

This section describes how to identify and resolve problems that might occur in the hardware components of the Cisco MDS 9000 Family. It includes the following sections:

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Overview

The key to success when troubleshooting the system hardware is to isolate the problem to a specific system component. The first step is to compare what the system is doing to what it should be doing. Because a startup problem can usually be attributed to a single component, it is more efficient to isolate the problem to a subsystem rather than troubleshoot each separate component in the system.

Problems with the initial power up are often caused by a module that is not firmly connected to the backplane or a power supply that has been disconnected from the power cord connector.

Overheating can also cause problems with the system, though typically only after the system has been operating for an extended period of time. The most common cause of overheating is the failure of a fan module.

The Cisco MDS 9000 Family includes the following subsystems on most chassis:

- Power supply--This includes the power supply fans.
- Fan module--The chassis fan module should operate whenever system power is on. You should see the Fan LED turn green and should hear the fan module to determine whether or not it is operating. If the Fan LED is red, this indicates that one or more fans in the fan module is not operating. You should immediately contact your customer service representative. (See the "Steps to Perform Before Calling TAC".) There are no installation adjustments that you can make if the fan module does not function properly at initial startup.

 **Note:** If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this website: [Cisco Technical Support](http://www.cisco.com/technicalsupport)

- Supervisor module-- The supervisor module contains the operating system software, so check your supervisor module if you have trouble with the system software. Status LEDs on the supervisor module indicate whether or not the supervisor module can initialize a switching module.

If you have a redundant supervisor module, refer to the following website for the latest Cisco MDS 9000 Family configuration guides for descriptions of how the redundant supervisor module comes online and how the software images are handled:

<http://www.cisco.com/univercd/cc/td/doc/product/sn5000/mds9000/index.htm>

- Switching module--Status LEDs on each module indicate if it has been initialized by the supervisor module. A module that is partially installed in the backplane can cause the system to halt.

SNMP Traps

You can set SNMP traps to monitor fans, power supplies and temperature settings, or to test a call home application without risking adverse impact to your production SAN.

Use any of the following commands to set SNMP traps:

- **test pfm test-SNMP-trap fan**

- **test pfm test-SNMP-trap powersupply**
- **test pfm test-SNMP-trap temp-sensor**

 **Note:** You do not have to physically remove the fan or power supply, nor do you have to physically increase the temperature, to generate these traps.

Troubleshooting Startup Issues

LEDs indicate all system states in the startup sequence. By checking the LEDs, you can determine when and where the system failed in the startup sequence.

To identify startup problems, follow these steps:

-
1. Turn on the power supplies by turning the switch to the on position (I). You should immediately hear the system fan module begin to operate. If not, see the "Troubleshooting Power Supply Issues" section.
 2. If you determine that the power supplies are functioning normally yet the fan module is faulty, see the "Troubleshooting Fan Issues" section.
 3. Verify that the LEDs on the supervisor module display as follows:
 - a. The Status LED flashes orange once and stays orange during diagnostic boot tests. It turns green when the module is operational (online). If the system software cannot start up, this LED stays orange.
 - b. The System LED turns green, indicating that all chassis environmental monitors are reporting that the system is operational. If one or more of the environmental monitors reports a problem, the System LED is orange or red.
 - c. The Active LED turns green, indicating that the supervisor module is operational and active. If the supervisor module is in standby mode, the Active LED is orange.
 - d. Each Link LED flashes orange once and stays orange during diagnostic boot tests, and it turns green when the module is operational (online). If no signal is detected, the Link LED turns off. The Link LED blinks orange if the port is bad.

If any LEDs on the supervisor module front panel are red or orange after the initialization time, see the "Troubleshooting Supervisor Issues" section. If you have a redundant supervisor module, refer to the following website for the latest Cisco MDS 9000 Family configuration guides for descriptions of the supervisor module LEDs, how the redundant supervisor module comes online, and how the software images are handled:

[1]

4. Verify that the Status LEDs on the supervisor module and on each switching module are green when the supervisor module completes initialization. This LED indicates that the modules are receiving power, have been recognized by the supervisor module, and contain a valid Flash code version. This LED does not indicate the state of the individual interfaces on the switching modules. If a Status LED is red or orange, see the "Troubleshooting Supervisor Issues" section.
 5. Verify that the terminal is set correctly and that it is connected properly to the supervisor module console port if the boot information and system banner are not displayed.
-

Troubleshooting Power Supply Issues

This section describes power supply problems.

All Power Supply LEDS Are Off

Symptom: The following system messages may be generated with this symptom:

Error Message PLATFORM-2-PS_FAIL: Power supply [dec] failed or shutdown (Serial No. [chars]).

Explanation Power supply failed or has been shut down.

Recommended Action Enter the **show environment power** and **show platform internal info** CLI commands or similar Fabric Manager or Device Manager command to collect more information. Refer to power supply documentation in the relevant hardware installation guide to learn more on increasing or decreasing power supply capacity and configuring power supplies.

Error Message PLATFORM-2-PS_MISMATCH: Detected power supply [chars]. This reduces the redundant power available to the system and can cause service disruptions.

Explanation Detected a new power supply that has reduced capacity compared to an existing power supply.

Recommended Action Refer to power supply document on increasing decreasing power supply capacity and configuring power supplies. Enter the **show environment power** and **show platform internal info** CLI command or similar Fabric Manager/Device Manager command to collect more information.

Error Message PLATFORM-5-PS_REMOVE: Power supply [dec] removed (Serial No. [chars]).

Explanation Power supply has been removed.

Recommended Action No action is required.

Table 4-1 All Power Supply LEDS Are Off

Symptom	Possible Cause	Solution
All power supply LEDS are off.	Power supply is not correctly seated in the chassis.	Remove and reinstall the power supply. Refer to the appropriate hardware installation guide for your chassis.
	Power supply is shut down.	Choose Physical > Power Supplies and check the OperStatus on Device Manager, or use the show environment power CLI command to determine if the power supply is shut down. If the status is shut down, then the supervisor has shut down the power supply. The supervisor shuts down the lower capacity power

		supply only if it detects a mismatched pair of power supplies and the mode is redundant or if there is a transition from combined to redundant mode. If both power supplies are the same capacity or the mode is combined, Cisco SAN-OS never shuts down a power supply.
	Power supply is not operational.	Troubleshoot the power supplies. See the "Troubleshooting the Power Supplies" section.

Power Supply Input Ok LED is Red

Symptom Power supply Input Ok LED is red.

Table 4-2 Power Supply Input Ok LED is Red

Symptom	Possible Cause	Solution
Power supply Input Ok LED is red.	Power supply is not correctly seated in the chassis.	Remove and reinstall the power supply. Refer to the appropriate hardware installation guide for your chassis.
	PEMs on a Cisco MDS 9500 Series chassis are not correctly installed.	Remove and reinstall the power supply PEMs. Refer to the appropriate hardware installation guide for your chassis.
	External power source is not operational.	Power down the switch and verify the external power source. Use independent power sources to each redundant power supply in a Cisco MDS 9500 Series director.
	Power supply is not operational.	Troubleshoot the power supplies. See the "Troubleshooting the Power Supplies" section.

Power Supply Output Failed LED is On

Symptom Power Supply Output Failed LED is on.

Table 4-3 Power Supply Output Failed LED is On

Symptom	Possible Causes	Solutions
Power Supply Output Failed LED is on.	Power supply is not operational.	Troubleshoot the power supplies. See the "Troubleshooting the Power Supplies" section.

Power Supply Fan Ok LED is Red

Symptom Power supply Fan Ok LED is red.

The following system messages may be generated with this symptom:

Error Message PLATFORM-2-PS_FANFAIL: Fan in Power supply [dec] failed.

Explanation Fan module in the power supply has failed.

Recommended Action Enter the **show environment power** and **show platform internal info** CLI command or similar Fabric Manager/Device Manager command to collect more information. Introduced in Cisco MDS SAN-OS Release 1.3(1).

Table 4-4 Power Supply Fan Ok LED is Red

Symptom	Possible Cause	Solution
Power supply Fan Ok LED is red.	Fan has failed on the power supply.	Choose Physical > Temperature sensors on Device Manager or use the show environment temperature CLI command to verify that the chassis temperature is normal. Verify that no temperature sensors are approaching the minor thresholds. If the temperature sensors are near or over a threshold value, you should replace the power supply.
	Power supply is not operational.	Troubleshoot the power supplies. See the "Troubleshooting the Power Supplies" section.

Troubleshooting the Power Supplies

To isolate a power supply problem, follow these steps:

1. Verify that the Input Ok LED on the power supply is green. If the Input Ok LED is green, the AC or DC source is operational and the power supply is functional.
2. If the Input Ok LED is off, first ensure that the power supply is flush with the chassis. Turn the power switch off, tighten the captive screw(s), and then turn the power switch on (I). If the Input Ok LED remains off, there might be a problem with the AC source or the DC source, or with the power cable.
 - a. Turn off the power to the switch by pressing or turning both power switches to 0, connect the power cord to another power source if one is available, and turn the power on. If the Input Ok LED is now green, the problem was the first power source.
 - b. If the Input Ok LED fails to light after you connect the power supply to a new power source, replace the power cord and turn the switch on. If the Input Ok LED lights at this point, return the first power cord for replacement.

c. If the Input Ok LED still fails to light when the switch is connected to a different power source with a new power cord, the power supply is probably faulty. If a second power supply is available, install it in the second power supply bay and contact your customer service representative for further instructions.

 **Note:** If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL: [\[2\]](#)

3. Repeat Step 1 if you have a second (redundant) power supply.

4. Choose **Physical > Power Supplies** on Device Manager or use the **show environment power** command to verify the status of your power supplies.

Example 4-1 Output of show environment power

```
switch# show environment power
```

```
-----
PS  Model                Power      Power      Status
-----
1   DS-CAC-1900W          1019.34   24.27      ok
2   DS-CAC-1900W          1019.34   24.27      ok
```

```
Mod Model                Power      Power      Power      Power      Status
   Model                Requested  Requested  Allocated  Allocated
   (Watts)              (Amp @42V) (Watts)    (Amp @42V)
-----
3   DS-X9016              220.08    5.24       220.08     5.24      powered-up
4   DS-X9308-SMIP         210.00    5.00       210.00     5.00      powered-up
5   DS-X9530-SF1-K9       220.08    5.24       220.08     5.24      powered-up
```

```
Power Usage Summary:
```

```
-----
Power Supply redundancy mode:          redundant
Total Power Capacity                   1019.34 W
Power reserved for Supervisor(s) [-]   440.16 W
Power reserved for Fan Module(s) [-]   126.00 W
Power currently used by Modules [-]    430.08 W
```

If you are unable to resolve the problem or if you determine that either a power supply or backplane connector is faulty, contact your customer support representative.

Troubleshooting Fan Issues

This section describes fan failure problems.

Fan Is Not Spinning

Symptom Fan is not spinning.

Table 4-5 Fan Is Not Spinning

Symptom	Possible Cause	Solution
Fan is not spinning.	Fan is not correctly seated in	Loosen the captive screws, remove the fan module and reinstall it to ensure that the fan module is

	the chassis.	seated properly. Tighten all captive screws, and then restart the system.
	Power supply is not operational.	Troubleshoot the power supplies. See the "Troubleshooting Power Supply Issues" section.

Fan Is Spinning; Fan LED is Red

Symptom Fan is spinning, but fan LED is red.

Table 4-6 Fan Is Spinning; Fan LED is Red

Symptom	Possible Cause	Solution
Fan is spinning but fan LED is red.	Fan is not correctly seated in the chassis.	Loosen the captive screws, remove the fan module and reinstall it to ensure that the fan module is seated properly. Tighten all captive screws, and then restart the system.
	Fan module has failed.	Troubleshoot the Fan Module. See the "Troubleshooting a Fan Failure Using the CLI" section.

Troubleshooting a Fan Failure Using Device Manager

To troubleshoot a fan module problem using Device Manager, follow these steps:

1. Choose **Physical > Fan**. You see the Fan Status dialog box.
2. If the OperStatus is failure, one or more fans are not operational. Replace the failed fan module before your switch overheats. You should see the following system message in the switch log:

Error Message PLATFORM-1-CASA_FAN_FAIL: Fan module [dec] Failed.

Explanation Fan module failed and needs to be replaced. This can lead to overheating and temperature alarms.

Recommended Action Enter the **show platform internal info** command or similar Fabric Manager/Device Manager command to collect more information.

3. If the OperStatus is absent, the fan module has been removed. As soon as the fan module is removed, Cisco SAN-OS starts a five-minute countdown.



Caution: If the fan module is not reinserted within five minutes, the entire switch is shutdown.

Software reads a byte on the SEEPROM to determine if the fan module is present. If the fan module is partially inserted or if software is unable to access the SEEPROM on the fan module for any other reason, then Cisco SAN-OS cannot distinguish this case from a real fan module removal. The switch will be shut down in five minutes. The following priority 0 syslog messages are printed every five seconds:

Error Message PLATFORM-0-FAIL_REMOVED: Fan module removed. Fan module has been absent for [dec] seconds.

Explanation Fan module was removed. This could lead to temperature alarms.

Recommended Action Replace the fan module immediately.

4. Remove and reinstall or replace the fan module. If the Fan LED is still red, the system detects a fan module failure. Contact your customer service representative for instructions.



Note: If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Troubleshooting a Fan Failure Using the CLI

To troubleshoot a fan module problem using the CLI, follow these steps:

1. Use the **show environment fan** command to verify the status of each fan type.

Example 4-2 show environment fan Output

```
switch# show environment fan
-----
Fan           Model           Hw           Status
-----
Chassis      DS-9SLOT-FAN   1.2         ok
PS-1         --              --           ok
PS-2         --              --           absent
```

2. If the fan status is failure, one or more fans are not operational. Replace the failed fan module before your switch overheats. You should see the following system message in the log:

Error Message PLATFORM-1-CASA_FAN_FAIL: Fan module [dec] Failed.

Explanation Fan module failed and needs to be replaced. This can lead to overheating and temperature alarms.

Recommended Action Enter the **show platform internal info** command to collect more information.

3. If the fan status is absent, the fan module has been removed. As soon as the fan module is removed, Cisco SAN-OS starts a five-minute countdown.



Caution: If the fan module is not reinserted within five minutes, the entire switch is shut down.

Software reads a byte on the SEEPROM to determine if the fan module is present. If the fan module is partially inserted or if software is unable to access the SEEPROM on the fan module for any other reason, then Cisco SAN-OS cannot distinguish this case from a real fan module removal. The switch will be shut down in five minutes. The following priority 0 syslog messages are printed every five seconds:

Error Message PLATFORM-0-FAIL_REMOVED: Fan module removed. Fan module has been absent for [dec] seconds.

Explanation Fan module was removed. This could lead to temperature alarms.

Recommended Action Replace the fan module immediately.

4. Remove and reinstall or replace the fan module. If the Fan LED is still red, the system detects a fan module failure. Contact your customer service representative for instructions.



Note: If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Temperature Threshold Violations

Each module in the chassis has at least two temperature sensors. Each temperature sensor is configured with a minor and a major threshold. Example 4-3 gives the **show environment temperature** CLI command sample output. It shows how temperature information can be retrieved from the switch. Choose **Physical > Temperature Sensors** on Device Manager to view a similar output.

Example 4-3 Output of show environment temperature Command

```
switch# show environment temperature
-----
Module   Sensor      MajorThresh  MinorThres  CurTemp     Status
         (Celsius)   (Celsius)    (Celsius)
-----
4        Outlet      75           60          36          ok
4        Intake      65           50          29          ok
5        Outlet      75           60          35          ok
5        Intake      65           50          34          ok
6        Outlet      75           60          35          ok
6        Intake      65           50          34          ok
9        Outlet      75           60          45          ok
9        Intake      65           50          40          ok
```

The intake sensor, located at the airflow intake on the module, is the most critical indicator of module temperature. All Cisco SAN-OS actions are taken when the major threshold of an intake sensor is exceeded.

A minor threshold violation or a major threshold violation on an outlet sensor results in the following system message:

Error Message PLATFORM-0-MOD_TEMPMAJALRM: Module [dec] reported major temperature alarm.

Explanation Module in the slot exceeded a major temperature threshold.

Recommended Action Enter the **show environment temperature** CLI command or choose **Physical > Temperature Sensors** on Device Manager to collect more information.

This violation also generates a Call Home event and an SNMP notification.

A major temperature threshold violation on a module intake sensor results in the following system message:

Error Message PLATFORM-0-MOD_TEMPshutdown: Module [dec] powered down due to major temperature alarm.

Explanation Module shutdown due to temperature exceeding major threshold.

Recommended Action Enter the **show environment temperature** CLI command or similar Fabric Manager/Device Manager command to collect more information.

If Cisco SAN-OS detects a major temperature threshold violation on a redundant supervisor intake sensor, it immediately shuts down the redundant supervisor. This will result in either a switchover or in the standby supervisor module shutting down, depending which supervisor module violated the threshold.

If Cisco SAN-OS detects a major temperature threshold violation on an intake sensor on the only operational supervisor in a switch, a 120-second countdown starts. If the temperature recovers, the countdown is discarded. Otherwise, the switch power supplies are shutdown. The following syslog messages are printed every five seconds during the countdown:

Error Message PLATFORM-0-SYS_RESET: [chars] System shutdown in [dec] seconds.

Explanation System shutdown in the number of seconds shown in the error message.

Recommended Action Enter **show environment temperature** CLI command or similar Fabric Manager/Device Manager command to collect more information.

Sometimes, a temperature sensors fails. No explicit action is taken for this condition except generating the following system message:

Error Message PLATFORM-5-MOD_TEMPFAIL: Module [dec] temperature sensor failed.

Explanation Module contains a faulty temperature sensor.

Recommended Action Enter the **show environment temperature** CLI command or similar Fabric Manager/Device Manager command to collect more information.

Troubleshooting Clock Module Issues

A Cisco MDS 9500 Series director has two clock modules: A and B. Use the **show environment clock** CLI command to view the clock module status. (See Example 4-4.)

Example 4-4 Output of show environment clock Command

```
switch# show environment clock
```

Clock	Model	Hw	Status
A	DS-C9500-CL	0.0	ok/active
B	DS-C9500-CL	0.0	ok/standby

On a clock module failure, the system switches over to the redundant clock module automatically. This also results in a hardware reset of the switch. When the switch reboots, it displays the current active clock module. The following syslog message is printed at switch bootup time, indicating the current active clock module:

Error Message: PLATFORM-0-CHASSIS_CLKSWRESET: Switch reset due to clock switch.

Explanation: Chassis clock source has failed and system will be reset. System will automatically start using the redundant clock module.

Recommended Action: Replace the failed clock module during the next maintenance window.

Typically, clock module A is the active clock. On a failure of clock module A, clock module B becomes the active clock. Refer to the hardware installation guide for your platform at the following website to replace a clock module: http://www.cisco.com/en/US/products/hw/ps4159/ps4358/prod_installation_guides_list.html

Troubleshooting Other Hardware Issues

 **Note:** To issue commands with the **internal** keyword, you must have an account that is a member of the network-admin group.

To identify a hardware issue with a module using the CLI, follow these steps:

1. Use the **show module internal exceptionlog** command.

The exception log is a wraparound log of all errors and exceptional conditions on each module. Some exceptions are catastrophic, some partially affect certain ports in a module, and others are for warning purposes. Each log entry includes the following fields:

- device id--The device that logged the exception. This is interpreted by your customer support representative.
- device errorcode--The error code that occurred on the device. This is interpreted by your customer support representative.
- error type--The severity level of the error. Software errors are typically minor or warning. All other errors may be hardware problems.
- Number Ports that failed--The number of ports on the module that are no longer operational.
- system time--The timestamp when the problem occurred.

The exception log is stored in the NVRAM on the supervisor module.

Most hardware errors are logged in this command output. If the error type field indicates anything other than minor or warning error, then it is most likely a hardware failure. (See Example 4-5.)

Example 4-5 Output of show module internal exceptionlog Command

```
switch# show module internal exceptionlog
***** Exception info for module 6 *****
exception information --- exception instance 1 ----
device id:                85
device errorcode:         0xc550120c
system time:               (1127748710 ticks) Mon Sep 26 15:31:50 2005
<br />
error type:                Minor error
Number Ports went bad: none
<br />
***** Exception info for module 8 ***** <---Possible failed module</nowiki>
<br />

exception information --- exception instance 1 ----
device id:                12
system time:               (1127843531 ticks) Tue Sep 27 17:52:11 2005
<br />
error type:                FATAL error <----- Error Type field
Number Ports went bad:
1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16
```

2. View the error statistics from the **show hardware internal errors** command output.

Some error statistics reported under FC-MAC are not necessarily errors, but those counters normally do not increment for a port that is in an operational state.

3. View the interrupt counts in the **show hardware internal errors** command output.

Note the following:

- Some interrupts are not necessarily error interrupts.
- Some interrupts have a threshold before the corresponding ports are declared as faulty. Do not conclude that the hardware is faulty because of some interrupt counts. However, these commands are useful for your customer support representative when debugging the problems.
- Some interrupt counts might show up under UP-XBAR and DOWN-XBAR ASICs when one of the supervisors is pulled out or restarted.

Troubleshooting Supervisor Issues

Supervisor initiation varies depending on whether or not you have a redundant supervisor present. When two supervisors are present in the system at powerup, one of the supervisors becomes active and the other standby. The active supervisor initialization differs from the standby supervisor.

If there is no active supervisor in the system, the supervisor that boots up first will default to the active supervisor. If there is an active supervisor in the system, the supervisor that is booting up will default to the standby supervisor state. The standby supervisor needs to mirror the state of the active supervisor. After all components on the standby are synchronized with those of the active supervisor, the standby supervisor is up.

Cisco SAN-OS maintains debug information during runtime. When a supervisor reboots, much of the debug information is lost. However, all critical information is stored in NVRAM and can be used to reconstruct the failure. When an active supervisor reboots, the information that is stored in its NVRAM cannot be obtained until it comes back up again. Once the supervisor reboots, use the following CLI commands to view the persistent log:

- **show logging nvram**
- **show system reset-reason**
- **show module internal exception-log**

This section describes how to diagnose when an active or standby supervisor fails to initialize properly. This section includes the following topics:

- Active Supervisor Reboots
- Standby Supervisor Not Recognized by Active Supervisor
- Standby Supervisor Stays in Powered-Up State

Active Supervisor Reboots

Symptom Active supervisor reboots.

Table 4-7 Active Supervisor Reboots

Symptom	Possible Cause	Solution
---------	----------------	----------

Active supervisor reboots.	Supervisor process crashed, resulting in a supervisor reload.	Use the show system reset-reason CLI command to view the cause of the reset after the supervisor reboots. (See Example 4-6.) If you have a standby supervisor, the standby is now the active supervisor. Display the system message log on the standby supervisor to see the same information. (See Example 4-7.) Use the show process log CLI command to view a list of process restarts.
	Runtime diagnostics failure detected.	Use the show module internal exceptionlog CLI command on the standby supervisor to view the cause of the reset after the supervisor reboots. (See Example 4-8.) If you have a standby supervisor, the standby is now the active supervisor. Display the system message log on the standby supervisor to see the same information. See (Example 4-9.) Optionally, when the supervisor reboots, use the show system reset-reason CLI command to view this same information. See also the "Troubleshooting Cisco SAN-OS Software System Reboots" section.

Example 4-6 displays the reason for when a supervisor module reboots after a process crash.

Example 4-6 Reset Reason for Supervisor Reboot Caused by Failed Process

```
switch# show system reset-reason
----- reset reason for module 6 -----
1) At 94009 usecs after Tue Sep 27 18:52:13 2005
   Reason: Reset triggered due to HA policy of Reset
   Service: Service "xbar" <----- Process that caused the reboot
   Version: 2.1(2)
```

Example 4-7 displays the system messages on the standby supervisor when a supervisor reboots after a process crash.

Example 4-7 System Messages for Supervisor Reboot Caused by Failed Process

```
Switch# show logging

2005 Sep 27 18:58:05 172.20.150.204 %SYSMGR-3-SERVICE_CRASHED: Service "xbar" (PID 1225)
hasn't caught signal 9 (no core).

2005 Sep 27 18:58:06 172.20.150.204 %SYSMGR-3-SERVICE_CRASHED: Service "xbar" (PID 2349)
hasn't caught signal 9 (no core).

2005 Sep 27 18:58:06 172.20.150.204 %SYSMGR-3-SERVICE_CRASHED: Service "xbar" (PID 2352)
hasn't caught signal 9 (no core).
```

Example 4-8 displays the exception log that appears when a supervisor module reboots after a runtime diagnostic failure.

Example 4-8 Exception Log for Supervisor Reboot Caused by Runtime Diagnostic Failure

```
switch# show module internal exceptionlog module 6
```

Cisco_MDS_SanOS_Troubleshooting_Guide_--_Troubleshooting_Hardware

```
***** Exception info for module 6 *****
exception information --- exception instance 1 ----

device id:          12

device errorcode:   0x80000020

system time:        (1127917068 ticks) Wed Sep 28 14:17:48 2005

error type:         FATAL error <----- exception that caused the reboot

Number Ports went bad:

1,2,3,4,5,6

exception information --- exception instance 2 ----

device id:          12

device errorcode:   0x00060a02

system time:        (1127917067 ticks) Wed Sep 28 14:17:47 2005

error type:         Warning

Number Ports went bad:

1,2,3,4,5,6
```

Example 4-9 displays the system messages on the standby supervisor module when a supervisor module reboots after a runtime diagnostic failure.

Example 4-9 System Messages for Supervisor Reboot Caused by Runtime Diagnostic Failure

```
Switch# show logging

2005 Sep 28 14:17:47 172.20.150.204 %XBAR-5-XBAR_STATUS_REPORT: Module 6 reported status
for component 12 code 0x60a02.

2005 Sep 28 14:17:59 172.20.150.204 %PORT-5-IF_UP: Interface mgmt0 on slot 5 is up

2005 Sep 28 14:18:00 172.20.150.204 ÊLLHOME-2-EVENT: SUP_FAILURE
```

Standby Supervisor Not Recognized by Active Supervisor

Symptom Standby supervisor is not recognized by the active supervisor.

Table 4-8 Standby Supervisor Not Recognized by Active Supervisor

Symptom	Possible Cause	Solution
Standby supervisor not recognized by	Standby supervisor did not synchronize	See the "Standby Supervisor Not Recognized by Active Supervisor" section to verify the problem. Observe the boot process to verify that the LEDs

the active supervisor.	properly with active supervisor.	follow the proper boot sequence and verify that the standby supervisor goes through the proper power-up, initializing, and testing phases. If the standby supervisor is at the loader> prompt, use the reload module 6 force-dlnd command from the active supervisor to force the standby supervisor to netboot off of the active supervisor.
------------------------	----------------------------------	--

Verifying That a Standby Supervisor Failed to Synchronize Using the CLI

To verify that a standby supervisor did not synchronize with the active supervisor using the CLI, follow these steps:

1. Use the **show module** command on the active supervisor to verify that the active supervisor does not detect the standby supervisor. (See Example 4-10.)

Example 4-10 show module Command Output

```
switch# show module

Mod  Ports  Module-Type                Model                Status
---  -
5    0      Supervisor/Fabric-1        DS-X9530-SF1-K9     active *
8    8      IP Storage Services Module
                                     powered-dn

Mod  Sw          Hw      World-Wide-Name(s) (WWN)
---  -
5    2.1(2)     1.1     --

Mod  MAC-Address(es)                Serial-Num
---  -
5    00-0b-be-f7-4d-1c to 00-0b-be-f7-4d-20  JAB070307XG

* this terminal session
```

2. Telnet to the standby supervisor console port and verify that it is in standby mode. (See Example 4-11.)

Example 4-11 Verify Standby Supervisor Mode

```
runlog>telnet sw4-ts 2004
Trying 172.22.22.55...
Connected to sw4-ts.cisco.com (172.22.22.55).
Escape character is '^]'.

MDS Switch
 login: admin
 Password:
Cisco Storage Area Networking Operating System (SAN-OS) Software TAC support: http://www.cisco.com
Copyright (c) 2002-2005, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained herein are owned by other third parties and are used an

switch(standby)#
```

3. Use the **show system redundancy status** command on the active supervisor to verify that the standby supervisor did not complete the synchronization phase with the active supervisor.

```
switch# show system redundancy status
```

```
Redundancy mode
```

```
-----
      administrative:  HA
      operational:    None
```

```
This supervisor (sup-1)
```

```
-----
      Redundancy state:  Active
      Supervisor state:  Active
      Internal state:    Active with HA standby
```

```
Other supervisor (sup-2)
```

```
-----
      Redundancy state:  Standby
      Supervisor state:  HA standby
      Internal state:    HA synchronization in progress
```

The most likely reason for the synchronization to stall is that one of the software components on the standby supervisor failed to synchronize its state with the active supervisor.

4. Use the **show system internal sysmgr gsyncstats** command on the active supervisor to determine which processes did not synchronize on the standby supervisor.

```
switch# show system internal sysmgr gsyncstats
```

Name	Gsync done	Gsync time(sec)
aaa	1	0
ExceptionLog	1	0
platform	1	1
radius	1	0
securityd	1	0
SystemHealth	1	0
tacacs	0	N/A
acl	1	0
ascii-cfg	1	1
bios_daemon	0	N/A
bootvar	1	0
callhome	1	0
capability	1	0
cdp	1	0
cfs	1	0
cimserver	1	0
cimxmlserver	0	N/A
confcheck	1	0
core-dmon	1	0
core-client	0	N/A
device-alias	1	0
dpvm	0	N/A
dstats	1	0
epld_upgrade	0	N/A
epp	1	1

5. Use the **show system internal sysmgr service all** command on the standby supervisor to determine whether or not any process is experiencing excessive restarts. (See Example 4-12[.])

 **Note:** This command may not be available if the standby supervisor is at the loader> prompt.

Example 4-12 Finding Excessive Restarts

```
switch(standby)# show system internal sysmgr service all
```

Name	UUID	PID	SAP	state	Start count
aaa	0x000000B5	1458	111	s0009	1
ExceptionLog	0x00000050	[NA]	[NA]	s0002	None
platform	0x00000018	1064	39	s0009	1
radius	0x000000B7	1457	113	s0009	1
securityd	0x0000002A	1456	55	s0009	1
vsan	0x00000029	1436	15	s0009	1
vshd	0x00000028	1408	37	s0009	1
wnn	0x00000030	1435	114	s0009	1
xbar	0x00000017	[NA]	[NA]	s0017	23
xbar_client	0x00000049	1434	917	s0009	1

Looking at the standby supervisor in Example 4-12 shows that the crossbar (xbar) software component has been restarted 23 times. This has probably prevented the standby from initializing properly.

6. Use the **reload module** command to restart the standby supervisor. If the restart fails, use the **reload module 6 force-dlnd** command from the active supervisor to force the standby supervisor to netboot off of the active supervisor.

Standby Supervisor Stays in Powered-Up State

Symptom Standby supervisor stays in powered-up state.

Table 4-9

Symptom	Possible Cause	Solution
Standby supervisor stays in powered-up state.	Standby supervisor did not synchronize properly with active supervisor.	See the "Verifying That a Standby Supervisor Is in the Powered-Up State Using Device Manager" section or the "Verifying That a Standby Supervisor Is in Powered-Up State Using the CLI" section.

Verifying That a Standby Supervisor Is in the Powered-Up State Using Device Manager

To verify that a standby supervisor is in the powered-up state using Device Manager, follow these steps:

1. Choose **Physical > Modules....** and verify that the operational status of the standby supervisor (OperStatus) is PoweredUp.
2. Right-click the standby supervisor and select **Reset** from the drop-down menu to restart the standby supervisor.

Verifying That a Standby Supervisor Is in Powered-Up State Using the CLI

To verify that a standby supervisor is in the powered-up state using the CLI, follow these steps:

1. Use the **show module** command on the active supervisor to verify that the standby supervisor is in the powered-up state. (See Example 4-13.)

Example 4-13 show module Command Output

```
switch# show module
```

Mod	Ports	Module-Type	Model	Status
5	0	Supervisor/Fabric-1	DS-X9530-SF1-K9	active *
6	0	Supervisor/Fabric-1		powered-up
8	8	IP Storage Services Module		powered-dn

Mod	Sw	Hw	World-Wide-Name (s) (WWN)
5	2.1(2)	1.1	--

Mod	MAC-Address(es)	Serial-Num
5	00-0b-be-f7-4d-1c to 00-0b-be-f7-4d-20	JAB070307XG

* this terminal session

2. Use the **show module internal event-history module** command to determine what component may have failed.
3. Use the **reload module** command to restart the standby supervisor.

Troubleshooting Supervisor Modules

 **Note:** If only one supervisor module is installed, ensure that automatic synchronization is off before servicing the other module. This prevents the switch from attempting to fail over to an unavailable module.

This section provides a workaround for a failed supervisor under certain conditions. An example situation is used to describe the problem and the workaround.

In this sample case, the supervisor failed when the standby was reloaded or when the supervisor was replaced with a new one. It was discovered that the failed supervisor either had its version of code changed, or the running configuration on the active supervisor was not saved with the appropriate boot parameters. In either case, the problem was mismatched code on the active and standby supervisors. One clue that indicated the mismatched code was a heartbeat error on the active supervisor. Because of this error, the current flash images were unable to be copied from the active supervisor to the standby.

The workaround was to copy the images to CompactFlash, switch consoles, and load code from CompactFlash onto the second supervisor. The second supervisor was at a loader prompt, which is indicative of missing boot statements. When a **dir slot0:** CLI command was entered, none of the images appeared. This may have been the result of mismatched images on supervisors or to not having current images in flash memory on the supervisor. Entering a **copy slot0: bootflash:** CLI command copied the images anyway. Once the images were loaded on the second supervisor and the boot statements were confirmed and saved on the active supervisor, the supervisor loaded and came up in standby mode.

Troubleshooting Switching and Services Modules

This section describes problems with switching and services modules and includes the following topics and symptoms:

- Overview of Module Status
- Module Initialization Overview
- Troubleshooting Powered-Down Modules
- Troubleshooting Reloaded Modules
- Troubleshooting Modules in an Unknown State
- Troubleshooting Modules Not Detected by the Supervisor
- Reinitializing a Failed Module Using Fabric Manager
- Reinitializing a Failed Module Using the CLI
- Module Resets

Overview of Module Status

Choose **Physical > Modules...** on Device Manager or use the **show module** CLI command to see the status of any module in a switch. (See Example 4-14.)

Example 4-14 show module Command Output

```
switch# show module 8

Mod  Ports  Module-Type                Model                Status
---  ---
8    8      IP Storage Services Module DS-X9308-SMIP       ok

Mod  Sw          Hw      World-Wide-Name(s) (WWN)
---  ---
8    2.1(2)     0.206   21:c1:00:05:30:00:8f:5e to 21:c8:00:05:30:00:8f:5e

Mod  MAC-Address(es)                Serial-Num
---  ---
8    00-05-30-00-9e-fa to 00-05-30-00-9f-06  JAB064704LH
```

The module status indicates the state of the module. Table 4-10 identifies all of the different states that a module can experience and provides a brief description of the state.

Table 4-10 Module States

Module Status	Description	Module Status Condition
OK	The module is up and running.	Good
powered-down	The module has been powered down because of user configuration or because of an error. Use the show running-config include poweroff CLI command to determine whether or not the module has been configured as powered-down. Otherwise, the module was powered down because of an error.	Good
err-pwd-dn		Failed

	If a module reports a FATAL error, the supervisor logs an exception and reboots the module. If the supervisor reboots the module for errors three times in a one-hour interval, the supervisor keeps the module permanently powered down.	
pwr-denied	The chassis does not have enough remaining power to power up the module. Use the show environment power CLI command to show the current power status of the switch.	Failed
powered-up	The module powered up and the supervisor is waiting for the module to initialize.	Transient
pwr-cycled	The module reloaded.	Transient
testing	The module has powered up and doing runtime diagnostics.	Transient
initializing	The module is receiving configuration from the supervisor.	Transient
upgrading	The module is in the process of a nondisruptive upgrade.	Transient
failure	The module has experienced a failure, but the module has not been power cycled because the debug flag was configured. Use the debug flag to collect debug information from the module as required by your customer support representative. Once all necessary data is collected, reload the module by using the reload module CLI command.	Failed

Module Initialization Overview

When a module is inserted into the switch, the module goes through an initial start up sequence. This sequence brings the module to a known good state before the module is declared online. The initialization sequence includes the following steps:

- Module Bootup
- Image Download
- Runtime Diagnostics
- Runtime Configuration
- Online and Operational

Most of the module related failures (such as the module not coming up, the module getting reloaded, and so on) can be analyzed by looking at the logs stored on the switch. Use the following CLI commands to view this information:

- **show system reset-reason module**
- **show version**
- **show logging**
- **show module internal exception-log**
- **show module internal event-history module**
- **show module internal event-history errors**

- **show platform internal event-history errors**
- **show platform internal event-history module**

Module Bootup

When a module is inserted into the switch, the supervisor puts the module in powered-up state. In this state, the supervisor waits for the module to boot and send its identification to the active supervisor.

If the supervisor does not receive the registration from the module within a given time frame, it power cycles the module. This failure is called a bootup failure. The failure codes for bootup failure can be obtained using the **show platform internal event-history errors** CLI command. (See Example 4-15.)

Example 4-15 Finding Bootup Failure Codes

```
switch# show platform internal event-history errors

The following error codes are defined
No Boot Device                = 0xF1
Boot Failed                   = 0xC0
Net Boot Failed               = 0xD0
Unknown Status                = 0x1B
```

Image Download

Once the supervisor receives the registration message, it checks the image compatibility matrix. The image compatibility determines whether or not the version of code running on the supervisor is compatible with the version of code running on the module. If the versions do not match, the module downloads an updated version of the code, reboots, and sends a registration message again with the updated parameters.

If the module is unable to download the code, the supervisor generates the following system message:

Error Message MODULE-2-MOD_DNLD_FAIL: Image download failed for module [dec].

Explanation The module failed to download a new image from the supervisor module.

Recommended Action Collect module information by entering the **show module internal all module** *dec* command.

In addition, the module generates a system message indicating the exact reason why the image download failed:

Error Message IMAGE_DNLD-SLOT#-2-ADDON_IMG_DNLD_FAILED: Module image download process failed. [chars].

Explanation The add-on image download to the module failed. This module is not operational until an add-on image has been successfully installed.

Recommended Action Verify the location and version of your module image. Enter the **install module** CLI command or similar Fabric Manager/Device Manager command to download a new module image.

If the image download fails, the supervisor power cycles the module. Choose **Logs > Switch Resident > Syslog > Since Reboot** in Device Manager or use the **show logging** CLI command to view the failure messages.

Runtime Diagnostics

After the module successfully registers with the supervisor, the module checks the hardware. If this fails, the module reports the error to the supervisor and generates the following system message:

Error Message MODULE-2-MOD_DIAG_FAIL: Module [dec] reported failure on ports [dec]/[dec]-[dec]/[dec] ([chars]) due to [chars] in device [dec] (device error [hex]).

Explanation The module reported a failure in the runtime diagnostic. Module manager is going to power cycle the module.

Recommended Action Collect information about the module by entering the **show module internal all module** CLI command.

In addition, this information is stored in the exception log (which is persistent across reboots). The supervisor then power cycles the module. Choose **Logs > Switch Resident > Syslog > Since Reboot** in Device Manager or use the **show logging** and **show module internal exception-log module** CLI commands to retrieve failure information.

Runtime Configuration

After the runtime diagnostics complete successfully, the module informs the supervisor that it is ready for configuration. Individual supervisor components configure the module. If any component reports a problem during this stage, the supervisor reboots the module. Use the **show module internal event-history module** CLI command to determine which component reported the problem.

Online and Operational

After all the supervisor components have configured the module, the module goes to the ok state. In this state, the module is online and operational. The supervisor continues to monitor the module periodically to verify correct operation. The following events are monitored:

- Heartbeat message--Sent between the supervisor and the module to verify that the module is running.
- Online health management (OHMS)--Sent from the supervisor to all the ports in the module to verify that traffic is flowing properly.

In addition, the module monitors itself and generates an exception if it detects an anomalous condition. If the exception is a FATAL error, the module is power cycled. Use the following CLI commands to view the conditions leading up to the problem:

- **show logging**
- **show module diag**
- **show module internal exception-log module**
- **show module internal event-history module**
- **show hardware internal errors**

Analyzing the Logs

In some instances, you may need to check other internal logs to verify the cause of a problem. You can use the state transition log and the error log in these instances. These logs may hold information not present in the system messages or in the exception log because of interactions between the module and the supervisor. The state transition log is sorted in ascending manner (that is, the latest state is at the end of the log). The error log is sorted in descending manner (that is, the latest error is at the beginning of the log).

Use the **show module internal event-history module** CLI command to view the state transition log for a module. Use the **show module internal event-history errors** CLI command to view the error log.

The state transition log indicates the current state of a given module. (See Example 4-16.) Each element of the transition log contains the following information:

- Timestamp
- Node that triggered the state transition
- Module state prior to transition
- Event that occurred
- Current state of module

Example 4-16 State Transition Log

```
7) FSM:<ID(2): Slot 8, node 0x0800> Transition at 14258 usecs after Mon Sep 26 17:50:56
2005
  Previous state: [LCM_ST_LC_POWERED_UP]
  Triggered event: [LCM_EV_PFM_LC_STATUS_POWERED_DOWN]
  Next state: [LCM_ST_LC_NOT_PRESENT]
```

Based on the above state transition you can infer that when the module was in the *powered-up* state, PFM triggered an event to power down the module. This trigger caused the state machine to go to the *not present* state.

Troubleshooting Module Issues

To isolate a module problem, follow these steps:

-
1. Verify that all Status LEDs are green. If any status LED is red or off, the module might have shifted out of its slot.
 2. Reseat the module until both ejector levers are at 90 degrees to the rear of the chassis.
 3. Tighten the captive screws at the left and right of the module front panel.
 4. Restart the system.

If the Status LED on a switching module is orange, the module might be busy or disabled. Refer to the following website for the latest Cisco MDS 9000 Family configuration guides to configure or enable the interfaces:

<http://www.cisco.com/univercd/cc/td/doc/product/sn5000/mds9000/index.htm>.

After the system reinitializes the interfaces, the Status LED on the module should be green.

5. If the module does not transition into the online state, see the symptoms listed in this section.

If you are unable to resolve a problem with the startup, gather the information listed under Appendix A, "Before Contacting Technical Support" and contact your technical support representative for assistance as directed in the "Obtaining Documentation, Obtaining Support, and Security Guidelines" section.

Troubleshooting Powered-Down Modules

Symptom Module is in the powered-down state.

The following system messages may be present if a module fails to power up:

Error Message PLATFORM-2-PFM_LC_BOOT_DEV_ABSENT: No bootflash found in Module [dec].

Explanation No bootflash found.

Recommended Action Put bootflash in the module and try again.

Error Message PLATFORM-2-PFM_LC_BOOT_DEV_FAIL: BAD Bootflash found in Module [dec].

Explanation Bad bootflash found.

Recommended Action Replace the bootflash in the module and try again.

Error Message PLATFORM-2-PFM_LC_NETBOOT_FAIL: Netboot for Module [dec] failed.

Explanation Netboot failed.

Recommended Action Replace the BIOS in the module. See the "Troubleshooting Cisco SAN-OS Software System Reboots" section.

Error Message PLATFORM-2-PFM_LC_REGISTRATION_FAIL: Could not register with Module [dec].

Explanation Module registration failed.

Recommended Action Replace the module.

Error Message PLATFORM-2-PFM_LC_STATUS: Module [dec] powered up with [dec] status.

Explanation Status for module that failed registration.

Recommended Action Replace the module.

Error Message PLATFORM-3-MOD_PWRFAIL: Module [dec] failed to power up (Serial No. [chars]).

Explanation The module failed to power up.

Recommended Action Enter the **show platform internal all module *dec*** CLI command to collect more information.

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Error Message PLATFORM-3-MOD_PWRIDPROMFAIL: Module [dec] failed to power up due to idprom read error.

Explanation The module cannot be powered up because of an IDPROM read error.

Recommended Action Enter the **show platform internal all module *dec*** and **show module internal all module *dec* show sprom module *dec dec*** CLI command to read module IDPROM contents to collect more information.

Error Message PLATFORM-5-MOD_PWRDN: Module [dec] powered down (Serial No. [chars]).

Explanation The module is powered down.

Enter the **show module** , **show platform internal all module** *dec* and **show module internal all module** *dec* CLI command to collect more information if you suspect module has been powered down due to errors.

Table 4-11 Module is in the Powered-Down State

Symptom	Possible Cause	Solution
Module is in powered-down state.	Module experienced boot-up failures.	Choose Logs > Switch Resident > Syslog > Sever Events on Device Manager or use the show logging CLI command to verify bootup problems. Right-click the module in Device Manager and select Reset or use the reload module CLI command to restart the module. See the "Reinitializing a Failed Module Using Fabric Manager" section or the "Reinitializing a Failed Module Using the CLI" section.
	Module failed to register with the supervisor.	Use the show module internal event-history module CLI command and look for: Triggered event: [LCM_EV_LCP_REGISTRATION_TIMEOUT] to verify that the module did not register. Right-click the module in Device Manager and select Reset or use the reload module CLI command to restart the module. See the "Reinitializing a Failed Module Using Fabric Manager" section or the "Reinitializing a Failed Module Using the CLI" section.
	Module failed to connect to fabric.	Use the show system internal xbar internal event-history module CLI command and look for : Triggered event: [XBM_MOD_EV_SYNC_FAILED] to verify that the module could not connect to the fabric. Right-click the module in Device Manager and select Reset or use the reload module CLI command to restart the module. See the "Reinitializing a Failed Module Using Fabric Manager" section or the "Reinitializing a Failed Module Using the CLI" section.
	Supervisor failed to configure the module.	Verify the cause of the failure. See the "Diagnosing a Powered-Down Module" section. Right-click the module in Device Manager and select Reset or use the reload module CLI command to restart the module. See the "Reinitializing a Failed Module Using Fabric Manager" section or the

"Reinitializing a Failed Module Using the CLI" section.

Diagnosing a Powered-Down Module

To diagnose the reason for a powered-down module using the CLI, follow these steps:

1. Use the **show system reset-reason module** to show the reason for the last reload of the module.
2. Use the **show module** command to verify the status of the module.

```
switch# show module
```

Mod	Ports	Module-Type	Model	Status
5	0	Supervisor/Fabric-1	DS-X9530-SF1-K9	ha-standby
6	0	Supervisor/Fabric-1	DS-X9530-SF1-K9	active *
8	8	IP Storage Services Module		powered on

Mod	Sw	Hw	World-Wide-Name(s) (WWN)
5	2.1(2)	1.1	--
6	2.1(2)	0.602	--

Mod	MAC-Address(es)	Serial-Num
5	00-0b-be-f7-4d-1c to 00-0b-be-f7-4d-20	JAB070307XG
6	00-05-30-00-93-7e to 00-05-30-00-93-82	JAB0637059v

- 3 Use the **show logging** command to see what events occurred on this module.

```
Switch# show logging
```

```
2005 Sep 27 15:26:02 172.20.150.204 %PLATFORM-5-MOD_DETECT: Module 8 detected (Serial number JAB064704LH)
2005 Sep 27 15:26:02 172.20.150.204 %PLATFORM-5-MOD_PWRUP: Module 8 powered up (Serial number JAB064704LH)
2005 Sep 27 15:27:03 172.20.150.204 %MODULE-5-MOD_REINIT: Re-initializing module 8
2005 Sep 27 15:27:09 172.20.150.204 %PLATFORM-5-MOD_DETECT: Module 8 detected (Serial number JAB064704LH)
2005 Sep 27 15:27:09 172.20.150.204 %PLATFORM-5-MOD_PWRUP: Module 8 powered up (Serial number JAB064704LH)
2005 Sep 27 15:28:10 172.20.150.204 %MODULE-5-MOD_REINIT: Re-initializing module 8
2005 Sep 27 15:28:15 172.20.150.204 %PLATFORM-5-MOD_DETECT: Module 8 detected (Serial number JAB064704LH)
2005 Sep 27 15:28:15 172.20.150.204 %PLATFORM-5-MOD_PWRUP: Module 8 powered up (Serial number JAB064704LH)
2005 Sep 27 15:29:16 172.20.150.204 %MODULE-5-MOD_REINIT: Re-initializing module 8
2005 Sep 27 15:29:22 172.20.150.204 %PLATFORM-5-MOD_DETECT: Module 8 detected (Serial number JAB064704LH)
```

Note that module 8 powered up and reinitialized three times. This indicates that the module was never able to go online. The supervisor powered down the module.

4. Use the **show module internal exception module** command to view the exception log.

```
switch# show module internal exceptionlog module 8
***** Exception info for module 8 *****

exception information --- exception instance 1 ----
device id:          8
device errorcode:   0x40000002
system time:        (1127835023 ticks) Tue Sep 27 15:30:23 2005

error type:         Warning
Number Ports went bad: none

exception information --- exception instance 2 ----
device id:          8
device errorcode:   0x40000002
system time:        (1127834956 ticks) Tue Sep 27 15:29:16 2005

error type:         Warning
Number Ports went bad: none

exception information --- exception instance 3 ----
device id:          8
device errorcode:   0x40000002
system time:        (1127834890 ticks) Tue Sep 27 15:28:10 2005

error type:         Warning
Number Ports went bad: none

exception information --- exception instance 4 ----
device id:          8
device errorcode:   0x40000002
system time:        (1127834823 ticks) Tue Sep 27 15:27:03 2005
```

Note that the time when the module was reinitialized (from system messages) and the time when the exceptions were raised (in the exception log) are correlated. This means that device ID:8 had errors while bringing the module up.

5. Use the **show module internal activity module** and the **show module internal event-history module** commands to gather more information.

```
Switch# show module internal event-history module 8

79) Event:ESQ_START length:32, at 665931 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0x2710, Ret:success
Seq Type:SERIAL

80) Event:ESQ_REQ length:32, at 667362 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0x1, Ret:success
[E_MTS_TX] Dst:MTS_SAP_ILC_HELPER(125), Opc:MTS_OPC_LC_IS_MODULE_SAME(2810)

81) Event:ESQ_REQ length:32, at 667643 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0x2, Ret:success
[E_MTS_TX] Dst:MTS_SAP_MIGUTILS_DAEMON(949), Opc:MTS_OPC_LC_INSERTED(1081)

82) Event:ESQ_RSP length:32, at 673004 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0x2, Ret:success
```

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```
[E_MTS_RX] Src:MTS_SAP_MIGUTILS_DAEMON(949), Opc:MTS_OPC_LC_INSERTED(1081)

83) Event:ESQ_REQ length:32, at 673265 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0x3, Ret:success
[E_MTS_TX] Dst:MTS_SAP_XBAR_MANAGER(48), Opc:MTS_OPC_LC_INSERTED(1081)

85) Event:ESQ_RSP length:32, at 692394 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0x3, Ret:(null)
E_MTS_RX] Src:MTS_SAP_XBAR_MANAGER(48), Opc:MTS_OPC_LC_INSERTED(1081)

86) FSM:<ID(3): Slot 8, node 0x0802> Transition at 692410 usecs after Tue Sep 27
15:30:23 2005
Previous state: [LCM_ST_CHECK_INSERT_SEQUENCE]
Triggered event: [LCM_EV_LC_INSERTED_SEQ_FAILED]
Next state: [LCM_ST_CHECK_REMOVAL_SEQUENCE]

87) Event:ESQ_START length:32, at 692688 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0x2710, Ret:success
Seq Type:SERIAL

88) Event:ESQ_REQ length:32, at 696483 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0x1, Ret:success
[E_MTS_TX] Dst:MTS_SAP_MIGUTILS_DAEMON(949), Opc:MTS_OPC_LC_REMOVED(1082)

89) Event:ESQ_RSP length:32, at 698390 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0x1, Ret:success
[E_MTS_RX] Src:MTS_SAP_MIGUTILS_DAEMON(949), Opc:MTS_OPC_LC_REMOVED(1082)

108) Event:ESQ_REQ length:32, at 715171 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0xc, Ret:success
[E_MTS_TX] Dst:MTS_SAP_XBAR_MANAGER(48), Opc:MTS_OPC_LC_REMOVED(1082)

109) Event:ESQ_RSP length:32, at 716623 usecs after Tue Sep 27 15:30:23 2005
Instance:3, Seq Id:0xc, Ret:success
[E_MTS_RX] Src:MTS_SAP_XBAR_MANAGER(48), Opc:MTS_OPC_LC_REMOVED(1082)

110) FSM:<ID(3): Slot 8, node 0x0802> Transition at 716643 usecs after Tue Sep 2
7 15:30:23 2005
Previous state: [LCM_ST_CHECK_REMOVAL_SEQUENCE]
Triggered event: [LCM_EV_ALL_LC_REMOVED_RESP_RECEIVED]
Next state: [LCM_ST_LC_FAILURE]

111) FSM:<ID(3): Slot 8, node 0x0802> Transition at 716886 usecs after Tue Sep 2
7 15:30:23 2005
Previous state: [LCM_ST_LC_FAILURE]
Triggered event: [LCM_EV_LC_INSERTED_SEQ_FAILED]
Next state: [LCM_ST_LC_FAILURE]

112) FSM:<ID(3): Slot 8, node 0x0802> Transition at 717250 usecs after Tue Sep 2
7 15:30:23 2005
Previous state: [LCM_ST_LC_FAILURE]
Triggered event: LCM_EV_FAILED_MORE3TIMES
Next state: [LCM_ST_LC_NOT_PRESENT]

113) FSM:<ID(3): Slot 8, node 0x0802> Transition at 21633 usecs after Tue Sep 27
15:30:24 2005
Previous state: [LCM_ST_LC_NOT_PRESENT]
Triggered event: [LCM_EV_MODULE_POWERED_DOWN]
Next state: [LCM_ST_LC_NOT_PRESENT]
Curr state: LCM_ST_LC_NOT_PRESENT
```

6. Starting with the most recent time (end of the log) and moving backwards in this example, you can infer the following:

```
Curr state: [LCM_ST_LC_NOT_PRESENT]<---- Indicates that the module is not present.

Index 112) Triggered event: [LCM_EV_FAILED_MORE3TIMES] <----Indicates that the module
failed repeatedly.

Index 111) Triggered event: [LCM_EV_LC_INSERTED_SEQ_FAILED] <---Indicates that the
insertion sequence failed.

Index 86) Previous state: [LCM_ST_CHECK_INSERT_SEQUENCE]

Triggered event: [LCM_EV_LC_INSERTED_SEQ_FAILED]

Next state: [LCM_ST_CHECK_REMOVAL_SEQUENCE] <---- Indicate that when module was being
inserted, the insertion failed and the module was removed.

Index 85) Event:ESQ_RSP length:32, at 692394 usecs after Tue Sep 27 15:30:23 2005

Instance:3, Seq Id:0x3, Ret:(null)

[E_MTS_RX] Src:MTS_SAP_XBAR_MANAGER(48),

Opc:MTS_OPC_LC_INSERTED(1081) <---Indicates the event that caused the module insertion
to fail. This indicates that xbar_manager failed.
```

In this example, you can conclude that module is not coming up, because the XBAR Manager is failing during the insertion of the module.

Troubleshooting Reloaded Modules

Symptom Module is automatically reloaded.

The following system messages may be present if a module reloads:

Error Message MODULE-2-MOD_NOT_ALIVE: Module [dec] not responding... resetting.

Explanation The module is not replying to the hello message. The module manager will reset the module.

Recommended Action No action is required.

Error Message MODULE-2-MOD_SOMEPORTS_FAILED: Module [dec] reported failure on ports [dec]/[dec]-[dec]/[dec] ([chars]) due to [chars] in device [dec] (error [hex]).

Explanation Module reported a failure in the runtime diagnostic because of a failure in some of the ports.

Recommended Action Collect module information by entering the **show module internal all module** CLI command.

Error Message MODULE-2-MOD_DIAG_FAIL: Module [dec] reported failure on ports [dec]/[dec]-[dec]/[dec] ([chars]) due to [chars] in device [dec] (device error [hex]).

Explanation The module reported a failure in the runtime diagnostic. Module manager is going to power cycle the module.

Recommended Action Collect information about the module by entering the **show module internal all module** CLI command.

Error Message SYSTEMHEALTH-2-OHMS_MOD_PORT_LB_TEST_FAILED: Module [dec] Port [dec] has failed loop back tests.

Explanation Port loop back test failure.

Recommended Action No action is required.

Error Message SYSTEMHEALTH-2-OHMS_MOD_SNAKE_TEST_FAILED: Module [dec] has failed snake loopback tests.

Explanation Snake test failure.

Recommended Action No action is required.

Table 4-12 Module is Automatically Reloaded

Symptom	Possible Cause	Solution
Module is automatically reloaded.	Module experienced heartbeat failures.	Choose Logs > Switch Resident > Syslog > Sever Events on Device Manager or use the show logging CLI command to verify bootstrap problems. Use the show module internal event-history module CLI command and look for Triggered event: [LCM_EV_LCP_ALIVE_TIMEOUT] to verify that the module did not respond to heartbeat requests. Right-click the module in Device Manager and select Reset or use the reload module CLI command to restart the module. See the "Reinitializing a Failed Module Using Fabric Manager" section or the "Reinitializing a Failed Module Using the CLI" section.
	The module experienced runtime diagnostic failures.	Verify the cause of the failure. See the "Diagnosing a Reloaded Module" section. Right-click the module in Device Manager and select Reset or use the reload module CLI command to restart the module. See the "Reinitializing a Failed Module Using Fabric Manager" section or the "Reinitializing a Failed Module Using the CLI" section.

	Module lost synchronize with the fabric.	Use the show system internal xbar internal event-history errors and look for something similar to Rx MTS_OPC_SSA_LOST_SYNC_SERIAL slot 8 fabric 0 link 0 to verify that the module lost synchronization with the fabric. Right-click the module in Device Manager and select Reset or use the reload module CLI command to restart the module. See the "Reinitializing a Failed Module Using Fabric Manager" section or the "Reinitializing a Failed Module Using the CLI" section.
--	--	--

Diagnosing a Reloaded Module

To diagnose the reason for a reloaded module, follow these steps:

1. Right-click the module and select **Module** in Device Manager or use the **show module** CLI command to verify the status of the module.
2. Choose **Logs > Switch Resident > Syslog > Sever Events** in Device Manager or use the **show logging** CLI command to search for common reload problems.
3. Use the **show module internal exception module** CLI command to view the exception log.

```
switch# show module internal exceptionlog module 8

***** Exception info for module 8 *****
exception information --- exception instance 3 ----
device id:          0
device errorcode:   0x40730017
system time:        (1127843486 ticks) Tue Sep 27 17:51:26 2005

error type:         <span style="font-style: normal">''<font color="Black"> FATAL error
Number Ports went bad:
1,2,3,4,5,6,7,8

exception information --- exception instance 4 ----
device id:          5
device errorcode:   0x40730019
system time:        (1127843486 ticks) Tue Sep 27 17:51:26 2005

error type:         Minor error
Number Ports went bad:
8
```

4. Use the **show module internal event-history module** CLI command to gather more information.

```
Switch# show module internal event-history module 8

84) FSM:<ID(3): Slot 8, node 0x0802> Transition at 755101 usecs after Tue Sep 27
17:51:26 2005
  Previous state: [LCM_ST_LC_ONLINE]
  Triggered event: [LCM_EV_LCP_RUNTIME_DIAG_FAILURE]
  Next state: [LCM_ST_CHECK_REMOVAL_SEQUENCE]
```

```
85) Event:ESQ_START length:32, at 755279 usecs after Tue Sep 27 17:51:26 2005
    Instance:3, Seq Id:0x2710, Ret:success
    Seq Type:SERIAL
```

Troubleshooting Modules in an Unknown State

Symptom Module is in the unknown state.

Table 4-13 Module Is in an Unknown State

Symptom	Possible Cause	Solution
Module is in an unknown state.	Module experienced SPROM failures.	Verify the cause of the failure. See the "Diagnosing a Module in the Unknown State" section. Right-click on the module in Device Manager and select Reset or use the reload module CLI command to restart the module. See the "Reinitializing a Failed Module Using Fabric Manager" section or the "Reinitializing a Failed Module Using the CLI" section.

Diagnosing a Module in the Unknown State

To diagnose a module in the unknown state, follow these steps:

1. Right-click the module and select **Module** on Device Manager or use the **show module** CLI command to verify the status of the module.
2. Choose **Logs > Switch Resident > Syslog > Sever Events** on Device Manager or use the **show logging** CLI command to search for common problems.
3. Use the **show platform internal event-history errors** CLI command to view possible causes for the unknown state.

```
switch# show platform internal event-history
```

```
1) Event:E_DEBUG, length:37, at 370073 usecs after Thu Sep 29 17:22:48 2005
   [103] unable to init lc sprom 0 mod 8
```

```
switch# show platform internal event-history module 8
```

```
Inside pfm_show_eventlog
Index 1 TOKEN ID: 927
Index 2 TOKEN ID: 910
Module number 0x8
>>>>FSM: <Slot 8> has 2 logged transitions<<<<<
```

```
1) FSM:<Slot 8> Transition at 500219 usecs after Thu Sep 29 17:22:43 2005
   Previous state: [PLTFRM_STATE_MODULE_ABSENT]
   Triggered event: [PLTFRM_EVENT_MODULE_INSERTED]
   Next state: [PLTFRM_STATE_MODULE_PRESENT]
```

```

2) FSM:<Slot 8> Transition at 370112 usecs after Thu Sep 29 17:22:48 2005
   Previous state: [PLTFRM_STATE_MODULE_PRESENT]
   Triggered event: [PLTFRM_EVENT_MODULE_BOOTUP_ERROR]
   Next state: [PLTFRM_STATE_MODULE_UNRECOVERABLE_ERROR]
   Curr state: [PLTFRM_STATE_MODULE_UNRECOVERABLE_ERROR]

```

Troubleshooting Modules Not Detected by the Supervisor

Symptom Module is not detected by the supervisor.

Table 4-14 Module Is Not Detected by Supervisor

Symptom	Possible Cause	Solution
Module is not detected by the supervisor.	Module experienced SPROM failures.	Verify the cause of the failure. Right-click the module in Device Manager and select Reset or use the reload module CLI command to restart the module. See the "Reinitializing a Failed Module Using Fabric Manager" section or the "Reinitializing a Failed Module Using the CLI" section.
	Module is not supported by the current version of Cisco SAN-OS on the switch.	Upgrade the software version on the switch. See the "Installing SAN-OS Software Using Fabric Manager" section or the "Installing Cisco SAN-OS Software from the CLI" section.

Diagnosing a Module Not Detected by the Supervisor

To diagnose a module that has not been detected by the supervisor, follow these steps:

1. Right-click the module and select **Module** on Device Manager or use the **show module** CLI command to verify the status of the module.
2. Choose **Logs > Switch Resident > Syslog > Server Events** on Device Manager or use the **show logging** CLI command to search for common problems.
3. Use the **show platform internal event-history errors** CLI command to view possible causes.

```

switch# show platform internal event-history errors
1) Event:E_DEBUG, length:42, at 703984 usecs after Thu Sep 29 17:46:20 2005
   [103] Module 8 pwr mgmt I/O cntrl reg 0x74
2) Event:E_DEBUG, length:69, at 703888 usecs after Thu Sep 29 17:46:20 2005
   [103] Module 8 pwr mgmt rev reg 0x74 brd present but power ok not set

```

```

switch# show platform internal event-history module 8
Inside pfm_show_eventlog
Index 1 TOKEN ID: 927

```

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Index 2 TOKEN ID: 910
Module number 0x8

>>>>FSM: <Slot 8> has 10 logged transitions<<<<<

- 1) FSM:<Slot 8> Transition at 370299 usecs after Thu Sep 29 17:46:12 2005
Previous state: [PLTFRM_STATE_MODULE_ABSENT]
Triggered event: [PLTFRM_EVENT_MODULE_INSERTED]
Next state: [PLTFRM_STATE_MODULE_PRESENT]
 - 2) FSM:<Slot 8> Transition at 698894 usecs after Thu Sep 29 17:46:17 2005
Previous state: [PLTFRM_STATE_MODULE_PRESENT]
Triggered event: [PLTFRM_EVENT_MODULE_SPROM_READ]
Next state: [PLTFRM_STATE_MODULE_POWER_EVAL]
 - 3) FSM:<Slot 8> Transition at 705551 usecs after Thu Sep 29 17:46:17 2005
Previous state: [PLTFRM_STATE_MODULE_POWER_EVAL]
Triggered event: [PLTFRM_EVENT_MOD_START_POWER_UP]
Next state: [PLTFRM_STATE_MODULE_START_POWER_UP]
 - 4) FSM:<Slot 8> Transition at 110120 usecs after Thu Sep 29 17:46:20 2005
Previous state: [PLTFRM_STATE_MODULE_START_POWER_UP]
Triggered event: [PLTFRM_EVENT_MOD_END_POWER_UP]
Next state: [PLTFRM_STATE_MODULE_POWERED_UP]
 - 5) FSM:<Slot 8> Transition at 704067 usecs after Thu Sep 29 17:46:20 2005
Previous state: [PLTFRM_STATE_MODULE_POWERED_UP]
Triggered event: [PLTFRM_EVENT_MODULE_REMOVED]
Next state: [PLTFRM_STATE_MODULE_ABSENT]
-

When a module is inserted into the switch, the supervisor module reads the SPROM contents of the module. If the module is supported by the current version of Cisco SAN-OS, the module will be powered-up by the supervisor module. If the power status does not show that the module has powered up properly, the module information is not relayed to the supervisor.

Reinitializing a Failed Module Using Fabric Manager

To reinitialize a failed module using the Fabric Manager, follow these steps:

1. Choose **Switches > Copy Configuration** to save the running configuration to the startup configuration.
2. Choose **Switches > Hardware**. Select the **Module Status** tab in the Information pane and check the **Reset** check box to reload the module. Click the **Apply Changes** icon.
3. If the module is not up, choose **Switches > Hardware** and check the S/W Rev column to verify the software image on the module.
4. If the software image on the module is not the latest, choose **Tools > Other > Software Install** to download the latest image to supervisor bootflash memory.
5. Use the following command to force-download the software image from the supervisor to the module:

```
switch# reload module 2 force-dnld
```

6. If the module is still not up, choose **Switches > Hardware** and view the Power Admin column to verify the power status for the module.
7. If the module is not powered on, remove and reseal the module and select **on** from the Power Admin drop-down menu to power on the module.
8. If the module is still not operating, right-click on the switch in the map pane and select **Reset** to reload the entire switch.

Reinitializing a Failed Module Using the CLI

To reinitialize a failed module using the CLI, follow these steps:

1. Save the running configuration to the startup configuration.

```
switch# copy running-config start-config
```

2. Reload the module.

```
switch# reload module 2
```

3. If the module is not operating, verify the software image on the module.

```
switch# show module
```

4. If the software image on the module is not the latest, download the latest image to supervisor bootflash memory.

```
switch# copy tftp: bootflash:
```

5. Force-download the software image from the supervisor to the module.

```
switch# reload module 2 force-dnld
```

6. If the module is still not operating, verify the power status for the module.

```
switch# show environment power
```

7. If the module is not powered on, remove and reseal the module and then power on the module.

```
switch# config t
switch(config)# no poweroff module 2
switch(config)# exit
switch#
```

8. If the module is still not operating, reload the entire switch.

```
switch# reload
```

Module Resets

Resets and reboots of modules are covered in detail in the "Troubleshooting Cisco SAN-OS Software System Reboots" section. If you use the **module reset-reason** CLI command and the output has an "unknown" reset reason, this may indicate a hardware problem. Some of the conditions that may cause this include the following:

- The switch experienced a power reset. This may be because you reset the power supplies or because of a power interruption or failure.
 - The front panel reset button on the supervisor module was pressed.
 - Any hardware failure that caused the processor, dynamic memory, or I/O to reset or hang.
-
-

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