

# 58 Running Hardware Diagnostics

Hardware diagnostics provide you with software tools for diagnosing hardware-related problems on OmniSwitch and Omni Switch/Router switching modules. These diagnostics allow you to test switching modules off-line during network down time.

The OmniSwitch and Omni Switch/Router have a variety of switching modules interconnected by a frame backplane and/or cell backplane, and a management backplane. When a hardware failure occurs, the problem may be related to a number of different failures. As part of a systematic troubleshooting procedure, you can use the built-in diagnostic software to test basic connectivity and functionality.

You can run the tests individually or sequentially. Diagnostic software also provides an option that allows you to run all the tests in one session. The diagnostic tests performed vary depending on the switching module type under test.

The approach of the OmniSwitch and Omni Switch/Router diagnostic software is two-pronged. First, tests are performed for basic connectivity over the management bus. Second, basic functionality is tested, including memory (i.e., VRAM, CAM), software loading, and CPU usage tests.

The following tests are available for the OmniSwitch and Omni Switch/Router:

- **alpreg** Alpine ASIC Register Test
- **bigft** Bigfoot ASIC Register Test
- **csr** Command Status Register Test
- **fddimac** FDDI MAC Register Test
- **fddiphy** FDDI PHY Register Test
- **gigareg** Giga-Chip ASIC Register Test
- **ifled** Submodule LED Test
- **ilb** Internal Loopback Test (replaces **mloopphy** in Release 3.4 and later)
- **ilbstress** Internal Loopback Stress Test
- **mammem** Mammoth ASIC Register and Memory Test
- **mamcam** Mammoth CAM Test
- **mloopmac** Mammoth MAC Loopback Test
- **mvbus** Mammoth VBUS Test
- **port** Switching Module Port and Traffic Test
- **sahi** SAHI Register and Memory Test
- **stress** Port Stress Test (available for Ethernet and CSM modules)
- **submem** Submodule Local Memory Test
- **sunl** SUNI Register Test

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- **whsreg** Whistler Register Test
  - **wsmcable** WSM/WSX Cable Connection Test

The following tests available for the Omni Switch/Router only:

- **hrexmem** HRE-X Memory Test
- **hrexport** HRE-X Port Test (MPX only)
- **morreg** Moriah Register Test
- **mreg** M013 Register Test
- **pcam** Pseudo CAM Test
- **tellreg** Telluride Register Test
- **xcam** Alcatel CAM Off-Board Test

The following tests available for the OmniSwitch only:

- **boardup** Board Up Test
- **camoffbrd** CAM Off-board Test
- **camonbrd** CAM On-board Test
- **cbrport** Constant Bit Rate Port Test
- **cmreg** CSM-AB-CM Register Test
- **cmtest** CSM-AB-CM Clock Test
- **dmux** Mux/Dmux Register Test
- **fabric** Fabric Register Test
- **hrecam** HRE CAM Test
- **hremem** HRE Memory Test
- **hreport** HRE Data Port Test
- **iop** Input/Output Processing Register and Memory Tests, and BIST
- **loopdle** DLE Loopback Test
- **loopfi** FCSM Fabric Interface (FI) Loopback Test
- **looppmc** PMC Loopback Test
- **loopsahi** FCSM II SAHI Loopback Test
- **loopvit** Vitesse Loopback Test
- **pal** PAL Test
- **phyreg** PHY Register Test
- **sercable** Serial Cable Connection Test
- **vbus** VRAM Bus Test
- **vram** Video RAM Test

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## Running Diagnostics

You must log in to the **diag** account to access the hardware diagnostics functionality. The **framefab** and **cellfab** commands also require being logged in as **diag** to run these commands.

There are several image files used for hardware diagnostics. These files have the following uses:

- **diagx.img** Omni Switch/Router diagnostics image file
- **desx.img** Omni Switch/Router stress test image file
- **diag.img** OmniSwitch diagnostics image file (MPM, MPM-II, MPM-1G)
- **diagc.img** OmniSwitch diagnostics image file (MPM-C)
- **diag3.img** OmniSwitch diagnostics image file (MPM-III)
- **dmesm.img** OmniSwitch stress test image file
- **dni.img** OmniSwitch on-board diagnostics test image file (must be used with non Mammoth-based modules)

### ◆ Note ◆

To function properly, hardware diagnostics must be run offline (i.e., the switch should not be connected to a network) or during network downtimes. In addition, spanning tree must be set to **OFF** via the **stc** command.

The OK2 LED of the module under test will be set to red if a failure is detected by diagnostic testing. The OK2 LED can be restored by resetting the module or by rebooting the chassis.

Diagnostics may not run if the **mpm.cfg** and **mpm.cnf** files are not in their default configurations. In addition, some diagnostics may affect the settings in configuration files. Therefore, any customized **mpm.cfg** and **mpm.cnf** files should be saved prior to testing. Once testing is completed, these files should be restored and the chassis rebooted prior to normal operation.

The default **mpm.cfg** and **mpm.cnf** files are obtained by performing the following steps:

1. Remove these files from flash memory by renaming the files to names besides **mpm.cfg** and **mpm.cnf**. For example, you can rename **mpm.cfg** to **mpm\_cfg.old** to highlight the fact that it is the original version of the file.
2. Delete the **mpm.cfg** and **mpm.cnf** files from flash memory.
3. Reboot the system. The management processor module (an MPM on an OmniSwitch and an MPX on an Omni Switch/Router) will create default **mpm.cfg** and **mpm.cnf** files when these files are missing from flash memory. These default files are the ones to be used with diagnostic software.

# Login to Run Diagnostics

You must log in to the **diag** account to access the hardware diagnostics functionality. The **diag** user is a superset of the **admin** user. The **diag** user can run all hardware diagnostics in addition to all of the capabilities available to the **admin** user. The default password for the **diag** user is **switch**.

Once logged in as a **diag** user, the Main Menu will display as follows.

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registered in the United States Patent and Trademark Office

Command	Main Menu
File	Manage system files
Summary	Display summary info for VLANs, bridge, interfaces, etc.
VLAN	VLAN management
Networking	Configure/view network parameters such as routing, etc.
Interface	View or configure the physical interface parameters
Security	Configure system security parameters
System	View/set system-specific parameters
Services	View/set service parameters
Switch	Enter Any to Any Switching Menu
Help	Help on specific commands
Diag	Display diagnostic level commands
Exit/Logout	Log out of this session
?	Display the current menu contents

Note the menu listing for **Diag** underneath the **Help** sub-menu. To access the diagnostics sub-menu, enter **diag** at the prompt. If the display mode is set to verbose, the diagnostics sub-menu will display as follows:

Command	Diagnostic Menu
reset	Reset a module in a slot
maskta	Control masking of temperature alarm led
test	Run tests on one or more slot modules
cellfab	Run the Cell Fabric Tests
framefab	Run the Frame Fabric Tests
testdisp	Display test blocks on one or all slot modules
testcfg	Configure test parameters on one or all slot modules

The **test** command is the main interface into the diagnostics functionality; you must logged in as **diag** to run this command. The **testdisp** and **testcfg** commands also require being logged in as **diag** to run these commands. The **reset** and **maskta** commands have specialized functionality; you do not have to be logged in as **diag** to use these commands, but you do at least need to be logged in as **admin**. Each of the sub-menu options is described in the sections that follow.

## Resetting a Switching Module

The **reset** command initiates a soft reset on the module in a specified slot. Conceptually, resetting a switching module with this command is similar to switching off power to the module; the module will be in the same state after a reset as it is after a power on.

### ◆ Note ◆

The primary MPM module cannot be reset. To reset the secondary MPM, use the **secreset** command, which is described in Chapter 10, “Configuring Management Processor Modules.”

To reset a switching module, enter the **reset** command followed by the slot number for the module. For example, to reset the switching module in slot 4, enter:

```
reset 4
```

A message similar to the following displays:

```
Resetting slot of type xxxx may crash system
Attempt reset anyway {Y/N}? (N) :
```

Enter a **Y** and press **<Enter>** at this point. The module will be reset and the following message will indicate the reset took place:

```
resetting slot 4 to enable
```

## Disabling a Switching Module

The **reset** command can also be used to disable a switching module. When used in conjunction with the **swap** command, this option is useful if you want to hot swap a module. (See Chapter 7, “OmniSwitch Switching Modules,” for information on how to hot swap a switching module.)

To disable a switching module, enter the **reset** command followed by the slot number for the module and followed by **disable**. For example, to reset the switching module in slot 4, enter:

```
reset 4 disable
```

at the system prompt. To enable the switching module again, enter the reset command followed by the slot number for the module, and followed, optionally, by **enable** (**enable** is the default for the **reset** command). For example, to enable a previously disabled switching module in slot 4, enter:

```
reset 4 enable
```

at the system prompt.

# Temperature Masking

The temperature sensor on the original MPM (not the MPM II or MPM 1G) initiates an alarm in some cases when an over-temperature condition does not exist. In addition, due to device hysteresis, once this alarm is triggered it does not go off until the device cools down significantly. These false alarms are due to the low accuracy of the temperature sensor on the original MPM (not applicable to the OmniStack).

The **maskta** command provides a way of modifying the behavior of the temperature alarm to mask the effect of the temperature sensor. By masking the temperature alarm bits, you can ensure that the MPM's TEMP LED never comes on or that it comes on but goes off after a specified delay time. By default, temperature masking is disabled.

To enable temperature masking, enter

**maskta enable**

This command masks the temperature alarm completely. The TEMP LED will not come on even if the temperature exceeds the set ranges. The following message confirms the masking:

**Masking of Temperature Alarm enabled**

You could also enable temperature alarm masking but not mask the alarm completely. If you enter an integer after the **maskta enable** command, the TEMP LED will still come on but it will go off after the number of minutes you specified. For example, if you enter the command

**maskta enable 5**

the temperature alarm will still turn on, but it will turn off automatically five (5) minutes after the alarm-initiating event occurs.

### ◆ Note ◆

Once you enter a minute value when enabling temperature alarm masking, that value is saved even if you disable masking. To reset the minute value you must re-enable temperature alarm masking and set the minute value to zero (i.e., enter the command **maskta enable 0**).

To disable temperature alarm masking, enter:

**maskta disable**

This is the default setting, so you only need to specify this command if you had previously enabled alarm masking. The following message confirms that you disabled masking:

**Masking of Temperature Alarm disabled**

## Running Hardware Diagnostics

The **test** command initiates one or more test routines on a switching module that you specify. You can also optionally test all switching modules in one test session. Test status, instructions, and a summary of results are provided as output. Start a diagnostic test session using the following command syntax:

```
test <slot_number> [<repeat_count> [<test_name>]]
```

where

- <slot\_number>** Indicates the slot number in the OmniSwitch/OmniStack for the module on which you want to run tests. You cannot specify the slot where the MPM module resides. If you enter **all** for this parameter, then all switching modules in the chassis will be tested. This parameter is required; if you do not enter a slot number then the test session will not start.
- <repeat\_count>** Indicates the number of times to run the specified tests on the module. This value can be an integer between 0 and 999. A value of zero (0) repeats the test infinitely. The default value is 1. This default will be assumed if you do not enter a **repeat\_count**.
- <test\_name>** Indicates the test to be performed on the module. You can indicate the test name or **all** to run all tests. You can enter only one test name or **all**. The default is **all**. This default will be assumed if you do not enter a **test\_name**.

### ◆ Note◆

A combination of **repeat\_count** set to 0 and **test\_name** set to **all** allows the user to run either the port test infinitely or all off-board tests infinitely. If the user selects to run the port test when prompted, all the off-board tests are run once followed by an infinite run of the port test. See *Sample Command Lines* on page 58-11 for more information.

Descriptions of each test follows:

- alpreg** Tests the Alpine registers. Test the Alpine control logic, registers, and data/address lines.
- bigft** Tests the Bigfoot registers. Test the Bigfoot control logic, registers, and data/address lines.
- boardup** Basic tests of the switching module including an image file download, communication with the MPM over the MBUS, reset circuitry, interprocessor communication, and the switching module's CPU.
- camoffbrd** Tests the CAM memory on the switching module. This test is run by the MPM over the management bus. It tests the CAM control logic, CAM access, and the data line and buffers.
- camonbrd** This CAM test is similar to the one executed by **camoffbord** except it is executed by code downloaded to the switching module. The switching module's CPU runs this CAM test.

<b>cbrport</b>	Tests the CBR Port. Two port tests are performed: one through the Utopia Mux/AAL5 port, and the other through the CBR Port. The Utopia Mux/AAL5 port test generates packets in the switching module's AAL1 SAR and sends them through interface Mux and AAL5 network port and back to the AAL1 SAR for verification. The CBR port test generates packets in the switching module's AAL1 SAR and sends them through the CBR port and back to the AAL1 SAR for verification. This test requires external cables. The system will provide user with instructions for setting up external cables or wrap plugs for port test and prompts the user for input upon completion of setup. This test can be bypassed in case cables are not available. For information on cables required for port test, see <i>OmniSwitch Port Test Wrap Cable/Plug Requirements</i> on page 58-12.
<b>cmreg</b>	Tests the CSM Clock Module registers. Test the CSM Clock Module control logic, registers, and data/address lines.
<b>cmtest</b>	Tests the CSM Clock Module external and internal clock resolution logic. This test requires additional hardware (e.g., FCSM, WSM-T1, CSM-AB-155, CSM-AB-DS1.)
<b>csr</b>	Tests the command/status registers. Includes testing management bus buffers, management bus read/write control logic, reset and LED memory, ID EEPROM, and reset circuitry.
<b>dmux</b>	Tests the Demux registers. Test the Demux control logic, registers, and data/address lines.
<b>fabric</b>	Tests the Fabric ASIC registers. Test the Fabric ASIC control logic, registers, and data/address lines.
<b>fddimac</b>	Tests the FDDI MAC registers. Test the FDDI MAC control logic, registers, and data/address lines.
<b>fddiphy</b>	Tests the FDDI PHY registers. Test the FDDI PHY control logic, registers, and data/address lines.
<b>gigareg</b>	Tests the Giga-Chip registers. Test the Giga-Chip control logic, registers, and data/address lines.
<b>hrecam</b>	Tests the HRE CAM. Tests the HRE CAM control logic, CAM access, and the data line and buffers.
<b>hremem</b>	Tests the HRE local memory. Includes testing the HRE read/write functions, data/address, and the memory.
<b>hreport</b>	Tests the HRE. Packets are generated by the MPM and placed on the VBUS to be claimed by the HRE. The HRE will insert additional routing information to the claimed packet and place it back on the VBUS to be claimed and verified by the MPM. This test does not require external cables. This test can be bypassed.
<b>hrexmem</b>	Tests the HRE-X's local memory. Includes testing the HRE-X read/write functions, data/address, and the memory.
<b>hrexport</b>	Tests the HRE-X's functionally. Packets are generated by the MPX, sent out to the port, and claimed by the HRE-X. The HRE-X will insert additional routing information to the claimed packet and place it back on MVBUS to be claimed and verified by the MPX. This test can be bypassed or modified. See <i>Running Diagnostics on an Entire Chassis</i> on page 58-34.



<b>ilb</b>	Performs a port test using the internal loopback at the PHY or framer interface. Packets are generated by the MPM/MPX and sent out to the port and returned through an internal loopback within the PHY or framer. The MPM/MPX verifies the packets on a bit by bit basis.
<b>ilbstress</b>	Performs a stress test using the internal loopback at the PHY or framer interface. Packets are generated by the MPM/MPX and sent out to the port and returned through an internal loopback within the PHY or framer. The MPM/MPX verifies the packets on a bit by bit basis. See the description for stress test on page 58-10. If Ethernet type switch is tested, this test requires the <b>dmesm.img</b> (OmniSwitch) or <b>desx.img</b> (Omni Switch/Router) to be in the flash memory.
<b>ifled</b>	Tests the Control/Status LED register. Tests the write function of the Control/Status LED register, LED data lines, and LEDs.
<b>iop</b>	Tests the IOP registers, external memories and control logic. Includes testing IOP functionality by invoking and verifying IOP Built In Tests. Data/address are also tested.
<b>loopdle</b>	Tests the DLE internal loopback. Packets are generated by the MPM packet and sent through the VBUS to the switching module, internally looped back, and returned to the MPM for verification. This test does not require external cables. This test can be bypassed.
<b>loopfi</b>	Tests the FCSM IOP internal loopback. Packets are generated by the MPM packets and sent through the VBUS to the switching module, internally looped back, and returned to the MPM for verification. This test does not require external cables. In addition, this test can be bypassed.
<b>looppmc</b>	Tests the PMC Internal Loopback. Packets are generated by the MPM packets and sent through the VBUS to the switching module, internally looped back, and returned to the MPM for verification. This test does not require external cables. This test can be bypassed.
<b>loopsahi</b>	Performs a port test using the internal loopback within the SAHI ASIC. Packets are generated by the MPM/MPX and sent out to the port and returned through an internal loopback within the SAHI ASIC. The MPM/MPX verifies the packets on a bit by bit basis.
<b>loopvit</b>	Tests the Vitesse Internal Loopback. Packets are generated by the MPM packets and sent through the VBUS to the switching module, internally looped back, and returned to the MPM for verification. This test does not require external cables. This test can be bypassed.
<b>mamcam</b>	Tests the Mammoth CAM. Tests the Mammoth CAM control logic, CAM access, and the data line and buffers.
<b>mammem</b>	Tests the Mammoth registers and memory. Includes testing the Mammoth control logic, registers, internal memory, internal cache, external SDRAM, SRAM, and data/address lines.
<b>mloopmac</b>	Performs a port test using the internal loopback within the Mammoth MAC chip. Packet are generated by the MPM/MPX and sent out to the port and returned through an internal loopback within the Mammoth MAC chip. The MPM/MPX verifies the packets on a bit by bit basis.
<b>morreg</b>	Tests the Moriah registers. Test the Moriah control logic, registers, and data/address lines.
<b>mreg</b>	Tests the M013 submodule registers' control logic, registers, and data/address lines.

<b>mvbus</b>	Tests the mammoth VBUS circuitry. Frames are generated within the Mammoth buffer system, sent out the VBUS, and then received on various Mammoth queues. Data integrity is verified.
<b>pal</b>	Tests the LED PAL. Includes testing the PAL control logic, LEDs, and data lines.
<b>pcam</b>	Tests the HRE-X Pseudo CAM. Tests the HRE-X Pseudo CAM control logic, CAM access, and the data line and buffers.
<b>phyreg</b>	Tests the PHY registers. Test the PHY control logic, registers, and data/address lines.
<b>port</b>	Functional testing of physical ports with a burst of data packets generated by the MPM/MPX. Packets are generated by the MPM/MPX, sent out the physical port, looped back through external cables or wrap plugs, and returned to the MPM/MPX. The returned packets are verified bit by bit by the MPM/MPX. Except for FCSM I/II, the port test requires the use of external cables or wrap plugs. The system will provide user with instructions for setting up external cables or wrap plugs for port test and prompts the user for input upon completion of setup. This test can be bypassed if cables are not available. For more information on port tests, see <i>Port Tests</i> on page 58-11. For information on cables required for the port test, see <i>OmniSwitch Port Test Wrap Cable/Plug Requirements</i> on page 58-12 for the OmniSwitch and <i>Omni Switch/Router Port Test Wrap Cable/Plug Requirements</i> on page 58-20 for the Omni Switch/Router.
<b>sahi</b>	Tests SAHI registers. Includes testing SAHI control logic, internal memory, and data/address.
<b>sercable</b>	Tests the switching module's capability of identifying whether a serial cable is connected or not and what type of serial cable connected to its port(s). Includes testing of serial cable line, transceiver, and PLD.
<b>stress</b>	Functional testing of physical ports with continuous full-wire traffic. The data packets are initially generated by the MPM/MPX, sent out the physical port, and looped back through external cables or wrap plugs. Once the packets are returned, modifications in the packets' destination address allows the packets to continuously circulate between the NI CPU and the external cables or wrap plugs for a predefined period. Once the predefined period is reached the packets are returned to the MPM/MPX. The packets are checked on a bit by bit basis by the MPM/MPX. If Ethernet type switch is tested, this test requires the <b>dmesm.img</b> (OmniSwitch) or <b>desx.img</b> (Omni Switch/Router) to be in the flash memory. Stress test requires the use of external cables or wrap plugs. The system will provide user with instructions for setting up external cables or wrap plugs for stress test and prompts the user for input upon completion of setup. For more information on port tests, see <i>Port Tests</i> on page 58-11. For information on cables required for the port test, see <i>OmniSwitch Port Test Wrap Cable/Plug Requirements</i> on page 58-12 for the OmniSwitch and <i>Omni Switch/Router Port Test Wrap Cable/Plug Requirements</i> on page 58-20 for the Omni Switch/Router.
<b>submem</b>	Tests the submodule's local memory. Includes testing local memory control logic, data/address lines, and local memory.
<b>sunl</b>	Tests the SUNI registers. Includes testing the SUNI control logic, registers, and data/address lines.
<b>tellreg</b>	Tests the Telluride ASIC registers. Test the Telluride ASIC control logic, registers, and data/address lines.

<b>vbus</b>	Test the VBUS transmit and receive functions. Packets generated in the switching module's VRAM are sent out the VBUS from the switching module under test to itself. The switching module claims and inspects the packets. Also tests the SAM control logic and the VRAM Sequence Engine (VSE).
<b>vram</b>	Tests the VRAM memory. Includes testing VRAM control logic, VRAM access memory, and data/address lines.
<b>whsreg</b>	Tests the Whistler registers. Test the Whistler control logic, registers, and data/address lines.
<b>wsmcable</b>	Tests the detection of DCE and DTE cables by the WSM circuitry. The operator is prompted for the appropriate cable connection.
<b>xcam</b>	Tests the Alcatel CAM. Tests the Alcatel CAM control logic, CAM access, and the data line and buffers.

## Sample Command Lines

There are numerous ways to specify a test session through the **test** command. The following are some sample command lines along with a description of what they test. The following command:

**test all 100 vram**

would run the VRAM test on all the modules in the chassis that are capable of executing the VRAM test for 100 times. In another example, the following command:

**test 3 0 all**

would run either all the off-board tests or the port test on the module in slot 3 infinitely. Finally, the following command:

**test 4 5**

would run all tests (the default) on the module in slot 4 five (5) times.

## Halting Diagnostic Tests in Progress

Depending on how many tests and repeat iterations you specify, a test session could take some time to complete. If you need to halt in-progress tests, enter **CTRL-C**. This key sequence pauses the testing and provides a test summary report. You will be prompted to restart the testing after the pause.

### ◆ Note◆

During certain phases of diagnostic testing, the **CTRL-C** will not be immediately processed. This delay may last several seconds.

## Port Tests

Because port-to-port cabling is required, port tests may not be available on some modules with only one port, one daughtercard, or on some modules with mismatched daughtercards. Examples of modules that cannot run port tests with single or mismatched daughtercards include 100BaseTx, CDDI, and, FDDI modules. When a port test is run, packets are generated in the MPM and sent out to the switching module, externally looped, and sent back to the MPM. The MPM then inspects the packets. The tables on the following pages provide specific cable/plug information.

OmniSwitch Port Test Wrap Cable/Plug Requirements	
Module Type	Cable Type
ASM-155C	ASM/CSM Wrap Plug. Refer to <i>ASM/CSM Wrap Plug – RJ-45 Connector</i> on page 58-37.
ASM-155FM	Multi-mode fiber optic wrap plug with SC connectors.
ASM-155FS	Single-mode fiber optic cable with SC connectors.
ASM-CE (SC port)	Single-mode fiber optic cable with SC connectors.
ASM-CE (Serial port)	Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
ASM-CE (T1/E1 port)	T1/E1 Crossover Wrap Cable. Refer to <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
ASM-DS3	RG 59/U Type coaxial cable with BNC connectors.
ASM-E3	RG 59/U Type coaxial cable with BNC connectors.
ASM2-155FM	Multi-mode fiber optic wrap plug with SC connectors.
ASM2-155FS	Single-mode fiber optic cable with SC connectors.
ASM2-155FSH	Single-mode fiber optic cable with SC connectors. Requires fiber optic attenuator.
ASM2-155RFM	Multi-mode fiber optic wrap plug with SC connectors.
ASM2-155RFS	Single-mode fiber optic cable with SC connectors.
ASM2-622FM	Multi-mode fiber optic wrap plug with SC connectors.
ASM2-622FS	Single-mode fiber optic cable with SC connectors.
ASM2-622FSH	Single-mode fiber optic cable with SC connectors. Requires fiber optic attenuator.
ASM2-622RFM	Multi-mode fiber optic wrap plug with SC connectors.
ASM2-622RFS	Single-mode fiber optic cable with SC connectors.
ASM2-622RFSH	Single-mode fiber optic cable with SC connectors. Requires fiber optic attenuator.

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OmniSwitch Port Test Wrap Cable/Plug Requirements (cont.)	
Module Type	Cable Type
CSM-A25-12 CSM-A25-24	ASM/CSM Wrap Plug. Refer to <i>ASM/CSM Wrap Plug – RJ-45 Connector</i> on page 58-37.
CSM-155C-8	ASM/CSM Wrap Plug. Refer to <i>ASM/CSM Wrap Plug – RJ-45 Connector</i> on page 58-37.
CSM-155FM-8	Multi-mode fiber optic wrap plug with SC connectors.
CSM-155FS-8	Single-mode fiber optic cable with SC connectors.
CSM 155FSH-8	Single-mode fiber optic cable with SC connectors. Requires fiber optic attenuator.
CSM-622FM-2	Multi-mode fiber optic wrap plug with SC connectors.
CSM-622FS-2	Multi-mode fiber optic wrap plug with SC connectors.
CSM-622FSH-2	Single-mode fiber optic cable with SC connectors. Requires fiber optic attenuator.
CSM-U (CSM-AB-155C-2)	ASM/CSM Wrap Plug. Refer to <i>ASM/CSM Wrap Plug – RJ-45 Connector</i> on page 58-37.
CSM-U (CSM-AB-155FM-2)	Multi-mode fiber optic wrap plug with SC connectors.
CSM-U (CSM-AB-155FS-2)	Single-mode fiber optic cable with SC connectors.
CSM-U (CSM-AB-155FSH-2)	Single-mode fiber optic cable with SC connectors. Requires fiber optic attenuator.
CSM-U (CSM-AB-E1-4)	T1/E1 Crossover Wrap Cable. Refer to <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
CSM-U (CSM-AB-T1-4)	T1/E1 Crossover Wrap Cable. Refer to Figure <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
CSM-U (CSM-AB-DS3-2)	RG 59/U Type coaxial cable with BNC connectors.
CSM-U (CSM-AB-E3-2)	RG 59/U Type coaxial cable with BNC connectors.

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OmniSwitch Port Test Wrap Cable/Plug Requirements (cont.)	
Module Type	Cable Type
CSM-U (CSM-AB-CE-E1)	T1/E1 Crossover Wrap Cable. Refer to <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
CSM-U (CSM-AB-CE-T1)	T1/E1 Crossover Wrap Cable. Refer to <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
CSM-U (CSM-AB-CM-E1)	T1/E1 Crossover Wrap Cable. Refer to Figure <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36. Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
CSM-U (CSM-AB-CM-T1)	T1/E1 Crossover Wrap Cable. Refer to Figure <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36. Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
CSM-U (CSM-AB-IMA-E1)	T1/E1 Crossover Wrap Cable. Refer to <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
CSM-U (CSM-AB-IMA-T1)	T1/E1 Crossover Wrap Cable. Refer to Figure <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
CSM-U (CSM-ABT-155FM)	Multi-mode fiber optic wrap plug with SC connectors.
CSM-U (CSM-ABT-155FS)	Single-mode fiber optic cable with SC connectors.
CSM-U (CSM-ABT-155FSH)	Single-mode fiber optic cable with SC connectors. Requires fiber optic attenuator.
CSM-U (CSM-ABT-DS3)	RG 59/U Type coaxial cable with BNC connectors.
CSM-U (CSM-ABT-E3)	RG 59/U Type coaxial cable with BNC connectors.

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OmniSwitch Port Test Wrap Cable/Plug Requirements (cont.)	
Module Type	Cable Type
ESM-100FM-FD	Multi-mode fiber optic cable with ST connectors.
ESM-100FS-FD	Single-mode fiber optic cable with ST connectors.
ESM-100C-FD	ESM Wrap Plug. Refer to <i>ESM Wrap Plug – RJ-45 Connector</i> on page 58-36.
ESM-100C-4	ESM Wrap Plug. Refer to <i>ESM Wrap Plug – RJ-45 Connector</i> on page 58-36.
ESM-100C-8	ESM Wrap Plug. Refer to <i>ESM Wrap Plug – RJ-45 Connector</i> on page 58-36.
ESM-100C-5	Ethernet Crossover Wrap Cable. Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
ESM-100CFM-5 (Multi-mode fiber port)	Multi-mode fiber optic cable with ST connectors.
ESM-100CFS-5 (Single-mode fiber port)	Single-mode fiber optic cable with ST connectors.
ESM-100CFx-5 (copper ports)	Ethernet Crossover Wrap Cable. Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.

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OmniSwitch Port Test Wrap Cable/Plug Requirements (cont.)	
Module Type	Cable Type
ESM-C-8	Ethernet Crossover Wrap Cable. Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
ESM-C-12	Ethernet Crossover Wrap Cable. Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
ESM-F-8	Multi-mode fiber optic wrap plug with ST connectors.
ESM-T-12	Port/Stress (Full Duplex) test: Telco Full Duplex Wrap Cable. Refer to <i>Telco (Full Duplex) Wrap Plug – 50-pin RJ-21 Connector</i> on page 58-39.  Port/Stress (Half Duplex) test: Telco Half Duplex Wrap Cable. Refer to <i>Telco (Half Duplex) Wrap Plug – 50-pin RJ-21 Connector</i> on page 58-38.
ESM-U (AB-AFD)	AUI to 10BaseFL full-duplex transceiver and a multi-mode fiber optic cable with ST connectors.
ESM-U (AB-AT)	AUI to 10BaseT transceiver and Ethernet Crossover Wrap Cable. Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
ESM-U (AB-T)	Ethernet Crossover Wrap Cable. Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
ESM-U (AB-B)	RG 59/U Type coaxial cable with BNC connectors.
ESM-U (AB-FL)	Multi-mode fiber optic cable with ST connectors.
ESM-U (AB-FL-S)	Single-mode fiber optic cable with ST connectors.

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OmniSwitch Port Test Wrap Cable/Plug Requirements (cont.)	
Module Type	Cable Type
ESM-C-16	ESM Wrap Plug. Refer to <i>ESM Wrap Plug – RJ-45 Connector</i> on page 58-36.
ESM-C-32	Ethernet Crossover Wrap Cable. Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
ESM-FM-16W	Multi-mode fiber optic wrap plug with ST connectors.
ESM-100C-12	ESM Wrap Plug. Refer to <i>ESM Wrap Plug – RJ-45 Connector</i> on page 58-36. Ethernet Crossover Wrap Cable. Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
ESM-100FM-8	Multi-mode fiber optic wrap plug with SC connectors.
ESM-T-24W	Port/Stress (Full Duplex) test: Telco Full Duplex Wrap Cable. Refer to <i>Telco (Full Duplex) Wrap Plug – 50-pin RJ-21 Connector</i> on page 58-39.  Port Stress (Half Duplex) test: Telco Half Duplex Wrap Cable. Refer to <i>Telco (Half Duplex) Wrap Plug – 50-pin RJ-21 Connector</i> on page 58-38.
ESM-100C-32W	Port/Stress (Full Duplex) test: ESM Wrap Plug. Refer to <i>ESM Wrap Plug – RJ45 Connector</i> .  Port/Stress (Half Duplex) test: Ethernet Crossover Wrap Cable. Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
GSM-FM-2W	Port/Stress (Full Duplex) test: Multi-mode fiber optic wrap plug with SC connectors.  Port/Stress (Half Duplex) test: Multi-mode fiber optic cable with SC connectors.
GSM-FS-2W	Port (Full and Half Duplex) and Stress tests: Single-mode fiber optic cable with SC connectors.

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OmniSwitch Port Test Wrap Cable/Plug Requirements (cont.)	
Module Type	Cable Type
FCSM	No cables or wrap plugs required.
FCSM II	No cables or wrap plugs required.
FSM-C	CDDI Crossover Wrap Cable. Refer to <i>CDDI Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-37.
FSM-M	Multi-mode fiber optic cable with MIC connectors.
FSM-S	Single-mode fiber optic cable with SC connectors.
FSM-SH	Single-mode fiber optic cable with SC connectors. Requires fiber optic attenuator.
TSM-F-6	Multi-mode fiber optic cable with ST connectors.
TSM-C-6	Token Ring Straight Through Wrap Cable. Refer to <i>Token Ring Straight Through Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-37. (A Multistation Access Unit (MAU) is required to perform the port test in on this module.)
TSM-CD-6	Token Ring Straight Through Wrap Cable. Refer to <i>Token Ring Straight Through Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-37.
TSM-CD-16W	Token Ring Straight Through Wrap Cable. Refer to <i>Token Ring Straight Through Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-37.

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OmniSwitch Port Test Wrap Cable/Plug Requirements (cont.)	
Module Type	Cable Type
WSM-S-2 (no compression)	Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSM-SC-4 WSM-SC-4W WSM-SC-8 WSM-SC-8W	Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSM-BRI-SC	BRI S/T Crossover Wrap Cable. Refer to <i>BRI S/T Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-48 (RJ-45) Connectors</i> on page 58-39. Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSM-FE1-SC-2	T1/E1 Crossover Wrap Cable. Refer to <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36. Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSM-FT1-SC-2	T1/E1 Crossover Wrap Cable. Refer to Figure <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36. Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSM-M013-2 WSM-M013-4	RG 59/U Type coaxial cable with BNC connectors.

The table below provides specific cable/plug information for Omni Switch/Router switching modules.

Omni Switch/Router Port Test Wrap Cable/Plug Requirements	
Module Type	Cable Type
GSX-FM-2W GSX-FM-4W	Port/Stress (Full Duplex) test: Multi-mode fiber optic wrap plug with SC connectors.  Port/Stress (Half Duplex) test: Multi-mode fiber optic cable with SC connectors.
GSX-FS-2W GSX-FS-4W	Port (Full and Half Duplex) and Stress tests: Single-mode fiber optic cable with SC connectors.
ESX-100C-12W	Port Stress (Full Duplex) test: ESM Wrap Plug. Refer to <i>ESM Wrap Plug – RJ-45 Connector</i> on page 58-36.  Port Stress (Half Duplex) test: Ethernet Crossover Wrap Cable Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
ESX-100C-32W	Port/Stress (Full Duplex) test: ESM Wrap Plug. Refer to <i>ESM Wrap Plug – RJ-45 Connector</i> on page 58-36.  Port/Stress (Half Duplex) test: Ethernet Crossover Wrap Cable Refer to <i>Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36.
ESX-100FM-12W	Port/Stress (Full Duplex) test: Multi-mode fiber optic wrap plug with MT-RJ connectors.  Port/Stress (Half Duplex) test: Multi-mode fiber optic cable with MT-RJ connectors.
ESX-100FS-12W	Port/Stress (Full Duplex) test: Single mode fiber optic wrap plug with MT-RJ connectors.  Port/Stress (Half Duplex) test: Single mode fiber optic cable with MT-RJ connectors.
ESX-FM-24W	Port/Stress (Full Duplex) test: Multi-mode fiber optic wrap plug with VF-45 connectors.  Port/Stress (Half Duplex) test: Multi-mode fiber optic cable with VF-45 connectors.

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Omni Switch/Router Port Test Wrap Cable/Plug Requirements (cont.)	
Module Type	Cable Type
ASX-155FM	Port test: Multi-mode fiber optic wrap plug with SC connectors.
ASX-155FS	Port test: Single-mode fiber optic cable with SC connectors.
ASX-155FSH	Port test: Single-mode fiber optic cable with SC connectors. Requires fiber optic attenuator.
ASX-155RFM	Port test: Multi-mode fiber optic wrap plug with SC connectors.
ASX-155RFS	Port test: Single-mode fiber optic cable with SC connectors.
ASX-622RFS-1W	Port test: Single-mode fiber optic cable with SC connectors.
ASX-622RFM-1W	Port test: Multi-mode fiber optic wrap plug with SC connectors.
ASX-DS3	RG 59/U Type coaxial cable with BNC connectors.
ASX-E3	RG 59/U Type coaxial cable with BNC connectors.
FSX-M	Multi-mode fiber optic cable with MIC connectors.
FSX-S	Single-mode fiber optic cable with SC connectors.
FSX-SH	Single-mode fiber optic cable with SC connectors. Requires fiber optic attenuator.
TSX-CD-16W	Token Ring Straight Through Wrap Cable. Refer to <i>Token Ring Straight Through Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-37.

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Omni Switch/Router Port Test Wrap Cable/Plug Requirements (cont.)	
Module Type	Cable Type
WSX-S-2W (no compression)	Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSX-SC-4W	Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSX-SC-8W	Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSX-BRI-SC-2W	BRI S/T Crossover Wrap Cable. Refer to <i>BRI S/T Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-48 (RJ-45) Connectors</i> on page 58-39. Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSX-FE1-SC-2W	T1/E1 Crossover Wrap Cable. Refer to <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36. Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSX-FT1-SC-2W	T1/E1 Crossover Wrap Cable. Refer to Figure <i>T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors</i> on page 58-36. Twisted pair 28GA serial cable with HD50-26 connectors – DCE to DTE.
WSX-M013-2W WSX-M013-4W	RG 59/U Type coaxial cable with BNC connectors.

## Sample Test Session: Ethernet Module

Test sessions and results will vary among the various switching modules. This section shows the output from a test session on an ESM-C-12. The module is in slot 3 and all tests were requested to be run one time. The command to start this test is

**test 3**

After you enter the **test** command line, the following displays:

**Port Tests are available for the selected slot(s).  
These tests require external cabling.**

**Do you wish to run the Port Tests (y/n) (y)**

Enter **y** to run port tests or **n** to skip them. If you select to run the port tests, you will be instructed on how to cable the ports. This cabling will vary depending on the module type, number of ports, and cable type. In this example, the following displays:

**Connect the following cables on Slot 3:**

**Port 1 to Port 2  
Port 3 to Port 4  
Port 5 to Port 6  
Port 7 to Port 8  
Port 9 to Port 10  
Port 11 to Port 12**

**Press <Enter> when finished.**

Cable the ports according to the instructions. For Ethernet tests, you should use cross-over cable to connect the ports. Press **<Enter>** when you have finished the cabling.

### ◆ Note ◆

You cannot use the **test** command on an MPM module without a Hardware Routing Engine (HRE).

The next thing that happens is the module is reset, then the rest of the tests will run.

Testing Slot 3 - Ether/12

Resetting slot 3...

Test In Progress: CSR Test

OK1, OK2 LEDS will display the following pattern: OFF RED OFF GREEN OFF

AMBER OFF - Passed

Test In Progress: VRAM Test - Passed

Test In Progress: CAMOFFBRD Test(1K) - Passed

Loading dni.img...

Test In Progress: BOARDUP Test - Passed

Test In Progress: CAMONBRD Test(1K) - Passed

Test In Progress: VBUS Test - Passed

Restoring slot 3...

Test In Progress: PORT Test (3-0)

Wait for ports to come up . Done.

Error - Frame #1 not found - Failed

FAILED - PORT TEST: Tx Port1 -> Rx Port2 at Test Number 95001

Expected Data: 1

Measured Data: 0

Test Summation:

Started: WED DEC 17 10:48:13 1997

Slot 3	Passes	Fails
Ether/12 (3-0)		
CSR	1	0
VRAM	1	0
CAMOFFBRD	1	0
BOARDUP	1	0
CAMONBRD	1	0
VBUS	1	0
PORT	0	1

Failure Summation:

Ether/12 (3-0)

Test	Fail No.	Test No.	Exp. Data	Meas. Data	Iter. No.	Time	Temp (C)
PORT	1	95001	00000001	00000000	1	10:49:47	30.5

Completed: WED DEC 17 10:49:47 1997

Disconnect the following cables on Slot 3:

- Port 1 to Port 2
- Port 3 to Port 4
- Port 5 to Port 6
- Port 7 to Port 8
- Port 9 to Port 10
- Port 11 to Port 12

Press <Enter> when finished.



The tests are complete at this point. A summary of the test results and failures is displayed at the end of the test sequence. In this example, the module passed all tests except the port test. The ESM-C-12 module in slot 3 should have a red OK2 LED to indicate diagnostics failure. And the **Failure Summation** section displays only the first three failures when you request multiple test iterations.

You should now disconnect the cables used in the external loopback tests. Press **<Enter>** and the module will be restored to its normal, pre-testing state. The OK2 LED will remain red until the module is reset or the chassis is rebooted.

The main system command prompt re-displays.

# Displaying Available Diagnostic Tests

The **testdisp** command provides the user with a display of applicable tests for a particular slot or for the entire chassis configuration. To display available diagnostic tests for a switching module, enter the **testdisp** command followed by the slot number for the module. The slot number is an integer ranging from 1 to the number of slots in the chassis (3 for 3-slot OmniSwitches; 5 for 5-slot OmniSwitches; 9 for 9-slot OmniSwitches; and 3, 4, or 5 for OmniStacks).

### ◆ Note ◆

You cannot use the **testdisp** command on an MPM module without an HRE.

No default value is set and input must be provided at the time of entering the command. For example, to display available diagnostic tests for the switching module in slot 3, enter:

**testdisp 3**

at the system prompt. The following is a sample display.

```
Ether/12 (3-0)
  CSR - Tests the Command/Status Registers
  VRAM - Tests the VRAM
CAMOFFBRD - Tests the CAM
BOARDUP - Basic NI Tests
CAMONBRD - Tests the CAM
VBUS - Tests the VSE/SAM
PORT - Tests the Ports
```

To display all available diagnostic tests for the entire chassis, excluding slot(s) occupied by an MPM without an HRE, enter:

**testdisp all**

at the system prompt. The tests are displayed per slot module starting from slot module 1.

## Configuring the Diagnostic Test Environment

The **testcfg** command allows the user to tailor diagnostic testing characteristics per slot module. To configure diagnostic tests for a switching module, enter the **testcfg** command followed by the slot number for the module. The slot number is an integer ranging from 1 to the number of slots in the chassis (3 for 3-slot OmniSwitches; 5 for 5-slot OmniSwitches; 9 for 9-slot OmniSwitches; and 3, 4, or 5 for OmniStacks).

### ◆ Note ◆

You cannot use the **testcfg** command on an MPM module.

The **testcfg** command allows the user to bypass testing individual slots when running the **test all** command. In addition, the **testcfg** command allows the user to configure the port speed and port mode for applicable Ethernet or Token Ring modules for tailoring of individual slots during diagnostic testing.

No default value is set and input must be provided at the time of entering the command. For example, to configure applicable diagnostic tests for the switching module in slot 4, enter:

**testcfg 4**

at the system prompt. The following is a typical example for an ATM switching module.

**Test Configuration for slot 4**

1) Skip this slot during test { No (1),  
Yes (2) } : No

Enter (option=value/save/cancel) :

Note that for all switching modules other than Ethernet and Token Ring modules, the **Skip this slot during test** option is the only available one. See *Configuring Tests for Ethernet Modules* on page 58-28 for information on using the **testcfg** command with Ethernet modules, and *Configuring Tests for Token Ring Modules* on page 58-29 for information on using the **testcfg** command with Token Ring modules.

**Skip this slot during test.** Allows the user to select to bypass this slot when the **test all** command is issued. The default is **No**. If you want the **test all** command to skip this module, enter

**1=2**

The following will then be displayed.

**Test Configuration for slot 4**

1) Skip this slot during test { No (1),  
Yes (2) } : Yes

Enter (option=value/save/cancel) :

Enter **save** if you want to make this change. If you enter **save**, the change will be made and the following will be displayed.

**Configuration Saved**

If you want to cancel this change, enter **cancel** and the **testcfg** command will terminate and the following will be displayed.

**Exiting menu - Test Configuration not modified**

### Configuring Tests for Ethernet Modules

Tailoring of applicable Ethernet modules includes selection of Port Speeds and of Port Modes. To configure applicable diagnostic tests for an Ethernet 10/100 switching module in slot 3, enter:

**testcfg 3**

at the system prompt. The following is a sample display of the test configuration for an Ethernet 10/100 switching module.

**Test Configuration for slot 3**

```
1) Skip this slot during test { No (1),  
                               Yes (2) } : No  
2) Port Speed { 10/100 (1),  
                100   (2),  
                10    (3) }           : 10/100  
3) Port Mode { Full Duplex (1),  
              Half Duplex (2) }       : Full Duplex  
  
Enter (option=value/save/cancel) :
```

To change any of the values above, enter the line number, followed by an equal sign, and followed by the new value. For example, to change the **Port Mode** field to half duplex, enter

**3=2**

at the prompt. The configurable fields displayed by the **testcfg** command for an Ethernet module are described below.

**Skip this slot during test.** Allows the user to select to bypass this slot when the **test all** command is issued. The default is **No**.

**Port Speed.** Allows the user to select module port speed during the diagnostic port test. Selection includes 10/100BaseT, 100BaseT, or 10BaseT. The default is **10/100BaseT**, which alternates the speed of the port test from 10 to 100 on each pass of the port test.

**Port Mode.** Allows the user to select module port mode during diagnostic port test. Selection includes Full Duplex or Half Duplex. The default value is **Full Duplex**.

Enter **save** if you want to make this change. If you want to cancel this change, enter **cancel** and the **testcfg** command will terminate.

## Configuring Tests for Token Ring Modules

Token Ring configuration tailoring includes selection of Port Speeds and of Port Modes. To configure applicable diagnostic tests for a TSM-CD-6 switching module in slot 4, enter:

**testcfg 4**

at the system prompt. The following is a sample display of the test configuration for a TSM-CD-6 slot module.

### Test Configuration for slot 4

```

1) Skip this slot during test { No (1),
                               Yes (2) } : No
2) Port Speed { 4/16 (1),
                 16  (2),
                 4   (3) } : 16
3) Port Mode { Stn/Lobe, Lobe/Stn (1),
                Stn/Lobe Only (2),
                Lobe/Stn Only (3) } : Stn/Lobe

```

Enter (option=value/save/cancel) :

To change any of the values above, enter the line number, followed by an equal sign, and followed by the new value. For example, to change the **Port Speed** field to 16Mbps, enter

**2=2**

at the prompt. The configurable fields displayed by the **testcfg** command for a Token Ring module are described below.

**Skip this slot during test.** Allows the user to select to bypass this slot when the **test all** command is issued. The default is **No**.

**Port Speed.** Allows the user to select module port speed during the diagnostic port test. Selection includes 4/16Mbps, 16Mbps, or 4Mbps. The default is **16Mbps**. Selecting **4/16** alternates the speed of the port test between 4 to 16 on each pass of the port test.

**Port Mode.** Allows the user to select module port mode during the diagnostic port test. Selection includes Stn/Lobe, Lobe/Stn, or Stn/Lobe Only, or Lobe/Stn Only. The default value is **Stn/Lobe**. **Stn/Lobe, Lobe/Stn** alternates each physical port pair between station to lobe and lobe to station on each speed selected for pass of the port test.

Enter **save** if you want to make this change. If you want to cancel this change, enter **cancel** and the **testcfg** command will terminate.

## Running Cell Fabric Tests on OmniSwitch CSMs

You can test the OmniSwitch cell bus backplane and the cell fabric ASIC of every switching module with the **cellfab** command. The syntax for this command is as follows:

**cellfab [<repeat\_count>]**

The **<repeat\_count>** option lets you set the number of times to run the test, which can be from 0 to 999. If you enter **0**, the **cellfab** test will continue indefinitely. If you do not use the **<repeat\_count>** option, then the **cellfab** test will be executed once.

The chassis should be fully loaded to achieve a thorough testing of both the cell fabric ASICs and cell bus. In addition, the chassis should be configured as a “pure” ATM switch with an MPM II or MPM 1G, a Frame to Cell Switching Module (FCSM), Cell Switching Modules (CSMs), and *no* frame-based switching modules. See Chapter 41, “Cell Switching Modules, (CSMs)” for more information on configuring an OmniSwitch as a pure ATM switch.

To execute the **cellfab** test once, for example, enter

**cellfab**

at the system prompt. A screen similar to the following will be displayed.

```
Avoiding ARP delay ...
Testing All Slots
Test In Progress: FABRIC Test - Passed
```

Test Summation:

Started: WED OCT 28 17:38:59 1998

All Slots	Passes	Fails
FABRIC	1	0

Test Coverage:

All Fabric Inputs/Outputs not tested:

```
Fabric in slot 2 (FCSM) has 33 inputs (0-32) and 1 output (0)
Input 0 2 3 4
All Outputs tested
```

```
Fabric in slot 3 (CSM-OC12) has 33 inputs (0-32) and 4 outputs (0-3)
Input 0 2 3 4
All Outputs tested
```

```
Fabric in slot 4 (CSM-OC12) has 33 inputs (0-32) and 4 outputs (0-3)
Input 0 2 3 4
All Outputs tested
```

—Output continues on next page—

Fabric in slot 5 (CSM-OC12) has 33 inputs (0-32) and 4 outputs (0-3)

Input 0 2 3 4

All Outputs tested

Fabric in slot 6 (CSM-OC12) has 33 inputs (0-32) and 4 outputs (0-3)

Input 0 2 3 4

All Outputs tested

Fabric in slot 7 (CSM-OC12) has 33 inputs (0-32) and 4 outputs (0-3)

Input 0 2 3 4

All Outputs tested

Fabric in slot 8 (CSM-OC12) has 33 inputs (0-32) and 4 outputs (0-3)

Input 0 2 3 4

All Outputs tested

Fabric in slot 9 (CSM-OC12) has 33 inputs (0-32) and 4 outputs (0-3)

Input 0 2 3 4

All Outputs tested

Completed: WED OCT 28 17:39:45 1998

If you need to halt the **cellfab** test, press **CTRL-C**. This key sequence pauses the testing and provides a test summary report. You will be prompted to restart the testing after the pause.

◆ **Note** ◆

During certain phases of diagnostic testing, the **CTRL-C** will not be immediately processed. This delay may last several seconds.

## Running Frame Fabric Tests on Omni Switch/Routers

You can test the Omni Switch/Router Modified VBUS (MVBUS) backplane and the frame fabric ASIC of every switching module with the **framefab** command. The syntax for this command is as follows:

```
framefab [<repeat_count> | ilb <repeat_count>]
```

The **<repeat\_count>** option lets you set the number of times to run the test, which can be from 0 to 999. If you enter **0**, the **framefab** test will continue indefinitely. If you do not use the **<repeat\_count>** option, then the **framefab** test will be executed once.

Using the **<repeat\_count>** option requires the use of external cables or wrap plugs for the first physical port of every switching module in the chassis. The external cables or wrap plugs used in this test are identical to the one listed in the full duplex port test. See *Omni Switch/Router Port Test Wrap Cable/Plug Requirements* on page 58-20 for more information.

The **ilb** option, which can be used with the **<repeat\_count>** option, performs an internal loop-back. Using this option performs the **framefab** test without the use of external cables or wrap plugs.

The chassis should be fully loaded (i.e., Omni Switch/Router modules in all slots) to achieve a thorough testing of both the frame fabric ASICs and the Omni Switch/Router backplane. In addition, an MPX should be installed in Slot 1.

To execute the framefab test indefinitely, for example, enter

```
framefab 0
```

at the system prompt. A screen similar to the following will be displayed.

```
Testing All Slots  
Test In Progress: FABRIC Test
```

```
Test Summation:
```

```
Started: TUE OCT 27 18:40:31 1998
```

<b>All Slots</b>	<b>Passes</b>	<b>Fails</b>
<b>FABRIC</b>	<b>1199</b>	<b>18</b>

```
Failure Summation:
```

<b>Test</b>	<b>Fail No.</b>	<b>Test No.</b>	<b>Exp. Data</b>	<b>Meas. Data</b>	<b>Iter. No.</b>	<b>Time</b>	<b>Temp (C)</b>
<b>FABRIC</b>	<b>1</b>	<b>110402</b>	<b>00004cec</b>	<b>00000000</b>	<b>6</b>	<b>18:50:34</b>	<b>43.0</b>
<b>FABRIC</b>	<b>2</b>	<b>110504</b>	<b>0000a9e4</b>	<b>00000000</b>	<b>13</b>	<b>18:56:45</b>	<b>43.0</b>
<b>FABRIC</b>	<b>3</b>	<b>110307</b>	<b>0008a6ff</b>	<b>00000000</b>	<b>159</b>	<b>21:26:05</b>	<b>43.0</b>

```
First 3 Failure(s) Detail:
```

```
Fail No. 1 - FRAME FABRIC TEST: Slot 5 failed. No packet Received from slot: 3  
Fail No. 2 - FRAME FABRIC TEST: Slot 6 failed. No packet Received from slot: 5  
Fail No. 3 - FRAME FABRIC TEST: Slot 4 failed. No packet Received from slot: 8
```

— Output continues on next page —



### Test Coverage:

#### All Fabric Inputs/Outputs not tested:

Fabric in slot 2 (ESX-C12) has 9 inputs (0-8) and 1 output (0)

All inputs tested

All Outputs tested

Fabric in slot 3 (ESX-C12) has 9 inputs (0-8) and 1 output (0)

All inputs tested

All Outputs tested

Fabric in slot 4 (ESX-C12) has 9 inputs (0-8) and 1 output (0)

All inputs tested

All Outputs tested

Fabric in slot 5 (ESX-C12) has 9 inputs (0-8) and 1 output (0)

All inputs tested

All Outputs tested

Fabric in slot 6 (ESX-C12) has 9 inputs (0-8) and 1 output (0)

All inputs tested

All Outputs tested

Fabric in slot 7 (ESX-C12) has 9 inputs (0-8) and 1 output (0)

All inputs tested

All Outputs tested

Fabric in slot 8 (ESX-C12) has 9 inputs (0-8) and 1 output (0)

All inputs tested

All Outputs tested

Fabric in slot 9 (ESX-C32) has 9 inputs (0-8) and 1 output (0)

All inputs tested

All Outputs tested

Completed: WED OCT 28 16:24:04 1998

If you need to halt the **framefab** tests, press **CTRL-C**. This key sequence pauses the testing and provides a test summary report. You will be prompted to restart the testing after the pause.

### ◆ Note ◆

During certain phases of diagnostic testing, the **CTRL-C** will not be immediately processed. This delay may last several seconds.

If your chassis is not fully loaded, the **framefab** test will report that the frame fabric in the empty slot was not tested.

# Running Diagnostics on an Entire Chassis

The **testcfg** command allows you to tailor diagnostic testing characteristics by module or for an entire chassis. (Please refer to *Configuring the Diagnostic Test Environment* on page 58-27 for configuring tests for a single module.)

For example, to configure diagnostic tests for an entire chassis, enter

**testcfg all**

at the system prompt. A screen similar to the following will be displayed.

Test Configuration

1) Diagnostic Mode

{ Normal

Diagnostic

(1),

(2) }

: Normal

2) Stop on Failure

{ Disable

Enable

(1),

(2) }

: Disable

3) Port Test Bypass

{ Disable

Enable

(1),

(2) }

: Disable

4) Port Test Type

{ Port

ILB

STRESS

ILBSTRESS

(4) }

: Port

5) HRE-X Test Mode

{ Do not test HRE-X

Test HRE-X

(1),

(2) }

: Test HRE-X

Enter (option=value/save/cancel) :

◆ Note ◆

Option 5, **HRE-X Test Mode**, does not display on the OmniSwitch.

Select the number of the item you want to change. To change any of the values listed above, enter the line number, followed by an equal sign, and then the new value. For example, to change the port test type to **STRESS**, enter:

**4=3**

To update the values you have changed, enter **save**. If you do not want to save the changes enter **quit** or **cancel**, or press **Ctrl-D**. If you enter **save**, the change will be made and the following message will be displayed.

**Configuration Saved**

If you cancel the **testcfg** command, it will terminate and the following will be displayed.

**Exiting menu - Test Configuration not modified**

The fields displayed by the **testcfg** command with the **all** option are described below.

## 1) Diagnostic Mode

Enter **1** (the default) to set to normal diagnostics testing or **2** for a more detailed version of diagnostic testing. However, setting this field to **2** requires more user intervention during a test.

## 2) Stop on Failure

Enter **2** to halt diagnostics in an active state when a failure occurs or **1** (the default) to exit diagnostics and display the **Test Summation** and **Failure Summation** sections of the **test** command output. Setting this field to **2** can be used to further troubleshoot problems. However, setting this field to **2** requires more user intervention during a test.

## 3) Port Test Bypass

Enter **2** to complete testing of all ports regardless of port test failures or **1** (the default) to stop testing at the first port failure. Setting this field to **2** can be used to further troubleshoot problems.

## 4) Port Test Type

Enter **1** (the default) for a port test, **2** for an Internal Loopback (ILB) test, **3** for a stress test, or **4** for an ILB stress test. External cables are required for the port and stress tests but not for the ILB test. In addition, the stress test requires a special image file (see *Running Diagnostics* on page 58-3) and is only available for Cell Switching Modules (CSMs) and Mammoth-based Ethernet switching modules on the OmniSwitch, and Ethernet (ESX and GSX) modules on the Omni Switch/Router.

### ◆ Note ◆

Option 5, **HRE-X Test Mode**, is for the Omni Switch/Router only.

## 5) HRE-X Test Mode

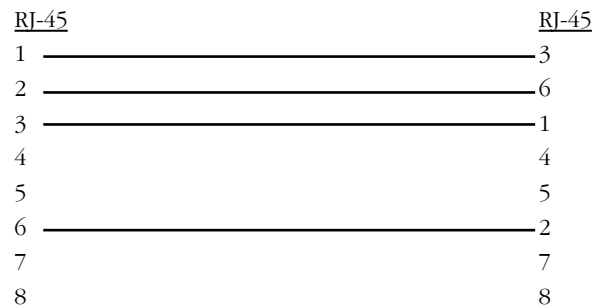
This option lets you configure port tests for HRE-Xs installed on Omni Switch/Router switching modules. It does not affect the port test for HRE-Xs installed on MPXs. Currently, the port test on HRE-Xs installed on switching modules runs in conjunction with the normal port test.

Each physical port is tested with the normal port test path and then through the HRE-X port test path before testing the next physical port. Subsequent physical ports are tested with only the normal port test path.

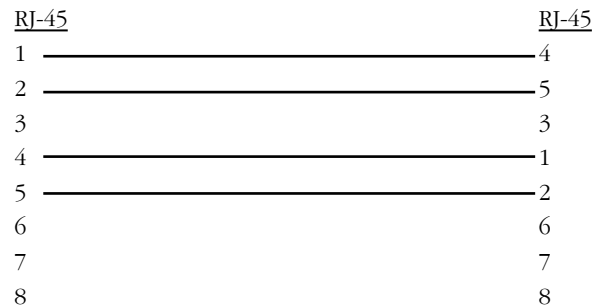
Enter **1** to bypass testing of the HRE-X when the port test is run or **2** to perform the test as described above.

# Diagnostic Test Cable Schematics

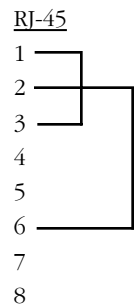
The figures below and on the following pages provide information on port test cables and plugs.



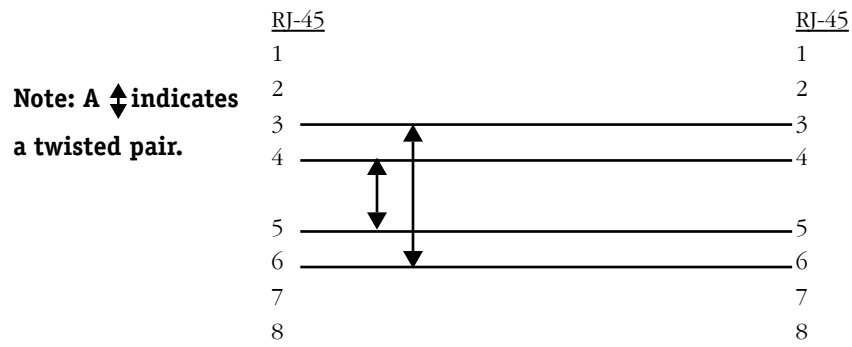
## Ethernet Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors



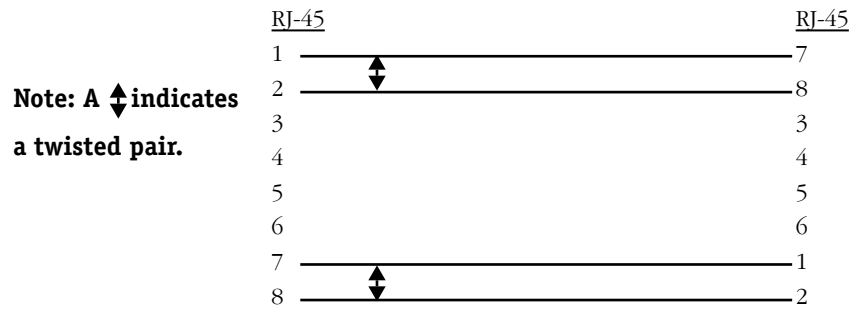
## T1/E1 Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors



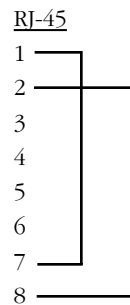
## ESM Wrap Plug – RJ-45 Connector



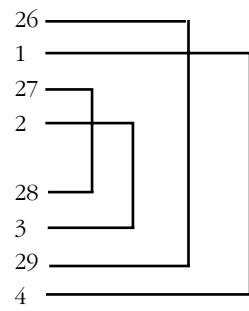
**Token Ring Straight Through Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors**



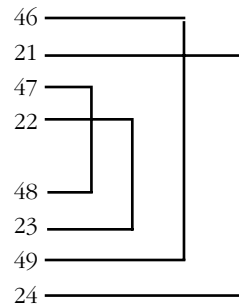
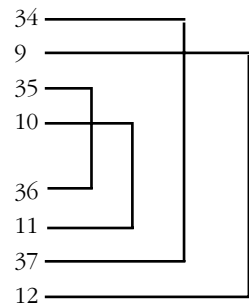
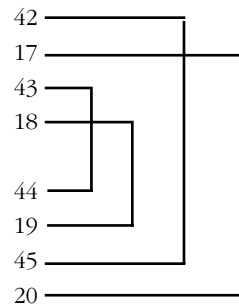
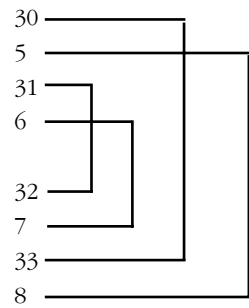
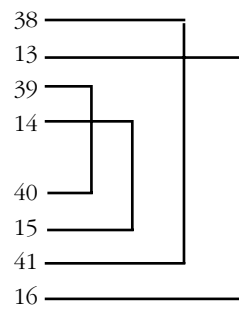
**CDDI Crossover Wrap Cable — Category 5 UTP Copper Cable with RJ-45 Connectors**



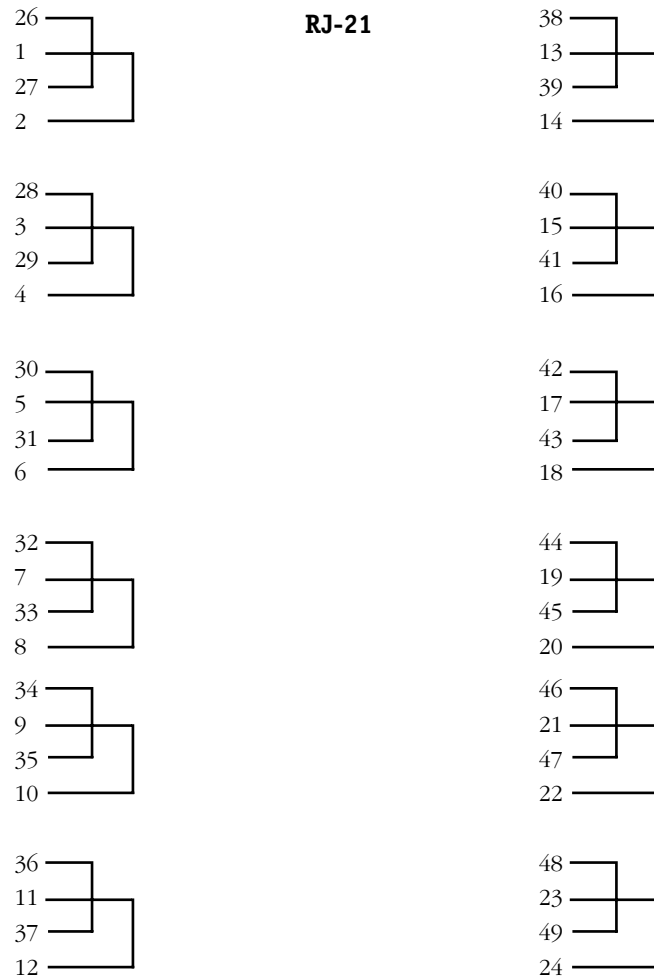
**ASM/CSM Wrap Plug — RJ-45 Connector**



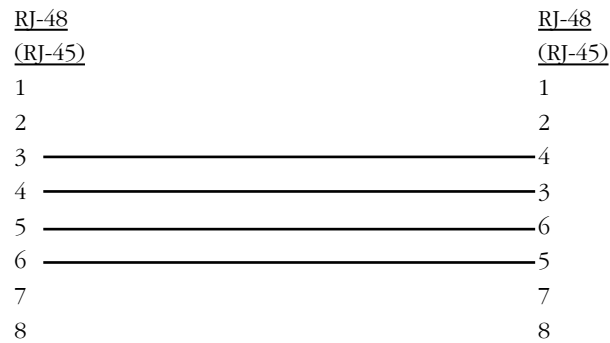
**RJ-21**



**Telco (Half Duplex) Wrap Plug – 50-pin RJ-21 Connector**



**Telco (Full Duplex) Wrap Plug – 50-pin RJ-21 Connector**



**BRI S/T Crossover Wrap Cable — Category 5 UTP Copper Cable  
with RJ-48 (RJ-45) Connectors**

