Troubleshooting Cisco 3800 Series Routers

Your Cisco 3800 series integrated services router goes through extensive testing and burn-in before leaving the factory. If you encounter problems, use this document to help isolate problems or to eliminate the router as the source of the problem.

This document contains the following sections:

Note To troubleshoot network modules, see the *Cisco Network Modules Hardware Installation Guide*. To troubleshoot interface cards, see the *Cisco Interface Cards Installation Guide*. These documents are available on Cisco.com.

If you cannot find the source of the problem, contact a customer service representative. For information about obtaining technical support, see the "Cisco One-Year Limited Hardware Warranty Terms" section on page 9 of "Introduction to Cisco 3800 Series Routers Hardware Documentation." Before you call, have the following information ready:

- Router type and serial number (for serial number locations, see the "Product Identification" section on page 6 of "Overview of Cisco 3800 Series Routers")
- Maintenance agreement or warranty information
- Type of software and version number
- Date you received the router
- Brief description of the problem
- Brief explanation of the steps taken to isolate the problem

Solving Problems

The key to solving problems is to isolate the problem to a specific subsystem by comparing what the router is doing to what it should be doing.

The LEDs on the front and rear panel of the router enable you to determine router performance and operation. LEDs are described in the "LEDs" section on page 41.

When solving problems, consider the following subsystems:

- Power and cooling systems—External power source, power cable, router power supply and circuit breaker, and router blower and fan. Also consider inadequate ventilation or air circulation.
- Network modules and interface cards—LEDs on the modules and interface cards help identify a failure.
- Cables—External cables that connect the router to the network.

Troubleshooting the Power and Cooling Systems

Both the system power LED and the fans can help you troubleshoot a power problem. Check the following items.

Note The Cisco 3845 router has two system power LEDs, one for each power supply, labeled SYS PWR1 and SYS PWR2.

Normal Indications

With the power switch on, normal indications are:

- SYS LED steady green
- SYS PWR LED steady green for the Cisco 3825 router, or SYS PWR1 or SYS PWR2 LED steady green for the Cisco 3845 router (depending on which power supply is active)
- Fans operating

Fault Indications

Check the following symptoms to locate or eliminate faults in the power and cooling systems:

- With the power switch on, what color is the SYS LED?
  - If the LED is steady green, the router is receiving power and is functional.
  - If the LED is amber, the router is receiving power but is not functional.
  - If the LED is off, check the power source and power cable.
- With the power switch on, the SYS LED steady green, and the SYS PWR LED (Cisco 3825) or SYS PWR1 or SYS PWR2 LED (Cisco 3845) steady green, do the fans operate?
  - If yes, the power system is functioning.
  - If no, check the fans.

- With the power switch on and the SYS LED steady green, do the fans operate?
  - If yes, the power system is functioning.
  - If no, check the fans.
- With the power switch on and the SYS PWR LED (Cisco 3825) or SYS PWR1 or SYS PWR2 LED (Cisco 3845) off, do the fans operate?
  - If yes, the router is receiving power. The fans are connected directly to the DC outputs of the power supply.
  - If no, check the power source and power cable.
- Does the router shut down after being on a short time?
  - Check for an environmentally induced shutdown. See the next section, "Environmental Reporting Features."
  - Check the environmental site requirements in the "General Site Requirements" section on page 3 of "Preinstallation Requirements and Planning for Cisco 3800 Series Routers."
  - Check for a power supply failure by inspecting the SYS PWR LED on the Cisco 3825 router, or the SYS PWR1 or SYS PWR2 LED on the Cisco 3845 router (depending on which power supply is active). If the LED is green, the power supply is functional.
- Router partially boots, but LEDs do not come on.
  - Check for a power supply failure by inspecting the SYS PWR LED on the Cisco 3825 router or the SYS PWR1 LED or SYS PWR2 LED on the Cisco 3845 router (depending on which power supply is active). If the LED is green, the power supply is functional.
  - If the SYS PWR LED is not on, see the "Cisco One-Year Limited Hardware Warranty Terms" section on page 9 of "Introduction to Cisco 3800 Series Routers Hardware Documentation" for information about customer service. For warranty information, see the "Cisco 90-Day Limited Hardware Warranty Terms" section on page 10 of "Introduction to Cisco 3800 Series Routers Hardware Documentation."

Environmental Reporting Features

If the router is operating at an abnormally high temperature, the following message is displayed on the console screen:

```
System detected OVERTEMPERATURE condition. Please resolve cooling problem immediately!
```

Some causes of abnormally high router temperature are:

- Fan failure
- Air conditioning failure in the room
- Air blockage to cooling vents

Take steps to correct the problem. See also the "Site Environment" section on page 4 and the "Equipment Racks" section on page 5 of "Preinstallation Requirements and Planning for Cisco 3800 Series Routers."

Troubleshooting Modules, Cables, and Connections

Network problems can be caused by a module; cables or cable connections; or external devices such as a modem, transceiver, hub, wall jack, WAN interface, or terminal. Check for the following symptoms to help isolate the problem:

- Network module or interface card is not recognized by the router.
  - Make sure that the module or interface card is firmly seated in its slot.
  - Check the LEDs on the module or interface card. For information on these LEDs, see the *Cisco Network Modules Hardware Installation Guid*e and the *Cisco Interface Cards Installation Guide*.
  - Make sure that you have a version of Cisco IOS software that supports the network module or interface card. To determine which Cisco IOS releases support your router, network modules, and interface cards, go to the Software Advisor at http://tools.cisco.com/Support/Fusion/. You must have an account on Cisco.com.
- Module or card is recognized, but interface ports do not initialize.
  - Make sure that the module or card is firmly seated in its slot.
  - Check external cable connections.
  - Make sure that you have a version of Cisco IOS software that supports network module or interface card. To determine which Cisco IOS releases support your router, network modules, and interface cards, go to the Software Advisor at http://tools.cisco.com/Support/Fusion/. You must have an account on Cisco.com.
- Router does not boot properly, or constantly or intermittently reboots.
  - Make sure that all modules are firmly seated in their slots.
  - Check the router chassis or software. For information about customer service, see the "Cisco One-Year Limited Hardware Warranty Terms" section on page 9 of "Introduction to Cisco 3800 Series Routers Hardware Documentation." For warranty information, see the "Cisco 90-Day Limited Hardware Warranty Terms" section on page 10 of "Introduction to Cisco 3800 Series Routers Hardware Documentation."
- Router boots, but the console screen is frozen.
  - Check the external console connection.
  - Verify that the parameters for your terminal are set as follows:
    - The data rate matches the one configured for the router (9600 bps is the default)
    - 8 data bits
    - No parity
    - 1 stop bit
- Router powers on and boots only when a particular network module or interface card is removed.
  - Check the network module or interface card. For information about customer service, see the "Cisco One-Year Limited Hardware Warranty Terms" section on page 9 of "Introduction to Cisco 3800 Series Routers Hardware Documentation." For warranty information, see the "Cisco 90-Day Limited Hardware Warranty Terms" section on page 10 of "Introduction to Cisco 3800 Series Routers Hardware Documentation."

- Router powers on and boots only when a particular cable is disconnected.
  - There may be a problem with the module, interface card, or cable. For information about customer service, see the "Cisco One-Year Limited Hardware Warranty Terms" section on page 9 of "Introduction to Cisco 3800 Series Routers Hardware Documentation." For warranty information, see the "Cisco 90-Day Limited Hardware Warranty Terms" section on page 10 of "Introduction to Cisco 3800 Series Routers Hardware Documentation."

LEDs

LEDs enable you to determine router performance and operation. Figure 26 and Figure 27 show the LEDs on the Cisco 3825 router. Figure 28 and Figure 29 show the LEDs on the Cisco 3845 router. Each power supply in a Cisco 3845 router also has its own LED.

For an explanation of these LEDs, see Table 5.

Figure 26 Cisco 3825 Front-Panel LEDs

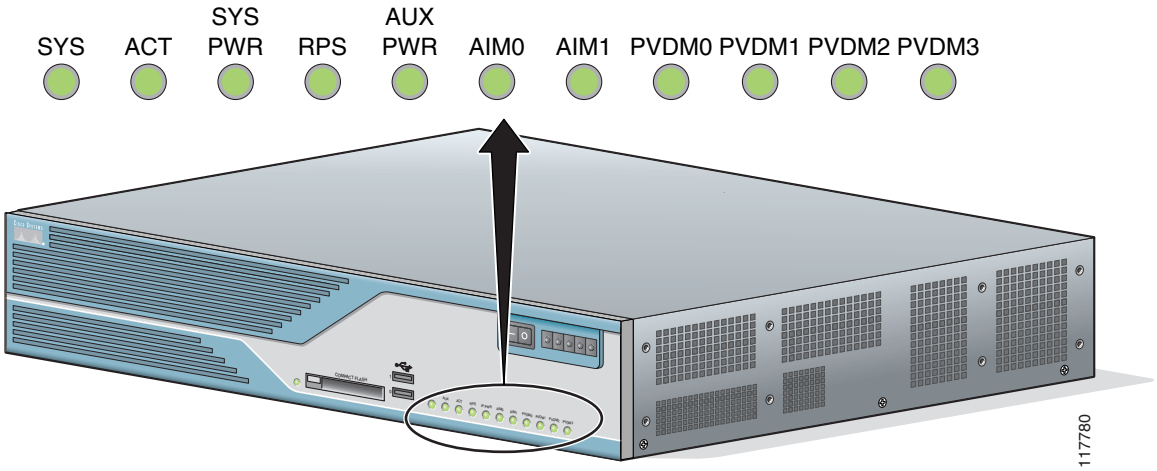

Figure 27 Cisco 3825 Rear-Panel LEDs

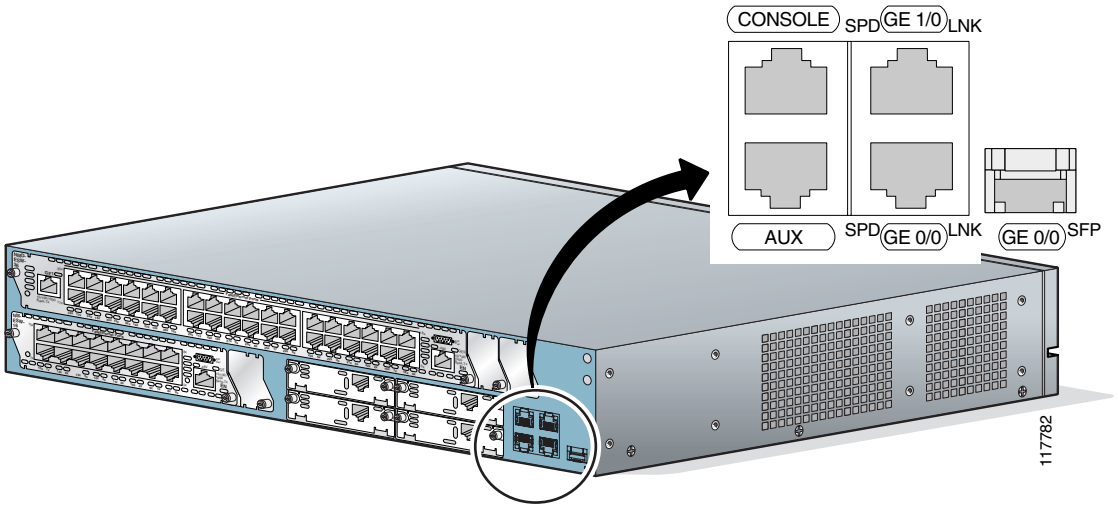

Figure 28 Cisco 3845 Front-Panel LEDs

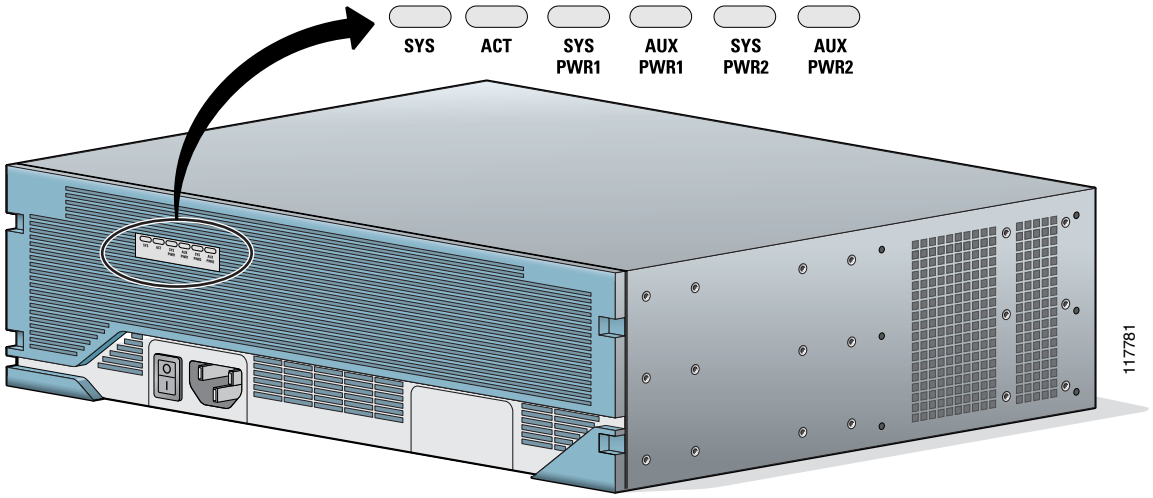

Figure 29 Cisco 3845 Router Rear-Panel LEDs

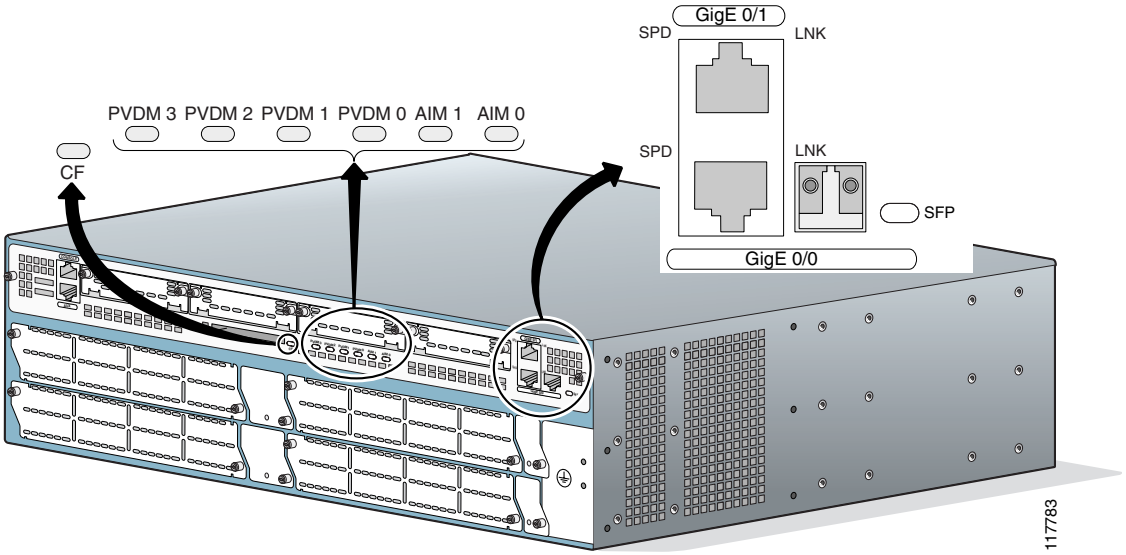

Table 5 Cisco 3800 Series LED Indicators

LED	3825	3845	Color and State	Meaning
SYS	Front	Front	Off	Router not receiving power
			Steady green	Normal operation (power-up complete)
			Blinking green	Booting or in ROM monitor mode (immediately after power-up)
			Amber	Powered but malfunctioning
ACT	Front	Front	Off	No packet activity
			Steady or blinking green	Packets transmitted or received on any WAN or LAN port, or router is monitoring internal activities (power-up completed)
SYS PWR	Front	—	Off	Router not receiving power
			Steady green	Normal operation (immediately after power-up)
RPS	Front	—	Off	Connected to primary power system
			Steady green	Connected to redundant power system
SYS PWR1	—	Front	Off	Router not receiving power, power supply 1 not present, or power-up not completed
			Steady green	Present and enabled (power-up completed)
			Amber	Present and off or malfunctioning
SYS PWR2	—	Front	Off	Router not receiving power, power supply 2 not present, or power-up not completed
			Steady green	Present and enabled (power-up completed)
			Amber	Present and off or malfunctioning

Table 5 Cisco 3800 Series LED Indicators (continued)

LED	3825	3845	Color and State	Meaning
AUX PWR	Front	—	Off	IP phone power off or not present, or power-up not completed
			Steady green	Present and enabled (power-up completed)
			Amber	Powered but malfunctioning
AUX PWR1	—	Front	Off	IP phone power supply 1 off or not present, or power-up not completed
			Steady green	Present and enabled (power-up completed)
			Amber	Powered but malfunctioning
AUX PWR2	—	Front	Off	IP phone power supply 2 off or not present, or power-up not completed
			Steady green	Present and enabled (power-up completed)
			Amber	Powered but malfunctioning
AIM0	Front	Rear	Off	AIM0 not present
			Green	Present and enabled
			Amber	Present but malfunctioning
AIM1	Front	Rear	Off	AIM1 not present
			Green	Present and enabled
			Amber	Present but malfunctioning
PVDM0	Front	Rear	Off	PVDM0 not present
			Green	Present and enabled
			Amber	Present but malfunctioning
PVDM1	Front	Rear	Off	PVDM1 not present
			Green	Present and enabled
			Amber	Present but malfunctioning
PVDM2	Front	Rear	Off	PVDM2 not present
			Green	Present and enabled
			Amber	Present but malfunctioning
PVDM3	Front	Rear	Off	PVDM3 not present
			Green	Present and enabled
			Amber	Present but malfunctioning
CF	Front	Rear	Off	CompactFlash memory card not being accessed
			Steady green	CompactFlash card being accessed; do not eject
			Blinking green	CompactFlash card being accessed; do not eject
SFP	Rear	Rear	Off	SFP link not established
			Green	SFP port active, link established
GE0: Link	Rear	Rear	Off	No link
			Green	Ethernet cable present, link established

Table 5 Cisco 3800 Series LED Indicators (continued)

LED	3825	3845	Color and State	Meaning
GE0: Speed	Rear	Rear	Blinking green	Blink frequency indicates port speed 1 blink per second: 10 Mbps 2 blinks per second: 100 Mbps 3 blinks per second: 1000 Mbps
GE1: Link	Rear	Rear	Off	No link
			Green	Ethernet cable present, link established
GE1: Speed	Rear	Rear	Blinking green	Blink frequency indicates port speed 1 blink per second: 10 Mbps 2 blinks per second: 100 Mbps 3 blinks per second: 1000 Mbps
PS1	—	Front	Off	Power supply 1 not present
			Steady green	Present and enabled
			Amber	Present and off or malfunctioning
PS2	—	Front	Off	Power supply 2 not present
			Steady green	Present and enabled
			Amber	Present and off or malfunctioning

The show environment Command

The **show environment** command can help you monitor and troubleshoot router power and ventilation status.

This is an example of the output of the **show environment** command for a Cisco 3825 router with an AC power supply and no Redundant Power System:

```
Router# show environment

Redundant Power System is not present.
SYS PS1 is present.
        Type: AC
AUX (-48V) PS1 is absent.
Fan 1 Normal
Fan 2 Normal
Fan 3 Normal
Fan Speed is Normal
Alert settings:
 Intake temperature warning: Enabled, Threshold: 50
 Core temperature warning: Enabled, Threshold: 70 (CPU: 95)
Board Temperature: Normal
 Internal-ambient temperature = 29, Normal
 CPU temperature = 46, Normal
 Intake temperature = 31, Normal
Voltage 1(3300) is Normal, Current voltage = 3316 mV
Voltage 2(5150) is Normal, Current voltage = 5210 mV
Voltage 3(2500) is Normal, Current voltage = 2525 mV
Voltage 4(1200) is Normal, Current voltage = 1191 mV
```

This is an example of the output of the **show environment** command for a Cisco 3845 router that has one AC power supply with IP phone power output installed:

```
Router# show environment

SYS PS1 is present
    Fan status: Normal
        Input Voltage status: Normal
        DC Output Voltage status: Normal
        Type: AC
        Thermal status: Normal
SYS PS2 is absent
AUX (-48V) PS1 is present
AUX (-48V) PS2 is absent
Fan 1 Normal
Fan 2 Normal
Fan 3 Normal
Fan Speed is Normal

Alert settings:
Intake temperature warning: Enabled, Threshold: 50
Core temperature warning: Enabled, Threshold: 70 (CPU: 90)
Board Temperature: Normal
 Internal-ambient temperature = 31, Normal
 CPU temperature = 50, Normal
 Intake temperature = 25, Normal
 Backplane temperature = 24, Normal
Voltage 1(3300) is Normal, Current voltage = 3284 mV
Voltage 2(5150) is Normal, Current voltage = 5210 mV
Voltage 3(2500) is Normal, Current voltage = 2549 mV
Voltage 4(1200) is Normal, Current voltage = 1215 mV
```

Error Messages

This section describes error messages that may appear on an external console screen. (For more information about consoles, see the "Connecting a Console or Modem" section on page 11 of "Connecting Cables to Cisco 3800 Series Routers.")

Cisco IOS software checks the system once every 30 seconds. If an error still exists, the error message is displayed again; if the error has cleared, a recovery message is displayed.

Error Message `System detected OVERTEMPERATURE condition. Please resolve cooling problem immediately!`

Explanation The router is operating at a temperature higher than the user-set threshold, possibly caused by fan failure, air-conditioning failure in the room, or air blockage to cooling vents.

Recommended Action Make sure that the ambient room temperature does not exceed 40 degrees C and that airflow to the router is not blocked. See the "Site Environment" section on page 4 and the "Equipment Racks" section on page 5 of "Preinstallation Requirements and Planning for Cisco 3800 Series Routers."

If this condition persists, the power-supply thermal monitor automatically shuts down the router. Call your Cisco technical support representative for help, if necessary.

Error Message `Fan 1|2|3 had a rotation error reported.`

Explanation The specified fan is not rotating at the desired speed.

Recommended Action If this error is detected, the router system software automatically increases the fan speed to high. If the rotation error disappears, fan speed is kept at high. If this error appears repeatedly, there is something wrong with the fan. The error will reappear until action is taken.

Error Message `Voltage 1|2|3|4 (3300 mv|5150 mv|2500 mv|1200 mv) has exceeded recommended operating limits.`

Explanation One of the internal voltage outputs is outside its operating limits.

Recommended Action System failure. See the "Cisco One-Year Limited Hardware Warranty Terms" section on page 9 of "Introduction to Cisco 3800 Series Routers Hardware Documentation" for information about customer service.

Cisco 3845 Router Error Messages

The Cisco 3845 router supports two internal power supplies and returns the following error messages for them.

Error Message `System detected SYS PS 1|2 input voltage fail condition.`

Explanation Power to the indicated power supply has failed.

Recommended Action Check the input power source and power cable.

Error Message `System detected SYS PS 1|2 output voltage fail condition.`

Explanation The indicated power supply has failed.

Recommended Action Replace the power supply. See "Installing and Upgrading Internal Components in Cisco 3800 Series Routers."

Error Message `System detected AUX (-48V) PS 1|2 fail condition.`

Explanation The indicated AC power supply with IP phone power output has failed.

Recommended Action Replace the power supply. See "Installing and Upgrading Internal Components in Cisco 3800 Series Routers."

Error Message `System detected thermal warning on SYS PS 1|2. System is close to auto shutdown limit.`

Explanation The power supply is operating at an abnormally high temperature.

Recommended Action Make sure that the ambient room temperature does not exceed 40 degrees C and that air flow to the router is not blocked. See the "Site Environment" section on page 4 and the "Equipment Racks" section on page 5 of "Preinstallation Requirements and Planning for Cisco 3800 Series Routers."

The power supply fan may have failed or be about to fail. Replace the power supply. See "Installing and Upgrading Internal Components in Cisco 3800 Series Routers."

If this condition persists, the power-supply thermal monitor automatically shuts down the router. Call your Cisco technical support representative for help, if necessary.

Error Message `System detected SYS PS 1|2 fan fail condition.`

Explanation The fan on the indicated power supply has failed.

Recommended Action Replace the power supply. See "Installing and Upgrading Internal Components in Cisco 3800 Series Routers."

Error Message `There is more than one failure with power system 1|2 or this power system has been turned off.`

Explanation Multiple failures have occurred in the indicated power supply. This message can also appear if you have installed two power supplies in a Cisco 3845 router, but only one is powered on.

Recommended Action If the power supply is turned off, turn it on. If it has failed, replace it. See "Installing and Upgrading Internal Components in Cisco 3800 Series Routers."

Jumper Settings

If a ROM monitor failure occurs, you may need to change a jumper setting on the motherboard so the router can boot for troubleshooting. Procedures for accessing the motherboard are described and jumper locations are shown in "Installing and Upgrading Internal Components in Cisco 3800 Series Routers." You may need to set one of the following jumpers:

- DUART DFLT—Sets the console connection data rate to 9600 regardless of user configuration

  Change this setting if the console displays garbage characters. The jumper forces the data rate to a known good value.

- BOOT DFLT—Boots from the read-only boot image in case an upgrade is corrupted

  Change this setting if the router consistently hangs or crashes after a ROM monitor upgrade.

- WDOG DIS—Disables the watchdog timer

If you change either of the first two settings as shown, the router stays in the new configuration during subsequent power cycles and the jumper can be removed.

Note The jumpers are not needed to troubleshoot Cisco IOS problems. If the Cisco IOS software becomes corrupted, remove the CompactFlash memory card to force the router to boot in ROM monitor mode.

Change these settings only after consulting with your service representative or Cisco technical support.

Recovering a Lost Password

You can recover a lost enable password, but an enable secret password is encrypted and is not recoverable. If you lose an enable secret password configured on your router, you can replace it with a new enable secret password.

For password recovery and replacement procedures, see http://www.cisco.com/en/US/products/hw/routers/ps274/products_password_recovery09186a0080094774.shtml.

More Troubleshooting Help

For information about obtaining technical support, see the "Cisco One-Year Limited Hardware Warranty Terms" section on page 9 of "Introduction to Cisco 3800 Series Routers Hardware Documentation."