Configuring the PA-5EFL Port Adapter

To continue your Cisco PA-5EFL port adapter installation, you must configure the *Ethernet* interfaces. The instructions that follow apply to all supported platforms. Minor differences between the platforms—with Cisco IOS software commands—are noted.

This chapter contains the following sections:

Using the EXEC Command Interpreter

You modify the configuration of your router through the software command interpreter called the *EXEC* (also called enable mode). You must enter the privileged level of the EXEC command interpreter with the **enable** command before you can use the **configure** command to configure a new interface or change the existing configuration of an interface. The system prompts you for a password if one has been set.

The system prompt for the privileged level ends with a pound sign (#) instead of an angle bracket (>). At the console terminal, use the following procedure to enter the privileged level:

Step 1 At the user-level EXEC prompt, enter the **enable** command. The EXEC prompts you for a privileged-level password as follows:

```
Router> enable

Password:
```

Step 2 Enter the password (the password is case sensitive). For security purposes, the password is not displayed.

When you enter the correct password, the system displays the privileged-level system prompt (#):

```
Router#
```

To configure the new interfaces, proceed to the "Configuring the Interfaces" section on page 4-2.

Configuring the Interfaces

After you verify that the new PA-5EFL port adapter is installed correctly (the enabled LED goes on), use the privileged-level **configure** command to configure the new interfaces. Have the following information available:

- Protocols you plan to route on each new interface
- IP addresses, if you plan to configure the interfaces for IP routing
- Bridging protocols you plan to use

If you installed a new PA-5EFL port adapter or if you want to change the configuration of an existing interface, you must enter configuration mode to configure the new interfaces. If you replaced a PA-5EFL port adapter that was previously configured, the system recognizes the new interfaces and brings each of them up in their existing configuration.

For a summary of the configuration options available and instructions for configuring interfaces on a PA-5EFL port adapter, refer to the appropriate configuration publications listed in the "Related Documentation" section on page vi.

You execute configuration commands from the privileged level of the EXEC command interpreter, which usually requires password access. Contact your system administrator, if necessary, to obtain password access. (See the "Using the EXEC Command Interpreter" section on page 4-1 for an explanation of the privileged level of the EXEC.)

This section contains the following subsections:

Shutting Down an Interface

Before you remove an interface that you will not replace, or replace port adapters, use the **shutdown** command to shut down (disable) the interfaces to prevent anomalies when you reinstall the new or reconfigured interface processor. When you shut down an interface, it is designated *administratively down* in the **show** command displays.

Follow these steps to shut down an interface:

Step 1 Enter the privileged level of the EXEC command interpreter (also called enable mode). (See the "Using the EXEC Command Interpreter" section on page 4-1 for instructions.)

Step 2 At the privileged-level prompt, enter configuration mode and specify that the console terminal is the source of the configuration subcommands, as follows:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

Step 3 Shut down interfaces by entering the **interface ethernet** subcommand (followed by the interface address of the interface) and then enter the **shutdown** command. Table 4-1 shows the command syntax.

When you have finished, press **Ctrl-Z**—hold down the **Control** key while you press **Z**—or enter **end** or **exit** to exit configuration mode and return to the EXEC command interpreter.

Table 4-1 Syntax of the shutdown Command

Platform	Command	Example

Cisco 7120 series routers	**interface**, followed by the *type* (**ethernet**) and *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 and interface 1 on a port adapter in port adapter slot 3.
		`Router(config-if)# interface ethernet 3/0`
		`Router(config-if)# shutdown`
		`Router(config-if)# interface ethernet 3/1`
		`Router(config-if)# shutdown`
		`Ctrl-Z`
		`Router#`

Cisco 7140 series routers	**interface**, followed by the *type* (**ethernet**) and *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 and interface 1 on a port adapter in port adapter slot 4.
		`Router(config-if)# interface ethernet 4/0`
		`Router(config-if)# shutdown`
		`Router(config-if)# interface ethernet 4/1`
		`Router(config-if)# shutdown`
		`Ctrl-Z`
		`Router#`

Cisco 7200 series routers	**interface**, followed by the *type* (**ethernet**) and *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 and interface 1 on a port adapter in port adapter slot 6.
		`Router(config-if)# interface ethernet 6/0`
		`Router(config-if)# shutdown`
		`Router(config-if)# interface ethernet 6/1`
		`Router(config-if)# shutdown`
		`Ctrl-Z`
		`Router#`

Cisco uBR7223 router	**interface**, followed by the *type* (**ethernet**) and *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 and interface 1 on a port adapter in port adapter slot 1.
		`Router(config-if)# interface ethernet 1/0`
		`Router(config-if)# shutdown`
		`Router(config-if)# interface ethernet 1/1`
		`Router(config-if)# shutdown`
		`Ctrl-Z`
		`Router#`

Cisco uBR7246 router	**interface**, followed by the *type* (**ethernet**) and *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 and interface 1 on a port adapter in port adapter slot 2.
		`Router(config-if)# interface ethernet 2/0`
		`Router(config-if)# shutdown`
		`Router(config-if)# interface ethernet 2/1`
		`Router(config-if)# shutdown`
		`Ctrl-Z`
		`Router#`

Cisco 7301 router	**interface**, followed by the *type* (**ethernet**) and *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for the 0 interface on a port adapter in slot 1.
		`Router(config-if)# interface ethernet 1/0`
		`Router(config-if)# shutdown`
		`Ctrl-Z`
		`Router#`

Table 4-1 Syntax of the shutdown Command (continued)

Platform	Command	Example

VIP in Cisco 7000 series or Cisco 7500 series routers	**interface**, followed by the *type* (**ethernet**) and *slot/port adapter/port* (interface-processor-slot-number/ port-adapter-slot-number/ interface-port-number)	The example is for interface 0 and interface 1 on a port adapter in port adapter slot 1 of a VIP installed in interface processor slot 1.
		`Router(config-if)# interface ethernet 1/1/0`
		`Router(config-if)# shutdown`
		`Router(config-if)# interface ethernet 1/1/0`
		`Router(config-if)# shutdown`
		`Ctrl-Z`
		`Router#`

Note If you need to shut down additional interfaces, enter the **interface ethernet** command (followed by the interface address of the interface) for each of the interfaces on your port adapter. Use the **no shutdown** command to enable the interface.

Step 4 Write the new configuration to NVRAM as follows:

```
Router# copy running-config startup-config
[OK]
Router#
```

The system displays an OK message when the configuration has been stored in NVRAM.

Step 5 Verify that new interfaces are now in the correct state (shut down) using the **show interfaces ethernet** command (followed by the interface address of the interface) to display the specific interface. Table 4-2 provides examples.

Table 4-2 Examples of show interfaces Command

Platform	Command	Example

Cisco 7120 series routers	**show interfaces ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 on a port adapter in port adapter slot 1.
		`Router# show interfaces ethernet 1/0`
		`Serial 1/0 is administratively down, line protocol is down`
		`[Additional display text omitted from this example]`

Cisco 7140	**show interfaces ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 on a port adapter in port adapter slot 1.
		`Router# show interfaces ethernet 1/0`
		`Serial 1/0 is administratively down, line protocol is down`
		`[Additional display text omitted from this example]`

Table 4-2 Examples of show interfaces Command (continued)

Platform	Command	Example

Cisco 7200 series	**show interfaces ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 on a port adapter in port adapter slot 6.
		`Router# show interfaces ethernet 6/0`
		`Serial 6/0 is administratively down, line protocol is down`
		`[Additional display text omitted from this example]`

Cisco uBB7223 router	**show interfaces ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 on a port adapter in port adapter slot 1.
		`Router# show interfaces ethernet 1/0`
		`Serial 1/0 is administratively down, line protocol is down`
		`[Additional display text omitted from this example]`

Cisco uBR7246 router	**show interfaces ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 on a port adapter in port adapter slot 2.
		`Router# show interfaces ethernet 2/0`
		`Serial 2/0 is administratively down, line protocol is down`
		`[Additional display text omitted from this example]`

Cisco 7301 router	**show interfaces ethernet**, followed by slot/port (port-adapter-slot-number/ interface-port-number)	The example is for interface 0 on a port adapter in port adapter slot 1.
		`Router# show interfaces ethernet 1/0`
		`Serial 1/0 is administratively down, line protocol is down`
		`[Additional display text omitted from this example]`

VIP2 in Cisco 7000 series or Cisco 7500 series routers	**show interfaces ethernet**, followed by *slot/port adapter/port* (interface-processor-slot-number/ port-adapter-slot-number/ interface-port-number)	The example is for interface 0 on a port adapter in port adapter slot 1 of a VIP2 in interface processor slot 1.
		`Router# show interfaces ethernet 1/1/0`
		`Ethernet 1/1/0 is administratively down, line protocol is down`
		`[Additional display text omitted from this example]`

Step 6 Reenable interfaces by doing the following:

a. Repeat Step 3 to reenable an interface. Substitute the **no shutdown** command for the **shutdown** command.

b. Repeat Step 4 to write the new configuration to memory. Use the **copy running-config startup-config** command.

c. Repeat Step 5 to verify that the interfaces are in the correct state. Use the **show interfaces ethernet** command followed by the interface address of the interface.

For complete descriptions of software configuration commands, refer to the publications listed in the "Related Documentation" section on page vi.

Performing a Basic Configuration

Following are instructions for a basic configuration: enabling an interface and specifying IP routing. You might also need to enter other configuration subcommands, depending on the requirements for your system configuration and the protocols you plan to route on the interface. For complete descriptions of configuration subcommands and the configuration options available for ethernet interfaces, refer to the appropriate software documentation.

In the following procedure, press the **Return** key after each step unless otherwise noted. At any time you can exit the privileged level and return to the user level by entering **disable** at the prompt as follows:

```
Router# disable

Router>
```

Step 1 Enter configuration mode and specify that the console terminal is the source of the configuration subcommands, as follows:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

Step 2 Specify the first interface to configure by entering the **interface ethernet** subcommand, followed by the interface address of the interface you plan to configure. Table 4-3 gives examples.

Table 4-3 Examples of interface ethernet Subcommand

Platform	Command	Example

Cisco 7120 series routers	**interface ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for the first interface of a port adapter in port adapter slot 3.
		`Router(config)# interface ethernet 3/0`
		`Router(config-if)#`

Cisco 7140 series routers	**interface ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for the first interface of a port adapter in port adapter slot 4.
		`Router(config)# interface ethernet 4/0`
		`Router(config-if)#`

Table 4-3 Examples of interface ethernet Subcommand (continued)

Platform	Command	Example

Cisco 7200 series routers	**interface ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for the first interface of a port adapter in port adapter slot 1.
		`Router(config)# interface ethernet 1/0`
		`Router(config-if)#`

Cisco uBR7223 router	**interface ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for the first interface of a port adapter in port adapter slot 1.
		`Router(config)# interface ethernet 1/0`
		`Router(config-if)#`

Cisco uBR7246 router	**interface ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for the first interface of a port adapter in port adapter slot 2.
		`Router(config)# interface ethernet 2/0`
		`Router(config-if)#`

Cisco 7301 router	**interface ethernet**, followed by *slot/port* (port-adapter-slot-number/ interface-port-number)	The example is for the first interface of a port adapter in port adapter slot 1.
		`Router(config)# interface ethernet 1/0`
		`Router(config-if)#`

VIP2 in Cisco 7000 series or Cisco 7500 series routers	**interface ethernet**, followed by *slot/port adapter/port* (interface-processor-slot-number/ port-adapter-slot-number/ interface-port-number)	The example is for the first interface of a port adapter in port adapter slot 1 of a VIP2 in interface processor slot 1.
		`Router(config)# interface ethernet 1/1/0`
		`Router(config-if)#`

Step 3 Assign an IP address and subnet mask to the interface (if IP routing is enabled on the system) by using the **ip address** subcommand, as in the following example:

```
Router(config-if)# ip address 10.0.0.0 10.255.255.255
```

Step 4 Add any additional configuration subcommands required to enable routing protocols and set the interface characteristics.

Step 5 Reenable the interfaces using the **no shutdown** command. (See the "Shutting Down an Interface" section on page 4-2.)

Step 6 Configure all additional port adapter interfaces as required.

Step 7 After including all of the configuration subcommands to complete your configuration, press **Ctrl-Z**—hold down the **Control** key while you press **Z**—or enter **end** or **exit** to exit configuration mode and return to the EXEC command interpreter prompt.

Step 8 Write the new configuration to NVRAM as follows:

```
Router# copy running-config startup-config
[OK]
Router#
```

This completes the procedure for creating a basic configuration.

Checking the Configuration

After configuring the new interface, use the **show** commands to display the status of the new interface or all interfaces, and use the **ping** and **loopback** commands to check connectivity. This section includes the following subsections:

Using show Commands to Verify the New Interface Status

Table 4-4 demonstrates how you can use the **show** commands to verify that new interfaces are configured and operating correctly and that the *PA-5EFL* appears in them correctly. Sample displays of the output of selected **show** commands appear in the sections that follow. For complete command descriptions and examples, refer to the publications listed in the "Related Documentation" section on page vi.

Note The outputs that appear in this document may not match the output you receive when running these commands. The outputs in this document are examples only.

Table 4-4 Using show Commands

Command	Function	Example
show version or **show hardware**	Displays system hardware configuration, the number of each interface type installed, Cisco IOS software version, names and sources of configuration files, and boot images	`Router# show version`
show controllers	Displays all the current interface processors and their interfaces	`Router# show controllers`
show diag *slot*	Displays types of port adapters installed in your system and information about a specific port adapter slot, interface processor slot, or chassis slot	`Router# show diag 2`
show interfaces *type* **1**/ *interface-port-number*	Displays status information about a specific type of interface (for example, ethernet) in a Cisco 7120 series router	`Router# show interfaces ethernet 1/1`
show interfaces *type* **4**/ *interface-port-number*	Displays status information about a specific type of interface (for example, ethernet) in a Cisco 7140 series router	`Router# show interfaces ethernet 4/1`
show interfaces *type port-adapter-slot-number/ interface-port- number*	Displays status information about a specific type of interface (for example, ethernet) in a Cisco 7200 series router	`Router# show interfaces ethernet 1/0`

Table 4-4 Using show Commands (continued)

Command	Function	Example
show interfaces *type* **1**/ *interface-port-number*	Displays status information about a specific type of interface (for example, ethernet) in a Cisco uBR7223 router	`Router# show interfaces ethernet 1/1`
show interfaces *type* **1** or **2**/ *interface-port-number*	Displays status information about a specific type of interface (for example, ethernet) in a Cisco uBR7246 router	`Router# show interfaces ethernet 2/0`
show interfaces *type* **1**/ *interface-port-number*	Displays status information about a specific type of interface (for example, ethernet) in a Cisco 7301 router	`Router# show interfaces ethernet 1/0`
show interfaces *type interface-processor-slot-number*/ *port-adapter-slot-number*/ *interface-port-number*	Displays status information about a specific type of interface (for example, ethernet) on a VIP2 in a Cisco 7000 series or Cisco 7500 series router	`Router# show interfaces ethernet 3/1/0`
show protocols	Displays protocols configured for the entire system and for specific interfaces	`Router# show protocols`
show running-config	Displays the running configuration file	`Router# show running-config`
show startup-config	Displays the configuration stored in NVRAM	`Router# show startup-config`

If an interface is shut down and you configured it as up, or if the displays indicate that the hardware is not functioning properly, ensure that the interface is properly connected and terminated. If you still have problems bringing up the interface, contact a service representative for assistance. This section includes the following subsections:

- Using the show version or show hardware Commands, page 4-9
- Using the show diag Command, page 4-12
- Using the show interfaces Command, page 4-14

Choose the subsection appropriate for your system. Proceed to the "Using the ping Command to Verify Network Connectivity" section on page 4-19 when you have finished using the **show** commands.

Using the show version or show hardware Commands

Display the configuration of the system hardware, the number of each interface type installed, the Cisco IOS software version, the names and sources of configuration files, and the boot images, using the `show version` (or `show hardware`) command. The following sections offer some platform-specific output examples using the show version command.

Note The outputs that appear in this document may not match the output you receive when running these commands. The outputs in this document are examples only.

Cisco 7100 Series Routers

Following is an example of the **show version** command from a Cisco 7120 series router.

```
Router# show version
Cisco Internetwork Operating System Software
IOS (tm) EGR Software (c7100-IS-M), Version 12.0(4)XE, EARLY DEPLOYMENT
RELEASE)
TAC:Home:SW:IOS:Specials for info
Copyright (c) 1986-1999 by cisco Systems, Inc.
Compiled Thu 10-Jun-99 15:32 by linda
Image text-base:0x60008900, data-base:0x60D8E000

ROM:System Bootstrap, Version 12.0(19990720:023243)
[gautham-conn_4xe-PRE_ALPHE
BOOTFLASH:EGR Software (c7100-IS-M), Version 12.0(4)XE, EARLY DEPLOYMENT
RELEA)

Router uptime is 24 minutes
System restarted by power-on
System image file is "disk0:c7100-is-mz.120-4.XE"

cisco 7120-bad (EGR) processor with 61440K/69632K bytes of memory.
R527x CPU at 225Mhz, Implementation 40, Rev 10.0, 2048KB L2 Cache
Last reset from power-on
Bridging software.
X.25 software, Version 3.0.0.
4 Ethernet/IEEE 802.3 interfaces.
125K bytes of non-volatile configuration memory.

40960K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).
8192K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x2000
```

Cisco 7200 Series and Cisco uBR7200 Series Routers

Following is an example of the **show version** command from a Cisco 7200 series router.

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-J-M), Version 11.1(7)CA [biff 105]
Copyright (c) 1986-1996 by cisco Systems, Inc.
Compiled Sun 04-Aug-96 06:00 by biff
Image text-base: 0x600088A0, data-base: 0x605A4000

ROM: System Bootstrap, Version 11.1(7)CA RELEASED SOFTWARE

Router uptime is 4 hours, 22 minutes
System restarted by reload
System image file is "c7200-j-mz", booted via slot0

cisco 7206 (NPE150) processor with 12288K/4096K bytes of memory.
R4700 processor, Implementation 33, Revision 1.0 (Level 2 Cache)
Last reset from power-on
Bridging software.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
TN3270 Emulation software (copyright 1994 by TGV INC).
Chassis Interface.
4 Ethernet/IEEE 802.3 interfaces.
2 FastEthernet/IEEE 802.3 interfaces.
4 Token Ring /IEEE802.5 interfaces.
```

```
12 Serial network interfaces.
1 Compression port adapter.
125K bytes of non-volatile configuration memory.
1024K bytes of packet SRAM memory.

20480K bytes of Flash PCMCIA card at slot 0 (Sector size 128K).
8192K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x2
```

Cisco 7301 Routers

```
Router# show version
Cisco Internetwork Operating System Software
IOS (tm) 7301 Software (C7300-JS-M), Experimental Version 12.2(20020904:004736) [biff 107]
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Mon 09-Sep-02 18:02 by biff
Image text-base:0x600088F8, data-base:0x61A94000

ROM:System Bootstrap, Version 12.2(20020730:200705) [biff-TAZ2_QA_RELEASE_16B 101],
DEVELOPMENT SOFTWARE
BOOTLDR:7301 Software (C7301-BOOT-M), Experimental Version 12.2(20020813:014224)
[biff-TAZ2_QA_RELEASE_17B 101]

7301p2b uptime is 0 minutes
System returned to ROM by reload at 00:01:51 UTC Sat Jan 1 2000
System image file is "tftp://10.1.8.11/tazii/images/c7301-js-mz"

cisco 7301 (NPE-G1) processor (revision A) with 491520K/32768K bytes of memory.
Processor board ID 0
BCM1250 CPU at 700Mhz, Implementation 1, Rev 0.2, 512KB L2 Cache
1 slot midplane, Version 2.0

Last reset from power-on
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
3 Gigabit Ethernet/IEEE 802.3 interface(s)
509K bytes of non-volatile configuration memory.

62976K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).
32768K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x102
```

VIP2 in Cisco 7000 Series and Cisco 7500 Series Routers

Following is an example of the **show version** command from a Cisco 7500 series router.

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) GS Software (RSP-A), Version 11.1(7)CA [biff 125]
Copyright (c) 1986-1996 by cisco Systems, Inc.
Compiled Sat 10-Aug-96 17:56 by biff
Image text-base: 0x600108A0, data-base: 0x60952000

ROM: System Bootstrap, Version 5.3(16645) [biff 571], RELEASE SOFTWARE
ROM: GS Software (RSP-BOOT-M), Version 11.1(7)CA, RELEASE SOFTWARE (fc1)

Router uptime is 5 days, 4 minutes
System restarted by reload
```

```
System image file is "rsp-jv-mz", booted via slot0

cisco RSP2 (R4600) processor with 16384K bytes of memory.
R4600 processor, Implementation 32, Revision 2.0
Last reset from power-on
G.703/E1 software, Version 1.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
Bridging software.
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
TN3270 Emulation software (copyright 1994 by TGV Inc).
Chassis Interface.
1 EIP controller (6 Ethernet).
1 VIP2 controller (8 Ethernet)(1 HSSI).
14 Ethernet/IEEE 802.3 interfaces.
1 HSSI network interface.
125K bytes of non-volatile configuration memory.

8192K bytes of Flash PCMCIA card at slot 0 (Sector size 128K).
8192K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x0
```

Using the show diag Command

Display the types of port adapters installed in your system (and specific information about each) using the **show diag** *slot* command, where *slot* is the *port adapter slot* in a Cisco 7200 series routers, Cisco uBR7200 series router, and the Cisco 7301 router, and the *interface processor slot* in a Cisco 7000 series or Cisco 7500 series router with a VIP2.

The following sections offer some platform-specific output examples using the show version command.

Note The outputs that appear in this document may not match the output you receive when running these commands. The outputs in this document are examples only.

Cisco 7100 Series Routers

Following is an example of the **show diag** *slot* command that shows a PA-5EFL port adapter in port-adapter slot 3 of a Cisco 7120 series router.

```
Router# show diag 3
Slot 3:
        Ethernet port adapter, 5 ports
        Integrated port adapter is analyzed
        EEPROM contents at hardware discovery:
        Hardware revision 255.255               Board revision UNKNOWN
        EEPROM format version 1
        EEPROM contents (hex):
          0x20:01 D3 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
```

Note To use the **show diag** command with the Cisco 7140 series router, replace the slot argument **3** with **4**.

Cisco 7200 Series and Cisco uBR7200 Series Routers

Following is an example of the **show diag** *slot* command that shows a PA-5EFL port adapter in port adapter slot 2 of a Cisco 7200 series router.

```
Router# show diag 2
Slot 2:
Ethernet port adapter, 5 ports
Port adapter is analyzed
Port adapter insertion time 2d09h ago
Hardware revision 255.255               Board revision UNKNOWN
Serial number     4294967295    Part number    255-65535-255
Test history      0xFF          RMA number     255-255-255
EEPROM format version 1
EEPROM contents (hex):
0x20: 01 0D 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
```

Note Port adapters used with the Cisco 7200 VXR routers require the correct base hardware revision in order to function. The following error message occurs on bootup if the incorrect hardware revision is used:

```
> PA-3-REVNOTSUPPORTED:PA in slot 1 (Ethernet) requires base h/w revision of (1.5) for this
chassis
```

Use the **show diag** command to display the hardware revision.

Cisco 7301 Routers

Note Input/output data for the console port, auxiliary port, Gigabit Ethernet ports, and CompactFlash Disk are listed in the output of the **show c7300** command, rather than in the output of the **show diag** command. Use the **show diag** command for port adapter information.

```
Router# sh diag

Slot 1:
        POS Single Width, Multi Mode Port adapter, 1 port
        Port adapter is analyzed
        Port adapter insertion time 01:38:29 ago
        EEPROM contents at hardware discovery:
        Hardware revision 2.2           Board revision A0
        Serial number     28672741      Part number    73-3192-06
        FRU Part Number:PA-POS-OC3MM=

        Test history      0x0           RMA number     00-00-00
        EEPROM format version 1
        EEPROM contents (hex):
          0x20:01 96 02 02 01 B5 82 E5 49 0C 78 06 00 00 00 00
          0x30:50 00 00 00 02 08 19 00 00 00 FF FF FF FF FF FF
```

VIP2 in Cisco 7000 Series and Cisco 7500 Series Routers

Following is an example of the **show diag** *slot* command that shows a PA-5EFL in port adapter slot 0 on a VIP2 in interface processor slot 1.

```
Router# show diag 1
Slot 1:
        Physical slot 1, ~physical slot 0xE, logical slot 1, CBus 0
        Microcode Status 0xC
        Master Enable, LED, WCS Loaded
        Board is analyzed
        Pending I/O Status: Console I/O
        EEPROM format version 1
        VIP2 controller, HW rev 2.2, board revision UNKNOWN
        Serial number: 03508056  Part number: 73-1554-02
        Test history: 0x00        RMA number: 43-27-00
        Flags: cisco 7000 board; 7500 compatible

        EEPROM contents (hex):
          0x20: 01 15 02 02 00 35 87 58 49 06 12 02 00 2B 1B 00
          0x30: 12 2B 00 2A 1A 00 00 00 00 00 00 00 00 00 00 00

        Slot database information:
        Flags: 0x4      Insertion time: 0x10DC (00:01:17 ago)

        Controller Memory Size: 8 MBytes
        PA Bay 1 Information:
                Ethernet PA, 5 ports
                EEPROM format version 1
                HW rev 1.0, Board revision 6
                Serial number: 03522225  Part number: 73-1679-01
```

Using the show interfaces Command

The **show interfaces** command displays status information (including the physical slot and interface address) for the interfaces you specify. All of the examples that follow specify ethernet interface.

For complete descriptions of interface subcommands and the configuration options available for Cisco 7100, Cisco 7200, Cisco uBR7200, Cisco 7301, and VIP2 interfaces, refer to the publications listed in the "Related Documentation" section on page vi. The following sections offer some platform-specific output examples using the show interfaces command.

Note The outputs that appear in this document may not match the output you receive when running these commands. The outputs in this document are examples only.

Cisco 7100 Series

Following is an example of the **Show interfaces** command used with a Cisco 7120 series router and a Cisco 7140 series router.

In this example, the five ethernet interfaces (0 to 4) are on a port adapter in port adapter slot 3 of a Cisco 7120 series router; also, most of the status information for each interface is omitted. (Interfaces are administratively shut down until you enable them.)

```
Router# show interfaces ethernet 3/0
Ethernet3/0 is up, line protocol is up
  Hardware is AmdP2 Ethernet
  Internet address is 10.0.0.0
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
```

```
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]

Router# show interfaces ethernet 3/1
Ethernet3/1 is up, line protocol is up
  Hardware is AmdP2 Ethernet
  Internet address is 10.0.0.1
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]

Router# show interfaces ethernet 3/2
Ethernet3/2 is up, line protocol is up
  Hardware is AmdP2 Ethernet
  Internet address is 10.0.0.2
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
[Additional display text for remaining interfaces omitted]

Router# show interfaces ethernet 3/3
Ethernet3/3 is up, line protocol is up
  Hardware is AmdP2 Ethernet
  Internet address is 10.0.0.3
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
[Additional display text for remaining interfaces omitted]

Router# show interfaces ethernet 3/4
Ethernet3/4 is up, line protocol is up
  Hardware is AmdP2 Ethernet
  Internet address is 10.0.0.4
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
[Additional display text for remaining interfaces omitted]
```

Note To use the **show interfaces ethernet** command with the Cisco 7140 series router, replace the interface address arguments **3/0**, **3/1**, **3/2**, **3/3**, and **3/4** with **4/0**, **4/1**, **4/2**, **4/3**, and **4/4**, respectively.

Cisco 7120 Router

Following is an example of the **show interfaces ethernet** command, which shows all of the information specific to interface 0 on a PA-5EFL port adapter installed in port adapter slot 3 of a Cisco 7120 router.

```
Router# show interfaces ethernet 3/0
Ethernet3/0 is up, line protocol is up
Hardware is AmdP2 Ethernet
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output 1d17h, output hang never
  Last clearing of "show interface" counters never
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     24 packets output, 5137 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions     DCD=down  DSR=down  DTR=down  RTS=down  CTS=down
```

Note To use the **show interfaces ethernet** command with the Cisco 7140 router, replace the interface address argument **3/0** with **4/0**.

Cisco 7200 Series and Cisco uBR7200 Series Routers

Following is an example of the **show interfaces** command for Cisco 7200 series and Cisco uBR7200 series routers. In the example, the five ethernet interfaces (0 to 4) are on a port adapter in port adapter slot 2; also, most of the status information for each interface is omitted. (Interfaces are administratively shut down until you enable them.)

```
Router# show interfaces ethernet 2/0
Ethernet2/0 is administratively down, line protocol is down
  Hardware is AmdP2 Ethernet, address is 10.0.0.0 (bia 0000.0ca5.2389)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]


Router# show interfaces ethernet 2/1
Ethernet2/1 is administratively down, line protocol is down
  Hardware is AmdP2 Ethernet, address is 10.0.0.1 (bia 0000.0ca5.238a)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]

Router# show interfaces ethernet 2/2
Ethernet2/2 is administratively down, line protocol is down
  Hardware is AmdP2 Ethernet, address is 10.0.0.2 (bia 0000.0ca5.238b)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]


Router# show interfaces ethernet 2/3
Ethernet2/3 is administratively down, line protocol is down
  Hardware is AmdP2 Ethernet, address is 10.0.0.3 (bia 0000.0ca5.238c)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]

Router# show interfaces ethernet 2/4
Ethernet2/4 is administratively down, line protocol is down
  Hardware is AmdP2 Ethernet, address is 10.0.0.4 (bia 0000.0ca5.238d)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]
```

Following is an example of the **show interfaces ethernet** command, which shows all of the information specific to interface port 0 on a PA-5EFL installed in port adapter slot 2.

```
Router# show interfaces ethernet 2/0
Ethernet2/0 is administratively down, line protocol is down
  Hardware is AmdP2 Ethernet, address is 10.0.0.0 (bia 0000.0ca5.238e)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters 2:56:26
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
```

```
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 input packets with dribble condition detected
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets, 0 restarts
     0 output buffer failures, 0 output buffers swapped out
```

Cisco 7301 Router

Following is an example of the **show interfaces** command for Cisco 7301 routers. Most of the status information for each interface is omitted. (Interfaces are administratively shut down until you enable them.)

```
outer# show interfaces
GigabitEthernet0/0 is up, line protocol is up
  Hardware is BCM1250 Internal MAC, address is 0005.dd2c.7c1b (bia 0005.dd2c.7c1b)
  Internet address is 10.1.3.153/16
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Half-duplex, 100Mb/s, media type is RJ45
  output flow-control is off, input flow-control is off
  ARP type:ARPA, ARP Timeout 04:00:00
  Last input 00:00:01, output 00:00:07, output hang never
  Last clearing of "show interface" counters 19:00:50
  Input queue:0/75/63658/0 (size/max/drops/flushes); Total output drops:0

(display text omitted)

GigabitEthernet0/1 is up, line protocol is up
  Hardware is BCM1250 Internal MAC, address is 0005.dd2c.7c1a (bia 0005.dd2c.7c1a)
  Internet address is 192.18.1.1/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 5/255, rxload 6/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s, link type is autonegotiation, media type is SX
  output flow-control is off, input flow-control is off
  ARP type:ARPA, ARP Timeout 04:00:00
  Last input 18:56:46, output 00:00:09, output hang never
  Last clearing of "show interface" counters 19:00:52
  Input queue:0/75/16176489/0 (size/max/drops/flushes); Total output drops:0

(display text omitted)

GigabitEthernet0/2 is up, line protocol is up
  Hardware is BCM1250 Internal MAC, address is 0005.dd2c.7c19 (bia 0005.dd2c.7c19)
  Internet address is 1.1.1.1/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 5/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s, link type is autonegotiation, media type is SX
  output flow-control is off, input flow-control is off
  ARP type:ARPA, ARP Timeout 04:00:00
  Last input 00:04:42, output 00:00:01, output hang never
  Last clearing of "show interface" counters 19:00:54
  Input queue:0/75/22087/0 (size/max/drops/flushes); Total output drops:0

(display text omitted)
```

VIP2 in Cisco 7000 Series or Cisco 7500 Series Routers

Following is an example of the **show interfaces** command used with the VIP2. In this example, the five ethernet interfaces (0 to 4) are on a port adapter port adapter slot 0 of a VIP2 in interface processor slot 3; also, most of the status information for each interface is omitted. (Interfaces are administratively shut down until you enable them.)

```
Router# show interfaces ethernet 3/0/0
Ethernet3/0/1 is administratively down, line protocol is down
  Hardware is cyBus Ethernet, address is 0000.0ca5.2300 (bia 0000.0ca5.2389)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]

Router# show interfaces ethernet 3/0/1
Ethernet3/0/2 is administratively down, line protocol is down
  Hardware is cyBus Ethernet, address is 0000.0ca5.2301 (bia 0000.0ca5.238a)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]


Router# show interfaces ethernet 3/0/2
Ethernet3/0/3 is administratively down, line protocol is down
  Hardware is cyBus Ethernet, address is 0000.0ca5.2302 (bia 0000.0ca5.238b)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]

Router# show interfaces ethernet 3/0/3
Ethernet3/0/3 is administratively down, line protocol is down
  Hardware is cyBus Ethernet, address is 0000.0ca5.2303 (bia 0000.0ca5.238c)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]

Router# show interfaces ethernet 3/0/4
Ethernet3/0/4 is administratively down, line protocol is down
  Hardware is cyBus Ethernet, address is 0000.0ca5.2304 (bia 0000.0ca5.238d)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
[Additional display text omitted from this example]
```

Following is an example of the **show interfaces ethernet** command, which shows all of the information specific to interface 0 on a port adapter in port adapter slot 1 of a VIP2 in interface processor slot 3.

```
Router# show interfaces ethernet 3/1/0
Ethernet3/1/0 is administratively down, line protocol is down
  Hardware is cyBus Ethernet, address is 0000.0ca5.2305 (bia 0000.0ca5.238e)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters 2:56:26
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 input packets with dribble condition detected
     0 packets output, 0 bytes, 0 underruns
```

```
     0 output errors, 0 collisions, 0 interface resets, 0 restarts
     0 output buffer failures, 0 output buffers swapped out
```

Proceed to the next section "Using the ping Command to Verify Network Connectivity" to check network connectivity of the PA-5EFL and switch or router.

Using the ping Command to Verify Network Connectivity

Using the **ping** command, you can verify that an interface port is functioning properly. This section provides a brief description of this command. Refer to the publications listed in the "Related Documentation" section on page vi for detailed command descriptions and examples.

The **ping** command sends echo request packets out to a remote device at an IP address that you specify. After sending an echo request, the system waits a specified time for the remote device to reply. Each echo reply is displayed as an exclamation point (!) on the console terminal; each request that is not returned before the specified timeout is displayed as a period (.). A series of exclamation points (!!!!!) indicates a good connection; a series of periods (.....) or the messages [timed out] or [failed] indicate a bad connection.

Following is an example of a successful **ping** command to a remote server with the address 10.0.0.10:

```
Router# ping 10.0.0.10 <Return>
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echoes to 10.0.0.10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/15/64 ms
Router#
```

If the connection fails, verify that you have the correct IP address for the destination and that the device is active (powered on), and repeat the **ping** command.

Proceed to the next section "Using loopback Commands" to finish checking network connectivity.

Using loopback Commands

With the loopback test you can detect and isolate equipment malfunctions by testing the connection between the PA-5EFL interface and a remote device such as a modem or a CSU/DSU. The **loopback** subcommand places an interface in loopback mode, which enables test packets that are generated from the **ping** command to loop through a remote device or compact serial cable. If the packets complete the loop, the connection is good. If not, you can isolate a fault to the remote device or compact serial cable in the path of the loopback test.

Depending on the mode of the port, issuing the **loopback** command checks the following path:

- When no compact serial cable is attached to the PA-5EFL interface port, or if a DCE cable is attached to a port that is configured as line protocol up, the **loopback** command tests the path between the network processing engine and the interface port only (without leaving the network processing engine and port adapter).
- When a DTE cable is attached to the port, the **loopback** command tests the path between the network processing engine and the near (network processing engine) side of the DSU or modem to test the PA-5EFL interface and compact serial cable.