



CHAPTER 65

Performing Diagnostics

You can use diagnostics to test and verify the functionality of the hardware components of your system (chassis, supervisor engines, modules, and ASICs) while your Catalyst 4500 series switch is connected to a live network. Diagnostics consists of packet-switching tests that test hardware components and verify the data path and control signals.

Online diagnostics are categorized as bootup, on-demand, schedule, or health-monitoring diagnostics. Bootup diagnostics run during bootup; on-demand diagnostics run from the CLI; scheduled diagnostics run at user-designated intervals or specified times when the switch is connected to a live network; and health-monitoring runs in the background.

This chapter consists of these sections:

- [Configuring Online Diagnostics, page 65-1](#)
- [Performing Diagnostics, page 65-3](#)
- [Power-On Self-Test Diagnostics, page 65-10](#)



Note

For complete syntax and usage information for the switch commands used in this chapter, first look at the *Cisco Catalyst 4500 Series Switch Command Reference* and related publications at this location:

<http://www.cisco.com/en/US/products/hw/switches/ps4324/index.html>

If the command is not found in the Catalyst 4500 Series Switch Command Reference, it will be found in the larger Cisco IOS library. Refer to the *Cisco IOS Command Reference* and related publications at this location:

<http://www.cisco.com/en/US/products/ps6350/index.html>

Configuring Online Diagnostics

These sections describe how to configure online diagnostics:

- [Configuring On-Demand Online Diagnostics, page 65-2](#)
- [Scheduling Online Diagnostics, page 65-2](#)

Configuring On-Demand Online Diagnostics

You can run on-demand online diagnostic tests from the CLI. You can set the execution action to either stop or continue the test when a failure is detected, or to stop the test after a specific number of failures occur with the failure count setting. The iteration setting allows you to configure a test to run multiple times.

To schedule online diagnostics, perform this task:

Command	Purpose
Switch# diagnostic ondemand {iteration iteration_count} {action-on-error {continue stop} [error_count]}	Configures on-demand diagnostic tests to run, how many times to run (iterations), and what action to take when errors are found.

This example shows how to set the on-demand testing iteration count:

```
Switch# diagnostic ondemand iterations 3
Switch#
```

This example shows how to set the execution action when an error is detected:

```
Switch# diagnostic ondemand action-on-error continue 2
Switch#
```

Scheduling Online Diagnostics

You can schedule online diagnostics to run at a designated time of day or on a daily, weekly, or monthly basis. You can schedule tests to run only once or to repeat at an interval. Use the **no** form of this command to remove the scheduling.

To configure online diagnostics, perform this task:

Command	Purpose
Switch(config)# diagnostic schedule module number test {test_id test_id_range all} [port {num num_range all} {on mm dd yyyy hh:mm} {daily hh:mm} {weekly day_of_week hh:mm}]	Schedules on-demand diagnostic tests on the specified module for a specific date and time, how many times to run (iterations), and what action to take when errors are found.

This example shows how to schedule diagnostic testing on a specific date and time for a specific port on module 6:

```
Switch(config)# diagnostic schedule module 6 test 2 port 3 on may 23 2009 23:32
Switch(config)#
```

This example shows how to schedule diagnostic testing to occur daily:

```
Switch(config)# diagnostic schedule module 6 test 2 port 3 daily 12:34
Switch(config)#
```

This example shows how to schedule diagnostic testing to occur weekly:

```
Switch(config)# diagnostic schedule module 6 test 2 port 3 weekly friday 09:23
Switch(config)#
```

Performing Diagnostics

After you configure online diagnostics, you can start or stop diagnostic tests or display the test results. You can also see which tests are configured and what diagnostic tests have already run.

These sections describe how to run online diagnostic tests after they have been configured:

- [Starting and Stopping Online Diagnostic Tests, page 65-3](#)
- [Displaying Online Diagnostic Tests and Test Results, page 65-4](#)
- [Displaying Data Path Online Diagnostics Test Results, page 65-7](#)
- [Line Card Online Diagnostics, page 65-8](#)
- [Troubleshooting with Online Diagnostics, page 65-8](#)



Note

Before you enable any online diagnostics tests, enable the logging console or monitor to observe all warning messages.



Note

When running disruptive tests, only run them when you are connected using the console. When disruptive tests complete, a warning message on the console will recommend that you reload the system to return to normal operation. Strictly follow this warning.

Starting and Stopping Online Diagnostic Tests

After you configure diagnostic tests, you can use the **start** and **stop** keywords to begin or end a test.

To start or stop an online diagnostic command, perform one of these tasks:

Command	Purpose
Switch# diagnostic start module <i>number test {test_id </i> <i>test_id_range minimal complete</i> <i> basic per-port </i> <i>non-disruptive all} [port {num </i> <i>port#_range all}]</i>	Starts a diagnostic test on a port or range of ports on the specified module.
Switch# diagnostic stop module <i>number</i>	Stops a diagnostic test on the specified module.

This example shows how to start a diagnostic test on module 6:

```
Switch# diagnostic start module 6 test 2
Diagnostic[module 6]: Running test(s) 2 Run interface level cable diags
Diagnostic[module 6]: Running test(s) 2 may disrupt normal system operation
Do you want to continue? [no]: yes
Switch#
*May 14 21:11:46.631: %DIAG-6-TEST_RUNNING: module 6: Running online-diag-tdr{ID=2} ...
*May 14 21:11:46.631: %DIAG-6-TEST_OK: module 6: online-diag-tdr{ID=2} has completed
successfully
Switch#
```

This example shows how to stop a diagnostic test on module 6:

```
Switch# diagnostic stop module 6
Diagnostic[module 6]: Diagnostic is not active.
```

The message indicates no active diagnostic on module 6

Displaying Online Diagnostic Tests and Test Results

You can display the configured online diagnostic tests and check the results of the tests with the **show diagnostic** command.

To display the configured diagnostic tests, perform this task:

Command	Purpose
Switch# show diagnostic {bootup cns content [module num] description [module num] events [module num] [event-type event-type] ondemand result [module num] [detail] schedule [module num] simulation status}	Displays the test results of online diagnostics and lists supported test suites.

This example shows how to display the online diagnostics configured on module 1:

```
Switch# show diagnostic content module 6
```

module 6:

Diagnostics test suite attributes:

```

M/C/* - Minimal bootup level test / Complete bootup level test / NA
B/* - Basic ondemand test / NA
P/V/* - Per port test / Per device test / NA
D/N/* - Disruptive test / Non-disruptive test / NA
S/* - Only applicable to standby unit / NA
X/* - Not a health monitoring test / NA
F/* - Fixed monitoring interval test / NA
E/* - Always enabled monitoring test / NA
A/I - Monitoring is active / Monitoring is inactive
cable-tdr/* - Interface cable diags / NA
o/* - Ongoing test, always active / NA
```

ID	Test Name	Attributes	Test Interval day hh:mm:ss.ms	Thre- shold
1)	linecard-online-diag	M**D***I**	not configured	n/a
2)	online-diag-tdr	**PD***Icable-	not configured	n/a
3)	stub-rx-errors	***N***A**	000 00:01:00.00	n/a
4)	supervisor-rx-errors	***N***A**	000 00:01:00.00	n/a

This example shows how to display the test description for a given test on a module:

```
Switch# show diagnostic description module 6 test 1
```

linecard-online-diag :

```

Linecard online-diagnostics run after the system boots up but
before it starts passing traffic. Each linecard port is placed in
loopback, and a few packets are injected into the switching fabric
from the cpu to the port. If the packets are successfully
```

received by the cpu, the port passes the test. Sometimes one port or a group of ports sharing common components fail. The linecard is then placed in partial faulty mode. If no ports can loop back traffic, the board is placed in faulty state.

Switch#

This example shows how to display the online diagnostic results for module 6:

Switch# **show diagnostic result module 6**

Current bootup diagnostic level: minimal

module 6: SerialNo : JAB0815059L

Overall Diagnostic Result for module 6 : PASS

Diagnostic level at card bootup: minimal

Test results: (. = Pass, F = Fail, U = Untested)

- 1) linecard-online-diag -----> .
- 2) online-diag-tdr:

Port	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	U	U	.	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

- 3) stub-rx-errors -----> .
- 4) supervisor-rx-errors -----> .

Switch#

This example shows how to display the online diagnostic results details for module 6:

Switch# **show diagnostic result module 6 detail**

Current bootup diagnostic level: minimal

module 6: SerialNo : JAB0815059L

Overall Diagnostic Result for module 6 : PASS

Diagnostic level at card bootup: minimal

Test results: (. = Pass, F = Fail, U = Untested)

- 1) linecard-online-diag -----> .

```
Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 1
Last test testing type -----> n/a
Last test execution time -----> Jun 01 2009 11:19:36
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> Jun 01 2009 11:19:36
Total failure count -----> 0
Consecutive failure count ---> 0
```

Slot	Ports	Card Type	Diag Status	Diag Details
6	24	10/100/1000BaseT (RJ45)V, Cisco/IEEE	Passed	None

Detailed Status

. = Pass U = Unknown
 L = Loopback failure S = Stub failure
 P = Port failure
 E = EEPROM failure G = GBIC integrity check failure

Ports 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

 Ports 17 18 19 20 21 22 23 24

2) online-diag-tdr:

Port 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

 U U . U

Error code -----> 0 (DIAG_SUCCESS)
 Total run count -----> 1
 Last test testing type -----> OnDemand
 Last test execution time ----> Jun 03 2009 05:39:00
 First test failure time -----> n/a
 Last test failure time -----> n/a
 Last test pass time -----> Jun 03 2009 05:39:00
 Total failure count -----> 0
 Consecutive failure count ---> 0

Detailed Status

Interface	Speed	Local pair	Cable length	Remote channel	Status
Gi6/3	1Gbps	1-2	N/A	Unknown	Terminated
		3-6	N/A	Unknown	Terminated
		4-5	N/A	Unknown	Terminated
		7-8	N/A	Unknown	Terminated

3) stub-rx-errors -----> .

Error code -----> 3 (DIAG_SUCCESS)
 Total run count -----> 4
 Last test testing type -----> Health Monitoring
 Last test execution time ----> Dec 20 2009 22:30:41
 First test failure time -----> n/a
 Last test failure time -----> n/a
 Last test pass time -----> Dec 20 2009 22:30:41
 Total failure count -----> 0
 Consecutive failure count ---> 0

4) supervisor-rx-trends -----> .

Error code -----> 3 (DIAG_SUCCESS)
 Total run count -----> 4
 Last test testing type -----> Health Monitoring
 Last test execution time ----> Dec 20 2009 22:30:41
 First test failure time -----> n/a

```

Last test failure time -----> n/a
Last test pass time -----> Dec 20 2009 22:30:41
Total failure count -----> 0
Consecutive failure count ---> 0

```

Switch#

Displaying Data Path Online Diagnostics Test Results

A data path online diagnostic test verifies that the data paths between the supervisor engine and the linecards (defined as a number of stub ASICs) are functioning correctly. There is a direct connection between each stub ASIC on a line card and the supervisor engine. Error counters on the supervisor engine (supervisor-rx-trends) and each stub ASIC on a line card (stub-rx-trends) are monitored periodically. Error counters that continually increase indicate malfunctioning hardware in the data path and cause the test to fail. Data path online diagnostic tests are non-destructive and the error counters are polled every minute.

Errors on the stub end of the data path are reported as errors in traffic egressing to the line card from the supervisor engine switching ASICs. Some initial errors might be revealed as links are brought up, but they should not increase. An increasing count indicates a poor connection between the supervisor engine and a line card. If only one line card is affected, the cause is likely an incorrectly seated or faulty line card. The error counts include idle frames, so detection can occur when traffic is not flowing.

Errors on the supervisor end of the data path are reported as errors in traffic ingressing to the supervisor engine from linecards. The error counts should not increase and the detection includes idle frames. If the error counts increase for more than one line card, the likely cause is a faulty supervisor engine or chassis. If only one stub or line card is affected, the likely cause is a faulty line card or a defective mux buffer (for a redundant chassis).

In addition to running periodically, data path online diagnostics can be also be invoked on-demand in the following way:

```

Switch# diagnostic start module 1 test stub-rx-errors
*Apr 1 09:25:14.211: %DIAG-6-TEST_RUNNING: module 1: Running stub-rx-errors{ID=3} ...
*Apr 1 09:25:14.211: %DIAG-6-TEST_OK: module 1: stub-rx-errors{ID=3} has completed
Switch# diagnostic start module 1 test supervisor-rx-errors
*Apr 1 09:25:26.503: %DIAG-6-TEST_RUNNING: module 1: Running supervisor-rx-errors{ID=4}
...
*Apr 1 09:25:26.503: %DIAG-6-TEST_OK: module 1: supervisor-rx-errors{ID=4} has completed
successfully

```

Detailed information about the test results can be viewed as follows:

```
Switch# show diagnostic result module 1 test stub-rx-errors detail
```

Current bootup diagnostic level: minimal

Test results: (. = Pass, F = Fail, U = Untested)

```

3) stub-rx-errors -----> .

Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 7
Last test testing type -----> OnDemand
Last test execution time ----> Apr 01 2010 09:25:14
First test failure time -----> n/a
Last test failure time -----> n/a

```

```

Last test pass time -----> Apr 01 2010 09:25:14
Total failure count -----> 0
Consecutive failure count ---> 0

```

```
Switch# show diagnostic result module 1 test supervisor-rx-errors detail
```

```
Current bootup diagnostic level: minimal
```

```
Test results: (. = Pass, F = Fail, U = Untested)
```

```

4) supervisor-rx-errors -----> .

Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 4
Last test testing type -----> OnDemand
Last test execution time ----> Apr 01 2010 09:25:26
First test failure time ----> n/a
Last test failure time -----> n/a
Last test pass time -----> Apr 01 2010 09:25:26
Total failure count -----> 0
Consecutive failure count ---> 0

```

```
Switch#
```

Line Card Online Diagnostics

A line card online diagnostic test verifies that all ports on a line card are working correctly. The test can detect whether the path to the front panel port on the line card is broken. The test cannot indicate where along the path that the problem occurred.



Note

This test is run only for line cards that have stub chips.

Line card online diagnostics runs only once, when the line cards boot. This situation can happen when you insert a line card or power up a chassis.

Line card online diagnostics are performed by sending a packet from the CPU to every port on the line card. Because this packet is marked loopback, the CPU expects to see this packet return from the port. The packet first traverses the ASICs on the supervisor engine card, then travels by using the chassis backplane and the stub chip on the line cards to the PHYs. The PHY sends it back down the same path.



Note

The packet does not reach or exit the front panel port.

Troubleshooting with Online Diagnostics

A faulty line card occurs if any of the following conditions occurs.

- All ports fail
- All ports on a stub chip fail
- Only one port fails

For all of these situations, the output of the **show module** command would display the status of the line card as faulty:

```
Switch# sh mod
Chassis Type : WS-C4507R-E

Power consumed by backplane : 40 Watts

Mod Ports Card Type                               Model                Serial No.
---+-----+-----+-----+-----+-----+-----+-----+-----+-----+
3      8  Sup 8-E 10GE (SFP+), 1000BaseX (SFP)  WS-X45-SUP8-E        CAT1644L0X0
4      8  Sup 8-E 10GE (SFP+), 1000BaseX (SFP)  WS-X45-SUP8-E        CAT1644L0WW

M MAC addresses                                Hw  Fw           Sw           Status
--+-----+-----+-----+-----+-----+-----+-----+-----+-----+
3 c47d.4fa3.7600 to c47d.4fa3.7607 0.2 15.0(1r)SG(0 03.05.00.EX0.52  Ok
4 c47d.4fa3.7608 to c47d.4fa3.760f 0.2 15.0(1r)SG(0 03.05.00.EX0.52  Ok

Mod  Redundancy role    Operating mode    Redundancy status
-----+-----+-----+-----+-----+-----+-----+-----+-----+
3   Standby Supervisor  SSO                Standby hot
4   Active Supervisor   SSO                Active
```

Switch#

To troubleshoot a faulty line card, follow these steps:

Step 1 Enter the command **show diagnostic result module 3**.

If a faulty line card was inserted in the chassis, it will fail the diagnostics and the output will be similar to the following:

```
Current bootup diagnostic level: minimal

module 3:   SerialNo : JAB093305RP

Overall Diagnostic Result for module 3 : MAJOR ERROR
Diagnostic level at card bootup: minimal

Test results: (. = Pass, F = Fail, U = Untested)

1) linecard-online-diag -----> F
```

Switch#

Issue an RMA for the line card, contact TAC, and skip steps 2 and 3.

The output may display the following:

```
module 3:

Overall diagnostic result: PASS

Test results: (. = Pass, F = Fail, U = Untested)

1) linecard-online-diag -----> .
```

The message indicates that the line card passed online diagnostics either when it was inserted into the chassis the last time or when the switch was powered up (as reported by the “.”). You need to obtain additional information to determine the cause.

Step 2 Insert a different supervisor engine card and reinsert the line card.

If the line card passes the test, it suggests that the supervisor engine card is defective.

Issue an RMA for the supervisor engine, contact TAC, and skip step 3.

Because online diagnostics are not run on the supervisor engine card, you cannot use the **#show diagnostic module 1** command to test whether the supervisor engine card is faulty.

Step 3 Reinsert the line card in a different chassis.

If the line card passes the test, the problem is associated with the chassis.

Issue an RMA for the chassis and contact TAC.

Power-On Self-Test Diagnostics

The following topics are discussed:

- [Overview of Power-On Self-Test Diagnostics, page 65-10](#)
- [Power-On Self-Test Results, page 65-10](#)
- [Troubleshooting the Test Failures, page 65-14](#)

Overview of Power-On Self-Test Diagnostics

All Catalyst 4500 series switches have power-on self-test (POST) diagnostics that run whenever a supervisor engine boots. POST tests the basic hardware functionality for the supervisor switching engine, its associated packet memory and other on-board hardware components. The results of the POST impacts how the switch boots, because the health of the supervisor engine is critical to the operation of the switch. The switch might boot in a marginal or faulty state.

The POST results are indicated with a period (.) or a Pass for Pass, an F for a Fail and a U for Untested.

Power-On Self-Test Results

The following topics are discussed:

- [Sample Display of the POST on an Active Supervisor Engine, page 65-10](#)
- [Sample Display of the POST on a Standby Supervisor Engine, page 65-12](#)

Sample Display of the POST on an Active Supervisor Engine

```
Switch# show diagnostic result mod 4 detail

Current bootup diagnostic level: minimal

module 4:   SerialNo : CAT1644L0WW

Overall Diagnostic Result for module 4 : PASS
Diagnostic level at card bootup: minimal

Test results: (. = Pass, F = Fail, U = Untested)

1) supervisor-bootup -----> .
```

```

Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 1
Last test testing type -----> n/a
Last test execution time ----> May 06 2013 13:02:19
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> May 06 2013 13:02:19
Total failure count -----> 0
Consecutive failure count ---> 0

```

Power-On-Self-Test Results for ACTIVE Supervisor

prod: WS-X45-SUP8-E part: 73-14915-02 serial: CAT1644L0WW

Power-on-self-test for Module 4: WS-X45-SUP8-E

CPU Subsystem Tests ...

seeprom: Pass

Traffic: L3 Loopback ...

Test Results: Pass

Traffic: L2 Loopback ...

Test Results: Pass

Module 4 Passed

2) linecard-online-diag -----> .

```

Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 1
Last test testing type -----> n/a
Last test execution time ----> May 06 2013 13:02:19
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> May 06 2013 13:02:19
Total failure count -----> 0
Consecutive failure count ---> 0

```

Slot	Ports	Card Type	Diag Status	Diag Details
4	8	Sup 8-E 10GE (SFP+), 1000BaseX (SFP)	Skipped	Packet memory

Detailed Status

```

. = Pass          U = Unknown
L = Loopback failure  S = Stub failure
P = Port failure
E = SEEPROM failure  G = GBIC integrity check failure

```

Ports	1	2	3	4	5	6	7	8

3) stub-rx-errors -----> .

```

Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 74
Last test testing type -----> Health Monitoring

```

```

Last test execution time ----> May 06 2013 14:16:19
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> May 06 2013 14:16:19
Total failure count -----> 0
Consecutive failure count ---> 0

```

```
4) supervisor-rx-errors -----> .
```

```

Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 74
Last test testing type -----> Health Monitoring
Last test execution time ----> May 06 2013 14:16:19
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> May 06 2013 14:16:19
Total failure count -----> 0
Consecutive failure count ---> 0

```

Sample Display of the POST on a Standby Supervisor Engine

```
Switch# show diagnostic result module 3 detail
```

```
Current bootup diagnostic level: minimal
```

```
module 3: SerialNo :
```

```
Overall Diagnostic Result for module 3 : PASS
```

```
Diagnostic level at card bootup: minimal
```

```
Test results: (. = Pass, F = Fail, U = Untested)
```

```
1) supervisor-bootup -----> .
```

```

Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 1
Last test testing type -----> n/a
Last test execution time ----> May 06 2013 13:02:19
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> May 06 2013 13:02:19
Total failure count -----> 0
Consecutive failure count ---> 0

```

```
Power-On-Self-Test Results for STANDBY Supervisor
```

```
prod: WS-X45-SUP8-E part: 73-14915-02 serial: CAT1644L0X0
```

```
Power-on-self-test for Module 3: WS-X45-SUP8-E
```

```
CPU Subsystem Tests ...
```

```
seeprom: Pass
```

```
Traffic: L3 Loopback ...
```

```
Test Results: Pass
```

```
Traffic: L2 Loopback ...
```

```
Test Results: Pass
```

Module 3 Passed

2) linecard-online-diag -----> .

```
Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 1
Last test testing type -----> n/a
Last test execution time -----> May 06 2013 13:02:19
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> May 06 2013 13:02:19
Total failure count -----> 0
Consecutive failure count ----> 0
```

Slot	Ports	Card Type	Diag Status	Diag Details
3	8	Sup 8-E 10GE (SFP+), 1000BaseX (SFP)	Passed	None

Detailed Status

```
-----
. = Pass                U = Unknown
L = Loopback failure    S = Stub failure
P = Port failure
E = SEEPROM failure     G = GBIC integrity check failure
```

Ports	1	2	3	4	5	6	7	8

3) stub-rx-errors -----> .

```
Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 66
Last test testing type -----> Health Monitoring
Last test execution time -----> May 06 2013 14:08:33
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> May 06 2013 14:08:33
Total failure count -----> 0
Consecutive failure count ----> 0
```

4) supervisor-rx-errors -----> .

```
Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 66
Last test testing type -----> Health Monitoring
Last test execution time -----> May 06 2013 14:08:33
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> May 06 2013 14:08:33
Total failure count -----> 0
Consecutive failure count ----> 0
```

**Note**

To ensure that the maximum number of ports are tested, ensure that both supervisor engines are present on power-up.

Troubleshooting the Test Failures

A failure of any of the POST tests reflects a problem with the hardware on the supervisor engine. Cisco IOS boots the supervisor engine with limited functionality, allowing you to evaluate and display the diagnostic test results. To determine the failure cause, do one of the following:

- Evaluate whether the hardware failure is persistent by power cycling the supervisor engine to rerun the POST tests.
- Remove and reinsert the supervisor engine into the chassis to ensure that the seating is correct. Contact Cisco Systems customer support team for more information.

**Note**

On a redundant chassis, concurrent POST is supported on supervisor engines that are already inserted. However, if a second supervisor engine is inserted while the first one is loading, you might boot the first supervisor engine in a faulty Cisco IOS state (POST will abort, and some of the POST's tests will be bypassed). This situation only happens during concurrent bootup of the supervisor engines. You should not insert any additional supervisor engines in the empty supervisor engine slot while an already seated supervisor engine is running POST. The POST sequence is completed when the "Exiting to ios..." message is displayed.