



Channelized E1 and Channelized T1 Setup Commands

This chapter describes commands needed to configure channelized E1 and channelized T1 for the following:

- ISDN PRI on any platform that supports PRI
- Robbed bit (in-band) signaling for analog calls over digital T1 lines
- Channel-associated (out-of-band) signaling over digital E1 lines on the AS5200 access servers

In Cisco IOS Release 11.3, all commands supported on the Cisco 7500 series are also supported on the Cisco 7000 series.

autodetect encapsulation

To enable automatic detection of the encapsulation types in operation over a point-to-point link to a specified serial or ISDN interface, use the **autodetect encapsulation** interface configuration command. To disable automatic, dynamic detection of the encapsulation types in operation on a link, use the **no** form of this command.

autodetect encapsulation *encapsulation-type*
no autodetect encapsulation

Syntax Description

encapsulation-type One or both of the encapsulation keywords **v120** and **ppp**.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Release 11.2.

At least one encapsulation type is required in the command, but you can specify additional encapsulation types.

Use this command to enable the specified serial or ISDN interface to accept calls and dynamically change the encapsulation in effect on the interface when the remote device does not signal the call type. For example, if an ISDN call does not identify the call type in the Lower Layer Compatibility fields and is using an encapsulation that is different from the one configured on the interface, the interface can change its encapsulation type dynamically.

This command enables interoperability with ISDN terminal adapters that use V.120 encapsulation but do not signal V.120 in the call setup message. An ISDN interface that by default answers a call as synchronous serial with PPP encapsulation can change its encapsulation and answer such calls.

Automatic detection is attempted for the first 10 seconds after the link is established or the first five packets exchanged over the link, whichever is first.

Related Commands

You can use the master indexes or search online to find documentation of related commands.

encapsulation

cas-group (controller e1)

To configure an E1 controller on a Cisco AS5200 with channel associated signaling (also known as *robbed bit signaling*), use the **cas-group** controller configuration command. Use the **no** form of this command to disable channel associated signaling for one or more timeslots.

```
cas-group channel timeslots range type signal
no cas-group channel timeslots range type signal
```

Syntax Description

<i>channel</i>	Single channel group number, in the range 0 to 30.
timeslots <i>range</i>	One or more ranges of timeslot values, in the range 1 to 31. You can specify timeslot ranges (for example, 1-31), individual timeslots separated by commas (for example 1, 3, 5), or a combination of the two (for example 1-3, 8, 17-31). The 16th timeslot is not specified in the command line, because it is reserved for transmitting the channel signaling.
type <i>signal</i>	Specifies the type of channel associated signaling. Choose one of the following signal types to configure: <ul style="list-style-type: none"> • e&m-fgb—Specifies ear and mouth channel signaling with feature group b support. • e&m-fgd—Specifies ear and mouth channel signaling with feature group d support. • fxs-loopstart— Specifies foreign exchange system loopstart signaling support. • fxs-groundstart—Specifies foreign exchange system ground start signaling support. • sas-loopstart—Specifies specific access station loopstart signaling support. • sas-groundstart—Specifies specific access station ground start signaling support.

Default

No channel associated signaling is configured on the controller.

Command Mode

Controller configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

Use this command to configure support for incoming and outgoing call signals (such as on-hook and off-hook) on each E1 controller.

If you specify the timeslot range 1-31 at the router prompt, the system software automatically uses the 16th timeslot to transmit the channel associated signaling.

Example

The following example configures timeslots 1-30 with ear and mouth channel signaling with feature group b support on a Cisco AS5200. Because the signaling is transmitted through the 16th timeslot, this timeslot is not brought up or displayed in the output.

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller e1 0
Router(config-controller)# cas-group 1 timeslots 1-31 type e&m-fgb
Router(config-controller)#
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 1 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 2 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 3 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 4 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 5 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 6 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 7 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 8 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 9 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 10 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 11 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 12 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 13 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 14 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 15 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 17 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 18 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 19 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 20 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 21 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 22 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 23 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 24 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 25 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 26 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 27 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 28 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 29 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 30 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 31 is up
```

cas-group (controller t1)

To configure channelized T1 timeslots with channel associated signaling (also known as *robbed bit signaling*), which enables a Cisco AS5200 modem to receive and transmit analog calls, use the **cas-group** controller configuration command. Use the **no** form of this command to disable channel associated signaling for one or more timeslots.

```
cas-group channel timeslots range type signal
no cas-group channel timeslots range type signal
```

Syntax Description

<i>channel</i>	Single channel group number, in the range 0 to 23.
timeslots <i>range</i>	One or more ranges of timeslot values, in the range 1 to 24. You can specify timeslot ranges (for example, 1-24), individual timeslots separated by commas (for example 1, 3, 5), or a combination of the two (for example 1-3, 8, 15-23). The 24th timeslot is not specified in the command line, because it is reserved for transmitting the channel signaling.
type <i>signal</i>	Type of channel associated signaling. Choose one of the following signal types: <ul style="list-style-type: none"> • e&m-fgb—Specifies ear and mouth channel signaling with feature group b support. • e&m-fgd—Specifies ear and mouth channel signaling with feature group d support. • fxs-loopstart—Specifies foreign exchange system loopstart signaling support. • fxs-groundstart—Specifies foreign exchange system ground start signaling support. • sas-loopstart—Specifies specific access station loopstart signaling support. • sas-groundstart—Specifies specific access station ground start signaling support.

Default

No channelized T1 robbed bit signaling is configured.

Command Mode

Controller configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

Use this command to enable a Cisco AS5200 modem to receive and transmit incoming and outgoing call signaling (such as on-hook and off-hook) through each T1 controller that is configured for a channelized T1 line.

Switched 56 digital calls are not supported in this feature.

Example

The following example configures all 24 channels with ear and mouth channel signaling with feature group b support on a Cisco AS5200:

```
AS5200(config)# controller T1 0
AS5200(config-controller)# cas-group 1 timeslots 1-24 type e&m-fgb
AS5200(config-controller)#
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 1 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 2 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 3 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 4 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 5 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 6 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 7 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 8 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 9 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 10 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 11 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 12 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 13 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 14 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 15 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 16 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 17 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 18 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 19 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 20 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 21 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 22 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 23 is up
%DSX0-5-RBSLINEUP: RBS of controller 1 timeslot 24 is up
```

channel-group

Use the **channel-group** controller configuration command to define the timeslots that belong to each T1 or E1 circuit.

```
channel-group number timeslots range [speed {48 | 56 | 64}]
```

Syntax Description

<i>number</i>	Channel-group number. When configuring a T1 data line, channel-group numbers can be values from 0 to 23. When configuring an E1 data line, channel-group numbers can be values from 0 to 30.
timeslots range	One or more timeslots or ranges of timeslots belonging to the channel group. The first timeslot is numbered 1. For a T1 controller, the timeslot range is from 1 to 24. For an E1 controller, the timeslot range is from 1 to 31.
speed { 48 56 64 }	(Optional) Line speed (in kilobits per second) of the T1 or E1 link.

Default

The default line speed when configuring a T1 controller is 56 kbps.

The default line speed when configuring an E1 controller is 64 kbps.

Command Mode

Controller configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3MA.

Use this command in configurations where the router or access server must communicate with a T1 or E1 fractional data line. The channel-group number may be arbitrarily assigned and must be unique for the controller. The timeslot range must match the timeslots assigned to the channel group. The service provider defines the timeslots that comprise a channel group.

On the Cisco MC3810 access concentrator, only one channel group can be configured on a controller.

Example

In the following example, three channel groups are defined. Channel-group 0 consists of a single timeslot, channel-group 8 consists of 7 timeslots and runs at a speed of 64 kbps per timeslot, and channel-group 12 consists of a single timeslot.

```
channel-group 0 timeslots 1
channel-group 8 timeslots 5,7,12-15,20 speed 64
channel-group 12 timeslots 2
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

framing

linecode

clear controller

Use the **clear controller** EXEC command to reset the T1 or E1 controller.

clear controller {**t1** | **e1**} *slot/port* (Cisco 7200 series and Cisco 7500 series)

clear controller {**t1** | **e1**} *number* (Cisco 4000 series)

Syntax Description

slot/port Backplane slot number and port number on the interface. See your hardware installation manual for the specific slot and port numbers.

number Network interface module (NIM) number, in the range 0 through 2.

Command Mode

EXEC

Examples

The following example resets the T1 controller at slot 4, port 0 on a Cisco 7500 series router:

```
clear controller t1 4/0
```

The following example resets the E1 controller at NIM 0 on a Cisco 4000 series router:

```
clear controller e1 0
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

controller e1

controller t1

clock source (controller)

Use the **clock source** controller configuration command to set the E1 line clock source for the Cisco AS5200.

```
clock source line {primary | secondary}  
no clock source line {primary | secondary} |
```

Syntax Description

line	E1 line from which the clocking is taken.
primary	Primary TDM clock source.
secondary	Secondary TDM clock source.

Default

Primary TDM clock source is taken from the E1 controller 0 on the Cisco AS5200.

Secondary TDM clock source is taken from the E1 controller 1 on the Cisco AS5200.

Command Mode

Controller configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

Configure the **clock source line primary** command on the controller that takes the most reliable clocking from an E1 line. Configure the **clock source line secondary** command on the controller that has the next best known clocking. With this configuration, the primary line clocking is backed up to the secondary line if the primary clocking shuts down.

Examples

The following example configures the Cisco AS5200 to use the E1 controller 0 as the primary clocking source and the E1 controller 1 as the secondary clocking source:

```
controller e1 0  
  framing esf  
  linecode hdb3  
  pri-group timeslots 1-23  
  clock source line primary  
!  
controller e1 1  
  framing esf  
  linecode hdb3  
  pri-group timeslots 1-23  
  clock source line secondary
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

framing
linecode

clock source (Cisco AS5200)

To select the clock source for the time-division multiplexing (TDM) bus in a Cisco AS5200 access server, use the **clock source** interface configuration command. The **no** form of this command configures the clock source to its default setting.

```
clock source {line {primary | secondary} | internal}  
no clock source line {primary | secondary}
```

Syntax Description

line	Clock source on the active line.
primary	Primary TDM clock source.
secondary	Secondary TDM clock source.
internal	Free-running clock (also known as internal clock) as the clock source.

Defaults

Primary TDM clock source from the T1 0 controller

Secondary TDM clock source from the T1 1 controller

Command Mode

Interface configuration

Usage Guidelines

To use the clocking coming in from a T1 line, configure the **clock source line primary** command on the T1 interface that has the most reliable clocking. Configure the **clock source line secondary** command on the T1 interface that has the next best known clocking. With this configuration, the primary line clocking is backed up to the secondary line if the primary clocking shuts down.

Example

The following example configures the Cisco AS5200 access server to use T1 controller 0 as the primary clock source and T1 controller 1 as the secondary clock source:

```
controller t1 0  
  clock source line primary  
controller t1 1  
  clock source line secondary
```

controller

To configure a T1 or E1 controller and enter controller configuration mode, use the **controller** global configuration command.

controller {**t1** | **e1**} *slot/port* (on the Cisco 7200 and Cisco 7500 series)

controller {**t1** | **e1**} *number* (on the Cisco AS5200 and Cisco 4000 series)

Syntax Description

t1 T1 controller.

e1 E1 controller.

slot/port Backplane slot number and port number on the interface. See your hardware installation manual for the specific values and slot numbers.

number Network processor module (NPM) number, in the range 0 through 2.

Default

No T1 or E1 controller is configured.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Release 10.0; the **e1** keyword was added in Release 10.3

This command is used in configurations where the router or access server is intended to communicate with a T1 or E1 fractional data line. Additional parameters for the T1 or E1 line must be configured for the controller before the T1 or E1 circuits can be configured by means of the **interface** global configuration command.

This command is used on a Cisco 7500 series or Cisco 4000 series router.

This command does not apply to the Cisco 7200 series.

Example

In the following example, the MIP in slot 4, port 0 of a Cisco 7500 is configured as a T1 controller:

```
controller t1 4/0
```

In the following example, NIM 0 of a Cisco 4000 is configured as a T1 controller:

```
controller t1 0
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

channel-group
clear controller lex
clear controller t1
clock source (controller)
framing
linecode
show controllers e1
show controller t1

cpp authentication

To enable negotiation of authentication with a router or bridge that supports the Combinet Proprietary Protocol (CPP) and that is calling in to this router, use the **cpp authentication** interface configuration command. To disable negotiation of CPP authentication, use the **no** form of this command.

```
cpp authentication
no cpp authentication
```

Syntax Description

This command has no arguments or keywords.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Release 11.2.

Use this command for authenticating the device that is calling in to this router.

Use this command to communicate over an ISDN interface with Combinet devices that do not support Point-to-Point Protocol (PPP) but do support the Combinet Proprietary Protocol (CPP).

Currently, most Combinet devices *do* support PPP. Cisco routers can communicate over ISDN with these devices by using PPP encapsulation, which supports both routing and fast switching.

This command is supported on ISDN and dialer interfaces.

This command uses names and passwords from the **username password** command. It does not support the Terminal Access Controller Access Control System (TACACS).

Example

The following example configures a Primary Rate Interface to communicate with a Combinet bridge that does not support PPP:

```
controller t1 1/1
 framing esf
 linecode b8zs
 pri-group timeslots 1-23
 isdn switchtype primary-4ess

interface Serial1/1:23
 encapsulation cpp
 cpp callback accept
 cpp authentication
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

cpp callback accept
encapsulation cpp
username password

cpp callback accept

To enable the router to accept callback from a Combinet router or bridge that supports the Combinet Proprietary Protocol (CPP), use the **cpp callback accept** interface configuration command.

cpp callback accept

Syntax Description

This command has no arguments or keywords.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

Use this command to communicate over an ISDN interface with Combinet devices that do not support PPP but do support CPP.

Currently, most Combinet devices *do* support PPP. Cisco routers can communicate over ISDN with these devices by using PPP encapsulation, which supports both routing and fast switching.

This command is supported on ISDN and dialer interfaces.

Example

The following example configures the PRI interface serial1/1:23 to communicate with a Combinet router or bridge that does not support PPP:

```
controller t1 1/1
  framing esf
  linecode b8zs
  pri-group timeslots 1-23
  isdn switchtype primary-4ess
!
interface Serial1/1:23
  encapsulation cpp
  cpp callback accept
  cpp authentication
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

cpp authentication
encapsulation cpp

description (controller)

To add a description to an E1 or T1 controller, use the **description** controller configuration command. Use the **no** form of this command to remove the description.

description *string*
no description

Syntax Description

string Comment or a description to help you remember what is attached to the controller.

Default

No description is added.

Command Mode

Controller configuration

Usage Guidelines

The **description** command is meant solely as a comment to be put in the configuration to help you remember what certain E1 or T1 controllers are used for. The description affects the MIP interfaces only and appears in the output of the **show controllers e1**, **show controllers t1**, and **show running-config** EXEC commands.

Example

The following example describes a 3174 controller:

```
controller t1
  description 3174 Controller for test lab
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

show controllers e1
show controller t1
show running-config

description (interface)

To add a description to an interface configuration, use the **description** interface configuration command. Use the **no** form of this command to remove the description.

description *string*
no description

Syntax Description

string Comment or a description to help you remember what is attached to this interface.

Default

No description is added.

Command Mode

Interface configuration

Usage Guidelines

The **description** command is meant solely as a comment to be put in the configuration to help you remember what certain interfaces are used for. The description appears in the output of the following EXEC commands: **show startup-config**, **show interfaces**, and **show running-config**.

Example

The following example shows how to add a description for a T1 interface:

```
interface serial 0
description Fractional T1 line to Mountain View -- 128 kbps
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

show interfaces
show running-config
show startup-config

dialer outgoing

To configure the dialer map class for an NSF dialing plan to support outgoing calls, use the **dialer outgoing** map-class dialer configuration command.

dialer outgoing *classname*

Syntax Description

classname Keyword for a specified AT&T Primary-4ESS NSF dialing plan; the following keywords are supported: **sdn**, **megacomm**, and **accunet**.

Default

This command is disabled; no classname is provided.

Command Mode

Map-class dialer configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

Use this command only to define a dialer map class for an NSF call-by-call service offered by AT&T on Primary-4ESS ISDN switches. This command is not used for other vendors and switch types.

Example

The following partial example shows a class called sdn to support the Software Defined Network (SDN) dialing plan. For a more complete example using all the related commands, see the **map-class dialer** command.

```
dialer outgoing sdn
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer map class
map-class dialer
dialer voice-call

dialer voice-call

To configure the dialer map class for an NSF dialing plan to support outgoing voice calls, use the **dialer voice-call** map-class dialer command.

dialer voice-call

Syntax Description

This command has no arguments and keywords.

Default

This command is disabled.

Command Mode

Map-class dialer configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

Example

The following partial example defines a dialer map class to support the SDN dialing plan and to support outgoing voice calls. For a more complete example using all the related commands, see the **map-class dialer** command.

```
map-class dialer sdnplan
dialer voice-call
dialer outgoing sdn
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer map class
map-class dialer
dialer outgoing

encapsulation cpp

To enable encapsulation for communication with routers or bridges using the Combinet Proprietary Protocol (CPP), use the **encapsulation cpp** interface configuration command.

encapsulation cpp

Syntax Description

This command has no arguments or keywords.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

Use this command to communicate over an ISDN interface with Combinet devices that do not support PPP but do support CPP.

Currently, most Combinet devices *do* support PPP. Cisco routers can communicate over ISDN with these devices by using PPP encapsulation, which supports both routing and fast switching.

Combinet devices support only IP, IPX, and bridging. For AppleTalk, Cisco routers automatically perform half-bridging with Combinet devices.

This command is supported on ISDN BRIs and Primary Rate Interfaces (PRIs) only.

Example

The following example configures PRI interface serial 1/1:23 to communicate with a Combinet router or bridge that does not support PPP:

```
controller t1 1/1
 framing esf
 linecode b8zs
 pri-group timeslots 1-23
 isdn switchtype primary-4ess
!
interface Serial1/1:23
 encapsulation cpp
 cpp callback accept
 cpp authentication
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

cpp authentication
cpp callback accept

framing

Use the **framing** controller configuration command to select the frame type for the T1 or E1 data line.

framing {**sf** | **esf**} (for T1 lines)
framing {**crc4** | **no-crc4**} [**australia**] (for E1 lines)

Syntax Description

sf	Specifies Super Frame as the T1 frame type.
esf	Specifies Extended Super Frame as the T1 frame type.
crc4	Specifies CRC4 frame as the E1 frame type.
no-crc4	Specifies no CRC4 frame as the E1 frame type.
australia	(Optional) Specifies the E1 frame type used in Australia.

Defaults

Super Frame is the default on a T1 line.

CRC4 frame is the default on an E1 line.

Command Mode

Controller configuration

Usage Guidelines

Use this command in configurations where the router or access server is intended to communicate with T1 or E1 fractional data line. The service provider determines which framing type, either **sf**, **esf**, or **crc4**, is required for your T1/E1 circuit.

Example

The following example selects Extended Super Frame as the T1 frame type:

```
framing esf
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

channel-group
linecode

interface serial

To specify a serial interface created on a channelized E1 or channelized T1 controller (for ISDN PRI, channel-associated signaling, or robbed-bit signaling), use the **interface serial** global configuration command.

interface serial *slot/port:timeslot* (on the Cisco 7200 and Cisco 7500 series)
interface serial *number:timeslot* (on the Cisco AS5200 and Cisco 4000 series)

Syntax Description

<i>slot/port</i>	Slot number and port number where the channelized E1 or T1 controller is located.
<i>number</i>	Channelized E1 or T1 controller number.
<i>timeslots</i>	<p>For ISDN, the D channel timeslot, which is :23 channel for channelized T1 and the :15 for channelized E1. PRI timeslots are in the range 0 to 23 for channelized T1 and in the range 0 to 30 for channelized E1.</p> <p>For channel-associated signaling or robbed-bit signaling, the channel group number.</p> <p>The colon (:) is required.</p> <p>On a dual port card, it is possible to run channelized on one port and primary rate on the other port.</p>

Default

None

Command Mode

Global configuration

Usage Guidelines

The D channel is always the **:23** channel for T1 and the **:15** for E1.

Examples

This command first appeared prior to Release 10.0.

The following example configures channel groups on timeslots 1 to 11 and ISDN PRI on timeslots 12 to 24 of T1 controller 0. Then the examples configures the first two channel groups as serial interfaces 0:0 and 0:1.

```
controller t1 0
channel-group 0 timeslot 1-6
channel-group 1 timeslot 7
channel-group 2 timeslot 8
channel-group 3 timeslot 9-11
pri-group timeslots 12-24
!
```

```
interface serial 0:0
ip address 131.108.13.2 255.255.255.0
encapsulation ppp
!
interface serial 0:1
ip address 131.108.13.3 255.255.255.0
encapsulation ppp
```

The following example configures ISDN PRI on T1 controller 4/1 and then configures the D channel on the resulting serial interface 4/1:23:

```
controller t1 4/1
framing crc4
linecode hdb3
pri-group timeslots 1-24

interface serial 4/1:23
ip address 131.108.13.1 255.255.255.0
encapsulation ppp
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

circuit

controller

show interfaces

show interfaces serial bchannel

isdn answer1, isdn answer2

To have the router verify a called-party number or subaddress number in the incoming setup message for ISDN PRI calls, if the number is delivered by the switch, use the **isdn answer1** interface configuration command. To remove the verification request, use the **no** form of this command.

```
isdn answer1 [called-party-number][:subaddress]  
no isdn answer1 [called-party-number][:subaddress]
```

To have the router verify an *additional* called-party number or subaddress number in the incoming setup message for ISDN PRI calls, if the number is delivered by the switch, use the **isdn answer2** interface configuration command. To remove this second verification request, use the **no** form of this command.

```
isdn answer2 [called-party-number][:subaddress]  
no isdn answer2 [called-party-number][:subaddress]
```

Syntax Description

<i>called-party-number</i>	(Optional) Telephone number of the called party. At least one value— <i>called-party-number</i> or <i>subaddress</i> —must be specified.
<i>:subaddress</i>	(Optional) Subaddress number, 20 or fewer characters long, used for ISDN multipoint connections. At least one value— <i>called-party-number</i> or <i>subaddress</i> —must be specified. Use the colon (:) when you configure both the called party number and the subaddress, or when you configure only the subaddress.

Default

The router does not verify the called-party or subaddress number.

Command Mode

Interface configuration

Usage Guidelines

If you do not specify the **isdn answer1** or **isdn answer2** command, all calls are processed and/or accepted. If you specify the **isdn answer1** or **isdn answer2** command, the router must verify the incoming called-party number and the subaddress before processing and/or accepting the call. The verification proceeds from right to left for the called-party number; it also proceeds from right to left for the subaddress number.

You can configure just the called-party number or just the subaddress. In such a case, only that part is verified. To configure a subaddress only, include the colon (:) before the subaddress number.

You can declare a digit a “don’t care” digit by entering it as an *x* or *X*. In such a case, any incoming digit is allowed.

Examples

In the following partial configuration example, 5552222 is the called-party number and 1234 is the subaddress:

```
interface serial 4/1:0
  isdn answer1 5552222:1234
```

In the following partial configuration example, only the subaddress is configured:

```
interface serial 4/1:0
  isdn answer1 :1234
```

isdn caller

To configure ISDN caller ID screening, use the **isdn caller** interface configuration command. To disable this feature, use the **no** form of this command.

isdn caller *number*
no isdn caller *number*

Syntax Description

number Telephone number for which to screen. Specify an *x* or *X* to represent a single “don’t-care” character. The maximum length of each number is 25 characters.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Release 11.2 F.

This command configures the router to accept calls from the specified number.

Caller ID screening is available on Cisco 7200 and 7500 series, Cisco 4000 series, Cisco 3000 series, and Cisco 2500 series routers that have one or more BRIs.

The maximum length of each number is 25 characters. You can specify up to 64 numbers per interface.

Note Caller ID screening requires a local switch that is capable of delivering the caller ID to the router. If you enable caller ID screening but do not have such a switch, no calls are allowed in.

Examples

The following example configures the router to accept a call with a delivered caller ID equal to 4155551234:

```
isdn caller 4155551234
```

The following example configures the router to accept a call with a delivered caller ID having 41555512 and any numbers in the last two positions:

```
isdn caller 41555512xx
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

show dialer

isdn calling-number

To configure an ISDN PRI serial interface to present a billing number of the device making the outgoing call, use the **isdn calling-number** interface configuration command. To remove a previously configured calling number, use the **no** form of this command.

```
isdn calling-number calling-number  
no isdn calling number
```

Syntax Description

calling-number Number of the device making the outgoing call; only one entry is allowed and it is limited to 16 digits.

Default

No calling number is presented.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

An interface can have only one ISDN calling-number entry.

This command is intended for use when the network offers better pricing on calls in which devices present the calling number (that is, the billing number). The calling number information is included in the outgoing Setup message.

Note This command can be used with all ISDN PRI switches.

Example

In the following example, the T1 controller is configured and then the D channel interface is configured to present the billing number 4233570925 when it makes outgoing calls:

```
controller t1 1/1  
  framing esf  
  linecode b8zs  
  pri-group timeslots 1-23  
  isdn switchtype primary-4ess  
!  
interface serial 1/1:23  
  ip address 7.1.1.1 255.255.255.0  
  encapsulation ppp  
  isdn calling-number 4233570925  
  dialer map ip 7.1.1.2 name dallas 14193460913
```

Related Commands

You can use the index or search online to find documentation of related commands.

interface serial

isdn fast-rollover-delay

To specify the time delay between successive attempts to dial out to a number, use the **isdn fast-rollover-delay** interface configuration command.

```
isdn fast-rollover-delay seconds
```

Syntax Description

seconds Number of seconds to delay before dialing the next dialer map after receiving an ISDN message indicating the current call will not succeed.

Default

This command is disabled by default. If enabled, the default value of the timer is 0 seconds.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared at Cisco IOS Release 11.1.

This command provides a timer separate from the dialer wait-for-carrier timer to control the amount of time that elapses before calls are redialed. This delay is provided to allow the old call to be torn down completely before the new call is attempted.

When using PPP callback, this command specifies the time delay before the callback is done. This command is necessary on some ISDN switches because the new call may be attempted before the old call is completely torn down. This causes the call back to fail.

Use this command when *all* the following conditions are true:

- You are dialing into a BRI that has two phone numbers configured, one for each B-channel.
- You have a dialer map for each phone number.
- The first call succeeds but the second call fails with no channel available.

If this has occurred, set **isdn fast-rollover-delay** to 5 seconds and try again.

A delay of 5 seconds should cover most cases. Configure sufficient delay to make sure the ISDN RELEASE_COMPLETE message has been sent or received before making the fast rollover call. Use the **debug isdn q931** command to display this information.

Example

The following partial example sets the fast-rollover delay that is suggested when all the conditions specified above are true.

```
isdn fast-rollover-delay 5
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer map
dialer wait-for-carrier
ppp callback

isdn incoming-voice modem

To allow all incoming ISDN voice calls to access onboard modems, use the **isdn incoming-voice modem** interface configuration command. Use the **no** form of this command to stop all incoming voice calls from accessing the modems

isdn incoming-voice modem [56 | 64]

no isdn incoming-voice modem

Syntax Description

56 (Optional) Answers all voice calls at 56 kbps.

64 (Optional) Answers all voice calls at 64 kbps.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1 AA.

Configure this command on each D channel in the access server or router. Incoming circuit switched data calls are not affected by this command.

This command is not used for channelized T1 or channelized E1 network scenarios. These networks use traditional analog trunks that have in-band signaling. Use the **isdn incoming-voice modem** command only when you are using ISDN.

Example

The following example enables incoming and outgoing ISDN calls to route to the modems using the D channel serial interface:

```
interface serial 0:23
  isdn incoming-voice modem
```

isdn incoming-voice data

To answer incoming voice calls at a configured rate (overriding the incoming data rate in the call), use the **isdn incoming-voice data** interface configuration command.

isdn incoming-voice data [56 | 64]

Syntax Description

56 Answers all voice calls at 56 kbps.

64 Answers all voice calls at 64 kbps.

Default

None

Command Mode

Interface configuration

Usage Guidelines

When used without a keyword, this command checks the bearer capacity.

If this command is used, the dialing side must dial at 56 kbps.

Ordinarily, a data device ignores incoming voice calls, but the tariff structure for data and voice calls might make it less expensive to do “data over voice” calls.

Example

The following partial example for channelized T1 configures the D channel (hence, all B channels) to answer all incoming voice calls at 56 kbps:

```
interface serial 0:23
  isdn incoming-voice data 56
```

isdn not-end-to-end

For incoming calls, to override the speed that the network reports it will use to deliver the call data, use the **isdn not-end-to-end** interface configuration command.

isdn not-end-to-end {56 | 64}

Syntax Description

56 Answers all voice calls at 56 kbps.

64 Answers all voice calls at 64 kbps.

Default

The default line speed is 64 kbps.

Command Mode

Interface configuration

Usage Guidelines

This command might be needed to handle incoming calls properly. Although a call might originate at a speed of 56 kbps, the network or internetworking networks might improperly deliver the call to the user at a speed of 64 kbps. This creates a speed mismatch and causes the data to be garbled. Enabling this command makes the router look more closely at the information elements of the incoming call to determine a speed.

A speed mismatch can occur when the source and destination ISDN ports do not belong to the same network.

Example

In the following example, the line speed for incoming calls is set to 56 kbps:

```
isdn not-end-to-end 56
```

isdn sending-complete

To specify that the Sending Complete information element (IE) is included in the outgoing SETUP message, use the **isdn sending-complete** interface configuration command.

isdn sending-complete

Syntax Description

This command has no arguments and keywords.

Default

This command is disabled by default.

Command Mode

Interface configuration

Usage Guidelines

Some switches in some countries want a Sending Complete information element to be included in the outgoing SETUP message to indicate that the entire number is included. The Sending Complete IE is needed for Hong Kong and Taiwan, and the **isdn sending-complete** command forces it to be sent.

Example

```
interface serial 0:15
description connected to PBX 61886
ip address 7.1.1.1 255.255.255.0
encapsulation ppp
isdn sending-complete
dialer idle-timeout 20
dialer map ip 7.1.1.2 name rudder 61884
dialer map ip 7.1.1.3 name goodie 61885
dialer-group 1
ppp authentication chap
```

isdn switch-type

To specify the central office switch type on the ISDN interface, use the **isdn switch-type** global configuration command.

isdn switch-type *switch-type*

Syntax Description

switch-type Service provider switch type; see Table 37 for a list of supported switches.

Default

The switch type defaults to **none**, which disables the switch on the ISDN interface.

Command Mode

Global configuration

Usage Guidelines

To disable the switch on the ISDN interface, specify **isdn switch-type none**.

Table 37 lists supported PRI switch types by geographic area.

Table 37 ISDN Service Provider PRI Switch Types

Keywords by Area	Switch Type
none	No switch defined
Europe	
primary-net5	European ISDN PRI switches; covers the Euro-ISDN E-DSS1 signaling system and is ETSI-compliant.
Japan	
primary-ntt	Japanese ISDN PRI switches
North America	
primary-4ess	AT&T 4ESS switch type for the U.S.
primary-5ess	AT&T 5ESS switch type for the U.S.
primary-dms100	NT DMS-100 switch type for the U.S.

Example

The following example configures the French VN3 ISDN switch type:

```
isdn switch-type vn3
```

linecode

Use the **linecode** controller configuration command to select the line-code type for the T1 or E1 line.

linecode {**ami** | **b8zs** | **hdb3**}

Syntax Description

- | | |
|-------------|---|
| ami | Specifies alternate mark inversion (AMI) as the line-code type. Valid for T1 or E1 controllers; the default for T1 lines. |
| b8zs | Specifies B8ZS as the line-code type. Valid for T1 controller only. |
| hdb3 | Specifies high-density bipolar 3 (hdb3) as the line-code type. Valid for E1 controller only; the default for E1 lines. |

Defaults

AMI is the default for T1 lines.

High-density bipolar 3 is the default for E1 lines.

Command Mode

Controller configuration

Usage Guidelines

Use this command in configurations where the router or access server must communicate with T1 fractional data lines. The T1 service provider determines which line-code type, either **ami** or **b8zs**, is required for your T1 circuit. Likewise, the E1 service provider determines which line-code type, either **ami** or **hdb3**, is required for your E1 circuit.

Example

The following example specifies B8ZS as the line-code type:

```
linecode b8zs
```

loopback (controller)

To loop an entire E1 line (including all channel-groups defined on the controller) toward the line and back toward the router or access server, use the **loopback** controller configuration command. To remove the loop, use the **no** form of this command.

loopback
no loopback

Syntax Description

This command has no arguments or keywords.

Default

Disabled

Command Mode

Controller configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

This command is useful for testing the DCE device (CSU/DSU) itself.

To show interfaces currently in loopback operation, use the **show interfaces loopback EXEC** command.

Example

The following example configures the loopback test on the E1 line:

```
controller e1 0
  loopback
```

loopback local (controller)

To loop an entire T1 line (including all channel-groups defined on the controller) toward the line and the router or access server, use the **loopback local** controller configuration command. To remove the loop, use the **no** form of this command.

loopback local
no loopback local

Syntax Description

This command has no arguments or keywords.

Default

Disabled

Command Mode

Controller configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

This command is useful for testing the DCE device (CSU/DSU) itself.

To show interfaces currently in loopback operation, use the **show interfaces loopback EXEC** command.

Example

The following example configures the loopback test on the T1 line:

```
controller t1 0
  loopback local
```

loopback local (interface)

To loop a channelized T1 or channelized E1 channel-group, use the **loopback local** interface configuration command. To remove the loop, use the **no** form of this command.

loopback local
no loopback local

Syntax Description

This command has no arguments or keywords.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

This command is useful for looping a single channel-group in a channelized environment without disrupting the other channel-groups.

To show interfaces currently in loopback operation, use the **show interfaces loopback EXEC** command.

Example

The following example configures the loopback test on the T1 line:

```
interface serial 1/0:22
 loopback local
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

show interfaces loopback

loopback remote (controller)

To loop packets from a MIP through the CSU/DSU, over a dedicated T1 link, to the remote CSU at the single destination for this T1 link and back, use the **loopback remote** controller configuration command. To remove the loop, use the **no** form of this command.

loopback remote
no loopback remote

Syntax Description

This command has no arguments or keywords.

Default

Disabled

Command Mode

Controller configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

This command applies only when the device supports the remote function. It is used for testing the data communication channels.

For MIP cards, this controller configuration command applies if *only one* destination exists at the remote end of the cloud, the entire T1 line is dedicated to it, and the device at the remote end is a CSU (not a CSU/DSU). This is an uncommon case; MIPs are not usually used in this way.

To show interfaces currently in loopback operation, use the **show interfaces loopback EXEC** command.

Example

The following example configures a remote loopback test:

```
interface serial 0
 loopback remote
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

show interfaces loopback

loopback remote (interface)

To loop packets through a CSU/DSU, over a DS-3 link or a channelized T1 link, to the remote CSU/DSU and back, use the **loopback remote** interface configuration command. To remove the loop, use the **no** form of this command.

loopback remote
no loopback remote

Default

This command is disabled.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

This command applies only when the remote CSU/DSU device supports the function. It is used for testing the data communication channels. The loopback usually is performed at the line port, rather than the DTE port, of the remote CSU/DSU.

For a multiport interface processor (MIP) connected to a network via a channelized T1 link, the **loopback remote** interface configuration command applies if the remote interface is served by a DDS line (56 kbps or 64 kbps) and the device at the remote end is a CSU/DSU. In addition, the CSU/DSU at the remote end *must* react to latched DDS CSU loopback codes. Destinations that are served by other types of lines or that have CSU/DSUs that do not react to latched DDS CSU codes cannot participate in an interface remote loopback. Latched DDS CSU loopback code requirements are described in AT&T specification TR-TSY-000476, "OTGR Network Maintenance Access and Testing."

To show interfaces currently in loopback operation, use the **show interfaces loopback EXEC** command.

Example

The following example configures a remote loopback test:

```
interface serial 0
  loopback remote
```

Related Commands

show interfaces loopback

map-class dialer

To define a class of shared configuration parameters for outgoing calls from an ISDN interface, use the **map-class dialer** global configuration command.

map-class dialer *classname*

Syntax Description

classname Unique class identifier.

Default

Disabled; no class name is provided.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

The *classname* in the **map-class dialer** command used to specify the class must be the same as a *classname* used in a **dialer map** command.

This command is used to define classes of calls for PPP callback for DDR, for ISDN Advice of Charge, and for NSF call-by-call dialing plans.

For NSF call-by-call support on ISDN Primary-4ESS switches only, use one of the dialing-plan keywords listed in Table 38.

Table 38 NSF Keywords and Supported Services

Keyword	NSF Dialing Plan	Data	Voice	International
sdnplan	SDN	Yes	Yes	GSDN (Global SDN)
megaplan	MEGACOMM	No	Yes	Yes
accuplan	ACCUNET	Yes	Yes	Yes

Example

The following example configures the PPP callback server on an ISDN BRI interface on a router in Atlanta. The callback server requires an enable timeout and a map class to be defined.

```
interface BRI0
 ip address 7.1.1.7 255.255.255.0
 encapsulation ppp
 dialer callback-secure
 dialer enable-timeout 2
 dialer map ip 7.1.1.8 name atlanta class dial1 81012345678901
 dialer-group 1
 ppp callback accept
 ppp authentication chap
!
```

```
map-class dialer dial1
  dialer callback-server username
```

In the following example, the ISDN switch type is set to Primary-4ESS, ISDN PRI is configured on T1 controller 1/0, and the D channel is configured for dialer map classes that reference the NSF dialing plans. Finally, the **map-class dialer** command uses a dialing plan keyword and the **dialer outgoing** command refers to the same plan.

```
isdn switch-type primary-4ess
!
!
controller T1 1/0
  framing esf
  linecode b8zs
  pri-group timeslots 1-24
!
interface Serial1/0:23
  description This is the DMS D-channel 415-390-9503
  ip address 6.1.1.3 255.255.255.0
  encapsulation ppp
  no keepalive
  dialer map ip 6.1.1.1 name tommyjohn class sdnplan 14085770715
  dialer map ip 6.1.1.2 name angus class megaplan 14085773775
  dialer map ip 6.1.1.4 name angus class accuplan 14085773778
  dialer-group 1
  ppp authentication chap
!
map-class dialer sdnplan
  dialer outgoing sdn
!
map-class dialer megaplan
  dialer voice-call
  dialer outgoing mega
!
map-class dialer accuplan
  dialer outgoing accu
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer map class

map-class dialer

dialer outgoing

pri-group

To specify ISDN Primary Rate Interface (PRI) on a channelized T1 or channelized E1 controller, use the **pri-group** controller configuration command. Use the **no** form of this command to remove the ISDN PRI configuration.

```
pri-group [timeslots range]  
no pri-group
```

Syntax Description

timeslots *range* (Optional) Specifies a single range of values from 1 to 23 for channelized T1 and from 1 to 31 for channelized E1.

Default

This command is disabled.

Command Mode

Controller configuration

Usage Guidelines

Before you enter the **pri-group** command, you must specify an ISDN PRI switch type and an E1 or T1 controller.

Examples

The following example configures ISDN PRI on all timeslots of the T1 controller in slot 1 port 0 on a Cisco 7200 series router:

```
isdn switch-type primary-4ess  
controllers t1 1/0  
framing esf  
linecode b8zs  
pri-group timeslots 1-24
```

The following example configures E1 controller 0 on a Cisco 4000 series router for ISDN PRI on all timeslots:

```
isdn switch-type primary-net5  
controllers e1 0/0  
framing esf  
linecode b8zs  
pri-group timeslots 1-31
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

```
controllers e1  
controllers t1  
framing  
isdn switch-type  
linecode b8zs
```

show controllers e1

Use the **show controllers e1** privileged EXEC command to display information about the E1 links supported by the Network Processor Module (NPM) (Cisco 4000) or MultiChannel Interface Processor (MIP) (Cisco 7500 series).

show controllers e1 [*slotport*] (on the Cisco 7500 series)

show controller e1 *number* (on the Cisco 4000 series)

Syntax Description

<i>slotport</i>	Backplane slot number and port number on the interface. See your hardware installation manual for the specific slot and port numbers.
<i>number</i>	Network processor module (NPM) number, in the range 0 through 2.

Command Mode

Privileged EXEC

Usage Guidelines

The NPM or MIP can query the port adapters to determine their current status. Issue a **show controllers e1** command to display statistics about the E1 link.

If you specify a slot and port number, each 15-minute period will be displayed.

This command displays controller status that is specific to the controller hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

Sample Displays

The following is sample output from the **show controllers e1** command on the Cisco 7500 series:

```
Router# show controllers e1

e1 0/0 is up.
  Applique type is Channelized E1 - unbalanced
  Framing is CRC4, Line Code is HDB3
  No alarms detected.
  Data in current interval (725 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
  Total Data (last 24 hours)
    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
```

Following is an example of the **show controllers e1** display including the board identifier type:

```
Router# show controllers e1

E1 4/1 is up.
  No alarms detected.
  Framing is CRC4, Line Code is hdb3
  Data in current interval (0 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
Total Data (last 79 15 minute intervals):
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
    
```

Table 39 describes the **show controllers e1** display fields.

Table 39 Show Controllers E1 Field Descriptions

Field	Description
e1 0/0 is up.	The E1 controller 0 in slot 0 is operating. The controller's state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped).
Applique type	The applique type is shown and will indicate balanced or unbalanced.
Framing is	Shows the current framing type.
Linecode is	Shows the current linecode type.
No alarms detected.	Any alarms detected by the controller are displayed here. Possible alarms are as follows: <ul style="list-style-type: none"> • 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.
Data in current interval (725 seconds elapsed)	Shows the current accumulation period, which rolls into the 24 hour accumulation every 15 minutes. 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	Indicates the occurrence of either a Bipolar Violation (BPV) or Excessive Zeros (EXZ) error event.
Path Code Violations	Indicates a frame synchronization bit error in the D4 and E1-noCRC formats, or a CRC error in the ESF and E1-CRC formats.
Slip Secs	Indicates the replication or deletion of the payload bits of a DS1 frame. A slip might be performed when there is a difference between the timing of a synchronous receiving terminal and the received signal.
Fr Loss Secs	Indicates the number of seconds an Out Of Frame (OOF) error is detected.
Line Err Secs	Line Errored Seconds (LES) is a second in which one or more Line Code Violation errors are detected.
Degraded Mins	A Degraded Minute is one in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3.
Errored Secs	In ESF and E1 CRC links, an Errored Second is a second in which one of the following are detected: one or more Path Code Violations; one or more Out of Frame defects; one or more Controlled Slip events; a detected AIS defect. For SF and E1 no-CRC links, the presence of Bipolar Violations also triggers an Errored Second.

Table 39 Show Controllers E1 Field Descriptions (Continued)

Field	Description
Bursty Err Secs	A second with fewer than 320 and more than 1 Path Coding Violation error, no Severely Errored Frame defects and no detected incoming AIS defects. Controlled slips are not included in this parameter.
Severely Err Secs	For ESF signals, a second with one of the following errors: 320 or more Path Code Violation errors; one or more Out of Frame defects; a detected AIS defect. For E1-CRC signals, a second with one of the following errors: 832 or more Path Code Violation errors; one or more Out of Frame defects. For E1-nonCRC signals, a second with 2048 Line Code Violations or more. For D4 signals, a count of 1-second intervals with Framing Errors, or an Out of Frame defect, or 1544 Line Code Violations.
Unavail Secs	A count of the total number of seconds on the interface.

show controllers t1

To display information about the T1 links, use the **show controllers t1** privileged EXEC command.

show controllers t1 [*slot/port*] (Cisco 7500 series)
show controller t1 *number* (Cisco 4000 series)

Syntax Description

slot/port Backplane slot number and port number on the interface. See your hardware installation manual for the specific slot and port numbers.

number Network processor module (NPM) number, in the range 0 through 2.

Command Mode

EXEC

Usage Guidelines

This command displays controller status that is specific to the controller hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

The NPM or MIP can query the port adapters to determine their current status. Issue a **show controller t1** command to display statistics about the T1 link.

If you specify a slot and port number, each 15 minute period will be displayed.

Sample Display

The following is sample output from the **show controller t1** command on the Cisco 7500 series:

```
Router# show controllers t1

T1 4/1 is up.
No alarms detected.
Framing is ESF, Line Code is AMI, Clock Source is line
Data in current interval (0 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
Total Data (last 79 15 minute intervals):
  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
```

Table 40 describes the **show controllers t1** display fields.

Table 40 Show Controller T1 Field Descriptions

Field	Description
T1 0/0 is up.	The T1 controller 0 in slot 0 is operating. The controller's state can be up, down, administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped).

Table 40 Show Controller T1 Field Descriptions (Continued)

Field	Description
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.
Data in current interval (725 seconds elapsed)	Shows the current accumulation period, which rolls into the 24-hour accumulation every 15 minutes. 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	Indicates the occurrence of either a Bipolar Violation (BPV) or Excessive Zeros (EXZ) error event.
Path Code Violations	Indicates a frame synchronization bit error in the D4 and E1-noCRC formats, or a CRC error in the ESF and E1-CRC formats.
Slip Secs	Indicates the replication or deletion of the payload bits of a DS1 frame. A slip may be performed when there is a difference between the timing of a synchronous receiving terminal and the received signal.
Fr Loss Secs	Indicates the number of seconds an Out Of Frame (OOF) error is detected.
Line Err Secs	Line Errored Seconds (LES) is a second in which one or more Line Code Violation errors are detected.
Degraded Mins	A Degraded Minute is one in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3.
Errored Secs	In ESF and E1-CRC links, an Errored Second is a second in which one of the following are detected: one or more Path Code Violations; one or more Out of Frame defects; one or more Controlled Slip events; a detected AIS defect. For D4 and E1-noCRC links, the presence of Bipolar Violations also triggers an Errored Second.
Bursty Err Secs	A second with fewer than 320 and more than 1 Path Coding Violation error, no Severely Errored Frame defects and no detected incoming AIS defects. Controlled slips are not included in this parameter.
Severely Err Secs	For ESF signals, a second with one of the following errors: 320 or more Path Code Violation errors; one or more Out of Frame defects; a detected AIS defect. For E1-CRC signals, a second with one of the following errors: 832 or more Path Code Violation errors; one or more Out of Frame defects. For E1-noCRC signals, a second with 2048 Line Code Violations or more. For D4 signals, a count of 1-second intervals with Framing Errors, or an Out of Frame defect, or 1544 Line Code Violations.
Unavail Secs	A count of the total number of seconds on the interface.

show interfaces serial bchannel

To display information about the physical attributes of the ISDN PRI over channelized E1 or channelized T1 B and D channels, use the **show interfaces serial bchannel** EXEC command.

show interfaces serial *slotport* **bchannel** *channel-number*
show interfaces serial *number* **bchannel** *channel-number*

Syntax Description

<i>slotport</i>	Backplane slot number and port number on the interface. See your hardware installation manual for the specific slot and port numbers.
<i>number</i>	Network processor module (NPM) number, in the range 0 through 2.
<i>channel-number</i>	E1 Channel number in the range 1 to 31 or T1 channel number in the range 1 to 23.

Command Mode

EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2 F.

show isdn

To display the information about memory, Layer 2 and Layer 3 timers, and the status of PRI channels, use the **show isdn** global configuration command.

```
show isdn { active | history | memory | services | status [dsl | serial number] | timers }
```

Syntax Description

active	Displays current call information, including called number, the time until the call is disconnected, AOC charging units used during the call, and whether the AOC information is provided during calls or at end of calls.
history	Displays historic and current call information, including the called number, the time until the call is disconnected, AOC charging time units used during the call, and whether the AOC information is provided during calls or at the end of calls.
memory	Displays memory pool statistics. This keyword is for use by technical development staff only.
services	Displays the status of PRI channels.
status [<i>dsl</i> <i>serial number</i>]	Displays the status of all ISDN interfaces or, optionally, a specific digital signal link (DSL) or a specific ISDN PRI interface (created and configured as a serial interface). Values of <i>dsl</i> range 0 to 15.
timers	Displays the values of Layer 2 and Layer 3 timers.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

Sample Displays

The following is sample output from the **show isdn active** command:

```
Router# show isdn active

-----
                          ISDN ACTIVE CALLS
-----
History Table MaxLength = 320 entries
History Retain Timer = 15 Minutes
-----
Call Calling   Called      Duration  Remote   Time until  Recorded Charges
Type Number    Number      Seconds   Name     Disconnect  Units/Currency
-----
Out           9876543222  Active(10) idacom    11        u(E)
Out           9876543210  Active(34) idacom 115      5         u(D)
-----
```

The following is sample output from the **show isdn history** command:

```
Router# show isdn history

-----
                          ISDN CALL HISTORY
-----
History Table MaxLength = 320 entries
History Retain Timer = 15 Minutes
-----
Call Calling      Called      Duration  Remote   Time until  Recorded Charges
Type Number       Number      Seconds   Name     Disconnect  Units/Currency
-----
Out              47887654    240      blackcanary
In   67893        90         delorean
Out              56745678    Active(90) blackcanary 240    13    u(D)
-----
```

Table 41 describes the fields in the **show isdn active** and **show isdn history** output displays.

Table 41 Show ISDN Active and Show ISDN History Field Descriptions

Field	Description
History Table MaxLength	Maximum number of entries that can be retained in the Call History table.
History Retain Timer	Maximum number of seconds any entry can be retained in Call History table.
Call Type	Type of call: incoming or outgoing.
Calling Number	For incoming calls, the number from which the call was received.
Called Number	For outgoing calls, the number to which the call was placed.
Duration Seconds	Number of seconds the call lasted. Indicates whether the call is still active, and how many seconds it has lasted so far.
Remote Name	Name of the host placing the call or the host called.
Time until Disconnect	Number of seconds before the call is configured to disconnect because of the static idle timer for the map class or the interface.
Recorded Charges Units/Currency	For outgoing calls, number of ISDN AOC charging units used or the currency cost of the call.

The following sample display shows the output of the **show isdn service** command when PRI is configured on a T1 controller:

```
Router# show isdn service

PRI Channel Statistics:
ISDN Se1/0:23, Channel (1-31)
  Activated dsl 0
  State (0=Idle 1=Propose 2=Busy 3=Reserved 4=Restart 5=Maint)
  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 3 3 3 3 3 3 3
  Channel (1-31) Service (0=Inservice 1=Maint 2=Outofservice)
  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

Table 42 describes the fields in the sample output of the **show isdn service** command.

Table 42 Show ISDN Service Field Descriptions

Field	Description
ISDN Se1/0:23	ISDN PRI interface corresponding to serial interface 1/0:23.
Channel (1-31)	Channel range "1-31" is a standard format for both T1 and E1 outputs, but the state value shown identifies whether the channel is used.
Activated dsl 0	The digital signal link (DSL) value is 0.
State (0=Idle 1=Propose 2=Busy 3=Reserved 4=Restart 5=Maint)	Current state of each channel. Channels 24 through 31 are marked as reserved when the output is from T1.
Channel (1-31) Service (0=Inservice 1=Maint 2=Outofservice)	Service state assigned to each channel. Channel 24 is marked as out of service. ¹

1. If channel 24 (marked as out of service) is configured as the NFAS primary D channel, NFAS will roll over to the backup D channel if one is configured. If channel 24 is a B channel, calls will not be accepted to it.

The following shows sample output from the **show isdn status** command for PRI interfaces configured on two different ports of the same controller. This example shows one active call.

```
Router# show isdn status

The current ISDN Switchtype = primary-5ess
ISDN Serial1/0:23 interface
  Layer 1 Status:
    ACTIVE
  Layer 2 Status:
    TEI = 0, State = MULTIPLE_FRAME_ESTABLISHED
  Layer 3 Status:
    0 Active Layer 3 Call(s)
  Activated dsl 0 CCBs = 0
  Number of active calls = 0
  Number of available B-channels = 23
ISDN Serial1/1:23 interface
  Layer 1 Status:
    ACTIVE
  Layer 2 Status:
    TEI = 0, State = MULTIPLE_FRAME_ESTABLISHED
  Layer 3 Status:
    1 Active Layer 3 Call(s)
  Activated dsl 1 CCBs = 1
    CCB:callid=8001, callref=0, sapi=0, ces=0, B-chan=23
  Number of active calls = 1
  Number of available B-channels = 22
  Total Allocated ISDN CCBs = 1
```

Table 43 describes significant fields in the output of the **show isdn status** command.

Table 43 Show ISDN Status Field Descriptions

Field	Description
ISDN Switchtype = primary-5ess	PRI switch type the router is connected to.
ISDN Serial1/0:23 interface	Serial slot, port, and timeslot numbers that define the PRI interface location.
Layer 1 Status	
ACTIVE	Status of ISDN Layer 1.
Layer 2 Status	
TEI = 65, State = MULTIPLE_FRAME_ESTABLISHED	Status of ISDN Layer 2. Terminal endpoint identifier number and multiframe structure state.
Layer 3 Status:	
1 Active Layer 3 Call(s)	Number of active calls.
Activated dsl 1 CCBs =	Number of the Digital Signal Link activated. Number of call control blocks in use.
CCB:callid=8001, callref=0, sapi=0, ces=1, B-chan=23	Call control block information about the active call.
Number of active calls =	Number of active calls.
Number of available B-channels =	Number of B channels that are not being used.
Total Allocated ISDN CCBs =	Number of ISDN call control blocks that are allocated.