CHAPTER 3

Troubleshooting

Use the information in this chapter to help isolate problems you might encounter with the Cisco 1721 router or to rule out the router as the source of the problem.

This appendix contains the following sections:

Contacting Your Cisco Reseller

If you cannot locate the source of a problem, contact your local reseller for advice. Before you call, you should have the following information ready:

- Chassis type and serial number
- Maintenance agreement or warranty information
- Type and version number of the Cisco IOS installed on your router
- Date you received the router
- Brief description of the problem
- Brief description of the steps you have taken to isolate the problem
- Output from the **show tech-support** command

Recovering a Lost Password

This section describes how to recover a lost enable password and how to enter a new enable secret password.

Password recovery consists of the following major processes:

- Determining the Configuration Register Value

  With this process, you determine the configuration of the router, so that you may restore the configuration after the password is recovered.

- Resetting the Router

  With this process, you reconfigure the router to its intial startup configuration. You then display the enable password, if one is used.

- Resetting the Password

  If you are using an enable secret password, you enter a new password with this process. You then restore the router to its prior configuration.

- Resetting the Configuration Register Value

  If you are using an enable password, you use this process to restore the router to its prior configuration.

Note See the "Hot Tips" section on Cisco.com for additional information on replacing enable secret passwords.

Determining the Configuration Register Value

Follow these steps to determine the configuration register value:

Step 1 Connect an ASCII terminal or a PC running a terminal-emulation program to the console port on the router. See the "Connecting a PC" section in Chapter 2, "Installation."

Step 2 Configure the terminal to operate at 9600 baud, 8 data bits, no parity, 1 stop bit and no flow control.

Step 3 Reboot the router by pressing the power switch to the off (0) position and then to the on (|) position.

Step 4 At the user EXEC prompt (`Router>`), enter the **show version** command to display the existing configuration register value (shown at the end of this example output):

```
Router> show version

Cisco Internetwork Operating System Software
IOS (tm) C1700 Software (C1700-K9SY-M), Version 12.2(4)YA EARLY
DEPLOYMENT RELEASE SOFTWARE (fc1)
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Mon 14-Jan-02 16:34 by ramesh
Image text-base: 0x80008108, data-base: 0x80BC77E8

ROM: System Bootstrap, Version 12.2(7r)XM1, RELEASE SOFTWARE (fc1)

1721 uptime is 4 days, 23 hours, 54 minutes
System returned to ROM by reload
Running default software

cisco 1721 (MPC860P) processor (revision 0x101) with 36864K/12288K
bytes of memory.
Processor board ID VEN0539000D (3033334544), with hardware revision
0000
MPC860P processor: part number 5, mask 2
Bridging software.
X.25 software, Version 3.0.0.
1 Ethernet/IEEE 802.3 interface(s)
1 FastEthernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
1 Virtual Private Network (VPN) Modules(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x0
```

Step 5 Record the setting of the configuration register. It is usually 0x0.

Step 6 Record the break setting, as given by bit 8 of the configuration register.

- Break enabled—Bit 8 is set to 0.
- Break disabled (default setting)—Bit 8 is set to 1.

Resetting the Router

Follow these steps to reset the router:

Step 1 Do one of the following:

- If break is enabled, go to Step 2.
- If break is disabled, turn off the router, wait 5 seconds, and turn it on again. Within 60 seconds, press the **Break** key. The terminal displays the ROM monitor prompt. Go to Step 3.

Note Some terminal keyboards have a key labeled Break. If your keyboard does not have a Break key, refer to the documentation that came with the terminal for instructions on how to send a break. To send a break in Windows HyperTerminal, enter Ctrl-Break.

Step 2 Send a break. The terminal displays the following prompt:

```
rommon 2>
```

Step 3 Enter **confreg 0x142** to reset the configuration register:

```
rommon 2> confreg 0x142
```

Step 4 Initialize the router by entering the **reset** command:

```
rommon 2> reset
```

The router resets, and the configuration register is set to 0x142. The router boots the system image in Flash memory and displays the following:

```
--- System Configuration Dialog ---
```

Step 5 Enter **no** in response to the prompts until the following message is displayed:

```
Press RETURN to get started!
```

Step 6 Press **Return**. The following prompt appears:

```
Router>
```

Step 7 Enter the **enable** command to enter privileged EXEC mode. Configuration changes can be made only in this mode.

```
Router> enable
```

The prompt changes to the privileged EXEC prompt:

```
Router#
```

Step 8 Enter the **show startup-config** command to display an enable password in the configuration file:

```
Router# show startup-config
```

If you are using an enable password, it will appear in the startup configuration. Write down the password and keep the record secure.

If you are using a secret enable password, there will be no enable password in the startup configuration.

Step 9 Enter the **copy startup-config running-config** command to return to your startup configuration:

```
Router# copy startup-config running-config
```

If you are recovering an enable password, skip the next section, "Resetting the Password," and complete the password recovery process by performing the steps in the "Resetting the Configuration Register Value" section.

If you are resetting an enable secret password, you will not see it displayed in the **show startup-config** command output. Complete the password recovery process by performing the steps in the "Resetting the Password" section, which follows.

Resetting the Password

Follow these steps to reset an enable secret password and restore the configuration of the router:

Step 1 Enter the **configure terminal** command to enter configuration mode:

```
Router# configure terminal
```

Step 2 Enter the **enable secret** command to reset the enable secret password in the router:

```
Router(config)# enable secret <gobbledegook>
```

Step 3 Enter the **config-register** command and the original configuration register value that you recorded in Step 5 in the "Determining the Configuration Register Value" section on page 3-2.

Step 4 Press **Ctrl-Z** to exit configuration mode.

```
Router(config)# Ctrl-Z
```

Step 5 Save your configuration changes:

```
Router# copy running-config startup-config
```

Step 6 Reboot the router, and enter the enable secret password.

Resetting the Configuration Register Value

Follow these steps to restore the configuration of the router after you have recovered an enable password:

Step 1 Enter the **configure terminal** command to enter configuration mode:

```
Router# configure terminal
```

Step 2 Enter the **config-register** command and the original configuration register value that you recorded in Step 5 in the "Determining the Configuration Register Value" section on page 3-2.

Step 3 Press **Ctrl-Z** to exit configuration mode:

```
Router(config)# Ctrl-Z
```

Step 4 Reboot the router, and enter the recovered enable password.

Problem Solving

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

In problem solving, consider the following subsystems of the router:

- WICs—Refer to the LEDs on the cards and the LEDs on the router front panel to help identify a failure. For more information on WICs, refer to the *Cisco WAN Interface Cards Hardware Installation Guide*, which comes with each card.
- Cables—Check all the external cables that connect the router to the network.
- Power system—Check the external power source, power cable, router power supply, and circuit breaker. Check for inadequate ventilation or air circulation that might cause overheating.
- ISDN configuration—Consider ISDN-specific hardware and software configurations (ISDN BRI WICs only).

OK LED Diagnostics

Use the front-panel OK LED to determine any problems with the router. When the router first boots up, it performs a power-on self-test (POST). If the router detects a problem during the POST, the OK LED blinks in different patterns (described in Table 3-1), depending on the problem. A pattern consists of a specific number of blinks that is repeated until the router is turned off. If the router experiences any of these problems, contact your Cisco reseller.

Table 3-1 OK LED Blinking Patterns

Number of Blinks	Meaning
2	The 860P dual-port random-access memory (DPRAM) has failed.
3	The parameter RAM area of the 860P DPRAM has failed.
4	The 860P system protection control register has a write failure.
5	The router cannot detect the dynamic random-access memory (DRAM).
6	The user programmable machine has a write failure.
9	The router DRAM has failed.

Troubleshooting WICs and Cables

Use the **show diag** command to help determine problems with a card. Table 3-2 lists problems that could occur with WAN interface cards (WICs) and the possible causes of these problems.

Table 3-2 Troubleshooting WICs

Symptom	Possible Cause(s)

Router does not recognize WIC.	• Confirm that the Cisco IOS software version installed in the router supports the WIC. The *Cisco WAN Interface Cards Hardware Installation Guide* lists the software requirements for each card.
	• Make sure that the WIC is correctly installed in the router. See the "Installing WICs" section in the "Installation" chapter of this guide.
	• Use the **show diag** command to display information about the card:
	`Router# show diag`
	`Slot 0:`
	`C1721 1FE Mainboard port adapter, 4 ports`
	`Port adapter is analyzed`
	`Port adapter insertion time unknown`
	`Hardware revision 0.0 Board revision UNKNOWN`
	`Serial number 1314672220 Part number 00-0000-00`
	`Test history 0x0 RMA number 00-00-00`
	`EEPROM format version 1`
	`EEPROM contents (hex):`
	`0x20: 01 B2 00 00 4E 5C 4E 5C 00 00 00 00 00 00 00 00`
	`0x30: 00 00 00 04 00 00 00 00 00 00 00 00 00 00 00 00`
	`WIC Slot 0:`
	`Serial 1T WAN daughter card`
	`Hardware revision 1.1 Board revision E0`
	`Serial number 7131279 Part number 73-1775-02`
	`Test history 0x0 RMA number 00-00-00`
	`Connector type Wan Module`
	`EEPROM format version 1`
	`EEPROM contents (hex):`
	`0x20: 01 02 01 01 00 6C D0 8F 49 06 EF 02 00 00 00 00`
	`0x30: 70 00 00 00 98 01 23 01 FF FF FF FF FF FF FF FF`

Table 3-2 Troubleshooting WICs (continued)

Symptom	Possible Cause(s)
Router recognizes the WIC(s), but the card port(s) do not initialize.	• Make sure that the WIC is correctly installed in the router. See the "Installing WICs" section in the "Installation" chapter of this guide. • Check the external cable connections to make sure they are secure.
Router does not boot properly, or router continuously or intermittently reboots.	Make sure that the WIC is correctly installed in the router. See the "Installing WICs" section in the "Installation" chapter of this guide.
Router boots, but the console screen is frozen.	• Make sure that the console cable is securely connected to the router and to the PC or terminal. • Verify that the parameters for your terminal are set to the following: – 9600 baud – 8 data bits – No parity generated or checked – 1 stop bit
Router powers on and boots only when a particular WIC is removed from the router.	• Confirm that the Cisco IOS software version installed in the router supports the WIC. The *Cisco WAN Interface Cards Hardware Installation Guide* lists the software requirements for each card. • The router might be overheating. Contact your Cisco reseller.
Router powers on and boots only when a particular cable is disconnected.	There might be a problem with the WIC or with the card cables. Consult your Cisco reseller for warranty information.

Troubleshooting the Power System

If the router external power supply fails, you should return it to your Cisco reseller. Table 3-3 list symptoms and possible causes of power problems.

Table 3-3 Troubleshooting the Power System

Symptom	Possible Cause(s)
Router shuts down after being on a short time.	• Make sure that the area in which the router is installed meets the environmental site requirements in Appendix A, "Technical Specifications," in this guide. • If the front panel PWR LED is not on, the power supply has failed.
The router attempts to boot, but all LEDs remain off.	The power supply has failed.
The router is on, but the front panel PWR LED is off.	The power supply has failed.
The front panel PWR LED is on, the front panel OK LED is off, and the router does not pass console or EIA data.	The power supply has failed.

Troubleshooting ISDN

Because ISDN uses many variables and supports many different configurations, it sometimes can cause problems for the router. This section describes possible problems related to the ISDN line.

Two commands are useful for troubleshooting ISDN:

- For routers with an ISDN S/T WIC, enter the **clear interface** command to terminate any active ISDN calls and to reset the ISDN BRI interface. Do this for each ISDN port installed in the router:

```
Router# clear interface bri0
Router# clear interface bri1
```

- For routers with an ISDN U WIC, use the **clear controller** command to terminate any active ISDN calls, to reset the ISDN BRI interface, and to reset the ISDN line between the router and the central office switch. Do this for each ISDN port installed in the router:

```
Router# clear controller bri0
Router# clear controller bri1
```

Table 3-4 lists troubleshooting methods for ISDN-related problems that might occur.

Table 3-4 Troubleshooting ISDN

WIC	Symptom(s)	Check the Following	Possible Causes
ISDN S/T	Router is on, but OK LED on the card is off.	• Is the OK LED on the router front panel on?	• If the OK LED is not on, the router might be malfunctioning. Contact your Cisco reseller.
		• Are all ISDN cables properly connected?	• If the cables are properly connected, the ISDN line might be malfunctioning. Check with your ISDN service provider.
		• Is the NT-1 LED on?	• If the NT-1 LED is not on, the NT1 might be malfunctioning.
ISDN U	Router is on, but the NT-1 LED on the card is off.	• Is the OK LED on?	• If the OK LED is not on, the router might be malfunctioning. Contact your Cisco reseller.
		• Are all ISDN cables properly connected?	• If the cables are properly connected, the ISDN line might be malfunctioning. Check with your ISDN service provider.
		• Is the ISDN line connected to the card ISDN U port?	• If the line is connected to the port, the ISDN line might be malfunctioning. Check with your ISDN service provider.