T3 and E3 Controller Commands on the Cisco IOS XR Software

This module provides command line interface (CLI) commands for configuring T3/E3 controllers on the Cisco CRS Router.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.

bert e3

To start or stop a configured bit error rate test (BERT) on an E3 controller or channel group, use the **bert e3** command in EXEC mode . To return to the default state, use the **no** form of this command.

bert e3 *interface-path-id* [**error**] {**start** | **stop**}

Syntax Description	*interface-path-id*	Physical interface or virtual interface.
		Note Use the **show interfaces** command to see a list of all interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (**?**) online help function.
	error	(Optional) Injects errors into the running BERT stream.
	start	Starts the BERT on the E3 controller or channel.
	stop	Stops the BERT on the E3 controller or channel.

Command Default	No default behavior or values

Command Modes	EXEC

Command History	**Release**	**Modification**
	Release 3.5.0	This command was introduced for T3/E3 lines.

Usage Guidelines

For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack*/*slot*/*module*/*port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

  - *rack*: Chassis number of the rack.

  - *slot*: Physical slot number of the line card.

  - *module*: Module number. A physical layer interface module (PLIM) is always 0.

  - *port*: Physical port number of the interface.

- If specifying a virtual interface, the number range varies, depending on interface type.

Note

Before you can start a BERT on an E3 controller, you must configure a BERT pattern using the **bert pattern** command. If desired, you can also adjust the default setting (1 minute) of the BERT interval using the **bert interval** command. Both of these commands are available in E3 configuration mode.

To view the BERT results, use the **show controllers e3** command in EXEC mode . The BERT results include the following information:

- Type of test pattern selected
- Status of the test
- Interval selected
- Time remaining on the BERT
- Total bit errors
- Total bits received

BERT is data intrusive. Regular data cannot flow on a line while the test is in progress. The line is put in an alarm state when a BERT is in progress and restored to a normal state after a BERT has been terminated.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows how to start and stop a BERT on an E3 controller:

```
RP/0/RP0/CPU0:router# bert e3 0/3/0/0/0 start
RP/0/RP0/CPU0:router# bert e3 0/3/0/0/0 stop
```

The following example shows how to inject errors into the BERT stream on an E3 controller:

```
RP/0/RP0/CPU0:router# bert e3 0/3/0/0 error
```

Related Commands

Command	Description
	Specifies the duration of a bit error rate test (BERT) pattern on a T3/E3 line.
	Enables a BERT pattern on a T3/E3 line or an individual channel group.
	Displays information about the E3 links and hardware and software drivers for the E3 controller.

bert error

To insert errors into a BERT stream on a T3/E3 line, use the **bert error** command in T3 configuration mode. To disable a BERT pattern, use the **no** form of this command.

bert error [*number*]

Syntax Description	*number* Specifies the number of BERT errors to introduce into the bit stream. The range is from 1 to 255. The default is 1.

Command Default   The default is 1.

Command Modes   T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced for T3/E3 lines.

Usage Guidelines   Use the **bert error** command with the **bert pattern** command.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples   The following example shows how to insert 10 errors into the BERT bit stream on the T3 controller in slot 0, subslot 3:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/0/3/1/10
RP/0/RP0/CPU0:router(config-t3e3)# bert error 10
```

Related Commands

Command	Description
bert interval, on page 6	Specifies the duration of a bit error rate test (BERT) pattern on a T3/E3 line.
bert pattern, on page 7	Enables a BERT pattern on a T3/E3 line or an individual channel group.
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

bert interval

To specify the duration of a bit error rate test (BERT) pattern on a T3/E3 line, use the **bert interval** command in the appropriate configuration mode. To revert to the default interval, use the **no** form of this command.

bert   interval *time*

Syntax Description	*time* Duration (in minutes) of the BERT. The interval can be a value from 1 to 14400. The default is 1 minute.

Command Default   A BERT runs for 1 minute.

Command Modes   T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced for T3/E3 lines.

Usage Guidelines   Use the **bert interval** command with the **bert pattern** command. If the **bert interval** command is not used, then the BERT runs for a default of 1 minute.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples   The following example shows how to limit the BERT to 10 minutes on the T3 controller in slot 0, subslot 3:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/0/3/1/10
RP/0/RP0/CPU0:router(config-t3e3)# bert interval 10
```

Related Commands

Command	Description
bert error, on page 5	Insert errors into a BERT stream on a T3/E3 line.
bert pattern, on page 7	Enables a BERT pattern on a T3/E3 line or an individual channel group.
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

bert pattern

To enable a bit error rate test (BERT) pattern on a T3/E3 line or an individual channel group, use the **bert pattern** command in T3 or E3 configuration mode. To disable a BERT pattern, use the **no** form of this command.

bert pattern {**0s** | **1s** | **2^11** | **2^15** | **2^20** | **2^20-QRSS** | **2^23** | **2^9**}

Syntax Description		
0s	Invokes a repeating pattern of zeros (...000...).
1s	Invokes a repeating pattern of ones (...111...).
2^11	(Channel group only) Invokes a pseudorandom O.151 test pattern that is 32,768 bits in length.
2^15	Invokes a pseudorandom O.151 test pattern that is 32,768 bits in length.
2^20	Invokes a pseudorandom O.153 test pattern that is 1,048,575 bits in length.
2^20-QRSS	Invokes a pseudorandom quasi-random signal sequence (QRSS) 0.151 test pattern that is 1,048,575 bits in length.
2^23	Invokes a pseudorandom O.151 test pattern that is 8,388,607 bits in length.
2^9	(Channel group only) Invokes a pseudorandom 0.153 test pattern of 511 bits in length.
alt-0-1	Invokes a repeating pattern of alternating zeros and ones (...01010...).

Command Default

BERT pattern test is disabled

Command Modes

T3 configuration

E3 configuration

Command History	Release	Modification
	Release 3.5.0	This command was introduced.
	Release 3.6.0	The **1in8**, **2^11**, **2^9**, **3in24**, **55Daly**, **55Octet**, **ds0-1**, **ds0-2**, **ds0-3**, and **ds0-4** keywords were added.
	Release 3.7.0	The **none** keyword was removed.

Usage Guidelines

BERT is supported on each of the T3/E3 links. It is done only over an unframed T3/E3 signal and is run on only one port at a time. It is also supported on an individual channel group.

To begin a BERT, commit the configuration and use the **bert t3** or **bert e3** command in EXEC mode.

To view the BERT results, use the **show controllers t3** command in EXEC mode. The BERT results include the following information:

- Type of test pattern selected
- Status of the test

- Interval selected
- Time remaining on the BERT
- Total bit errors
- Total bits received

BERT is data intrusive. Regular data cannot flow on a line while the test is in progress. The line is put in an alarm state when a BERT is in progress and restored to a normal state after a BERT has been terminated.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows how to enable the running of a BERT pattern of all zeros on the T3 controller in slot 0, subslot 3:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/0/3/1/10
RP/0/RP0/CPU0:router(config-t3e3)# bert pattern 0s
```

Related Commands

Command	Description
bert error, on page 5	Insert errors into a BERT stream on a T3/E3 line.
bert interval, on page 6	Specifies the duration of a bit error rate test (BERT) pattern on a T3/E3 line.
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

bert t3

To start or stop a configured bit error rate test (BERT) on a T3 controller or channel group, use the **bert t3** command in EXEC mode .

bert t3 *interface-path-id* [**error**] {**start** | **stop**}

Syntax Description	*interface-path-id*	Physical interface or virtual interface.
		Note Use the **show interfaces** command to see a list of all interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (**?**) online help function.
	error	(Optional) Injects errors into the running BERT stream.
	start	Starts the BERT on the T3 controller or channel.
	stop	Stops the BERT on the T3 controller or channel.

Command Default No default behavior or values

Command Modes EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack*/*slot*/*module*/*port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

  - *rack*: Chassis number of the rack.

  - *slot*: Physical slot number of the line card.

  - *module*: Module number. A physical layer interface module (PLIM) is always 0.

  - *port*: Physical port number of the interface.

- If specifying a virtual interface, the number range varies, depending on interface type.

Note Before you can start a BERT on a T3 controller, you must configure a BERT pattern using the **bert pattern** command. If desired, you can also adjust the default setting (1 minute) of the BERT interval using the **bert interval** command. Both of these commands are available in T3 configuration mode.

To view the BERT results, use the **show controllers t3** command in EXEC mode . The BERT results include the following information:

- Type of test pattern selected
- Status of the test
- Interval selected
- Time remaining on the BERT
- Total bit errors
- Total bits received

BERT is data intrusive. Regular data cannot flow on a line while the test is in progress. The line is put in an alarm state when a BERT is in progress and restored to a normal state after a BERT has been terminated.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows how to start and stop a BERT on a T3 controller:

```
RP/0/RP0/CPU0:router# bert t3 0/3/0/0 start
RP/0/RP0/CPU0:router# bert t3 0/3/0/0 stop
```

The following example shows how to inject errors into the BERT stream on a T3 controller:

```
RP/0/RP0/CPU0:router# bert t3 0/3/0/0 error
```

Related Commands

Command	Description
bert interval, on page 6	Specifies the duration of a bit error rate test (BERT) pattern on a T3/E3 line.
bert pattern, on page 7	Enables a BERT pattern on a T3/E3 line or an individual channel group.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

cablelength

To specify the distance of the cable from the routers to the network equipment, use the **cablelength** command in T3 or E3 configuration mode. To restore the default cable length, use the **no** form of this command.

cablelength *feet*

Syntax Description	*feet* Number of feet in the range from 0 to 450. The default is 224 feet.

Command Default The default is 224 feet.

Command Modes T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines You can specify a cable length from 0 to 450 feet; however, the hardware recognizes only two ranges: 0 to 49 and 50 to 450. For example, entering 35 feet uses the 0 to 49 range. If you later change the cable length to 40 feet, there is no change because 40 is still within the 0 to 49 range. However, if you change the cable length to 50, the 50 to 450 range is used. The actual number you enter is stored in the configuration file.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples The following example shows how to set the cable length for the router to 300 feet:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/0/0
RP/0/RP0/CPU0:router(config-t3)# cablelength 300
```

clear controller t3

To clear T3 controller data, use the **clear controller t3** command in EXEC mode .

clear   controller   t3 *interface-path-id*

Syntax Description	*interface-path-id* Physical interface or virtual interface.

> **Note**   Use the **show controllers** command to see a list of all controllers currently configured on the router.

For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default   No default behavior or values

Command Modes   EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines   For the *interface-path-id* argument, use the following guidelines:

- When specifying a T3 controller, the naming notation is *rack*/*slot*/*module*/*port*/*T3num*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

  - *rack*—Chassis number of the rack.

  - *slot*—Physical slot number of the line card or SIP.

  - *module*—Module number or subslot (for a SPA). A physical layer interface module (PLIM) is always 0.

  - *port*—Physical port number of the interface.

  - *T3num*—T3 controller number.

  To view the status of the controllers, use the **show controllers t3** command.

Task ID

Task ID	Operations
dwdm	read, write
interface	read, write

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows how to clear controller data for T3 controller 1 that is located in chassis 0, for a SIP installed in slot 6 with a SPA in subslot 2, and port 0 with T3 controller 1:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/2/0/1
```

Related Commands

Command	Description
controller t3, on page 18	Configures a T3 controller and enters T3 configuration mode.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

clock source (T3/E3)

To set clocking for individual T3 or E3 links, use the **clock source** command in T3 or E3 configuration mode. To return to the default, use the **no** form of this command.

clock   source   {internal | line}

Syntax Description	**internal** Specifies that the clock is generated from the internal clock of the T3 or E3 controller. The default is internal.

> **Note** When configuring clocking on a serial link, you need to configure one end to be **internal** and the other end to be **line**. If you configure **internal** clocking on both ends of a connection, framing slips occur. If you configure **line** clocking on both ends of a connection, the line does not come up.

line   Specifies that the clock on this controller derives its clocking from the external source to which the controller is connected, which is generally the telephone company central office (CO).

Command Default   The default clock source is internal.

Command Modes   T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines   If you do not specify the **clock source** command, the default clock source is used.

Configure the **clock source line** command if your telephone company or the remote data service unit provides the master clock of the T3 or E3 connection.

Configure the **clock source internal** command if your router provides the master clock of the T3 or E3 connection.

> **Note** For a back-to-back connection between two T3 or E3 network modules, one controller must be configured for internal clocking while the other controller must be configured for line clocking.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows how to set the clocking to line on the T3 controller 1 that is located in chassis 0, on a SIP installed in slot 6 with a SPA in subslot 0, on port 0 with T3 controller 1:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/0/0/1
RP/0/RP0/CPU0:router(config-t3)# clock source line
```

Related Commands

Command	Description
controller e3, on page 16	Configures an E3 controller and enters E3 configuration mode.
controller t3, on page 18	Configures a T3 controller and enters T3 configuration mode.

controller e3

To configure an E3 controller and enter E3 configuration mode, use the **controller e3** command in Global Configuration mode . To return to the default state, use the **no** form of this command.

controller e3 *interface-path-id*

Syntax Description	*interface-path-id*	Physical interface or virtual interface.

	Note	Use the **show controllers** command to see a list of all controllers currently configured on the router.
		For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default   No default behavior or values

Command Modes   Global Configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines   For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack*/*slot*/*module*/*port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

    - *rack*: Chassis number of the rack.

    - *slot*: Physical slot number of the line card.

    - *module*: Module number. A physical layer interface module (PLIM) is always 0.

    - *port*: Physical port number of the interface.

- If specifying a virtual interface, the number range varies, depending on interface type.

The **controller e3** command applies only to the 2-Port and 4-Port Clear Channel T3/E3 SPAs. Use the **card type** command to define the controller type to be E3.

To view the status of the controllers, use the **show controllers e3** command.

Task ID

Task ID	Operations
interface	read, write

Examples

The following example shows how to enter E3 configuration mode for a controller in slot 6, on the SPA in subslot 2, on E3 controller 0:

```
RP/0/RP0/CPU0:router(config)# controller e3 0/6/2/0
RP/0/RP0/CPU0:router(config-e3)#
```

Related Commands

Command	Description
hw-module subslot cardtype, on page 31	Sets the ports on a SPA in T3 or E3 mode.
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.

controller t3

To configure a T3 controller and enter T3 configuration mode, use the **controller t3** command in Global Configuration mode . To return to the default state, use the **no** form of this command.

controller **t3** *interface-path-id*

Syntax Description	*interface-path-id*	Physical interface or virtual interface.

> **Note** Use the **show controllers** command to see a list of all controllers currently configured on the router.

For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default No default behavior or values

Command Modes Global Configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines For the *interface-path-id* argument, use the following guidelines:

- When specifying a T3 controller, the naming notation is *rack*/*slot*/*module*/*port*/*T3num*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

    - *rack*—Chassis number of the rack.

    - *slot*—Physical slot number of the line card or SIP.

    - *module*—Module number or subslot (for a SPA). A physical layer interface module (PLIM) is always 0.

    - *port*—Physical port number of the interface.

    - *T3num*—T3 controller number.

- If specifying a virtual interface, the number range varies, depending on interface type.

For the 2-Port and 4-Port Clear Channel T3/E3 SPAs, use the **card type** command to define the controller type to be T3.

To view the status of the controllers, use the **show controllers t3** command.

Task ID

Task ID	Operations
interface	read, write

Examples

The following example shows how to enter T3 configuration mode for T3 controller 1 that is located in chassis 0, for a SIP installed in slot 6 with a SPA in subslot 2, and port 0 with T3 controller 1:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/2/0/1
RP/0/RP0/CPU0:router(config-t3)#
```

Related Commands

Command	Description
hw-module subslot cardtype, on page 31	Sets the ports on a SPA in T3 or E3 mode.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

delay clear (T3/E3)

To configure the amount of time before a T3 or E3 path delay trigger alarm is cleared, use the **delay clear** command in T3 or E3 configuration mode. To return the command to its default setting, use the **no** form of this command.

delay clear *value*

Syntax Description

| *value* | Value, in milliseconds, before a T3 or E3 path delay trigger alarm is cleared. The range is from 0 through 180000. The default is 10 seconds. |

Command Default

The default is 10 seconds.

Command Modes

T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows how to specify that T3 path delay trigger alarms should be cleared after 9000 seconds:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/4/2/0/1
RP/0/RP0/CPU0:router(config-t3)# delay clear 9000
```

Related Commands

Command	Description
delay trigger (T3/E3), on page 21	Configures a time value for the T3 or E3 path delay trigger.

delay trigger (T3/E3)

To configure a time value for the T3 or E3 path delay trigger, use the **delay trigger** command in T3 or E3 configuration mode. To return the command to its default setting, use the **no** form of this command.

delay trigger *value*

Syntax Description	*value* Sets the T3 or E3 path delay trigger value, in milliseconds. The range is from 0 through 60000. The default is 2.5 seconds.

Command Default The default is 2.5 seconds.

Command Modes T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.

Usage Guidelines If the timer for the T3 or E3 path delay trigger expires, an alarm is declared.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples The following example shows how to set the T3 path delay trigger to 8000 milliseconds:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/4/2/0/1
RP/0/RP0/CPU0:router(config-t3)# delay trigger 8000
```

Related Commands

Command	Description
delay clear (T3/E3), on page 20	Configures the amount of time before a T3 or E3 path delay trigger alarm is cleared.

description (T3/E3)

To configure a description for a T3 or E3 controller, use the **description** command in T3 or E3 configuration mode. To delete a T3 or E3 controller description, use the **no** form of this command.

description *text*

Syntax Description	*text* A text string comprised of alphanumeric characters.

Command Default No description is configured.

Command Modes T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.7.0	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
sonet-sdh	read, write
interface	read, write

Examples The following example shows how to configure a description for a T3 controller:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/2/0
RP/0/RP0/CPU0:router(config-t3)# description This is a sample description for T3 controller
0/6/2/0
```

Related Commands

Command	Description
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

down-when-looped (T3/E3)

To configure a T3 or E3 controller to inform the system that it is down when loopback is detected, use the **down-when-looped** command in T3 or E3 configuration mode.

down-when-looped

Syntax Description	This command has no keywords or arguments.
Command Default	By default, a T3 or E3 controller does not inform the system that it is down when loopback is detected.
Command Modes	T3 configuration
	E3 configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

This command does not have a **no** form.

Task ID

Task ID	Operations
sonet-sdh	read, write
interface	read, write

Examples

The following example shows how to configure a T3 controller to inform the system that the associated line is down if a loopback is detected:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/4/2/0
RP/0/RP0/CPU0:router(config-t3)# down-when-looped

down-when-looped is a traffic-affecting operation if any loopback is present
```

Related Commands

Command	Description
loopback (T3/E3), on page 33	Loops the entire T3 or E3 line on the T3 controller or E3 controller.

dsu bandwidth

To specify the maximum allowable bandwidth used by a T3 or an E3 controller, use the **dsu bandwidth** command in T3 or E3 configuration mode. To return to the default state, use the **no** form of this command.

dsu   bandwidth   kbps

Syntax Description	*kbps* Maximum bandwidth, in kilobits per second (kbps). Range is from 75 to 44210. The default is 44210.

Command Default   The default bandwidth is 44210.

Command Modes   T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines   The local interface configuration must match the remote interface configuration. For example, if you reduce the maximum bandwidth to 16,000 on the local port, you must also do the same on the remote port.

The **dsu bandwidth** command reduces the bandwidth by padding the E3 and T3 frame.

To verify the data service unit (DSU) bandwidth configured on the interface, use the **show controllers t3** or **show controllers e3** command in EXEC mode.

When G.751 framing is used on E3 links, DSU bandwidth can be used to select a payload subrate from 34,010 kbps down to 22 kbps. Before framing bypass can be used, a DSU bandwidth of 34,010 kbps must be configured.

Although software allows the user to configure a continuous range of bandwidths in subrate modes, vendors support bandwidths only in quantums (for example, in a ADC Kentrox T3 link, bandwidth must be in multiples of 500 kbps). Therefore, the software sets the user-configured bandwidth to the closest vendor-supported bandwidth. Use the **show controllers t3** or **show controllers e3** command to display the actual bandwidth that is configured.

The following table shows DSU modes and vendor-supported bandwidths.

Table 1: DSU Modes and Vendor-supported Bandwidths

Mode	Bandwidth (in kbps)	Bandwidth Multiples (in kbps)
Digital Link or Cisco	358–34010 for E3300–44210 for T3	358 300.746
ADC Kentrox T3/E3 IDSU	1000–34010 for E31500–44210 for T3	500 500
Larscom Access T45	3100–44210 kbps	3158

Mode	Bandwidth (in kbps)	Bandwidth Multiples (in kbps)
Adtran T3SU 300	75–44210 kbps	75.186
Verilink HDM 2182	1500–44210 kbps	1579

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows how to set the maximum allowable DSU bandwidth to 16,000 kbps on a SIP in slot 6, on the SPA in subslot 2, for port 0, and T3 controller 1:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/2/0/1
RP/0/RP0/CPU0:router(config-t3)# dsu bandwidth 16000
```

Related Commands

Command	Description
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

dsu mode

To specify the interoperability mode used by a T3 or an E3 controller, use the **dsu mode** command in T3 or E3 configuration mode. To return to the default state, use the **no** form of this command.

dsu mode mode

Syntax Description	*mode* DSU mode. Valid values are as follows: • (T3 only) **adtran** • (E3 only) cisco • digital-link • kentrox • (T3 only) **larscom** • (T3 only) **verilink** For T3, digital-link is default and for E3 cisco is default.

Command Default For T3, digital-link is default and for E3 cisco is default.

Command Modes T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines The default DSU mode Cisco is equivalent to Digilink Mode with Scrambling Enabled. This mode was added to enable scrambling along with Digilink mode on E3 Controllers.

Digilink Mode, by definition does not support scrambling for E3 Controllers though it supports the same for T3 Controllers. For T3 controllers, there is no functional default DSU mode. The DSU Mode Cisco is not applicable for T3 Controller.

For interoperability, it is recommended to always configure the DSU mode command under T3/E3 Controller by matching the DSU type of the remote port.

To enable Scrambling, configure Scramble under the respective Serial Interface for the T3/E3 Controller.

Refer to Table 1: DSU Modes and Vendor-supported Bandwidths, on page 24 for more information regarding the modes.

The local interface configuration must match the remote interface configuration. For example, if you define the data service unit (DSU) interoperability mode as **digital-link** on the local port, you must also do the same on the remote port.

You must know what type of DSU is connected to the remote port to determine if it interoperates with a T3 or an E3 controller. The **dsu mode** command enables and improves interoperability with other DSUs.

To verify the DSU mode configured on the interface, use the **show controllers t3** command in EXEC mode.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows how to set the DSU mode to **digital-link** for T3 controller 1 located in chassis 0, on a SIP in slot 6 and SPA in subslot 2, and port 0 with T3 controller 1:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/2/0/1
RP/0/RP0/CPU0:router(config-t3)# dsu mode digital-link
```

Related Commands

Command	Description
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

dsu remote

To control the bandwidth usage with the remote port, use the **dsu remote** command in T3 or E3 configuration mode. To return to the default state, use the **no** form of this command.

dsu remote {disable | fullrate}

Syntax Description		
	disable	Denies incoming remote requests to reset the bandwidth to the full rate.
	fullrate	Requests that the remote port set its bandwidth to full rate.

Command Default

Remote accept is the default.

Command Modes

T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To verify the DSU remote settings configured on the interface, use the **show controllers t3** or **show controllers e3** command in EXEC mode.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows how to specify that the connected remote port set its bandwidth to full rate:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/2/0
RP/0/RP0/CPU0:router(config-t3)# dsu remote fullrate
```

Related Commands

Command	Description
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

framing (E3)

To select the frame type for E3 data lines, use the **framing** command in E3 configuration mode. To disable E3 framing, use the **no** form of this command.

framing {**g751** | **g832**}

Syntax Description

g751	Specifies that G.751 framing is used as the E3 framing type. The default is G.751.
g832	Specifies that G.832 framing is used as the E3 framing type.

Command Default   The default is G.751.

Command Modes   E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines   If you do not use the **framing** command, the default is used by the E3 controllers to automatically determine the framing type received from the far-end equipment.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples   The following example shows how to select G751 as the E3 frame type:

```
RP/0/RP0/CPU0:router(config)# controller e3 0/6/0/0
RP/0/RP0/CPU0:router(config-e3)# framing g751
```

Related Commands

Command	Description
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.

framing (T3)

To select the frame type for T3 data lines, use the **framing** command in T3 configuration mode. To disable T3 framing, use the **no** form of this command.

framing {**auto-detect** | **c-bit** | **m23**}

Syntax Description

auto-detect	Specifies that application identification channel signal framing is used as the T3 framing type.
c-bit	Specifies that C-bit framing is used as the T3 framing type. The default is **c-bit**.
m23	Specifies that M23 framing is used as the T3 framing type.

Command Default   The default is **c-bit**.

Command Modes   T3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines   If you do not use the **framing** command, the default is used by the T3 controllers to automatically determine the framing type received from the far-end equipment.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples   The following example shows how to select M23 as the T3 frame type:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/0/0/1
RP/0/RP0/CPU0:router(config-t3)# framing m23
```

Related Commands

Command	Description
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

hw-module subslot cardtype

To set the ports on a SPA in T3 or E3 mode, use the **hw-module subslot cardtype** command in Global Configuration mode . To deselect the card type, use the **no** form of this command.

hw-module subslot subslot-id cardtype {**e3** | **t3**}

Syntax Description

subslot-id	Subslot to be power cycled. The *subslot-id* argument is entered in the *rack/slot/subslot* notation.
e3	Clear-channel E3 with integrated DSUs.
t3	Clear-channel T3 with integrated data service units (DSUs). The default for the 2-Port and 4-Port Clear Channel T3/E3 SPAs is T3 .

Command Default

The default for the 2-Port and 4-Port Clear Channel T3/E3 SPAs is T3.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced for T3 and E3 modes.

Usage Guidelines

The **hw-module subslot cardtype** command applies only to the following SPAs:

  • 2-Port and 4-Port Clear Channel T3/E3 SPAs

By default, the 2-Port and 4-Port Clear Channel T3/E3 SPAs boot in T3 mode . Use the **hw-module subslot cardtype** command to change the setting to E3 for the 2-Port and 4-Port Clear Channel T3/E3 SPAs .

If there are nondefault configurations on the card interfaces, you must delete them before you can change the card type. Use the **no controller** { **e3** | **t3**}and **no interface serial** commands to delete any T3, E3, or serial configurations.

Task ID

Task ID	Operations
root-lr	read, write

Examples

The following example shows how to configure all ports of a 2-Port or 4-Port Clear Channel T3/E3 SPA located in slot 5, subslot 2 to E3 mode:

```
RP/0/RP0/CPU0:router(config)# hw-module subslot 0/5/2 cardtype e3
```

Related Commands

Command	Description
controller e3, on page 16	Configures an E3 controller and enters E3 configuration mode.

Command	Description
controller t1	
controller t3, on page 18	Configures a T3 controller and enters T3 configuration mode.

loopback (T3/E3)

To loop the entire T3 or E3 line on the T3 controller or E3 controller, use the **loopback** command in T3 or E3 configuration mode. To remove the loop, use the **no** form of this command.

loopback {**local** | {**network** | **remote** {**line** | **payload**}}}

Syntax Description		
	local	Loops the data back toward the router and sends an alarm indication signal (AIS) out toward the network.
	network {**line**	**payload**}	Sets the loopback toward the network before going through the framer (**line**) or after going through the framer (**payload**).
	remote {**line**	**payload**}	Sends a far-end alarm control (FEAC) request to the remote end requesting that it enter into a network line loopback. FEAC requests (and therefore remote loopbacks) are possible only when the T3 is configured for C-bit framing. The M23 format does not support remote loopbacks.

Command Default   No loops are configured on the T3 line.

Command Modes   T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines   Use the **loopback** command for troubleshooting purposes. To verify that a loopback is configured on the interface, use the **show controllers t3** or **show controllers e3** command in EXEC mode. Note that remote loopback is valid only in C-bit parity mode.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples   This example shows how to configure the T3 for a local loopback:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/3/0/0
RP/0/RP0/CPU0:router(config-t3)# loopback local
```

Related Commands

Command	Description
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.

Command	Description
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

mdl

To configure the Maintenance Data Link (MDL) message defined in the ANSI T1.107a-1990 specification, use the **mdl** command in T3 configuration mode. To remove the message, use the **no** form of this command.

{**mdl string {eic** | **fi** | **fic** | **gen-number** | **lic** | **port-number** | **unit}** *string* | **transmit {idle-signal** | **path** | **test-signal} {disable** | **enable}}**

Syntax Description		
string eic *string*	Specifies the Equipment Identification Code; can be up to 10 characters.	
string fi *string*	Specifies the Facility Identification Code sent in the MDL Path message; can be up to 38 characters.	
string fic *string*	Specifies the Frame Identification Code; can be up to 10 characters.	
string gen-number *string*	Specifies the Generator number string sent in the MDL Test Signal message; can be up to 38 characters.	
string lic *string*	Specifies the Location Identification Code; can be up to 11 characters.	
string port-number *string*	Specifies the Port number string sent in the MDL Idle Signal message; can be up to 10 characters.	
string unit *string*	Specifies the Unit Identification Code; can be up to 6 characters.	
transmit idle-signal	Specifies the transmission of the MDL Idle Signal message.	
transmit path	Specifies the transmission of the MDL Path message.	
transmit test-signal	Specifies the transmission of the MDL Test Signal message.	
disable	**enable**	Disables or enables transmission of the specified message.	

Command Default   No MDL message is configured.

Command Modes   T3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines   Use the **show controllers t3** command to display MDL information (received strings). MDL information is displayed only when framing is set to C-bit.

Note   MDL is supported only when the DS3 framing is C-bit parity.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows the **mdl** commands on a T3 controller in slot 1, subslot 2, port 0:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/1/2/0
RP/0/RP0/CPU0:router(config-t3)# clock source line
RP/0/RP0/CPU0:router(config-t3)# mdl string eic ID
RP/0/RP0/CPU0:router(config-t3)# mdl string fic Building B
RP/0/RP0/CPU0:router(config-t3)# mdl string unit ABC
RP/0/RP0/CPU0:router(config-t3)# mdl string fi Facility Z
RP/0/RP0/CPU0:router(config-t3)# mdl string port-number Port 7
RP/0/RP0/CPU0:router(config-t3)# mdl transmit path enable
RP/0/RP0/CPU0:router(config-t3)# mdl transmit idle-signal enable
```

Related Commands

Command	Description
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

mode

To set the mode of the T3/E3 controller, use the **mode** command in T3 or E3 configuration mode. To disable the controller mode, use the **no** form of this command.

mode {**atm** | **serial**}

Syntax Description	**atm** Specifies the mode of the port to be a clear channel transporting ATM.
	serial (T3 and E3 only) Specifies the mode of the port to be clear channel serial. The default for the 2-Port and 4-Port Clear Channel T3/E3 SPAs is serial.

Command Modes

T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced for T3/E3 controllers.

Usage Guidelines

You can change the mode of a controller only when there are no subinterfaces defined for the controller.

For channelized SPAs, you must use the **mode** command before you can configure any channelized controllers.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples

The following example shows how to change the mode of a T3 port to atm:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/0/0
RP/0/RP0/CPU0:router(config-t3)# mode atm
```

Related Commands

Command	Description
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.

national bits (E3)

To enable or disable the national reserved bit pattern on an E3 port, use the **national bits** command in E3 configuration mode. To revert to the default value, use the **no** form of this command.

national bits {**disable** | **enable**}

Syntax Description	**disable**	Disables national reserved bits for an E3 port.
	enable	Enables national reserved bits for an E3 port. The default is **enable**.

Command Default The default is **enable**.

Command Modes E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples The following example shows how to enable the national bits for an E3 controller:

```
RP/0/RP0/CPU0:router(config)# controller e3 0/6/2/0
RP/0/RP0/CPU0:router(config-e3)# national bits enable
```

Related Commands

Command	Description
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.

show controllers e3

To display information about the E3 links and hardware and software drivers for the E3 controller, use the **show controllers e3** command in EXEC mode .

show controllers e3 *interface-path-id* [{**all** | **bert** | **brief** | **internal-state** | **tabular**}]

Syntax Description	*interface-path-id*	Physical interface or virtual interface.
		Note Use the **show interfaces** command to see a list of all interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (**?**) online help function.
	all	Displays all information for the controllers.
	bert	Displays internal E3 bit error rate test results.
	brief	Displays summary information for the E3 controller.
	internal-state	Displays internal E3 state information.
	tabular	Displays E3 controller information in tabular format.

Command Default No default behavior or values

Command Modes EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack*/*slot*/*module*/*port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

  - *rack*: Chassis number of the rack.

  - *slot*: Physical slot number of the line card.

  - *module*: Module number. A physical layer interface module (PLIM) is always 0.

  - *port*: Physical port number of the interface.

- If specifying a virtual interface, the number range varies, depending on interface type.

Task ID

Task ID	Operations
interface	read

Examples

The following example shows sample output from the **show controllers e3** command for a single E3 port:

```
RP/0/RP0/CPU0:router# show controllers e3 0/2/0/0

E3 0/2/0/0 is down
Transmitter is sending RAI.
Receiver has loss of frame.
Framing is G.751, Line Code is B3ZS, Clock Source is Internal
Subrate is enabled. Mode: Cisco(default), Bandwidth: 34010 kbps
Remote accept is enabled
Remote fullrate has no request outstanding
Data in current interval (360 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
   360 Unavailable Secs, 0 Line Errored Secs
   0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
```

The following example shows sample output from the **show controllers e3** command using the **tabular** keyword, for a single E3 port:

```
RP/0/RP0/CPU0:router# show controllers e3 0/2/0/0 tabular

E3 0/2/0/0 is down
Transmitter is sending RAI.
Receiver has loss of frame.
Framing is G.751, Line Code is B3ZS, Clock Source is Internal
Subrate is enabled. Mode: Cisco(default), Bandwidth: 34010 kbps
Remote accept is enabled
Remote fullrate has no request outstanding
INTERVAL      LCV   PCV   CCV   PES  PSES  SEFS   UAS   LES   CES   CSES
07:49-07:56    0     0     0     0     0     0    380    0     0     0
Data in current interval (380 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
   380 Unavailable Secs, 0 Line Errored Secs
   0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
```

Table 2: show controllers e3 Field Descriptions

Field	Description
Transmitter is sending RAI	Any alarms detected by the controller are displayed here. Possible alarms are as follows: • Transmitter is sending remote alarm. • Transmitter is sending AIS. • Receiver has loss of signal. • Receiver is getting AIS. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms.
Framing	Framing type on the controller. Values are G.751 and G.832.
Line Code	Line coding format on the controller.
Clock Source	Clock source on the channelized controller. Values are internal and line.
Data in current interval (seconds elapsed)	Shows the current accumulation period, which rolls into the 24-hour accumulation every 15 minutes. The accumulation period is from 1 to 900 seconds. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer.
Line Code Violations	Line Code Violations (LCVs) is a count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) that occur over the accumulation period. An EXZ increments the LCV by one regardless of the length of the zero string.
P-bit Coding Violation	For all DS3 applications, a P-bit coding violation (PCV) error event is a P-bit parity error event. A P-bit parity error event is the occurrence of a received P-bit code on the DS3 M-frame that is not identical to the corresponding locally calculated code.
C-bit Coding Violation	For C-bit parity and SYNTRAN DS3 applications, the C-bit coding violation (CCV) is the count of coding violations reported by the C-bits. For C-bit parity, it is the count of CP-bit parity errors that occur during the accumulation interval. For SYNTRAN, it is a count of CRC-9 errors that occur during the accumulation interval.
P-bit Err Secs	P-bit errored seconds (PES) is a second with one or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge does not increment when unavailable seconds are counted.
P-bit Severely Err Secs	P-bit severely errored seconds (PSES) is a second with 44 or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge does not increment when unavailable seconds are counted.
Severely Err Framing Secs	Severely errored framing seconds (SEFS) is a second with one or more out-of-frame defects or a detected incoming AIS.

Field	Description
Unavailable Secs	The number of unavailable seconds (UAS) is calculated by counting the number of seconds for which the interface is unavailable. For more information, see RFC 1407, *DS3 MIB Variables*.
Line Errored Secs	Line errored seconds (LES) is a second in which one or more code violations or one or more LOS defects occurred.
C-bit Errored Secs	C-bit errored seconds (CES) is a second with one or more C-bit code violations (CCV), one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted.
C-bit Severely Errored Secs	C-bit severely errored seconds (CSES) is a second with 44 or more CCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted.
Total Data (last 24 hours)	Shows the last 15-minute accumulation period.

Related Commands

Command	Description
controller e3, on page 16	Configures an E3 controller and enters E3 configuration mode.

show controllers t3

To display information about the T3 links and hardware and software drivers for the T3 controller, use the **show controllers t3** command in EXEC mode .

show controllers t3 *interface-path-id* [{**all** | **bert** | **brief** | **internal-state** | **tabular**}]

Syntax Description

interface-path-id	Physical interface or virtual interface.
	Note Use the **show interfaces** command to see a list of all interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (**?**) online help function.
all	Displays all information for the controllers.
bert	Displays internal T3 bit error rate test results.
brief	Displays summary information for the controller.
internal-state	Displays internal T3 state information.
tabular	Displays T3 controller information in tabular format.

Command Default   No default behavior or values

Command Modes   EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines   For the *interface-path-id* argument, use the following guidelines:

- When specifying a T3 controller, the naming notation is *rack*/*slot*/*module*/*port*/*T3num*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

  - *rack*—Chassis number of the rack.

  - *slot*—Physical slot number of the line card or SIP.

  - *module*—Module number or subslot (for a SPA). A physical layer interface module (PLIM) is always 0.

  - *port*—Physical port number of the interface.

  - *T3num*—T3 controller number.

- If specifying a virtual interface, the number range varies, depending on interface type.

Task ID	Task ID	Operations
	interface	read

Examples

The following example shows sample output from the **show controllers t3** command using the **brief** keyword for a single T3 port:

```
RP/0/RP0/CPU0:router# show controllers t3 0/4/2/0/1 brief

T3 0/4/2/0 is up
  No alarms detected.
  mode: serial
  MDL transmission is disabled
    EIC: , LIC: , FIC: , UNIT:
     Path FI:
     Idle Signal PORT_NO:
     Test Signal GEN_NO:
  FEAC code received: No code is being received
  Framing is C-BIT Parity, Line Code is B3ZS, Clock Source is Internal
  Alarm Soaking Interval:
                 Alarm Declaring= 2500 msec
                 Alarm clearing = 10000 msec
  BERT test result (not running)
     Test Pattern : Not Configured, Status : not running, Sync Detected : 0
     Interval : 1 minute(s), Time Remain : 0 (ms)
     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
```

Table 3: show controllers t3 brief Field Descriptions

Field	Description
T3 0/4/2/0/1 is up	T3 channel is operating. The channel state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped).
No alarms detected	Any alarms detected by the controller are displayed here. Possible alarms are as follows: • Transmitter is sending remote alarm. • Transmitter is sending AIS. • Receiver has loss of signal. • Receiver is getting AIS. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms.
mode	Mode of the T3 controller, which can be ATM, serial, or T1serial or T1 .
MDL transmission	Status of the Maintenance Data Link (either enabled or disabled) and the values of the MDL message fields.

Field	Description
EIC	Equipment Identification Code.
LIC	Location Identification Code.
FIC	Frame Identification Code.
UNIT	Unit Identification Code.
Path FI	Path facility identifier.
Idle Signal PORT_NO	Identifies the port that initiates the idle signal message.
Test Signal GEN_NO	Generator number to send in test signal messages.
FEAC code received	Whether or not a far-end alarm code request is being received. Possible values are as follows: • DS3 Eqpt. Failure (SA) • DS3 LOS/HBER • DS3 Out-of-Frame • DS3 AIS Received • DS3 IDLE Received • DS3 Eqpt. Failure (NSA) • Common Eqpt. Failure (NSA) • Multiple DS1 LOS/HBER • DS1 Eqpt. Failure • Single DS1 LOS/HBER • DS1 Eqpt. Failure (NSA) • No code is being received
Framing	Framing type on the channelized controller. Values are auto-detect, M23, and C-Bit.
Line Code	Line coding format on the channelized controller. Values are AMI and B8ZS.
Clock Source	Clock source on the channelized controller. Values are internal and line.
Alarm Soaking Interval	Values of the following alarm soaking intervals: • Alarm declarings: amount of time, in milliseconds, after which an alarm is declared. • Alarm clearing: amount of time, in milliseconds, after which an alarm is cleared.
BERT test result	Indicates the current state of the test. Can be one of the following: • running—BER test is still in progress. • done—BER test is complete. • not running—BER test is not running on the controller.
Test Pattern	Indicates the test pattern you selected for the test.

Field	Description
Status	Indicates the current synchronization state (sync).
Sync Detected	Indicates the number of times synchronization has been detected during this test.
Interval	Indicates the length of the test.
Time Remain	Indicates the time remaining for the test to run. **Note** If you terminate a BER test, you receive a message similar to the following: Time Remain : 2 minute(s) (unable to complete) "(Unable to complete)" signifies that you interrupted the test.
Bit Errors (since BERT started)	Bit errors that have been detected since the test started.
Bits Received (since BERT started)	Total number of test bits that have been received since the test started.
Bit Errors (since last sync)	Bit errors that have been detected since the synchronization started.
Bits Received (since last sync)	Total number of test bits that have been received since the synchronization started.

The following example shows sample output from the **show controllers t3** command using the **tabular** keyword, for a single T3 port:

```
RP/0/RP0/CPU0:router# show controllers 0/4/2/0/1 tabular

T3 0/4/2/0/1 is up
  INTERVAL     LCV   PCV   CCV   PES  PSES  SEFS   UAS   LES   CES  CSES
  09:00-09:02   0     0     0     0     0     0     0     0     0     0
  08:45-09:00   0     0     0     0     0     0     0     0     0     0
  08:30-08:45   0     0     0     0     0     0     0     0     0     0
  08:15-08:30   0     0     0     0     0     0     0     0     0     0
  08:00-08:15   0     0     0     0     0     0     0     0     0     0
  07:45-08:00   0     0     0     0     0     0     0     0     0     0
  07:30-07:45   0     0     0     0     0     0     0     0     0     0
.
.
.
```

The following example shows sample output from the **show controllers t3** command for a single T3 port:

```
RP/0/RP0/CPU0:router# show controllers t3 0/4/2/0/1

  T3 0/4/2/0/1 is up
  No alarms detected.
  mode: serial
  MDL transmission is disabled
    EIC: , LIC: , FIC: , UNIT:
     Path FI:
     Idle Signal PORT_NO:
```

```
     Test Signal GEN_NO:
  FEAC code received: No code is being received
  Framing is C-BIT Parity, Line Code is B3ZS, Clock Source is Internal
  Data in current interval (695 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:
     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
.
.
.
```

Table 4: show controllers t3 and show controllers t3 tabular Field Descriptions

Field	Description
T3 0/4/2/0/1 is up	T3 channel is operating. The channel state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped).
No alarms detected	Any alarms detected by the controller are displayed here. Possible alarms are as follows: • Transmitter is sending remote alarm. • Transmitter is sending AIS. • Receiver has loss of signal. • Receiver is getting AIS. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms.
mode	Mode of the T3 controller, which can be ATM, serial, T1, or E1 serial or T1 ATM or serial .
MDL transmission	Status of the Maintenance Data Link (either enabled or disabled) and the values of the MDL message fields.
EIC	Equipment Identification code.

Field	Description
LIC	Location Identification code.
FIC	Frame Identification code.
UNIT	Unit Identification code.
Path FI	Path facility identifier.
Idle Signal PORT_NO	Identifies the port that initiates the idle signal message.
Test Signal GEN_NO	Generator number to send in test signal messages.
FEAC code received	Whether or not a far-end alarm code request is being received. Possible values are as follows: • DS3 Eqpt. Failure (SA) • DS3 LOS/HBER • DS3 Out-of-Frame • DS3 AIS Received • DS3 IDLE Received • DS3 Eqpt. Failure (NSA) • Common Eqpt. Failure (NSA) • Multiple DS1 LOS/HBER • DS1 Eqpt. Failure • Single DS1 LOS/HBER • DS1 Eqpt. Failure (NSA) • No code is being received
Framing	Framing type on the channelized controller. Values are M23 and C-Bit.
Line Code	Line coding format on the channelized controller. Values are AMI and B8ZS.
Clock Source	Clock source on the channelized controller. Values are internal and line.
Data in current interval (seconds elapsed)	Shows the current accumulation period, which rolls into the 24-hour accumulation every 15 minutes. The accumulation period is from 1 to 900 seconds. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer.
Line Code Violations	Line Code Violations (LCVs) is a count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) that occur over the accumulation period. An EXZ increments the LCV by one regardless of the length of the zero string.
P-bit Coding Violation	For all DS3 applications, a P-bit coding violation (PCV) error event is a P-bit parity error event. A P-bit parity error event is the occurrence of a received P-bit code on the DS3 M-frame that is not identical to the corresponding locally calculated code.

Field	Description
C-bit Coding Violation	For C-bit parity and SYNTRAN DS3 applications, the C-bit coding violation (CCV) is the count of coding violations reported by the C-bits. For C-bit parity, it is the count of CP-bit parity errors that occur during the accumulation interval. For SYNTRAN, it is a count of CRC-9 errors that occur during the accumulation interval.
P-bit Err Secs	P-bit errored seconds (PES) is a second with one or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge does not increment when unavailable seconds are counted.
P-bit Severely Err Secs	P-bit severely errored seconds (PSES) is a second with 44 or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge does not increment when unavailable seconds are counted.
Severely Err Framing Secs	Severely errored framing seconds (SEFS) is a second with one or more out-of-frame defects or a detected incoming AIS.
Unavailable Secs	The number of unavailable seconds (UAS) is calculated by counting the number of seconds for which the interface is unavailable. For more information, see RFC 1407, *DS3 MIB Variables*.
Line Errored Secs	Line errored seconds (LES) is a second in which one or more code violations or one or more LOS defects occurred.
C-bit Errored Secs	C-bit errored seconds (CES) is a second with one or more C-bit code violations (CCV), one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted.
C-bit Severely Errored Secs	C-bit severely errored seconds (CSES) is a second with 44 or more CCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted.

Related Commands

Command	Description
controller t3, on page 18	Configures a T3 controller and enters T3 configuration mode.

shutdown (T3/E3)

To disable a T3 or E3 controller, use the **shutdown** command in T3 or E3 configuration mode. To restart a disabled T3 or E3 controller, use the **no** form of this command.

shutdown

Syntax Description   This command has no keywords or arguments.

Command Default   No default behavior or values

Command Modes   T3 configuration

E3 configuration

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines   Shutting down the T3 or E3 controller disables all functions on the interface and sends an AIS alarm to the network. The **shutdown** command marks the interface as unavailable. To check if the controller is disabled, use the **show controllers t3** or **show controllers e3** command.

Task ID

Task ID	Operations
sonet-sdh	read, write

Examples   The following example shows how to bring up a controller that was previously shut down:

```
RP/0/RP0/CPU0:router(config)# controller t3 0/6/0/0
RP/0/RP0/CPU0:router(config-t3)# no shutdown
```

Related Commands

Command	Description
show controllers e3, on page 39	Displays information about the E3 links and hardware and software drivers for the E3 controller.
show controllers t3, on page 43	Displays information about the T3 links and hardware and software drivers for the T3 controller.