



APPENDIX **A**

Online Diagnostic Tests

This appendix describes the online diagnostic tests and provides recommendations for how to use them.



Note

- For information about configuring online diagnostic tests see [Chapter 12, “Configuring Online Diagnostics.”](#)
- We recommend that before you enable any online diagnostics tests that you enable the logging console/monitor to see all warning messages.
- We recommend that when you are running disruptive tests that you only run the tests when connected through console. When disruptive tests are complete a warning message on the console recommends that you reload the system to return to normal operation: strictly follow this warning.
- While tests are running, all ports are shut down as a stress test is being performed with looping ports internally and external traffic might affect the test results. The switch must be rebooted to bring the switch to normal operation. When you issue the command to reload the switch, the system will ask you if the configuration should be saved.
- Do not save the configuration.
- If you are running the tests on the switch processor (SP), after the test is initiated and complete, you must reload or power down and then power up the switch.
- If you are running the tests on other modules, after the test is initiated and complete, you must reset the module.



Tip

For additional information about Cisco Catalyst 6500 Series Switches (including configuration examples and troubleshooting information), see the documents listed on this page:

http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html

The online diagnostic tests are included in these categories:

- [Global Health-Monitoring Tests, page A-2](#)
- [Per-Port Tests, page A-4](#)
- [PFC Layer 2 Forwarding Engine Tests, page A-9](#)
- [DFC Layer 2 Forwarding Engine Tests, page A-11](#)
- [PFC Layer 3 Forwarding Engine Tests, page A-17](#)

- [DFC Layer 3 Forwarding Engine Tests, page A-22](#)
- [Replication Engine Tests, page A-27](#)
- [Fabric Tests, page A-29](#)
- [Exhaustive Memory Tests, page A-32](#)
- [IPSEC Services Modules Tests, page A-34](#)
- [Stress Tests, page A-36](#)
- [Critical Recovery Tests, page A-37](#)
- [General Tests, page A-39](#)

Global Health-Monitoring Tests

These are the global health monitoring tests:

- [TestEARLInternalTables, page A-2](#)
- [TestSPRPInbandPing, page A-3](#)
- [TestScratchRegister, page A-3](#)
- [TestMacNotification, page A-4](#)
- [TestErrorCounterMonitor, page A-4](#)

TestEARLInternalTables

The TestEARLInternalTables test detects most PFC and DFC hardware table problems by running consistency checks on the PFC and DFC hardware tables. The test runs every 5 minutes.

A failure of the test for the PFC results in one of these actions:

- Failover to the redundant supervisor engine.
- If a redundant supervisor engine is not installed, shutdown of the supervisor engine.

A failure of the test for a test of a DFC results in one of these actions:

- Up to two resets of the DFC-equipped switching module.
- Shutdown following a third failure.

A CallHome message is generated if CallHome is configured on the system.

Table A-1 *TestEARLInternalTables Test Attributes*

| Attribute | Description |
|---------------------------------|----------------------------|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not disable. |
| Default | On. |
| Release | 12.2(33)SX12. |
| Corrective action | Reset the affected module. |
| Hardware support | PFC and DFCs. |

TestSPRPInbandPing

The TestSPRPInbandPing test detects most runtime software driver and hardware problems on supervisor engines by running diagnostic packet tests using the Layer 2 forwarding engine, the Layer 3 and 4 forwarding engine, and the replication engine on the path from the switch processor to the route processor. Packets are sent at 15-second intervals. Ten consecutive failures of the test results in failover to the redundant supervisor engine (default) or reload of the supervisor engine if a redundant supervisor engine is not installed.

Table A-2 TestSPRPInbandPing Test Attributes

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not disable. Test is automatically disabled during CPU-usage spikes in order to maintain accuracy. |
| Default | On. |
| Release | 12.1(13)E, 12.2(14)SX to 12.2(17d)SXB5, and 12.2(18)SXD. |
| Corrective action | Reset the active supervisor engine. |
| Hardware support | Active and standby supervisor engine. |

TestScratchRegister

The TestScratchRegister test monitors the health of application-specific integrated circuits (ASICs) by writing values into registers and reading back the values from these registers. The test runs every 30 seconds. Five consecutive failures causes a supervisor engine to switchover (or reset), if you are testing the supervisor engine, or in the module powering down when testing a module.

Table A-3 TestScratchRegister Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not disable. |
| Default | On. |
| Release | 12.2(14)SX. |
| Corrective action | Reset the malfunctioning supervisor engine or power down the module. |
| Hardware support | Supervisor Engine 720, DFC-equipped modules, WS-X6148-FE-SFP, WS-X6148A-GE-TX, and WS-X6148A-RJ-45 . |

TestMacNotification

The TestMacNotification test verifies that the data and control path between DFC modules and supervisor engines is working properly. This test also ensures Layer 2 MAC address consistency across Layer 2 MAC address tables. The test runs every six seconds. Ten consecutive failures causes the module to reset during bootup or runtime (default). After three consecutive resets, the module powers down.

Table A-4 *TestMacNotification Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not disable. |
| Default | On. |
| Release | 12.2(14)SX. |
| Corrective action | Reset the module. After the module has ten consecutive failures or three consecutive resets, it powers down. |
| Hardware support | DFC-equipped modules. |

TestErrorCounterMonitor

The TestErrorCounterMonitor test monitors the errors/interrupts that occur on each module in the system by periodically polling for the error counters maintained in the module. If the errors exceed a threshold value, a syslog message is displayed with detailed information including the error-counter identifier, port number, total failures, consecutive failures, and the severity of the error counter.

Table 1-5 *TestErrorCounterMonitor Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not disable. This test is automatically disabled during CPU-usage spikes to maintain accuracy |
| Default | On. |
| Release | 12.2(33)SXH. |
| Corrective action | Display a syslog message indicating the error-counters detected on that port. |
| Hardware support | All modules including the supervisor engines. |

Per-Port Tests

The per-port tests consist of the following tests:

- [TestNonDisruptiveLoopback](#), page A-5
- [TestLoopback](#), page A-5

- [TestActiveToStandbyLoopback](#), page A-6
- [TestUnusedPortLoopback](#), page A-6
- [TestTransceiverIntegrity](#), page A-7
- [TestNetflowInlineRewrite](#), page A-7
- [TestPortTxMonitoring](#), page A-9

TestNonDisruptiveLoopback

The TestNonDisruptiveLoopback test verifies the data path between the supervisor engine and the network ports of a module. In this test, a Layer 2 packet is flooded onto VLAN that contains a group of test ports. The test port group consists of one port per port ASIC channel. Each port in the test port group nondisruptively loops back the packet and directs it back to the supervisor engine's inband port. The ports in the test port group are tested in parallel.

Table A-6 TestNonDisruptiveLoopback Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not disable. |
| Default | On. |
| Release | 12.2(18)SXF. |
| Corrective action | Error disable a port after 10 consecutive failures. Error disable a channel if all of its ports failed the test in one test cycle. Reset the module after a failure of all channels. |
| Hardware support | WS-X6148-FE-SFP, WS-X6148A-GE-TX and WS-X6148A-RJ-45. |

TestLoopback

The TestLoopback test verifies the data path between the supervisor engine and the network ports of a module. In this test, a Layer 2 packet is flooded onto a VLAN that consists of only the test port and the supervisor engine's inband port. The packet loops back in the port and returns to the supervisor engine on that same VLAN.

Table A-7 TestLoopback Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | Schedule during downtime. |
| Default | Runs at bootup or after online insertion and removal (OIR). |

Table A-7 *TestLoopback Test Attributes (continued)*

| | |
|--------------------------|---|
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | Error disable a port if the loopback test fails on the port. Reset the module if all of the ports fail. |
| Hardware support | All modules including supervisor engines. |

TestActiveToStandbyLoopback

The TestActiveToStandbyLoopback test verifies the data path between the active supervisor engine and the network ports of the standby supervisor engine. In this test, a Layer 2 packet is flooded onto a VLAN that consists of only the test port and the supervisor engine's inband port. The test packets are looped back in the targeted port and are flooded back onto the bus with only the active supervisor engines' inband port listening in on the flooded VLAN.

Table A-8 *TestActiveToStandbyLoopback Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of loopback port (for example, Spanning Tree Protocol). |
| Recommendation | Schedule during downtime. |
| Default | Runs at bootup or after OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | Error disable a port if the loopback test fails on the port. Reset the supervisor engine if all of the ports fail. |
| Hardware support | Standby supervisor engine only. |

TestUnusedPortLoopback

The TestUnusedPortLoopback test verifies the data path between the supervisor engine and the network ports of a module in the runtime periodically. In this test, a Layer 2 packet is flooded onto the VLAN associated with the test port and the supervisor engine inband port only. The packet loops back in the port and returns to the supervisor engine on the same VLAN. It's similar to TestLoopback but only runs on unused (admin down) network ports and only one unused port per port ASIC. This test substitutes the lack of nondisruptive loopback test in current ASICs and runs every 60 seconds.

Table 1-9 *TestUnusedPortLoopback Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not disable. This test is automatically disabled during CPU-usage spikes to maintain accuracy |
| Default | On. |

Table 1-9 *TestUnusedPortLoopback Test Attributes (continued)*

| | |
|--------------------------|--|
| Release | 12.2(33)SXH |
| Corrective action | Display a syslog message indicating the port(s) that failed. For modules other than supervisor engines, if all port groups fail (for example, at least one port per port ASIC fails more than the failure threshold for all port ASICs), the default action is to reset the module and power down the module after two resets. |
| Hardware support | All modules including supervisor engines. |

TestTransceiverIntegrity

The TestTransceiverIntegrity test is a security test performed on the transceiver during transceiver online insertion and removal (OIR) or module bootup to make sure that the transceiver is supported.

Table A-10 *TestTransceiverIntegrity Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Not applicable. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | Error disable the port. |
| Hardware support | All modules with transceivers. |

TestNetflowInlineRewrite

The TestNetflowInlineRewrite test verifies the NetFlow lookup operation, the ACL permit and deny functionality, and the inline rewrite capabilities of the port ASIC. The test packet will undergo a NetFlow table lookup to obtain the rewrite information. The VLAN and the source and destination MAC addresses are rewritten when the packet reaches the targeted port.

Table A-11 *TestNetflowInlineRewrite Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on configuration of loopback port (for example, Spanning Tree Protocol). |
| Recommendation | Schedule during downtime. Run this test during bootup only. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |

Table A-11 *TestNetflowInlineRewrite Test Attributes (continued)*

| | |
|--------------------------|--|
| Corrective action | None. See the system message guide for more information. |
| Hardware support | All modules including supervisor engines. |

TestPortTxMonitoring

The test polls the transmit counters on each port periodically and displays a syslog and error disables the port if no activity is seen for the configured time interval and failure threshold. You configure the time interval and threshold by entering the **diagnostic monitor interval** and **diagnostic monitor threshold** commands. The test does not source any packets, but leverages the CDP protocol that transmits packets periodically. If CDP is disabled, the polling for that port is skipped. The test runs every 75 seconds and the failure threshold is set to 5 by default.

Table 1-12 TestPortTxMonitoring Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not disable. The TestSPRPInbandPing test is automatically disabled during CPU-usage spikes. |
| Default | On. |
| Release | 12.2(33)SXH. |
| Corrective action | Display a syslog message indicating the port(s) that failed. Error disable the port(s) that failed. |
| Hardware support | All modules including the supervisor engines. |

PFC Layer 2 Forwarding Engine Tests

The PFC Layer 2 Forwarding Engine tests consist of the following tests:

- [TestNewIndexLearn](#), page A-9
- [TestDontConditionalLearn](#), page A-10
- [TestBadBpduTrap](#), page A-10
- [TestMatchCapture](#), page A-11
- [TestStaticEntry](#), page A-11

TestNewIndexLearn

The TestNewIndexLearn test is a combination of the TestNewLearn and the TestIndexLearn tests, which are described in the “[PFC Layer 2 Forwarding Engine Tests](#)” section on page A-11.

Table A-13 TestNewIndexLearn Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | If you experience problems with the Layer 2 forwarding engine learning capability, run this test on-demand to verify the Layer 2 learning functionality. This test can also be used as a health-monitoring test. |

Table A-13 *TestNewIndexLearn Test Attributes (continued)*

| | |
|--------------------------|--|
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines only. |

TestDontConditionalLearn

The TestDontConditionalLearn test is a combination of the TestDontLearn and the TestConditionalLearn tests, which are described in the “[DFC Layer 2 Forwarding Engine Tests](#)” section on page A-11.

Table A-14 *TestDontConditionalLearn Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | If you experience problems with the Layer 2 forwarding engine learning capability, run this test on-demand to verify the Layer 2 learning functionality. This test can also be used as a health monitoring test. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines only. |

TestBadBpduTrap

The TestBadBpduTrap test is a combination of the TestTrap and the TestBadBpdu tests, which are described in the “[DFC Layer 2 Forwarding Engine Tests](#)” section on page A-11.

Table A-15 *TestBadBpduTrap Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | If you experience problems with the Layer 2 forwarding engine learning capability, run this test on-demand to verify the Layer 2 learning functionality. This test can also be used as a health-monitoring test. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines only. |

TestMatchCapture

The TestMatchCapture test is a combination of the TestProtocolMatchChannel and the TestCapture tests, which are described in the “DFC Layer 2 Forwarding Engine Tests” section on page A-11.

Table A-16 TestMatchCapture Test Attributes

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Run this test on-demand to verify the Layer 2 learning functionality. This test can also be used as a health-monitoring test. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines only. |

TestStaticEntry

The TestStaticEntry test verifies that static entries are populated in the Layer 2 MAC address table. This functionality is verified during diagnostic packet lookup by the Layer 2 forwarding engine.

Table A-17 TestStaticEntry Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | If you experience problems with the Layer 2 forwarding engine learning capability, run this test on-demand to verify the Layer 2 learning functionality. This test can also be used as a health-monitoring test. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

DFC Layer 2 Forwarding Engine Tests

These are the DFC Layer 2 Forwarding Engine tests:

- [TestDontLearn](#), page A-12
- [TestNewLearn](#), page A-12
- [TestIndexLearn](#), page A-13
- [TestConditionalLearn](#), page A-13

- [TestTrap](#), page A-14
- [TestBadBpdu](#), page A-15
- [TestProtocolMatchChannel](#), page A-15
- [TestCapture](#), page A-16
- [TestStaticEntry](#), page A-16

TestDontLearn

The TestDontLearn test verifies that new source MAC addresses are not populated in the MAC address table when they should not be learned. This test verifies that the “don't learn” feature of the Layer 2 forwarding engine is working properly. For DFC-enabled modules, the diagnostic packet is sent from the supervisor engine inband port through the switch fabric and looped back from one of the ports on the DFC-enabled module. The “don't learn” feature is verified during diagnostic packet lookup by the Layer 2 forwarding engine.

Table A-18 *TestDontLearn Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | Schedule during downtime. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | DFC-enabled modules. |

TestNewLearn

The TestNewLearn test verifies the Layer 2 source MAC address learning functionality of the Layer 2 forwarding engine. For supervisor engines, a diagnostic packet is sent from the supervisor engine inband port to verify that the Layer 2 forwarding engine is learning the new source MAC address from the diagnostic packet. For DFC-enabled modules, a diagnostic packet is sent from the supervisor engine inband port through the switch fabric and looped backed from one of the ports on the DFC-enabled module. The Layer 2 learning functionality is verified during the diagnostic packet lookup by the Layer 2 forwarding engine.

Table A-19 *TestNewLearn Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |

Table A-19 *TestNewLearn Test Attributes (continued)*

| | |
|--------------------------|--|
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | DFC-enabled modules. |

TestIndexLearn

The TestIndexLearn test ensures that existing MAC address table entries can be updated. This test verifies the Index Learn feature of the Layer 2 forwarding engine is working properly. When running the test on the supervisor engine, the diagnostic packet is sent from the supervisor engine's inband port and performs a packet lookup using the supervisor engine Layer 2 forwarding engine. For DFC-enabled modules, the diagnostic packet is sent from the supervisor engine's inband port through the switch fabric and looped back from one of the DFC ports. The Index Learn feature is verified during the diagnostic packet lookup by the Layer 2 forwarding engine.

Table A-20 *TestIndexLearn Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | DFC-enabled modules. |

TestConditionalLearn

The TestConditionalLearn test verifies the ability to learn a Layer 2 source MAC address under specific conditions. When running the test on the supervisor engine, the diagnostic packet is sent from the supervisor engine's inband port and performs a packet lookup using the supervisor engine Layer 2

forwarding engine. For DFC-enabled modules, the diagnostic packet is sent from the supervisor engine's inband port through the switch fabric and looped back from one of the DFC ports. The Conditional Learn feature is verified during the diagnostic packet lookup by the Layer 2 forwarding engine.

Table A-21 *TestConditionalLearn Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | DFC-enabled modules. |

TestTrap

The TestTrap test verifies the ability to trap or redirect packets to the switch processor. This test verifies that the Trap feature of the Layer 2 forwarding engine is working properly. When running the test on the supervisor engine, the diagnostic packet is sent from the supervisor engine's inband port and performs a packet lookup using the supervisor engine's Layer 2 forwarding engine. For DFC-enabled modules, the diagnostic packet is sent from the supervisor engine's inband port through the switch fabric and looped back from one of the DFC ports. The Trap feature is verified during the diagnostic packet lookup by the Layer 2 forwarding engine.

Table A-22 *TestTrap Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | DFC-enabled modules. |

TestBadBpdu

The TestBadBpdu test verifies the ability to trap or redirect packets to the switch processor. This test verifies that the Trap feature of the Layer 2 forwarding engine is working properly. When running the test on the supervisor engine, the diagnostic packet is sent from the supervisor engine's inband port and performs a packet lookup using the supervisor engine's Layer 2 forwarding engine. For DFC-enabled modules, the diagnostic packet is sent from the supervisor engine's inband port through the switch fabric and looped back from one of the DFC ports. The BPDU feature is verified during the diagnostic packet lookup by the Layer 2 forwarding engine.

Table A-23 *TestBadBpdu Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | DFC-enabled modules. |

TestProtocolMatchChannel

The TestProtocolMatchChannel test verifies the ability to match specific Layer 2 protocols in the Layer 2 forwarding engine. When running the test on the supervisor engine, the diagnostic packet is sent from the supervisor engine's inband port and performs a packet lookup using the supervisor engine's Layer 2 forwarding engine. For DFC-enabled modules, the diagnostic packet is sent from the supervisor engine's inband port through the switch fabric and looped back from one of the DFC ports. The Match feature is verified during the diagnostic packet lookup by the Layer 2 forwarding engine.

Table A-24 *TestProtocolMatchChannel Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | DFC-enabled modules. |

TestCapture

The TestCapture test verifies that the capture feature of Layer 2 forwarding engine is working properly. The capture functionality is used for multicast replication. When running the test on the supervisor engine, the diagnostic packet is sent from the supervisor engine's inband port and performs a packet lookup using the supervisor engine's Layer 2 forwarding engine. For DFC-enabled modules, the diagnostic packet is sent from the supervisor engine's inband port through the switch fabric and looped back from one of the DFC ports. The Capture feature is verified during the diagnostic packet lookup by the Layer 2 forwarding engine.

Table A-25 *TestCapture Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | Schedule during downtime. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | DFC-enabled modules. |

TestStaticEntry

The TestStaticEntry test verifies the ability to populate static entries in the Layer 2 MAC address table. When running the test on the supervisor engine, the diagnostic packet is sent from the supervisor engine's inband port and performs a packet lookup using the supervisor engine's Layer 2 forwarding engine. For DFC-enabled modules, the diagnostic packet is sent from the supervisor engine's inband port through the switch fabric and looped back from one of the DFC ports. The Static Entry feature is verified during the diagnostic packet lookup by the Layer 2 forwarding engine.

Table A-26 *TestStaticEntry Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | DFC-enabled modules. |

PFC Layer 3 Forwarding Engine Tests

These are the PFC Layer 3 Forwarding Engine tests:

- [TestFibDevices](#), page A-17
- [TestIPv4FibShortcut](#), page A-18
- [TestIPv6FibShortcut](#), page A-18
- [TestMPLSFibShortcut](#), page A-19
- [TestNATFibShortcut](#), page A-19
- [TestL3Capture2](#), page A-20
- [TestAclPermit](#), page A-20
- [TestAclDeny](#), page A-21
- [TestQoS](#), page A-22

TestFibDevices

The TestFibDevices test verifies whether the FIB TCAM and adjacency devices are functional. One FIB entry is installed on each FIB TCAM device. A diagnostic packet is sent to make sure that the diagnostic packet is switched by the FIB TCAM entry installed on the TCAM device. This is not an exhaustive TCAM device test; only one entry is installed on each TCAM device.



Note

Compared to the IPv4FibShortcut and IPv6FibShortcut tests, this test tests all FIB and adjacency devices using IPv4 or IPv6 packets, depending on your configuration.

Table A-27 *TestFibDevices Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Run this test on-demand to verify the Layer 3 forwarding functionality if you experience problems with the routing capability. This test can also be used as a health-monitoring test. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestIPv4FibShortcut

The TestIPv4FibShortcut test verifies the IPV4 FIB forwarding of the Layer 3 forwarding engine is working properly. One diagnostic IPV4 FIB and adjacency entry is installed and a diagnostic packet is sent to make sure that the diagnostic packet is forwarded according to rewritten MAC and VLAN information.

Table A-28 *TestIPv4FibShortcut Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Run this test on-demand to verify the Layer 3 forwarding functionality if you experience problems with the routing capability. This test can also be used as a health-monitoring test. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestIPv6FibShortcut

The TestIPv6FibShortcut test verifies that the IPV6 FIB forwarding of the Layer 3 forwarding engine is working properly. One diagnostic IPV6 FIB and adjacency entry is installed and a diagnostic IPv6 packet is sent to make sure the diagnostic packet is forwarded according to rewritten MAC and VLAN information.

Table A-29 *TestIPv6FibShortcut Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Run this test on-demand to verify the Layer 3 forwarding functionality if you experience problems with the routing capability. This test can also be used as a health-monitoring test. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestMPLSFibShortcut

The TestMPLSFibShortcut test verifies that the MPLS forwarding of the Layer 3 forwarding engine is working properly. One diagnostic MPLS FIB and adjacency entry is installed and a diagnostic MPLS packet is sent to make sure that the diagnostic packet is forwarded according to the MPLS label from the adjacency entry.

Table A-30 *TestMPLSFibShortcut Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | This test can also be used as a health-monitoring test. Use as a health-monitoring test if you are routing MPLS traffic. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestNATFibShortcut

The TestNATFibShortcut test verifies the ability to rewrite a packet based on the NAT adjacency information (rewrite destination IP address). One diagnostic NAT FIB and adjacency entry is installed and the diagnostic packet is sent to make sure that the diagnostic packet is forwarded according to the rewritten IP address.

Table A-31 *TestNATFibShortcut Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | This test can also be used as a health-monitoring test. Use as a health-monitoring test if the destination IP address is being rewritten (for example, if you are using NAT). |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestL3Capture2

The TestL3Capture2 test verifies that the Layer 3 capture (capture 2) feature of the Layer 3 forwarding engine is working properly. This capture feature is used for ACL logging and VACL logging. One diagnostic FIB and adjacency entry with a capture 2 bit set is installed and a diagnostic packet is sent to make sure that the diagnostic packet is forwarded according to the capture bit information.

Table A-32 *TestL3Capture2 Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive. |
| Recommendation | This test can not be used as a health-monitoring test. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestAclPermit

The TestAclPermit test verifies that the ACL permit functionality is working properly. An ACL entry permitting a specific diagnostics packet is installed in the ACL TCAM. The corresponding diagnostic packet is sent from the supervisor engine and looked up by the Layer 3 forwarding engine to make sure that it hits the ACL TCAM entry and gets permitted and forwarded appropriately.

Table A-33 *TestACLPermit Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive. |
| Recommendation | This test can not be used as a health-monitoring test. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestAclDeny

The TestAclDeny test verifies that the ACL deny feature of the Layer 2 and Layer 3 forwarding engine is working properly. The test uses different ACL deny scenarios such as input, output, Layer 2 redirect, Layer 3 redirect, and Layer 3 bridges to determine whether or not the ACL deny feature is working properly.

Table A-34 TestACLDeny Test Attributes

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not disable. |
| Default | On. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | Automatic ASIC reset for recovery. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestNetflowShortcut

The TestNetflowShortcut test verifies that the NetFlow forwarding functionality of the Layer 3 forwarding engine is working properly. One diagnostic NetFlow entry and adjacency entry is installed, and a diagnostic packet is sent to make sure it is forwarded according to the rewritten MAC and VLAN information.

Table A-35 TestNetflowShortcut Test Attributes

| Attributes | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped back ports. The disruption is 500 ms. |
| Recommendation | Run this test on-demand if you suspect that NetFlow is not working properly. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestQoS

The TestQoS test verifies whether or not the QoS input and output TCAM is functional by programming the QoS input and output TCAM so that the ToS value of the diagnostic packet is changed to reflect either input or output.

Table A-36 TestQoS Test Attributes

| Attributes | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped back ports. The disruption is 500 ms. |
| Recommendation | Schedule during downtime. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

DFC Layer 3 Forwarding Engine Tests

These are the DFC Layer 3 Forwarding Engine tests:

- [TestFibDevices](#), page A-22
- [TestIPv4FibShortcut](#), page A-23
- [TestIPv6FibShortcut](#), page A-24
- [TestMPLSFibShortcut](#), page A-24
- [TestNATFibShortcut](#), page A-25
- [TestL3Capture2](#), page A-25
- [TestAclPermit](#), page A-26
- [TestAclDeny](#), page A-26
- [TestQoS](#), page A-27
- [TestNetflowShortcut](#), page A-27

TestFibDevices

The TestFibDevices test verifies that the FIB TCAM and adjacency devices are functional. One FIB entry is installed on each FIBTCAM device and a diagnostic packet is sent to make sure that the diagnostic packet is switched by the FIB TCAM entry installed on the TCAM device. This is not an exhaustive TCAM device test. Only one entry is installed on each TCAM device.



Note

Compared to the IPv4FibShortcut and IPv6FibShortcut tests, the TestFibDevices test tests all FIB and adjacency devices using IPv4 or IPv6 packets, depending on your configuration.

Table A-37 TestFibDevices Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | Schedule during downtime. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestIPv4FibShortcut

The TestIPv4FibShortcut test verifies that the IPv4 FIB forwarding functionality of the Layer 3 forwarding engine is working properly. One diagnostic IPv4 FIB and adjacency entry is installed and a diagnostic packet is sent to make sure that the diagnostic packet is forwarded according to rewritten MAC and VLAN information.

Table A-38 TestIPv4FibShortcut Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestIPv6FibShortcut

The TestIPv6FibShortcut test verifies that the IPv6 FIB forwarding functionality of the Layer 3 forwarding engine is working properly. One diagnostic IPv6 FIB and adjacency entry is installed and a diagnostic IPv6 packet is sent to make sure that the diagnostic packet is forwarded according to rewritten MAC and VLAN information.

Table A-39 TestIPv6FibShortcut Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestMPLSFibShortcut

The TestMPLSFibShortcut test verifies that the MPLS forwarding functionality of the Layer 3 forwarding engine is working properly. One diagnostic MPLS FIB and adjacency entry is installed and a diagnostic MPLS packet is sent to make sure that the diagnostic packet is forwarded using the MPLS label from the adjacency entry.

Table A-40 TestMPLSFibShortcut Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestNATFibShortcut

The TestNATFibShortcut test verifies the ability to rewrite a packet based on NAT adjacency information, such as the rewrite destination IP address. One diagnostic NAT FIB and adjacency entry is installed and a diagnostic packet is sent to make sure the diagnostic packet is forwarded according to the rewritten IP address.

Table A-41 TestNATFibShortcut Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestL3Capture2

The TestL3Capture2 test verifies that the Layer 3 capture (capture 2) feature of the Layer 3 forwarding engine is working properly. This capture feature is used for ACL logging and VACL logging. One diagnostic FIB and adjacency entry with a capture 2-bit set is installed, and a diagnostic packet is sent to make sure that the diagnostic packet is forwarded according to capture bit information.

Table A-42 TestL3Capture2 Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestAclPermit

The TestAclPermit test verifies that the ACL permit functionality is working properly. An ACL entry permitting a specific diagnostics packet is installed in the ACL TCAM. The corresponding diagnostic packet is sent from the supervisor engine and is looked up by the Layer 3 forwarding engine to make sure it hits the ACL TCAM entry and gets permitted and forwarded correctly.

Table A-43 TestACLPermit Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | This test runs by default during bootup or after a reset or OIR. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestAclDeny

The TestAclDeny test verifies that the ACL deny feature of the Layer 2 and Layer 3 forwarding engine is working properly. The test uses different ACL deny scenarios such as input and output Layer 2 redirect, Layer 3 redirect, and Layer 3 bridges.

Table A-44 TestACLDeny Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. Duration of the disruption depends on the configuration of the looped-back port (for example, Spanning Tree Protocol). |
| Recommendation | Schedule during downtime if you are using ACLs. |
| Default | Off. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestQoS

The TestQoS test verifies whether or not the QoS input and output TCAM is functional by programming the QoS input and output TCAM so that the ToS value of the diagnostic packet is changed to reflect either input or output.

Table A-45 *TestQoS Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. The disruption is typically less than one second. |
| Recommendation | Schedule during downtime. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

TestNetflowShortcut

The TestNetFlowShortcut test verifies that the NetFlow forwarding functionality of the Layer 3 forwarding engine is working properly. One diagnostic NetFlow entry and adjacency entry is installed and a diagnostic packet is sent to make sure it is forwarded according to the rewritten MAC and VLAN information.

Table A-46 *TestNetflowShortcut Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Disruptive for looped-back ports. Disruption is typically less than one second. |
| Recommendation | Run this test on-demand if you suspect that NetFlow is not working properly. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and DFC-enabled modules. |

Replication Engine Tests

These are the Replication Engine tests:

- [TestL3VlanMet](#), page A-28
- [TestIngressSpan](#), page A-28
- [TestEgressSpan](#), page A-29

TestL3VlanMet

The TestL3VlanMet test verifies that the multicast functionality of the replication engine is working properly. The replication engine is configured to perform multicast replication of a diagnostic packet onto two different VLANs. After the diagnostic packet is sent out from the supervisor engine's inband port, the test verifies that two packets are received back in the inband port on the two VLANs configured in the replication engine.

Table A-47 **TestL3VlanMet Test Attributes**

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Disruptive for DFC-equipped modules. Disruption is typically less than one second on looped-back ports. |
| Recommendation | Run this test on-demand to test the multicast replication abilities of the replication engine. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and WS-65xx, WS-67xx, and WS-68xx modules. |

TestIngressSpan

The TestIngressSpan test ensures that the port ASIC is able to tag packets for ingress SPAN. This test also verifies that the ingress SPAN operation of the rewrite engine for both SPAN queues is working properly.

Table A-48 **TestIngressSpan Test Attributes**

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for both SPAN sessions. Also disruptive for the loopback port on modules. Duration of the disruption depends on the configuration of the loopback port (for example, Spanning Tree Protocol). |
| Recommendation | Run this test on-demand. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and WS-65xx and WS-67xx modules. |

TestEgressSpan

The TestEgressSpan test verifies that the egress SPAN replication functionality of the rewrite engine for both SPAN queues is working properly.

Table A-49 TestEgressSpan Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive for both SPAN sessions. Disruption is typically less than one second. |
| Recommendation | Run this test on-demand. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | Supervisor engines and WS-65xx and WS-67xx modules. |

Fabric Tests

These are the Fabric tests:

- [TestFabricSnakeForward](#), page A-29
- [TestFabricSnakeBackward](#), page A-30
- [TestSynchedFabChannel](#), page A-30
- [TestFabricCh0Health](#), page A-31
- [TestFabricCh1Health](#), page A-31

TestFabricSnakeForward

The TestFabricSnakeForward test consists of two test cases: the internal snake test and the external snake test. The internal snake test generates the test packets inside the fabric ASIC and the test data path is limited so that it stays inside the fabric ASIC. The external snake test generates the test packet using the supervisor engine inband port; the test data path involves the port ASIC, the rewrite engine ASIC inside the supervisor engine, and the fabric ASIC. Whether or not the supervisor engine local channel is synchronized to the fabric ASIC determines which test is used. If it is synchronized, the external snake test is used; if it is not, the internal snake test is used. For both tests, only the channels that are not synchronized to any modules are involved in the test. The Forward direction indicates that the snaking direction is from the low-numbered channel to the high-numbered channel.

Table A-50 TestFabricSnakeForward Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Run on-demand. This test can result in high CPU utilization. |
| Default | This test runs by default during bootup or after a reset or OIR. |

Table A-50 *TestFabricSnakeForward Test Attributes (continued)*

| | |
|--------------------------|---|
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | Supervisor engines crash to ROMMON; SFMs reset. |
| Hardware support | Supervisor Engine 720 and SFM. |

TestFabricSnakeBackward

The TestFabricSnakeBackward test consists of two test cases: the internal snake test and the external snake test. The internal snake test generates the test packets inside the fabric ASIC, and the test data path is limited so that it stays inside the fabric ASIC. The external snake test generates the test packet using the supervisor engine inband port and the test data path involves the port ASIC, the rewrite engine ASIC inside the supervisor engine, and the fabric ASIC. Whether or not the supervisor engine local channel is synchronized to the fabric ASIC determines which test is used. If it is synchronized, the external snake test is used; if it is not, internal snake test is used. For both tests, only the channels that are not synchronized to any modules are involved in the test. The backward direction indicates that the snaking direction is from the high-numbered channel to the low-numbered channel.

Table A-51 *TestFabricSnakeBackward Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Run on-demand. This test can result in high CPU utilization. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | Supervisor engines crash to ROMMON; SFMs reset. |
| Hardware support | Supervisor Engine 720 and SFM. |

TestSynchedFabChannel

The TestSynchedFabChannel test periodically checks the fabric synchronization status for both the module and the fabric. This test is available only for fabric-enabled modules. This test is not a packet-switching test so it does not involve the data path. This test sends an SCP control message to the module and fabric to query the synchronization status.

Table A-52 *TestSynchedFabChannel Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not turn this test off. Use as a health-monitoring test. |
| Default | On. |
| Release | 12.1(13)E, 12.2(14)SX. |

Table A-52 *TestSynchedFabChannel Test Attributes (continued)*

| | |
|--------------------------|--|
| Corrective action | The module resets after five consecutive failures. Three consecutive reset cycles results in the module powering down. A fabric switchover may be triggered, depending on the type of failure. |
| Hardware support | All fabric-enabled modules. |

TestFabricCh0Health

The TestFabricCh0Health test constantly monitors the health of the ingress and egress data paths for fabric channel 0 on 10-gigabit modules. The test runs every five seconds. Ten consecutive failures are treated as fatal and the module resets; three consecutive reset cycles may result in a fabric switchover.

Table A-53 *TestFabricSCh0Health Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not turn this test off. Use as a health-monitoring test. |
| Default | On. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | The module resets after 10 consecutive failures. Three consecutive resets powers down the module. |
| Hardware support | WS-X6704-10GE and WS-6702-10GE. |

TestFabricCh1Health

The TestFabricCh1Health test constantly monitors the health of the ingress and egress data paths for fabric channel 1 on 10-gigabit modules. The test runs every five seconds. Ten consecutive failures are treated as fatal and the module resets; three consecutive reset cycles may result in a fabric switchover.

Table A-54 *TestFabricCh1Health Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not turn this test off. Use as a health-monitoring test. |
| Default | On. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | The module resets after 10 consecutive failures. Three consecutive failures resets powers down the module. |
| Hardware support | WS-X6704-10GE module. |

Exhaustive Memory Tests

The exhaustive memory tests include the following tests:

- [TestFibTcamSSRAM](#), page A-32
- [TestAsicMemory](#), page A-32
- [TestAclQosTcam](#), page A-33
- [TestNetflowTcam](#), page A-33
- [TestQoSSTcam](#), page A-34


Note

Because the supervisor engine must be rebooted after running memory tests, run memory tests on the other modules before running them on the supervisor engine. For more information about running on-demand online diagnostic tests see the [“Configuring On-Demand Online Diagnostics”](#) section on page 12-3.

TestFibTcamSSRAM

The TestFibTcamSSRAM test checks the FIB TCAM and Layer 3 Adjacency SSRAM memory.

Table A-55 *TestFibTcamSSRAM Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive. Disruption is several hours. |
| Recommendation | Use this test only if you suspect a problem with the hardware or before putting the hardware into a live network. Do not run any traffic in the background on the module that you are testing. The supervisor engine must be rebooted after running this test. |
| Default | Off. |
| Release | 12.1(20)E, 12.2(14)SX, 12.2(17a)SX. |
| Corrective action | Not applicable. |
| Hardware support | All modules including supervisor engines. |

TestAsicMemory

The TestAsicMemory test uses an algorithm to test the memory on a module.

Table A-56 *TestAsicMemory Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Disruptive. Disruption is approximately one hour. |

Table A-56 *TestAsicMemory Test Attributes (continued)*

| | |
|--------------------------|--|
| | Use this test only if you suspect a problem with the hardware or before putting the hardware into a live network. Do not run any traffic in the background on the module that you are testing. The supervisor engine must be rebooted after running this test. |
| Recommendation | |
| Default | Off. |
| Release | 12.2(17a)SX. |
| Corrective action | Not applicable. |
| Hardware support | All modules including supervisor engines. |

TestAclQosTcam

The TestAclQosTcam test tests all the bits and checks the location of both ACL and QOS TCAMs on the PFC. It is not supported on the PFC3A.

Table A-57 *TestAclQosTcam Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive. Disruption is approximately one hour. |
| | Use this test only if you suspect a problem with the hardware or before putting the hardware into a live network. Do not run any traffic in the background on the module that you are testing. The supervisor engine must be rebooted after running this test. |
| Recommendation | |
| Default | Off. |
| Release | 12.2(18)SXD. |
| Corrective action | Not applicable. |
| Hardware support | All modules including supervisor engines. |

TestNetflowTcam

The TestNetflowTcam test tests all the bits and checks the location of the Netflow TCAM.

Table A-58 *TestNetflowTcam Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Disruptive. Disruption is several minutes and can vary depending on the version of the PFC. |

Table A-58 *TestNetflowTcam Test Attributes (continued)*

| | |
|--------------------------|--|
| | Use this test only if you suspect a problem with the hardware or before putting the hardware into a live network. Do not run any traffic in the background on the module that you are testing. The supervisor engine must be rebooted after running this test. |
| Recommendation | |
| Default | Off. |
| Release | 12.2(18)SXD. |
| Corrective action | Not applicable. |
| Hardware support | All modules including supervisor engines. |

TestQoSSTcam

The TestQoSSTcam test performs exhaustive memory tests for QoS TCAM devices.

Table A-59 *TestQoSSTcam Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive. Disruption is several minutes and can vary depending on the version of the PFC. |
| Recommendation | Use this test only if you suspect a problem with the hardware or before putting the hardware into a live network. Do not run any traffic in the background on the module that you are testing. The supervisor engine must be rebooted after running this test. |
| Default | Off. |
| Release | 12.2(18)SXD. |
| Corrective action | Not applicable. |
| Hardware support | All modules including supervisor engines. |

IPSEC Services Modules Tests

The IPSEC Services Modules Tests include the following tests:

- [TestIPSecClearPkt](#), page A-35
- [TestHapiEchoPkt](#), page A-35
- [TestIPSecEncryptDecryptPkt](#), page A-35

TestIPSecClearPkt

The TestIPSecClearPkt test sends a packet through the switch fabric or bus from the supervisor engine inband port through to the crypto engine. The packet is sent back without encryption from the crypto engine to the supervisor engine in-band port. The packet is checked to verify that the encryption is not done and that the packet data fields are reserved. The Layer 2 lookup drives the packet between the supervisor in-band port and the crypto engine.

Table A-60 TestIPSecClearPkt Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Run this test on-demand. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.2(18)SXE2.2. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | VPN service module. |

TestHapiEchoPkt

The TestHapiEchoPkt test sends a Hapi Echo packet to the crypto engine using the control path. After the Hapi Echo packet is sent to the crypto engine, it is echoed back from the crypto engine. The packet is sent from the supervisor engine inband port to the crypto engine using index-direct and is sent back using broadcast to a diagnostic VLAN.

Table A-61 TestHapiEchoPkt Test Attributes

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive. |
| Recommendation | Run this test on-demand. This test cannot be run from on-demand CLI. |
| Default | On. |
| Release | 12.2(18)SXE2. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | VPN service module. |

TestIPSecEncryptDecryptPkt

The TestIPSecEncryptDecryptPkt test checks the encryption functionality by exchanging a packet between the supervisor engine in-band port and the crypto engine of the IPsec services modules (WS-SVC-IPSEC, SPA-IPSEC) using the switch fabric or bus (whichever is applicable). After several

exchanges, the packet is checked to verify that the original data is preserved after the encryption and decryption process performed by the crypto engine. The Layer 2 lookup drives the packet between the supervisor in-band port and the crypto engine.

Table A-62 *TestIPSecEncryptDecryptPkt Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. Test runs every minute by default. |
| Recommendation | This test can only be run at bootup. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.2(18)SXE2.2. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | VPN services module. |

Stress Tests

The stress tests consist of the following tests:

- [TestTrafficStress](#), page A-36
- [TestEobcStressPing](#), page A-37

TestTrafficStress

The TestTrafficStress test stress tests the switch and the installed modules by configuring all of the ports on the modules into pairs, which then pass packets between each other. After allowing the packets to pass through the switch for a predetermined period, the test verifies that the packets are not dropped.

Table A-63 *TestTrafficStress Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Disruptive. Disruption is several minutes. |
| Recommendation | Use this test to qualify hardware before installing it in your network. |
| Default | Off. |
| Release | 12.2(18)SXF. |
| Corrective action | Not applicable. |
| Hardware support | Supervisor Engine 720 and Supervisor Engine 32. |

TestEobcStressPing

The TestEobcStressPing test stress tests a module's EOBC link with the supervisor engine. The test is started when the supervisor engine initiates a number of sweep-ping processes (the default is one). The sweep-ping process pings the module with 20,000 SCP-ping packets. The test passes if all 20,000 packets respond before each packet-ping timeout, which is two seconds. If unsuccessful, the test allows five retries to account for traffic bursts on the EOBC bus during the test.

Table A-64 TestEobcStressPing Test Attributes

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Disruptive. Disruption is several minutes. |
| Recommendation | Use this test to qualify hardware before installing it in your network. |
| Default | Off. |
| Release | 12.2(18)SXD. |
| Corrective action | Not applicable. |
| Hardware support | Supervisor Engine 720 and Supervisor Engine 32. |

Critical Recovery Tests

The critical recovery tests consist of the following tests:

- [TestL3HealthMonitoring](#), page A-37
- [TestTxPathMonitoring](#), page A-38
- [TestSynchedFabChannel](#), page A-38

The TestFabricCh0Health and TestFabricCh1Health tests are also considered critical recovery tests. See the “Fabric Tests” section on page A-29 for a description of these tests.

TestL3HealthMonitoring

The TestL3HealthMonitoring test triggers a set of diagnostic tests involving IPv4 and IPv6 packet switching on a local DFC whenever the system tries to self-recover from a detected hardware fault. The tests shut down the front panel port (usually port 1) for testing purposes. If the diagnostic tests are not passing, it is an indication that the hardware fault cannot be fixed and a self-recovery sequence will be applied again.

Table A-65 TestL3HealthMonitoring Test Attributes

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Disruptive. Disruption is typically less than one second. Duration of the disruption depends on the configuration of looped-back port (for example, Spanning Tree Protocol). Forwarding and port functions are disrupted during the test. |

Table A-65 *TestL3HealthMonitoring Test Attributes (continued)*

| | |
|--------------------------|----------------------|
| Recommendation | Do not disable. |
| Default | On. |
| Release | 12.2(14)SX. |
| Corrective action | Not applicable. |
| Hardware support | DFC-equipped modules |

TestTxPathMonitoring

The TestTxPathMonitoring test sends index-directed packets periodically to each port on the Supervisor Engine 720 and WS-X67xx series modules to verify ASIC synchronization and correct any related problems. The test runs every two seconds.

Table A-66 *TestTxPathMonitoring Test Attributes*

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not change the default settings. |
| Default | On. |
| Release | 12.2(14)SX. |
| Corrective action | Not applicable (self-recovering). |
| Hardware support | Supervisor Engine 720 and WS-67xx series modules. |

TestSynchedFabChannel

The TestSynchedFabChannel test periodically checks the fabric synchronization status for both the module and the fabric. This test is available only for fabric-enabled modules. This test is not a packet-switching test so it does not involve the data path. This test sends an SCP control message to the module and fabric to query the synchronization status.

Table A-67 *TestSynchedFabChannel Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not turn off. Use as a health-monitoring test. |
| Default | On. |
| Release | 12.1(13)E, 12.2(14)SX. |
| Corrective action | None. See the system message guide for more information. |
| Hardware support | All fabric-enabled modules. |

General Tests

The general tests consist of the following tests:

- [ScheduleSwitchover](#), page A-39
- [TestFirmwareDiagStatus](#), page A-39
- [TestCFRW](#), page A-40

ScheduleSwitchover

The ScheduleSwitchover test allows you to trigger a switchover at any time using the online diagnostics scheduling capability.

Table A-68 *ScheduleSwitchover Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Disruptive. |
| Recommendation | Schedule this test during downtime to test the ability of the standby supervisor engine to take over after a switchover. |
| Default | Off. |
| Release | 12.2(17B)SXA |
| Corrective action | None |
| Hardware support | Supervisor engines only. |

TestFirmwareDiagStatus

The TestFirmwareDiagStatus test displays the results of the power-on diagnostic tests run by the firmware during the module bootup.

Table A-69 *TestFirmwareDiagStatus Test Attributes*

| Attribute | Description |
|---------------------------------|--|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | This test can only be run at bootup. |
| Default | This test runs by default during bootup or after a reset or OIR. |
| Release | 12.2(18)SXD |
| Corrective action | None. See the system message guide. |
| Hardware support | All modules, including supervisor engines. |

TestCFRW

The TestCFRW test verifies the CompactFlash disk or disks on the supervisor engine. This test is performed during system boot-up or whenever a disk is inserted. A 128-byte temporary file is written to each disk present in the slot and read back. The content read back is checked and the temporary file is deleted. You can also execute this test from the CLI.

Table A-70 TestCFRW Test Attributes

| Attribute | Description |
|---------------------------------|---|
| Disruptive/Nondisruptive | Nondisruptive. |
| Recommendation | Do not disable. No traffic is affected. |
| Default | On. |
| Release | 12.2(33)SXH. |
| Corrective action | Format or replace the failed CompactFlash. |
| Hardware support | External CompactFlash on the active and the standby Supervisor Engine 720 and Supervisor Engine 32. |



Tip

For additional information about Cisco Catalyst 6500 Series Switches (including configuration examples and troubleshooting information), see the documents listed on this page:

http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html