



ISDN Basic Rate Service Setup Commands

This chapter describes the commands available to configure ISDN basic rate interfaces for dial-up solutions on your router.

For configuration tasks and examples to get the ISDN line up and running, see the “Setting Up ISDN Basic Rate Service” chapter of the *Dial Solutions Configuration Guide*. To complete the configuration for dial-in or dial-out routing or bridging, see the relevant chapters in “Dial-on-Demand Routing” part of the *Dial Solutions Configuration Guide*.

interface bri

To configure a Basic Rate Interface (BRI) interface and enter interface configuration mode, use the **interface bri** global configuration command.

```
interface bri number  
interface bri slot/port (Cisco 7200 series)
```

To configure a BRI subinterface only, use the following form of the **interface bri** global configuration command:

```
interface bri number.subinterface-number [multipoint | point-to-point]  
interface bri slot/port.subinterface-number [multipoint | point-to-point] (Cisco 7200 series)
```

Syntax Description

<i>number</i>	Port, connector, or interface card number. The numbers are assigned at the factory at the time of installation or when added to a system, and can be displayed with the show interfaces command.
<i>slot/port</i>	Backplane slot number and port number on the interface. See your hardware installation manual for the specific slot and port numbers.
<i>.subinterface-number</i>	Subinterface number in the range 1 to 4294967293. The <i>number</i> or <i>slot/port</i> that precedes the period (.) must match that of the interface this subinterface belongs to.
multipoint point-to-point	(Optional) Specifies a multipoint or point-to-point subinterface. The default is multipoint .

Default

The default mode for subinterfaces is multipoint.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

This command was modified in Cisco IOS Release 11.2 P to include slot/port syntax for the PA-8B-ST and PA-4B-U port adapters on Cisco 7200 series routers.

Subinterfaces can be configured to support partially meshed Frame Relay networks. (Refer to the “Configuring Frame Relay” chapter in the *Wide-Area Networking Configuration Guide*.)

Example

The following example configures BRI 0 to call and receive calls from two sites, use Point-to-Point Protocol (PPP) encapsulation on outgoing calls, and use Challenge Handshake Authentication Protocol (CHAP) authentication on incoming calls:

```
interface bri 0
  encapsulation ppp
  no keepalive
  dialer map ip 131.108.36.10 name EB1 234
  dialer map ip 131.108 36.9 name EB2 456
  dialer-group 1
  isdn spid1 0146334600
  isdn spid2 0146334610
  isdn T200 1000
  ppp authentication chap
```

Related Commands

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

- dialer map**
- dialer-group**
- encapsulation ppp**
- isdn spid1**
- isdn spid2**
- ppp authentication chap**
- ppp authentication pap**
- show interfaces bri**

isdn answer1, isdn answer2

To have the router verify a called-party number or subaddress number in the incoming setup message for ISDN BRI 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 BRI 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.
:	Identifies the number that follows as a subaddress. Use the colon (:) when you configure both the called party number and the subaddress, or when you configure only the subaddress.
<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.

Default

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

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

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 configuring it as an *x* or *X*. In such a case, any incoming digit is allowed.

Examples

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

```
interface bri 0
  isdn answer1 5552222:1234
```

In the following example, only the subaddress is configured:

```
interface bri 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* 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 Cisco IOS Release 10.3.

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

Caller ID screening is available on Cisco 7000 series with RSP7000, 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 index or search online to find documentation of related commands.

show dialer

isdn calling-number

To configure an ISDN BRI 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 ISDN network offers better pricing on calls in which devices present the calling number (that is, the billing number).

Note This command cannot be used with German 1TR6 ISDN BRI switches. It can be used with all other switches.

Example

In the following example, the ISDN BRI interface is configured to present the number 5551212 when it makes outgoing calls:

```
interface bri 0  
  isdn calling-number 5551212
```

Related Commands

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

interface bri

isdn modem-busy-cause

To send a specific ISDN cause code to the switch, use the **isdn modem-busy-cause** interface configuration command. To return to the default condition, use the **no** form of this command.

```
isdn modem-busy-cause {cause-code-number | busy | not-available}  
no isdn modem-busy-cause {cause-code-number | busy | not-available}
```

Syntax Description

<i>cause-code-number</i>	Sends a cause code number (submitted as an integer in the range of 1 through 127) to the switch.
busy	Sends the USER-BUSY code to the switch.
not-available	Sends the CHANNEL-NOT-AVAILABLE code to the switch.

Default

The default condition is no cause code override. If the **isdn-modem-busy-cause** command is not configured, the default cause codes for the application are sent.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3.

This command overrides specific cause codes (such as modem availability and resource pooling) that are sent to the switch by ISDN applications. When the **isdn-modem-busy-cause** command is entered, the configured cause codes are sent to the switch; otherwise, the default cause codes for the application are sent. ISDN protocol errors are still reflected in the cause codes and are not overridden.

Example

The following example sends the CHANNEL-NOT-AVAILABLE code to the ISDN switch:

```
interface serial0:20  
  isdn modem-busy-cause not-available
```

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 second call or the call back to fail.

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

- A BRI has two phone numbers configured, one for each B-channel.
- You are dialing into this BRI.
- 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 index or search online to find documentation of related commands.

dialer map
dialer wait-for-carrier
ppp callback

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** 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 BRI 0 to answer all incoming voice calls at 56 kbps:

```
interface bri 0
  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 required in Hong Kong and Taiwan, and the **isdn sending-complete** command forces it to be sent.

Example

In the following example, the **isdn sending-complete** command applies to an ISDN BRI interface:

```
interface BRI0
  description connected to PBX 61886
  ip address 172.1.1.1 255.255.255.0
  encapsulation ppp
  isdn sending-complete
  dialer idle-timeout 20
  dialer map ip 172.1.1.2 name rudder 61884
  dialer map ip 172.1.1.3 name bosun 61885
  dialer-group 1
  ppp authentication chap
!
```

isdn spid1

Use the **isdn spid1** interface configuration command to define at the router the service profile identifier (SPID) number that has been assigned by the ISDN service provider for the B1 channel. Use the **no** form of this command to disable the specified SPID, thereby preventing access to the switch.

```
isdn spid1 spid-number [ldn]  
no isdn spid1 spid-number [ldn]
```

Syntax Description

<i>spid-number</i>	Number identifying the service to which you have subscribed. This value is assigned by the ISDN service provider and is usually a 10-digit telephone number with some extra digits.
<i>ldn</i>	(Optional) Local directory number (LDN), as delivered by the service provider in the incoming setup message. This is a 7-digit number assigned by the service provider. If you include the local directory number in the no form of this command, access to the switch is permitted, but the other B channel may not be able to receive incoming calls.

Default

No SPID number is defined.

Command Mode

Interface configuration

Usage Guidelines

This command is required for DMS-100 and National ISDN-1 (NI-1) switches only.

On these switches, you must define the LDN if you want to receive any incoming calls on the B2 channel. The ISDN switch checks for the LDN to determine whether both channels can be used to transmit and receive data. If the LDN is not present, then only the B1 channel can be used for full-duplex communication. However, the other channel can still be used for making outgoing calls.

Example

The following example defines, on the router, a SPID and LDN for the B1 channel:

```
isdn spid1 415555121301 5551215
```

isdn spid2

Use the **isdn spid2** interface configuration command to define at the router the SPID number that has been assigned by the ISDN service provider for the B2 channel. Use the **no** form of this command to disable the specified SPID, thereby preventing access to the switch.

```
isdn spid2 spid-number [ldn]  
no isdn spid2 spid-number [ldn]
```

Syntax Description

<i>spid-number</i>	Number identifying the service to which you have subscribed. This value is assigned by the ISDN service provider and is usually a 10-digit telephone number with some extra digits.
<i>ldn</i>	(Optional) Local directory number, as delivered by the service provider in the incoming setup message. This is a 7-digit number also assigned by the service provider. If you include the LDN in the no form of this command, the access to the switch is permitted, but the other B channel might not be able to receive incoming calls.

Default

No SPID number is defined.

Command Mode

Interface configuration

Usage Guidelines

This command is required for DMS-100 and National ISDN-1 (NI-1) switches only.

You must define the LDN if you want to receive any incoming calls on the B1 channel. The ISDN switch checks for the LDN to determine whether both channels can be used to transmit and receive data. If the LDN is not present, then only the B2 channel can be used for full-duplex communication. However, the other channel can still be used for making outgoing calls.

Example

The following example defines, on the router, a SPID and LDN for the B2 channel:

```
isdn spid2 415555121202 5551214
```

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 27 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 27 lists supported switch types by geographic area.

Table 27 ISDN Service Provider BRI Switch Types

Keywords by Area	Switch Type
none	No switch defined
Australia	
basic-ts013	Australian TS013 switches
Europe	
basic-1tr6	German 1TR6 ISDN switches
basic-nwnet3	NET3 switch type for Norway (phase 1)
basic-net3	NET3 ISDN switch type for Europe; covers the Euro-ISDN E-DSS1 signaling system
vn2	French VN2 ISDN switches
vn3	French VN3 ISDN switches
Japan	
ntt	Japanese NTT ISDN switches
North America	
basic-5ess	AT&T basic rate switches
basic-dms100	Northern Telecom DMS-100 basic rate switches
basic-ni1	National ISDN-1 switches
New Zealand	
basic-nznet3	New Zealand Net3 switches

Example

The following example configures the French VN3 ISDN switch type:

```
isdn switch-type vn3
```

isdn tei

To configure when ISDN Layer 2 terminal endpoint identifier (TEI) negotiation should occur, use the **isdn tei** global configuration command. Use the **no** form of this command to restore the default.

```
isdn tei [first-call | powerup]  
no isdn tei
```

Syntax Description

first-call	(Optional) ISDN TEI negotiation occurs when the first ISDN call is placed or received.
powerup	(Optional) ISDN TEI negotiation occurs when the router is powered on.

Default

powerup

Command Mode

Global configuration

Usage Guidelines

Use this command with care. This command is for BRI configuration only.

Example

The following example configures the router to negotiate TEI when the first ISDN call is placed or received:

```
isdn tei first-call
```

isdn twait-disable

To delay a National ISDN (NI-1) BRI switch a random time before activating the Layer 2 interface when the switch starts up, use the **isdn twait-disable** interface configuration command.

isdn twait-disable

Syntax Description

This command has no arguments and keywords.

Default

This command is enabled by default.

Command Mode

Interface configuration

Usage Guidelines

This random-length delay prevents mass power failures from causing the network ISDN switches to be overwhelmed when power returns and all the devices startup at the same time.

The random delay is in the range 1 to 300 seconds.

Example

The following example configures a random wait period after a power failure:

```
isdn twait-disable
```

show controllers bri

To display information about the ISDN Basic Rate Interface (BRI), use the **show controllers bri** privileged EXEC command.

show controllers bri *number*
show controllers bri *slotport* (Cisco 7200 series)

Syntax Description

<i>number</i>	Interface number. The value is 0 through 7 if the router has one 8-port BRI network interface module (NIM), or 0 through 15 if the router has two 8-port BRI NIMs.
<i>slotport</i>	Backplane slot number and port number on the interface. See your hardware installation manual for the specific slot and port numbers.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

This command was modified in Cisco IOS Release 11.2 P to include slot/port syntax for the PA-8B-ST and PA-4B-U port adapters on Cisco 7200 series routers.

Sample Display

The following is sample output from the **show controllers bri** command:

```
Router# show controllers bri 0

BRI unit 0
D Chan Info:
Layer 1 is ACTIVATED
idb 0x32089C, ds 0x3267D8, reset_mask 0x2
buffer size 1524
RX ring with 2 entries at 0x2101600 : Rxhead 0
00 pak=0x4122E8 ds=0x412444 status=D000 pak_size=0
01 pak=0x410C20 ds=0x410D7C status=F000 pak_size=0
TX ring with 1 entries at 0x2101640: tx_count = 0, tx_head = 0, tx_tail = 0
00 pak=0x000000 ds=0x000000 status=7C00 pak_size=0
0 missed datagrams, 0 overruns, 0 bad frame addresses
0 bad datagram encapsulations, 0 memory errors
0 transmitter underruns
B1 Chan Info:
Layer 1 is ACTIVATED
idb 0x3224E8, ds 0x3268C8, reset_mask 0x0
buffer size 1524
RX ring with 8 entries at 0x2101400 : Rxhead 0
00 pak=0x421FC0 ds=0x42211C status=D000 pak_size=0
01 pak=0x4085E8 ds=0x408744 status=D000 pak_size=0
02 pak=0x422EF0 ds=0x42304C status=D000 pak_size=0
03 pak=0x4148E0 ds=0x414A3C status=D000 pak_size=0
04 pak=0x424D50 ds=0x424EAC status=D000 pak_size=0
05 pak=0x423688 ds=0x4237E4 status=D000 pak_size=0
```

```

06 pak=0x41AB98 ds=0x41ACF4 status=D000 pak_size=0
07 pak=0x41A400 ds=0x41A55C status=F000 pak_size=0
TX ring with 4 entries at 0x2101440: tx_count = 0, tx_head = 0, tx_tail = 0
00 pak=0x000000 ds=0x000000 status=5C00 pak_size=0
01 pak=0x000000 ds=0x000000 status=5C00 pak_size=0
02 pak=0x000000 ds=0x000000 status=5C00 pak_size=0
03 pak=0x000000 ds=0x000000 status=7C00 pak_size=0
0 missed datagrams, 0 overruns, 0 bad frame addresses
0 bad datagram encapsulations, 0 memory errors
0 transmitter underruns
B2 Chan Info:
Layer 1 is ACTIVATED
idb 0x324520, ds 0x3269B8, reset_mask 0x2
buffer size 1524
RX ring with 8 entries at 0x2101500 : Rxhead 0
00 pak=0x40FCF0 ds=0x40FE4C status=D000 pak_size=0
01 pak=0x40E628 ds=0x40E784 status=D000 pak_size=0
02 pak=0x40F558 ds=0x40F6B4 status=D000 pak_size=0
03 pak=0x413218 ds=0x413374 status=D000 pak_size=0
04 pak=0x40EDC0 ds=0x40EF1C status=D000 pak_size=0
05 pak=0x4113B8 ds=0x411514 status=D000 pak_size=0
06 pak=0x416ED8 ds=0x417034 status=D000 pak_size=0
07 pak=0x416740 ds=0x41689C status=F000 pak_size=0
TX ring with 4 entries at 0x2101540: tx_count = 0, tx_head = 0, tx_tail = 0
00 pak=0x000000 ds=0x000000 status=5C00 pak_size=0
01 pak=0x000000 ds=0x000000 status=5C00 pak_size=0
02 pak=0x000000 ds=0x000000 status=5C00 pak_size=0
03 pak=0x000000 ds=0x000000 status=7C00 pak_size=0
0 missed datagrams, 0 overruns, 0 bad frame addresses
0 bad datagram encapsulations, 0 memory errors
0 transmitter underruns

```

Table 28 describes the significant fields in the display.

Table 28 Show Controllers BRI Field Descriptions

Field	Description
BRI unit 0	Interface type and unit number.
Chan Info	D and B channel numbers.
Layer 1 is ACTIVATED	Status can be DEACTIVATED, PENDING ACTIVATION, or ACTIVATED.
idb ds reset_mask	Information about internal data structures and parameters.
buffer size	Number of bytes allocated for buffers.
RX ring with - entries at -	Information about the Receiver Queue.
Rxhead	Start of the Receiver Queue.
pak ds status pak_size	Information about internal data structures and parameters.
TX ring with - entries at -	Information about the Transmitter Queue.
tx_count	Number of packets to transmit.
tx_head	Start of the transmit list.
tx_tail	End of the transmit list.

Table 28 Show Controllers BRI Field Descriptions (Continued)

Field	Description
missed datagrams	Incoming packets missed due to internal errors.
overruns	Number of times the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
bad frame addresses	Frames received with a cyclic redundancy check (CRC) error and noninteger number of octets.
bad datagram encapsulations	Packets received with bad encapsulation.
memory errors	Internal direct memory access (DMA) memory errors.
transmitter underruns	Number of times that the transmitter has been running faster than the router can handle.

The following is a partial sample output from the **show controllers bri** command on a Cisco 7200 series router:

```

BRI slot 2 interface 0 with integrated NT1
Layer 1 is ACTIVATED. (ISDN L1 State F7)
Master clock for slot 2 is bri interface 0.
Total chip configuration successes: 193, failures: 0, timeouts: 0
D Channel Information:
  Channel state: UP Channel IDB: 6092AC64
  RX ring entries: 5, buffer size 512
  RX descriptor ring: head = 165F4D8, tail = 165F508
  RX buffer ring: head = 6093A260, tail = 6093A290
  00 params=0x2000000 status=0x0 data ptr=0x1650F84 next ptr=0x165F4D8
  01 params=0x2000000 status=0xC0080000 data ptr=0x1651884 next ptr=0x165F4E8
  02 params=0x2000000 status=0xC0080000 data ptr=0x1651644 next ptr=0x165F4F8
  03 params=0x2000000 status=0x0 data ptr=0x1651404 next ptr=0x165F508
  04 params=0x42000000 status=0x0 data ptr=0x16511C4 next ptr=0x165F4C8
  TX ring entries: 5, in use: 0, buffer size 512
  TX descriptor ring: head = 3C2049C0, tail = 3C2049C0
  TX buffer ring: head = 608EC0C4, tail = 608EC0C4
  00 params=0x80000000 data ptr=0x00000000 next ptr=0x4D0049A8
  01 params=0x80000000 data ptr=0x00000000 next ptr=0x4D0049B4
  02 params=0x80000000 data ptr=0x00000000 next ptr=0x4D0049C0
  03 params=0xC0000000 data ptr=0x00000000 next ptr=0x4D0049CC
  04 params=0x0 data ptr=0x00000000 next ptr=0x4D00499C
List of timeslots (sw): 2
    
```

Table 29 describes the significant fields in the display.

Table 29 Show Controllers BRI Field Descriptions

Field	Description
BRI slot 2 interface 0 with integrated NT1	Interface type and slot and port number.
Layer 1 is ACTIVATED	Status can be DEACTIVATED, PENDING ACTIVATION, or ACTIVATED.
Master clock	The first interface that comes up on an MBRI port adapter holds the master clock. This clock is used for all interfaces on that port adapter. If the master clock interface goes down, the second interface that came up becomes the master clock interface.
Total chip configuration successes	Counters of successful chip configuration.

Table 29 Show Controllers BRI Field Descriptions (Continued)

Field	Description
failures	Counters of bad chip configuration.
timeouts	Counters of failing to initialize chip.
D Channel Information	Information related to D-channel status.
Channel state	Channel state can be UNUSED, IDLE, DOWN, STANDBY, UP, THROTTLED, ILLEGAL.
Channel IDB	Internal interface channel description.
RX (or TX) ring entries	Internal receive queue.
RX (or TX) descriptor ring	Internal receive queue to manage hardware chip
RX (or TX) buffer ring	Internal receive queue to hold inbound packets.
Rxhead	Start of the receiver queue.
params, status, data ptr, next ptr	Information about internal data structures and params.
List of timeslots (sw)	Timeslots assigned to this channel.

show dialer interface bri

To display general diagnostic information for ISDN BRI interfaces configured for DDR, use the **show dialer interface bri EXEC** command.

show dialer interface bri *number*

Syntax Description

number (Optional) BRI interface number.

Command Mode

EXEC

Sample Displays

If you enter the **show dialer interface bri** command for the D channel of an ISDN BRI, the command output also displays the B channels. That is, the command **show dialer interface bri 0** displays information of interfaces bri 0, bri 0:1, and bri 0:2. Similarly, use of the related command **show dialer interface serial 0:23** (for a channelized T1 line configured for ISDN PRI) displays information for serial interfaces 0:23, 0:0, 0:1, and so forth to 0:22.

If you have defined a dialer group that consists of the interfaces serial 0, serial 1, and bri 2, the command **show dialer interface dialer 1** displays information for interfaces bri 0, bri 0:1, bri 0:2, serial 1, and serial 0.

The following is sample output from the **show dialer interface bri** command for a BRI interface when dialer profiles are configured:

```
impulse# show dialer interface bri 0

BRI0 - dialer type = ISDN

Dial String      Successes  Failures   Last called  Last status

0 incoming call(s) have been screened.

BRI0: B-Channel 1
Idle timer (120 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)

Dialer state is data link layer up

Dial reason: ip (s=6.1.1.8, d=6.1.1.1)

Interface bound to profile Dialer0

Time until disconnect 102 secs
Current call connected 00:00:19
Connected to 5773872 (wolfman)

BRI0: B-Channel 2
Idle timer (120 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is idle
```

Table 30 describes significant fields shown in the display.

Table 30 Show Dialer Interface BRI Field Descriptions

Field	Description
BRI0 - dialer type = ISDN	ISDN dialer.
Dial string	Dial strings of logged calls (telephone numbers). On ISDN BRI interfaces, if you have specified a subaddress number in the dialer string , this number is included in the dial string after a colon.
Successes	Successful connections (even if no data is passed).
Failures	Failed connections; call not successfully completed.
Last called	Time that last call occurred to specific dial string.
Last status	Status of last call to specific dial string (successful or failed).
0 incoming call(s) have been screened.	Number of calls subjected to Dialer Profiles screening to determine how the call is to be treated.
BRI0: B-Channel 1	Header indicating the following data is for B channel 1.
Idle timer (120 secs), Fast idle timer (20 secs)	Settings (in seconds) for the idle timer and the fast idle timer.
Wait for carrier (30 secs), Re-enable (15 secs)	Settings (in seconds) for the wait for carrier timer and the reenable timer.
Dialer state is data link layer up	The message “data link layer up” suggests that the dialer came up properly; if it says anything else then dialer did not come up properly. The message “physical layer up” means the line protocol (LCP) came up, but the NCP did not come up. The show interfaces command also provides the similar information.
Dial reason: ip (s=6.1.1.8, d=6.1.1.1)	What initiated the dial, namely an IP packet, plus source and destination address in the packet.
Interface bound to profile Dialer0	Dialer profile that is bound to this interface or B channel.
Time until disconnect	Time until line is configured to disconnect. This field is displayed if the interface is currently connected to a destination.
Current call connected	Time at which the current call was connected.
Connected to	Dial string to which line is currently connected.

If an interface is connected to a destination, a display is provided that indicates the idle time before the line is disconnected. (The value decrements each second.) Then the duration of the current connection is shown. The following shows an example of this display; it appears after the third line in the **show dialer** display:

```
Time until disconnect 596 secs
Current call connected 0:00:25
```

After a call disconnects, the system displays the time remaining before being it can dial again. The following is an example of this display; it appears after the third line in the **show dialer** display:

```
Time until interface enabled 8 secs
```

show dialer interface bri

If caller ID screening is configured on an ISDN BRI, the **show dialer** command display includes a line similar to the following:

```
1 incoming call(s) have been screened.
```

This line reports the number of calls that have been screened.

show interfaces bri

Use the **show interfaces bri** privileged EXEC command to display information about the BRI D channel or about one or more B channels.

```
show interfaces bri number[:bchannel] | [first] [last] [accounting]  
show interfaces bri slot/port (Cisco 7200 series)
```

Syntax Description

<i>number</i>	Interface number. The value is 0 through 7 if the router has one 8-port BRI NIM, or 0 through 15 if the router has two 8-port BRI NIMs. Specifying just the number will display the D channel for that BRI interface.
<i>slot/port</i>	On the Cisco 7200 series, slot location and port number of the interface.
: <i>bchannel</i>	(Optional) Colon (:) followed by a specific B channel number.
<i>first</i>	(Optional) Specifies the first of the B channels; the value can be either 1 or 2.
<i>last</i>	(Optional) Specifies the last of the B channels; the value can only be 2, indicating B channels 1 and 2.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 10.3.

This command was modified in Cisco IOS Release 11.2 P to include slot/port syntax for the PA-8B-ST and PA-4B-U port adapters on Cisco 7200 series routers.

Use either the *bchannel-number* argument or the *first* or *last* arguments to display information about specified B channels.

Use the **show interfaces bri** *number* form of the command (without the optional *bchannel*, or *first* and *last* arguments) to obtain D channel information.

Use the command syntax sample combinations in Table 31 to display the associated output.

Table 31 Sample Show Interfaces BRI Combinations

Command Syntax	Displays
show interfaces	All interfaces in the router
show interfaces bri 2	Channel D for BRI interface 2
show interfaces bri 2:1	Channel B1 on BRI interface 2
show interfaces bri 2:2	Channel B2 on BRI interface 2
show interfaces bri 4 1	Channel B1 on BRI interface 4

Table 31 Sample Show Interfaces BRI Combinations (Continued)

Command Syntax	Displays
show interfaces bri 4 2	Channel B2 on BRI interface 4
show interfaces bri 4 1 2	Channels B1 and B2 on BRI interface 4
show interfaces bri	Error message: "% Incomplete command."

Sample Displays

The following is sample output from the **show interfaces bri** command:

```
Router# show interfaces bri 0:1

BRI0:1 is down, line protocol is down
Hardware is BRI
MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 1/255
Encapsulation PPP, loopback not set, keepalive not set
LCP Closed
Closed: IPCP
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
  0 packets input, 0 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 packets output, 0 bytes, 0 underruns
  0 output errors, 0 collisions, 7 interface resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions
```

The following is sample output from the **show interfaces bri** command on a Cisco 7200 series router:

```
Router# show interfaces bri 2/0

BRI2/0 is up, line protocol is up (spoofing)
Hardware is BRI
Internet address is 11.1.1.3/27
MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 1/255
Encapsulation PPP, loopback not set
Last input 00:00:01, output 00:00:01, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/64/0 (size/threshold/drops)
  Conversations 0/1 (active/max active)
  Reserved Conversations 0/0 (allocated/max allocated)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
  609 packets input, 2526 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  615 packets output, 2596 bytes, 0 underruns
  0 output errors, 0 collisions, 5 interface resets
  0 output buffer failures, 0 output buffers swapped out
  3 carrier transitions
```

Table 32 describes the fields shown in the display.

Table 32 Show Interfaces BRI Field Descriptions

Field	Description
BRI... is {up down administratively down}	Indicates whether the interface hardware is currently active (whether line signal is present) and if it has been taken down by an administrator.
line protocol is {up down administratively down}	Indicates whether the software processes that handle the line protocol consider the line usable (that is, whether keepalives are successful).
Hardware is	Hardware type.
Internet address is	IP address and subnet mask, followed by packet size.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether loopback is set or not.
keepalive	Indicates whether keepalives are set or not.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface. Useful for knowing when a nonfunctioning interface failed.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks (**) are printed.
Output queue, drops Input queue, drops	Number of packets in output and input queues. Each number is followed by a slash (/), the maximum size of the queue, and the number of packets dropped due to a full queue.
Five minute input rate Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and media access control (MAC) encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the medium's minimum packet size.

Table 32 Show Interfaces BRI Field Descriptions (Continued)

Field	Description
giants	Number of packets that are discarded because they exceed the medium's maximum packet size.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so this sum may not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating station or far-end device does not match the checksum calculated from the data received. On a serial link, CRCs usually indicate noise, gain hits, or other transmission problems on the data link.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. Broadcast storms and bursts of noise can increase the ignored count.
abort	Illegal sequence of one bits on a serial interface. This usually indicates a clocking problem between the serial interface and the data link equipment.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Number of collisions. These can occur when you have several devices connected on a multiport line.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal or by a cable problem. If the system recognizes that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
restarts	Number of times the controller was restarted because of errors.
carrier transitions	Number of times the carrier detect signal of a serial interface has changed state. Check for modem or line problems if the carrier detect line is changing state often.

show isdn

To display the information about calls, history, memory, status, and Layer 2 and Layer 3 timers, use the **show isdn EXEC** command.

```
show isdn { active | history | memory | status [dsl | interface-type 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.
status [<i>dsl</i> <i>interface-type number</i>]	Displays the status of all ISDN interfaces or, optionally, a specific digital signal link (DSL) or a specific ISDN interface. Values of <i>dsl</i> range from 0 to 15. <i>Interface-type</i> can be bri or serial .
timers	Displays the values of Layer 2 and Layer 3 timers.

Command Mode

EXEC

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

Table 33 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 is sample output from the **show isdn timers** command:

```
Router# show isdn timers

ISDN Layer 2 values:
    K      = 0    outstanding I-frames
    N200   = 0    max number of retransmits
    T200   = 0    seconds
    T202   = 2    seconds
    T203   = 0    seconds
ISDN Layer 3 values:
    T303   = 0    seconds
    T305   = 0    seconds
    T308   = 0    seconds
    T310   = 0    seconds
    T313   = 0    seconds
```

```

T316 = 0    seconds
T318 = 0    seconds
T319 = 0    seconds

```

Table 34 displays some typical values of the timers shown in the **show isdn timers** display. The values of the timers depend on the switch type and typically are used only for homologation purposes. See the Q.921 specifications for detailed technical definitions of the Layer 2 timers; see the Q.931 specifications for detailed technical definitions of the Layer 3 timers.

Table 34 Show ISDN Timers Command Output

Field	Typical Value
ISDN Layer 2 values:	
K = 0 outstanding I-frames	1
N200 = 0 max number of retransmits	3
T200 = 0 seconds	1
T202 = 2 seconds	2
T203 = 0 seconds	10
ISDN Layer 3 values:	
T303 = 0 seconds	4
T305 = 0 seconds	30
T308 = 0 seconds	4
T310 = 0 seconds	40
T313 = 0 seconds	0
T316 = 0 seconds	4
T318 = 0 seconds	4
T319 = 0 seconds	4

The following is sample output from the **show isdn status** command when no calls are active:

```

Router# show isdn status

The current ISDN Switchtype = basic-5ess
ISDN BRI0 interface
  Layer 1 Status:
    ACTIVE
  Layer 2 Status:
    TEI = 65, State = MULTIPLE_FRAME_ESTABLISHED
  Spid Status:
    TEI 65, ces = 1, state = 5(init)
    spid1 configured, no LDN, spid1 sent, spid1 valid
    Endpoint ID Info: epsf = 0, usid = 3, tid = 7F
  Layer 3 Status:
    0 Active Layer 3 Call(s)
  Activated dsl 0 CCBs = 0
  Number of active calls = 0
  Number of available B-channels = 2
  Total Allocated ISDN CCBs = 0

```

The following is sample output from the **show isdn status** command with one active call:

```
Router# show isdn status

The current ISDN Switchtype = ntt
ISDN BRI0 interface
  Layer 1 Status:
    ACTIVE
  Layer 2 Status:
    TEI = 64, State = MULTIPLE_FRAME_ESTABLISHED
  Layer 3 Status:
    1 Active Layer 3 Call(s)
  Activated dsl 0 CCBs = 1
    CCB:callid=8003, callref=0, sapi=0, ces=1, B-chan=1
  Number of active calls = 1
  Number of available B-channels = 1
  Total Allocated ISDN CCBs = 1
```

Table 35 describes the fields in the **show isdn status** command output.

Table 35 Show ISDN Status Field Descriptions

Field	Description
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.
Spid Status	
TEI 65, ces = 1, state = 5(init)	Terminal endpoint identifier number and state.
spid1 configured, no LDN, spid1 sent, spid1 valid	SPID configuration information. For example, local directory number is defined.
Endpoint ID Info: epsf = 0, usid = 3, tid = 7F	Endpoint identifier information.
Layer 3 Status:	
1 Active Layer 3 Call(s)	Number of active calls.
Activated dsl 0 CCBs =	Number of the Digital Signal Link activated. Number of call control blocks in use.
CCB:callid=8003, callref=0, sapi=0, ces=1, B-chan=1	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.