Monitoring and Testing

This chapter tells you how to use the Cisco 6200 Manager to monitor and test a Cisco 6200 DSLAM. This chapter includes the following sections:

- Status Alarm Overview
- Cisco 6200 DSLAM Status
- Monitoring and Testing Components
- Card and Port Monitoring and Testing

5.1 Status Alarm Overview

The Cisco 6200 Manager provides you with detailed information about the status of the Cisco 6200 DSLAM and its cards and ports. You should monitor the system and identify and respond to problems that may impact system performance.

Many of the status alarms are represented by color-coded status indicators in the Cisco 6200 Manager. Indicator colors are given in Table 5-1.

Table 5-1   Color-Coded Status Indicators

Color	Meaning
Red	Critical alarm. Affects many or all of the subscribers connected to the node.
Orange	Major alarm. Affects several subscribers, such as all subscribers associated with a single subscriber line card (SLC).
Yellow	Minor alarm. Affects a small number of the subscribers.

Color	Meaning (Continued)
Green	Okay.
Gray	Unknown.

5.2 Cisco 6200 DSLAM Status

The Cisco 6200 Manager displays alarm information in several windows.

- The Server Polling Status window displays an alarm if one or more of the Cisco 6200 DSLAMs associated with a server is having problems.

- The Element Status Display window displays an alarm for each Cisco 6200 DSLAM that is having problems.

- The Component Status Display window displays an alarm for the DSLAM component that is having problems. (This window is described in the section "Monitoring and Testing Components.")

5.2.1 Monitoring Server Status

The Server Polling Status window (Figure 4-1) displays the server name, IP address, and server status. The server alarm states are listed in Table 5-2.

Table 5-2   Server Status Alarms

Degree	Color	Description
Critical	Red	One or more of the DSLAMs associated with the server has a critical alarm or is in the unknown state.
Major	Orange	One or more of the DSLAMs associated with the server has a major alarm.
Minor	Yellow	One or more of the DSLAMs associated with the server has a minor alarm.
Okay	Green	The server and its associated DSLAMs have no alarms
Unknown	Gray	The server or network connection to the server is down.

To find out which Cisco 6200 DSLAM is sending the alarm, click twice on the server name to access the Element Status Display window.

5.2.2 Monitoring Element Status

In addition to the hostname, IP address, and system type, the Element Status Display window (Figure 4-4) indicates system up time and system status. System up time can help you estimate system reliability and set maintenance schedules; entries in the status column can warn you of an immediate or impending problem.

Table 5-3 describes the Element Status Display window status alarms.

Table 5-3   DSLAM Status Alarms

Degree	Color	Description
Critical	Red	All subscribers have lost service.
Major	Orange	An SLC is not functioning properly or is absent from a configured slot.
Minor	Yellow	There is a problem with an individual subscriber line, or there is something that could cause future trouble. For example, a fan failure does not affect customers immediately, but it could cause a calamity if left unremedied.
Okay	Green	The system is behaving properly.
Unknown	Gray	The server is not receiving information from the DSLAM.

Note   If an Subscriber Line Card (SLC) reports separate, individual failures on all of its modems at once, the chassis still reports a minor alarm status, even though no traffic is flowing through the SLC. In alarm processing, the quality of the alarm is more important than the quantity. Multiple lower-level alarms are not converted into a higher-level alarm.

To learn more about the cause of system status alarms, click twice on Cisco 6200 DSLAM to access the Component Status window.

5.3   Monitoring and Testing Components

After you click the **Display** button in the Element Status Display window, the Component Status window appears (see Figure 5-1). From this window you can check the status of card and environment alarms, monitor and test cards, and add new subscribers. For information on adding new subscribers, see the section "Provisioning Subscribers" in Chapter 4, "Configuring with the Manager."

The upper display area of the Component Status Display window features

- Information about the environmental status alarm states

- A graphical representation of the cards in a Cisco 6200 DSLAM chassis

Depending on the procedure you choose, the lower part of the display allows you to monitor and test NTC or SLC. For more information, see the section below "Card and Port Monitoring and Testing."

In addition, you can view and update subscriber information from the Component Status Display window. For more information on this, refer to Chapter 4, "Configuring with the Manager."
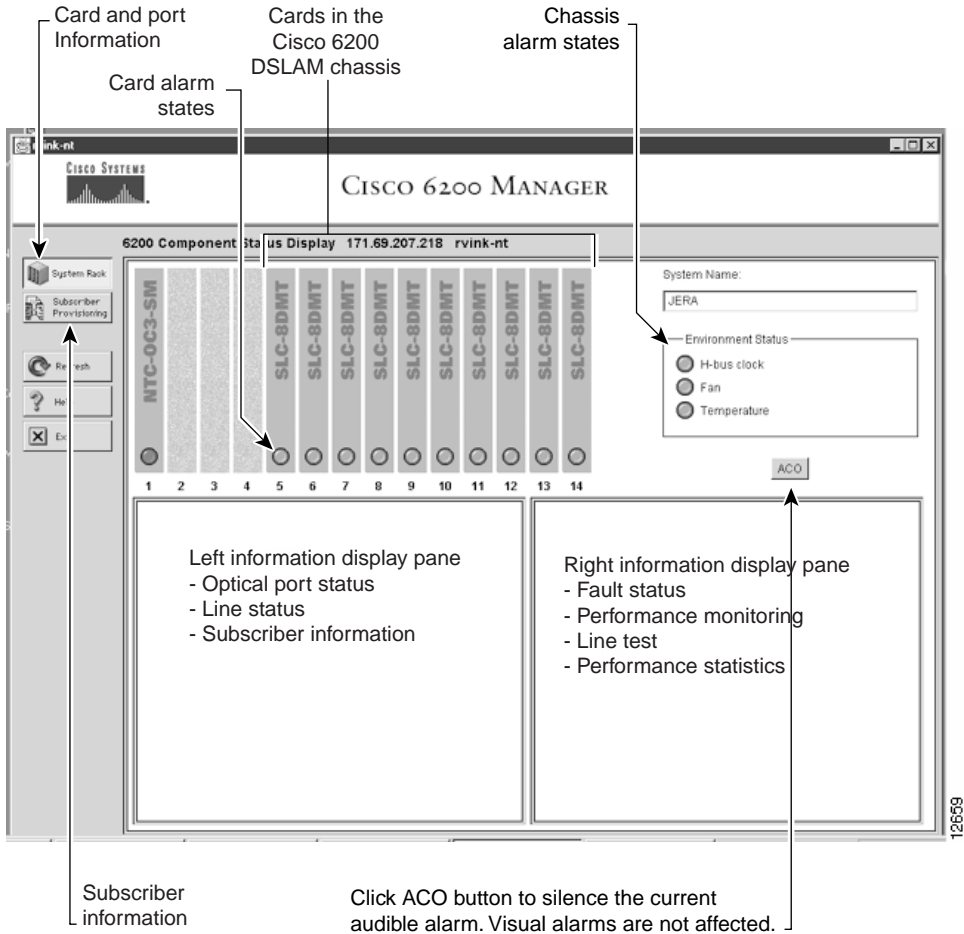
5.3.1   Environmental Status Alarms

The environment status is displayed in the upper right of the Component Status Display window (Figure 5-1). The Cisco 6200 Manager shows only the higher level of alarms at the system level. The environment status display provides the following information:

- The H-bus clock status light indicates whether data is moving as expected between the MPC, NTC, and SLCs.

- The Fan status light indicates whether the fans are functioning properly.

- The Temperature status light indicates whether the chassis temperature is within the acceptable range.

Below the Environment Status display is the alarm cutoff (ACO) button. Use this button to turn off audible alarms.

Figure 5-1   Cisco 6200 Component Status Window

Card and port
Information

Cards in the
Cisco 6200
DSLAM chassis

Chassis
alarm states

Card alarm
states

Subscriber
information

Click ACO button to silence the current
audible alarm. Visual alarms are not affected.

5.3.2 Card Status

The Component Status Display window (Figure 5-1) includes a graphical representation of the cards in a Cisco 6200 DSLAM chassis. The representation shows

- Slots that are occupied

- Types of cards in each slot

- Alarm state of each card

5.4 Card and Port Monitoring and Testing

To access detailed information about a card, click on a card in the upper part of the Component Status Display window (Figure 5-2). Information about the card appears in the panes at the bottom of the window. (If the pane displays subscriber information, not status information, click on the **System Rack** button on the upper left of the window.)

The information displayed in these panes depends on what card or slot you have selected in the upper portion of the Component Status Display window. You can monitor an NTC or SLC. The Manager does not provide information about the MPC.

**Figure 5-2   Component Status Display Window**
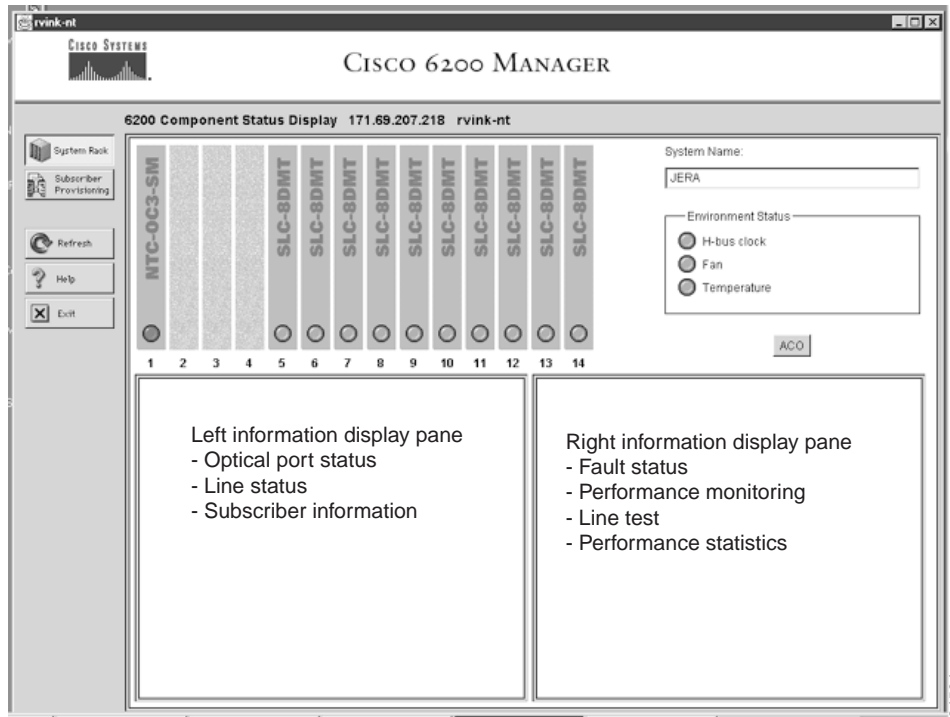
5.4.1 Monitoring and Testing an NTC

To monitor and test an NTC, perform the following steps:

Step 1   Click the NTC card in the upper pane. The Optical Port Status pane (see Figure 5-3) appears at the lower left side of the Component Status Display window.

Step 2   Move your mouse cursor on top of the graphical image in the Optical Port Status pane. A message appears indicating the status of the port.

Figure 5-3 **Optical Port Status Pane**
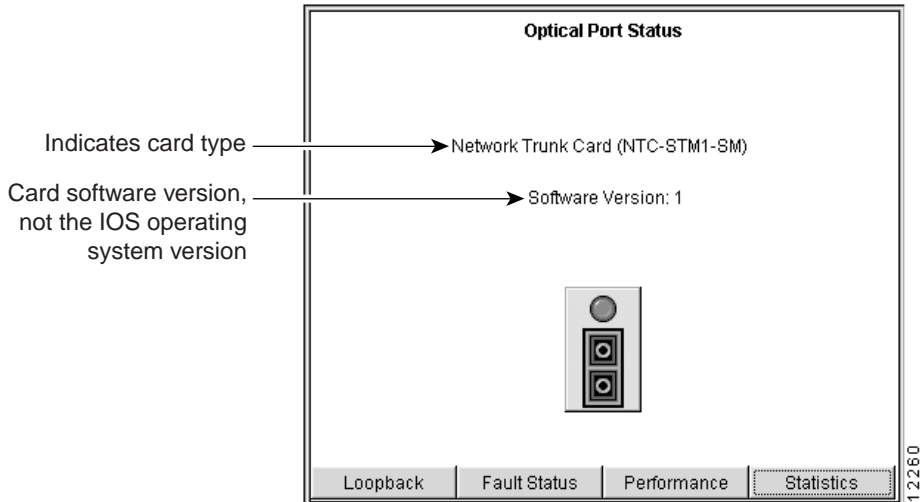
To get more information or to run a loopback test, click one of the buttons at the bottom of the Optical Port Status pane.

Monitoring NTC Port Fault Status

To monitor optical port fault status, click on the **Fault Status** button in the Optical Port Status pane. The Optical Port Fault Status pane is displayed (see Figure 5-4). In that pane, the Near End Alarms column refers to alarms that occur at the CO side, and the Far End Alarms column refers to alarms that occur at the CPE side.

Figure 5-4   Optical Port Fault Status Pane (for an NTC STM-1)
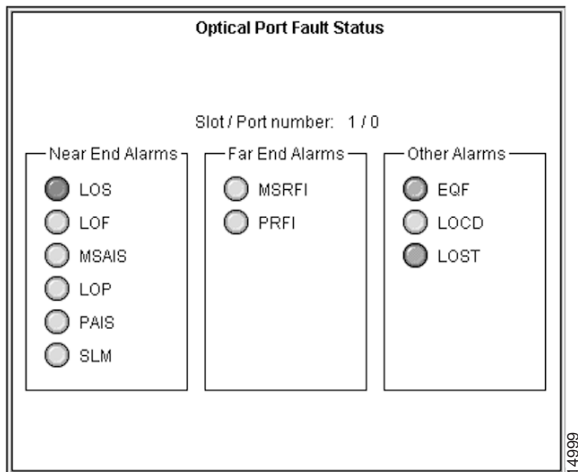
Fault Condition Acronyms

Table 5-4 lists the fault conditions that are detected and treated as critical alarms for the NTC (OC-3 trunk card). For more information on these terms, refer to Appendix A, "Glossary."

Table 5-4   Critical NTC Alarms

Fault Condition	Acronym
Equipment Failure	EQF
Loss of Signal	LOS
Loss of Frame	LOF
Multiplex Section Alarm Indication Signal (NTC STM-1 cards)	MSAIS
Line Alarm Indication Signal (NTC OC-3 cards)	LAIS
Loss of Pointer	LOP
Path Alarm Indication Signal	PAIS

Fault Condition	Acronym
Multiplex Section Remote Failure Indication (NTC STM-1 cards)	MSRFI
Line Remote Failure Indication (NTC OC-3 cards)	LRFI
Path Remote Failure Indication	PRFI
Signal Label Mismatch	SLM
Loss of Cell Delineation	LOCD
Loss of Synchronization	LOST

Fault Detection Hierarchy

Sometimes one failure can trigger numerous fault detectors. For example, when a SONET signal is lost, framing is also lost. Fault detection software uses a hierarchical principle, however, in that it reports only the fault that is most likely to be the root cause of a problem.

Table 5-5 lists the fault detection hierarchy for the OC-3-based NTC.

Table 5-5   Fault Detection Hierarchy

When this fault occurs...[1]	These faults are set to Unknown or Suppressed
EQF	All the rest of the fault conditions
LOS	LOF, LAIS, LOP, PAIS, SLM, LRFI, PRFI, and LOCD
LOF	LAIS, LOP, PAIS, SLM, LRFI, PRFI, and LOCD
LAIS	LOP, PAIS, and SLM
LOP	PAIS, SLM, and LOCD
PAIS	SLM

1   See Table 5-4 for an expansion of these fault condition acronyms.

Monitoring NTC Port Performance

To see how a port is being used, click the **Performance** button in the Optical Port Status pane. The Performance Monitoring pane is displayed (Figure 5-5).

Figure 5-5   NTC Performance Monitoring Pane
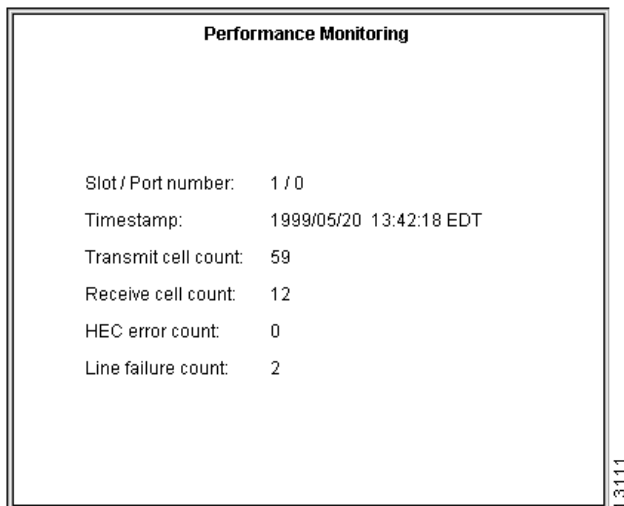
The pane provides the following information:

- Slot and port number

- Timestamp—The time that the performance values were first displayed

- Transmit cell count—Number of nonnull cells transmitted downstream

- Receive cell count—Number of nonnull upstream cells received with good, or correctable, header checksums

- HEC error count—Number of upstream cells received with uncorrectable header checksum

- Line failure count—Number of LOS, LOF, and LAIS failures.

Obtaining NTC Performance Statistics

To get performance statistics, click the **Statistics** button in the Optical Port Status pane. The Performance Statistics pane is displayed (Figure 5-6).

Figure 5-6   NTC Performance Statistics

The Performance Statistics display provides the following information: :

- Slot and port number
- Timestamp
- Errored seconds
- Severely errored seconds
- Status

Running NTC Loopbacks

You can run loopbacks to test the ATM line. This test is performed with third-party test equipment. For more information about loopback tests, refer to the *Cisco 6200 User Guide*.

To run loopback on a port, click the **Start Loopback** button in the Optical Port Status pane and choose **Yes** when the Confirm window appears. Once you start a loopback test, a **Stop Loopback** button appears, which you can click at any time.

Note   When you click the **Start Loopback** button, you disrupt service for all customers on this port. When you click the **Stop Loopback** button, service is resumed.

## 5.4.2 Monitoring and Testing an SLC

When you monitor and test an SLC, you use the Line Status pane. This pane has eight connectors labeled Port 0 to Port 7. If the connector is filled (for example, Figure 5-7, CAP Port 0), the corresponding subscriber port is provisioned and enabled. If a connector is empty (for example, CAP Port 1 in the same figure), the corresponding port is unprovisioned. If the connector is crossed out (for example, CAP Port 7 in the figure), the corresponding port is provisioned but disabled.

To monitor and test an SLC, perform the following steps:

Step 1   Click the SLC card in the upper pane. The Line Status pane (see Figure 5-7) appears at the lower left side of the Component Status Display window. The text in the Line Status pane varies with the type of SLC you select—the SLC-8CAP card or SLC-8DMT card.

Step 2   Move your mouse cursor on top of one of the ports in the Optical Port Status pane. A message appears indicating the status of the port, such as whether it is enabled and active.

To get more information or to run a line test, click one of the buttons at the bottom of the Line Status pane.

Figure 5-7   SLC Line Status Pane
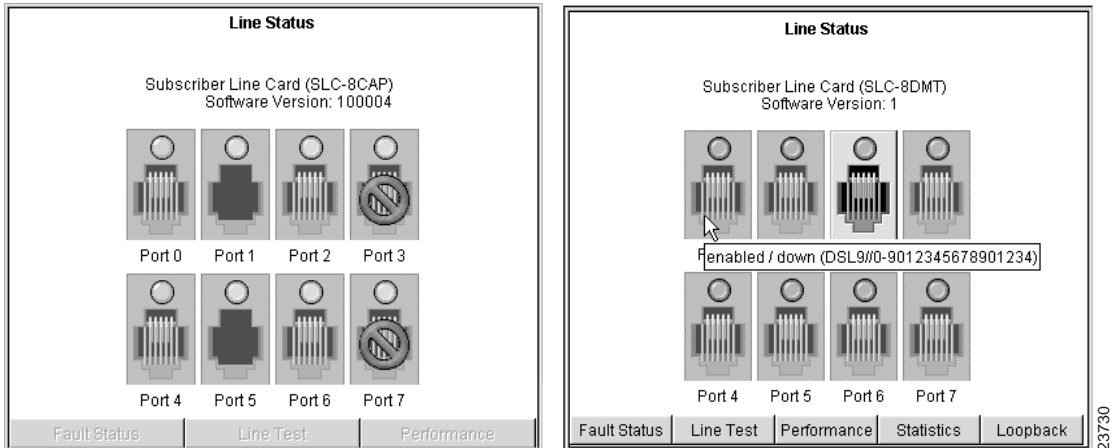
Monitoring SLC Line Fault Status

To monitor line fault status, select a port and click the **Fault Status** button in the Line Status pane. The Line Fault Status pane is displayed. The Line Fault Status pane for SLCs is shown in Figure 5-8.

In addition to subscriber name and slot/port number, this pane indicates the following:

- Line mode—Whether the line is active, down, or training

- Upstream and downstream line rates—Actual line rates

- Upstream and downstream signal to noise ratio (SNR) margins—The SNR margins that you set in the IOS CLI

- Upstream and downstream errored seconds (CAP only)—Number of seconds with line errors

- Upstream and downstream attenuation (DMT only)—Amount of power lost, measured in dB

The pane also provides status indicators for upstream loss of cell delineation (LOCD), DMT upstream loss of signal (LOS), DMT upstream loss of frame (LOF), and DMT downstream loss of power (LPR).
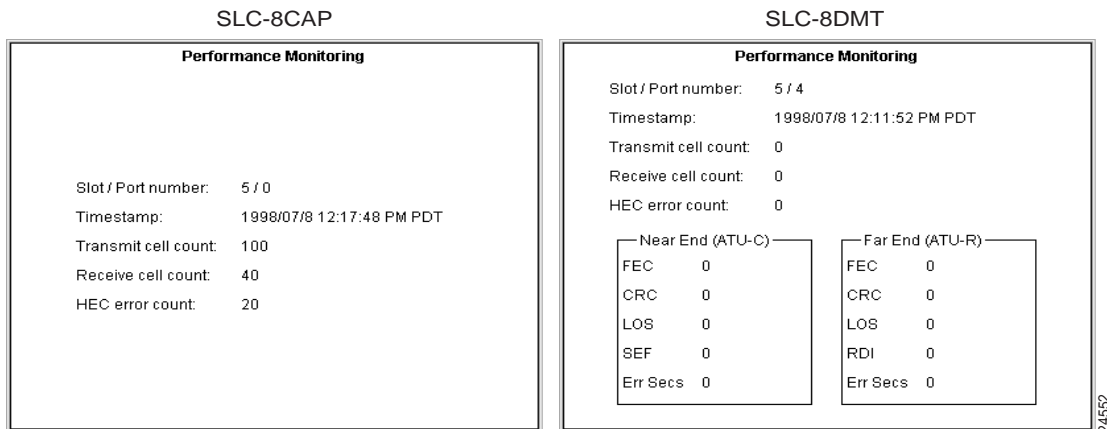
Figure 5-8   SLC Line Fault Status Pane
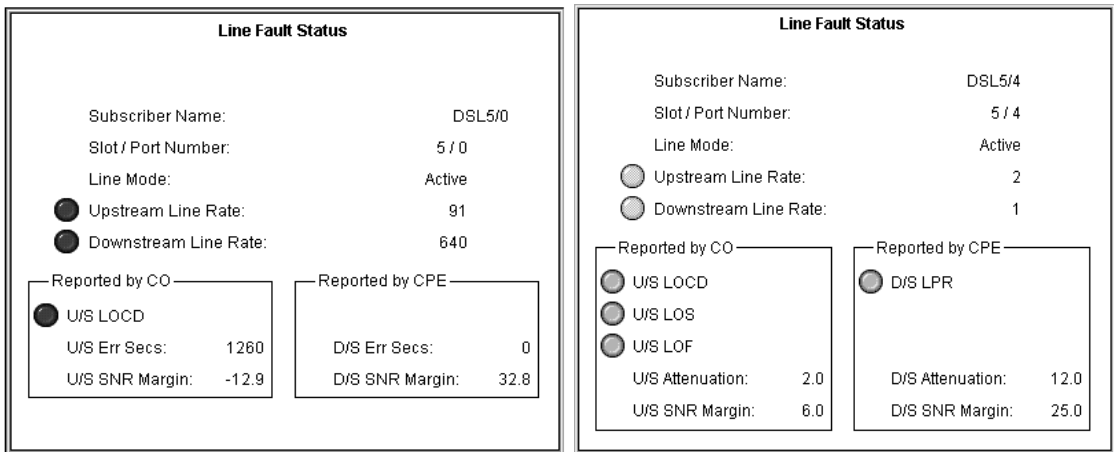
Monitoring SLC Port Performance

To see how a port is being used, click the **Performance** button in the Line Status pane. The Performance Monitoring pane is displayed (see Figure 5-9).

The pane provides the following information:

- Slot and port number

- Timestamp—The time that the performance values were first displayed.

- Transmit cell count—Number of nonnull cells transmitted downstream

Figure 5-9 SLC Performance Monitoring Pane

SLC-8CAP

SLC-8DMT

Performance Monitoring	
Slot / Port number:	5 / 0
Timestamp:	1998/07/8 12:17:48 PM PDT
Transmit cell count:	100
Receive cell count:	40
HEC error count:	20

Performance Monitoring			
Slot / Port number:	5 / 4		
Timestamp:	1998/07/8 12:11:52 PM PDT		
Transmit cell count:	0		
Receive cell count:	0		
HEC error count:	0		
Near End (ATU-C)		Far End (ATU-R)	
FEC	0	FEC	0
CRC	0	CRC	0
LOS	0	LOS	0
SEF	0	RDI	0
Err Secs	0	Err Secs	0

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- Receive cell count—Number of nonnull upstream cells received with good, or correctable, header checksums

- HEC error count—Number of upstream cells received with uncorrectable header checksum

For DMT cards, the system displays additional information for the ADSL transmission unit (ATU) in the central office (C) and at the remote location (R). This information is listed under the headings Near End (ATU-C) and Far End (ATU-R). Data is provided for

- Forward error correction

- Cyclic redundancy check

- Loss of signal

- Severely errored frames (near end)

- Remote defect indication (far end)

- Errored seconds

Obtaining Performance Statistics on an SLC-8 DMT

To get performance statistics for SLC-8 DMTs, click the **Statistics** button in the Optical Port Status pane. The Performance Statistics pane is displayed (Figure 5-6).

Figure 5-10   NTC Performance Statistics

The Performance Statistics reports statistics for the near-end (from CPE to CO) and far-end (from CO to CPE). The pane displays the following information:

- Slot and port number
- Timestamp
- Loss of Signal
- Loss of Frame
- Errored seconds
- Status

Starting an SLC Line Test

The Cisco 6200 Manager allows you to run several types of line tests. Figure 5-11 shows CAP and DMT Line Test panes. These panes are used to start, abort, and clear tests and to view test results. The system provides you with the following information about the test:

- Status of the test
- Port under test
- Test type
- Bit error rate limit
- Start time
- Time interval
- Completion time
- Upstream and downstream bit error rate

If a field is not applicable to a particular test, it is grayed out in the appropriate Line Test pane.

Figure 5-11   SLC Line Test Pane
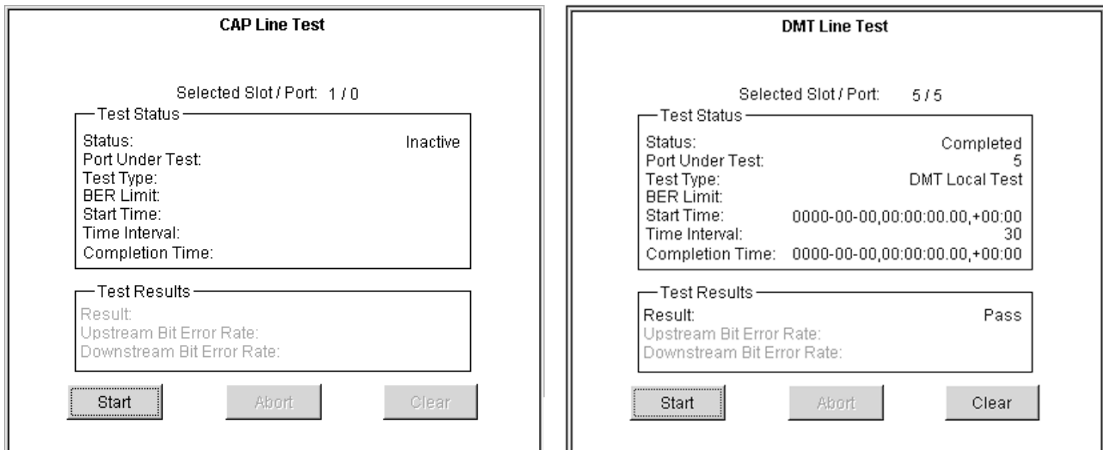
To start a line test

Step 1   Click the **Line Test** button in the Line Status pane (Figure 5-7). The Line Test pane is displayed (see Figure 5-11).

Step 2   Clear the statistics in the Line Test pane by clicking **Clear**.

Step 3   Click **Start** in the Line Test pane.

DMT Tests

The DMT test is used to test the status of the SLC-8DMT chipset. After you click **Start** in a DMT Line Test pane, the DMT test starts immediately. The results are displayed in the Line Test pane.

Note   If you want to cancel the test before it is complete, click **Abort**.


CAP Tests

If you are testing an SCL-8CAP card, CAP Start Test window displays after you click the **Start** button in the Line Test pane. The CAP Start Test window is shown in Figure 5-12.

You can choose between two types of CAP tests:

• Line quality. Tests the quality of the line. A subscriber line test runs for a user-specified period of time, measuring the error rate. The test can be run for from 5 to 60 minutes. The longer you run the test, the better the error detection.

• CAP hardware. Tests the CAP hardware chipset. The Test Interval and BER Limit fields are not applicable.

Customer service is interrupted while these tests are running.

Figure 5-12   CAP Start Test Window
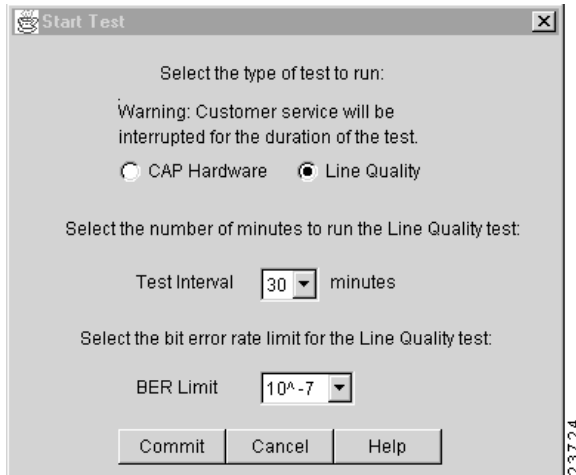
To run the test

Step 1   Choose the test type and, for line quality tests, set the test interval and BER limit.

Step 2   Click **Commit**.

The test status and results display in the CAP Line Test pane.

Running Loopbacks on an SLC-8DMT

You can run loopbacks on the SLC-8DMT. This test is performed with third-party test equipment. For more information about loopback tests, refer to the *Cisco 6200 User Guide*.

To run loopback

Step 1   Click the **Start Loopback** button in the DMT Line Status pane. The DMT Start Test window appears (Figure 5-13).

Step 2   Select either a local test or a DSL line test.

Step 3   Click **Commit**.

Customer service is interrupted while these tests are running.

Note   When you click the **Start Loopback** button, you disrupt service for all customers on this port. When you click the **Stop Loopback** button, service is resumed.

Figure 5-13   DMT Start Test Window