



Monitoring System Processes and Logs

This chapter provides details on monitoring the health of the switch. It includes the following sections:

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Displaying System Processes

Use the **show processes** command to obtain general information about all processes (see [Example 50-1](#) to [Example 50-6](#)).

Example 50-1 Displays System Processes

```
switch# show processes
PID      State  PC          Start_cnt  TTY  Process
-----  -
868      S      2ae4f33e   1          -    snmpd
869      S      2acee33e   1          -    rscn
870      S      2ac36c24   1          -    qos
871      S      2ac44c24   1          -    port-channel
872      S      2ac7a33e   1          -    ntp
-        ER      -          1          -    mdog
-        NR      -          0          -    vbuilder
```

Where:

- PID = process ID.
- State = process state.
 - D = uninterruptible sleep (usually I/O).
 - R = runnable (on run queue).
 - S = sleeping.
 - T = traced or stopped.
 - Z = defunct (“zombie”) process.

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- NR = not running.
- ER = should be running but currently not-running.
- PC = current program counter in hex format.
- Start_cnt = number of times a process has been started (or restarted).
- TTY = terminal that controls the process. A hyphen usually means a daemon not running on any particular TTY.
- Process = name of the process.

Example 50-2 Displays CPU Utilization Information

```
switch# show processes cpu
PID      Runtime(ms)   Invoked    uSecs   1Sec   Process
-----
 842      3807         137001     27      0.0   sysmgr
1112      1220         67974      17      0.0   syslogd
1269      220          13568      16      0.0   fcfwd
1276      2901         15419      188     0.0   zone
1277      738          21010      35      0.0   xbar_client
1278      1159         6789       170     0.0   wwn
1279      515          67617      7       0.0   vsan
```

Where:

- Runtime (ms) = CPU time the process has used, expressed in milliseconds.
- Invoked = number of times the process has been invoked.
- uSecs = microseconds of CPU time on average for each process invocation.
- 1Sec = CPU utilization in percentage for the last one second.

Example 50-3 Displays Process Log Information

```
switch# show processes log
Process      PID      Normal-exit  Stack-trace  Core      Log-create-time
-----
fspf         1339      N            Y            N         Jan  5 04:25
lcm          1559      N            Y            N         Jan  2 04:49
rib          1741      N            Y            N         Jan  1 06:05
```

Where:

- Normal-exit = whether or not the process exited normally.
- Stack-trace = whether or not there is a stack trace in the log.
- Core = whether or not there exists a core file.
- Log-create-time = when the log file got generated.

Example 50-4 Displays Detail Log Information About a Process

```
switch# show processes log pid 1339
Service: fspf
Description: FSPF Routing Protocol Application

Started at Sat Jan  5 03:23:44 1980 (545631 us)
Stopped at Sat Jan  5 04:25:57 1980 (819598 us)
Uptime: 1 hours 2 minutes 2 seconds
```

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```
Start type: SRV_OPTION_RESTART_STATELESS (23)
Death reason: SYSMGR_DEATH_REASON_FAILURE_SIGNAL (2)
Exit code: signal 9 (no core)
CWD: /var/sysmgr/work
```

Virtual Memory:

```
CODE      08048000 - 0809A100
DATA      0809B100 - 0809B65C
BRK       0809D988 - 080CD000
STACK     7FFFFFFD20
TOTAL     23764 KB
```

Register Set:

```
EBX 00000005      ECX 7FFFFFF8CC      EDX 00000000
ESI 00000000      EDI 7FFFFFF6CC      EBP 7FFFFFF95C
EAX FFFFFFFDFE    XDS 8010002B      XES 0000002B
EAX 0000008E (orig) EIP 2ACE133E      XCS 00000023
EFL 00000207      ESP 7FFFFFF654      XSS 0000002B
```

Stack: 1740 bytes. ESP 7FFFFFF654, TOP 7FFFFFFD20

```
0x7FFFFFF654: 00000000 00000008 00000003 08051E95 .....
0x7FFFFFF664: 00000005 7FFFFFF8CC 00000000 00000000 .....
0x7FFFFFF674: 7FFFFFF6CC 00000001 7FFFFFF95C 080522CD .....\"..
0x7FFFFFF684: 7FFFFFF9A4 00000008 7FFFFFFC34 2AC1F18C .....4.....*
```

Example 50-5 Displays All Process Log Details

```
switch# show processes log details
=====
Service: snmpd
Description: SNMP Agent

Started at Wed Jan  9 00:14:55 1980 (597263 us)
Stopped at Fri Jan 11 10:08:36 1980 (649860 us)
Uptime: 2 days 9 hours 53 minutes 53 seconds

Start type: SRV_OPTION_RESTART_STATEFUL (24)
Death reason: SYSMGR_DEATH_REASON_FAILURE_SIGNAL (2)
Exit code: signal 6 (core dumped)
CWD: /var/sysmgr/work

Virtual Memory:

CODE      08048000 - 0804C4A0
DATA      0804D4A0 - 0804D770
BRK       0804DFC4 - 0818F000
STACK     7FFFFFFCE0
TOTAL     26656 KB
...
```

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Example 50-6 Displays Memory Information About Processes

```
switch# show processes memory
PID      MemAlloc  StackBase/Ptr      Process
-----  -
1277     120632   7ffffcd0/7ffffefe4 xbar_client
1278      56800   7ffffce0/7ffffb5c  wwn
1279    1210220 7ffffce0/7ffffbac  vsan
1293     386144   7ffffcf0/7ffffebd4 span
1294    1396892 7ffffce0/7ffffdff4 snmpd
1295     214528 7ffffcf0/7ffff904  rscn
1296      42064 7ffffce0/7ffffb5c  qos
```

Where:

- MemAlloc = total memory allocated by the process.
- StackBase/Ptr = process stack base and current stack pointer in hex format.

Displaying System Status

Use the **show system** command to display system-related status information (see [Example 50-7](#) to [Example 50-10](#)).

Example 50-7 Displays Default Switch Port States

```
switch# show system default switchport
System default port state is down
System default trunk mode is on
```

Example 50-8 Displays Error Information for a Specified ID

```
switch# show system error-id 0x401D0019
Error Facility: module
Error Description: Failed to stop Linecard Async Notification.
```

Example 50-9 Displays the System Reset Information

```
switch# Show system reset-reason module 5
----- reset reason for module 5 -----
1) At 224801 usecs after Fri Nov 21 16:36:40 2003
   Reason: Reset Requested by CLI command reload
   Service:
   Version: 1.3(1)
2) At 922828 usecs after Fri Nov 21 16:02:48 2003
   Reason: Reset Requested by CLI command reload
   Service:
   Version: 1.3(1)
3) At 318034 usecs after Fri Nov 21 14:03:36 2003
   Reason: Reset Requested by CLI command reload
   Service:
   Version: 1.3(1)
4) At 255842 usecs after Wed Nov 19 00:07:49 2003
   Reason: Reset Requested by CLI command reload
   Service:
   Version: 1.3(1)
```

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The **show system reset-reason** 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.

Use the **clear system reset-reason** command to clear the reset-reason information stored in NVRAM and volatile persistent storage.

- In a Cisco MDS 9500 Series switch, this command clears the reset-reason information stored in NVRAM and volatile persistent storage in the active and standby supervisor modules.
- In a Cisco MDS 9200 Series switch, this command clears the reset-reason information stored in NVRAM and volatile persistent storage in the active supervisor module.

Example 50-10 Displays System Uptime

```
switch# show system uptime
Start Time: Sun Oct 13 18:09:23 2030
Up Time:    0 days, 9 hours, 46 minutes, 26 seconds
```

Use the **show system resources** command to display system-related CPU and memory statistics (see [Example 50-11](#)).

Example 50-11 Displays System-Related CPU and Memory Information

```
switch# show system resources
Load average:  1 minute: 0.43   5 minutes: 0.17   15 minutes: 0.11
Processes   :  100 total, 2 running
CPU states  :  0.0% user,  0.0% kernel,  100.0% idle
Memory usage: 1027628K total,  313424K used,  714204K free
              3620K buffers,  22278K cache
```

Where:

- Load average—Displays the number of running processes. The average reflects the system load over the past 1, 5, and 15 minutes.
- Processes—Displays the number of processes in the system, and how many are actually running when the command is issued.
- CPU states—Displays the CPU usage percentage in user mode, kernel mode, and idle time in the last one second.
- Memory usage—Displays the total memory, used memory, free memory, memory used for buffers, and memory used for cache in KB. Buffers and cache are also included in the *used* memory statistics.

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Core and Log Files

You can save cores (from the active supervisor module, the standby supervisor module, or any switching module) to an external Flash (slot 0) or to a TFTP server in one of two ways:

- On demand—Copies a single file based on the provided process ID.
- Periodically—Copies core files periodically as configured by the user.

A new scheme overwrites any previously issued scheme. For example, if you perform another core log copy task, the cores are periodically saved to the new location or file.



Tip

Be sure to create any required directory before performing this task. If the directory specified by this task does not exist, the switch software logs a system message each time a copy cores is attempted.

To copy the core and log files on demand, follow this step:

| | Command | Purpose |
|--------|---|--|
| Step 1 | switch# copy core:7407 slot0:coreSample | Copies the core file with the process ID 7407 as coreSample in slot 0. |
| | switch# copy core://5/1524 tftp://1.1.1.1/abcd | Copies cores (if any) of a process with PID 1524 generated on slot 5 to a TFTP server. |

- If the core file for the specified process ID is not available, you see the following response:

```
switch# copy core:133 slot0:foo
No core file found with pid 133
```

- If two core files exist with the same process ID, only one file is copied:

```
switch# copy core:7407 slot0:foo1
2 core files found with pid 7407
Only "/isan/tmp/logs/calc_server_log.7407.tar.gz" will be copied to the destination.
```

To copy the core and log files periodically, follow these steps:

| | Command | Purpose |
|--------|---|--|
| Step 1 | switch# config t | Enters configuration mode. |
| Step 2 | switch(config)# system cores slot0:coreSample | Copies the core file coreSample to slot 0. |
| | switch(config)# system cores tftp://1.1.1.1/abcd | Copies the core file (abcd) in the specified directory on the TFTP server. |
| | switch(config)# no system cores | Disables the core files copying feature. |

Saving the Last Core to Flash

This last core dump is automatically saved to the flash in the /mnt/pss/ partition before the switchover or reboot occurs. Three minutes after the supervisor module reboots, the saved last core is restored from the flash partition (/mnt/pss) back its original RAM location. This restoration is a background process and is not visible to the user.

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Tip

The timestamp on the restored last core file displays the time when the supervisor booted up—not when the last core was actually dumped. To obtain the exact time of the last core dump, check the corresponding log file with the same PID.

To view the last core information, issue the **show cores** command in EXEC mode.

To view the time of the actual last core dump, issue the **show process log** command in EXEC mode.

Clearing the Core Directory

Use the **clear cores** command to clean out the core directory. The software keeps the last few cores per service and per slot and clears all other cores present on the active supervisor module.

```
switch# clear cores
```

Displaying Core Status

Use the **show system cores** command to display the currently configured scheme for copying cores. See Examples 50-12 to 50-14.

Example 50-12 Displays the Status of System Cores

```
switch# show system cores
Transfer of cores is enabled
```

Example 50-13 Displays All Cores Available for Upload from the Active Supervisor Module

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

Where `Module-num` shows the slot number on which the core was generated. In this example, the `fspf` core was generated on the active supervisor module (slot 5), `fcc` was generated on the standby supervisor module (slot 6), and `acltcam` and `fib` were generated on the switching module (slot 8).

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Example 50-14 Displays Logs on the Local System

```
switch# show processes log
Process          PID      Normal-exit  Stack  Core  Log-create-time
-----
ExceptionLog    2862      N           Y      N    Wed Aug  6 15:08:34 2003
acl              2299      N           Y      N    Tue Oct 28 02:50:01 2003
bios_daemon     2227      N           Y      N    Mon Sep 29 15:30:51 2003
capability       2373      N           Y      N    Tue Aug 19 13:30:02 2003
core-client     2262      N           Y      N    Mon Sep 29 15:30:51 2003
fcanalyzer      5623      N           Y      N    Fri Sep 26 20:45:09 2003
fcd             12996     N           Y      N    Fri Oct 17 20:35:01 2003
fcdomain        2410     N           Y      N    Thu Jun 12 09:30:58 2003
ficon           2708     N           Y      N    Wed Nov 12 18:34:02 2003
ficonstat       9640     N           Y      N    Tue Sep 30 22:55:03 2003
flogi           1300     N           Y      N    Fri Jun 20 08:52:33 2003
idehsd          2176     N           Y      N    Tue Jun 24 05:10:56 2003
lmgrd           2220     N           N      N    Mon Sep 29 15:30:51 2003
platform        2840     N           Y      N    Sat Oct 11 18:29:42 2003
port-security   3098     N           Y      N    Sun Sep 14 22:10:28 2003
port            11818    N           Y      N    Mon Nov 17 23:13:37 2003
rlir            3195     N           Y      N    Fri Jun 27 18:01:05 2003
rscn            2319     N           Y      N    Mon Sep 29 21:19:14 2003
securityd       2239     N           N      N    Thu Oct 16 18:51:39 2003
snmpd           2364     N           Y      N    Mon Nov 17 23:19:39 2003
span            2220     N           Y      N    Mon Sep 29 21:19:13 2003
syslogd         2076     N           Y      N    Sat Oct 11 18:29:40 2003
tcap            2864     N           Y      N    Wed Aug  6 15:09:04 2003
tftpd           2021     N           Y      N    Mon Sep 29 15:30:51 2003
vpm             2930     N           N      N    Mon Nov 17 19:14:33 2003
```

Kernel Core Dumps



Caution

Changes to the kernel cores should be made by an administrator or individual who is completely familiar with switch operations.

When a specific module's operating system (OS) crashes, it is sometimes useful to obtain a full copy of the memory image (called a kernel core dump) to identify the cause of the crash. When the module experiences a kernel core dump it triggers the proxy server configured on the supervisor. The supervisor sends the module's OS kernel core dump to the Cisco MDS 9000 System Debug Server. Similarly, if the supervisor OS fails, the supervisor sends its OS kernel core dump to the Cisco MDS 9000 System Debug Server.



Note

The Cisco MDS 9000 System Debug Server is a Cisco application that runs on Linux. It creates a repository for kernel core dumps. You can download the Cisco MDS 9000 System Debug Server from the Cisco.com website at <http://www.cisco.com/kobayashi/sw-center/sw-stornet.shtml>.

Kernel core dumps are only useful to your technical support representative. The kernel core dump file, which is a large binary file, must be transferred to an external server that resides on the same physical LAN as the switch. The core dump is subsequently interpreted by technical personnel who have access to source code and detailed memory maps.

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**Tip**

Core dumps take up disk space on the Cisco MDS 9000 System Debug Server application. If all levels of core dumps (**level all** option) are configured, you need to ensure that a minimum of 1 GB of disk space is available on the Linux server running the Cisco MDS 9000 System Debug Server application to accept the dump. If the process does not have sufficient space to complete the generation, the module resets itself. All changes made to kernel cores are saved to the running configuration.

To configure the external server, follow these steps:

| | Command | Purpose |
|---------------|--|--|
| Step 1 | switch# config terminal switch(config)# | Enters configuration mode. |
| Step 2 | switch(config)# kernel core target 10.50.5.5 succeeded | Configures the external server's IP address. |

To configure the module information, follow these steps:

| | Command | Purpose |
|---------------|---|--|
| Step 1 | switch# config terminal switch(config)# | Enters configuration mode. |
| Step 2 | switch(config)# kernel core module 5 succeeded | Configures kernel core generation for module 5. |
| | switch(config)# kernel core module 5 level header succeeded | Configures kernel core generation for module 5, and limits the generation to header-level cores. |
| Step 3 | switch(config)# kernel core limit 2 succeeded | Configures kernel core generations for two modules. The default is 1 module. |

All changes made to kernel cores may be viewed using the **show running-config** command. Alternatively, use the **show kernel cores** command to view specific configuration changes (see [Example 50-15](#) to [Example 50-17](#)).

Example 50-15 Displays the Core Limit

```
switch# show kernel core limit
2
```

Example 50-16 Displays the External Server

```
switch# show kernel core target
10.50.5.5
```

Example 50-17 Displays the Core Settings for the Specified Module

```
switch# show kernel core module 5
module 5 core is enabled
  level is header
  dst_ip is 10.50.5.5
  src_port is 6671
  dst_port is 6666
  dump_dev_name is eth1
  dst_mac_addr is 00:00:0C:07:AC:01
```

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Online System Health Management

The Online Health Management System (system health) is a hardware fault detection and recovery feature. It ensures the general health of switching, services, and supervisor modules in any switch in the Cisco MDS 9000 Family.

The system health application runs on all Cisco MDS modules and monitors system hardware in a given MDS switch. The system health application running in the standby supervisor module only monitors the standby supervisor module—if that module is available in the HA standby mode.

See the “[HA Switchover Characteristics](#)” section on page 8-2.

The system health application launches a daemon process in all modules and runs multiple tests on each module to test individual module components. The tests run at pre-configured intervals, cover all major fault points, and isolate any failing component in the MDS switch. The system health running on the active supervisor maintains control over all other system health components running on all other modules in the switch.

On detecting a fault, the system health application attempts the following recovery actions:

- Sends Call Home and system messages and exception logs as soon as it detects a failure.
- Shuts down the failing module or component (such as an interface).
- Isolates failed ports from further testing.
- Reports the failure to the appropriate software component.
- Switches to the standby supervisor module, if an error is detected on the active supervisor module and a standby supervisor module exists in the Cisco MDS switch. After the switchover, the new active supervisor module restarts the active supervisor tests.
- Reloads the switch if a standby supervisor module does not exist in the switch.
- Provides CLI support to view, test, and obtain test run statistics or change the system health test configuration on the switch.
- Performs tests to focus on the problem area:
- Retrieves its configuration information from persistent storage.

Each module is configured to run the test relevant to that module. You can change the default parameters of the test in each module as required.

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System Health Initiation

By default, the system health feature is enabled in each switch in the Cisco MDS 9000 Family.

To disable or enable this feature in any switch in the Cisco MDS 9000 Family, follow these steps:

| | Command | Purpose |
|--------|--|--|
| Step 1 | switch# config terminal switch(config)# | Enters configuration mode. |
| Step 2 | switch(config)# no system health System Health is disabled. | Disables system health from running tests in this switch. |
| | switch(config)# system health System Health is enabled. | Enables (default) system health to run tests in this switch. |
| Step 3 | switch(config)# no system health interface fc8/1 System health for interface fc8/13 is disabled. | Disables system health from testing the specified interface. |
| | switch(config)# system health interface fc8/1 System health for interface fc8/13 is enabled. | Enables (default) system health to test for the specified interface. |

Loopback Test Configuration Frequency

Loopback tests are designed to identify hardware errors in the data path in the module(s) and the control path in the supervisors. One loopback frame is sent to each module at a preconfigured frequency—it passes through each configured interface and returns to the supervisor module.

The loopback tests can be run at frequencies ranging from 5 seconds (default) to 255 seconds. If you do not configure the loopback frequency value, the default frequency of 5 seconds is used for all modules in the switch. Loopback test frequencies cannot be altered for each module. The configured value is constant for all modules.

To configure the frequency of loopback tests for all modules in any switch in the Cisco MDS 9000 Family, follow these steps:

| | Command | Purpose |
|--------|---|---|
| Step 1 | switch# config terminal switch(config)# | Enters configuration mode. |
| Step 2 | switch(config)# system health loopback frequency 50 The new frequency is set at 50 Seconds. | Configures the loopback frequency to 50 seconds. The default loopback frequency is 5 seconds. The valid range is from 5 to 255 seconds. |

Hardware Failure Action

The failure-action command controls the Cisco SAN-OS software from taking any action if a hardware failure is determined while running the tests.

By default, this feature is enabled in all switches in the Cisco MDS 9000 Family—action is taken if a failure is determined and the failed component is isolated from further testing.

Failure action is controlled at individual test levels (per module), at the module level (for all tests), or for the entire switch.

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To configure failure action in a switch, follow these steps:

| | Command | Purpose |
|--------|--|---|
| Step 1 | switch# config terminal switch(config)# | Enters configuration mode. |
| Step 2 | switch(config)# system health failure-action System health global failure action is now enabled. | Enables the switch to take failure action (default) . |
| Step 3 | switch(config)# no system health failure-action System health global failure action now disabled. | Reverts the switch configuration to prevent failure action being taken. |
| Step 4 | switch(config)# system health module 1 failure-action System health failure action for module 1 is now enabled. | Enables switch to take failure action for failures in module 1. |
| Step 5 | switch(config)# no system health module 1 loopback failure-action System health failure action for module 1 loopback test is now disabled. | Prevents the switch from taking action on failures determined by the loopback test in module 1. |

Test Run Requirements

Enabling a test does not guarantee that a test will run.

Tests on a given interface or module only run if you enable system health for all of the following items:

- The entire switch.
- The required module.
- The required interface.



Tip

The test will not run if system health is disabled in any combination. If system health is disabled to run tests, the test status shows up as disabled.



Tip

If the specific module or interface is enabled to run tests, but is not running the tests due to system health being disabled, then tests shows up as enabled, (not running).

Tests for a Specified Module

The system health feature in the SAN-OS software performs tests in the following areas:

- Active supervisor's in-band connectivity to the fabric.
- Standby supervisor's arbiter availability.
- Boot flash connectivity and accessibility on all modules.
- EOBC connectivity and accessibility on all modules.
- Data path integrity for each interface on all modules.
- Management port's connectivity.
- Caching services module batteries (for temperature, age, full-charge capacity, (dis)charge ability and backup capability) and cache disks (for connectivity, accessibility and raw disk I/O).

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- User-driven test for external connectivity verification, port is shutdown during the test (FC ports only).
- User-driven test for internal connectivity verification (Fibre Channel and iSCSI ports).

To perform the required test on a specific module, follow these steps:

| | Command | Purpose |
|---------------|---|---|
| Step 1 | switch# config terminal switch(config)# | Enters configuration mode. |
| Note | The following steps can be performed in any order. | |
| Step 2 | switch(config)# system health module 8 battery-charger battery-charger test is not configured to run on module 8. | Enables the battery-charger test on both batteries in the CSM module residing in slot 8. If the switch does not have a CSM in slot 8, this message is issued, |
| Step 3 | switch(config)# system health module 8 cache-disk cache-disk test is not configured to run on module 8. | Enables the cache-disk test on both disks in the CSM module residing in slot 8. If the switch does not have a CSM in slot 8, this message is issued, |
| Note | The various options for each test are described in the next step. Each command can be configured in any order. The various options are presented in the same step for documentation purposes. | |
| Step 4 | switch(config)# system health module 8 bootflash System health for module 8 Bootflash is already enabled. | Enables the bootflash test on Module 8. |
| | switch(config)# system health module 8 bootflash frequency 200 The new frequency is set at 200 Seconds. | Sets the new frequency of the bootflash test on module 8 to 200 seconds. |
| Step 5 | switch(config)# system health module 8 eobc System health for module 8 EOBC is now enabled. | Enables the EOBC test on Module 8. |
| Step 6 | switch(config)# system health module 8 loopback System health for module 8 EOBC is now enabled. | Enables the loopback test on Module 8. |
| Step 7 | switch(config)# system health module 5 management System health for module 8 EOBC is now enabled. | Enables the management test on Module 5. |

Clearing Previous Error Reports

You can clear the error history for Fibre Channel interfaces, iSCSI interfaces, for an entire module, or one particular test for an entire module. By clearing the history, you are directing the software to retest all failed components that were previously excluded from tests.

If you previously enabled the failure-action option for a period of time (for example, one week) to prevent OHMS from taking any action when a failure is encountered and after that week you are now ready to start receiving these errors again, the you must clear the system health error status for each test.



Tip

The management port test cannot be run on a standby supervisor module.

Use the EXEC-level **system health clear-errors** command at the interface or module level to erase any previous error conditions logged by the system health application. The **battery-charger**, the **bootflash**, the **cache-disk**, the **eobc**, the **inband**, the **loopback**, and the **mgmt** test options can be individually specified for a given module.

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The following example clears the error history for the specified Fibre Channel interface:

```
switch# system health clear-errors interface fc 3/1
```

The following example clears the error history for the specified module:

```
switch# system health clear-errors module 3
```

The following example clears the management port test error history for the specified module:

```
switch# system health clear-errors module 1 mgmt
```

Performing Internal Loopbacks

Internal loopback tests send and receive FC2 frames to/from the same ports and provides the round trip time taken in microseconds. These tests are available for both Fibre Channel and iSCSI interfaces.

Use the EXEC-level **system health internal-loopback** command to explicitly run this test on demand (when requested by the user) within ports for the entire module.

```
switch# system health internal-loopback interface iscsi 8/1
Internal loopback test on interface iscsi8/1 was successful.
Round trip time taken is 79 useconds
```



Note

If the test fails to complete successfully, the software analyzes the failure and prints the following error:
External loopback test on interface fc 7/2 failed. Failure reason: Failed to loopback, analysis complete Failed device ID 3 on module 1

Performing External Loopbacks

External loopback tests send and receive FC2 frames to/from the same port. You need to connect a cable (or a plug) to loop the Rx port to the Tx port before running the test. This test is only available for Fibre Channel interfaces.

Use the EXEC-level **system health external-loopback** command to run this test on demand for external devices connected to a switch that is part of a long-haul network.

```
switch# system health external-loopback interface fc 3/1
This will shut the requested interfaces Do you want to continue (y/n)? [n] y
External loopback test on interface fc3/1 was successful.
```

Use the **system health external-loopback interface force** command to shut down the required interface directly without a back out confirmation.

```
switch# system health external-loopback interface fc 3/1 force
External loopback test on interface fc3/1 was successful.
```



Note

If the test fails to complete successfully, the software analyzes the failure and prints the following error:
External loopback test on interface fc 7/2 failed. Failure reason: Failed to loopback, analysis complete Failed device ID 3 on module 1

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Interpreting the Current Status

The status of each module or test depends on the current configured state of the OHMS test in that particular module (see [Table 50-1](#)).

Table 50-1 OHMS Configured Status for Tests and Modules

| Status | Description |
|------------------|---|
| Enabled | You have currently enabled the test in this module and the test is not running. |
| Disabled | You have currently disabled the test in this module. |
| Running | You have enabled the test and the test is currently running in this module. |
| Failing | This state is displayed if a failure is imminent for the test running in this module—possibility of test recovery exists in this state. |
| Failed | The test has failed in this module—and the state cannot be recovered. |
| Stopped | The test has been internally stopped in this module by the Cisco SAN-OS software. |
| Internal failure | The test encountered an internal failure in this module. For example, the system health application is not able to open a socket as part of the test procedure. |
| Diags failed | The startup diagnostics has failed for this module or interface. |
| On demand | The system health external-loopback or the system health internal-loopback tests are currently running in this module. Only these two commands can be issued on demand. |
| Suspended | Only encountered in the MDS 9100 Series due to one oversubscribed port moving to a E or TE port mode. If one oversubscribed port moves to this mode, the other three oversubscribed ports in the group are suspended. |

The status of each test in each module is visible when you display any of the **show system health** commands. See the “[Displaying System Health](#)” section on page 50-15.

Displaying System Health

Use the **show system health** command to display system-related status information (see [Example 50-18](#) to [Example 50-23](#)).

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Example 50-18 Displays the Current Health of All Modules in the Switch

```
switch# show system health
```

Current health information for module 2.

| Test | Frequency | Status | Action |
|-----------|-----------|---------|---------|
| Bootflash | 5 Sec | Running | Enabled |
| EOBC | 5 Sec | Running | Enabled |
| Loopback | 5 Sec | Running | Enabled |

Current health information for module 6.

| Test | Frequency | Status | Action |
|-----------------|-----------|---------|---------|
| InBand | 5 Sec | Running | Enabled |
| Bootflash | 5 Sec | Running | Enabled |
| EOBC | 5 Sec | Running | Enabled |
| Management Port | 5 Sec | Running | Enabled |

Example 50-19 Displays the Current Health of a Specified Module

```
switch# show system health module 8
```

Current health information for module 8.

| Test | Frequency | Status | Action |
|-----------|-----------|---------|---------|
| Bootflash | 5 Sec | Running | Enabled |
| EOBC | 5 Sec | Running | Enabled |
| Loopback | 5 Sec | Running | Enabled |

Example 50-20 Displays Health Statistics for All Modules

```
switch# show system health statistics
```

Test statistics for module # 1

| Test Name | State | Freq(s) | Run | Pass | Fail | CFail | Errs |
|-----------|---------|---------|-------|-------|------|-------|------|
| Bootflash | Running | 5s | 12900 | 12900 | 0 | 0 | 0 |
| EOBC | Running | 5s | 12900 | 12900 | 0 | 0 | 0 |
| Loopback | Running | 5s | 12900 | 12900 | 0 | 0 | 0 |

Test statistics for module # 3

| Test Name | State | Freq(s) | Run | Pass | Fail | CFail | Errs |
|-----------|---------|---------|-------|-------|------|-------|------|
| Bootflash | Running | 5s | 12890 | 12890 | 0 | 0 | 0 |
| EOBC | Running | 5s | 12890 | 12890 | 0 | 0 | 0 |
| Loopback | Running | 5s | 12892 | 12892 | 0 | 0 | 0 |

Test statistics for module # 5

| Test Name | State | Freq(s) | Run | Pass | Fail | CFail | Errs |
|-----------|-------|---------|-----|------|------|-------|------|
|-----------|-------|---------|-----|------|------|-------|------|

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```
InBand           Running           5s  12911  12911    0    0    0
Bootflash        Running           5s  12911  12911    0    0    0
EOBC             Running           5s  12911  12911    0    0    0
Management Port Running           5s  12911  12911    0    0    0
-----
```

Test statistics for module # 6

```
-----
Test Name        State           Freq(s)  Run    Pass    Fail CFail Errs
-----
InBand           Running         5s       12907  12907    0     0     0
Bootflash        Running         5s       12907  12907    0     0     0
EOBC             Running         5s       12907  12907    0     0     0
-----
```

Test statistics for module # 8

```
-----
Test Name        State           Freq(s)  Run    Pass    Fail CFail Errs
-----
Bootflash        Running         5s       12895  12895    0     0     0
EOBC             Running         5s       12895  12895    0     0     0
Loopback         Running         5s       12896  12896    0     0     0
-----
```

Example 50-21 Displays Statistics for a Specified Module

```
switch# show system health statistics module 3
```

Test statistics for module # 3

```
-----
Test Name        State           Freq(s)  Run    Pass    Fail CFail Errs
-----
Bootflash        Running         5s       12932  12932    0     0     0
EOBC             Running         5s       12932  12932    0     0     0
Loopback         Running         5s       12934  12934    0     0     0
-----
```

Example 50-22 Displays Loopback Test Statistics for the Entire Switch

```
switch# show system health statistics loopback
```

```
-----
Mod Port Status           Run    Pass    Fail    CFail Errs
-----
 1  16 Running         12953  12953    0     0     0
 3  32 Running         12945  12945    0     0     0
 8   8 Running         12949  12949    0     0     0
-----
```

Example 50-23 Displays Loopback Test Statistics for a Specified Interface

```
switch# show system health statistics loopback interface fc 3/1
```

```
-----
Mod Port Status           Run    Pass    Fail    CFail Errs
-----
 3   1 Running             0     0     0     0     0
-----
```



Note

Interface-specific counters will remain at zero unless the module-specific loopback test reports errors or failures.

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Example 50-24 Displays the Loopback Test Time Log for All Modules

```
switch# show system health statistics loopback timelog
-----
Mod      Samples    Min (usecs)  Max (usecs)  Ave (usecs)
  1         1872         149          364          222
  3         1862         415          743          549
  8         1865         134          455          349
-----
```

Example 50-25 Displays the Loopback Test Time Log for a Specified Module

```
switch# show system health statistics loopback module 8 timelog
-----
Mod      Samples    Min (usecs)  Max (usecs)  Ave (usecs)
  8         1867         134          455          349
-----
```

Default Settings

Table 50-2 lists the default system health and log settings.

Table 50-2 Default System Health and Log Settings

| Parameters | Default |
|------------------------|------------|
| Kernel core generation | One module |
| System health | Enabled |
| Loopback frequency | 5 seconds |
| Failure action | Enabled. |