Troubleshooting

Read this chapter to learn how to isolate faults in the Cisco 6200 advanced digital subscriber line access multiplexer (DSLAM). Most problems in a Cisco 6200 system can be traced to one of the system's field-replaceable units (FRUs):

- Management processor card (MPC)
- Network trunk card (NTC)
- Subscriber line card (SLC)
- Fan tray and air filter
- Power entry module (PEM)

All Cisco 6200 FRUs are hot-swappable, except the PEM in the case where only one is operating.

Table 7-1 lists symptoms and recommendations for each FRU. In some situations, the table recommends that you replace an FRU. Procedures for removing and replacing the FRUs can be found in the document *Cisco 6200 FRU Installation and Replacement*.
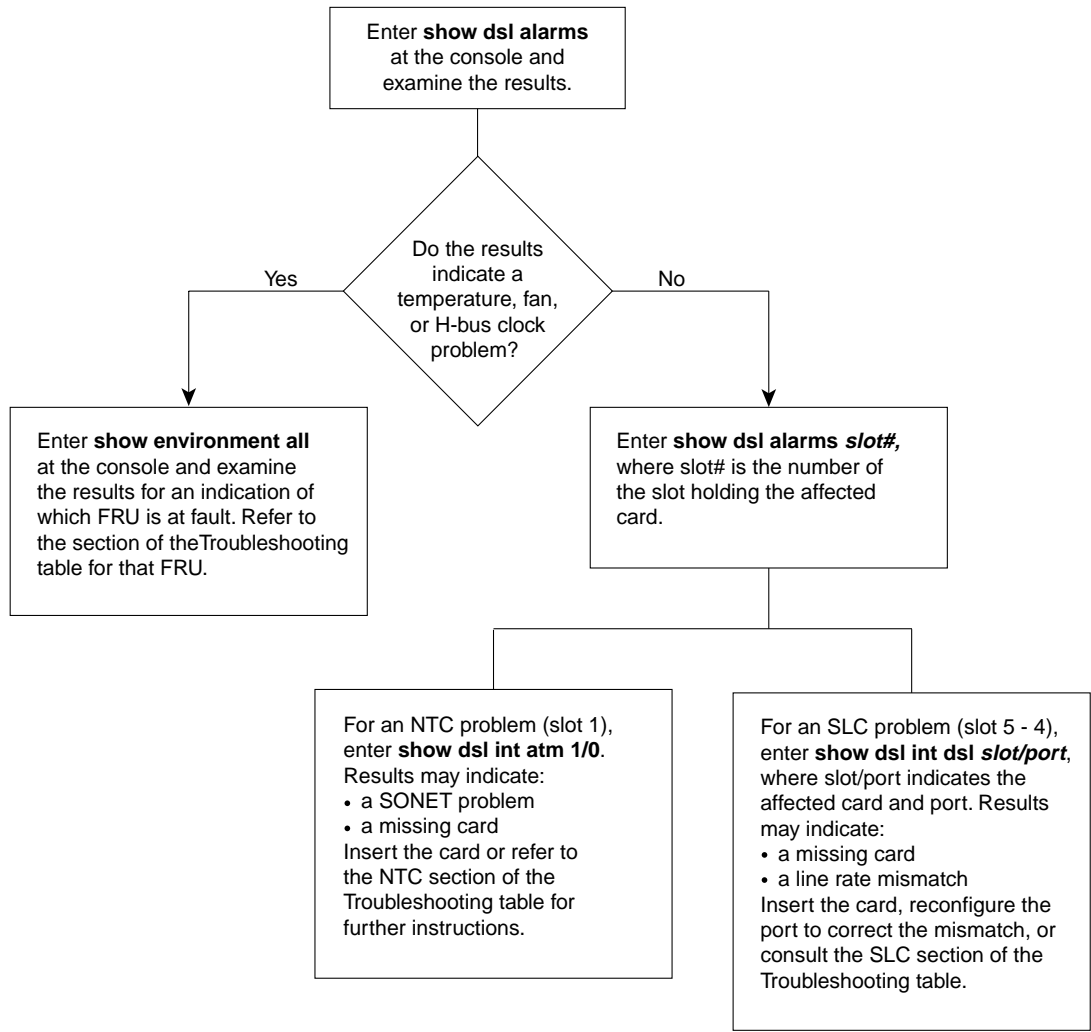
Before using Table 7-1, make the following basic checks:

- Are the ports properly configured? Refer to either of these sources for configuration instructions:
    - Chapter 4, "Configuration Procedures" (CLI information)
    - *User Guide for the Cisco 6200 Manager* (GUI information)
- Are power leads and data cables firmly connected at both ends?
- Are all cards firmly seated and securely screwed to the chassis?
- Are the fan tray and the power entry modules (PEMs) properly connected and secured to the chassis?

Note   Check the release notes for more information on how to solve problems.

Table 7-1   **Troubleshooting**

FRU Affected	Symptom	Steps to Take
—	System fails to come up.	**1** Check the Power LEDs on all cards and PEMs. If none are on, see the PEM section of this table.
		2 If the system has power, check the Ready LED on the MPC. If the Ready LED is yellow, see the MPC section of this table.
		3 Attempt to establish a console connection to the Cisco 6200. If you cannot connect, see the recommendation for the symptom "You cannot establish a console or Telnet connection to the system," below in this section of the table.
		4 If you achieve a console connection:
		— Enter **show int ether 0/1**. If the port is administratively down, enter these commands to enable it: ```c6200> configure terminal` `Enter configuration commands, one per line.` `End with CNTL/Z.` `6200(config-if)# int eth0/1` `6200(config-if)# no shut` `6200(config-if)# exit` `6200(config)# exit` `6200#```
		— Enter **show log** to review console messages recorded in the system log.
	System experiences a critical alarm. (Critical LED on MPC lights red.)	Enter the **show dsl alarms** command at the console. Refer to Figure 7-1 for further instructions.
	System experiences a major alarm. (Major LED on MPC lights red.)	Enter the **show dsl alarms** command at the console. Refer to Figure 7-1 for further instructions.
	System experiences a minor alarm. (Minor LED on MPC lights yellow.)	Enter the **show dsl alarms** command at the console. Refer to Figure 7-1 for further instructions.
	You cannot establish a console or Telnet connection to the system.	**1** Ensure that the terminal settings match those in Table 2-1.
		2 If you still cannot connect, check the console cable. Is it firmly connected? Is it the right kind of cable with proper connectors? Refer to Appendix A, "Pin Assignments," to check pinouts.
		3 If the cable checks out and you cannot connect to the box, press the reset button on the MPC. If the problem persists, replace the MPC.
	System overheats.	Troubleshoot the fan tray, referring to the Fan Tray section of this table.
	System experiences a clocking problem.	Troubleshoot the NTC, referring to the NTC section of this table.
	System experiences a power problem.	Troubleshoot the PEM(s), referring to the PEM section of this table.

Figure 7-1   Troubleshooting Major, Critical, and Minor Alarms

```
                    ┌──────────────────────────┐
                    │ Enter show dsl alarms     │
                    │   at the console and      │
                    │   examine the results.    │
                    └──────────────────────────┘
                                  │
                                  ▼
                           ╱────────────╲
                          ╱ Do the results╲
                  Yes    ╱   indicate a     ╲   No
            ◄───────────  temperature, fan,  ───────────►
                         ╲  or H-bus clock   ╱
                          ╲   problem?      ╱
                           ╲──────────────╱
                │                                 │
                ▼                                 ▼
  ┌──────────────────────────┐      ┌──────────────────────────┐
  │ Enter show environment all│     │ Enter show dsl alarms slot#,│
  │ at the console and examine │     │ where slot# is the number of│
  │ the results for an indication│   │ the slot holding the affected│
  │ of which FRU is at fault. Refer│ │ card.                      │
  │ to the section of theTroubleshooting│└──────────────────────┘
  │ table for that FRU.        │                  │
  └──────────────────────────┘          ┌─────────┴─────────┐
                                         │                   │
                                         ▼                   ▼
                          ┌────────────────────┐  ┌────────────────────┐
                          │ For an NTC problem  │  │ For an SLC problem  │
                          │ (slot 1), enter     │  │ (slot 5 - 4), enter │
                          │ show dsl int atm 1/0.│ │ show dsl int dsl    │
                          │ Results may indicate:│ │ slot/port, where    │
                          │ • a SONET problem   │  │ slot/port indicates │
                          │ • a missing card    │  │ the affected card   │
                          │ Insert the card or  │  │ and port. Results   │
                          │ refer to the NTC    │  │ may indicate:       │
                          │ section of the      │  │ • a missing card    │
                          │ Troubleshooting table│ │ • a line rate mismatch│
                          │ for further         │  │ Insert the card,    │
                          │ instructions.       │  │ reconfigure the port│
                          └────────────────────┘  │ to correct the mismatch,│
                                                   │ or consult the SLC  │
                                                   │ section of the      │
                                                   │ Troubleshooting table.│
                                                   └────────────────────┘
```

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FRU Affected	Symptom	Steps to Take
Management processor card (MPC)	Power LED is not lit.	**1** Check power LEDs on other cards. If none are lit, refer to the PEM section of this table.
		2 If power LEDs on other cards are lit, remove the card from its slot and check for bent or broken pins on both the card and the backplane. Return the card to its slot and screw it firmly into place.
		3 Replace the card.[1]
		4 If the problem persists with a new card, there may be a fault in your backplane. Contact Cisco's TRC.
	Ready LED is yellow, indicating that the MPC failed its power-on self test.	Press the reset switch on the MPC. If the problem persists, replace the card.[1]
	The MPC comes up, but you cannot Telnet to the system.	**1** Check the configuration of your LAN for both the Cisco 6200 and the Telnet source.
		2 Check the cabling and connectors between the Telnet source and the Cisco 6200. Refer to Appendix A, "Pin Assignments," to check pinouts.
	Card cannot be fully inserted into its slot.	Inspect connectors on both the card and the backplane, looking for bent pins or other damage.

1 A node's software and configuration files can be stored in NVRAM and on a PCMCIA Flash card. If the files are stored on a PCMCIA card, you can move the PCMCIA card from the faulty MPC to the replacement MPC before you install the replacement MPC. This enables the new MPC to initialize itself without resetting other cards. If the new MPC must read the chassis configuration from NVRAM, it resets all of the cards in the chassis. See *Cisco 6200 FRU Installation and Replacement* for complete instructions on replacing MPCs and other cards.

FRU Affected	Symptom	Steps to Take
Network trunk card (NTC)	Power LED is not lit.	1 Check power LEDs on other cards. If none are lit, refer to the PEM section of this table.
		2 If power LEDs on other cards are lit, remove the card from its slot and check for bent or broken pins on both the card and the backplane. Return the card to its slot and screw it firmly into place.
		3 Replace the card.
		4 If the problem persists with a new card, there may be a fault in your backplane. Contact Cisco's TRC.
	Trunk fails to come up. Ready LED is yellow, indicating that the NTC failed its power-on self test.	1 Use the **show ipc nodes** command to find out whether there is a communication problem between the NTC and the MPC. There should be an entry in the resulting display for each SLC and NTC. If there is an entry for each card, skip to step 2. If one or more cards is not listed, do the following:
		— At the console, enter **show int ethernet 0/1**. If the port reports CRC errors or collisions, the backplane Ethernet may be improperly terminated. See the next item. If the port is administratively down, enter these commands to enable it:

```
c6200> configure terminal
Enter configuration commands, one per line.
End with CNTL/Z.
6200(config-if)# int eth0/1
6200(config-if)# no shut
6200(config-if)# exit
6200(config)# exit
6200#
```

		— Ensure that the terminators on the backplane Ethernet connectors are in place. The backplane Ethernet connectors are BNC connectors. In most cases, they are located on the rear of the chassis, labeled ETH1 and ETH2. One is near the upper right corner and the other is near the lower right corner. (In some chassis, the backplane Ethernet connectors are at the front of the chassis, located behind panels at the top and bottom.)
		— Use the MPC section of this table to troubleshoot the MPC.
		2 Check the alarm LEDs on the MPC or enter **show dsl alarms** to check the alarm status of the system. If any alarms are indicated, refer to Figure 7-1.
		3 Use the command **show dsl status** to ensure that the card is provisioned to be in this slot. (Nothing is displayed for slots that are not provisioned.) If necessary, update the configuration.
		4 To reset the card, pull it part way out of its slot, then push it back in and screw it into place.
		5 If the problem persists, replace the card.

FRU Affected	Symptom	Steps to Take
Network trunk card (NTC)	Trunk fails to come up or performs poorly.	**1** Enter the command **show dsl int atm 1/0**. The results tell you about alarms, clocking mode, loopback status, and trunk status. If the trunk is administratively down, use the **no shut** config command to bring it up.
		2 Use the **loopback** command to run an OC-3 loopback test. You must install test equipment at the remote end to inject and receive data for a loopback test. See Chapter 5, "Command Reference," for more information on the **loopback** command.
		3 If your cable is too long or if your optical signal passes through too many connectors, signal attenuation will cause signal quality problems. Check cable length and number of connectors.
		4 Check optical connectors for damage or for scratches on the optical surface. Replace connectors if necessary.
		5 Check optical connectors for dirt on the optical surface. If a connector is dirty, clean it by blowing compressed air from a distance of 3 inches (8 cm). You can also clean the connectors on most cables with an alcohol-moistened, lint-free wipe. Check the cable manufacturer's cleaning instructions first. To prevent problems from dirty or damaged connectors, keep any unused optical connector covered with its protective cap.
		6 Check optical power at both ends of the connection.
		7 Check for a card type mismatch. You must have cards of the same type (OC3, for example) and mode (single mode or multimode) at both ends of the connection.
		8 Check for a cable type mismatch. You must use multimode cable with multimode cards, or single mode cable with single mode cards.
	Card cannot be fully inserted into its slot.	Inspect connectors on both the card and the backplane, looking for bent pins or other damage.

FRU Affected	Symptom	Steps to Take
Subscriber line card (SLC)	Power LED is not lit.	**1** Check power LEDs on other cards. If none are lit, refer to the PEM section of this table.
		2 If power LEDs on other cards are lit, replace the card.
		3 If the problem persists with a new card, there may be a fault in your backplane. Contact Cisco's TRC.
	All ports on a card fail to come up (modems don't train). Ready LED may be yellow, indicating that the SLC failed its power-on self test.	**1** Use the **show ipc nodes** command to find out whether there is a communication problem between the SLC and the MPC. There should be an entry in the resulting display for each SLC and NTC. If there is an entry for each card, skip to step 2. If one or more cards is not listed, do the following:
		— At the console, enter **show int ethernet 0/1**. If the port reports CRC errors or collisions, the backplane Ethernet may be improperly terminated. See the next item. If the port is administratively down, enter these commands to enable it:

```
c6200> configure terminal
Enter configuration commands, one per line.
End with CNTL/Z.
6200(config-if)# int eth0/1
6200(config-if)# no shut
6200(config-if)# exit
6200(config)# exit
6200#
```

		— Ensure that the terminators on the backplane Ethernet connectors are in place. The backplane Ethernet connectors are BNC connectors. On some models, these connectors are accessible from the front of the chassis, located behind panels at the top and bottom of the unit. On other models, the connectors are accessible from the rear of the chassis, located behind the metal panels that cover the data and power connectors.
		— Use the MPC section of this table to troubleshoot the MPC.
		2 Check the alarm LEDs on the MPC or enter **show dsl alarms** to check the alarm status of the system. If any alarms are indicated, refer to Figure 7-1.
		3 Use the command **show dsl status** to that ensure the card is provisioned to be in this slot. (Nothing is displayed for slots that are not provisioned.) If necessary, update the configuration.
		4 To reset the card, pull it part way out of its slot, then push it back in and screw it into place.
		5 If the problem persists, replace the card.

FRU Affected	Symptom	Steps to Take
Subscriber line card (SLC)	A line fails to come up (modems don't train), or a port LED flashes continuously.	**1** Use the command **show dsl interface dsl** *slot/port* to display the port's configuration. Check the display to ensure the port is properly provisioned.
		2 Ensure that the CPE at the subscriber site is powered up.
		3 Perform a continuity check to ensure that the cabling to the CPE is connected and intact. (If there is a phone on the line, check for a dial tone.)
		Note Alternatives to steps 2 and 3, if you don't have access to perform these checks: enter the command **show dsl interface dsl** *slot/port.* On a **DMT** interface, look for Line Status (near the top). If this reads "CPE not detected," troubleshoot the CPE and the local loop. On a **CAP** interface, look in the Signal-to-noise ratio (SNR) section of the resulting display for CO receiverGain, CPE transmitPower, and CPE receiverGain:
		— CO receiverGain: If the CPE and the local loop are working properly, this value should be in the single digits—ideally 1 or 2. (Ignore the parenthetical gain1 and gain2 values.)
		— CPE transmitPower: Should be positive (for example, 7 db).
		— CPE receiverGain: Should be negative (for example, -18 db).
		If the CPE is disconnected or turned off, or if there's a break in the local loop, expect to see a CO receiverGain value over 10 db, and values of 0 db for both CPE transmitPower and CPE receiverGain.
		4 (For CAP SLCs only) Use the **linetest** command or the Cisco 6200 Manager (GUI) to perform a CAP hardware test to determine whether the port on the SLC is healthy.
		5 Plug a modem into the line at the CO (cutting out the local loop). If the modems train over the shorter distance, the problem lies in the subscriber loop or in the CPE.
	Card cannot be fully inserted into its slot.	Inspect connectors on both the card and the backplane, looking for bent pins or other damage.
	Card experiences problems in one slot but operates normally in another.	There may be a fault in your backplane. Contact Cisco's TRC.

FRU Affected	Symptom	Steps to Take
Fan tray and air filter	Fans do not run.	**1** Make sure the fan tray is fully inserted into the chassis.
		2 Check input power connections. If connections are loose or their polarity is reversed, chassis does not receive power and fans do not run.
		3 Replace the fan tray.
	Fans run but the system overheats.	**1** Make sure that all intake and exhaust vents on the front, rear, and sides of the chassis are free of blockages.
		2 Make sure that the ambient temperature and other environmental factors in the system area are within the ranges specified in Table 1-1.
		3 Make sure all cards, blank faceplates, and covers are in place. The cooling system cannot operate effectively unless the chassis is fully enclosed.
		4 Enter the **show environment all** command and check the results to see if individual fans have failed. If so, replace the fan tray.
		5 Check the air filter, and if necessary clean or replace it. Refer to Chapter 6, "Preventive Maintenance," for instructions.
		6 Reduce the ambient temperature.
Power entry module (PEM)	Green LED on PEM fails to go on.	**1** Make sure the circuit breaker on the PEM is turned on.
		2 Make sure the PEM is properly seated and screwed in place.
		3 Make sure power leads are properly connected to power connectors on the backplane. If connections are loose or their polarity is reversed, chassis does not receive power.
		4 Check the power source.
		5 Move the PEM to the other PEM slot. If the PEM still fails, replace it.
	PEM experiences problems in one slot but operates normally in the other.	There may be a fault in your backplane. Contact Cisco's TRC.