

# Troubleshooting

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There are several ways to troubleshoot problems associated with installation and performance. For instance, the LEDs on the front panel provide the quickest way to evaluate the operation of the switch. The statistics provided by the management console or SNMP management station can provide more details about the cause of connectivity and performance problems. In addition, the power-on self-test (POST) determines if the switch is functioning properly when powered up. If the switch does not operate properly or you are unable to access the management console, you can try to resolve these problems by using the diagnostic console.

Potential problems are discussed under the following topics in this chapter:

- Understanding POST failures
- Diagnosing problems
- Using the diagnostic console

# Understanding POST Failures

The 13 tests in POST detect nonfatal and fatal failures when the switch is powered up. Additional information about POST is provided in the “Powering Up the Switch and Running the Power-On Self-Test” section on page 2-6.

If your switch has a fatal failure, the management console is not available. Contact your Cisco sales representative.

If a nonfatal failure occurs, the SYSTEM LED turns amber. A POST failure message, such as the one in Figure 6-1, is displayed on the Menu Console Logon Screen. In this example, ports 1x to 8x and port Ax (or port A) failed test 1 (nonfatal—port loopback test).

**Figure 6-1 Example of a POST Failure Message**

```
Catalyst 1900 Management Console
Copyright (c) Cisco Systems, Inc. 1993-1998
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Standard Edition Software
Ethernet address:      00-E0-1E-7E-B4-40

PCA Number: 73-2239-01
PCA Serial Number: SAD01200001
Model Number: WS-C1924-A
System Serial Number: FAA01200001
-----
*** Power On Self Test (POST) failed ***
*** Failed Test(s): 1
*** Failed Port(s): 1 2 3 4 5 6 7 8 A
1 user(s) now active on Management Console.
Press any key to continue.
```

Table 6-1 lists the individual tests, types of failures, and any recovery actions.

**Table 6-1 POST Failure Descriptions**

<b>Port Status LEDs</b>	<b>Failure</b>
16x	Fatal—ECU DRAM test. Switch is not operational. Contact Cisco Systems.
15x	Not used during POST.
14x	Not used during POST.
13x	Not used during POST.
12x	Fatal—Forwarding engine test. Switch is not operational. Contact Cisco Systems.
11x	Fatal—Forwarding engine SRAM test. Switch is not operational. Contact Cisco Systems.
10x	Fatal—Packet DRAM test. Switch is not operational. Contact Cisco Systems.
9x	Fatal—ISLT ASIC test. Switch is not operational. Contact Cisco Systems.
8x	Fatal—Port control/status test. Switch is not operational. Contact Cisco Systems.
7x	Fatal—System timer interrupt test. Switch is not operational. Contact Cisco Systems.
6x	Fatal—CAM SRAM test. Switch is not operational. Contact Cisco Systems.
5x	Nonfatal—Real-time clock test.  If this test failed, the switch forwards packets. However, if the switch unexpectedly shuts down, it cannot restart itself automatically.
4x	Nonfatal—Console port test.  If this test failed, you cannot access the management console through the console port. You can still Telnet to the management console.
3x	Fatal—Content addressable memory test. Switch is not operational. Contact Cisco Systems.
2x	Nonfatal—Built-in address test.  If this test failed, the switch uses the default Ethernet address of the switch and begins forwarding packets.
1x	Nonfatal—Port loopback test.  If this test failed, some functionality to one or more ports is lost. The switch disables any port(s) that failed this test, and the failure message on the Menu Console Logon Screen indicates which port(s) did not pass this test. Connect only to ports that passed this test.

## Diagnosing Problems

Table 6-2 lists symptoms, possible causes, and corrective actions associated with

- Poor performance.
- No connectivity.
- No access to out-of-band management.

**Table 6-2 Common Problems and Their Solutions**

Symptom	Possible Cause	Resolution
Poor performance or excessive errors	<p><b>Incorrect full-duplex settings for 10BaseT and 100BaseT connections.</b></p> <p>Full-duplex status is shown with the Mode button and the FDUP LED.</p> <p>Check the port statistics:</p> <ul style="list-style-type: none"> <li>• FCS and alignment errors on the port mean the switch port is configured for full-duplex operation and the other device is a repeater or half-duplex device.</li> <li>• Late collisions mean the port is configured for half-duplex operation and the attached device is full duplex.</li> </ul>	<p>Configure the port for half-duplex operation.</p> <p>Configure the port for full-duplex operation.</p>
	<p><b>Cabling distance exceeded.</b></p> <p>Port statistics show excessive FCS, late-collision, or alignment errors. For 100BaseTX connections:</p> <ul style="list-style-type: none"> <li>• The distance between the port and the attached device exceeds 100 meters.</li> <li>• If attached to a repeater, the total distance between the two end stations exceeds the 100BaseT cabling guidelines.</li> </ul> <p>For 10BaseT connections: The distance between the port and the attached device exceeds 100 meters.</p>	<p>Reduce the cable length to within the recommended distances.</p> <p>See your 100BaseT repeater documentation for cabling guidelines.</p> <p>Reduce the cable length to within the recommended distances.</p>
	<p><b>Bad adapter in attached device</b></p> <p>Excessive errors found in port statistics.</p>	<p>Run the adapter card diagnostic utility.</p>

**Table 6-2 Common Problems and Their Solutions (Continued)**

<b>Symptom</b>	<b>Possible Cause</b>	<b>Resolution</b>
No connectivity	<b>Incorrect or bad cable.</b>	
	<ul style="list-style-type: none"> <li>• A crossover cable was used when straight-through was required, or vice-versa.</li> <li>• Bad cable.</li> </ul>	<p>See the “Connectors and Cables” appendix for the correct pinouts and the proper use of crossover vs. straight-through cables.</p> <p>Replace with a known good cable.</p>
No management console access	<b>Configuration problems</b>	Use the Diagnostic Console - Systems Engineering Menu to reset the switch.
	<b>Incorrect baud rate</b>	Reset the modem parameters to their factory defaults with the Diagnostic Console - System Debug Interface Menu.
RPS LED solid amber	<b>RPS not operational</b>	Verify that the RPS is connected properly to the switch and is connected to an AC power outlet.
SYSTEM LED off	<b>Power cord not connected</b>	Plug in both ends of the power cord.
SYSTEM LED amber; port status LEDs off	<b>Corrupt firmware</b>	See the “Recovering from Corrupted Firmware” section on page 6-10 of this chapter for firmware upgrade instructions.
Port status LED off	<b>Devices not powered up</b>	Ensure both devices have power.
	<b>Cable connection loose</b>	Verify the connection at both ends of cable.
	<b>Wrong cable type</b>	Verify the cable type (crossover vs. straight-through).
	<b>Incorrect wiring</b>	See the “Connectors and Cables” appendix for pinout information.
	<b>Faulty cable</b>	Replace the cable with a known good one.

**Table 6-2 Common Problems and Their Solutions (Continued)**

Symptom	Possible Cause	Resolution
Port status LED alternating green and amber	<b>Link fault</b> Errors (such as excessive collisions, CRC errors, and alignment and jabber errors) could be affecting connectivity.	Verify port termination and check integrity of the connected devices.
Port status LED solid amber	<b>Port not forwarding</b> The port might be disabled by management, suspended due to an address violation, or suspended by Spanning-Tree Protocol due to the presence of network loops.	<ul style="list-style-type: none"><li>• Investigate the device that is connected to the disabled port on the switch.</li><li>• Enable the port through in-band or out-of-band management.</li></ul>

## Using the Diagnostic Console

The diagnostic console is a menu-drive interface that you can use to perform the following tasks:

- Recover from corrupted firmware
- Recover from a lost or forgotten password
- Reset the switch to factory defaults
- Reset the characteristics of the console port to the factory defaults

How you access the diagnostic console depends on which task you are performing.

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**Note** Access to the Diagnostic Console - System Debug Interface Menu requires physical access to the switch. Remote users cannot display the password.

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## Diagnostic Console Logon Screen

To display the Diagnostic Console Logon Screen, follow these steps:

- Step 1** Configure the physical characteristics of the management station or modem to match those of the console port (9600 baud, 8 data bits, 1 stop bit, no parity, no flow control), connect the console port to the management station or modem, and then start up your terminal emulation program.
- Step 2** Disconnect the power cord from the rear panel.
- Step 3** Press the Mode button on the front panel, and hold it in.
- Step 4** While holding in the Mode button, reconnect the power cord.
- Step 5** Continue to hold in the Mode button until the SYSTEM LED turns amber and the Diagnostic Console Logon Screen shown in Figure 6-2 appears.

**Figure 6-2** Diagnostic Console Logon Screen

```
-----  
Cisco Systems Diagnostic Console  
Copyright(c) Cisco Systems, Inc. 1997  
All rights reserved.  
  
Ethernet Address: 00-E0-1E-7E-B4-40  
-----  
  
Press enter to continue.
```

# Diagnostic Console - Systems Engineering Menu

To display the Diagnostic Console - Systems Engineering Menu (see Figure 6-3), press **Return** on the Diagnostic Console Logon Screen. Use the Diagnostic Console - Systems Engineering Menu to troubleshoot firmware problems and then bring up the firmware as usual.

**Figure 6-3 Diagnostic Console - Systems Engineering Menu**

```
Diagnostic Console - Systems Engineering

Operation firmware version: 8.00.00 Status: valid
Boot firmware version: 3.02

[C] Continue with standard system start up
[U] Upgrade operation firmware (XMODEM)
[S] System Debug Interface

Enter Selection:
```

**Operation firmware version**—The current version of the switch firmware.

**Status**—Valid or invalid. If the firmware is not valid, the [C] option is not displayed, and the following warning is displayed:

```
WARNING!!! Operation Firmware is invalid
Upgrade firmware to enable switch operation.
```

**Boot firmware version**—Current version of the write-protected part of the firmware that supports the diagnostic console.

**[C] Continue with standard system start up**—Use this option after you have resolved the firmware problems with options [U] or [S]. The system exits the diagnostic console and brings up the firmware as usual.

**[U] Upgrade operation firmware**—Initiate a firmware upgrade. This option works with XMODEM and uses the default RS-232 parameters: 9600 baud, 8 data bits, 1 stop bit, no parity, no flow control. You are prompted to choose a baud rate of 9600 or 57600 for the download. The console baud rate returns to 9600 immediately after the download.

Instead of using XMODEM, you can use 1KXMODEM to reduce download time significantly.

**[S] System Debug Interface**—Display the Diagnostic Console - System Debug Interface Menu shown in Figure 6-4.

## Diagnostic Console - System Debug Interface Menu

To display the Diagnostic Console - System Debug Interface Menu (see Figure 6-4), select the **[S]** option from the Diagnostic Console - Systems Engineering Menu. Use this menu to reset the console port or the entire switch to the factory defaults. You can also use this menu to display the factory-installed management console password.

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**Note** Access to the Diagnostic Console - System Debug Interface Menu requires physical access to the switch. Remote users cannot display the password.

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**Figure 6-4** Diagnostic Console - System Debug Interface Menu

```
Diagnostic Console - System Debug Interface

[G] Generic I/O
[M] Memory (CPU) I/O
[F] Return system to factory defaults
[R] Reset main console RS232 interface to 9600,8,1,N
[V] View Management Console password
[P] POST diagnostic console

[X] Exit to Previous Menu

Enter Selection:
```

**[G] Generic I/O**—For Cisco personnel only.

**[M] Memory (CPU) I/O**—For Cisco personnel only.

**[F] Return system to factory defaults**—Return the switch to its factory settings. All static and dynamic addresses are removed, as are the IP address and all other configurations. Enter **Y** (yes) or **N** (no), and press **Return**. The changes take effect when the switch is reset.

**[R] Reset main console RS232 interface to 9600, 8, 1, N**—Use this option if you have lost the management console connection because of an improper modem configuration. When the switch is reset, the default RS-232 configuration is used.

**[V] View Management Console password**—Display the password set for the management console.

**[P] POST diagnostic console**—For Cisco personnel only.

# Recovering from Corrupted Firmware

If the switch firmware has become corrupted, you can access the switch to upgrade the firmware. To recover from corrupted firmware, follow these steps:

**Step 1** From the Diagnostic Console - Systems Engineering Menu (Figure 6-3), select the **[U]** option.

**Step 2** Enter **Y** (yes) at the prompt to confirm the download:

```
Do you wish to continue with the download process, [Y]es or [N]o?
```

It can take up to 1 minute to erase the existing firmware.

You are then prompted to choose a transmission speed. Enter **9** (for 9600) or **5** (for 57600) at the prompt:

```
Do you wish to upgrade at [9]600 (console speed) or [5]7600?
```

The following prompt appears:

```
Waiting for image at the configured baud rate
```

**Step 3** Start the XMODEM transfer from the application you are running (make sure you have changed the baud rate on the application to match your selection).

The Diagnostic Console Logon Screen is displayed, and the switch returns to 9600 baud when the upgrade is complete.

Press **Return** to display the Diagnostic Console - Systems Engineering Menu, and select the **[C]** option to restart the switch using the upgraded firmware.

## Recovering from a Lost or Forgotten Password

If you have forgotten the password set for the management console, you can view the password from the Diagnostic Console - System Debug Interface Menu (see Figure 6-4).

Select the **[S]** option on the Diagnostic Console - Systems Engineering Menu, and then select the **[V]** option on the Diagnostic Console - System Debug Interface Menu to display the management console password.

If you want to change the password, select the **[M]** option on the Console Settings Menu (see Figure 5-3).

## Resetting the Switch to Factory Defaults

There can be times when you need the diagnostic console even though the firmware is valid. This could happen, for example, if the switch configuration prevents the firmware from executing properly and you cannot display the management console.

To reset to the switch to the factory defaults, select the **[F]** option from the Diagnostic Console - Systems Engineering Menu, and press **Return**. Then select the **[C]** option from the Diagnostic Console - Systems Engineering Menu to continue with system start up.

## Resetting the Management Console to Factory Defaults

To reset to the management console to the factory defaults, follow these steps:

**Step 1** Select the **[S]** option from the Diagnostic Console - Systems Engineering Menu, and press **Return** to display the Diagnostic Console - System Debug Interface Menu.

**Step 2** Select the **[R]** option from the Diagnostic Console - System Debug Interface Menu, and press **Return**.

The following are the console port settings for normal operation: 9600 baud, 8 data bits, 1 stop bit, no parity, no flow control.

**Step 3** Select the **[C]** option from the Diagnostic Console - Systems Engineering Menu to continue with system startup.

