



CHAPTER 4

Configuring the PA-4E1G

To continue your PA-4E1G installation, you must configure the serial 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, page 4-1](#)
- [Configuring the Interfaces, page 4-2](#)
- [Customizing the Configuration, page 4-9](#)
- [Checking the Configuration, page 4-11](#)

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 to 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-4E1G 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
- Clock timing source you plan to use for each new interface and clock speeds for external timing

If you installed a new PA-4E1G 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-4E1G that was previously configured, the system recognizes the new interfaces and brings them up in their existing configurations.

For a summary of the configuration options available and instructions for configuring interfaces on a PA-4E1G, refer to the appropriate configuration publications listed in the [“Related Documentation” section on page viii](#).

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, page 4-2](#)
- [Performing a Basic Interface Configuration, page 4-7](#)

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 port adapter. 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 serial** subcommand (followed by the interface address of the interface), and then enter the **shutdown** command.
- 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 shows the **shutdown** command syntax for the supported platforms.

**Table 4-1 Syntax of the shutdown Command for the Supported Platforms**

| Platform                                             | Command                                                                                                                                              | Example                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cisco 7120 series routers                            | <b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port</i> (port-adapter-slot-number/interface-port-number)<br><br><b>shutdown</b> | The example is for interface 0 and interface 1 on a port adapter in port adapter slot 3.<br><br>Router(config-if)# <b>interface serial 3/0</b><br>Router(config-if)# <b>shutdown</b><br>Router(config-if)# <b>interface serial 3/1</b><br>Router(config-if)# <b>shutdown</b><br><b>Ctrl-Z</b><br>Router# |
| Cisco 7140 series routers                            | <b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port</i> (port-adapter-slot-number/interface-port-number)<br><br><b>shutdown</b> | The example is for interface 0 and interface 1 on a port adapter in port adapter slot 4.<br><br>Router(config-if)# <b>interface serial 4/0</b><br>Router(config-if)# <b>shutdown</b><br>Router(config-if)# <b>interface serial 4/1</b><br>Router(config-if)# <b>shutdown</b><br><b>Ctrl-Z</b><br>Router# |
| Cisco 7200 series routers and Cisco 7200 VXR routers | <b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port</i> (port-adapter-slot-number/interface-port-number)<br><br><b>shutdown</b> | The example is for interface 0 and interface 1 on a port adapter in port adapter slot 6.<br><br>Router(config-if)# <b>interface serial 6/0</b><br>Router(config-if)# <b>shutdown</b><br>Router(config-if)# <b>interface serial 6/1</b><br>Router(config-if)# <b>shutdown</b><br><b>Ctrl-Z</b><br>Router# |
| Cisco 7201 router                                    | <b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port</i> (port-adapter-slot-number/interface-port-number)<br><br><b>shutdown</b> | The example is for interface 0 and interface 1 on a port adapter in port adapter slot 1.<br><br>Router(config-if)# <b>interface serial 1/0</b><br>Router(config-if)# <b>shutdown</b><br>Router(config-if)# <b>interface serial 1/1</b><br>Router(config-if)# <b>shutdown</b><br><b>Ctrl-Z</b><br>Router# |
| Cisco uBR7223 router                                 | <b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port</i> (port-adapter-slot-number/interface-port-number)<br><br><b>shutdown</b> | The example is for interface 0 and interface 1 on a port adapter in port adapter slot 1.<br><br>Router(config-if)# <b>interface serial 1/0</b><br>Router(config-if)# <b>shutdown</b><br>Router(config-if)# <b>interface serial 1/1</b><br>Router(config-if)# <b>shutdown</b><br><b>Ctrl-Z</b><br>Router# |
| Cisco uBR7246 router                                 | <b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port</i> (port-adapter-slot-number/interface-port-number)<br><br><b>shutdown</b> | The example is for interface 0 and interface 1 on a port adapter in port adapter slot 2.<br><br>Router(config-if)# <b>interface serial 2/0</b><br>Router(config-if)# <b>shutdown</b><br>Router(config-if)# <b>interface serial 2/1</b><br>Router(config-if)# <b>shutdown</b><br><b>Ctrl-Z</b><br>Router# |

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

| Platform                                                        | Command                                                                                                                                                                                           | Example                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cisco 7301 router                                               | <b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port</i> (port-adapter-slot-number/interface-port-number)<br><br><b>shutdown</b>                                              | The example is for interface 0 and interface 1 on a port adapter in port adapter slot 1.<br><br>Router(config-if)# <b>interface serial 1/0</b><br>Router(config-if)# <b>shutdown</b><br>Router(config-if)# <b>interface serial 1/1</b><br>Router(config-if)# <b>shutdown</b><br><b>Ctrl-Z</b><br>Router#                                                                |
| Cisco 7304 PCI Port Adapter Carrier Card in a Cisco 7304 router | <b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port</i> (module-slot-number/interface-port-number)<br><br><b>shutdown</b>                                                    | The example is for interface 0 and interface 1 on a port adapter in a Cisco 7304 PCI Port Adapter Carrier Card in module slot 3 of a Cisco 7304 router.<br><br>Router(config-if)# <b>interface serial 3/0</b><br>Router(config-if)# <b>shutdown</b><br>Router(config-if)# <b>interface serial 3/1</b><br>Router(config-if)# <b>shutdown</b><br><b>Ctrl-Z</b><br>Router# |
| Cisco 7401ASR router                                            | <b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port</i> (port-adapter-slot-number/interface-port-number)<br><br><b>shutdown</b>                                              | The example is for interface 0 and interface 1 on a port adapter in port adapter slot 1.<br><br>Router(config-if)# <b>interface serial 1/0</b><br>Router(config-if)# <b>shutdown</b><br>Router(config-if)# <b>interface serial 1/1</b><br>Router(config-if)# <b>shutdown</b><br><b>Ctrl-Z</b><br>Router#                                                                |
| VIP in Cisco 7000 series routers and Cisco 7500 series routers  | <b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port adapter/port</i> (interface-processor-slot-number/port-adapter-slot-number/interface-port-number)<br><br><b>shutdown</b> | The example is for interface 1 and interface 0 on a port adapter in port adapter slot 1 of a VIP installed in interface processor slot 1.<br><br>Router(config-if)# <b>interface serial 1/1/1</b><br>Router(config-if)# <b>shutdown</b><br>Router(config-if)# <b>interface serial 1/1/0</b><br>Router(config-if)# <b>shutdown</b><br><b>Ctrl-Z</b><br>Router#           |



**Note** If you need to shut down additional interfaces, enter the **interface serial** 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** command (followed by the interface type and interface address of the interface) to display the specific interface.

Table 4-2 provides examples of the **show interfaces serial** command for the supported platforms.

**Table 4-2** Examples of the **show interfaces serial** Command for the Supported Platforms

| Platform                                             | Command                                                                                                       | Example                                                                                                                                                                                                                                            |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cisco 7120 series routers                            | <b>show interfaces serial</b> , followed by <i>slot/port</i> (port-adapter-slot-number/interface-port-number) | The example is for interface 0 on a port adapter in port adapter slot 3.<br>Router# <b>show interfaces serial 3/0</b><br><br>Serial 3/0 is administratively down, line protocol is down<br><br>[Additional display text omitted from this example] |
| Cisco 7140 series routers                            | <b>show interfaces serial</b> , followed by <i>slot/port</i> (port-adapter-slot-number/interface-port-number) | The example is for interface 0 on a port adapter in port adapter slot 4.<br>Router# <b>show interfaces serial 4/0</b><br><br>Serial 4/0 is administratively down, line protocol is down<br><br>[Additional display text omitted from this example] |
| Cisco 7200 series routers and Cisco 7200 VXR routers | <b>show interfaces serial</b> , followed by <i>slot/port</i> (port-adapter-slot-number/interface-port-number) | The example is for interface 0 on a port adapter in port adapter slot 6.<br>Router# <b>show interfaces serial 6/0</b><br><br>Serial 6/0 is administratively down, line protocol is down<br><br>[Additional display text omitted from this example] |
| Cisco 7201 router                                    | <b>show interfaces serial</b> , followed by <i>slot/port</i> (port-adapter-slot-number/interface-port-number) | The example is for interface 0 on a port adapter in port adapter slot 1.<br>Router# <b>show interfaces serial 1/0</b><br><br>Serial 1/0 is administratively down, line protocol is down<br><br>[Additional display text omitted from this example] |
| Cisco uBR7223 router                                 | <b>show interfaces serial</b> , followed by <i>slot/port</i> (port-adapter-slot-number/interface-port-number) | The example is for interface 0 on a port adapter in port adapter slot 1.<br>Router# <b>show interfaces serial 1/0</b><br><br>Serial 1/0 is administratively down, line protocol is down<br><br>[Additional display text omitted from this example] |

Table 4-2 Examples of the `show interfaces serial` Command for the Supported Platforms (continued)

| Platform                                                        | Command                                                                                                                                                          | Example                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cisco uBR7246 router                                            | <code>show interfaces serial</code> , followed by <i>slot/port</i> (port-adapter-slot-number/interface-port-number)                                              | The example is for interface 0 on a port adapter in port adapter slot 2.<br>Router# <code>show interfaces serial 2/0</code><br><br>Serial 2/0 is administratively down, line protocol is down<br><br>[Additional display text omitted from this example]                                                                           |
| Cisco 7301 router                                               | <code>show interfaces serial</code> , followed by <i>slot/port</i> (port-adapter-slot-number/interface-port-number)                                              | The example is for interface 0 on a port adapter in port adapter slot 1.<br>Router# <code>show interfaces serial 1/0</code><br><br>Serial 1/0 is administratively down, line protocol is down<br><br>[Additional display text omitted from this example]                                                                           |
| Cisco 7304 PCI Port Adapter Carrier Card in a Cisco 7304 router | <code>show interfaces serial</code> , followed by <i>slot/port</i> (module-slot-number/interface-port-number)                                                    | The example is for interface 0 on a port adapter in a Cisco 7304 PCI Port Adapter Carrier Card in module slot 3 of a Cisco 7304 router.<br>Router(config-if)# <code>show interfaces serial 3/0</code><br><br>Serial 3/0 is administratively down, line protocol is down<br><br>[Additional display text omitted from this example] |
| Cisco 7401ASR router                                            | <code>show interfaces serial</code> , followed by <i>slot/port</i> (port-adapter-slot-number/interface-port-number)                                              | The example is for interface 0 on a port adapter in port adapter slot 1.<br>Router# <code>show interfaces serial 1/0</code><br><br>Serial 1/0 is administratively down, line protocol is down<br><br>[Additional display text omitted from this example]                                                                           |
| VIP in Cisco 7000 series routers and Cisco 7500 series routers  | <code>show interfaces serial</code> , followed by <i>slot/port adapter/port</i> (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 VIP in interface processor slot 1.<br>Router# <code>show interfaces serial 1/1/0</code><br><br>Serial 1/1/0 is administratively down, line protocol is down<br><br>[Additional display text omitted from this example]                                |

- Step 6** Re-enable interfaces by doing the following:
- Repeat Step 3 to re-enable an interface. Substitute the **no shutdown** command for the **shutdown** command.
  - Repeat Step 4 to write the new configuration to memory. Use the **copy running-config startup-config** command.
  - Repeat Step 5 to verify that the interfaces are in the correct state. Use the **show interfaces** command followed by the interface type and interface address of the interface.

For complete descriptions of software configuration commands, refer to the publications listed in the “[Related Documentation](#)” section on page viii.

## Performing a Basic Interface Configuration

Following are instructions for a basic configuration, which include 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 serial 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 subcommand **interface serial** subcommand, followed by the interface address of the interface you plan to configure.

[Table 4-3](#) gives examples of the **interface serial** subcommand for the supported platforms.

**Table 4-3** Examples of the interface serial Subcommand for the Supported Platforms

| Platform                  | Command                                                                                                        | Example                                                                                                                                                   |
|---------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cisco 7120 series routers | <b>interface serial</b> , followed by <i>slot/port</i><br>(port-adapter-slot-number/<br>interface-port-number) | The example is for the first interface of a port adapter in port adapter slot 3.<br><br>Router(config)# <b>interface serial 3/0</b><br>Router(config-if)# |
| Cisco 7140 series routers | <b>interface serial</b> , followed by <i>slot/port</i><br>(port-adapter-slot-number/<br>interface-port-number) | The example is for the first interface of a port adapter in port adapter slot 4.<br><br>Router(config)# <b>interface serial 4/0</b><br>Router(config-if)# |

**Table 4-3** Examples of the interface serial Subcommand for the Supported Platforms (continued)

| Platform                                                        | Command                                                                                                                                                         | Example                                                                                                                                                                                                                      |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cisco 7200 series routers and Cisco 7200 VXR routers            | <b>interface serial</b> , followed by <i>slot/port</i><br>(port-adapter-slot-number/<br>interface-port-number)                                                  | The example is for the first interface of a port adapter in port adapter slot 6.<br><br>Router (config) # <b>interface serial 6/0</b><br>Router (config-if) #                                                                |
| Cisco 7201 router                                               | <b>interface serial</b> , followed by <i>slot/port</i><br>(port-adapter-slot-number/<br>interface-port-number)                                                  | The example is for the first interface of a port adapter in port adapter slot 1.<br><br>Router (config) # <b>interface serial 1/0</b><br>Router (config-if) #                                                                |
| Cisco uBR7223 router                                            | <b>interface serial</b> , followed by <i>slot/port</i><br>(port-adapter-slot-number/<br>interface-port-number)                                                  | The example is for the first interface of a port adapter in port adapter slot 1.<br><br>Router (config) # <b>interface serial 1/0</b><br>Router (config-if) #                                                                |
| Cisco uBR7246 router                                            | <b>interface serial</b> , followed by <i>slot/port</i><br>(port-adapter-slot-number/<br>interface-port-number)                                                  | The example is for the first interface of a port adapter in port adapter slot 2.<br><br>Router (config) # <b>interface serial 2/0</b><br>Router (config-if) #                                                                |
| Cisco 7301 router                                               | <b>interface serial</b> , followed by <i>slot/port</i><br>(port-adapter-slot-number/<br>interface-port-number)                                                  | The example is for the first interface of a port adapter in port adapter slot 1.<br><br>Router (config) # <b>interface serial 1/0</b><br>Router (config-if) #                                                                |
| Cisco 7304 PCI Port Adapter Carrier Card in a Cisco 7304 router | <b>interface serial</b> , followed by <i>slot/port</i> (module-slot-number/<br>interface-port-number)                                                           | The example is for the first interface on a port adapter in a Cisco 7304 PCI Port Adapter Carrier Card in module slot 3 of a Cisco 7304 router.<br><br>Router (config) # <b>interface serial 3/0</b><br>Router (config-if) # |
| Cisco 7401ASR router                                            | <b>interface serial</b> , followed by <i>slot/port</i><br>(port-adapter-slot-number/<br>interface-port-number)                                                  | The example is for the first interface of a port adapter in port adapter slot 1.<br><br>Router (config) # <b>interface serial 1/0</b><br>Router (config-if) #                                                                |
| VIP in Cisco 7000 series routers and Cisco 7500 series routers  | <b>interface serial</b> , followed by <i>slot/port adapter/port</i><br>(interface-processor-slot-number/<br>port-adapter-slot-number/<br>interface-port-number) | The example is for the first interface of a port adapter in port adapter slot 1 of a VIP in interface processor slot 1.<br><br>Router (config) # <b>interface serial 1/1/0</b><br>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** Re-enable 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.

## Customizing the Configuration

Use the privileged-level **configure** command to perform an advanced interface configuration. You will need the following information to perform this configuration:

- Timing source for each new interface (a line-derived or internal clock signal)
- Whether you will use framed or unframed mode on the interfaces
- The cyclic redundancy check (CRC) you want to use



### Caution

Always issue a **clear interface** command after altering the configuration of an interface, particularly after changing a time slot or CRC4 setting.

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This section contains the following topics:

- [Configuring Framed and Unframed Mode, page 4-9](#)
- [Configuring Timing \(Clock\) Signals, page 4-10](#)
- [Configuring Cyclic Redundancy Checks, page 4-10](#)

## Configuring Framed and Unframed Mode

The PA-4E1G supports both framed (G.704) and unframed (G.703) modes of operation; the default is unframed operation.

To enable framed operation, you must specify the start and stop slots, separated by a hyphen, as follows:

```
timeslot 0/start-slot-31/stop-slot
```

Following is an example of using the **timeslot** command with a start slot of 1 and a stop slot of 13:

```
Router# timeslot 1-13
```

Nonconfigurable combinations of start and stop slots will be ignored, and the interface will be left unchanged.

In framed mode, the system default is not to use time slot 16 for data. To use slot 16 for data, use the **ts16** command in addition to the **timeslot 1-17** command, as follows:

```
Router# timeslot 1-17
Router# ts16
```

To restore the system default, use the **no ts16** command.

## Configuring Timing (Clock) Signals

Each PA-4E1G operates either with an external clock signal that it recovers from the received data stream or its own internal clock signal. The default is the external clock source line.

To specify the clock source, use the **clock source {line | internal}** command.

To change the default and use the internal clock, use the **clock source internal** command.

To return the interface to the default state, use the **clock source line** command. (The **no clock source internal** command also returns the interface to the default state.)



**Note**

All E1-G.703/G.704 interfaces operate at a default clock rate of 2.048 Mbps; you cannot configure the clock rate.

## Configuring Cyclic Redundancy Checks

The 4-bit cyclic redundancy check (CRC4) is an error-checking technique that uses a calculated numeric value to detect errors in transmitted data. By default, CRC4 is not enabled. The sender of a data frame calculates the frame check sequence (FCS). Before it sends a frame, the sender appends the FCS value to the message. The receiver recalculates the FCS and compares its calculation to the FCS from the sender. If there is a difference between the two calculations, the receiver assumes that a transmission error occurred and sends a request to the sender to resend the frame.



**Note**

The E1-G.703/G.704 interface on the PA-4E1G is compliant with BABT 221. The E1-G.703/G.704 interface supports CRC4 in framed mode only.

Table 4-4 summarizes cyclic redundancy check (CRC) commands.

**Table 4-4** CRC Commands

| Command         | Function                         | Example                                                                                                                                                                                 |
|-----------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>crc 4</b>    | Enable 4-bit CRC.                | The example enables 4-bit CRC on a serial interface:<br><br>Router(config)# <b>interface serial 3/0</b><br>Router(config-if)# <b>crc 4</b>                                              |
| <b>no crc 4</b> | Return to default, CRC disabled. | The example disables 4-bit CRC on a serial interface and returns to the default, CRC disabled:<br><br>Router(config)# <b>interface serial 3/0</b><br>Router(config-if)# <b>no crc 4</b> |

Enable CRC4 using the **crc 4** command. Before you can enable 4-bit CRC, you must use the **interface serial** command (followed by the interface address of the interface) to select the interface on which you want to enable 4-bit CRC. This command functions in the same way on all supported platforms.

In the example that follows, 4-bit CRC is specified:

```
Router(config-if)# crc 4
```

The preceding command example applies to all systems in which the PA-4E1G is supported. Use the **no crc 4** command to disable CRC4 and return the interface to the default CRC disabled setting.

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 prompt. Then write the new configuration to NVRAM using the **copy running-config startup-config** command.

For command descriptions, refer to the *Configuration Fundamentals Configuration Guide*.

## 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, page 4-11](#)
- [Using the ping Command to Verify Network Connectivity, page 4-24](#)
- [Using loopback Commands, page 4-25](#)

## Using show Commands to Verify the New Interface Status

Table 4-5 demonstrates how you can use the **show** commands to verify that new interfaces are configured and operating correctly and that the PA-4E1G 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 publication listed in the “[Related Documentation](#)” section on page viii.



### 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 4-5** Using show Commands

| Command                                                       | Function                                                                                                                                                                   | Example                                   |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| <b>show version</b> or<br><b>show hardware</b>                | 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# <b>show version</b>               |
| <b>show controllers</b>                                       | Displays all the current interface processors and their interfaces                                                                                                         | Router# <b>show controllers</b>           |
| <b>show diag slot</b>                                         | Displays types of port adapters installed in your system and information about a specific port adapter slot, interface processor slot, or chassis slot                     | Router# <b>show diag 2</b>                |
| <b>show interfaces type</b><br><b>3/interface-port-number</b> | Displays status information about a specific type of interface (for example, serial) in a Cisco 7120 series router                                                         | Router# <b>show interfaces serial 3/1</b> |

Table 4-5 Using show Commands (continued)

| Command                                                                                                           | Function                                                                                                                                                                                                 | Example                                     |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>show interfaces</b> <i>type 4/interface-port-number</i>                                                        | Displays status information about a specific type of interface (for example, serial) in a Cisco 7140 series router                                                                                       | Router# <b>show interfaces serial 4/1</b>   |
| <b>show interfaces</b> <i>type port-adapter-slot-number/interface-port-number</i>                                 | Displays status information about a specific type of interface (for example, serial) in a Cisco 7200 series router, Cisco 7200 VXR router, Cisco 7201 router, Cisco 7301 router, or Cisco 7401ASR router | Router# <b>show interfaces serial 1/0</b>   |
| <b>show interfaces</b> <i>type 1/interface-port-number</i>                                                        | Displays status information about a specific type of interface (for example, serial) in a Cisco uBR7223 router                                                                                           | Router# <b>show interfaces serial 1/1</b>   |
| <b>show interfaces</b> <i>type 1 or 2/interface-port-number</i>                                                   | Displays status information about a specific type of interface (for example, serial) in a Cisco uBR7246 router                                                                                           | Router# <b>show interfaces serial 2/0</b>   |
| <b>show interfaces</b> <i>type 2 or 3 or 4 or 5/interface-port-number</i>                                         | Displays status information about a specific type of interface (for example, serial) on a Cisco 7304 PCI Port Adapter Carrier Card in a Cisco 7304 router                                                | Router# <b>show interfaces serial 3/0</b>   |
| <b>show interfaces</b> <i>type interface-processor-slot-number/port-adapter-slot-number/interface-port-number</i> | Displays status information about a specific type of interface (for example, serial) on a VIP in a Cisco 7000 series router or Cisco 7500 series router                                                  | Router# <b>show interfaces serial 3/1/0</b> |
| <b>show protocols</b>                                                                                             | Displays protocols configured for the entire system and for specific interfaces                                                                                                                          | Router# <b>show protocols</b>               |
| <b>show running-config</b>                                                                                        | Displays the running configuration file                                                                                                                                                                  | Router# <b>show running-config</b>          |
| <b>show startup-config</b>                                                                                        | Displays the configuration stored in NVRAM                                                                                                                                                               | Router# <b>show startup-config</b>          |

If the interface is 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 4-13](#)
- [Using the show diag Command, page 4-17](#)
- [Using the show interfaces Command, page 4-19](#)

## Using the show version or show hardware Commands

Display the configuration of the system hardware, the number and type 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.



### 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.

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

- [Cisco 7100 Series Routers—Example Output of the show version Command, page 4-13](#)
- [Cisco 7200 Series Routers, Cisco 7200 VXR Routers, and Cisco uBR7200 Series Routers—Example Output of the show version Command, page 4-14](#)
- [Cisco 7201 Router—Example Output of the show version Command, page 4-14](#)
- [Cisco 7401ASR Router—Example Output of the show version Command, page 4-15](#)
- [VIP in Cisco 7000 Series and Cisco 7500 Series Routers—Example Output of the show version Command, page 4-16](#)

### Cisco 7100 Series Routers—Example Output of the show version Command

Following is an example of the **show version** command from a Cisco 7120 series router with a PA-4E1G installed:

```
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.
G.703/E1 software, Version 1.0.
G.703/JT2 software, Version 1.0.

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 Routers, Cisco 7200 VXR Routers, and Cisco uBR7200 Series Routers—Example Output of the show version Command

Following is an example of the **show version** command from a Cisco 7200 series router with a PA-4E1G installed:

```

Router# show version

Cisco Internetwork Operating System Software
IOS (c) 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
Last reset from power-on
G.703/E1 software, Version 1.0.
G.703/JT2 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.
4 Serial network interfaces.

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 7201 Router—Example Output of the show version Command

Following is an example of the **show version** command from a Cisco 7201 router:

```

Router# show version

Cisco IOS Software, 7200 Software (C7200P-ADVENTERPRISEK9-M), Version
12.4(biffDEV.061001), INTERIM SOFTWARE Copyright (c) 1986-2006 by Cisco Systems, Inc.
Compiled Sun 01-Oct-06 23:42 by biff
ROM: System Bootstrap, Version 12.4(4r)XD5, RELEASE SOFTWARE (fc1)

```

```

BOOTLDR: Cisco IOS Software, 7200 Software (C7200P-KBOOT-M), Version 12.4(TAZ3DEV.060927),
INTERIM SOFTWARE
c7201alpha1 uptime is 5 days, 18 hours, 32 minutes System returned to ROM by power-on
System image file is "disk0:c7200p-adventerprisek9-mz.2006-10-01.biffdev"
This product contains cryptographic features and is subject to United States and local
country laws governing import, export, transfer and use. Delivery of Cisco cryptographic
products does not imply third-party authority to import, export, distribute or use
encryption.
Importers, exporters, distributors and users are responsible for compliance with U.S. and
local country laws. By using this product you agree to comply with applicable laws and
regulations. If you are unable to comply with U.S. and local laws, return this product
immediately.
A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html
If you require further assistance please contact us by sending email to export@cisco.com.
Cisco 7201 (c7201) processor (revision A) with 917504K/65536K bytes of memory.
Processor board ID 222222222222
MPC7448 CPU at 1666Mhz, Implementation 0, Rev 2.2
1 slot midplane, Version 2.255
Last reset from power-on
1 FastEthernet interface
4 Gigabit Ethernet interfaces
2045K bytes of NVRAM.
62443K bytes of USB Flash usbflash0 (Read/Write)
250880K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).
65536K bytes of Flash internal SIMM (Sector size 512K).
Configuration register is 0x2

```

### Cisco 7401ASR Router—Example Output of the show version Command

Following is an example of the **show version** command from a Cisco 7401ASR router with a PA-4E1G installed:

```

Router# show version

Cisco Internetwork Operating System Software
IOS (tm) 7401ASR Software (C7401ASR-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 "c7401ASR-j-mz", booted via slot0

cisco 7401ASR processor with 12288K/4096K bytes of memory.
R4700 processor, Implementation 33, Revision 1.0 (Level 2 Cache)
Last reset from power-on
Last reset from power-on
G.703/E1 software, Version 1.0.
G.703/JT2 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.
4 Serial network interfaces.

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
```

## VIP in Cisco 7000 Series and Cisco 7500 Series Routers—Example Output of the show version Command

Following is an example of the **show version** command from a Cisco 7500 series routers with a PA-4E1G installed:

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) GS Software (RSP-JV-M), Version 11.1(14)CA [biff 184]
Synced to mainline version: 11.1(13)
Copyright (c) 1986-1998 by cisco Systems, Inc.
Compiled Wed 08-Oct-98 00:37 by biff
Image text-base: 0x600108A0, data-base: 0x609DC000

ROM: System Bootstrap, Version 5.3(16645) [biff 571]
ROM: GS Software (RSP-BOOT-M), Version 11.1(618) [biff 191]

Router uptime is 3 hours, 14 minutes
System restarted by reload
System image file is "biff/rsp-jv-mz.g703", booted via tftp from 1.1.1.253

cisco RSP2 (R4600) processor with 32768K bytes of memory.
R4600 processor, Implementation 32, Revision 2.0
Last reset from power-on
G.703/E1 software, Version 1.0.
G.703/JT2 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 VIP2 controllers (4 Serial).
4 Serial network interfaces.

125K bytes of non-volatile configuration memory.

16384K bytes of Flash PCMCIA card at slot 0 (Sector size 128K).
8192K bytes of Flash internal SIMM (Sector size 256K).
No slave installed in slot 7.
Configuration register is 0x2
```

## 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 7100 series router, Cisco 7200 series router, Cisco 7200 VXR router, Cisco uBR7200 series router, Cisco 7201 router, Cisco 7301 router, and Cisco 7401ASR router, the *module slot* in a Cisco 7304 PCI Port Adapter Carrier Card in a Cisco 7304 router, and the *interface processor slot* in a Cisco 7000 series router or Cisco 7500 series router with a VIP.



### 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.

The following sections offer some platform-specific output examples using the **show diag** command:

- [Cisco 7100 Series Routers—Example Output of the show diag Command, page 4-17](#)
- [Cisco 7200 Series Routers, Cisco 7200 VXR Routers, and Cisco uBR7200 Series Routers—Example Output of the show diag Command, page 4-17](#)
- [Cisco 7201 Router—Example Output of the show diag Command, page 4-18](#)
- [Cisco 7401ASR Router—Example Output of the show diag Command, page 4-18](#)
- [VIP in Cisco 7000 Series Routers and Cisco 7500 Series Routers—Example Output of the show diag Command, page 4-19](#)

### Cisco 7100 Series Routers—Example Output of the show diag Command

Following is an example of the **show diag** command that shows a PA-4E1G installed in port adapter slot 3 of a Cisco 7120 series router:

```
Router# show diag 3
Slot 3:
Mx serial (ME1-UNBAL) port adapter, 4 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
```



### Note

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

### Cisco 7200 Series Routers, Cisco 7200 VXR Routers, and Cisco uBR7200 Series Routers—Example Output of the show diag Command

Following is an example of the **show diag** command that shows a PA-4E1G installed in port adapter slot 6 of a Cisco 7200 series router:

```
Router# show diag 6
Slot 6:
Mx serial (ME1-UNBAL) port adapter, 4 ports
Port adapter is analyzed
Port adapter insertion time 00:48:28 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 255
EEPROM contents (hex):
 0x20: FF 41 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

```

### Cisco 7201 Router—Example Output of the show diag Command

Following is an example of the **show diag** command from a Cisco 7201 router:

```

Router# show diag 1
Slot 1:
 Dual OC3 POS Port adapter, 2 ports
 Port adapter is analyzed
 Port adapter insertion time 00:02:19 ago
 EEPROM contents at hardware discovery:
 Hardware Revision : 1.0
 PCB Serial Number : JAE07520DYL
 Part Number : 73-8220-02
 Board Revision : A0
 RMA Test History : 00
 RMA Number : 0-0-0-0
 RMA History : 00
 Deviation Number : 0
 Product (FRU) Number : PA-POS-2OC3
 Top Assy. Part Number : 800-21857-02
 EEPROM format version 4
 EEPROM contents (hex):
 0x00: 04 FF 40 03 E3 41 01 00 C1 8B 4A 41 45 30 37 35
 0x10: 32 30 44 59 4C 82 49 20 1C 02 42 41 30 03 00 81
 0x20: 00 00 00 00 04 00 88 00 00 00 00 CB 94 50 41 2D
 0x30: 50 4F 53 2D 32 4F 43 33 20 20 20 20 20 20 20 20
 0x40: 20 C0 46 03 20 00 55 61 02 FF FF FF FF FF FF FF
 0x50: 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
 0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

```

### Cisco 7401ASR Router—Example Output of the show diag Command

Following is an example of the **show diag** command that shows a PA-4E1G installed in port adapter slot 1 of a Cisco 7401ASR router:

```

Router# show diag 1
Slot 1:
 Mx serial (ME1-UNBAL) port adapter, 4 ports
 Port adapter is analyzed
 Port adapter insertion time 00:48:28 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 255
 EEPROM contents (hex):
 0x20: FF 41 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

```

## VIP in Cisco 7000 Series Routers and Cisco 7500 Series Routers—Example Output of the show diag Command

Following is an example of the **show diag** command that shows a PA-4E1G installed in port adapter slot 1 of a VIP2 in interface processor slot 9:

```
Router# show diag 9
Slot 9:
 Physical slot 9, ~physical slot 0x6, logical slot 9, CBus 0
 Microcode Status 0x4
 Master Enable, LED, WCS Loaded
 Board is analyzed
 Pending I/O Status: None
 EEPROM format version 1
 VIP2 controller, HW rev 2.3, board revision A0
 Serial number: 03515977 Part number: 73-1684-03
 Test history: 0x00 RMA number: 00-00-00
 Flags: cisco 7000 board; 7500 compatible

 EEPROM contents (hex):
 0x20: 01 15 02 03 00 35 A6 49 49 06 94 03 00 00 00 00
 0x30: 50 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

 Slot database information:
 Flags: 0x4 Insertion time: 0x3C68 (03:16:49 ago)

 Controller Memory Size: 16 MBytes DRAM, 1024 KBytes SRAM

 PA Bay 1 Information:
 G703 Serial PA, 4 ports
 EEPROM format version 255
 HW rev FF.FF, Board revision UNKNOWN
 Serial number: 4294967243 Part number: 255-65535-255
```

## Using the show interfaces Command

Display status information (including the physical slot and interface address) for the interfaces you specify using the **show interfaces** command.

For complete descriptions of interface subcommands and the configuration options available the individual platforms, refer to the publications listed in the [“Related Documentation”](#) section on [page viii](#).



### 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.

The following sections provide some platform-specific output examples using the **show interfaces** command:

- [Cisco 7100 Series Routers—Example Output of the show interfaces Command, page 4-20](#)
- [Cisco 7200 Series Routers, Cisco 7200 VXR Routers, and Cisco uBR7200 Series Routers—Example Output of the show interfaces Command, page 4-21](#)
- [Cisco 7201 Router—Example Output of the show interfaces Command, page 4-22](#)
- [Cisco 7401ASR Router—Example Output of the show interfaces Command, page 4-22](#)
- [VIP in Cisco 7000 Series Routers or Cisco 7500 Series Routers—Example Output of the show interfaces Command, page 4-23](#)

## Cisco 7100 Series Routers—Example Output of the show interfaces Command

Following are examples of the **show interfaces serial** command used with a Cisco 7120 series router and a Cisco 7140 series router.

In these examples, the four serial interfaces (0 to 3) 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 serial 3/0
Serial3/0 is up, line protocol is up
 Hardware is 4ME1-UNBAL
 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 serial 3/1
Serial3/1 is up, line protocol is up
 Hardware is 4ME1-UNBAL
 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 serial 3/2
Serial3/2 is up, line protocol is up
 Hardware is 4ME1-UNBAL
 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 omitted from this example]
```

```
Router# show interfaces serial 3/3
Serial3/3 is up, line protocol is up
 Hardware is 4ME1-UNBAL
 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 omitted from this example]
```



### Note

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

Following is an example of the **show interfaces serial** command, which shows all of the information specific to interface 0 on a PA-4E1G installed in port adapter slot 3 of a Cisco 7120 series router:

```
Router# show interfaces serial 3/0
Serial3/0 is up, line protocol is up
 Hardware is 4ME1-UNBAL
 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 serial** command with the Cisco 7140 series router, replace the interface address argument **3/0** with **4/0**.

### Cisco 7200 Series Routers, Cisco 7200 VXR Routers, and Cisco uBR7200 Series Routers—Example Output of the show interfaces Command

Following are examples of the **show interfaces serial** command for Cisco 7200 series routers, Cisco 7200 VXR routers, and Cisco uBR7200 series routers. In these examples, the four serial interfaces (0 to 3) are on a port adapter in port adapter slot 1; also, most of the status information for each interface is omitted. (Interfaces are administratively shut down until you enable them.)

```

Router# show interfaces serial 1/0
Serial1/0 is up, line protocol is up
Hardware is 4ME1-UNBAL
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 not set\
[Additional display text omitted from this example]

```

```

Router# show interfaces serial 1/1
Serial1/1 is up, line protocol is up
Hardware is 4ME1-UNBAL
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 not set\
[Additional display text omitted from this example]

```

```

Router# show interfaces serial 1/2
Serial1/2 is up, line protocol is up
Hardware is 4ME1-UNBAL
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 not set\
[Additional display text omitted from this example]

```

```

Router# show interfaces serial 1/3
Serial1/3 is up, line protocol is up
Hardware is 4ME1-UNBAL
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 not set\
[Additional display text omitted from this example]

```

Following is an example of the **show interfaces serial** command, which shows all of the information specific to interface port 0 on a PA-4E1G installed in port adapter slot 1:

```

Router# show interfaces serial 1/0
Serial1/0 is up, line protocol is up
 Hardware is 4ME1-UNBAL
 Internet address is 5.0.0.2/8
 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
 Encapsulation HDLC, loopback not set, keepalive not set
 Last input 00:00:00, output never, output hang never
 Last clearing of "show interface" counters 00:32:21
 Input queue: 0/75/0 (size/max/drops); Total output drops: 0
 Queueing strategy: weighted fair

```

```

Output queue: 0/64/0 (size/threshold/drops)
 Conversations 0/0 (active/max active)
 Reserved Conversations 0/0 (allocated/max allocated)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
 33 packets input, 10824 bytes, 0 no buffer
 Received 66 broadcasts, 0 runts, 0 giants
 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
 0 packets output, 0 bytes, 0 underruns
 0 output errors, 0 collisions, 0 interface resets
 0 output buffer failures, 0 output buffers swapped out
 0 carrier transitions
 0 alarm indications, 0 remote alarms, 0 rx LOF, 0 rx LOS
 DCD up, BER inactive, NELR inactive, FELR inactive

```

### Cisco 7201 Router—Example Output of the show interfaces Command

Following is an example of the **show interfaces** command for a Cisco 7201 router:

```

Router# show interfaces
GigabitEthernet0/0 is up, line protocol is up
 Hardware is MV64460 Internal MAC, address is 0019.56c5.2adb (bia
0019.56c5.2adb)
 Internet address is 209.165.200.225
 MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
 reliability 255/255, txload 1/255, rxload 45/255
 Encapsulation ARPA, loopback not set
 Keepalive set (10 sec)
 Full-duplex, 1000Mb/s, media type is RJ45
 output flow-control is XON, input flow-control is XON
 ARP type: ARPA, ARP Timeout 04:00:00
 Last input 00:07:03, output 00:00:07, output hang never
 Last clearing of "show interface" counters 00:00:04
 Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
 Queueing strategy: fifo
 Output queue: 0/40 (size/max)
 5 minute input rate 180240000 bits/sec, 430965 packets/sec
 5 minute output rate 0 bits/sec, 0 packets/sec
 2222975 packets input, 133378500 bytes, 0 no buffer
 Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
 0 watchdog, 0 multicast, 0 pause input
 0 input packets with dribble condition detected
 0 packets output, 0 bytes, 0 underruns
 0 output errors, 0 collisions, 0 interface resets
 0 babbles, 0 late collision, 0 deferred
 0 lost carrier, 0 no carrier, 0 pause output
 0 output buffer failures, 0 output buffers swapped out

```

### Cisco 7401ASR Router—Example Output of the show interfaces Command

Following is an example of the **show interfaces serial** command for a Cisco 7401ASR router. This example shows all of the information specific to interface port 0 on a PA-4E1G installed in port adapter slot 1:

```

Router# show interfaces serial 1/0
Serial1/0 is up, line protocol is up
 Hardware is 4ME1-UNBAL
 Internet address is 5.0.0.2/8
 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
 Encapsulation HDLC, loopback not set, keepalive not set

```

```

Last input 00:00:00, output never, output hang never
Last clearing of "show interface" counters 00:32:21
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/64/0 (size/threshold/drops)
 Conversations 0/0 (active/max active)
 Reserved Conversations 0/0 (allocated/max allocated)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
 33 packets input, 10824 bytes, 0 no buffer
 Received 66 broadcasts, 0 runts, 0 giants
 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
 0 packets output, 0 bytes, 0 underruns
 0 output errors, 0 collisions, 0 interface resets
 0 output buffer failures, 0 output buffers swapped out
 0 carrier transitions
 0 alarm indications, 0 remote alarms, 0 rx LOF, 0 rx LOS
 DCD up, BER inactive, NELR inactive, FELR inactive

```

### VIP in Cisco 7000 Series Routers or Cisco 7500 Series Routers—Example Output of the show interfaces Command

Following are examples of the **show interfaces serial** command used with the VIP2. In these examples, the four serial interfaces (0 to 3) are on a port adapter in port adapter slot 1 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 serial 3/1/0
Serial3/1/0 is up, line protocol is up
Hardware is cyBus Serial
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 not set
[Additional display text omitted from this example]

```

```

Router# show interfaces serial 3/1/1
Serial3/1/1 is up, line protocol is up
Hardware is cyBus Serial
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 not set
[Additional display text omitted from this example]

```

```

Router# show interfaces serial 3/1/2
Serial3/1/2 is up, line protocol is up
Hardware is cyBus Serial
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 not set
[Additional display text omitted from this example]

```

```

Router# show interfaces serial 3/1/3
Serial3/1/3 is up, line protocol is up
Hardware is cyBus Serial
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 not set
[Additional display text omitted from this example]

```

Following is an example of the **show interfaces serial** 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 serial 3/1/0
Serial3/1/0 is up, line protocol is up
 Hardware is cyBus Serial
 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 not set
 Last input 00:44:43, output 00:00:54, output hang never
 Last clearing of "show interface" counters 01:53:04
 Queueing strategy: fifo
 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
 2 packets input, 140 bytes, 0 no buffer
 Received 2 broadcasts, 0 runts, 0 giants
 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
 113 packets output, 37064 bytes, 0 underruns
 0 output errors, 0 collisions, 1 interface resets
 0 output buffer failures, 0 output buffers swapped out
 6 carrier transitions
 0 alarm indications, 0 remote alarms, 0 rx LOF, 0 rx LOS
 DCD up, BER inactive, NELR inactive, FELR inactive
```

Proceed to the next section “[Using the ping Command to Verify Network Connectivity](#)” to check network connectivity of the PA-4E1G 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 the **ping** command. Refer to the publications listed in the “[Related Documentation](#)” section on page viii 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); then 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-4E1G interface and a remote device such as a modem or CSC/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.

The E1-G.703/G.704 interface supports the same local loopback test as other (data communications) interfaces. Using the loopback functions, you can check the integrity of the physical data path between the motherboard (or chassis system) and the PA-4E1G with the **loopback** command. The loopback signal follows this path regardless of whether or not a cable is attached to the port.

Figure 4-1 shows the signal path of the loopback function. The **no loopback** command disables all loopback tests on the interface.

**Note**

Because each E1-G.703/G.704 interface uses a default clock rate of 2.048 Mbps, you do not have to configure a clock signal on the interface before performing a loopback test.

**Figure 4-1** Loopback Path



