



CHAPTER 4

Configuring the PA-POS-20C3

To continue your port adapter installation you must configure the Packet-over-SONET (POS) interfaces. The following instructions apply to all supported platforms. Minor differences among 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 4-5](#)
- [Checking the Configuration, page 4-8](#)
- [Push/Pull Mode Description, page 4-30](#)
- [PA-POS-20C3 Statistics Counters, page 4-30](#)
- [PA-POS-20C3 Error Messages, page 4-31](#)
- [Making a Back-to-Back Connection, page 4-32](#)

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.

```
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-POS-2OC3 is installed correctly (the ENABLED LED goes on), use the privileged-level **configure** command to configure the new interfaces. Have the following information available:

- IP addresses, if you plan to configure the interface for IP routing
- MTU size
- Framing mode
- Transmit clock source
- Loopback modes (if testing is required)

If you installed a new PA-POS-2OC3 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-POS-2OC3 that was previously configured, the system recognizes the new interfaces and brings each of them up in their existing configurations.

For a summary of the configuration options available and instructions for configuring the interfaces on a PA-POS-2OC3, refer to the appropriate configuration publications listed in the [“Related Documentation” section on page iv](#).

You execute configuration commands 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](#) for an explanation of the privileged level of the EXEC.) Contact your system administrator, if necessary, to obtain password access.

On power up, the OC-3 interface on a new PA-POS-2OC3 is shut down. To enable the interfaces, you must enter the **no shutdown** command in configuration mode. (See [“Performing a Basic Interface Configuration” section on page 4-3](#).) When the OC-3 interface is enabled (taken out of shutdown) with no additional arguments, the default interface configuration file parameters look like those in [Table 4-1](#).

Table 4-1 PA-POS-2OC3 Configuration Default Values

Parameter ¹	Configuration Commands	Default Value
MTU	mtu bytes (no mtu bytes)	4470 bytes
Framing	pos framing sdh (no pos framing sdh)	SONET framing
Loopback internal	loop internal (no loop internal)	No internal loopback
Loopback line	loop line (no loop line)	No line loopback
Transmit clocking source	clock source internal clock source line	Loop timing
Cyclic redundancy checks	crc 16 crc 32	crc 16
SONET payload scrambling	pos scramble-atm (no pos scramble-atm)	No scrambling

1. These default parameters apply to the PA-POS-2OC3 in all supported platforms.

Performing a Basic Interface Configuration

Following are instructions for performing a basic configuration, which include enabling an interface (with the **no shutdown** command) and specifying IP routing. You might also need to enter other configuration commands, depending on the requirements for your system configuration and the protocols you plan to route on the interface. For complete descriptions of configuration commands and the configuration options available for the interfaces of your port adapter, 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>
```



Note

The Cisco 7200 VXR Port Adapter Jacket Card requires no configuration. Configure a port adapter in it as you would any other port adapter.

- Step 1** 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** Specify the new interface to configure by entering the **interface pos** subcommand, followed by the interface address of the interface you plan to configure.

[Table 4-2](#) gives examples of the **interface pos** subcommand for the supported platforms.

Table 4-2 Examples of the interface pos Subcommand for the Supported Platforms

Platform	Command	Example
Cisco 7200 VXR routers ¹	interface pos , followed by <i>slot/port</i> (<i>port-adapter-slot-number/</i> <i>interface-port-number</i>)	This example is for interface 0 of a PA-POS-20C3 in port adapter slot 6: Router(config)# interface pos 6/0 Router(config-if)#
Cisco 7201 router	interface pos , followed by <i>slot/port</i> (<i>port-adapter-slot-number/</i> <i>interface-port-number</i>)	The example is for interface 1 of a PA-POS-20C3 in port adapter slot 1: Router(config)# interface pos 1/1 Router(config-if)#
Cisco 7301 router	interface pos , followed by <i>slot/port</i> (<i>port-adapter-slot-number/</i> <i>interface-port-number</i>)	The example is for interface 1 of a PA-POS-20C3 in port adapter slot 1: Router(config)# interface pos 1/1 Router(config-if)#
Cisco 7304 PCI port adapter carrier card in a Cisco 7304 router	interface pos , followed by <i>slot/port</i> (module-slot-number/ interface-port-number)	The example is for 3 interface 0 of a PA-POS-20C3 in a Cisco 7304 PCI Port Adapter Carrier Card in module slot 3 of a Cisco 7304 router. Router(config)# interface pos 3/0 Router(config-if)#

Table 4-2 Examples of the interface pos Subcommand for the Supported Platforms (continued)

Platform	Command	Example
Cisco 7401ASR router	interface pos , followed by <i>slot/port</i> (<i>port-adapter-slot-number/</i> <i>interface-port-number</i>)	The example is for interface 1 of a PA-POS-20C3 in port adapter slot 1: Router (config)# interface pos 1/1 Router (config-if)#
VIPs in the Cisco 7500 series routers (7505, 7507, 7513)	interface pos followed by <i>slot/port adapter/port</i> (<i>interface-processor-slot-number/</i> <i>port-adapter-slot-number/</i> <i>interface-port-number</i>)	The example is for interface 0 in port adapter slot 1 of a VIP installed in interface processor slot 1. Router (config)# interface pos 1/1/0 Router (config-if)# shutdown Ctrl-Z Router#
Cisco 7600 series routers (7603, 7606, 7609, 7613) with FlexWAN or Enhanced FlexWAN	interface pos followed by <i>slot/port adapter/port</i> <i>module-slot-number/</i> <i>port-adapter-bay-number/</i> <i>interface-port-number</i>	Module slot number— ² through 6 or 9 (depending on the number of slots in the switch) Router (config)# interface pos 1/1/0 Router (config-if)# shutdown Ctrl-Z Router#

- For the Cisco 7206VXR router shelves, the interface specified in the above example would include a shelf number. For example, the command **interface pos 5/3/0** specifies the OC-3 interface of the PA-POS-20C3 in port adapter slot 3 of router shelf 5.
- Slot 1 is reserved for the supervisor engine. If a redundant supervisor engine is used, it must go in slot 2; otherwise, slot 2 can be used for other modules.

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** configuration subcommand, as in the following example:

```
Router (config-if)# ip address 10.0.0.10 255.255.255.255
```

Step 4 Change the shutdown state to up and enable the interface as follows:

```
Router (config-if)# no shutdown
```

The **no shutdown** command passes an **enable** command to the interface and causes the Cisco PA-POS-20C3 port adapter to configure itself based on the previous configuration commands sent.

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

Step 6 After including all of the configuration commands 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 7 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

You can customize the default values of all configuration parameters to match your network environment. Use the interface subcommands in the following sections if you need to customize the PA-POS-20C3 configuration:

- [Setting the MTU Size, page 4-5](#)
- [Configuring Framing, page 4-6](#)
- [Setting the Source of the Transmit Clock, page 4-6](#)
- [Configuring Cyclic Redundancy Checks, page 4-6](#)
- [Configuring SONET Payload Scrambling, page 4-7](#)
- [Configuring APS, page 4-7](#)

**Note**

The interface subcommands that follow function the same regardless of the platform in which your PA-POS-20C3 is installed; however, all these commands require that you first enter the **interface pos** command to select the interface that you want to configure.

In all the configuration examples that follow, the interface address argument for the **interface pos** command is for a Cisco 7200 VXR router: 3/0 (port adapter slot 3, interface 0).

For the appropriate **interface pos** command syntax to use for your particular platform, see [Table 4-2 on page 4-3](#).

Setting the MTU Size

**Note**

The default value, 4470 bytes, exactly matches the maximum transmission unit (MTU) of the fiber distributed data interface (FDDI) and high-speed serial interface (HSSI) interfaces for autonomous switching.

The default MTU size is 4470 bytes.

Step 1 To set the MTU size, enter the **mtu bytes** command, where *bytes* is a value in the range of 64 to 9216.

```
Router(config)# interface pos 3/0  
Router(config-if)# mtu 3000
```

Step 2 To restore the default of 4470 bytes, enter the **no mtu** command.

Configuring Framing

The default framing value is SONET STS-3c.

-
- Step 1** To configure for SDH STM-1, enter the **pos framing sdh** command:

```
Router(config)# interface pos 3/0  
Router(config-if)# pos framing sdh
```

- Step 2** To change back to SONET STS-3c, enter the **no pos framing sdh** command.
-

Setting the Source of the Transmit Clock

The clocking default value specifies that the PA-POS-20C3 use the recovered receive (RX) clock to provide transmit (TX) clocking (called *loop timing*).

**Note**

If line loopback is selected, the PA-POS-20C3 is forced into loop timing mode until the loopback is disengaged.

-
- Step 1** To specify that the Cisco PA-POS-20C3 port adapter generate the transmit clock internally, enter the **clock source internal** command:

```
Router(config)# interface pos 3/0  
Router(config-if)# clock source internal
```

- Step 2** To restore loop timing, enter the **no clock source internal** command or the **clock source line** command.
-

Configuring Cyclic Redundancy Checks

The cyclic redundancy check (CRC) default value is a 16-bit CRC (CRC-CITT). The CRC is an error-checking technique that uses a calculated numeric value to detect errors in transmitted data. The PA-POS-20C3 also supports a 32-bit CRC. The sender of a data frame calculates the frame check sequence (FCS). The sender appends the FCS value to outgoing messages. The receiver recalculates the FCS and compares it to the FCS from the sender. If a difference exists, the receiver assumes that a transmission error occurred and sends a request to the sender to resend the frame.

-
- Step 1** To configure an interface for a 32-bit CRC, enter the **crc 32** command:

```
Router(config)# interface pos 3/0  
Router(config-if)# crc 32
```

- Step 2** To disable the 32-bit CRC and return the interface to the default 16-bit CRC, enter the **no crc 32** command.
-

Configuring SONET Payload Scrambling

The default value for SONET payload scrambling is disabled. SONET payload scrambling applies a self-synchronous scrambler ($x^{43}+1$) to the Synchronous Payload Envelope (SPE) of the OC-3 interface to ensure sufficient bit-transition density.



Note

Both ends of the connection must use the same scrambling algorithm.

You enable SONET payload scrambling using the **pos scramble-atm** command. (This command has no keywords or arguments.)

Step 1 To enable SONET payload scrambling, use the following command sequence:

```
Router(config)# interface pos 3/0
Router(config-if)# pos scramble-atm
Router(config-if)# no shutdown
Router(config-if)# end
```

Step 2 To verify that SONET payload scrambling is enabled on an interface, enter the **show startup-config** command. If scrambling is enabled, the following line is displayed in the configuration:

```
pos scramble-atm
```

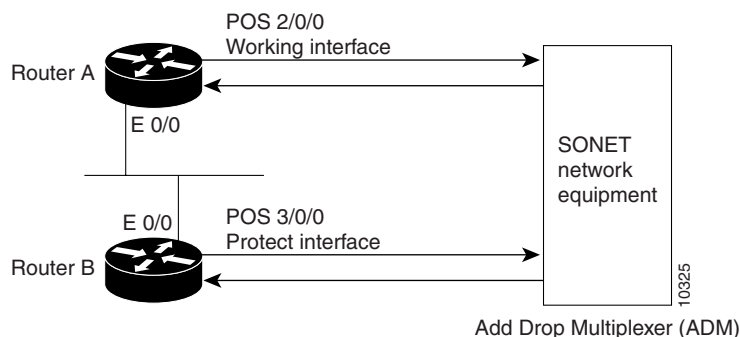
Step 3 To disable SONET payload scrambling, use the **no pos scramble-atm** command.

Configuring APS

The automatic protection switching (APS) feature allows switchover of packet-over-SONET (POS) circuits in the event of circuit failure and is often required when connecting SONET equipment to telco equipment. APS refers to the mechanism of using a protect POS interface in the SONET network as the backup for working POS interface. When the working interface fails, the protect interface quickly assumes its traffic load.

The following example shows the configuration of APS on router A and router B. (See [Figure 4-1](#).) In this example, router A is configured with the working interface, and router B is configured with the protect interface. If the working interface on router A becomes unavailable, the connection will automatically switch over to the protect interface on router B.

Figure 4-1 Basic APS Configuration



On router A, which contains the working interface, use the following configuration:

```
Router# configure terminal
Router(config)# interface loopback 1
Router(config-if)# ip address 10.7.7.7 255.255.255.0
Router(config)# interface pos 2/0/0
Router(config-if)# aps group 1
Router(config-if)# aps working 1
Router(config-if)# pos ais-shut
Router(config-if)# end
Router#
```

On router B, which contains the protect interface, use the following configuration:

```
Router# configure terminal
Router(config)# interface loopback 2
Router(config-if)# ip address 10.7.7.6 255.255.255.0
Router(config)# interface pos 3/0/0
Router(config-if)# aps group 1
Router(config-if)# aps protect 1 10.7.7.7
Router(config-if)# pos ais-shut
Router(config-if)# end
Router#
```



Note

The loopback interface is used as the interconnect. The **aps group** command is used even when a single protect group is configured.

To verify the configuration or to determine if a switch over has occurred, use the **show aps** command.

For more information on SONET APS, see the following documents:

- *Automatic Protection Switching of Packet-over-SONET Circuits* at the following URL:
http://www.cisco.com/en/US/products/sw/iosswrel/ps1824/products_feature_guide09186a0080087ad9.html
- *Configuring Redundancy for POS/APS* at the following URL:
http://www.cisco.com/en/US/tech/tk482/tk607/technologies_tech_note09186a0080094c54.shtml

Checking the Configuration

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

- [Using show Commands to Verify the New Interface Status, page 4-9](#)
- [Using the ping Command to Verify Network Connectivity, page 4-29](#)
- [Using loopback Commands, page 4-29](#)

For complete command descriptions and examples, refer to the publications listed in the “[Related Documentation](#)” section on page iv.

Using show Commands to Verify the New Interface Status

Table 4-3 demonstrates how you can use the **show** commands to verify that new interfaces are configured and operating correctly and that the PA-POS-20C3 appears in them correctly. Sample displays of the output of selected **show** commands appear in the sections that follow.


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 4-3 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 pos <i>port-adapter-slot-number/port number</i>	Displays status information about the OC-3 interface in a Cisco 7200VXR series router	Router# show interfaces pos 3/0
show interfaces pos <i>port-adapter-slot-number/port number</i>	Displays status information about the OC-3 interface in a Cisco 7201 router	Router# show interfaces pos 1/0
show interfaces pos <i>port-adapter-slot-number/port number</i>	Displays status information about the OC-3 interface in a Cisco 7301 router	Router# show interfaces pos 1/0
show interfaces pos <i>module-slot-number/</i> <i>interface-port-number</i>	Displays status information about interface 0 on a Cisco 7304 PCI Port Adapter Carrier Card in a Cisco 7304 router	Router# show interfaces pos 3/0
show interfaces pos <i>port-adapter-slot-number/port number</i>	Displays status information about the OC-3 interface in a Cisco 7401ASR router	Router# show interfaces pos 1/0
show interfaces pos <i>interface-processor-slot-number/port-</i> <i>adapter-slot-number/interface-port-number</i>	Displays status information about a POS interface on a VIP in a Cisco 7500 series router	Router# show interfaces pos 3/1/0
show interfaces pos <i>interface-processor-slot-number/port-</i> <i>adapter-slot-number/interface-port-number</i>	Displays status information about a POS interface on a FlexWAN module in a Cisco 7600 series router	Router# show interfaces pos 8/1/0

Table 4-3 Using show commands (continued)

Command	Function	Example
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:

- [Using the show version or show hardware Commands, page 4-10](#)
- [Using the show diag Command, page 4-16](#)
- [Using the show interfaces Command, page 4-22](#)

Choose the subsection appropriate for your system. Proceed to the “[Using the ping Command to Verify Network Connectivity](#)” section on [page 4-29](#) 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. This section contains examples for some of the supported platforms.



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 platform-specific output examples using the **show version** command:

- [Cisco 7200 VXR Routers—Example Output of the show version Command, page 4-11](#)
- [Cisco 7201 Router—Example Output of the show version Command, page 4-11](#)
- [Cisco 7301 Router—Example Output of the show version Command, page 4-12](#)
- [Cisco 7304 Router—Example Output of the show version Command, page 4-13](#)
- [Cisco 7401ASR Router—Example Output of the show version Command, page 4-13](#)
- [VIP in Cisco 7500 Series Routers—Example Output of the show version Command, page 4-14](#)
- [Cisco 7600 Routers with FlexWAN and Enhanced FlexWAN—Example Output of the show version Command, page 4-15](#)

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

Following is an example of the **show version** command from a Cisco 7206VXR series router with the PA-POS-20C3 installed.

```
Router# show version

c7200-C1#
c7200-C1#show version
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-P-M), Version 12.3(8.4), MAINTENANCE INTERIM SOFTWARE
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Thu 22-Apr-04 04:57 by kellythw
Image text-base: 0x60008AF4, data-base: 0x619FE000

ROM: System Bootstrap, Version 12.2(20030826:190624) [BLD-npeg1_rommon_r11 102],
DEVELOPMENT SOFTWARE
BOOTLDR: 7200 Software (C7200-KBOOT-M), Version 12.2(15)B, EARLY DEPLOYMENT RELEASE
SOFTWARE (fc1)

c7200-C1 uptime is 1 week, 1 day, 2 hours, 58 minutes
System returned to ROM by reload at 11:44:49 UTC Wed Aug 4 2004
System image file is "disk2:c7200-p-mz.123-8.4"
Last reload reason: Reload command

cisco 7206VXR (NPE-G1) processor (revision A) with 983040K/65536K bytes of memory.
Processor board ID 31524452
SB-1 CPU at 700MHz, Implementation 1, Rev 0.2, 512KB L2 Cache
6 slot VXR midplane, Version 2.7

"....."

12 FastEthernet/IEEE 802.3 interface(s)
3 Gigabit Ethernet/IEEE 802.3 interface(s)
2 Packet over SONET network interface(s)
509K bytes of non-volatile configuration memory.

47040K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).
250880K bytes of ATA PCMCIA card at slot 2 (Sector size 512 bytes).
16384K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x210

c7200-C1#
```

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 7301 Router—Example Output of the show version Command

Following is an example of the **show version** command from a Cisco 7301 router with the Cisco PA-POS-20C3 port adapter installed.

```
Router# show version
```

```
Cisco Internetwork Operating System Software
IOS (tm) 7301 Software (C7301-JS-M), Version 12.3(9), RELEASE SOFTWARE (fc2)
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Fri 14-May-04 09:42 by dchih
Image text-base: 0x60008AF4, data-base: 0x61F86000
ROM: System Bootstrap, Version 12.2(8r)B3, RELEASE SOFTWARE (fc1)
7301A-1 uptime is 7 weeks, 2 days, 23 minutes
System returned to ROM by power-on
System image file is "disk0:c7301-js-mz.123-9"
cisco 7301 (NPE) processor (revision A) with 983040K/65536K bytes of memory.
Processor board ID 74804277
SB-1 CPU at 700MHz, Implementation 1, Rev 0.2, 512KB L2 Cache
1 slot midplane, Version 2.0
Last reset from power-on
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
3 Gigabit Ethernet/IEEE 802.3 interface(s)
2 Packet over SONET network interface(s)
509K bytes of non-volatile configuration memory.
62976K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).
32768K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x2102
```

Cisco 7304 Router—Example Output of the show version Command

Following is an example of the **show version** command from a Cisco 7304 router with the Cisco PA-POS-2OC3 port adapter installed.

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) 7300 Software (C7300-JS-M), Version 12.2(20)S3, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Thu 20-May-04 17:58 by pwade
Image text-base: 0x40008BF4, data-base: 0x427D2000

ROM: System Bootstrap, Version 12.1(12r)EX1, RELEASE SOFTWARE (fc1)
Currently running ROMMON from ROM 0
BOOTLDR: 7300 Software (C7300-JS-M), Version 12.2(20)S3, RELEASE SOFTWARE (fc2)

7304-1 uptime is 1 week, 6 days, 21 hours, 59 minutes
System returned to ROM by power-on
System image file is "disk0:c7300-js-mz.122-20.S3"

cisco 7300 (NSE100) processor (revision E) with 458752K/65536K bytes of memory.
Processor board ID SCA0606011G
R7000 CPU at 350Mhz, Implementation 39, Rev 3.3, 256KB L2, 1024KB L3 Cache
4 slot midplane, Version 65.48

Last reset from power-on
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
PXF processor tmc0 'system:pxf/ucode1' is running ( v4.1 ).
PXF processor tmc1 'system:pxf/ucode1' is running ( v4.1 ).
1 FastEthernet/IEEE 802.3 interface(s)
2 Gigabit Ethernet/IEEE 802.3 interface(s)
1 ATM network interface(s)
2 Packet over SONET network interface(s)
509K bytes of non-volatile configuration memory.

31744K bytes of ATA compact flash in bootdisk (Sector size 512 bytes).
62976K bytes of ATA compact flash in disk0 (Sector size 512 bytes).
Configuration register is 0x2102
```

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 the Cisco PA-POS-2OC3 port adapter installed.

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) 7400 Software (C7400-JS-M), Version 12.2(613), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Sun 01-Dec-02 15:26 by prasath
Image text-base:0x600088F4, data-base:0x61F32000

ROM: System Bootstrap, Version 12.2(2r)DD, RELEASE SOFTWARE (fc1)

7401 uptime is 6 days, 15 hours, 25 minutes
System returned to ROM by reload at 02:46:08 UTC Thu Dec 19 2002
System image file is "disk0:c7400-js-mz"
```

```
cisco 7401ASR (NSE) processor (revision A) with 114688K/16384K bytes of memory.
Processor board ID 74990464
R7000 CPU at 375Mhz, Implementation 39, Rev 3.3, 256KB L2, 2000KB L3 Cache
1 slot ASR midplane, Version 2.0
```

```
Last reset from power-on
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
PXF processor tmc is running.
2 Gigabit Ethernet/IEEE 802.3 interface(s)
2 Packet over SONET network interface(s)
509K bytes of non-volatile configuration memory.
```

```
62720K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).
8192K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x0
```

VIP in 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 router with the Cisco PA-POS-20C3 port adapter installed.

```
Router#show version
```

```
Cisco Internetwork Operating System Software
IOS (tm) RSP Software (RSP-PV-M), Version 12.2(613), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Sun 08-Dec-02 16:14 by prasath
Image text-base:0x60010B50, data-base:0x61620000
```

```
ROM:System Bootstrap, Version 11.1(2), RELEASE SOFTWARE (fc1)
```

```
Router uptime is 1 minute
System returned to ROM by reload at 00:53:36 UTC Mon Dec 9 2002
System image file is "slot0:rsp-pv-mz"
```

```
cisco RSP8 (R7000) processor with 131072K/8216K bytes of memory.
R7000 CPU at 250Mhz, Implementation 39, Rev 1.0, 256KB L2, 2048KB L3 Cache
Last reset from power-on
G.703/E1 software, Version 1.0.
G.703/JT2 software, Version 1.0.
X.25 software, Version 3.0.0.
Bridging software.
Chassis Interface.
1 EIP controller (6 Ethernet).
1 VIP4-50 RM5271 controller (2 POS).
6 Ethernet/IEEE 802.3 interface(s)
2 Packet over SONET network interface(s)
123K 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).
Configuration register is 0x0
```

Cisco 7600 Routers with FlexWAN and Enhanced FlexWAN—Example Output of the show version Command

Following is an example of the **show version** command from a Cisco 7600 router with the Cisco PA-POS-2OC3 port adapter installed in a FlexWAN module:

```
Router#show version
```

```
Cisco Internetwork Operating System Software
IOS (tm) s72033_rp Software (s72033_rp-PK9SV-M), Version 12.2(17d)SXB1, RELEASE SOFTWARE
(fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Fri 28-May-04 19:13 by ccai
Image text-base: 0x40020FBC, data-base: 0x41F38000
ROM: System Bootstrap, Version 12.2(14r)S1, RELEASE SOFTWARE (fc1)
BOOTLDR: s72033_rp Software (s72033_rp-PK9SV-M), Version 12.2(17d)SXB1, RELEASE SOFTWARE
(fc2)
pe2 uptime is 2 weeks, 6 days, 18 hours, 44 minutes
Time since pe2 switched to active is 2 weeks, 6 days, 18 hours, 43 minutes
System returned to ROM by power-on (SP by power-on)
System image file is "sup-bootflash:s72033-pk9sv-mz.122-17d.SXB1.bin"
```

```
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 CISC07609 (R7000) processor (revision 1.0) with 458752K/65536K bytes of memory.
Processor board ID FOX071000FH
SR71000 CPU at 600Mhz, Implementation 0x504, Rev 1.2, 512KB L2 Cache
Last reset from power-on
X.25 software, Version 3.0.0.
Bridging software.
2 FlexWAN controllers (3 POS).
1 GIGA-WAN controller (4 GIGAWAN Ports).
1 4-port OC12 POS controller (4 POS).
1 1-port OC48 POS controller (1 POS).
1 Dual-port OC12c ATM controller (2 ATM).
10 Virtual Ethernet/IEEE 802.3 interface(s)
36 Gigabit Ethernet/IEEE 802.3 interface(s)
2 ATM network interface(s)
8 Packet over SONET network interface(s)
1917K bytes of non-volatile configuration memory.
8192K bytes of packet buffer memory.
65536K bytes of Flash internal SIMM (Sector size 512K).
Configuration register is 0x2102
```

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 VXR 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 7500 series router with a VIP. In the FlexWAN module, the **show diag** command is used without the *slot* designation.



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 platform-specific output examples using the **show diag** command:

- [Cisco 7200VXR Series Routers—Example Output of the show diag Command, page 4-16](#)
- [Cisco 7201 Router—Example Output of the show diag Command, page 4-17](#)
- [Cisco 7301 Router—Example Output of the show diag Command, page 4-17](#)
- [Cisco 7304 Router—Example Output of the show diag Command, page 4-18](#)
- [Cisco 7401ASR Router—Example Output of the show diag Command, page 4-20](#)
- [VIP in Cisco 7500 Series Routers—Example Output of the show diag Command, page 4-21](#)
- [Cisco 7600 Series Routers with FlexWAN and Enhanced FlexWAN—Example Output of the show diag Command, page 4-22](#)

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

Following is an example of the **show diag** command for a PA-POS-20C3 in port adapter slot 2 of a Cisco 7200 VXR router:

```
Router# show diag 2
Slot 2:
Dual OC3 POS Port adapter, 2 ports
Port adapter is analyzed
Port adapter insertion time 16:01:44 ago
EEPROM contents at hardware discovery:
Hardware Revision      :1.0
PCB Serial Number     :000000000000
Part Number           :73-8220-01
Board Revision        :01
RMA Test History      :00
RMA Number            :0-0-0-0
RMA History           :00
Unknown Field (type 0088):00 00 00 00
Product Number        :PA-POS-20C3
Top Assy. Part Number  :800-21857-01
EEPROM format version 4
EEPROM contents (hex):
0x00:04 FF 40 03 E3 41 01 00 C1 8B 30 30 30 30 30 30
0x10:30 30 30 30 30 82 49 20 1C 01 42 30 31 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 01 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 7201 Router—Example Output of the show diag Command

Following is an example of the **show diag** command on 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-20C3
  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 FF
    0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
    0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

Cisco 7301 Router—Example Output of the show diag Command

Following is an example of the **show diag** command for a PA-POS-20C3 in port adapter slot 1 of a Cisco 7301 router:

```
Router# show diag 1
Slot 1:
  Dual OC3 POS Port adapter, 2 ports
  Port adapter is analyzed
  Port adapter insertion time 7w2d ago
  EEPROM contents at hardware discovery:
  Hardware Revision : 1.0
  PCB Serial Number : JAE080216FB
  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-20C3
  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 38 30
0x10: 32 31 36 46 42 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 7304 Router—Example Output of the show diag Command

Following is an example of the **show diag** command for a PA-POS-20C3 in router module slot 5 of a Cisco 7304 router:

```

Router# show diag 5
Slot 5: is a PA CC with the following PA in its slot0:
Slot 0:
  Dual OC3 POS Port adapter, 2 ports
  Port adapter is analyzed
  Port adapter insertion time 00:01:02 ago
  EEPROM contents at hardware discovery:
  Hardware Revision       : 1.0
  PCB Serial Number      : JAE0826MGXV
  Part Number            : 73-8220-03
  Board Revision         : A0
  RMA Test History       : 00
  RMA Number             : 0-0-0-0
  RMA History            : 00
  Deviation Number       : 0
  Product Number         : PA-POS-20C3
  Top Assy. Part Number  : 800-21857-03
  EEPROM format version 4
  EEPROM contents (hex):
    0x00: 04 FF 40 03 E3 41 01 00 C1 8B 4A 41 45 30 38 32
    0x10: 36 4D 47 58 56 82 49 20 1C 03 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 03 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

  BCM1125 LDT Host Bridge, handle=0
  BCM bridge, config=0x0
  (0x00):dev, vendor id           = 0x0002166D
  (0x04):status, command          = 0x00100107
  (0x08):class code, revid        = 0x06000003
  (0x0C):hdr, lat timer, cls      = 0x00010000
  (0x18):bus id registers         = 0x00000000
  (0x1C):secondary status        = 0x000001F1
  (0x20):mem base/limit           = 0x0000FFF0
  (0x30):io upper limit/base     = 0x000001FF
  (0x34):capabilities ptr         = 0x00000040
  (0x38):expansion rom bar       = 0x00000000
  (0x3C):bridge ctrl             = 0x00220000
  (0x40):LDT cmd, cap id,        = 0x20010008
  (0x44):Link config/control     = 0x00000000
  (0x48):Link frequency          = 0x801F0023
  (0x50):SRIcmd, srirxdn, sritxdn = 0x00001010
  (0x54):SRI tx numerator        = 0x0000FFFF
  (0x58):SRI rx numerator        = 0x0000FFFF
  (0x68):Error status/control    = 0x00000000

```

```
(0x6C):Tx ctrl, databufalloc      = 0x00041515
(0xC8):Tx buffer count max       = 0x00FFFFFF
(0xDC):Rx CRC expected           = 0xECBFD6C
(0xF0):Rx CRC received           = 0xFFD6DDF6
```

BCM PCI Host Bridge:

```
bus_no=0, device_no=0
DeviceID=0x0001, VendorID=0x166D, Cmd=0x0146, Status=0x02A0
Cls=0x06/0x00/0x00, Rev=0x03, LatencyTimer=0x2C, CacheLineSize=0x10
BaseAddr0=0x60000008, BaseAddr1=0x00000000, MaxLat=0x00, MinGnt=0x00
SubsysDeviceID=0x0000, SubsysVendorID=0xFFFF, ErrorAddr=0x0000000A
```

Bus Watcher Counters

```
cor_l2cache_data_ecc_count = 0
bad_l2cache_data_ecc_count = 0
cor_l2cache_tag_ecc_count  = 0
bad_l2cache_tag_ecc_count  = 0
cor_memory_data_ecc_count  = 0
bad_memory_data_ecc_count  = 0
bus_errors                  = 0
```

BCM Status Registers

```
A_SCD_BUS_ERR_STATUS = 0000000080000000
A_BUS_ERR_DATA_0     = 73DD75FF794FF9FA
A_BUS_ERR_DATA_1     = DFEFE79FF3F3E766
A_BUS_ERR_DATA_2     = FFCFE5EAF5BFF7E7
A_BUS_ERR_DATA_3     = 9BF3BB5FB56AFF79
A_SCD_SYSTEM_REVISION = 00000001112421FF
A_IO_INTERRUPT_STATUS = 0000000000000000
A_IO_INTERRUPT_ADDR0 = 0000000000000000
A_IO_INTERRUPT_ADDR1 = 0000000000000000
```

Data Mover Channel 1 (Packet moving DMA engine 1):

```
channel=0x606E2648, ring=0x6000080, context=0x606E26D8, entries=256
dma_used=0, dma_head=0, dma_tail=0
dma_complete=0, exhausted_dma_entries=0
post_dma_cb=0x601808A4, post_dma_cb_count=0
```

Registered interfaces:

```
POS0/0
state=1, desc_count=0, byte_count=0, total_bytes=0
ring=0x60963070, ring_count=0, ring_head=0, ring_tail=0
POS0/1
state=1, desc_count=0, byte_count=0, total_bytes=0
ring=0x60970C70, ring_count=0, ring_head=0, ring_tail=0
```

Data Mover Channel 2 (Packet moving DMA engine 2):

```
channel=0x606E3F78, ring=0x60010C0, context=0x606E4008, entries=256
dma_used=0, dma_head=0, dma_tail=0
dma_complete=0, exhausted_dma_entries=0
post_dma_cb=0x601808A4, post_dma_cb_count=0
```

```
PA Carrier Card Line Card, 2 ports
Line Card state: Active
Insertion time: 00:01:30 ago
Bandwidth points: 310000
EEPROM contents at hardware discovery:
Hardware Revision      : 1.1
Boot Time out         : 0000
PCB Serial Number     : CAT080200WV
Part Number           : 73-8261-03
Board Revision        : A0
Fab Version           : 02
RMA Test History      : 00
```

```

RMA Number           : 0-0-0-0
RMA History          : 00
Deviation Number     : 1-5720
Product Number       : 7300-CC-PA
Top Assy. Part Number : 68-1910-03
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
Calibration Data     : Minimum: 0 dBmV, Maximum: 0 dBmV

Calibration values :
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 03 C3 41 01 01 46 00 00 C1 8B 43 41 54
0x10: 30 38 30 32 30 30 57 56 82 49 20 45 03 42 41 30
0x20: 02 02 03 00 81 00 00 00 00 04 00 80 00 01 16 58
0x30: CB 94 37 33 30 30 2D 43 43 2D 50 41 20 20 20 20
0x40: 20 20 20 20 20 20 87 44 07 76 03 C4 08 00 00 00
0x50: 00 00 00 00 00 C5 08 00 00 00 00 00 00 00 C8
0x60: 09 00 00 00 00 00 00 00 00 00 F3 00 41 01 08 F6
0x70: 48 43 34 F6 48 43 34 02 31 04 B0 64 32 28 37 26
0x80: 05 DC 64 32 28 37 26 09 C4 64 32 28 32 DD 0C E4
0x90: 64 32 28 43 24 14 1E 64 32 28 65 BA 2E E0 AA 82
0xA0: 64 F4 24 D1 20 AA 82 64 80 EF FE 02 E9 2B FF FF
0xB0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xC0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xD0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xE0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xF0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x100: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x110: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x120: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x130: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x140: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x150: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x160: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x170: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x180: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x190: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1A0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1B0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1C0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1D0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1E0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1F0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

FPGA information:
Current FPGA version      : 01.20
IOS bundled FPGA version : 01.20
CPLD version             : 00.06

```

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

Following is an example of the **show diag** command for a PA-POS-20C3 in port adapter slot 1 of a Cisco 7401ASR router:

```

Router# show diag 1
Slot 12/1:
NSE Card state: Primary
Insertion time: 16w4d ago
C7300 NSE Mainboard EEPROM:
Hardware Revision : 2.3
PCB Serial Number : CAB0532JYYB
Part Number : 73-5198-02
Board Revision : A0

```

```

Fab Version : 02
RMA Test History : 00
RMA Number : 0-0-0-0
RMA History : 00
Deviation Number : 0-0
Product Number : 7300-NSE-100
Top Assy. Part Number : 68-1002-02
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
Calibration Data : Minimum: 0 dBmV, Maximum: 0 dBmV
Calibration values :
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 02 8B 41 02 03 C1 8B 43 41 42 30 35 33
0x10: 32 4A 59 59 42 82 49 14 4E 02 42 41 30 02 02 03

```

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

Following is an example of the **show diag** command that shows a PA-POS-20C3 in port adapter slot 4 on a VIP in interface processor slot 1:

```

Router#show diag 1
Slot 1:
  Physical slot 1, ~physical slot 0xE, logical slot 1, CBus 0
  Microcode Status 0x4
  Master Enable, LED, WCS Loaded
  Board is analyzed
  Pending I/O Status:None
  EEPROM format version 1
  VIP4-80 RM7000 controller, HW rev 2.02, board revision A0
  Serial number:18588146 Part number:73-3143-03
  Test history:0x00 RMA number:00-00-00
  Flags:cisco 7000 board; 7500 compatible

  EEPROM contents (hex):
  0x20:01 22 02 02 01 1B A1 F2 49 0C 47 03 00 00 00 00
  0x30:50 13 33 00 00 00 00 00 00 00 00 00 00 00 00 00

  Slot database information:
  Flags:0x4 Insertion time:0x41FCECC (6d22h ago)

  Controller Memory Size:64 MBytes CPU SDRAM, 64 MBytes Packet SDRAM

  PA Bay 0 Information:
    POS PA, 2 port, PA-POS-20C3
    EEPROM format version 4
    HW rev 1.00, Board revision 01
    Serial number:000000000000 Part number:73-8220-01

  --Boot log begin--

Cisco Internetwork Operating System Software
IOS (tm) VIP Software (SVIP-DW-M), Version 12.2(613), RELEASE SOFTWARE (fc1)
TAC Support:http://www.cisco.com/tac
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Sun 08-Dec-02 16:10 by prasath
Image text-base:0x60010930, data-base:0x604C0000

  --Boot log end--

```

Cisco 7600 Series Routers with FlexWAN and Enhanced FlexWAN—Example Output of the show diag Command

Following is an example of the **show diag** command that shows a PA-POS-20C3 in bay 1 in a FlexWAN module:

```
Router#show diag
  Slot 6: Logical_index 17
  FlexWAN controller
  Board is analyzed ipc ready
  HW rev 1.4, board revision D0
  Serial Number: SAD053706A5 Part number: 73-3869-07
  Slot database information:
  Flags: 0x2004 Insertion time: 0x1CCC8 (2w6d ago)
  Controller Memory Size:
    112 MBytes CPU Memory
    16 MBytes Packet Memory
    128 MBytes Total on Board SDRAM
  IOS (tm) cwlc Software (cwpa-DW-M), Version 12.2(17d)SXB1,
  RELEASE SOFTWARE (fc2)
  PA Bay 1 Information:
    POS PA, 2 port, PA-POSSW-MM
    EEPROM format version 1
    HW rev 2.02, Board revision A0
    Serial number: 29xxxxxxx Part number: 73-xxxx-xx
```

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 the individual platforms, refer to the publications listed in the “[Related Documentation](#)” section on page iv.



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 platform-specific output examples using the **show interfaces** command:

- [Cisco 7200 VXR Routers—Example Output of the show interfaces Command, page 4-23](#)
- [Cisco 7201 Router—Example Output of the show interfaces Command, page 4-23](#)
- [Cisco 7301 Router—Example Output of the show interfaces Command, page 4-24](#)
- [Cisco 7304 Router—Example Output of the show interfaces Command, page 4-26](#)
- [Cisco 7401ASR Router—Example Output of the show interfaces Command, page 4-27](#)
- [VIP in Cisco 7500 Series Routers—Example Output of the show interfaces Command, page 4-27](#)
- [Cisco 7600 Series Routers with FlexWAN and Enhanced FlexWAN—Example Output of the show interfaces Command, page 4-28](#)

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

Following is an example of the **show interfaces pos** command for a PA-POS-20C3 in port adapter slot 4 of a Cisco 7200VXR router:

```
Router# show interfaces pos 4/0

PE3#sh int pos4/1
POS4/1 is down, line protocol is down
  Hardware is Packet over Sonet
  Internet address is 142.50.8.3/24
  MTU 4470 bytes, BW 155000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, crc 16, loopback not set
  Keepalive not set
  Scramble disabled
  Last input never, output never, output hang never
  Last clearing of "show interface" counters 3d23h
  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 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 IP multicast)
    0 runts, 0 giants, 0 throttles
      0 parity
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 applique, 20 interface resets
    0 output buffer failures, 0 output buffers swapped out
    0 carrier transitions
```



Note

For the Cisco 7206VXR router shelves in the Cisco AS5800 Universal Access Router, the **show interfaces pos** command requires a shelf number in the format **show interfaces pos shelf-number/port-adapter-slot-number/interface-port**. For example, the command **show interfaces pos 5/3/0** specifies the OC-3 interface of a Cisco PA-POS-20C3 port adapter in port adapter slot 3 of router shelf 5.

Cisco 7201 Router—Example Output of the show interfaces Command

Following is an example of the **show interfaces** command for the 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 7301 Router—Example Output of the show interfaces Command

Following is an example of the **show interfaces** command for a PA-POS-20C3 in a Cisco 7301 router:

```

Router# show interfaces

GigabitEthernet0/0 is up, line protocol is up
Hardware is BCM1250 Internal MAC, address is 000e.d624.dc1b (bia 000e.d624.dc1b)
  Description: ***GE Connection to IXIA 1/4
  Internet address is 198.1.1.1/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
  reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  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 never, output 00:05:28, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  30 second input rate 0 bits/sec, 0 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
  0 packets input, 0 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
  7349 packets output, 565794 bytes, 0 underruns
  3 output errors, 0 collisions, 4 interface resets
  0 babbles, 0 late collision, 0 deferred
  3 lost carrier, 0 no carrier, 0 pause output
  0 output buffer failures, 0 output buffers swapped out
GigabitEthernet0/1 is up, line protocol is up
Hardware is BCM1250 Internal MAC, address is 000e.d624.dc1a (bia 000e.d624.dc1a)
  Description: ***GE Connection to 7301A-2
  Internet address is 200.1.1.1/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
  reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  Full-duplex, 1000Mb/s, link type is autonegotiation, media type is SX
  output flow-control is XON, input flow-control is XON
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:50:13, output 00:05:30, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0

```



```

Queueing strategy: fifo
Output queue: 0/40 (size/max)
30 second input rate 0 bits/sec, 0 packets/sec
30 second output rate 0 bits/sec, 0 packets/sec
353 packets input, 31060 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, 23988 multicast, 0 pause input
0 input packets with dribble condition detected
7757 packets output, 591048 bytes, 0 underruns
3 output errors, 0 collisions, 4 interface resets
0 babbles, 0 late collision, 0 deferred
3 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out
GigabitEthernet0/2 is up, line protocol is up

Hardware is BCM1250 Internal MAC, address is 000e.d624.dc19 (bia 000e.d624.dc19)
Internet address is 10.0.0.9/24
MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Full-duplex, 100Mb/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 00:00:14, output 00:00:03, output hang never
Last clearing of "show interface" counters never
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 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
251458 packets input, 38023771 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, 797565 multicast, 0 pause input
0 input packets with dribble condition detected
523031 packets output, 51462809 bytes, 0 underruns
8 output errors, 0 collisions, 4 interface resets
0 babbles, 0 late collision, 0 deferred
8 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out
POS1/0 is administratively down, line protocol is down
Hardware is Packet over Sonet
MTU 4470 bytes, BW 155000 Kbit, DLY 100 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, crc 16, loopback not set
Keepalive set (10 sec)
Scramble disabled
Last input never, output never, output hang never
Last clearing of "show interface" counters never
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 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 throttles
0 parity
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 applique, 0 interface resets

```

```

    0 output buffer failures, 0 output buffers swapped out
    0 carrier transitions
    POS1/1 is administratively down, line protocol is down
Hardware is Packet over Sonet
  MTU 4470 bytes, BW 155000 Kbit, DLY 100 usec,
  reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, crc 16, loopback not set
  Keepalive set (10 sec)
  Scramble disabled
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  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 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 throttles
  0 parity
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 packets output, 0 bytes, 0 underruns
  0 output errors, 0 applique, 0 interface resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions

```

Cisco 7304 Router—Example Output of the show interfaces Command

Following is an example of the **show interfaces pos** command for a PA-POS-20C3 in port adapter slot 5 of a Cisco 7304 router:

```

Router# show interfaces pos5/0

POS5/0 is administratively down, line protocol is down
  Hardware is Packet over Sonet
  MTU 4470 bytes, BW 155000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, crc 16, loopback not set
  Keepalive set (10 sec)
  Scramble disabled
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  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 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 IP multicast)
    0 runts, 0 giants, 0 throttles
    0 parity
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 applique, 1 interface resets
    0 output buffer failures, 0 output buffers swapped out
    0 carrier transitions

Router#sh int pos5/1
POS5/1 is administratively down, line protocol is down
  Hardware is Packet over Sonet
  MTU 4470 bytes, BW 155000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, crc 16, loopback not set

```

```

Keepalive set (10 sec)
Scramble disabled
Last input never, output never, output hang never
Last clearing of "show interface" counters never
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 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 IP multicast)
  0 runs, 0 giants, 0 throttles
    0 parity
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 packets output, 0 bytes, 0 underruns
  0 output errors, 0 applique, 1 interface resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions

```

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

Following is an example of the **show interfaces pos** command for a PA-POS-20C3 in port adapter slot 1 of a Cisco 7401ASR router:

```

Router# show interfaces pos 1/0

POS1/0 is administratively down, line protocol is down
Hardware is Packet over Sonet
MTU 4470 bytes, BW 155000 Kbit, DLY 100 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 runs, 0 giants
    0 parity
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  10 packets output, 234 bytes, 0 underruns
  0 output errors, 0 applique, 0 interface resets
  0 output buffers copied, 0 interrupts, 0 failures
  0 carrier transitions

```

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

Following is an example of the **show interfaces pos** command used with the VIP. In this example, the two serial interfaces (0 to 1) are on a port adapter in port adapter slot 1 of a VIP in interface processor slot 1. Most of the status information for each interface is omitted. (Interfaces are administratively shut down until you enable them.)

```

Router#show interface pos 1/0/1

POS1/0/1 is up, line protocol is up
Hardware is cyBus Packet Over Sonet
Internet address is 11.0.0.1/16
MTU 4470 bytes, BW 155000 Kbit, DLY 100 usec,
  reliability 240/255, txload 4/255, rxload 1/255
Encapsulation HDLC, crc 16, loopback not set

```

```

Keepalive not set
Scramble disabled
Last input 00:24:38, output 02:58:40, output hang never
Last clearing of "show interface" counters 00:00:52
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 366000 bits/sec, 953 packets/sec
5 minute output rate 2977000 bits/sec, 7476 packets/sec
  100 packets input, 856 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
      0 parity
  8 input errors, 8 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 packets output, 0 bytes, 0 underruns
  0 output errors, 0 applique, 0 interface resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions

```

Cisco 7600 Series Routers with FlexWAN and Enhanced FlexWAN—Example Output of the show interfaces Command

Following is an example of the **show interfaces pos** command that shows a PA-POS-20C3 in slot 1 in a FlexWAN module in a Cisco 7609 router (slot 8):

```

Router# show interfaces pos 8/1/0

POS8/1/0 is down, line protocol is down
Hardware is Packet over Sonet
Description: SMB 5B1
Internet address is 192.85.10.1/24
MTU 4470 bytes, BW 155000 Kbit, DLY 100 usec,
   reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, crc 16, loopback not set
Keepalive set (10 sec)
Scramble enabled
LCP Closed
Closed: IPCP, CDPCP
Last input never, output never, output hang never
Last clearing of "show interface" counters 2w6d
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
30 second input rate 0 bits/sec, 0 packets/sec
30 second output rate 0 bits/sec, 0 packets/sec
  0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
      0 parity
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 packets output, 0 bytes, 0 underruns
  0 output errors, 0 applique, 0 interface resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions

```

Using the ping Command to Verify Network Connectivity

You can use the **ping** command to 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 iv 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.

Using loopback Commands

The loopback test allows you to troubleshoot, detect, and isolate equipment malfunctions by testing the connection between the OC-3 interface and a remote device. The **loopback** command places an interface in internal loopback (also called *local loopback*) or line loopback mode, which enables test packets that are generated from the **ping** command to loop through a remote device or a cable. If the packets complete the loop, the connection is good. If not, you can isolate a fault to the remote device or the cable in the path of the loopback test.

**Note**

Engaging line loopback automatically switches the interface to loop timing. The interface switches back to the user-specified timing source once the loopback is disengaged.

Configuring an Interface for Internal Loopback

The default loopback setting is for no loopback. With internal (or local) loopback, packets from the router are looped back in the framer. Outgoing data gets looped back to the receiver without actually being transmitted. Internal loopback is useful for checking that the PA-POS-20C3 is working.

Step 1 To configure an interface for internal loopback, enter the **loop internal** command:

```
Router(config)# interface pos 3/0
Router(config-if)# loop internal
```

Step 2 To disable internal loopback, enter the **no loop internal** command.

Configuring an Interface for Line Loopback



Note

Engaging line loopback automatically switches the interface to loop timing. It switches back to the user-specified timing source when the loopback is disengaged.

The default loopback setting is for no loopback. With line loopback, the receive (RX) fiber is logically connected to the transmit (TX) optical fiber cable so that packets from the remote router are looped back to it. Incoming data gets looped around and retransmitted to the remote end omitting the received part which is of no significance.

Step 1 To configure an interface for line loopback, enter the **loop line** command:

```
Router(config)# interface pos 3/0
Router(config-if)# loop line
```

Step 2 To disable line loopback, enter the **no loop line** command.

For more information about interface subcommands and the configuration options available for the individual platforms, refer to the publications listed in the [“Related Documentation”](#) section on page iv.

Push/Pull Mode Description

The PA-POS-20C3 and PA-POS-10C3 port adapters support a different algorithm (from that of most port adapters) for handling data. On the transmit side, it can either pull packets from the CPU (Pull mode) or push packets from the CPU to the port adapter (Push mode). The PA-POS-20C3 and PA-POS-10C3 port adapters were developed with a software architecture that deviates from the design of previously developed port adapters. A majority of the port adapters allow data to be pulled from the CPU to their interfaces. By default, the TX DMA mode is Pull for NPE-G1 and Push for NPE-G2. You cannot change the default TX DMA modes for NPE-G1 and NPE-G2 using the **dma model pull enable** command. For NPE-G1, the TX DMA mode is always Pull and for NPE-G2, the TX DMA mode is always Push.

This functionality is implemented starting with the following Cisco IOS Releases: 12.4(24)T01, 12.4(22)T02, 12.4(20)T03, 12.2(33)SRD02, 12.2(33)SRC04, 12.2(33)SB07, and 12.2(31)SB16.

If you run the **dma model pull enable** command on NPE-G1, the running configuration shows that the Pull mode is enabled otherwise the information about Pull mode is not displayed in the running configuration. Running the **dma model pull enable** command on NPE-G2 results in an error message.



Caution

Only customers who have been advised by Cisco to use this CLI should do so. If you have not been advised by Cisco to use the **dma model pull enable** command, do not do so.

PA-POS-20C3 Statistics Counters

The PA-POS-20C3 maintains counts of certain errors. Each error counter is 16 bits. Errors include the following:

- CRC errors—Packet corrupted in reception
- Giants received—Packet length too large (greater than 16 KB)
- Runts—Packet length too small (less than or equal to 4 bytes)
- Ignores—No receive buffers available; receive buffers full

PA-POS-20C3 Error Messages

The only error message you should see is of the following type and format:

```
%POS-0-MSG:%DEBUGGER-0-STACK_DATA8: 00E0 FFFFFFFF 80057F50 00000000 00000000 FFFFFFFF  
80032CD4 00000000 00000000
```

**Note**

Contact the Cisco Technical Assistance Center (TAC) for assistance with this error message.

Making a Back-to-Back Connection

This section provides an example of two sample configuration files from a Cisco 7200 VXR router and a Cisco 7401ASR router connected back-to-back through their OC-3 interfaces.

-
- Step 1** To connect two PA-POS-2OC3-equipped routers back to back, attach the appropriate cable between the OC-3 interface port on each PA-POS-2OC3.
- By default, the PA-POS-2OC3 uses loop timing mode.
- Step 2** To specify that the Cisco PA-POS-2OC3 port adapter generates the transmit clock internally, add the **clock source internal** command to your configuration (see the first router example above: *clock source internal*).
-



Note

For back-to-back operation, at least one of the connected OC-3 interfaces *must* be configured to supply its internal clock to the line.

First Router

```
interface POS 3/0 <to select port 0 of PA-POS-2OC3 in a Cisco 7200 / Cisco 7401 series
router>
interface POS 3/1 <to select port 1 of PA-POS-2OC3 in a Cisco 7200 / Cisco 7401 series
router>
ip address 10.0.0.10 255.255.255.0
no keepalive
clock source internal
```

Second Router

```
interface POS 3/0 <to select port 0 of PA-POS-2OC3 in a Cisco 7200 / Cisco 7401 series
router>
interface POS 3/1 <to select port 1 of PA-POS-2OC3 in a Cisco 7200 / Cisco 7401 series
router>
ip address 10.0.0.20 255.255.255.0
no keepalive
```