Configuring the PA-2CE1

To continue your PA-2CE1 installation, you must configure the 2CE1 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 interface, proceed to the "Configuring the PA-2CE1 Interfaces" section on page 4-2.

Configuring the PA-2CE1 Interfaces

After you verify that the new PA-2CE1 is installed correctly (the enabled LED goes on), use the privileged-level **configure** command to configure the new interface. Have the following information available:

- ISDN switch type, when configuring ISDN PRI (Table 4-1 lists ISDN service provider switch types)
- E1 information, for example, line code, framing type, and so on
- Channel group and PRI group information and timeslot mapping
- Protocols and encapsulations you plan to use on the new interfaces
- Protocol specific information, such as internet protocol (IP) addresses, if you plan to configure the interfaces for IP routing
- Whether the new interface will use bridging

Table 4-1 ISDN Service Provider

Keywords by Area	Switch Type
Australia	
• basic-ts013	Australian TS013 switches
Europe	
• basic-1tr6	German 1TR6 ISDN switches
• basic-nwnet3	Norwegian NET3 ISDN switches (phase 1)
• basic-net3	NET3 ISDN switches (UK, Denmark, and other nations); covers the Euro-ISDN E-DSSI signaling system).
• basic-net5	NET5 switches (UK and Europe)
• primary-net5	European ISDN PRI switches (UK and Europe)
• vn2	French VN2 ISDN switches
• vn3	French VN3 ISDN switches
Japan	
• ntt	Japanese NTT ISDN switches
• primary-ntt	Japanese ISDN PRI switches

Table 4-1 ISDN Service Provider (continued)

Keywords by Area	Switch Type
North America	
• basic-5ess	AT&T basic rate switches
• basic-dms100	NT DMS-100 basic rate switches
• basic-ni1	National (North American) ISDN-1 switches
• primary-4ess	AT&T 4ESS switch type for the U.S. (ISDN PRI only)
• primary-5ess	AT&T 5ESS switch type for the U.S. (ISDN PRI only)
• primary-dms100	NT DMS-100 switch type for the U.S. (ISDN PRI only)
New Zealand	
• basic-nznet3	New Zealand NET3 switches

If you installed a new PA-2CE1 or if you want to change the configuration of the existing interface, you must enter configuration mode to configure the new interface. If you replaced a PA-2CE1 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 a PA-2CE1, 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 the Interface

Before you remove an interface that you will not replace, use the **shutdown** command to shut down (disable) the interface to prevent anomalies when you reinstall the new or reconfigured interface. 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 the interface by entering the **interface serial** subcommand (followed by the interface address of the interface), and then enter the **shutdown** command. Table 4-2 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 4-2 Syntax of the shutdown Command

Platform	Command	Example

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

VIP2 in Cisco 7000 series and Cisco 7500 series routers	**interface**, followed by the *type* (**serial**) and *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 0 of a VIP installed in interface processor slot 1.
		`Router(config-if)# interface serial 1/0/0`
		`Router(config-if)# shutdown`
		`Ctrl-Z`
		`Router#`

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 4-3 provides examples.

Table 4-3 Examples of the show interfaces Command

Platform	Command	Example

Cisco 7200 series routers	**show interfaces serial**, 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 serial 1/0`
		`srp 1/0 is administratively down, line protocol is down`
		`[Additional display text omitted from this example]`

VIP2 in Cisco 7000 series and Cisco 7500 series routers	**show interfaces serial**, 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 0 of a VIP in interface processor slot 1.
		`Router# show interfaces serial 1/0/0`
		`atm 1/0/0 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** 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 vi.

Performing a Basic Configuration

This section contains guidelines for performing a basic channelized E1 configuration and a basic channelized E1 ISDN PRI configuration: enabling a controller 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. This section contains the following subsections:

Configuring Channelized E1 Interfaces

Channel groups must be mapped before the 2CE1 controller can be configured. Following are controller commands used to map the channel group (the default variable is listed first):

- **controller e1** *chassis slot number/port adapter number/interface port number*
- **linecode** [*ami* | *hdb3*]
- **framing** [*crc4* | *no -crc4*]
- **loopback**
- **shutdown**
- **channel-group** *number* **timeslots** *list* [*speed* {**48** | **56** | **64**}]

  number is the channel group 0 to 30.

  timeslots is a number between 1 to 31. You can enter timeslots individually and separate them by commas or enter them as a range separated by a hyphen (for example, 1-3, 8, 9-18). Timeslot 0 is an illegal configuration.

  speed specifies the DS0 speed of the channel group; 64 kbps is the default.

Note Cisco 7000 series and Cisco 7500 series routers identify channel groups as serial interfaces by chassis slot number, port adapter (0 or 1), interface port number (0 or 1), and channel-group number (0 to 30). For example, the address of the 2CE1 installed in chassis slot 4, port adapter slot 1, interface port 1, and channel group 5 would be serial 4/1/1:5.

Before using the **configure** command, you must enter the privileged level of the EXEC command interpreter with the **enable** command. The system prompts you for a password if one has been set.

Use the following procedure to configure the PA-2CE1. Press the **Return** key after each configuration step, unless otherwise noted.

Step 1 Confirm that the system recognizes the PA-2CE1 by entering the **show running-config** command:

```
Router# show running-config
```

Step 2 Enter configuration mode and specify that the console terminal is the source of the configuration subcommands:

```
Router# configure terminal
```

Step 3 At the prompt, specify the controller to configure by entering the command **controller**, followed by **e1**, and *chassis slot number/port adapter number/interface port number.* The following example is for the 2CE1 in chassis slot 3, port adapter slot 1, interface port 1.

```
Router(config)# controller e1 3/1/1
```

Step 4 Specify the controller's framing type by entering the **framing** command:

```
Router(config-controller)# framing crc4
```

Step 5 Specify the controller's linecode format by entering the **linecode** command:

```
Router(config-controller)# linecode hdb3
```

Step 6 Specify a channel group and map timeslots to the channel group by entering the **channel-group** command. The following example specifies channel group 0 and maps timeslots 1, 3 through 5, and 7 to channel group 0:

```
Router(config-controller)# channel-group 0 timeslots 1,3-5,7
Router(config-controller)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/1/1:0,
changed state to down
%LINK-3-UPDOWN: Interface Serial3/1/1:0, changed state to up
```

Note Each channel group is presented to the system as a serial interface that can be configured individually.

Step 7 If IP routing is enabled on the system, assign an IP address and subnet mask to the channel group with the **interface** and **ip address** commands as follows:

```
Router(config-controller)# interface serial 3/1/1:0
Router(config-if)# ip address 10.1.15.1 255.255.255.0
Router(config-if)#
```

Step 8 Add any additional configuration commands required to enable routing protocols and adjust the interface characteristics.

Step 9 Use the **no shutdown** and **exit** commands respectively to reenable the interface and return to configuration mode as follows:

```
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/1/1:0,
changed state to up
%LINK-3-UPDOWN: Interface Serial3/1/1:0, changed state to up
```

Step 10 Repeat Step 6 through Step 9 for additional channel groups and timeslots.

Step 11 After configuring additional channel groups and timeslots, map all unused timeslots to an unused channel group and shut down the unused channel group by entering the **channel-group** and **shutdown** commands, respectively.

In the following example, unused timeslots 2, 6, and 8 through 31 are mapped to unused channel group 1, and channel group 1 is shut down:

```
Router(config)# controller e1 3/1/1
Router(config-controller)# channel-group 1 timeslots 2,6,8-31
Router(config-controller)#
Router(config-controller)# int serial 3/1/1:1
Router(config-if)# shutdown
Router(config-if)# exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/1/1:1,
changed state to down
%LINEPROTO-5-UPDOWN: Interface Serial3/1/1:1, changed state to
administratively down
```

Step 12 After including all of the configuration commands, to complete the configuration, press **Ctrl-Z—**(hold down the **Control** key while you press **Z—**) or enter **end** to exit configuration mode and return to the EXEC command interpreter prompt as follows:

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

Step 13 Write the new configuration to memory as follows:

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

The system displays an OK message when the configuration is stored.

Step 14 Exit the privileged level and return to the user level by entering **disable** at the prompt as follows:

```
Router# disable

Router>
```

This completes the procedure for creating a basic channelized E1 configuration. Proceed to the "Checking the Configuration" section on page 4-12 to check the interface configuration using **show** commands. For additional information about configuring channelized E1 interfaces, refer to the publications *Wide-Area Networking Configuration Guide* and *Wide-Area Networking Command Reference*.

Configuring Channelized E1 ISDN Interfaces

The PRI group must be mapped before the 2CE1 controller can be configured (there is only one PRI group for each controller). The following are controller commands used to map the PRI group:

- **isdn switch-type** *switch-type*
- **controller e1** *chassis slot number/port adapter number/interface port number*
- **linecode** *hdb3*
- **framing** *crc4*
- **loopback**
- **shutdown**
- **pri-group** [**timeslots** *list*]

  pri-group timeslots is a number between 1 to 31. (Timeslots 1 to 15 and 17 to 31 represent the B channels, and timeslot 16 represents the D channel. While the numbering scheme for entering timeslots is 1 to 31, the system recognizes the numbering of timeslots as 0 to 30. The PRI group is configured by using timeslot 16 [the D channel], which is recognized by the system as timeslot 15.) You can enter timeslots individually and separate them by commas or enter them as a range separated by a hyphen (for example, 1-3, 8, 9-18). The default DS0 speed of the PRI group is 64 kbps.

Note If you do not specify the timeslots, the controller is configured for 30 B channels (timeslots 1 to 15 and 17 to 31) and one D channel (timeslot 16).

Note Cisco 7000 series and Cisco 7500 series routers identify the PRI group as a serial interface by chassis slot number, port adapter slot (0 or 1), interface port number (0 or 1), and timeslot 16. For example, the address of the 2CE1 installed in chassis slot 3, port adapter slot 1, interface port 1, and timeslot 16 would be recognized by the system as serial 3/1/1:15.

In the following procedure, press the **Return** key after each configuration step:

Step 1 At the privileged-level prompt, enter configuration mode and specify that the console terminal will be the source of the configuration commands as follows:

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

Step 2 Identify the ISDN switch type. In the following example, the switch primary-net5 (a switch for the European Community) is identified as the switch type:

```
Router(config)# isdn switch-type primary-net5
```

Note The ISDN switch type that you identify is for all ISDN interface ports installed in the router.

Step 3 Specify the controller to configure by entering the command **controller** followed by **e1**, and *chassis slot number/port adapter number/interface port number*. The example that follows is for the 2CE1 in chassis slot 3, port adapter slot 1, interface port 1:

```
Router(config)# controller e1 3/1/1
```

Step 4 Specify the controller's framing type by entering the **framing** command as follows:

```
Router(config-controller)# framing crc4
```

Step 5 Specify the controller's linecode format by entering the **linecode** command as follows:

```
Router(config-controller)# linecode hdb3
```

Step 6 Map timeslots to the controller's PRI group by entering the **pri-group** command. The following example shows PRI-group timeslots 1, 3 through 5, and 7 (the B channels) selected and mapped to timeslot 16 (the D channel), which is recognized by the system as timeslot 15:

```
Router(config-controller)# pri-group timeslots 1,3-5,7
Router(config-controller)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/1/1:15,
changed state to down
%LINK-3-UPDOWN: Interface Serial3/1/1:15, changed state to up
```

Note In the above example, the line-protocol status for timeslot 16 (listed in the output as timeslot 15) represents the entire PRI group.

Each PRI group is presented to the system as a serial interface that can be configured individually.

Step 7 If IP routing is enabled on the system, assign an IP address and subnet mask to the PRI group with the **interface** and **ip address** commands as follows.

Note For channelized E1 ISDN PRI, the PRI group is configured by using timeslot 16, which is recognized by the system as timeslot 15.

```
Router(config-controller)# interface serial 3/1/1:15
Router(config-if)# ip address 10.1.15.1 255.255.255.0
Router(config-if)#
```

Step 8 Add any additional configuration commands required to enable routing protocols and adjust the interface characteristics.

Step 9 Use the **no shutdown** and **exit** commands respectively to reenable the interface and return to configuration mode as follows:

```
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/1/1:15,
changed state to up
%LINK-3-UPDOWN: Interface Serial3/1/1:15, changed state to up
```

Step 10 After configuring the PRI group and timeslots, map all unused timeslots to an unused channel group and shut down the unused channel group by entering the **channel-group** and **shutdown** commands, respectively.

Note Both PA-2CE1 interfaces support simultaneous operation in channelized E1 and ISDN PRI modes.

In the following example, unused timeslots 2, 6, 8 through 15, and 17 through 31 are mapped to unused channel group 2, and channel group 2 is shut down:

```
Router(config)# controller e1 3/1/1
Router(config-controller)# channel-group 2 timeslots 2,6,8-15,17-31
Router(config-controller)#
Router(config-controller)# interface serial 3/1/1:2
Router(config-if)# shutdown
Router(config-if)# exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/1/1:2,
changed state to down
%LINEPROTO-5-UPDOWN: Interface Serial3/1/1:2, changed state to
administratively down
```

Step 11 After including all of the configuration commands, to complete the configuration, press **Ctrl-Z** (hold down the **Control** key while you press **Z**) or enter **end** to exit configuration mode and return to the EXEC command interpreter prompt as follows:

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

Step 12 Write the new configuration to memory as follows:

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

Step 13 The system displays an OK message when the configuration is stored.

Step 14 Exit the privileged level and return to the user level by entering **disable** at the prompt as follows:

```
Router# disable

Router>
```

This completes the procedure for creating a basic channelized E1 ISDN PRI configuration. Proceed to the "Checking the Configuration" section on page 4-12 to check the interface configuration using **show** commands. For dialer interface configuration and additional channelized E1 ISDN PRI interface configuration information, refer to the publications *Wide-Area Networking Configuration Guide* and *Wide-Area Networking Command Reference*.

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-2CE1 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 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 port-adapter-slot-number/ interface-port-number*	Displays status information about a specific type of interface (for example, srp) in a Cisco 7200 series router	`Router# show interfaces srp 1/0`
show controllers	Displays all the current interface processors and their interfaces	`Router# show controllers`
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:

Choose the subsection appropriate for your system. Proceed to the "Using the ping Command to Verify Network Connectivity" section on page 4-23 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.

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 7200 Series Routers

Following is an example of the **show version** command from a Cisco 7206 router with the PA-2CE1:

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-J-M), Version 11.1(9)CA1
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(5) RELEASED SOFTWARE
ROM: 7200 Software (C7200-BOOT-M), RELEASED SOFTWARE 11.1(9)CA1

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.
Channelized E1, Version 1.0.
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).
Primary Rate ISDN software, Version 1.0.
Chassis Interface.
4 Ethernet/IEEE 802.3 interfaces.
1 FastEthernet/IEEE 802.3 interface.
4 Token Ring /IEEE802.5 interfaces.
12 Serial network interfaces.
2 Channelized E1/PRI ports.
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).
```

VIP2 in Cisco 7000 Series and Cisco 7500 Series Routers

Following is an example of the **show version** command used with a Cisco 7500 series router with an RSP2 installed:

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) GS Software (RSP-A), Version 11.1(10)CA
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 11.1(5), RELEASE SOFTWARE
ROM: GS Software (RSP-BOOT-M), Version 11.1(10)CA, RELEASE SOFTWARE

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 32768K bytes of memory.
R4600 processor, Implementation 32, Revision 2.0
Last reset from power-on
G.703/E1 software, Version 1.0.
Channelized E1, 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).
Primary Rate ISDN software, Version 1.0.
Chassis Interface.
1 EIP controller (6 Ethernet).
1 TRIP controller (4 Token Ring).
2 MIP controllers (4 E1).
1 VIP2 controller (2 E1)(4 Token Ring).
6 Ethernet/IEEE 802.3 interfaces.
8 Token Ring/IEEE 802.5 interfaces.
3 Serial network interfaces.
6 Channelized E1/PRI ports.
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).
No slave installed in slot 7.
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 router and the *interface processor slot* in a Cisco 7000 series or Cisco 7500 series router with a VIP2.

Note The ouputs 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 7200 Series Routers

Following is an example of the **show diag** *slot* command that shows a PA-2CE1 in port adapter slot 1:

```
Router# show diag 1

Slot 1:
        Channelized E1 port adapter, 2 ports
        Port adapter is analyzed
        Port adapter insertion time 02:18:20 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 06 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
```

VIP2 in Cisco 7000 Series and Cisco 7500 Series Routers

Following is an example of the **show diag** *slot* command that shows a PA-2CE1 on a VIP2 in interface processor slot 3:

```
Router# show diag 3
Slot 3:
        Physical slot 3, ~physical slot 0x7, logical slot 8, 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 2.3, board revision UNKNOWN
        Serial number: 03513619  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 9D 13 49 06 94 03 00 00 00 00
          0x30: 06 3D 00 2A 1A 00 00 00 00 00 00 00 00 00 00 00

        Slot database information:
        Flags: 0x4      Insertion time: 0x12A0 (08:56:58 ago)

        Controller Memory Size: 8 MBytes

        PA Bay 0 Information:
                Token Ring PA, 4 ports
                EEPROM format version 1
                HW rev 1.0, Board revision B0
                Serial number: 02825610  Part number: 73-1390-04

        PA Bay 1 Information:
Multi-channel (E1) port adapter, 2 ports
                EEPROM format version 255
                HW rev FF.FF, Board revision UNKNOWN
                Serial number: 4294967295  Part number: 255-65535-255
```

Using the show interfaces Command

The **show interfaces** command displays status information (including the physical slot and interface address) for the interfaces you specify. The example that follows specifies an ATM interface.

For complete descriptions of interface subcommands and the configuration options available for VIP2 interfaces, refer to the publications listed in the "Related Documentation" section on page vi.

Note The ouputs 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 7200 Series Routers

The following example of the **show interfaces serial** *port adapter slot number/interface port number:channel-group* command shows all of the information specific to the second 2CE1 interface port (interface port 1) in port adapter slot 1, channel group 0:

```
Router# show interfaces serial 1/1:0
Serial1/1:0 is up, line protocol is up
  Hardware is MPA-E1
  Internet address is 10.1.15.1
  MTU 1500 bytes, BW 1984 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set
  Last input 00:00:42, output 00:00:56, output hang never
  Last clearing of "show interface" counters never
  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  0/1 (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
     149 packets input, 40207 bytes, 0 no buffer
     Received 298 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     128 packets output, 44416 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     20 carrier transitions no alarm present
  Timeslot(s) Used:1-31, subrate: 64Kb/s, transmit delay is 0 flags
```

The following example of the **show interfaces serial** *port adapter slot number/interface port number:pri-group* command shows all of the information specific to the same interface (interface port 1 in port adapter slot 1) when the interface is configured for ISDN PRI:

```
Router# show interfaces serial 1/1:15
Serial1/1:15 is up, line protocol is up (spoofing)
  Hardware is MPA-E1
  Internet address is 10.1.15.1
  MTU 1500 bytes, BW 1984 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set
  Last input 00:00:42, output 00:00:56, output hang never
  Last clearing of "show interface" counters never
  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  0/1 (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
     149 packets input, 40207 bytes, 0 no buffer
     Received 298 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     128 packets output, 44416 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     20 carrier transitions no alarm present
  Timeslot(s) Used:1-31, subrate: 64Kb/s, transmit delay is 0 flags
```

VIP2 in Cisco 7000 Series and Cisco 7500 Series Routers

The following example of the **show interfaces serial** *slot/port adapter/port:channel-group* command shows all of the information specific to the second 2CE1 interface port (interface port 1) in chassis slot 3, port adapter slot 1, channel group 2:

```
Router# show interface serial 3/1/1:2
Serial3/1/1:2 is up, line protocol is up
  Hardware is cxBus E1
  Internet address is 10.1.15.1
  MTU 1500 bytes, BW 1536 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  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
     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 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions alarm present
  Timeslot(s) Used:1-31, Transmitter delay is 0 flags, transmit queue length 0
```

The following example of the **show interfaces serial** *slot/port adapter/port:pri-group* command shows all of the information specific to the same interface port (interface port 1 in chassis slot 3, port adapter slot 1) when the port is configured for ISDN PRI:

```
Router# show interfaces serial 3/1/1:15
Serial3/1/1:15 is up, line protocol is up (spoofing)
  Hardware is cxBus E1
  Internet address is 10.1.15.1
  MTU 1500 bytes, BW 1536 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  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
     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 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions alarm present
  Timeslot(s) Used:1-31, Transmitter delay is 0 flags, transmit queue length 0
```

Note In the above example, the term "spoofing" indicates that the interface is configured for ISDN PRI. The term "spoofing" is indicated only on timeslot 16 (the D channel), which is recognized by the system as timeslot 15.

Using the show controllers e1 Command

Use the **show controllers e1** command to identify the E1 cable type (balanced or unbalanced) attached to a PA-2CE1 that is configured for channelized E1.

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Following is an example of the **show controllers e1** command that shows a channelized E1 interface port (1/0) with an unbalanced cable attached:

```
Router# show controllers e1 1/0
E1 1/0 is up.
  Applique type is Channelized E1 - unbalanced
No far end block errors detected
  No alarms detected.
  Framing is CRC4, Line Code is HDB3, Clock Source is Line.
  Data in current interval (710 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Data in Interval 1:
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
[display text omitted]
```

Following is an example of the **show controllers e1** command that shows an E1 interface port (1/0) that is configured for ISDN PRI:

```
Router# show controllers e1 1/0
E1 1/0 is up.
  No alarms detected.
No far end block errors detected
  Framing is CRC4, Line Code is HDB3, Clock Source is Line.
  Data in current interval (710 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Data in Interval 1:
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
[display text omitted]
```

VIP2 in Cisco 7000 Series and Cisco 7500 Series Routers

Following is an example of the **show controllers e1** command that shows the status of a PA-2CE1 installed in port adapter slot 1 on a VIP2 in interface processor slot 3:

```
Router# show controllers e1
E1 3/1/0 is up.
  Applique type is Channelized E1 - unbalanced
No far end block errors detected
  No alarms detected.
  Framing is CRC4, Line Code is HDB3, Clock Source is Line.
  Data in current interval (700 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Data in Interval 1:
     10 Line Code Violations, 1 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 2 Line Err Secs, 0 Degraded Mins
     1 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 1 Unavail Secs
  Total Data (last 1 15 minute intervals):
     10 Line Code Violations, 1 Path Code Violations,
     0 Slip Secs, 0 Fr Loss Secs, 2 Line Err Secs, 0 Degraded Mins,
     1 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 1 Unavail Secs
E1 3/1/1 is up.
  Applique type is Channelized E1 - unbalanced
No far end block errors detected
  No alarms detected.
  Framing is CRC4, Line Code is HDB3, Clock Source is Line.
  Data in current interval (700 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Data in Interval 1:
     10 Line Code Violations, 1 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 2 Line Err Secs, 0 Degraded Mins
     1 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 1 Unavail Secs
  Total Data (last 1 15 minute intervals):
     10 Line Code Violations, 1 Path Code Violations,
     0 Slip Secs, 0 Fr Loss Secs, 2 Line Err Secs, 0 Degraded Mins,
     1 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 1 Unavail Secs
```

Proceed to the next section, “Using the ping Command to Verify Network Connectivity” to check network connectivity of the PA-2CE1 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.