CHAPTER 73

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.

Note Diagnostic shell mode is not supported on Supervisor Engine 7-E and Supervisor Engine 8-E, in wired mode.

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:

Note For complete syntax and usage information for the switch commands used in this chapter, see 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 a command is not in the *Catalyst 4500 Series Switch Command Reference*, you can locate it in the Cisco IOS library. See 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

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 73-3
- Displaying Online Diagnostic Tests and Test Results, page 73-4
- Displaying Data Path Online Diagnostics Test Results, page 73-7
- Line Card Online Diagnostics, page 73-8
- Troubleshooting with Online Diagnostics, page 73-8

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** *number* **test** {*test_id* | *test_id_range* | **minimal** | **complete** | **basic** | **per-port** | **non-disruptive** | **all**} **[port** {*num* | *port#_range* | **all**}]	Starts a diagnostic test on a port or range of ports on the specified module.
Switch# **diagnostic stop module** *number*	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

                                                    Test Interval    Thre-
  ID   Test Name                         Attributes    day hh:mm:ss.ms 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 = SEEPROM 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  U  U  U  U  U  U  U  U  U  U  U  U  U  U  U  U  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-destructure 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# show mod
Chassis Type : WS-C4507R
Power consumed by backplane : 40 Watts

Mod Ports Card Type                             Model             Serial No.
---+-----+-------------------------------------+-----------------+-----------
 1     6 Sup II+10GE 10GE (X2), 1000BaseX (SFP) WS-X4013+10GE     JAB091502G0
 2     6 Sup II+10GE 10GE (X2), 1000BaseX (SFP) WS-X4013+10GE     JAB091502FC
 3    48 100BaseX (SFP)                          WS-X4248-FE-SFP   JAB093305RP
 4    48 10/100BaseTX (RJ45)V                     WS-X4148-RJ45V    JAE070717E5
 5    48 10/100BaseTX (RJ45)V                     WS-X4148-RJ45V    JAE061303U3
 6    48 10/100BaseTX (RJ45)V                     WS-X4148-RJ45V    JAE061303WJ
 7    24 10/100/1000BaseT (RJ45)V, Cisco/IEEE    WS-X4524-GB-RJ45V JAB0815059Q

 M MAC addresses                     Hw  Fw          Sw              Status
--+--------------------------------+---+-----------+---------------+---------
 1 000b.5f27.8b80 to 000b.5f27.8b85 0.2 12.2(27r)SG( 12.2(37)SG Ok
 2 000b.5f27.8b86 to 000b.5f27.8b8b 0.2 12.2(27r)SG( 12.2(37)SG Ok
 3 0005.9a80.6810 to 0005.9a80.683f 0.4                             Ok
 4 000c.3016.aae0 to 000c.3016.ab0f 2.6                             Ok
 5 0008.a3a3.4e70 to 0008.a3a3.4e9f 1.6                             Ok
 6 0008.a3a3.3fa0 to 0008.a3a3.3fcf 1.6                              Faulty
 7 0030.850e.3e78 to 0030.850e.3e8f 1.0                             Ok

Mod  Redundancy role     Operating mode      Redundancy status
----+-------------------+------------------+-------------------------------
 1   Active Supervisor   SSO                 Active
 2   Standby Supervisor  SSO                 Standby hot
```

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 73-10
- POST Result Example, page 73-11
- Power-On Self-Test Results, page 73-13
- Troubleshooting the Test Failures, page 73-20

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.

POST is currently supported on the following supervisor engines:

- WS-X4014
- WS-X4515
- WS-X4516
- WS-X4516-10GE
- WS-X4013+
- WS-X4013+TS
- WS-X4013+10GE
- WS-C4948G

- WS-C4948G-10GE
- ME-4924-10GE
- WS-X45-SUP6-E
- WS-X45-SUP6L-E
- WS-X45-SUP7-E
- WS-X45-SUP7L-E
- WS-X45-SUP8-E

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

POST Result Example

For all the supervisor engines, POST performs CPU, traffic, system, system memory, and feature tests.

For CPU tests, POST verifies appropriate activity of the supervisor engine SEEPROM, temperature sensor, and Ethernet end-of-band channel (EOBC), when used.

The following example illustrates the output of a CPU subsystem test:

```
[..]
Cpu Subsystem Tests ...
seeprom: . temperature_sensor: . eobc: .
[..]
```

For traffic tests, the POST sends packets from the CPU to the switch. These packets loop several times within the switch core and validate the switching, the Layer 2 and the Layer 3 functionality. To isolate the hardware failures accurately, the loop back is done both inside and outside the switch ports.

The following example shows the output from the **show diagnositic result** command for Supervisor Engine 8-E, Supervisor Engine 7-E, and Supervisor Engine 7L-E:

```
Switch# show diagnostic result module 3 detail

Checking digital signature
/nfs/gsg-sw/interim/flo_gsbu8/newest_image/iosxe/prod/cat4500e-universal.bin: Digitally
Signed Development Software with key version A

Rommon reg: 0x00004FA8
Reset2Reg: 0x00000F00

Image load status: 0x00000000
#####
Snowtrooper 220 controller 0x04324CF8..0x044EDFA6 Size:0x0058B0C1 Program Done!
##############
Linux version 2.6.24.4.3.3.k10 (priypras@gsg-lnx-bld6) (gcc version 4.2.1 p4 (Cisco
c4.2.1-p4)) #1 SMP Mon Jul 18 02:35:13 PDT 2011
Starting System Services

diagsk10-post version 4.1.7.4

prod: WS-X45-SUP7-E part: 73-12064-08 serial: CAT1418L05H


Power-on-self-test for Module 1: WS-X45-SUP7-E
 Test Status: (. = Pass, F = Fail, U = Untested)


CPU Subsystem Tests ...
```

```
 seeprom: Pass

Traffic: L3 Looopback ...
 Test Results: Pass

Traffic: L2 Loopback ...
 Test Results: Pass
post done
Exiting to ios...
```

The following example shows the output from the **show diagnositic result** command for Supervisor
Engine 6-E and Supervisor Engine 6L-E:

```
Switch# show diagnostic result module 3 detail

module 3:    SerialNo : XXXXXXXXXXX

  Overall diagnostic result: PASS

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

_____

    1) supervisor-bootup --------------->
          Error code ------------------> 0 (DIAG_SUCCESS)
          Total run count -------------> 1
          Last test execution time ----> Oct 01 2007 17:37:04
          First test failure time -----> n/a
          Last test failure time ------> n/a
          Last test pass time ---------> Oct 01 2007 17:37:04
          Total failure count ---------> 0
          Consecutive failure count ---> 0
Power-On-Self-Test Results for ACTIVE Supervisor
prod: WS-X45-SUP6-E part: XXXXXXXXX serial: XXXXXXXXXX
Power-on-self-test for Module 3: WS-X45-SUP6-E
 Test Status: (. = Pass, F = Fail, U = Untested)

CPU Subsystem Tests ...
 seeprom: Pass

Traffic: L3 Loopback ...
 Test Results: Pass

Traffic: L2 Loopback ...
 Test Results: Pass

Switching Subsystem Memory ...
 Packet Memory Test Results: Pass

Module 3 Passed
_____

    2) linecard-online-diag ------------>
          Error code ------------------> 0 (DIAG_SUCCESS)
          Total run count -------------> 1
          Last test execution time ----> Oct 01 2007 17:37:04
          First test failure time -----> n/a
          Last test failure time ------> n/a
          Last test pass time ---------> Oct 01 2007 17:37:04
          Total failure count ---------> 0
          Consecutive failure count ---> 0

Slot Ports Card Type                            Diag Status      Diag Details
---- ----- ------------------------------------ ---------------- ------------
 3    6   Sup 6-E 10GE (X2), 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
      .   .   .   .   .   .
   _____
Switch#
```

Power-On Self-Test Results

The following topics are discussed:

Sample Display of the POST on an Active Supervisor Engine

Examples include:

Supervisor Engine 7-E, Supervisor Engine 7L-E, and Supervisor Engine 8-E

```
Switch# show diagnostic result module 3 detail

Current bootup diagnostic level: minimal

module 3:   SerialNo : CAT1450L1QU

  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 ----> Jul 21 2011 20:16:56
            First test failure time -----> n/a
            Last test failure time ------> n/a
            Last test pass time ---------> Jul 21 2011 20:16:56
            Total failure count ---------> 0
            Consecutive failure count ---> 0

Power-On-Self-Test Results for ACTIVE Supervisor

prod: WS-X45-SUP7-E part: 73-12064-08 serial: CAT1450L1QU

Power-on-self-test for Module 3: WS-X45-SUP7-E
 Test Status: (. = Pass, F = Fail, U = Untested)
```

```
CPU Subsystem Tests ...
 seeprom: Pass

Traffic: L3 Looopback ...
 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 ----> Jul 21 2011 20:16:56
            First test failure time -----> n/a
            Last test failure time ------> n/a
            Last test pass time ---------> Jul 21 2011 20:16:56
            Total failure count ---------> 0
            Consecutive failure count ---> 0

Slot Ports Card Type                              Diag Status     Diag Details
---- ----- ------------------------------------- ---------------- ------------
 3    4    Sup 7-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
      .   .   .   .


    _____

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

            Error code ------------------> 0 (DIAG_SUCCESS)
            Total run count -------------> 2
            Last test testing type ------> Health Monitoring
            Last test execution time ----> Jul 21 2011 20:18:57
            First test failure time -----> n/a
            Last test failure time ------> n/a
            Last test pass time ---------> Jul 21 2011 20:18:57
            Total failure count ---------> 0
            Consecutive failure count ---> 0

    _____

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

            Error code ------------------> 0 (DIAG_SUCCESS)
            Total run count -------------> 2
            Last test testing type ------> Health Monitoring
            Last test execution time ----> Jul 21 2011 20:18:57
```

```
                             First test failure time -----> n/a
                             Last test failure time ------> n/a
                             Last test pass time ---------> Jul 21 2011 20:18:57
                             Total failure count ---------> 0
                             Consecutive failure count ---> 0
        Switch#
```

Supervisor Engine 6-E and Supervisor Engine 6L-E

```
        Switch# show diagnostic result module 5 detail

Current bootup diagnostic level: minimal

module 5:    SerialNo : JAE1213CK36

  Overall Diagnostic Result for module 5 : 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 ----> Jul 21 2011 13:35:55
            First test failure time -----> n/a
            Last test failure time ------> n/a
            Last test pass time ---------> Jul 21 2011 13:35:55
            Total failure count ---------> 0
            Consecutive failure count ---> 0

Power-On-Self-Test Results for ACTIVE Supervisor

prod: WS-X45-SUP6-E part: 73-10597-06 serial: JAE1213CK36

Power-on-self-test for Module 5: WS-X45-SUP6-E

CPU Subsystem Tests ...
 seeprom: Pass

Traffic: L3 Looopback ...
 Test Results: Pass

Traffic: L2 Loopback ...
 Test Results: Pass

Switching Subsystem Memory ...
 Packet Memory Test Results: Pass


Module 5 Passed
Remote TenGigabitPort status: Untested


  _____


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

            Error code ------------------> 0 (DIAG_SUCCESS)
            Total run count ------------> 1
            Last test testing type ------> n/a
```

```
                 Last test execution time ----> Jul 21 2011 13:35:55
                 First test failure time -----> n/a
                 Last test failure time ------> n/a
                 Last test pass time ---------> Jul 21 2011 13:35:55
                 Total failure count ---------> 0
                 Consecutive failure count ---> 0


Slot Ports Card Type                              Diag Status     Diag Details
---- ----- ------------------------------------- --------------- ------------
 5    6    Sup 6-E 10GE (X2), 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
      .   .   .   .   .   .


  _____

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

            Error code ------------------> 0 (DIAG_SUCCESS)
            Total run count -------------> 1
            Last test testing type ------> Health Monitoring
            Last test execution time ----> Jul 21 2011 13:36:57
            First test failure time -----> n/a
            Last test failure time ------> n/a
            Last test pass time ---------> Jul 21 2011 13:36:57
            Total failure count ---------> 0
            Consecutive failure count ---> 0


  _____

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

            Error code ------------------> 0 (DIAG_SUCCESS)
            Total run count -------------> 1
            Last test testing type ------> Health Monitoring
            Last test execution time ----> Jul 21 2011 13:36:57
            First test failure time -----> n/a
            Last test failure time ------> n/a
            Last test pass time ---------> Jul 21 2011 13:36:57
            Total failure count ---------> 0
            Consecutive failure count ---> 0
Switch#
```

Sample Display of the POST on a Standby Supervisor Engine

Example include:

- Supervisor Engine 7-E and Supervisor Engine 7L-E, page 73-16
- Supervisor Engine 6-E and Supervisor Engine 6L-E, page 73-18

Supervisor Engine 7-E and Supervisor Engine 7L-E

```
Switch# show diagnostic result module 4 detail

Current bootup diagnostic level: minimal
```

```
module 4:   SerialNo :

  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 ----> Jul 21 2011 20:16:56
           First test failure time -----> n/a
           Last test failure time ------> n/a
           Last test pass time ---------> Jul 21 2011 20:16:56
           Total failure count ---------> 0
           Consecutive failure count ---> 0

Power-On-Self-Test Results for STANDBY Supervisor


Power-On-Self-Test utility did not run during last boot session


  _____


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

           Error code ------------------> 0 (DIAG_SUCCESS)
           Total run count -------------> 1
           Last test testing type ------> n/a
           Last test execution time ----> Jul 21 2011 20:16:56
           First test failure time -----> n/a
           Last test failure time ------> n/a
           Last test pass time ---------> Jul 21 2011 20:16:56
           Total failure count ---------> 0
           Consecutive failure count ---> 0

Slot Ports Card Type                            Diag Status     Diag Details
---- ----- ------------------------------------ --------------- ------------
 4    4   Sup 7-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
      .   .   .   .


  _____


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

           Error code ------------------> 0 (DIAG_SUCCESS)
           Total run count -------------> 1
           Last test testing type ------> Health Monitoring
           Last test execution time ----> Jul 21 2011 20:25:20
```

```
                    First test failure time -----> n/a
                    Last test failure time ------> n/a
                    Last test pass time ---------> Jul 21 2011 20:25:20
                    Total failure count ---------> 0
                    Consecutive failure count ---> 0
_____


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

                    Error code ------------------> 0 (DIAG_SUCCESS)
                    Total run count -------------> 1
                    Last test testing type ------> Health Monitoring
                    Last test execution time ----> Jul 21 2011 20:25:20
                    First test failure time -----> n/a
                    Last test failure time ------> n/a
                    Last test pass time ---------> Jul 21 2011 20:25:20
                    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.

Supervisor Engine 6-E and Supervisor Engine 6L-E

```
        Switch# show diagnostic result module 6 detail

Current bootup diagnostic level: minimal

module 6:    SerialNo :

  Overall Diagnostic Result for module 6 : 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 ----> Jul 21 2011 13:35:55
                    First test failure time -----> n/a
                    Last test failure time ------> n/a
                    Last test pass time ---------> Jul 21 2011 13:35:55
                    Total failure count ---------> 0
                    Consecutive failure count ---> 0

Power-On-Self-Test Results for STANDBY Supervisor

prod: WS-X45-SUP6-E part: 73-10597-04 serial: JAE1132SXQL

Power-on-self-test for Module 6: WS-X45-SUP6-E

CPU Subsystem Tests ...
 seeprom: Pass

Traffic: L3 Looopback ...
 Test Results: Pass
```

```
Traffic: L2 Loopback ...
 Test Results: Pass

Switching Subsystem Memory ...
 Packet Memory Test Results: Pass


Module 6 Passed
Remote TenGigabitPort status: Untested


   _____

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

           Error code -----------------> 0 (DIAG_SUCCESS)
           Total run count -------------> 1
           Last test testing type ------> n/a
           Last test execution time ----> Jul 21 2011 13:35:55
           First test failure time -----> n/a
           Last test failure time ------> n/a
           Last test pass time ---------> Jul 21 2011 13:35:55
           Total failure count ---------> 0
           Consecutive failure count ---> 0

Slot Ports Card Type                            Diag Status     Diag Details
---- ----- -------------------------------------- ---------------- ------------
 6    6   Sup 6-E 10GE (X2), 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
      .   .   .   .   .   .
   _____

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

           Error code -----------------> 0 (DIAG_SUCCESS)
           Total run count -------------> 3
           Last test testing type ------> Health Monitoring
           Last test execution time ----> Jul 21 2011 13:39:06
           First test failure time -----> n/a
           Last test failure time ------> n/a
           Last test pass time ---------> Jul 21 2011 13:39:06
           Total failure count ---------> 0
           Consecutive failure count ---> 0
   _____

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

           Error code -----------------> 0 (DIAG_SUCCESS)
           Total run count -------------> 3
           Last test testing type ------> Health Monitoring
           Last test execution time ----> Jul 21 2011 13:39:06
           First test failure time -----> n/a
           Last test failure time ------> n/a
           Last test pass time ---------> Jul 21 2011 13:39:06
           Total failure count ---------> 0
           Consecutive failure count ---> 0
```

```
Switch#
```

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.