Troubleshooting

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

This chapter contains the following sections:

- Contacting Your Cisco Reseller
- Recovering a Lost Password
- Problem-Solving

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
- Cisco IOS release 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** EXEC 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-SV3Y-M), Version 12.2(2)XK, EARLY
DEPLOYMENT
RELEASE SOFTWARE (fc1)
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 13-Oct-01 15:26 by ealyon
Image text-base: 0x800080FC, data-base: 0x80D117A8

ROM: System Bootstrap, Version 12.2(2)XK, RELEASE SOFTWARE (fc1)
ROM: C1700 Software (C1700-SV3Y-M), Version 12.2(4)XL, EARLY
DEPLOYMENT
RELEASE SOFTWARE (fc1)

Router uptime is 2 days, 1 minute
System returned to ROM by reload
Running default software

cisco 1760 (MPC860) processor (revision 0x00) with 62260K/3276K bytes
of memory.
Processor board ID 0000 (1314672220), with hardware revision 0000
MPC860 processor: part number 5, mask 2
Bridging software.
X.25 software, Version 3.0.0.
Basic Rate ISDN software, Version 1.1.
1 FastEthernet/IEEE 802.3 interface(s)
2 Serial(sync/async) network interface(s)
2 ISDN Basic Rate interface(s)
4 Voice FXS interface(s)
4 Voice NT or TE BRI interface(s)
32K bytes of non-volatile configuration memory.
8192K bytes of processor board System flash partition 1 (Read/Write)
8192K bytes of processor board System flash partition 2 (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 the router off, 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.

When problem-solving, consider the following subsystems of the router:

- WICs and VICs—Observe the LEDs on the cards and the LEDs on the router front panel to help identify a failure. For more information on WICs and VICs, refer to the *Cisco WAN Interface Cards Hardware Installation Guide* that 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 OK LED to help 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 a different pattern (described in Table 3-1), depending on the problem. A pattern is 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 Blinking Patterns of the OK LED

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

Troubleshooting WICs and VICs

Use the **show diag** command to help determine problems with a card.

```
Router# show diag

      Slot 0:
        C1760 1FE VE 4SLOT DV Mainboard Port adapter, 9 ports
        Port adapter is analyzed
        Port adapter insertion time unknown
        EEPROM contents at hardware discovery:
        Hardware Revision        : 0.0
        PCB Serial Number        :
        Part Number              : 00-0000-00
        Fab Version              : 04
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 03 16 41 00 00 C1 8B 00 00 00 30 30 30
          0x10: 30 00 00 00 00 82 00 00 00 00 02 04 FF FF FF FF
          0x20: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

        Packet Voice DSP Module Slot 0:
        Hardware Revision        : 2.2
        Part Number              : 73-3815-01
        Board Revision           : A0
```

```
  Deviation Number         : 0-0
  Fab Version              : 02
  PCB Serial Number        : ICP0339007X
  RMA Test History         : 00
  RMA Number               : 0-0-0-0
  RMA History              : 00
  Processor type           : 02
  Number of DSP's          : 2
  Type of DSP              : TMS320C549
  EEPROM format version 4
  EEPROM contents (hex):
  0x00:   04 FF 40 01 5B 41 02 02 82 49 0E E7 01 42 41 30
  0x10:   80 00 00 00 00 02 02 C1 8B 49 43 50 30 33 33 39
  0x20:   30 30 37 58 03 00 81 00 00 00 00 04 00 09 02 FF

  Packet Voice DSP Module Slot 1:
  Hardware Revision        : 2.2
  Part Number              : 73-3741-01
  Board Revision           : A0
  Deviation Number         : 0-0
  Fab Version              : 02
  PCB Serial Number        : ICP0326001Y
  RMA Test History         : 00
  RMA Number               : 0-0-0-0
  RMA History              : 00
  Processor type           : 02
  Number of DSP's          : 1
  Type of DSP              : TMS320C549
  EEPROM format version 4
  EEPROM contents (hex):
  0x00:   04 FF 40 01 5A 41 02 02 82 49 0E 9D 01 42 41 30
  0x10:   80 00 00 00 00 02 02 C1 8B 49 43 50 30 33 32 36
  0x20:   30 30 31 59 03 00 81 00 00 00 00 04 00 09 02 FF

WIC/VIC Slot 0:
  Serial 2T (12in1)
  Hardware revision 1.0   Board revision B0
  Serial number     0017662984    Part number    800-03181-01
  Test history      0x00          RMA number     00-00-00
  Connector type    PCI
  EEPROM format version 1
  EEPROM contents (hex):
  0x20:   01 12 01 00 01 0D 84 08 50 0C 6D 01 00 00 00 00
  0x30:   58 00 00 00 00 01 03 00 FF FF FF FF FF FF FF FF

  WIC/VIC Slot 1:
  Dual FXS Voice Interface Card
  Hardware revision 1.1   Board revision F0
```

```
Serial number     0014501612    Part number    800-02493-01
Test history      0x00          RMA number     00-00-00
Connector type    WAN Module
EEPROM format version 1
EEPROM contents (hex):
0x20:   01 0E 01 01 00 DD 46 EC 50 09 BD 01 00 00 00 00
0x30:   78 00 00 00 99 05 26 01 FF FF FF FF FF FF FF FF

VIC Slot 2:
Dual FXS Voice Interface Card
Hardware revision 1.1   Board revision B0
Serial number     0019621176    Part number    800-02493-02
Test history      0x00          RMA number     00-00-00
Connector type    WAN Module
EEPROM format version 1
EEPROM contents (hex):
0x20:   01 0E 01 01 01 2B 65 38 50 09 BD 02 00 00 00 00
0x30:   58 00 00 00 00 05 15 01 FF FF FF FF FF FF FF FF

 VIC Slot 3:
Dual NT or TE BRI Voice Interface Card
Hardware revision 1.0   Board revision B0
Serial number     0022850526    Part number    800-07272-01
Test history      0x00          RMA number     00-00-00
Connector type    PCI
EEPROM format version 1
EEPROM contents (hex):
0x20:   01 32 01 00 01 5C AB DE 50 1C 68 01 00 00 00 00
0x30:   58 00 00 00 00 10 27 00 FF FF FF FF FF FF FF FF
```

The **show diag** command displays similar information for each port available on the router.

Table 3-2 lists problems that could occur with the WICs and VICs and describes possible solutions.

Table 3-2 Troubleshooting WICs and VICs

Symptom	Possible Solutions
Router does not recognize the card.	• Confirm that the Cisco IOS release installed in the router supports the WIC or VIC. • Make sure that you have a Cisco IOS feature set that supports voice. The *Cisco WAN Interface Cards Hardware Installation Guide* lists the software requirements for each card. • Make sure that the card is correctly installed in the router. See the "Installing WICs and VICs" section in Chapter 2, "Installation."
Router recognizes the cards, but the card ports do not initialize.	• Make sure that the card is correctly installed in the router. Refer to the "Installing WICs and VICs" section in the "Installation" chapter. • Check the external cable connections to make sure they are secure.
Router does not boot properly, or router reboots continuously or intermittently.	Make sure that the WIC or VIC is correctly installed in the router. See the "Installing WICs and VICs" section in Chapter 2, "Installation."
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 – 1 stop bit – no flow control
Router does not boot or reset after the WIC or VIC is inserted.	There might be an electrical short. Turn off the router immediately.

Table 3-2 Troubleshooting WICs and VICs (continued)

Symptom	Possible Solutions
Router powers on and boots only when a particular WIC or VIC is removed from the router.	• There may be a problem with the WIC or VIC. Consult your Cisco reseller. • Confirm that the Cisco IOS release installed in the router supports the WIC or VIC. The *Cisco WAN Interface Cards Hardware Installation Guide* lists the software requirements for each card.
Router powers on and boots only when a particular cable is disconnected.	There might be a problem with the WIC or VIC cables. Consult your Cisco reseller for warranty information.

Troubleshooting the Power System

Table 3-3 lists symptoms of and possible solutions to power problems.

Table 3-3 Troubleshooting the Power System

Symptom	Possible Solutions
Router shuts down after being on for a short time.	• The router may be overheating. Make sure that nothing is blocking the fan vents on the side of the router. • Make sure that the area in which the router is installed meets the environmental site requirements given in Appendix A of this guide and in the "Site Requirements" section in the *Regulatory Compliance and Safety Information for Cisco 1700 Routers* document that came with your router. • If the 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. Return the router to your Cisco reseller.

Table 3-3 Troubleshooting the Power System (continued)

Symptom	Possible Solutions
The router is on, but the PWR LED is off.	The PWR LED is broken. Return the router to your Cisco reseller.
The PWR LED is on, the OK LED is off, and the router does not pass console or EIA data.	The router may be malfunctioning. Contact your Cisco reseller.

Troubleshooting ISDN

Because ISDN uses many variables and supports many different configurations, it can sometimes cause problems for the router.

Two commands are useful when 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 bri0/0
Router# clear interface bri1/0
```

- 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-specific problems that might occur.

Table 3-4 Troubleshooting ISDN

WIC	Symptom	Check the Following	Possible Solutions
ISDN S/T	Router is on, but the OK LED on the card is off.	Is the OK LED on?	If no, the router/WIC might be malfunctioning. Contact your Cisco reseller.
		Are all ISDN cables properly connected?	If yes, the ISDN line might be malfunctioning. Check with your ISDN service provider.
		Is the NT1 LED on?	If no, the NT1 might be malfunctioning.
ISDN U	Router is on, but the NT1 LED on the card is off.	Is the OK LED on?	If no, the router/WIC might be malfunctioning. Contact your Cisco reseller.
		Are all ISDN cables properly connected?	If yes, the ISDN line might be malfunctioning. Check with your ISDN service provider.

Table 3-4 Troubleshooting ISDN (continued)

WIC	Symptom	Check the Following	Possible Solutions
ISDN S/T or ISDN U	Card cannot make a connection to the remote router.	Use **show isdn status** command to check the following: Does the current ISDN switch type match actual switch type being used?	Use the **isdn switch-type** command to configure correct switch type.
		Is Layer 1 status deactivated?	• Verify that all ISDN cabling is connected properly. • Use the **show controller bri0** command to check for the message *CO RUNNING LOOPBACK TESTS* or *CO TESTING*. If you receive either message, contact your ISP.
		If Layer 1 status is active, does Layer 3 status say "2 Active Layer 3 calls"?	Router might have called itself. Check destination phone number configured with the **dialer map** command or the **dialer string** command.
		If Layer 1 status is active, does Layer 3 status say "No Active Layer 3 call(s)"?	Make sure that the destination phone number matches the remote router phone number. Make sure that the route to the destination matches the remote router network address.
		If Layer 1 status is active, does Layer 3 status say "1 Active Layer 3 call"?	Check the router protocol configurations.

Fan Behavior

The fans in the Cisco 1760 router are always on. They are not thermostatically controlled, but they are normally operational.