



CHAPTER 4

Configuring the PA-4B-U Interfaces

To continue your PA-4B-U port adapter installation, you must configure the PA-4B-U interfaces. The instructions that follow apply to all supported platforms. Minor differences between the platforms are noted.

This chapter contains the following sections:

- [Using the EXEC Command Interpreter, page 4-1](#)
- [Configuring the Interfaces, page 4-2](#)
- [Checking the Configuration, page 4-6](#)

Using the EXEC Command Interpreter

You can 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:

```
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-mode system prompt (#):

```
Router#
```

Configuring the Interfaces

After you verify that the new PA-4B-U is installed correctly (the enabled LED goes on), use the **configure** command to configure the new interfaces. Have the following information available:

- Protocols and encapsulations you plan to use on the new interfaces
- Protocol specific information, such as IP addresses if you will configure the interfaces for IP routing
- The ISDN switch type (Table 4-1 lists ISDN service provider switch types)

Table 4-1 ISDN Service Provider Switch Types

| Keywords by Area | Switch Type |
|--|--|
| Australia basic-ts013 | Australian TS013 switches |
| Europe basic-1tr6 basic-nwnet3 basic-net3 basic-net5 primary-net5 vn2 vn3 | German 1TR6 ISDN switches Norwegian NET3 ISDN switches (phase 1) NET3 ISDN switches (UK, Denmark, and other nations); covers the Euro-ISDN E-DSSI signaling system) NET5 switches (UK and Europe) European ISDN PRI switches (UK and Europe) French VN2 ISDN switches French VN3 ISDN switches |
| Japan ntt primary-ntt | Japanese NTT ISDN switches Japanese ISDN PRI switches |
| North America basic-5ess basic-dms100 basic-nil primary-4ess primary-5ess primary-dms100 | AT&T basic rate switches NT DMS-100 basic rate switches National (North American) ISDN-1 switches AT&T 4ESS switch type for the U.S. (ISDN PRI only) AT&T 5ESS switch type for the U.S. (ISDN PRI only) NT DMS-100 switch type for the U.S. (ISDN PRI only) |
| New Zealand basic-nznet3 | New Zealand NET3 switches |



Note

Cisco 7200 series routers do not support a combination of installed ISDN PRI and ISDN BRI interfaces. The ISDN switch type (PRI or BRI) that you identify during an ISDN configuration is for all ISDN interface ports installed in the router.

If you installed a new PA-4B-U or if you want to change the configuration of an existing interface, you must use the privileged-level **configure** command. If you replaced a PA-4B-U that was previously configured, the system will recognize the new PA-4B-U interfaces and bring each of them up in their existing configurations.

For complete descriptions of interface subcommands and the configuration options available for configuring interfaces on a port adapter, refer to the appropriate configuration publications listed in the section “[Related Documentation](#)” section on page vi.



Note Configuration commands are executed from the privileged level of the EXEC command interpreter, which usually requires password access. See the “[Using the EXEC Command Interpreter](#)” section on page 4-1 and contact your system administrator, if necessary, to obtain access.

This section contains the following configuration subsections for the standard configurations tasks:

- [Shutting Down an Interface](#), page 4-3
- [Performing a Basic Interface Configuration](#), page 4-4

Shutting Down an Interface

Before you replace an interface cable, replace port adapters, or remove an interface that you will not replace, use the **shutdown** command to shut down (disable) the interfaces. Doing so prevents anomalies from occurring when you reinstall the new or reconfigured port adapters. 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. (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 will be 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** Specify the slot/port address of the controller that you want shut down by entering the subcommand **interface**, followed by the *type (bri)* and *port adapter slot number/interface port number*. The example that follows is for a PA-4B-U in port adapter slot 1:
- ```
Router(config)# interface bri 1/0
```
- Step 4** Enter the **shutdown** command as follows:
- ```
Router(config-cont)# shutdown
```
- Step 5** To shut down additional existing interfaces, enter the *port adapter slot number/interface port number* of each interface followed by the **shutdown** command. When you have entered all the interfaces to be shut down, 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)# interface bri 1/0  
Router(config-int)# shutdown  
Ctrl-Z
```

```
Router#
```

- Step 6** 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 has been stored.

- Step 7** To verify that new interfaces are now in the correct state (shutdown), use the **show interfaces bri port adapter slot number/interface port number** command to display the specific interface, or use the **show interfaces command**, without variables, to display the status of all interfaces in the system.

```
Router# show interfaces bri 1/0

bri1/0 is down, line protocol is down
  Hardware is BRI
[display text omitted]
```

- Step 8** To re-enable the interfaces, repeat the previous steps, but use the **no shutdown** command; then write the new configuration to memory as follows:

```
Router(config)# interface bri 1/0
Router(config-int)# no shutdown
Ctrl-Z
Router#

Router# copy running-config startup-config
[OK]
Router# show interfaces bri 1/0

bri1/0 is up, line protocol is up
  Hardware is BRI
[display text omitted]
```

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

Performing a Basic Interface Configuration

Following are instructions for a basic configuration, which include 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. For complete descriptions of configuration subcommands and the configuration options available, refer to the publications listed in the [“Related Documentation” section on page vi](#).

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>
```



Note

Cisco 7200 series routers identify PA-4B-U interfaces by port adapter slot number and interface port number (0 through 3). For example, the address of the PA-4B-U installed in port adapter slot 4 and interface port 1 would be *bri 4/1*.

- Step 1** At the privileged-level prompt, enter configuration mode and specify that the console terminal will be 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** Identify the ISDN switch type. In the following example, the switch basic-net3 (a switch for the European Union) is identified as the switch type:

```
Router(config)# isdn switch-type basic-net3
```



Note The ISDN switch type that you identify is for all BRI interface ports installed in a Cisco 7200 series router.

- Step 3** At the prompt, specify the first interface to configure by entering the subcommand **interface**, followed by the *type (bri)*, and *port adapter slot number/interface port number*. The example that follows is for the PA-4B-U in port adapter slot 1, interface port 1:

```
Router(config)# interface bri 1/1
```

- Step 4** At the prompt, assign an IP address and subnet mask to the interface with the **ip address** configuration subcommand as in the following example:

```
Router(config-int)# ip address 10.10.10.1 255.255.255.0  
Router(config-int)#
```

- Step 5** Add any additional configuration subcommands required to enable routing protocols and adjust the interface characteristics.

- Step 6** Use the **no shutdown** command to re-enable the interfaces. See the [“Shutting Down an Interface”](#) section on page 4-3 for **no shutdown** command examples.

- Step 7** After including all of the configuration subcommands, to complete the configuration, enter **Ctrl-Z** (hold down the **Control** key while you press **Z**) or enter **end** to exit configuration mode.

- Step 8** Write the new configuration to memory as follows:

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

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

- Step 9** 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 configuration. Proceed to the next section to check the interface configuration using **show** commands. For additional information about configuring ISDN BRI interfaces, refer to the *Wide-Area Networking Configuration Guide* and *Wide-Area Networking Command Reference* on Cisco.com.

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** command to check connectivity. This section includes the following subsections:

- [Using show Commands to Verify the New Interface Status, page 4-6](#)
- [Using the ping Command to Verify Network Connectivity, page 4-9](#)

Using show Commands to Verify the New Interface Status

The following procedure demonstrates how you can use the **show** commands to verify that new interfaces are configured and operating correctly and that the port adapter 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.

Take the following steps to verify that the new interfaces are configured and operating correctly:

-
- Step 1** Display the system hardware configuration with the **show version** command. Ensure that the list includes the new BRI interfaces.
 - Step 2** Specify one of the new BRI interfaces with the **show interfaces type port adapter slot/interface port number** command and verify that the first line of the display specifies the interface with the correct slot number. Also verify that the interface and line protocol are in the correct state: up or down.
 - Step 3** Display all ISDN interfaces installed in the router and the ISDN switch type for the interfaces with the **show isdn status** command. Ensure that the correct ISDN switch type is displayed for the installed ISDN interfaces.
 - Step 4** Display the protocols configured for the entire system and specific interfaces with the **show protocols** command. If necessary, return to configuration mode to add or remove protocol routing on the system or specific interfaces.
 - Step 5** Display the running configuration file with the **show running-config** command. Display the configuration stored in NVRAM using the **show startup-config** command. Verify that the configuration is accurate for the system and each interface.
-

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 network interface is properly connected and terminated. If you still have problems bringing up the interface, contact a customer service representative for assistance.

This section includes the following subsections:

- [Using the show version or show hardware Commands, page 4-7](#)
- [Using the show diag Command, page 4-8](#)
- [Using the show interfaces Command, page 4-8](#)
- [Using the show isdn status Command, page 4-9](#)

For command descriptions and examples for the individual router platforms, refer to the publications listed in the “[Related Documentation](#)” section on page vi.

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

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

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-J-M), Version 11.1(9)CA1
Copyright (c) 1986-1996 by cisco Systems, Inc.
Compiled Sun 04-Aug-96 06:00 by rmontino
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.
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
Basic Rate ISDN software, version 1.0.
Chassis Interface.
12 Ethernet/IEEE 802.3 interfaces.
1 FastEthernet/IEEE 802.3 interface.
4 ISDN Basic Rate interfaces.
1 Compression port adapter.
Integrated NT1s for 4 ISDN Basic Rate 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
```

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*.



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 and Cisco 7200 VXR Routers—Example Output of the show diag Command

Following is an example of a **show diag** command from a Cisco 7200 series router with a PA-4B-U installed in port adapter slot 1:

```
Router# show diag 1
Slot 1:
  BRI (U) port adapter, 4 ports
  Port adapter is analyzed
  Port adapter insertion time 02:42:18 ago
  Hardware revision 1.0           Board revision UNKNOWN
  Serial number 4294967295       Part number 255-65535-255
  Test history 0xFF              RMA number 255-255-255
  EEPROM format version 1
  EEPROM contents (hex):
    0x20: 01 22 01 00 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
```

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 for individual interfaces, 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.

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

Following is an example of the **show interfaces bri** command from a Cisco 7200 series router that shows all of the information specific to the first PA-4B-U interface port (interface port 0) in port adapter slot 1:

```
Router# show interfaces bri 1/0
BRI1/0 is administratively down, line protocol is down
Hardware is BRI
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set
  Last input never, output never, 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 0/0 (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
  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, 0 interface resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions

```

Using the show isdn status Command

Display all the ISDN interfaces installed in the router and the ISDN switch type for the interfaces using the **show isdn status** command.

Cisco 7200 Series Routers and Cisco 7200 VXR Routers—Example Output of the show isdn status Command

Following is an example of a **show isdn status** command from a Cisco 7200 series router with a PA-4B-U installed in port adapter slot 1 and an ISDN switch type basic-5ess:

```

Router# show isdn status
The current ISDN Switchtype = basic-5ess
ISDN BRI1/0 interface
  Layer 1 Status:
    ACTIVE
  Layer 2 Status:
    TEI = 94, State = MULTIPLE_FRAME_ESTABLISHED
  Layer 3 Status:
    1 Active Layer 3 Call(s)
  Activated dsl 0 CCBs = 1
    CCB:callid=8001, sapi=0, ces=1, B-chan=1
ISDN BRI1/1 interface
  Layer 1 Status:
    DEACTIVATED
  Layer 2 Status:
    Layer 2 NOT Activated
  Layer 3 Status:
    No Active Layer 3 Call(s)
  Activated dsl 1 CCBs = 0
(Display text omitted.)

```

Using the ping Command to Verify Network Connectivity

Use the **ping** command to verify that an interface port is functioning properly after the system has booted successfully and is operational.

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 command 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 that the connection failed.

Following is an example of a successful **ping** command to a remote server with the address 10.10.10.1:

```
Router# ping 10.10.10.1 <Return>
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echoes to 10.10.10.1, 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.