



## Configuring the SA-Comp/1 and SA-Comp/4

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To continue your SA-Comp/1 and SA-Comp/4 service adapter installation, you must configure the *compression* interfaces. The instructions that follow apply to all supported platforms. Minor differences between the platforms—with Cisco IOS software commands—are noted.

This chapter contains the following sections:

- [Using the EXEC Command Interpreter, page 4-1](#)
- [Configuring the Interfaces, page 4-2](#)
- [Checking the Configuration, page 4-12](#)

### Using the EXEC Command Interpreter

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

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

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

```
Router> enable
```

```
Password:
```

- Step 2** Enter the password (the password is case sensitive). For security purposes, the password is not displayed. When you enter the correct password, the system displays the privileged-level system prompt (#):

```
Router#
```

---

To configure the new interfaces, proceed to the [“Configuring the Interfaces” section on page 4-2](#).

# Configuring the Interfaces

After you verify that the new SA-Comp/1 or SA-Comp/4 is installed correctly (the enabled LED goes on), use the privileged-level **configure** command to configure the new interfaces.



## Note

Configure the serial port adapter that is used with the SA-Comp/1 or SA-Comp/4. The SA/Comp/1 or SA-Comp/4 is not configurable. The information in this section is for the serial port adapter that is used with the SA/Comp/1 or SA-Comp/4.

Have the following information available:

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

If you installed a new SA-Comp/1 or SA-Comp/4 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 SA-Comp/1 or SA-Comp/4 that was previously configured, the system recognizes the new interfaces and brings each of them up in their existing configuration.

For a summary of the configuration options available and instructions for configuring interfaces on an SA-Comp/1 or SA-Comp/4, refer to the appropriate configuration publications listed in the [“Related Documentation” section on page vi](#).

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

This section contains the following subsections:

- [Shutting Down an Interface, page 4-2](#)
- [Performing a Basic Configuration, page 4-4](#)
- [Configuring Interfaces for Compression, page 4-6](#)

## Shutting Down an Interface

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

Follow these steps to shut down an interface:

- 
- Step 1** Enter the privileged level of the EXEC command interpreter (also called enable mode). (See the [“Using the EXEC Command Interpreter” section on page 4-1](#) for instructions.)
- Step 2** At the privileged-level prompt, enter configuration mode and specify that the console terminal is the source of the configuration subcommands, as follows:

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

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

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

**Table 4-1** Syntax of the shutdown Command

Platform	Command	Example
Cisco 7200 series routers	<b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port</i> (port-adapter-slot-number/interface-port-number)	The example is for interface 0 and interface 1 on a port adapter in port adapter slot 6. <pre>Router(config-if)# <b>interface serial 6/0</b> Router(config-if)# <b>shutdown</b> Router(config-if)# <b>interface serial 6/1</b> Router(config-if)# <b>shutdown</b> <b>Ctrl-Z</b> Router#</pre>
VIP2 in Cisco 7000 series or Cisco 7500 series routers	<b>interface</b> , followed by the <i>type (serial)</i> and <i>slot/port adapter/port</i> (interface-processor-slot-number/port-adapter-slot-number/interface-port-number)	The example is for interface 0 on a port adapter in port adapter slot 1 of a VIP2 installed in interface processor slot 1. <pre>Router(config-if)# <b>interface serial 1/1/1</b> Router(config-if)# <b>shutdown</b> Router(config-if)# <b>interface serial 1/1/0</b> Router(config-if)# <b>shutdown</b> <b>Ctrl-Z</b> Router#</pre>



**Note**

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

**Step 4** Write the new configuration to NVRAM as follows:

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

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

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

Table 4-2 Examples of the show interfaces Command

Platform	Command	Example
Cisco 7200 series routers	<b>show interfaces serial</b> , followed by <i>slot/port</i> (port-adapter-slot-number/interface-port-number)	The example is for interface 0 on a port adapter in port adapter slot 6.  Router# <b>show interfaces serial 6/0</b>  Serial 6/0 is administratively down, line protocol is down  [Additional display text omitted from this example]
VIP2 in Cisco 7000 series or Cisco 7500 series routers	<b>show interfaces serial</b> , followed by <i>slot/port adapter/port</i> (interface-processor-slot-number/port-adapter-slot-number/interface-port-number)	The example is for interface 0 on a port adapter in port adapter slot 1 of a VIP2 in interface processor slot 1.  Router# <b>show interfaces serial 1/1/0</b>  Serial 1/1/0 is administratively down, line protocol is down  [Additional display text omitted from this example]

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

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

## Performing a Basic Configuration

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

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

```
Router# disable
```

```
Router>
```

- Step 1** Enter configuration mode and specify that the console terminal is the source of the configuration subcommands, as follows:
- ```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```
- Step 2** Specify the first interface to configure by entering the **interface serial** subcommand, followed by the interface address of the interface you plan to configure. (The command for your port adapter may be different, for example, **interface atm**.) [Table 4-3](#) gives examples.

**Table 4-3 Examples of the interface serial Subcommand**

| Platform                                               | Command                                                                                                                                                         | Example                                                                                                                                                                                             |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cisco 7200 series routers                              | <b>interface serial</b> , followed by <i>slot/port</i><br>(port-adapter-slot-number/<br>interface-port-number)                                                  | The example is for the first interface of a port adapter in port adapter slot 6.<br><br>Router(config)# <b>interface serial 6/0</b><br>Router(config-if)#                                           |
| VIP2 in Cisco 7000 series or Cisco 7500 series routers | <b>interface serial</b> , followed by <i>slot/port adapter/port</i><br>(interface-processor-slot-number/<br>port-adapter-slot-number/<br>interface-port-number) | The example is for the first interface of a port adapter in port adapter slot 1 of a VIP2 in interface processor slot 1.<br><br>Router(config)# <b>interface serial 1/1/0</b><br>Router(config-if)# |

- Step 3** Assign an IP address and subnet mask to the interface (if IP routing is enabled on the system) by using the **ip address** subcommand, as in the following example:
- ```
Router(config-if)# ip address 10.0.0.0 10.255.255.255
```
- Step 4** Add any additional configuration subcommands required to enable routing protocols and set the interface characteristics.
- Step 5** Reenable the interfaces using the **no shutdown** command. (See the [“Shutting Down an Interface”](#) section on page 4-2.)
- Step 6** Configure all additional port adapter interfaces as required.
- Step 7** After including all of the configuration subcommands to complete your configuration, press **Ctrl-Z**—hold down the **Control** key while you press **Z**—or enter **end** or **exit** to exit configuration mode and return to the EXEC command interpreter prompt.
- Step 8** Write the new configuration to NVRAM as follows:
- ```
Router# copy running-config startup-config
[OK]
Router#
```

---

This completes the procedure for creating a basic configuration.

## Configuring Interfaces for Compression

The following sections explain how to use the CSA to configure PPP and Frame Relay compression on serial interfaces installed in Cisco 7200 series routers and the VIP2 in Cisco 7000 series and Cisco 7500 series routers.

This section contains the following subsections:

- [Cisco 7200 Series Compression Configuration Specifics, page 4-6](#)
- [VIP2 Compression Configuration Specifics, page 4-7](#)
- [Configuring Interfaces for PPP Compression, page 4-7](#)
- [Configuring Interfaces for Frame Relay Compression, page 4-9](#)

### Cisco 7200 Series Compression Configuration Specifics

A CSA installed in a Cisco 7200 series router will compress interfaces on serial port adapters installed in any port adapter slot. For a Cisco 7200 series router that has an installed CSA, there are two methods for configuring PPP and Frame Relay compression:

- **Software compression**—Compression is implemented in the Cisco IOS release software installed in the router's main processor.
- **Hardware compression**—Compression is implemented in the CSA hardware installed in a port adapter slot. Hardware compression removes compression and decompression responsibilities from the main processor installed in your router.

Use the **compress stac** [*software*] command to configure PPP compression on interfaces. The **compress stac** command used without the *software* variable enables hardware PPP compression on a specified interface; if a CSA is not installed in the router, software PPP compression is enabled on the interface.

If your Cisco 7200 series router has an installed CSA, you can force software PPP compression on an interface using the **compress stac** software command.

When multiple CSAs are installed in a Cisco 7200 series router, you can specify the CSA a particular interface uses for hardware PPP compression by using the **compress stac csa** [*port adapter slot*] command.



#### Note

To use the **compress stac csa** [*port adapter slot*] command, your Cisco 7204 or Cisco 7206 router must be running Cisco IOS Release 11.1(8)CA1, or a later release of 11.1 CA. The CSA is not supported in the Cisco 7200 VXR routers (the Cisco 7204VXR and Cisco 7206VXR) or in the Cisco 7202.

Use the **frame-relay map protocol protocol-address dlcI** [*ietf/cisco*] **payload-compress frf9 stac** [*csa csa\_number|software*] command to configure Frame Relay compression on an interface. Use the **frame-relay payload-compress frf9 stac** [*csa csa\_number|software*] command to configure Frame Relay compression on a subinterface.

The **frame-relay map protocol protocol-address dlcI** [*ietf/cisco*] **payload-compress frf9 stac** or the **frame-relay payload-compress frf9 stac** command used without variables enables hardware Frame Relay compression on a specified interface; if a CSA is not installed in the router, software Frame Relay compression is enabled on the interface.

When multiple CSAs are installed in a Cisco 7200 series router, you can specify the CSA a particular interface uses for hardware Frame Relay compression by using the **frame-relay map protocol protocol-address dlcI** [*ietf/cisco*] **payload-compress frf9 stac csa csa\_number** command or the CSA a particular subinterface uses for hardware Frame Relay compression by using the **frame-relay**

**payload-compress frf9 stac csa** *csa\_number* command. You can also force software Frame Relay compression on an interface using the **frame-relay map protocol protocol-address dlc***i [ietf|cisco]* **payload-compress frf9 stac software** command or on a subinterface using the **frame-relay payload-compress frf9 stac software** command.

## VIP2 Compression Configuration Specifics

A CSA installed in slot 0 or slot 1 of a VIP2 will only compress interfaces on the serial port adapter installed in the adjacent VIP2 slot. For Cisco 7000 and Cisco 7500 series routers that have an installed VIP2 with a CSA, there are three methods for configuring PPP and Frame Relay compression.

- Software compression—Compression is implemented in the Cisco IOS release software installed in the router's main processor.
- Distributed compression—Compression is implemented in software that is installed in a VIP2. Distributed compression removes compression and decompression responsibilities from the router's main processor and is supported only by Cisco 7000 series and Cisco 7500 series routers that have an installed VIP2.
- Hardware compression—Compression is implemented in the CSA hardware installed in a VIP2. Hardware compression removes compression and decompression responsibilities from the VIP2 or the main processor installed in your router.

Use the **compress stac** [*software|distributed*] command to configure PPP compression on interfaces. The **compress stac** command used without variables enables hardware PPP compression on a specified interface; if a CSA is not installed in the router, distributed compression is enabled on the interface; if a VIP2 is not installed in the router, software PPP compression is enabled on the interface.

If your Cisco 7000 or Cisco 7500 series router has an installed VIP2 with a CSA, you can force distributed PPP compression on an interface using the **compress stac distributed** command. You can also force software PPP compression on an interface using the **compress stac software** command.

Use the **frame-relay map protocol protocol-address dlc***i [ietf|cisco]* **payload-compress frf9 stac** [*software|distributed*] command to configure Frame Relay compression on an interface. Use the **frame-relay payload-compress frf9 stac** [*software|distributed*] command to configure Frame Relay compression on a subinterface.

The **frame-relay map protocol protocol-address dlc***i [ietf|cisco]* **payload-compress frf9 stac** or the **frame-relay payload-compress frf9 stac** command used without variables enables hardware compression on a specified interface; if a CSA is not installed in the router, distributed compression is enabled on the interface; if a VIP2 is not installed in the router, software compression is enabled on the interface.

If your Cisco 7000 or Cisco 7500 series router has an installed VIP2 with a CSA, you can force distributed Frame Relay compression on an interface using the **frame-relay map protocol protocol-address dlc***i [ietf|cisco]* **payload-compress frf9 stac distributed** command or on a subinterface using the **frame-relay payload-compress frf9 stac csa distributed** command. You can also force software Frame Relay compression on an interface using the **frame-relay map protocol protocol-address dlc***i [ietf|cisco]* **payload-compress frf9 stac software** command or on a subinterface using the **frame-relay payload-compress frf9 stac software** command.

## Configuring Interfaces for PPP Compression

Use the following instructions to configure PPP compression on a serial interface using the **compress stac** [*software|distributed*] command. Press the **Return** key after each step unless otherwise noted. At any time you can exit the privileged level and return to the user level by entering **disable** at the prompt as follows:

```
Router# disable
```

```
Router>
```

- Step 1** 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** At the prompt, specify the interface you want to configure for compression.

- For the Cisco 7200 series, enter the subcommand **interface** followed by the *type (serial)* and *port-adapter-slot/interface- port-number*. The following example is for the first serial interface in port adapter slot 2:

```
Router(config)# interface serial 2/0
```

- For the VIP2, enter the subcommand **interface** followed by the *type (serial)* and *slot/port adapter/interface port number*. The example that follows is for the first serial interface in port adapter slot 1 of a VIP2 in interface processor slot 3:

```
Router(config)# interface serial 3/1/0
```

- Step 3** Specify PPP encapsulation for the interface as follows:

```
Router(config-if)# encapsulation PPP
```



**Note** Hardware and distributed compression are only supported on PPP and Frame Relay links.

- Step 4** If you are configuring a Cisco 7200 series router and multiple CSAs are installed in the router, use the **compress stac csa** [*port adapter slot*] command to specify the CSA that the interface will use for hardware compression. In the following example, a CSA in port adapter slot 3 is used:

```
Router(config-if)# compress stac csa 3
```

- Step 5** Enter the **compress stac** [*software*] or **compress stac** [*softwaredistributed*] command as follows:

```
Router(config-if)# compress stac
```



**Note** The **compress stac** [*software*] command is supported on Cisco 7200 series routers whereas the **compress stac** [*softwaredistributed*] command is supported on the VIP2.

- Step 6** Configure compression on any additional interfaces.

- For the Cisco 7200 series, enter the port adapter slot and port of each additional interface followed by the **compress stac** [*software*] command. When you have finished configuring compression on interfaces, 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-if)# interface serial 2/1  
Router(config-if)# compress stac  
Router(config-if)# interface serial 2/2  
Router(config-if)# compress stac
```

**Ctrl-Z**

Router#

- For the VIP2, enter the interface processor slot, port adapter, and port of each additional interface, followed by the **compress stac** [*software|distributed*] command. When you have finished configuring compression on interfaces, 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-if)# interface serial 3/1/1
Router(config-if)# compress stac
Router(config-if)# interface serial 3/1/2
Router(config-if)# compress stac
Ctrl-Z
Router#
```

- Step 7** 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 8** Verify that compression is configured on the interfaces. To do so, use the **show compress** command to display the status of all interfaces in the system. See the “[Checking the Configuration](#)” section on page 4-12 for examples of the **show compress** command.

- Step 9** To remove compression from the interfaces, repeat the previous steps, but use the **no compress** command in Step 5; and then write the new configuration to memory as in the following example for the VIP2:

```
Router(config)# interface serial 3/1/0
Router(config-if)# no compress
Ctrl-Z
Router#

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

After you remove compression from an interface, the interface will not appear in the output from the **show compress** command.

---

This completes the procedure for configuring PPP compression on a serial interface. To check the configuration of the interfaces, proceed to the “[Checking the Configuration](#)” section on page 4-12.

## Configuring Interfaces for Frame Relay Compression

Following are instructions for configuring Frame Relay compression on interfaces using the **frame-relay map protocol protocol-address dlci [ietf|cisco] payload-compress frf9 stac [csa csa\_number|software]** command and the **frame-relay map protocol protocol-address dlci [ietf|cisco] payload-compress frf9 stac [software|distributed]** command, and on subinterfaces using the **frame-relay payload-compress frf9 stac [csa csa\_number|software]** command and the **frame-relay payload-compress frf9 stac [software|distributed]** command.

Before beginning the configuration, be prepared with the following information:

- Protocols you plan to route on each new interface
- Internet protocol (IP) addresses if you will configure the interfaces for IP routing
- The Data Link Connection Identifier (DLCI) number you will use to connect to the specified protocol address on the interface
- The Frame Relay encapsulation method you will use (IETF [the default] or Cisco) on each interface

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

```
Router# disable
Router>
```

---

**Step 1** 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** At the prompt, specify the first interface or subinterface you want to configure for compression.

- For a Cisco 7200 series interface configuration, enter the subcommand **interface**, followed by the *type (serial)* and *port-adapter-slot/interface-port-number*.

For a VIP2 interface configuration, enter the subcommand **interface**, followed by the *type (serial)* and *slot/port-adapter/interface-port-number*.

*The following example is for the first interface in port adapter slot 1 of a VIP2 in interface processor slot 3:*

```
Router(config)# interface serial 3/1/0
```

- For a Cisco 7200 series subinterface configuration, enter the subcommand **interface**, followed by the *type (serial)* and *port-adapter-slot/interface-port-number.subinterface-number point-to-point*.

For a VIP2 subinterface configuration, enter the subcommand **interface**, followed by the *type (serial)* and *slot/port-adapter/interface-port-number-subinterface-number point-to-point*.

*The following example is for subinterface 100 of the first interface in port adapter slot 1 of a VIP2 in interface processor slot 3:*

```
Router(config)# interface serial 3/1/0.100 point-to-point
```

**Step 3** Specify Frame Relay encapsulation for the interface or subinterface as follows:

```
Router(config-if)# encapsulation frame-relay
```




---

**Note** Hardware and distributed compression are only supported on Frame Relay and PPP links.

---

**Step 4** Configure compression on the interface or subinterface.

- For a Cisco 7200 series interface configuration, enter the **frame-relay map protocol protocol-address dlci [ietf|cisco] payload-compress frf9 stac [csa csa\_number|software]** command.

For a VIP2 interface configuration, enter the **frame-relay map protocol protocol-address dlci [ietf|cisco] payload-compress frf9 stac [software|distributed]** command.

The following example configures hardware-based Frame Relay compression on the interface (Cisco 7200 series or VIP2) specified in Step 2:

```
Router(config-if)# frame-relay map ip 10.1.1.1 105 ietf payload-compress frf9 stac
```

- For a Cisco 7200 series subinterface configuration, enter the **frame-relay payload-compress frf9 stac [csa csa\_number|software]** command.

For a VIP2 subinterface configuration, enter the **frame-relay payload-compress frf9 stac [software|distributed]** command.

The following example configures hardware-based Frame Relay compression on the subinterface (Cisco 7200 series or VIP2) specified in Step 2:

```
Router(config-if)# frame-relay payload-compress frf9 stac
```

**Step 5** Repeat Step 2 through Step 4 to configure compression on additional interfaces or subinterfaces. When you have finished, 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.

**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** Verify that compression is configured on the interfaces. To do so, use the **show compress** command (displays the status of all interfaces in the system). See the “[Checking the Configuration](#)” section on page 4-12 for examples of the **show compress** command.

**Step 8** To remove compression from the interfaces, repeat the previous steps, but use the **no frame-relay map protocol protocol-address dlci [ietf|cisco] payload-compress frf9 stac [csa csa\_number|software]** command, **no frame-relay map protocol protocol-address dlci [ietf|cisco] payload-compress frf9 stac [software|distributed]** command, **no frame-relay payload-compress frf9 stac [csa csa\_number|software]** command, or the **no frame-relay payload-compress frf9 stac [software|distributed]** command; then write the new configuration to memory as in the following example for the VIP2:

```
Router(config)# interface serial 3/1/0.100 point-to-point
Router(config-if)# no frame-relay map payload-compress frf9 stac
Ctrl-Z
Router#
```

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

After you remove compression from an interface, the interface will not appear in the output from the **show compress** command.

This completes the procedure for configuring Frame Relay compression on a serial interface or subinterface. To check the configuration of the interfaces, proceed to the next section “[Checking the Configuration](#).” For additional Frame Relay configuration information, refer to the chapter “Configuring Frame Relay” in the *Wide-Area Networking Configuration Guide* publication.

## Checking the Configuration

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

- [Using show Commands to Verify the New Interface Status, page 4-12](#)
- [Using the ping Command to Verify Network Connectivity, page 4-20](#)

## Using show Commands to Verify the New Interface Status

[Table 4-4](#) demonstrates how you can use the **show** commands to verify that new interfaces are configured and operating correctly and that the *SA-Comp/1* and *SA-Comp/4* appears in them correctly. Sample displays of the output of selected **show** commands appear in the sections that follow. For complete command descriptions and examples, refer to the publications listed in the “[Related Documentation](#)” section on page vi.



### Note

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

**Table 4-4** Using show Commands

| Command                                                       | Function                                                                                                                                                                   | Example                                   |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| <b>show version</b> or<br><b>show hardware</b>                | Displays system hardware configuration, the number of each interface type installed, Cisco IOS software version, names and sources of configuration files, and boot images | Router# <b>show version</b>               |
| <b>show controllers</b>                                       | Displays all the current interface processors and their interfaces                                                                                                         | Router# <b>show controllers</b>           |
| <b>show diag slot</b>                                         | Displays types of port adapters installed in your system and information about a specific port adapter slot, interface processor slot, or chassis slot                     | Router# <b>show diag 2</b>                |
| <b>show interfaces type 0 or 1/<br/>interface-port-number</b> | Displays status information about a specific type of interface (for example, serial)                                                                                       | Router# <b>show interfaces serial 1/0</b> |

Table 4-4 Using show Commands (continued)

| Command                                                                                                                                 | Function                                                                                                                                          | Example                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>show interfaces</b> <i>type</i><br><i>3/interface-port-number</i>                                                                    | Displays status information about a specific type of interface (for example, serial) in a Cisco 7120 series router                                | Router# <b>show interfaces serial 3/1</b>   |
| <b>show interfaces</b> <i>type</i><br><i>4/interface-port-number</i>                                                                    | Displays status information about a specific type of interface (for example, serial) in a Cisco 7140 series router                                | Router# <b>show interfaces serial 4/1</b>   |
| <b>show interfaces</b> <i>type</i><br><i>1/interface-port-number</i>                                                                    | Displays status information about a specific type of interface (for example, serial) in a Cisco uBR7223 router                                    | Router# <b>show interfaces serial 1/1</b>   |
| <b>show interfaces</b> <i>type 1 or 2/</i><br><i>interface-port-number</i>                                                              | Displays status information about a specific type of interface (for example, serial) in a Cisco uBR7246 router                                    | Router# <b>show interfaces serial 2/0</b>   |
| <b>show interfaces</b> <i>type interface-processor-</i><br><i>slot-number/port-adapter-slot-number/</i><br><i>interface-port-number</i> | Displays status information about a specific type of interface (for example, serial) on a VIP2 in a Cisco 7000 series or Cisco 7500 series router | Router# <b>show interfaces serial 3/1/0</b> |
| <b>show protocols</b>                                                                                                                   | Displays protocols configured for the entire system and for specific interfaces                                                                   | Router# <b>show protocols</b>               |
| <b>show running-config</b>                                                                                                              | Displays the running configuration file                                                                                                           | Router# <b>show running-config</b>          |
| <b>show startup-config</b>                                                                                                              | Displays the configuration stored in NVRAM                                                                                                        | Router# <b>show startup-config</b>          |

If 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 4-14](#)
- [Using the show diag Command, page 4-16](#)
- [Using the show interfaces Command, page 4-17](#)

Choose the subsection appropriate for your system. Proceed to the “[Using the ping Command to Verify Network Connectivity](#)” section on page 4-20 when you have finished using the **show** commands.

## Using the show version or show hardware Commands

Display the configuration of the system hardware, the number of each interface type installed, the Cisco IOS software version, the names and sources of configuration files, and the boot images, using the **show version** (or **show hardware**) command.



### Note

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

### Cisco 7200 Series Series Routers

Following is an example of the **show version** command from a Cisco 7200 series router with the *SA-Comp/1 and SA-Comp/4*:

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-J-M), Version 11.1(8)CA1
Copyright (c) 1986-1996 by cisco Systems, Inc.
Compiled Sun 21-Apr-95 12:22 by
Image text-base: 0x600088A0, data-base: 0x605A4000

ROM: System Bootstrap, Version 11.1(8)CA1

Router uptime is 4 hours, 22 minutes
System restarted by reload
System image file is "slot0:c7200-j-mz.960421", booted via slot0

cisco 7206 (NPE150) processor with 12288K/4096K bytes of memory.
R4700 processor, Implementation 33, Revision 1.0 (Level 2 Cache)
Last reset from power-on
Bridging software.
SuperLAT software copyright 1990 by Meridian Technology Corp.
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
TN3270 Emulation software (copyright 1994 by TGV Inc).
Chassis Interface.
4 Ethernet/IEEE 802.3 interfaces.
2 FastEthernet/IEEE 802.3 interfaces.
4 Token Ring /IEEE802.5 interfaces.
12 Serial network interfaces.
1 Compression port adapter.
125K bytes of non-volatile configuration memory.
1024K bytes of packet SRAM memory.

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

### VIP2 in Cisco 7000 Series and Cisco 7500 Series Routers

Following is an example of the **show version** command from a Cisco 7500 series router with the *SA-Comp/1 and SA-Comp/4*:

```
Router# show version

Cisco Internetwork Operating System Software
IOS (tm) GS Software (RSP-A), Version 11.1(6)CA [amcrae 125]
Copyright (c) 1986-1996 by cisco Systems, Inc.
Compiled Sat 10-Aug-96 17:56 by amcrae
```

```

Image text-base: 0x600108A0, data-base: 0x60952000

ROM: System Bootstrap, Version 5.3(16645) [szhang 571], INTERIM SOFTWARE
ROM: GS Software (RSP-BOOT-M), Version 11.1(6)CA, RELEASE SOFTWARE (fc1)

gshen_7500 uptime is 5 days, 4 minutes
System restarted by reload
System image file is "rsp-jv-mz", booted via slot0

cisco RSP2 (R4600) processor with 16384K bytes of memory.
R4600 processor, Implementation 33, Revision 2.0
Last reset from power-on
G.703/E1 software, Version 1.0.
SuperLAT software copyright 1990 by Meridian Technology Corp).
Bridging software.
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
TN3270 Emulation software (copyright 1994 by TGV Inc).
Chassis Interface.
 1 EIP controller (6 Ethernet).
 1 VIP2 controller (8 Serial)(1 Compression).
 6 Ethernet/IEEE 802.3 interfaces.
 1 HSSI network interface.
 1 Compression port adapter.
125K bytes of non-volatile configuration memory.

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

```

## Using the show compression Command

### Cisco 7200 Series Routers

Use the **show compress** command to determine which interfaces in the router are configured for compression (the **show compress** command displays only interfaces that are configured for compression). The **show compress** command displays all interfaces configured for compression, the type of compression configured on each interface, and the CSA that is compressing the interface's data.

In the following example, PPP compression and then Frame Relay compression information is displayed for the same serial interface (the first interface of the port adapter in slot 2):

```

Router# show compress
Serial2/0
  Hardware compression enabled
  CSA in slot 1 in use
  Compressed bytes sent:          4742 bytes   0 Kbits/sec   ratio: 10.700
  Compressed bytes rcv:          5092 bytes   0 Kbits/sec   ratio: 10.009
  restarts: 1
  last clearing of counters: 348 seconds

Router# show compress
Serial2/0 - DLCI: 105
  Hardware compression enabled
  CSA in slot 1 in use
  Compressed bytes sent:          4742 bytes   0 Kbits/sec   ratio: 10.700
  Compressed bytes rcv: 5092 bytes   0 Kbits/sec   ratio: 10.009
  restarts: 1
  last clearing of counters: 348 seconds

```

## VIP2 in Cisco 7000 Series and Cisco 7500 Series Routers

To determine which interfaces in the router are configured for compression, use the **show compress** command. All interfaces configured for compression are displayed, as well as the type of compression configured on each interface and which CSA is in use (the **show compress** command only displays interfaces that are configured for compression). The following examples show the same interface (the first interface of the port adapter in slot 1 of a VIP2 in interface processor slot 3) configured for PPP compression and then Frame Relay compression:

```
Router# sh compress
Serial3/1/0
    Distributed h/w compression enabled
CSA in slot 3 in use
    Compressed bytes sent:      4932 bytes    0 Kbits/sec  ratio: 10.500
    Compressed bytes rcv:      5019 bytes    0 Kbits/sec  ratio: 10.019
    restarts: 10
    last clearing of counters: 165828 seconds

Router# show compress
Serial3/1/0 - DLCI: 105
    Distributed h/w compression enabled
CSA in slot 3 in use
    Compressed bytes sent:      4942 bytes    0 Kbits/sec  ratio: 10.700
    Compressed bytes rcv:      5029 bytes    0 Kbits/sec  ratio: 10.009
    restarts: 10
    last clearing of counters: 162528 seconds
```

## Using the show diag Command

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



### Note

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

## Cisco 7200 Series Routers

Following is an example of the **show diag slot** command that shows an SA-Comp/1 or SA-Comp/4 in port adapter slot 1 of a Cisco 7200 series router. Specific port adapter information is displayed, as shown in the following example of a CSA in chassis slot 1:

```
Router# show diag 1
Slot 1:
    Compression engine 768K port adapter, 0 ports
    Port adapter is analyzed
    Port adapter insertion time 00:16:37 ago
    Hardware revision 255.255          Board revision UNKNOWN
    Serial number 4294967295          Part number 255-65535-255
    Test history 0xFF                  RMA number 255-255-255
    EEPROM format version 255
    EEPROM contents (hex):
        0x20: FF 09 FF FF FF FF FF FF FF FF FF FF FF FF FF
        0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

If the previous displays indicate that the hardware is not functioning properly, ensure that the network interfaces are properly connected and terminated. If you still have problems bringing up or shutting down an interface, contact a customer service representative for assistance.

## VIP2 in Cisco 7000 Series and Cisco 7500 Series Routers

Following is an example of the **show diag slot** command that shows an SA-Comp/1 or SA-Comp/4 in port adapter slot 0 on a VIP2 in interface processor slot 3:

```
Router# show diag 3
Slot 3:
Physical slot 3, ~physical slot 0xF, logical slot 0, CBus 0
Microcode Status 0x4
Master Enable, LED, WCS Loaded
Board is analyzed
Pending I/O Status: None
EEPROM format version 1
VIP2 controller, HW rev 2.1, board revision UNKNOWN
Serial number: 03341394 Part number: 73-1684-02
Test history: 0x00 RMA number: 00-00-00
Flags: cisco 7000 board; 7500 compatible

EEPROM contents (hex):
0x20: 01 15 02 01 00 32 FC 52 49 06 94 02 00 00 00 00
0x30: 07 2E 00 2A 1A 00 00 00 00 00 00 00 00 00 00 00

Slot database information:
Flags: 0x4 Insertion time: 0x8E11A48 (04:51:14 ago)

Controller Memory Size: 8 MBytes DRAM, 1024 KBytes SRAM

PA Bay 0 Information:
Compression PA, 3M SRAM, 0 ports
EEPROM format version 255
HW rev FF.FF, Board revision UNKNOWN
Serial number: 4294967295 Part number: 255-65535-255

PA Bay 1 Information:
Mueslix Serial PA, 8 ports
EEPROM format version 1
HW rev FF.FF, Board revision UNKNOWN
Serial number: 4294967295 Part number: 255-65535-255
```

If the displays indicate that the hardware is not functioning properly, ensure that the network interfaces are properly connected and terminated. If you still have problems bringing up or shutting down an interface, contact a customer service representative for assistance.

## Using the show interfaces Command

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

For complete descriptions of interface subcommands and the configuration options available for **Cisco 7200 series and VIP2** 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

Following is an example of the **show interfaces** command for Cisco 7200 series routers. The following examples show the same interface (the first interface of the port adapter in slot 2) configured for PPP compression and then Frame Relay compression (interfaces are administratively shut down until you enable them):

```
Router# show interfaces serial 2/0
Serial2/0 is up, line protocol is up
Hardware is M8T-V.35
  Internet address is 1.1.1.0
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation PPP, loopback not set, keepalive not set
(display text omitted)
```

```
Router# show interfaces serial 2/0
Serial2/0 is up, line protocol is up
Hardware is M8T-V.35
  Internet address is 1.1.1.0
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation FRAME-RELAY, loopback not set, keepalive not set
(display text omitted)
```

With the **show interfaces type-port-adapter-slot/interface-port-number** command, use arguments such as the interface type (serial, and so forth), port adapter slot, and the interface port number (port adapter slot/port) to display information about a specific serial interface only.

The following example of the **show interfaces serial port-adapter-slot/interface-port-number** command shows all of the information specific to the first PA-8T-V.35 interface port adapter in port adapter slot 2:

```
Router# show interfaces serial 2/0
Serial2/0 is up, line protocol is up
  Hardware is M8T-V.35
  Internet address is 1.1.1.0
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation PPP, loopback not set, keepalive not set
  LCP Open
  Open: ccp, ipcp, cdp
  Last input 00:00:07, output 00:00:05, output hang never
  Last clearing of "show interface" counters 3d23h
  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
    5743 packets input, 1886943 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    5743 packets output, 189253 bytes, 0 underruns
    0 output errors, 0 collisions, 4 interface resets
    0 output buffer failures, 0 output buffers swapped out
    4 carrier transitions      DCD=up DSR=up DTR=up RTS=up CTS=up
```

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

Proceed to the next section, [“Using the ping Command to Verify Network Connectivity,”](#) to check network connectivity of the *SA-Comp/1* or *SA-Comp/4* and switch or router.

## VIP2 in Cisco 7000 Series or Cisco 7500 Series Routers

Following is an example of the **show interfaces** command used with the VIP2. The following examples show the same interface (the first interface of the port adapter in slot 1 of a VIP2 in interface processor slot 3) configured for PPP compression and then Frame Relay compression (interfaces are administratively shut down until you enable them):

```
Router# show interfaces serial 3/1/0
Serial3/1/0 is up, line protocol is up
Hardware is cyBus Serial
  Internet address is 1.1.1.0
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation PPP, loopback not set, keepalive not set
(display text omitted)
```

```
Router# show interfaces serial 3/1/0
Serial3/1/0 is up, line protocol is up
Hardware is cyBus Serial
  Internet address is 1.1.1.0
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation FRAME-RELAY, loopback not set, keepalive not set
(display text omitted)
```

With the **show interfaces type slot/port-adapter/port** command, use arguments such as the interface type (serial, and so forth) and the slot, port adapter, and port numbers (slot/port adapter/port) to display information about a specific serial interface only.

The following example of the **show interfaces serial slot/port-adapter/port** command shows all of the information specific to the first PA-8T-V.35 interface port (interface port 0) in interface processor slot 3, port adapter slot 1:

```
Router# show interfaces serial 3/1/0
Serial3/1/0 is up, line protocol is up
  Hardware is cyBus Serial
  Internet address is 1.1.1.0
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation PPP, loopback not set, keepalive not set
  Last input 2d18h, output 00:00:54, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/64/0 (size/threshold/drops)
    Conversations 0/1 (active/max active)
    Reserved Conversations 0/0 (allocated/max allocated)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
  16 packets input, 1620 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants
  0 input errors, 0 CRC, 0 frame, 0 overrun, 1 ignored, 0 abort
  3995 packets output, 1147800 bytes, 0 underruns
  0 output errors, 0 collisions, 0 interface resets
  0 output buffer failures, 0 output buffers swapped out
  1 carrier transitions
  RTS up, CTS up, DTR up, DCD up, DSR up
```

For complete VIP2 command descriptions and examples, refer to the publications listed in the [“Related Documentation” section on page vi](#).

Proceed to the next section, [“Using the ping Command to Verify Network Connectivity,”](#) to check network connectivity of the *SA-Comp/1 or SA-Comp/4* and switch or router.

## Using the ping Command to Verify Network Connectivity

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

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

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

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

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