Release 1.3(x) to Cisco SAN-OS Release 2.0(x) and then issue the show running-config command, the switch displays the wrong user. The user shown after the nondisruptive upgrade is different from the user shown when you issue the show user-account command.	Recreate the user.