



Configuring Channelized mode for the Cisco PA-MC-2T3+

To continue your Cisco PA-MC-2T3+ port adapter installation, you must configure the PA-MC-2T3+ interface. 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 5-1](#)
- [Replacing an Existing Port Adapter, page 5-2](#)
- [Configuring a Channelized T3 Link, page 5-3](#)
- [Performing a Basic Serial Interface Configuration, page 5-24](#)
- [Checking the Configuration, page 5-26](#)

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#
```

Replacing an Existing Port Adapter

Before you remove or replace a port adapter, use the **shutdown** command to disable the port adapter to prevent anomalies when you remove and reinstall the port adapter. When you shut down an interface, it is designated *administratively down* in the **show** command displays.

Follow these steps to shut down an interface:

Step 1 Enter the privileged level of the EXEC command interpreter (also called enable mode). (See the “Using the EXEC Command Interpreter” section on page 5-1 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)#
```

Shutting Down the T3 Controller

Step 3 Shut down the T3 controller on the PA-MC-2T3+ with the controller command:

shutdown

This command sends a DS3 idle signal toward the network. You can bring the T3 controller back up with the **no shutdown** controller command.

Examples follow:

- The example that follows is for a port adapter on a VIP in interface processor slot 1 of the Cisco 7500 series router:

```
Router(config)# controller T3 1/0/0  
Router(config-controller)# shutdown
```

```
Router(config)# controller T3 1/0/1  
Router(config-controller)# shutdown
```

- The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0  
Router(config-controller)# shutdown
```

```
Router(config)# controller T3 1/1  
Router(config-controller)# shutdown
```



Note Both T3 ports of the PA-MC-2T3+ should be shut down before removing the port adapter.

Step 4 Verify that the two T3 ports are now shut down using the **show controller T3** command shown in the following examples:

The following example is for a PA-MC-2T3+ in port adapter slot 6 of a Cisco 7200 series router.

```
Router(config-controller)# end  
Router# show controller T3 6/0  
T3 6/0 is administratively down.
```

```
Router# show controller T3 6/1  
T3 6/1 is administratively down.
```

The following example is for a PA-MC-2T3+ in port adapter slot 1 of a VIP in a Cisco 7500 series router.

```
Router(config-controller)# end
Router# show controller T3 1/1/0
T3 1/1/0 is administratively down.
```

```
Router# show controller T3 1/1/1
T3 1/1/1 is administratively down.
```

Step 5 Save the shutdown configuration to nonvolatile memory.

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

Step 6 Replace the port adapter in the slot. See the “[Port Adapter Removal and Installation](#)” section on page 3-4 for more information.

Step 7 Reenable the port adapter by doing the following:

- a. Repeat Step 3 to reenable an interface but substitute the **no shutdown** command for the **shutdown** command.
- b. Repeat Step 4 to verify that the interfaces are in the correct state and no longer shut down. Use the **show controller T3** command.
- c. Repeat Step 5 to write the new configuration to memory. Use the **copy running-config startup-config** command.

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

Configuring a Channelized T3 Link

If you installed a new PA-MC-2T3+ or if you want to change the configuration of an existing PA-MC-2T3+ link, you must enter the privileged level of the EXEC command interpreter and then use the **configure** command. If you replace a PA-MC-2T3+ that was previously configured, the system recognizes the new PA-MC-2T3+ link and brings it up in its existing configuration.

After you verify that the new PA-MC-2T3+ is installed correctly (the enabled LED goes on), use the privileged-level **configure** command to configure the new interface. Be prepared with the information you need, such as the following:

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

The **configure** command requires privileged-level access to the EXEC command interpreter, which usually requires a password. Contact your system administrator if necessary to obtain EXEC-level access.

Configuring the T3 Controller

This section provides procedures and examples for configuring the T3 controller on the PA-MC-2T3+, and includes information on the following topics:

- [Selecting a T3 Controller, page 5-4](#)
- [Setting Channelized Mode for the T3 Controller, page 5-4](#)
- [Setting the Framing Type for the T3 Controller, page 5-5](#)
- [Specifying the Cable Length for the T3 Controller, page 5-6](#)
- [Setting the Clock Source for the T3 Controller, page 5-6](#)
- [Configuring MDL Messages for the T3 Controller, page 5-7](#)
- [Examples of MDL Message Configuration, page 5-7](#)
- [Configuring the Loopback Mode for the T3 Controller, page 5-8](#)
- [Shutting Down the T3 Controller, page 5-9](#)
- [Configuring T1 Lines, page 5-10](#)

Selecting a T3 Controller

You must enter the following controller command, before any other configuration commands, to select the T3 controller you want to configure:

controller T3 *interface-processor-slot/port-adapter-slot/T3-port for Cisco 7500 series router*

controller T3 *chassis-slot/T3-port for Cisco 7301 router*

controller T3 *chassis-slot/T3-port for Cisco 7401ASR router*

controller T3 *chassis-slot/T3-port for Cisco 7200 series router*

Examples of selecting the T3 controller follow:

- The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller t3 1/0/0
Router(config-controller)#
```

- The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller t3 1/0
Router(config-controller)#
```

Setting Channelized Mode for the T3 Controller



Note

Channelized mode is the default, so you only need to configure the T3 for channelized mode if it had previously been set to 'no channelized' mode.

To configure the T3 for channelized mode, **use the channelized command**. The following example is for a PA-MC-2T3+ in port adapter slot 1 of a Cisco 7200 series router.

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0
Router (config)# channelized
```

The following example is for a PA-MC-2T3+ in port adapter slot 1 of a VIP in a Cisco 7500 series router.

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/1/0
Router (config)# channelized
```

Change to channelized mode will cause cbus complex reset. Proceed? [yes/no]:

When the PA-MC-2T3+ is configured for channelized T3 mode, its default MTU size is set to 1500 for compatibility with other T3 equipment and port adapters.

When the T3 controller is configured to be channelized, 28 T1 lines are created. To configure the T1 lines, refer to the [“Configuring T1 Lines” section on page 5-10](#).



Caution

The change in MTU sizes will cause a memory recarve and cbus complex to occur, disrupting all traffic on the router for several minutes. (This occurs only on Cisco 7500 series routers.)

The following message will be displayed when switching from unchannelized to channelized mode on Cisco 7500 series routers:

Change to channelized mode will cause cbus complex reset. Proceed? [yes/no]:

Type Y for ‘yes’ at the end of the warning. At the prompt, type ^Z to exit. This will allow you to exit configuration mode and enter channelized mode.

Setting the Framing Type for the T3 Controller

At the prompt, specify the framing type using the controller command:

framing [c-bit | m23 | auto-detect]

You can set c-bit framing format as follows:

```
Router(config-controller)# framing c-bit
```

You can set m23 framing format as follows:

```
Router(config-controller)# framing m23
```

You can request the PA-MC-2T3+ to detect the framing type it is receiving from the far end and transmit that same framing type as follows:

```
Router(config-controller)# framing auto-detect
```

Specifying the Cable Length for the T3 Controller

At the prompt, specify the cable length using the controller command:

cablelength *feet*

where:

- *feet* is a numeral from 0 to 450.
- The default value is 49 feet.

An example follows:

```
Router(config-controller)# cablelength 40
```

**Note**

For the **cablelength** *feet* command, user-specified T3 cable lengths are structured into ranges as follows: 0–49 and 50–450 to represent short and long cables.

If the numerical value entered by the user falls within the lower range, then the PA-MC-2T3+ T3 port is set for short cable output levels. If the value falls into higher range, the long cable output levels will be used.

In the preceding example, a cable length of 40 is specified, which means that the 0–49 range is used. If you change the cable length to 45, then the 0–49 range still applies. Further, if you specify a cable length of 100 or 200, the 50–450 range applies in both cases. Only moving from one range (0–49) to the other range (50–450) has an effect. The actual cable-length number you enter is stored in the configuration file. It is recommended that the actual cable length be entered to ensure future compatibility.

Setting the Clock Source for the T3 Controller

At the prompt, set the internal or line clock source for the selected T3 controller with the controller command:

clock source {**internal** | **line**}

The default is clock source internal.

Examples follow:

- Instruct the PA-MC-2T3+ to use a line clock source.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0  
Router(config-controller)# clock source line
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0  
Router(config-controller)# clock source line
```

- Instruct the PA-MC-2T3+ to use an internal clock source.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0  
Router(config-controller)# clock source internal
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0  
Router(config-controller)# clock source internal
```

Configuring MDL Messages for the T3 Controller

You can configure Maintenance Data Link (MDL) messages (which are defined in the ANSI T1.107a-1990 specification) on the PA-MC-2T3+.



Note

MDL messages are only supported when the T3 framing is set for c-bit parity. (See the “[Setting the Framing Type for the T3 Controller](#)” section on page 5-5.)

To configure MDL messages, use the controller commands:

```
mdl { transmit { path | idle-signal | test-signal } | string { eic | lic | fic | unit | pfi | port | generator }
      string }
```

```
no mdl { transmit { path | idle-signal | test-signal } | string { eic | lic | fic | unit | pfi | port |
      generator } string }
```

where:

- **eic** is the equipment identification code (up to 10 characters).
- **lic** is the location identification code (up to 11 characters).
- **fic** is the frame identification code (up to 10 characters).
- **unit** is the unit identification code (up to 6 characters).
- **pfi** is the facility identification code to send in the MDL path message (up to 38 characters).
- **port** is the equipment port, which initiates the idle signal, to send in the MDL idle signal message (up to 38 characters).
- **generator** is the generator number to send in the MDL test signal message (up to 38 characters).

Use the **no** form of this command to remove MDL messages. The default is that no MDL message is configured.

Examples of MDL Message Configuration

Examples of configuring MDL messages follow:

- Enter controller configuration mode first.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router# configure t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0/0
Router(config-controller)#
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router# configure t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0
Router(config-controller)#
```

- Enable the MDL path message transmission as follows:

```
Router(config-controller)# mdl transmit path
```

- Enable the MDL idle signal message transmission as follows:

```
Router(config-controller)# md1 transmit idle-signal
```

- Enable the MDL test signal message transmission as follows:

```
Router(config-controller)# md1 transmit test-signal
```

- Enter the equipment identification code as follows:

```
Router(config-controller)# md1 string eic router A
```

- Enter the location identification code as follows:

```
Router(config-controller)# md1 string lic tst network
```

- Enter the frame identification code as follows:

```
Router(config-controller)# md1 string fic building b
```

- Enter the unit identification code as follows:

```
Router(config-controller)# md1 string unit abc
```

- Enter the facility identification code to send in the MDL path message as follows:

```
Router(config-controller)# md1 string pfi string
```

- Enter the port number to send in the MDL idle signal message as follows:

```
Router(config-controller)# md1 string port string
```

- Enter the generator number to send in the MDL test signal message as follows:

```
Router(config-controller)# md1 string generator string
```

Configuring the Loopback Mode for the T3 Controller

With loopbacks, you can detect and isolate equipment malfunctions by testing the connection between the PA-T3+ interface and the remote T3 device such as a DS3 MUX. Remote loopback sends a command to loop the T3 line at the far end (central office). It can be used to diagnose problems with cables from the port adapter to the switching office. Network loopback loops the PA-MC-2T3+ T3 port back to the network allowing the remote end to test the connection to the PA-MC-2T3+. Local loopback loops the PA-MC-2T3+ T3 port output back to itself allowing it to be tested in isolation from the T3 cables and remote T3 equipment.

The **loopback** subcommand places an interface in loopback mode, which enables test packets that are generated from the **ping** command to loop through a remote device and cables. If the packets complete the loop, the connection is good. If not, you can isolate a fault to the remote device or cables in the path of the loopback test.

You can configure the T3 controller for loopback modes using the controller command:

```
loopback [local | network | remote]
```

The default is no loopback.

To return the T3 controller to its default unlooped condition, use the **no** form of the command.

[Table 5-1](#) provides examples of the **loopback** {local | network | remote} command.

Table 5-1 Using loopback commands

loopback local	Sets the T3 port into local loopback mode. Local loopback loops the router output data back toward the router at the framer.	Router(config)# controller T3 10/0/0 router(config-controller)# loopback local
loopback network	Sets the T3 port into network line loopback mode. Network line loopback loops the data back toward the network (before the framer).	Router(config)# controller t3 10/0/0 router(config-controller)# loopback network line
loopback remote¹	Sends a command to the remote T3 device instructing it to loop itself back to the network (before the framer at the remote T3 device).	Router(config)# controller T310/0/0 router(config-controller)# loopback remote

1. Remote loopback mode works with C-bit framing only. The other loopback modes listed above work with C-bit, and M23. Refer to the [“Setting the Framing Type for the T3 Controller”](#) section on page 5-5 for information on configuring C-bit framing.

Configuring the T3 controller to Enable Remote Loopback

Equipment customer loopback enables the PA-MC-2T3+ port adapter to respond to remote T3 loopback and T1 loopback requests it receives from the remote site, while **equipment network loopback** causes the PA to ignore remote T3 and T1 loopback commands.

equipment [customer | network] loopback

```
router(config)# controller T3 3/0
router(config-controller)# equipment customer loopback
```

```
router(config)# controller T3 3/0
router(config-controller)# equipment network loopback
```



Note T3 remote loopbacks are only available when you use c-bit parity framing.

Shutting Down the T3 Controller

You can shut down the T3 controller on the PA-MC-2T3+ with the controller command:

shutdown

This command sends a DS3 idle signal toward the network. You can bring the T3 controller back up with the **no shutdown** controller command.

Examples follow:

- The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller t3 1/0/0
Router(config-controller)# shutdown
```

- The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller t3 1/0
Router(config-controller)# shutdown
```

Configuring T1 Lines

This section provides procedures and examples for configuring T1 lines on the T3 link of the PA-MC-2T3+, and includes information on the following topics:

- [Creating a Logical Channel Group on a T1 Line, page 5-10](#)
- [Removing a Logical Channel Group from a T1 Line, page -11](#)
- [Setting the Framing Format on a T1 Line, page 5-11](#)
- [Setting the Yellow Alarm Configuration for a T1 Line, page 5-12](#)
- [Setting the Clock Source on a T1 Line, page 5-12](#)
- [Setting the FDL Configuration for a T1 Line, page 5-13](#)
- [Setting Loopbacks on a T1 Line, page 5-13](#)
- [Configuring a BER Test on a T1 Line, page 5-16](#)
- [Sending a BER Test Pattern on a T1 Line, page 5-17](#)
- [Viewing the Results of a BER Test, page 5-18](#)
- [Terminating a BER Test, page 5-23](#)

**Note**

For consistency throughout the following configuration examples and whenever possible, the port addresses 1/0/0 and 1/0/0/1:1 are used for Cisco 7500 series routers and 1/0 and 1/0/1:1 for Cisco 7200 series routers.

Your PA-MC-2T3+ port addressing might be different depending on the Cisco 7200 series router chassis slot or the interface processor slot in which your VIP is installed and the VIP port adapter slot in which your PA-MC-2T3+ is installed.

Creating a Logical Channel Group on a T1 Line

You can create a logical channel group on a T1 line using the following controller command:

```
t1 t1-line-number channel-group channel-group-number timeslots list-of-timeslots  
[speed {56 | 64}]
```

where:

- *t1-line-number* is 1–28.
- **channel-group** defines a logical channel group.
- *channel-group-number* is 0–23.
- **timeslots** *list-of-timeslots* can be 1–24 or a combination of subranges within 1–24 (each subrange is a list of timeslots of the T1 line).
- **speed** {56 | 64} is an optional argument that specifies the speed of a time slot to be either 56 kbps or 64 kbps.

Configure logical channel group 20 on T1 line 1 and assign channelized timeslots 1 to 5 and 20 to 23.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0  
Router(config-controller)# t1 1 channel-group 20 timeslots 1-5, 20-23
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0
Router(config-controller)# t1 1 channel-group 20 timeslots 1-5, 20-23
```

**Note**

Each T1 link may have up to 24 channel groups with an overall limit of 128 for the 28 T1 links on each T3 port. Unused channel groups in one T3 port may not be used by the other T3 port.

**Note**

Each channel group defined with this command causes a serial interface to be created. Refer to the [“Performing a Basic Serial Interface Configuration”](#) section on page 5-24 for instructions on configuring these interfaces.

**Note**

All the encapsulation formats, such as PPP, HDLC, SMDS, Frame Relay, and switching types are applicable to the serial interface and can be set using the serial interface configuration commands.

Removing a Logical Channel Group from a T1 Line

You can remove a logical channel group from a T1 line with the following controller command:

```
no t1 t1-line-number channel-group channel-group-number
```

where:

- *t1-line-number* is 1–28.
- *channel-group-number* is 0–23.

Remove logical channel group 10 from channelized T1 line 1.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0
Router(config-controller)# no t1 1 channel-group 10
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0
Router(config-controller)# no t1 1 channel-group 10
```

**Note**

If logical channel groups had previously been configured on a port, and you switch to ‘no channelized’ mode, first remove all channel groups before invoking the ‘no channelized’ command.

Setting the Framing Format on a T1 Line

You can specify the T1 framing format using the controller command:

```
t1 t1-line-number framing {esf | sf}
```

where:

- The default framing format is extended super frame (ESF).
- *t1-line-number* is 1–28.

Examples follow:

- Set Super Frame (SF) framing format for T1 line 6.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 6 framing sf
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0
Router(config-controller)# t1 6 framing sf
```

- Other options for setting Super Frame (SF) include:

```
router(config-controller)#t1 6 framing ?
    esf  Extended Superframe Framing format
    sf   Superframe Framing Format

router(config-controller)#t1 6 framing sf ?
    hdlc-idle  Specify the HDLC idle pattern on a T1
               <cr>

router(config-controller)#t1 6 framing sf hdlc-idle ?
    0x7E  Use 0x7E as HDLC idle pattern
    0xFF  Use 0xFF as HDLC idle pattern

router(config-controller)#t1 6 framing sf hdlc-idle 0x7e ?
```

- Set ESF framing format for T1 line 16 as follows:

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 16 framing esf
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0
Router(config-controller)# t1 16 framing esf
```



Note

Use of the 0xFF HDLC idle pattern may help prevent false yellow alarms in the remote T1 device when SF framing is used.

Setting the Yellow Alarm Configuration for a T1 Line

You can use the `[no] t1 t1-line-number yellow {detection | generation}` command (where *t1-line-number* is 1–28) to turn the detection or generation of a yellow alarm on and off. When you select SF framing, you should consider using the `no t1-line-number yellow detection` command to turn off yellow alarm detection, because the yellow alarm can be incorrectly detected with SF framing.

Setting the Clock Source on a T1 Line

You can set the internal or line (network) clock source for a T1 line with the controller command:

```
t1 t1-line-number clock source {internal | line}
```

where:

- *t1-line-number* is 1–28.
- The default clock source is internal.

Examples follow:

- Instruct T1 line 1 to use an internal clock source.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 1 clock source internal
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0
Router(config-controller)# t1 1 clock source internal
```

- Instruct T1 line 16 to use a line clock source received from the network.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 16 clock source line
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0
Router(config-controller)# t1 16 clock source line
```



Note

Normally the T1 link should be configured to use the line clock recovered from the network. In cases where the network does not provide the clock, such as two PA-MC-2T3+ port adapters connected back-to-back, one end of the T1 link must be set to internal clock and the other end to line clock.

Setting the FDL Configuration for a T1 Line

To enable and disable 1-second transmissions of performance reports through the facility data link (per ANSI T1.403 specification), you must use the following command on both ends of the connection:

```
t1 t1-line-number fdl ansi
```

where: *t1-line-number* is 1–28.



Note

You can use this command *only* when the T1 framing is ESF. Use the **no** form of the command to disable remote performance reports.

Setting Loopbacks on a T1 Line

If you have difficulty with the PA-MC-2T3+ configuration or installation, you can troubleshoot the port adapter using the **loopback** command. Specify loopback for a T1 line using the following command:

```
t1 t1-line-number loopback [local | network | remote]
```

where: *t1-line-number* is 1–28.



Note

This command requires that you are in T3 controller mode.



Note

fdl loopback commands are available only for T1 lines configured for ESF framing.

Explanations of specific loopback modes follow:

local	Loops the router output data back toward the router at the T1 framer and sends an AIS signal out toward the network.
network {line payload }	Loops the data back toward the network before the T1 framer and automatically sets a local loopback at the HDLC controllers (line), or loops the payload data back toward the network at the T1 framer and automatically sets a local loopback at the HDLC controllers (payload).
remote line fdl {ansi bellcore }	<p>Sends a repeating, 16-bit ESF data link code word (00001110 11111111 for ANSI; 00010010 11111111 for Bellcore) to the remote end, requesting that it enter into a network line loopback.</p> <p>Specify the ansi keyword to enable the remote line facility data link (FDL) ANSI loopback on the T1 channel, per the ANSI T1.403 specification.</p> <p>Specify the bellcore keyword to enable the remote SmartJack loopback on the T1 channel, per the TR-TSY-000312 specification.</p>
remote line inband	Sends a repeating, 5-bit inband pattern (00001) to the remote end, requesting that it enter into a network line loopback.
remote payload [fdl] [ansi]	<p>Sends a repeating, 16-bit ESF data link code word (00010100 11111111) to the remote end, requesting that it enter into a network payload loopback. Enables the remote payload Facility Data Link (FDL) ANSI loopback on the T1 channel.</p> <p>You can optionally specify fdl and ansi, but it is not necessary.</p>

Examples of the **loopback** commands follow:

- Set the first T1 line into local loopback.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 1 loopback local
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0
Router(config-controller)# t1 1 loopback local
```

In the preceding examples, local loopback loops the router output data back toward the router at the T1 framer and sends an AIS out toward the network.

- Set the first T1 line into network line loopback.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

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

```
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 1 loopback network line
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0
Router(config-controller)# t1 1 loopback network line
```

In the preceding examples, network line loopback loops the data back toward the network (before the T1 framer).

- Set the first T1 line into network payload loopback.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 1 loopback network payload
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0
Router(config-controller)# t1 1 loopback network payload
```

In the preceding examples, network payload loopback loops just the payload data back toward the network at the T1 framer.

Examples of the **loopback remote** command follow:

- Set the first T1 line into remote line inband loopback.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 1 loop remote line inband
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0
Router(config-controller)# t1 1 loop remote line inband
```

In the preceding examples, remote line inband loopback sends a repeating five-bit in-band pattern (of 00001) to the remote end, requesting that it enter into a network line loopback.

- Set the first T1 line into remote line FDL ANSI loopback.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 1 loop remote line fdl ansi
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

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

```
Router(config)# controller T3 1/0
Router(config-controller)# t1 1 loop remote line fdl ansi
```

In the preceding examples, remote line FDL ANSI loopback sends a repeating 16-bit ESF data link code word (of 00001110 11111111) to the remote end, requesting that it enter into a network line loopback.

- Set the first T1 line into remote line FDL bellcore loopback

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router (config)#controller t3 1/0/0
Router (config-controller)#t1 1 loop remote line fdl bellcore
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router (config)#controller t3 1/0
Router (config-controller)#t1 1 loop remote line fdl bellcore
```

In the preceding examples, remote line FDL bellcore loopback sends a repeating 16-bit ESF data link code word (00010010 11111111) to the remote end, requesting that it enter into a network line loopbacks.

- Set the first T1 line into remote payload FDL ANSI loopback.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 1 loop remote payload fdl ansi
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller T3 1/0
Router(config-controller)# t1 1 loop remote payload fdl ansi
```

In the preceding examples, remote payload ANSI loopback sends a repeating 16-bit ESF data link code word (of 00010100 11111111) to the remote end, requesting that it enter into a network payload loopback.

Configuring a BER Test on a T1 Line

Bit error rate test (BERT) circuitry is built into the PA-MC-2T3+. With BER tests, you can test cables and signal problems in the field. You can configure BER tests on each of the 28 T1 lines but only one BER test can be active at a time.

There are two categories of test patterns that can be generated by the onboard BER test circuitry: pseudorandom and repetitive. The former test patterns are polynomial based numbers and conform to the CCITT/ITU O.151 and O.153 specifications; the latter test patterns are zeros or ones, or alternating zeros and ones.

A list of the available test patterns follows:

- Pseudorandom test patterns:
 - 2^{11} (per CCITT/ITU O.151)

- 2¹⁵ (per CCITT/ITU O.151)
- 2²⁰ (per CCITT/ITU O.153)
- 2²⁰ QRSS (per CCITT/ITU O.151)
- 2²³ (per CCITT/ITU O.151)
- Repetitive test patterns:
 - All zeros (0s)
 - All ones (1s)
 - Alternating zeros (0s) and ones (1s)

Both the total number of error bits received and the total number of bits received are available for analysis. You can set the testing period from 1 minute to 14,400 minutes (240 hours), and you can also retrieve the error statistics anytime during the BER test.

**Note**

BER testing for the T3 link is not supported in channelized T3 mode. It is only supported for unchannelized T3 ports.

When running a BER test, your system expects to receive the same pattern that it is transmitting. To accomplish this, two common options are available:

- Use a loopback somewhere in the link or network.
- Configure remote testing equipment to transmit the same BER test pattern at the same time.

Sending a BER Test Pattern on a T1 Line

You can send a BERT pattern on a T1 line with the controller command. The unframed option causes the BERT pattern to use the entire T1 bandwidth including the T1 framing as well as payload bits. If “unframed” is omitted, then the T1 will be either SF or ESF framed as configured by the “T1 n framing” command and the BERT pattern will occupy only the T1 payload bits.

t1 *t1-line-number* bert pattern *pattern* interval *time* [unframed]

where:

- *t1-line-number* is 1–28.
- *time* is 1–14400 minutes.
- *pattern* is:
 - 0s, repetitive test pattern of all zeros (as 00000...)
 - 1s, repetitive test pattern of all ones (as 11111...)
 - 2¹¹, pseudorandom test pattern (2,048 bits long)
 - 2¹⁵, pseudorandom O.151 test pattern (32,768 bits long).
 - 2²⁰-O153, pseudorandom O.153 test pattern (1,048,575 bits long)
 - 2²⁰-QRSS, pseudorandom QRSS O.151 test pattern (1,048,575 bits long)
 - 2²³, pseudorandom O.151 test pattern (8,388,607 bits long)
 - alt-0-1, repetitive alternating test pattern of zeros (0s) and ones (1s), as 01010101

Examples follow:

- Send a BERT pseudorandom pattern of 2²³ through T1 line 10 for 5 minutes.

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 10 bert pattern 2^23 interval 5 unframed
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0
Router(config-controller)# t1 10 bert pattern 2^23 interval 5 unframed
```

- Send a repetitive pattern of all ones through T1 line 10 for 14400 minutes (240 hours).

The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0
Router(config-controller)# t1 10 bert pattern 1s interval 14400 unframed
```

The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0
Router(config-controller)# t1 10 bert pattern 1s interval 14400 unframed
```


Note

You can terminate a BER test during the specified test period with the **no t1 bert** command.

Viewing the Results of a BER Test

You can view the results of a BER test using the controller command:

show controllers T3 *slot/port-adapter/t3-port for Cisco 7500 series router*

show controllers T3 *chassis-slot/t3-port/t1-line-number for Cisco 7401ASR router*

show controllers T3 *chassis-slot/t3-port/t1-line-number for Cisco 7200 series router*

where: *t1-line-number* is 1–28.

You can view the results of a BER test at the following times:

- After you terminate the test using the **no t1 bert** command
- After the test runs completely
- Anytime during the test (in real time)

Examples follow:

- The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router# show cont T3 1/0/0
```

```
T3 1/0/0 is up. Hardware is 2CT3+ single wide port adapter
CT3 H/W Version: 0.1.1, CT3 ROM Version: 0.95, CT3 F/W Version: 1.4.4
FREEDM version: 1, reset 0
Applique type is Channelized T3
No alarms detected.
MDL transmission is disabled
```

```
FEAC code received: No code is being received
Framing is C-BIT Parity, Line Code is B3ZS, Clock Source is Internal
Rx throttle total 0, equipment customer loopback
Data in current interval (9 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  9 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
```

```
Data in Interval 1:
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Data in Interval 2:
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Data in Interval 3:
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Data in Interval 4:
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Data in Interval 5:
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Data in Interval 6:
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Data in Interval 7:
  1 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 1 Severely Err Framing Secs
  0 Unavailable Secs, 1 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Total Data (last 7 15 minute intervals):
  1 Line Code Violations, 0 P-bit Coding Violation,
  0 C-bit Coding Violation, 0 P-bit Err Secs,
  0 P-bit Severely Err Secs, 1 Severely Err Framing Secs,
  0 Unavailable Secs, 1 Line Errored Secs,
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs

T1 1
  Not configured.

T1 2
  Not configured.

T1 3
  Not configured.

T1 4
  Not configured.

T1 5
  Not configured.
```

```
T1 6
  Not configured.

T1 7
  Not configured.

T1 8
  Not configured.

T1 9
  Not configured.

T1 10
  Not configured.
BERT test result (done)
  Test Pattern : All 1's, Status : Not Sync, Sync Detected : 0
  Interval : 14400 minute(s), Time Remain : 14400 minute(s)
  Bit Errors (since BERT started): 0 bits,
  Bits Received (since BERT started): 0 Kbits
  Bit Errors (since last sync): 0 bits
  Bits Received (since last sync): 0 Kbits

T1 11
  Not configured.

T1 12
  Not configured.

T1 13
  Not configured.

T1 14
  Not configured.

T1 15
  Not configured.

T1 16
  Not configured.

T1 17
  Not configured.

T1 18
  Not configured.

T1 19
  Not configured.

T1 20
  Not configured.

T1 21
  Not configured.

T1 22
  Not configured.

T1 23
  Not configured.

T1 24
  Not configured.
```

```
T1 25
  Not configured.
```

```
T1 26
  Not configured.
```

```
T1 27
  Not configured.
```

```
T1 28
  Not configured.
```

- The example that follows is for a port adapter in slot 5 of the Cisco 7200 series routers:

```
Router# show controllers T3 5/0

T3 5/0 is up. Hardware is 2CT3+ single wide port adapter
CT3 H/W Version: 0.1.1, CT3 ROM Version: 0.95, CT3 F/W Version: 1.4.4
FREEDM version: 1, reset 0
Applique type is Channelized T3
No alarms detected.
MDL transmission is disabled

FEAC code received: No code is being received
Framing is C-BIT Parity, Line Code is B3ZS, Clock Source is Internal
Rx throttle total 0, equipment customer loopback
Data in current interval (63 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Data in Interval 1:
  4905 Line Code Violations, 4562 P-bit Coding Violation
  5167 C-bit Coding Violation, 2 P-bit Err Secs
  1 P-bit Severely Err Secs, 3 Severely Err Framing Secs
  58 Unavailable Secs, 1 Line Errored Secs
  3 C-bit Errored Secs, 3 C-bit Severely Errored Secs
Data in Interval 2:
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs

(additional display text omitted)
```

```
T1 1
  Not configured.
```

```
T1 2
  Not configured.
```

```
T1 3
  Not configured.
```

```
T1 4
  Not configured.
```

```
T1 5
  Not configured.
```

```
T1 6
  Not configured.
```

```
T1 7
  Not configured.

T1 8
  Not configured.

T1 9
  Not configured.

T1 10
  Not configured.
BERT test result (running)
  Test Pattern : All 1's, Status : Sync, Sync Detected : 1
  Interval : 14400 minute(s), Time Remain : 14400 minute(s)
  Bit Errors (since BERT started): 0 bits,
  Bits Received (since BERT started): 92 Mbits
  Bit Errors (since last sync): 0 bits
  Bits Received (since last sync): 92 Mbits

T1 11
  Not configured.

T1 12
  Not configured.

T1 13
  Not configured.

T1 14
  Not configured.

T1 15
  Not configured.

T1 16
  Not configured.

T1 17
  Not configured.

T1 18
  Not configured.

T1 19
  Not configured.

T1 20
  Not configured.

T1 21
  Not configured.

T1 22
  Not configured.

T1 23
  Not configured.

T1 24
  Not configured.

T1 25
  Not configured.
```

```
T1 26
  Not configured.

T1 27
  Not configured.

T1 28
  Not configured.
```

The following explains the output of the preceding command, line by line:

Output Display Line	Explanation
BERT test result (running)	This line indicates the current state of the test. In this case, “running” indicates that the BER test is still in process. After a test is completed, “done” is displayed.
Test Pattern : 2^11, Status : Sync, Sync Detected : 1	This line indicates the test pattern you selected for the test (2^11), the current synchronization state (sync), and the number of times synchronization has been detected during this test (1).
Interval : 5 minute(s), Time Remain : 5 minute(s)	This line indicates the time the test takes to run and the time remaining for the test to run.
Interval : 5 minute(s), Time Remain : 2 minute(s) (unable to complete)	For a BER test that you terminate, this line indicates the time the test would have taken to run and the time remaining for the test to run had you not terminated it; “unable to complete” signifies that you interrupted the test.
Bit Errors(Since BERT Started): 6 bits, Bits Received(Since BERT start): 8113 Kbits Bit Errors(Since last sync): 6 bits Bits Received(Since last sync): 8113 Kbits	These four lines show the bit errors that have been detected versus the total number of test bits that have been received since the test started and since the last synchronization was detected. Bits and errors are only counted when the test status is “sync”.



Note

Unless unframed is selected, the BER test runs over the currently configured framing option for the specified T1 line (ESF or SF). Before running a BER test, you should configure the framing option that is appropriate to your application. (Refer to the [“Setting the Framing Format on a T1 Line”](#) section on page 5-11.)

Terminating a BER Test

You can terminate a BER test with the controller command:

```
no t1 t1-line-number bert
```

where: *t1-line-number* is 1–28.

Examples follow:

Terminate the BER test running on T1 line 10.

- The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router(config)# controller T3 1/0/0
Router(config-controller)# no t1 10 bert
```

- The example that follows is for a port adapter in slot 1 of the Cisco 7200 series routers:

```
Router(config)# controller T3 1/0
Router(config-controller)# no t1 10 bert
```

This completes the procedures for configuring and testing T1 lines.

To check your configurations using **show** commands, proceed to the [“Checking the Configuration” section on page 5-26](#); otherwise, proceed to the following sections to perform a basic interface configuration:

- [Performing a Basic Serial Interface Configuration, page 5-24](#)

Performing a Basic Serial Interface Configuration



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.

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 *serial* interfaces, refer to the appropriate software documentation.

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

```
Router# disable

Router>
```

-
- Step 1** Enter configuration mode and specify that the console terminal is the source of the configuration subcommands, as follows:

```
Router# configuration 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. [Table 5-2](#) provides examples.

Table 5-2 Examples of the interface serial Subcommand

Platform	Command	Example
Cisco 7200 series routers	interface serial , followed by <i>port-adapter-slot/T3-port/T1-line-number:channel-group number</i>	The example is for T3 port 0, T1 1, channel group 0 of a port adapter in port adapter slot 6. Router(config)# interface serial 6/0/1:0 Router(config-if)#
Cisco 7301 routers	interface serial , followed by <i>port-adapter-slot/T3-port/T1-line-number:channel-group number</i>	The example is for T3 port 0, T1 1, channel group 0 of a port adapter in port adapter slot 1. Router(config)# interface serial 1/0/1:0 Router(config-if)#
Cisco 7304 PCI Port Adapter Carrier Card in a Cisco 7304 router	interface serial , followed by <i>port-adapter-slot/T3-port/T1-line-number:channel-group number</i>	The example is for T3 port 0, T1 1, channel group 0 of a port adapter in a Cisco 7304 PCI Port Adapter Carrier Card in module slot 3 of a Cisco 7304 router. Router(config)# interface serial 1/0/1:0 Router(config-if)#
Cisco 7401ASR routers	interface serial , followed by <i>port-adapter-slot/T3-port/T1-line-number:channel-group number</i>	The example is for T3 port 0, T1 1, channel group 0 of a port adapter in port adapter slot 1. Router(config)# interface serial 1/0/1:0 Router(config-if)#
VIP in Cisco 7000 series or Cisco 7500 series routers	interface serial , followed by <i>interface-processor-slot/port-adapter-slot/T3-port/T1-line-number:channel-group number</i>	The example is for T3 port 0, T1 1, channel group 0 of a port adapter in port adapter slot 1 of a VIP in interface processor slot 4. Router(config)# interface serial 4/1/0/1:0 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 “[Replacing an Existing Port Adapter](#)” section on page 5-2.)

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.

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 5-26](#)
- [Displaying Remote Performance Reports, page 5-42](#)
- [Using the ping Command to Verify Network Connectivity, page 5-44](#)

Using show Commands to Verify the New Interface Status

[Table 5-3](#) demonstrates how you can use the **show** commands to verify that new interfaces are configured and operating correctly and that the PA-MC-2T3+ 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 viii](#).



Note

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

Table 5-3 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 controllers	Displays all the current interface processors and their interfaces	Router# show controllers
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

Table 5-3 Using show Commands (continued)

Command	Function	Example
show interfaces <i>type</i> <i>port-adapter-slot-number/</i> <i>T3-port-number/T1-line-number:</i> <i>channel-group number</i>	Displays status information about a specific type of interface (for example, serial) in a Cisco 7200 series, Cisco 7301 router, or Cisco 7401ASR router	Router# show interfaces serial 1/0/2:0
show interfaces <i>type module-slot-number/</i> <i>T3-port-number/T1-line-number:</i> <i>channel-group number</i>	Displays status information about a specific type of interface (for example, serial) on a Cisco 7304 PCI Port Adapter Carrier Card in a Cisco 7304 router	Router# show interfaces serial 1/0/2:0
show interfaces <i>type interface-processor-slot-number/port-adapter-slot-number/</i> <i>T3-port-number/T1-line-number:channel-group number</i>	Displays status information about a specific type of interface (for example, serial) on a VIP in a Cisco 7000 series or Cisco 7500 series router	Router# show interfaces serial 3/1/0/10:5
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 display indicates 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 5-27](#)
- [Using the show diag Command, page 5-31](#)
- [Using the show interfaces Command, page 5-33](#)
- [Using the show controllers Command, page 5-35](#)

Choose the subsection appropriate for your system. Proceed to the “[Using the ping Command to Verify Network Connectivity](#)” section on [page 5-44](#) 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. Following are 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.

Cisco 7200 Series Routers

Following is an example of the **show version** command from a Cisco 7200 series router with the PA-MC-2T3+:

```
Router# show version
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-JS-M), Released Version 12.0
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled Fri 02-Jun-00 04:19 by biff
Image text-base: 0x600088F8, data-base: 0x61274000

ROM: System Bootstrap, Version 11.1(10) [dschwart 10], RELEASE SOFTWARE (fc1)
BOOTFLASH: 7200 Software (C7200-BOOT-M), Version 11.1(25.1)CC, EARLY DEPLOYMENT

ranger uptime is 5 weeks, 14 hours, 32 minutes
System returned to ROM by reload

cisco 7206 (NPE150) processor with 90112K/8192K bytes of memory.
R4700 CPU at 150Mhz, Implementation 33, Rev 1.0, 512KB L2 Cache
6 slot midplane, Version 1.3

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.
4 Ethernet/IEEE 802.3 interface(s)
1 Serial network interface(s)
1 FDDI network interface(s)
2 Channelized T3 port(s)
125K bytes of non-volatile configuration memory.
1024K bytes of packet SRAM memory.

4096K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x0
```

Cisco 7301 Routers

```
Router# show version
Cisco Internetwork Operating System Software
IOS (tm) 7301 Software (C7300-JS-M), Experimental Version 12.2(20020904:004736) [biff 107]
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Mon 09-Sep-02 18:02 by biff
Image text-base:0x600088F8, data-base:0x61A94000

ROM: System Bootstrap, Version 12.2(20020730:200705) [biff-TAZ2_QA_RELEASE_16B 101],
DEVELOPMENT SOFTWARE
BOOTLDR:7301 Software (C7301-BOOT-M), Experimental Version 12.2(20020813:014224)
[biff-TAZ2_QA_RELEASE_17B 101]

7301p2b uptime is 0 minutes
System returned to ROM by reload at 00:01:51 UTC Sat Jan 1 2000
System image file is "tftp://10.1.8.11/tazii/images/c7301-js-mz"

cisco 7301 (NPE-G1) processor (revision A) with 491520K/32768K bytes of memory.
Processor board ID 0
BCM1250 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)
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 0x102

```

Cisco 7301 Routers



Note

Input/output data for the console port, auxiliary port, Gigabit Ethernet ports, and CompactFlash Disk are listed in the output of the **show c7300** command, rather than in the output of the **show diag** command. Use the **show diag** command for port adapter information.

```

Router# sh diag

Slot 1:
  POS Single Width, Multi Mode Port adapter, 1 port
  Port adapter is analyzed
  Port adapter insertion time 01:38:29 ago
  EEPROM contents at hardware discovery:
  Hardware revision 2.2          Board revision A0
  Serial number      28672741    Part number      73-3192-06
  FRU Part Number:PA-POS-OC3MM=

  Test history          0x0          RMA number      00-00-00
  EEPROM format version 1
  EEPROM contents (hex):
    0x20:01 96 02 02 01 B5 82 E5 49 0C 78 06 00 00 00 00
    0x30:50 00 00 00 02 08 19 00 00 00 FF FF FF FF FF FF

```

Cisco 7401ASR Routers

Following is an example of the **show version** command from a Cisco 7401ASR router with the PA-MC-2T3+:

```

Router# show version
Cisco Internetwork Operating System Software
IOS (tm) 7401ASR Software (C7401ASR)
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled Fri 02-Jun-00 04:19 by biff
Image text-base: 0x600088F8, data-base: 0x61274000

ROM: System Bootstrap, Version 11.1(10) [dschwart 10], RELEASE SOFTWARE (fc1)
BOOTFLASH: 7401ASR Software (C7401ASR-BOOT-M)

ranger uptime is 5 weeks, 14 hours, 32 minutes
System returned to ROM by reload

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.
4 Ethernet/IEEE 802.3 interface(s)
1 Serial network interface(s)

```

```

1 FDDI network interface(s)
2 Channelized T3 port(s)
125K bytes of non-volatile configuration memory.
1024K bytes of packet SRAM memory.

4096K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x0

```

VIP 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 a PA-MC-2T3+:

```

Router# show version
Cisco Internetwork Operating System Software
IOS (tm) RSP Software (RSP-JSV-M), Version 12.0(5.6)S2 [soma-v120_6
_s_throttle.build2 108]
Copyright (c) 1986-1999 by cisco Systems, Inc.
Compiled Tue 17-Aug-99 23:39 by biff
Image text-base: 0x60010908, data-base: 0x61030000

ROM: System Bootstrap, Version 11.1(2) [nitin 2], RELEASE SOFTWARE (fc1)
BOOTFLASH: RSP Software (RSP-BOOT-M), Version 12.0(19990624:041614)
[biff-mc2t3h 293]

7513_1 uptime is 4 days, 6 hours, 11 minutes
System returned to ROM by reload

cisco RSP2 (R4700) processor with 131072K/2072K bytes of memory.
R4700 CPU at 100Mhz, Implementation 33, Rev 1.0
Last reset from power-on
G.703/E1 software, Version 1.0.
G.703/JT2 software, Version 1.0.
Channelized E1, Version 1.0.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
Bridging software.
TN3270 Emulation software.
Primary Rate ISDN software, Version 1.1.
Chassis Interface.
1 EIP controller (4 Ethernet).
1 HIP controller (1 HSSI).
1 FSIP controller (8 Serial).
1 AIP controller (1 ATM).
1 TRIP controller (4 Token Ring).
1 FIP controller (1 FDDI).
2 VIP2 R5K controllers (2 E1)(2 Channelized T3).
4 Ethernet/IEEE 802.3 interface(s)
4 Token Ring/IEEE 802.5 interface(s)
66 Serial network interface(s)
1 HSSI network interface(s)
1 FDDI network interface(s)
1 ATM network interface(s)
2 Channelized T3 port(s)
123K bytes of non-volatile configuration memory.

16384K bytes of Flash PCMCIA card at slot 0 (Sector size 128K).
16384K bytes of Flash PCMCIA card at slot 1 (Sector size 128K).
8192K bytes of Flash internal SIMM (Sector size 256K).
No slave installed in slot 7.
Configuration register is 0x0

```

Using the show diag Command

Display the types of port adapters installed in your system (and specific information about each) using the **show diag slot** command, where *slot* is the *port adapter slot* in a Cisco 7100 series router, Cisco 7200 series router, Cisco 7301 router, and Cisco 7401ASR router and the *interface processor slot* in a Cisco 7000 series router or Cisco 7500 series router with a VIP. In the Cisco 7304 PCI Port Adapter Carrier Card in a Cisco 7304 router, *slot* is the router *module-slot-number*. The following examples show output 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.

Cisco 7200 Series Routers

Following is an example of the **show diag slot** command that shows a PA-MC-2T3+ in port adapter slot 5 of a Cisco 7200 series router:

```
router# show diag 5
Slot 5:
  2CT3+ single wide Port adapter, 2 ports
  Port adapter is analyzed
  Port adapter insertion time 18:34:20 ago
  EEPROM contents at hardware discovery:
  Hardware revision 1.00          Board revision A0
  Serial number 14338549         Part number 73-3388-03
  Test history 0x0              RMA number 00-00-00
  EEPROM format version 1
  EEPROM contents (hex):
    0x20: 01 B7 00 00 00 DA C9 F5 00 00 00 00 00 00 00
    0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Cisco 7301 Routers



Note

Input/output data for the console port, auxiliary port, Gigabit Ethernet ports, and CompactFlash Disk are listed in the output of the **show c7300** command, rather than in the output of the **show diag** command. Use the **show diag** command for port adapter information.

```
Router# sh diag
Slot 1:
  POS Single Width, Multi Mode Port adapter, 1 port
  Port adapter is analyzed
  Port adapter insertion time 01:38:29 ago
  EEPROM contents at hardware discovery:
  Hardware revision 2.2          Board revision A0
  Serial number 28672741         Part number 73-3192-06
  FRU Part Number:PA-POS-OC3MM=

  Test history 0x0              RMA number 00-00-00
  EEPROM format version 1
  EEPROM contents (hex):
    0x20:01 96 02 02 01 B5 82 E5 49 0C 78 06 00 00 00
    0x30:50 00 00 00 02 08 19 00 00 00 FF FF FF FF FF
```

Cisco 7401ASR Routers

Following is an example of the **show diag slot** command that shows a PA-MC-2T3+ in port adapter slot 1 of a Cisco 7401ASR router:

```
router# show diag 5
Slot 1:
  2CT3+ single wide Port adapter, 2 ports
  Port adapter is analyzed
  Port adapter insertion time 18:34:20 ago
  EEPROM contents at hardware discovery:
  Hardware revision 1.00          Board revision A0
  Serial number 14338549         Part number 73-3388-03
  Test history 0x0              RMA number 00-00-00
  EEPROM format version 1
  EEPROM contents (hex):
    0x20: 01 B7 00 00 00 DA C9 F5 00 00 00 00 00 00 00
    0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

VIP in Cisco 7000 Series and Cisco 7500 Series Routers

Following is an example of the **show diag slot** command that shows a PA-MC-2T3+ in port adapter slot 0 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
  VIP2 R5K controller, HW rev 2.02, board revision C0
  Serial number: 12720200 Part number: 73-2167-05
  Test history: 0x00      RMA number: 00-00-00
  Flags: cisco 7000 board; 7500 compatible
  EEPROM contents (hex):
    0x20: 01 1E 02 02 00 C2 18 48 49 08 77 05 00 00 00
    0x30: 60 00 00 01 00 00 00 00 00 00 00 00 00 00 00

  Slot database information:
  Flags: 0x4      Insertion time: 0x165C (18:47:18 ago)

  Controller Memory Size: 32 MBytes DRAM, 4096 KBytes SRAM

  PA Bay 0 Information:
    2CT3+ single wide PA, 2 ports
    EEPROM format version 1
    HW rev 1.00, Board revision A0
    Serial number: 14062933 Part number: 73-3388-03

  PA Bay 1 Information:
    Fast-Ethernet PA, 1 ports, 100BaseTX-ISL
    EEPROM format version 1
    HW rev 1.00, Board revision A0
    Serial number: 06641389 Part number: 73-1688-04

  --Boot log begin--

Cisco Internetwork Operating System Software
IOS (tm) VIP Software (SVIP-DW-M), Experimental Version 12.1(20000630:023314) []
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled Tue 11-Jul-00 13:15 by biff
```



```
Image text-base: 0x60010910, data-base: 0x60320000
```

```
--Boot log end--
```

Using the show interfaces Command

The **show interfaces** command displays status information (including the physical slot and interface address) for the interfaces you specify. Following are examples for some of the supported platforms; the examples specify serial interfaces.

For complete descriptions of interface subcommands and the configuration options available for Cisco 7200, Cisco 7301 routers, the Cisco 7304 PCI Port Adapter Carrier Card in Cisco 7304 routers, Cisco 7401ASR, and VIP interfaces, refer to the publications listed in the [“Related Documentation” section on page viii](#).



Note

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

Cisco 7200 Series Routers

Following is an example of the **show interfaces** command for Cisco 7200 series routers. In this example, the port adapter is in slot 1 of the Cisco 7200 series router:

```
Router# show interfaces serial 1/0/1:0
Serial1/0/1:0 is up, line protocol is up
  Hardware is 2CT3+
  Internet address is 1.1.1.1/24
  MTU 1500 bytes, BW 1536 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive not set
  Last input 19:04:01, output 12:49:52, output hang never
  Last clearing of "show interface" counters 13:09:09
  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
    18722 packets input, 2134308 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants
    82 input errors, 0 CRC, 0 frame, 82 overrun, 0 ignored, 0 abort
    18722 packets output, 2134308 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
    0 output buffers copied, 0 interrupts, 0 failures
    8 carrier transitions no alarm present
  Timeslot(s) Used: 1-24, Transmitter delay is 0 flags, transmit queue length 5
  non-inverted data
```

Cisco 7301 Router

Following is an example of the **show interfaces** command for Cisco 7301 routers. Most of the status information for each interface is omitted. (Interfaces are administratively shut down until you enable them.)

```
outer# show interfaces
GigabitEthernet0/0 is up, line protocol is up
  Hardware is BCM1250 Internal MAC, address is 0005.dd2c.7c1b (bia 0005.dd2c.7c1b)
  Internet address is 10.1.3.153/16
```

```

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)
Half-duplex, 100Mb/s, media type is RJ45
output flow-control is off, input flow-control is off
ARP type:ARPA, ARP Timeout 04:00:00
Last input 00:00:01, output 00:00:07, output hang never
Last clearing of "show interface" counters 19:00:50
Input queue:0/75/63658/0 (size/max/drops/flushes); Total output drops:0

```

(display text omitted)

```

GigabitEthernet0/1 is up, line protocol is up
Hardware is BCM1250 Internal MAC, address is 0005.dd2c.7c1a (bia 0005.dd2c.7c1a)
Internet address is 192.18.1.1/24
MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 5/255, rxload 6/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Full-duplex, 1000Mb/s, link type is autonegotiation, media type is SX
output flow-control is off, input flow-control is off
ARP type:ARPA, ARP Timeout 04:00:00
Last input 18:56:46, output 00:00:09, output hang never
Last clearing of "show interface" counters 19:00:52
Input queue:0/75/16176489/0 (size/max/drops/flushes); Total output drops:0

```

(display text omitted)

```

GigabitEthernet0/2 is up, line protocol is up
Hardware is BCM1250 Internal MAC, address is 0005.dd2c.7c19 (bia 0005.dd2c.7c19)
Internet address is 1.1.1.1/24
MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 5/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Full-duplex, 1000Mb/s, link type is autonegotiation, media type is SX
output flow-control is off, input flow-control is off
ARP type:ARPA, ARP Timeout 04:00:00
Last input 00:04:42, output 00:00:01, output hang never
Last clearing of "show interface" counters 19:00:54
Input queue:0/75/22087/0 (size/max/drops/flushes); Total output drops:0

```

(display text omitted)

Cisco 7401ASR Routers

Following is an example of the **show interfaces** command for Cisco 7401ASR routers. In this example, the port adapter is in slot 1 of the Cisco 7401ASR router:

```

Router# show interfaces serial 1/0/1:0
Serial1/0/1:0 is up, line protocol is up
Hardware is 2CT3+
Internet address is 1.1.1.1/24
MTU 1500 bytes, BW 1536 Kbit, DLY 20000 usec, rely 255/255, load 1/255
Encapsulation HDLC, loopback not set, keepalive not set
Last input 19:04:01, output 12:49:52, output hang never
Last clearing of "show interface" counters 13:09:09
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

```

```

18722 packets input, 2134308 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants
82 input errors, 0 CRC, 0 frame, 82 overrun, 0 ignored, 0 abort
18722 packets output, 2134308 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 output buffers copied, 0 interrupts, 0 failures
8 carrier transitions no alarm present
Timeslot(s) Used: 1-24, Transmitter delay is 0 flags, transmit queue length 5
non-inverted data

```

VIP in Cisco 7000 Series or Cisco 7500 Series Routers

Following is an example of the **show interfaces** command used with the VIP. In this example, a VIP is in interface processor slot 1, and the PA-MC-2T3+ is in port adapter slot 0.

```

Router# show interfaces serial 1/0/0/1:0
Serial1/0/0/1:0 is up, line protocol is up
  Hardware is 2CT3+
  Internet address is 1.1.1.1/24
  MTU 1500 bytes, BW 1536 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive not set
  Last input 19:04:01, output 12:49:52, output hang never
  Last clearing of "show interface" counters 13:09:09
  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
    18722 packets input, 2134308 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants
    82 input errors, 0 CRC, 0 frame, 82 overrun, 0 ignored, 0 abort
    18722 packets output, 2134308 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
    0 output buffers copied, 0 interrupts, 0 failures
    8 carrier transitions no alarm present
  Timeslot(s) Used: 1-24, Transmitter delay is 0 flags, transmit queue length 5
  non-inverted data

```

Using the show controllers Command

You can display information for all T1 lines within a PA-MC-2T3+ with the command:

```
show controllers T3 slot/port-adapter/port [brief | tabular | remote performance]
```

where:

- **brief** displays a list of configurations only.
- **tabular** displays a list of configurations and MIB data in a tabular format.
- **remote performance** displays a list of performance data from the remote end of a T1 connection.



Note

If you use the **show controllers T3 slot/port-adapter/port** command without either of the three optional arguments (**brief**, **tabular**, or **remote performance**), all information is displayed for the T3 controller you specified; therefore, the resulting display output can be extensive.

**Note**

You can use these three **show controllers T3** commands for Cisco 7200 series, Cisco 7301 routers, and Cisco 7401ASR routers in which the PA-MC-2T3+ is supported. The syntax is as follows:

- **show controllers T3 chassis-slot/T3-port brief**
- **show controllers T3 chassis-slot/T3-port tabular**
- **show controllers T3 chassis-slot/T3-port remote performance**

Examples of these **show controllers T3** commands for Cisco 7200 series and Cisco 7401ASR routers are not shown.

The **show controllers** command with no arguments displays information about every controller and interface in the router.

The following example is for a Cisco 7500 series router:

- **show controllers**

```
Router# show controllers
Serial0/1/0 -
  Framing is c-bit, Clock Source is Line
  Bandwidth limit is 44210, DSU mode 0, Cable length is 10
  Data in current interval (1 seconds elapsed):
    0 Line Code Violations, 0 P-bit Coding Violation
    0 C-bit Coding Violation
    0 P-bit Err Secs, 0 P-bit Sev Err Secs
    0 Sev Err Framing Secs, 0 Unavailable Secs
    0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Sev Err Secs

  No alarms detected.
Fddil/0 - hardware version 2.9, microcode version 20.4
  Phy-A registers:
    cr0 4, cr1 0, cr2 0, status 6, cr3 0
  Phy-B registers:
    cr0 4, cr1 4, cr2 0, status 3, cr3 0
  FORMAC registers:
    irdtlb 70DA, irdtneg F85E, irdthtt 6F8D, irdmir FFFF0BDC
    irdtrth F85F, irdtmax FBC5, irdtvxt 8585, irdstmc 0810
    irdmode 6A21, irdimsk E000, irdstat 8060, irdtpri 0000
  FIP registers
  ccbptr:      7F98  event_ptr:    0088  cmdreg:      0006  argreg:     0003
  memdptr:    0000  memdpage:    0000  memaptr:    0000  afaddr:    0602
  frpnr:      000F  aptr:        0004  tx_channel: 0000  tx_claim:  F002
  tx_claim_bc: 8011  tx_beacon:   F016  tx_beacon_bc: 8011  tx_clbn:   0000
  tx_pend:     0000  local_freeptr:00C8  hold_ctl:    0003  unused:    B000
  tx_active_cnt: 0000  txq_ptr:     00CC  tx_accptr:   0045  raw_ptr:   0080
  tx_state:    0003  rx_channel:  0000  rx_eof_channel:0000  rx_error:  00A0
  rx_pool:     00B8  rx_buf0:     7CB0  rx_buf1:     7CA0  rx_next0:  7C98
  rx_next1:    7C90  rx_limit_lo: 0004  rx_limit_hi: 00AD  rx_offset: 0028
  enabled:     0001  return:      0000  phya_ls_flag: 0001  unused:    0002
  phy_a_tmin:  0000  phy_a_tmax:  1388  unused:     0000  txq_fill:  0018
  lovenote:    0000  not_rcv_pkt: 0000  phyb_tmin:   0000  phyb_tmax: 1388
  t0:          0030  t1:          FE60  t2:          002E  t3:         0049
  txq_fill_txEOF:0018  unused:     0288  cur:         7F30  cnt:        0000
  fop:         9070  phyb_ls_flag: 0001  lst_fint:    9070  rx_count:   0004
  unused:      0000  bogus_claim: 0000  robin:       0000  park:       0000
  Total LEM: phy-a 0, phy-b 0
  T3 0/1/0 is down. Hardware is 2CT3+ single wide port adapter
  CT3 H/W Version: 0.1.1, CT3 ROM Version: 0.95, CT3 F/W Version: 1.3.2
```

```

FREEDM version: 1, reset 0
Applique type is Subrate T3
Receiver has idle signal.
MDL transmission is disabled

FEAC code received: No code is being received
Framing is C-BIT Parity, Line Code is B3ZS, Clock Source is Line
Rx throttle total 0, equipment customer loopback
Data in current interval (287 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  25152 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  287 C-bit Errored Secs, 287 C-bit Severely Errored Secs
Total Data (last 24 hours)
  0 Line Code Violations, 0 P-bit Coding Violation,
  7571467 C-bit Coding Violation, 0 P-bit Err Secs,
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs,
  0 Unavailable Secs, 0 Line Errored Secs,
  86400 C-bit Errored Secs, 86400 C-bit Severely Errored Secs
T3 0/1/1 is down. Hardware is 2CT3+ single wide port adapter
CT3 H/W Version: 0.1.1, CT3 ROM Version: 0.95, CT3 F/W Version: 1.3.2
FREEDM version: 1, reset 0
Applique type is Channelized T3
Receiver has loss of signal.
Framing is M23, Line Code is B3ZS, Clock Source is Internal
Rx throttle total 0, equipment customer loopback
Data in current interval (293 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  293 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Total Data (last 24 hours)
  0 Line Code Violations, 0 P-bit Coding Violation,
  0 C-bit Coding Violation, 0 P-bit Err Secs,
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs,
  86400 Unavailable Secs, 0 Line Errored Secs,
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
(additional displayed text not shown)

```

The following examples show command output display information for a PA-MC-2T3+ in port adapter slot 0 on a VIP installed in interface processor slot 4.

- **show controllers T3 4/0/0 brief**

```

Router# show controllers T3 4/0/0 brief

T3 4/0/0 is up. Hardware is 2CT3+ single wide port adapter
CT3 H/W Version: 0.1.1, CT3 ROM Version: 0.95, CT3 F/W Version: 0.15.3
FREEDM version: 1, reset 0
Applique type is Channelized T3
No alarms detected.
FEAC code received: No code is being received
Framing is M23, Line Code is B3ZS, Clock Source is Internal
Rx throttle total 0, equipment customer loopback

(additional displayed text not shown)

```

- **show controllers T3 4/0/0 tabular**

```
Router# show controllers t3 4/0/0 tabular
```

```
T3 4/0/0 is up. Hardware is 2CT3+ single wide port adapter
CT3 H/W Version: 0.1.1, CT3 ROM Version: 0.95, CT3 F/W Version: 0.15.3
FREEDM version: 1, reset 0
Applique type is Channelized T3
No alarms detected.
FEAC code received: No code is being received
Framing is M23, Line Code is B3ZS, Clock Source is Internal
Rx throttle total 0, equipment customer loopback
INTERVAL      LCV  PCV  CCV  PES  PSES  SEFS  UAS  LES  CES  CSES
13:32-13:38   0    0    0    0    0    0    0    0    0    0
13:17-13:32   0    0    0    0    0    0    0    0    0    0
13:02-13:17   0    0    0    0    0    0    0    0    0    0
12:47-13:02   0    0    0    0    0    0    0    0    0    0
12:32-12:47   0    0    0    0    0    0    0    0    0    0
12:17-12:32   0    0    0    0    0    0    0    0    0    0
12:02-12:17   0    0    0    0    0    0    0    0    0    0
11:47-12:02   0    0    0    0    0    0    0    0    0    0
11:32-11:47   0    0    0    0    0    0    0    0    0    0
11:17-11:32   0    0    0    0    0    0    0    0    0    0
11:02-11:17   0    0    0    0    0    0    0    0    0    0
10:47-11:02   0    0    0    0    0    0    0    0    0    0
10:32-10:47   0    0    0    0    0    0    0    0    0    0
10:17-10:32   0    0    0    0    0    0    0    0    0    0
10:02-10:17   0    0    0    0    0    0    0    0    0    0
09:47-10:02   0    0    0    0    0    0    0    0    0    0
09:32-09:47   0    0    0    0    0    0    0    0    0    0
09:17-09:32   0    0    0    0    0    0    0    0    0    0
09:02-09:17   0    0    0    0    0    0    0    0    0    0
08:47-09:02   0    0    0    0    0    0    0    0    0    0
08:32-08:47   0    0    0    0    0    0    0    0    0    0
08:17-08:32   0    0    0    0    0    0    0    0    0    0
08:02-08:17   0    0    0    0    0    0    0    0    0    0
07:47-08:02   0    0    0    0    0    0    0    0    0    0
07:32-07:47   0    0    0    0    0    0    0    0    0    0
07:17-07:32   0    0    0    0    0    0    0    0    0    0
07:02-07:17   0    0    0    0    0    0    0    0    0    0
06:47-07:02   0    0    0    0    0    0    0    0    0    0
06:32-06:47   0    0    0    0    0    0    0    0    0    0
06:17-06:32   0    0    0    0    0    0    0    0    0    0
06:02-06:17   0    0    0    0    0    0    0    0    0    0
05:47-06:02   0    0    0    0    0    0    0    0    0    0
05:32-05:47   0    0    0    0    0    0    0    0    0    0
05:17-05:32   0    0    0    0    0    0    0    0    0    0
05:02-05:17   0    0    0    0    0    0    0    0    0    0
04:47-05:02   0    0    0    0    0    0    0    0    0    0
04:32-04:47   0    0    0    0    0    0    0    0    0    0
04:17-04:32   0    0    0    0    0    0    0    0    0    0
04:02-04:17   0    0    0    0    0    0    0    0    0    0
03:47-04:02   0    0    0    0    0    0    0    0    0    0
03:32-03:47   0    0    0    0    0    0    0    0    0    0
03:17-03:32   0    0    0    0    0    0    0    0    0    0
03:02-03:17   0    0    0    0    0    0    0    0    0    0
02:47-03:02   0    0    0    0    0    0    0    0    0    0
02:32-02:47   0    0    0    0    0    0    0    0    0    0
02:17-02:32   0    0    0    0    0    0    0    0    0    0
02:02-02:17   0    0    0    0    0    0    0    0    0    0
01:47-02:02   0    0    0    0    0    0    0    0    0    0
01:32-01:47   0    0    0    0    0    0    0    0    0    0
01:17-01:32   0    0    0    0    0    0    0    0    0    0
01:02-01:17   0    0    0    0    0    0    0    0    0    0
```

```

00:47-01:02    0    0    0    0    0    0    0    0    0    0    0
00:32-00:47    0    0    0    0    0    0    0    0    0    0    0
  Total        0    0    0    0    0    0    0    0    0    0    0

```

T1 1 is down

timeslots: 1-24

FDL per ANSI T1.403 and AT&T 54016 spec.

Transmitter is sending LOF Indication.

Receiver is getting AIS.

Framing is ESF, Clock Source is Internal

INTERVAL	LCV	PCV	CSS	SELS	LES	DM	ES	BES	SES	UAS	SS
13:32-13:39	0	0	0	0	0	0	0	0	0	396	0
13:17-13:32	0	0	0	0	0	0	0	0	0	900	0
13:02-13:17	0	0	0	0	0	0	0	0	0	900	0
12:47-13:02	0	0	0	0	0	0	0	0	0	900	0
12:32-12:47	0	0	0	0	0	0	0	0	0	900	0
12:17-12:32	0	0	0	0	0	0	0	0	0	900	0
12:02-12:17	0	0	0	0	0	0	0	0	0	900	0
11:47-12:02	0	0	0	0	0	0	0	0	0	900	0
11:32-11:47	0	0	0	0	0	0	0	0	0	900	0
11:17-11:32	0	0	0	0	0	0	0	0	0	900	0
11:02-11:17	0	0	0	0	0	0	0	0	0	900	0
10:47-11:02	0	0	0	0	0	0	0	0	0	900	0
10:32-10:47	0	0	0	0	0	0	0	0	0	900	0
10:17-10:32	0	0	0	0	0	0	0	0	0	900	0
10:02-10:17	0	0	0	0	0	0	0	0	0	900	0
09:47-10:02	0	0	0	0	0	0	0	0	0	900	0
09:32-09:47	0	0	0	0	0	0	0	0	0	900	0
09:17-09:32	0	0	0	0	0	0	0	0	0	900	0
09:02-09:17	0	0	0	0	0	0	0	0	0	900	0
08:47-09:02	0	0	0	0	0	0	0	0	0	900	0
08:32-08:47	0	0	0	0	0	0	0	0	0	900	0
08:17-08:32	0	0	0	0	0	0	0	0	0	900	0
08:02-08:17	0	0	0	0	0	0	0	0	0	900	0
07:47-08:02	0	0	0	0	0	0	0	0	0	900	0
07:32-07:47	0	0	0	0	0	0	0	0	0	900	0
07:17-07:32	0	0	0	0	0	0	0	0	0	900	0
07:02-07:17	0	0	0	0	0	0	0	0	0	900	0
06:47-07:02	0	0	0	0	0	0	0	0	0	900	0
06:32-06:47	0	0	0	0	0	0	0	0	0	900	0
06:17-06:32	0	0	0	0	0	0	0	0	0	900	0
06:02-06:17	0	0	0	0	0	0	0	0	0	900	0
05:47-06:02	0	0	0	0	0	0	0	0	0	900	0
05:32-05:47	0	0	0	0	0	0	0	0	0	900	0
05:17-05:32	0	0	0	0	0	0	0	0	0	900	0
05:02-05:17	0	0	0	0	0	0	0	0	0	900	0
04:47-05:02	0	0	0	0	0	0	0	0	0	900	0
04:32-04:47	0	0	0	0	0	0	0	0	0	900	0
04:17-04:32	0	0	0	0	0	0	0	0	0	900	0
04:02-04:17	0	0	0	0	0	0	0	0	0	900	0
03:47-04:02	0	0	0	0	0	0	0	0	0	900	0
03:32-03:47	0	0	0	0	0	0	0	0	0	900	0
03:17-03:32	0	0	0	0	0	0	0	0	0	900	0
03:02-03:17	0	0	0	0	0	0	0	0	0	900	0
02:47-03:02	0	0	0	0	0	0	0	0	0	900	0
02:32-02:47	0	0	0	0	0	0	0	0	0	900	0
02:17-02:32	0	0	0	0	0	0	0	0	0	900	0
02:02-02:17	0	0	0	0	0	0	0	0	0	900	0
01:47-02:02	0	0	0	0	0	0	0	0	0	900	0
01:32-01:47	0	0	0	0	0	0	0	0	0	900	0
01:17-01:32	0	0	0	0	0	0	0	0	0	900	0
01:02-01:17	0	0	0	0	0	0	0	0	0	900	0
00:47-01:02	0	0	0	0	0	0	0	0	0	900	0
00:32-00:47	0	0	0	0	0	0	0	0	0	900	0

```
00:17-00:32    0    0    0    0    0    0    0    0    0    0    900    0
Total          0    0    0    0    0    0    0    0    0    0 47700  0
```

```
T1 2 is up
timeslots: 1-24
FDL per ANSI T1.403 and AT&T 54016 spec.
No alarms detected.
```

```
Framing is ESF, Clock Source is Internal
```

INTERVAL	LCV	PCV	CSS	SELS	LES	DM	ES	BES	SES	UAS	SS
13:32-13:39	0	0	0	0	0	0	0	0	0	0	0
13:17-13:32	0	0	0	0	0	0	0	0	0	0	0
13:02-13:17	0	0	0	0	0	0	0	0	0	0	0
12:47-13:02	0	0	0	0	0	0	0	0	0	0	0
12:32-12:47	0	0	0	0	0	0	0	0	0	0	0
12:17-12:32	0	0	0	0	0	0	0	0	0	0	0
12:02-12:17	0	0	0	0	0	0	0	0	0	0	0

```
(additional displayed text not shown)
```

**Note**

The PA-MC-2T3+ does not support slip buffers and always reports local controlled slip seconds (CSS) as 0.

- **show controllers t3 4/0/0 remote performance**

```
router # show controllers t3 4/0/0 remote performance
```

```
T3 4/0/0 is up. Hardware is 2CT+ single wide port adapter
CT3 H/W Version: 0.1.0, CT3 ROM Version: 0.95, CT3 F/W Version: 0.3.9
FREEDM version: 1, reset 0
```

```
T1 1 - Remote Performance Data (Not available)
```

```
.
.
```

```
(additional displayed text not shown)
```

**Note**

In the preceding example, remote performance data is unavailable.

If you use the **show controllers T3** command without specifying a port address (*slot/port-adapter/port/t1-line-number*), all information is displayed for all 28 T1 lines within every T3 port adapter in the router; therefore, the resulting display output can be extensive.

You can also display brief configuration information or tabular configuration and MIB information about a specific T1 line within a PA-MC-2T3+ with the command:

```
show controllers T3 slot/port-adapter/t3-port/t1-line-number [brief | tabular | remote performance]
```

where:

- *t1-line-number* is 1–28.
- **brief** displays a list of configurations only.
- **tabular** displays a list of configurations and MIB data in a tabular format.

The following examples show command output display information for a PA-MC-2T3+ in port adapter slot 0 on a VIP installed in interface processor slot 1, using the following commands.

**Note**

You can use these **show controllers T3** commands in Cisco 7200 series, Cisco 7301 routers, and Cisco 7401ASR routers in which the PA-MC-2T3+ is supported. The syntax is as follows:

— **show controllers T3 chassis-slot/t3-port/t1-line-number brief**

— **show controllers T3 chassis-slot/t3-port/t1-line-number tabular**

— **show controllers T3 chassis-slot/t3-port/t1-line-number remote performance**

Examples of these **show controllers T3** commands for Cisco 7200 series and Cisco 7401ASR routers are not shown.

- **show controllers t3 4/0/0/1 brief**

```
T3 4/0/0 is up. Hardware is 2CT3+ single wide port adapter
CT3 H/W Version: 0.1.1, CT3 ROM Version: 0.95, CT3 F/W Version: 0.15.3
FREEDM version: 1, reset 0
Applique type is Channelized T3
No alarms detected.
FEAC code received: No code is being received
Framing is M23, Line Code is B3ZS, Clock Source is Internal
Rx throttle total 0, equipment customer loopback

T1 1 is down
timeslots: 1-24
FDL per ANSI T1.403 and AT&T 54016 spec.
Transmitter is sending LOF Indication.
Receiver is getting AIS.
Framing is ESF, Clock Source is Internal
```

- **show controllers T3 4/0/0/1 tabular**

```
Router# show controllers t3 4/0/0 tabular
T3 4/0/0 is down. Hardware is 2CT3+ single wide port adapter
CT3 H/W Version : 0.1.1, CT3 ROM Version : 0.95, CT3 F/W Version : 1.3.2
FREEDM version: 1, reset 0
Applique type is Channelized T3
Receiver has loss of signal.
Framing is M23, Line Code is B3ZS, Clock Source is Internal
Rx throttle total 0, equipment network loopback
INTERVAL      LCV  PCV  CCV  PES  PSES  SEFS  UAS  LES  CES  CSES
14:53-15:05   0    0    0    0    0    0    716  0    0    0
14:38-14:53   0    0    0    0    0    0    900  0    0    0
14:23-14:38   0    0    0    0    0    0    900  0    0    0
14:08-14:23   0    0    0    0    0    0    900  0    0    0
13:53-14:08   0    0    0    0    0    0    900  0    0    0
13:38-13:53   0    0    0    0    0    0    900  0    0    0
13:23-13:38   0    0    0    0    0    0    900  0    0    0
13:08-13:23   0    0    0    0    0    0    900  0    0    0
12:53-13:08   0    0    0    0    0    0    900  0    0    0
12:38-12:53   0    0    0    0    0    0    900  0    0    0
12:23-12:38   0    0    0    0    0    0    900  0    0    0
12:08-12:23   0    0    0    0    0    0    900  0    0    0
11:53-12:08   0    0    0    0    0    0    900  0    0    0
11:38-11:53   0    0    0    0    0    0    900  0    0    0
11:23-11:38   0    0    0    0    0    0    900  0    0    0
11:08-11:23   0    0    0    0    0    0    900  0    0    0
10:53-11:08   0    0    0    0    0    0    900  0    0    0
10:38-10:53   50   2    2    0    0    0    112  0    0    0
(additional displayed text not shown)
```

**Note**

To enable and display remote performance reports, see the “[Setting the FDL Configuration for a T1 Line](#)” section on page 5-13, and the “[Displaying Remote Performance Reports](#)” section on page 5-42.

Displaying Remote Performance Reports

To display performance data from the remote T1 equipment, use the following command:

show controllers T3 0/1/0 remote performance.

Examples follow:

- The example that follows is for a port adapter on a VIP in interface processor slot 1:

```
Router# show controllers T3 1/1/0 remote performance
T3 1/1/0 is up. Hardware is 2CT3+ single wide port adapter
CT3 H/W Version : 1.0.0, CT3 ROM Version: 1.1, CT3 F/W Version: 0.23.0
FREEDM version: 1

T1 1 - Remote Performance Data
Data in current interval (356 seconds elapsed):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs
Data in Interval 1:
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  2 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs
Data in Interval 2:
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs
Total Data (last 2 15 minute intervals):
  1 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
  2 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs
T1 2 - Remote Performance Data
.
.
.
(additional displayed text not shown)
```

- The example that follows is for a port adapter in slot 3 of a Cisco 7200 series router:

```
router# show controllers t3 3/0 remote performance tabular
T3 3/0 is down. Hardware is 2CT3+ single wide port adapter
CT3 H/W Version : 0.1.1, CT3 ROM Version : 0.95, CT3 F/W Version : 1.3.2
FREEDM version: 1, reset 0

T1 1 - Remote Performance Data (Not available)

T1 2 - Remote Performance Data (Not available)

T1 3 - Remote Performance Data (Not available)

T1 4 - Remote Performance Data (Not available)
```

T1 5 - Remote Performance Data (Not available)

T1 6 - Remote Performance Data (Not available)

- The example that follows is for a port adapter in slot 1 of a Cisco 7200 series router:

```
Router# show controllers T3 1/0 remote performance
T3 1/0 is up. Hardware is 2CT3+ single wide port adapter
CT3 H/W Version :1.0.1, CT3 ROM Version :1.1, CT3 F/W Version :2.0.1
FREEDM version:1, reset 0
```

```
T1 1 - Remote Performance Data
Data in current interval (640 seconds elapsed):
 0 Line Code Violations, 0 Path Code Violations
 0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
 0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
 0 Unavail Secs
```

```
T1 2 - Remote Performance Data
Data in current interval (640 seconds elapsed):
 0 Line Code Violations, 0 Path Code Violations
 0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
 0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
 0 Unavail Secs
```

```
T1 3 - Remote Performance Data
Data in current interval (7 seconds elapsed):
 0 Line Code Violations, 0 Path Code Violations
 0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
 0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
 0 Unavail Secs
```

T1 4 - Remote Performance Data (Not available)

T1 5 - Remote Performance Data (Not available)

T1 6 - Remote Performance Data (Not available)

.
.
.

(additional displayed text not shown)



Note

If you do not first enable remote performance data with the **t1 t1-line-number fdl ansi** command, the following is displayed:

```
T1 1 - Remote Performance Data (Not available)
```



Note

Although the PA-MC-2T3+ does not support local controlled slip seconds (CSS), remote T1 equipment may report CSS values and they will be shown in the remote performance reports.

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 viii](#) for detailed command descriptions and examples.

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

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

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

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