

# isdn all-incoming-calls-v120

To configure an ISDN BRI or PRI interface to answer all incoming calls as V.120 when the terminal adapter uses V.120 signaling but does not send the Lower-Layer Compatibility field in Setup messages, use the **isdn all-incoming-calls-v120** command in interface configuration mode. To remove this configuration, use the **no** form of the command.

**isdn all-incoming-calls-v120**

**no isdn all-incoming-calls-v120**

**Syntax Description** This command has no arguments or keywords.

**Defaults** By default, ISDN interfaces answer calls as synchronous serial with PPP encapsulation.

**Command Modes** Interface configuration

Command History	Release	Modification
	11.2	This command was introduced.

**Usage Guidelines** Use this command only when you want *all* incoming calls to be answered as V.120. If you want the interface to automatically detect whether the incoming call uses V.120 or PPP encapsulation, use the **autodetect encapsulation** command.

This command applies only when the incoming call originates on an asynchronous device and needs to terminate in an available vty on the router.

**Examples** The following partial example shows that BRI 0 is configured to answer all calls as V.120:

```
interface bri 0
 isdn all-incoming-calls-v120
```

Related Commands	Command	Description
	<b>autodetect encapsulation</b>	Enables automatic detection of the encapsulation types in operation over a point-to-point link to a specified serial or ISDN interface.

## 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** command in interface configuration mode. 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** command in interface configuration mode. 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. The maximum number of digits for <i>called-party-number</i> is 50.
:	(Optional) 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 used for ISDN multipoint connections. At least one value— <i>called-party-number</i> or <i>subaddress</i> —must be specified. The maximum number of digits for <i>subaddress</i> is 50.

### Defaults

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

### Command Modes

Interface configuration

### Command History

Release	Modification
10.3	This command was introduced.

### Usage Guidelines

If you do not specify the **isdn answer1** or **isdn answer2** command, all calls are processed 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.

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**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 autodetect

To enable the automatic detection of ISDN SPIDs and switch type, use the **isdn autodetect** command in interface configuration mode. To disable the automatic detection of ISDN SPIDs and switch type, use the **no** form of this command.

**isdn autodetect**

**no isdn autodetect**

## Syntax Description

This command has no arguments or keywords.

## Defaults

The automatic detection of ISDN SPIDs and switch type is disabled.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.0(3)T	This command was introduced.

## Usage Guidelines

This command applies to North America only. If you are outside of North America, you must use the **isdn switch-type (BRI)** or **isdn switch-type (PRI)** interface configuration command to specify the ISDN switch type.

## Examples

The following example enables the automatic detection of ISDN SPIDs and switch type:

```
isdn autodetect
```

## Related Commands

Command	Description
<b>isdn spid1, isdn spid2</b>	Defines the SPID number that has been assigned by the ISDN service provider for the B1 channel.
<b>isdn switch-type (BRI)</b>	Specifies the central office switch type on the ISDN BRI interface.
<b>isdn switch-type (PRI)</b>	Specifies the central office switch type on the ISDN PRI interface.

# isdn bcac service audit

To enable service audits on an interface configured for B-Channel Availability Control (BCAC), use the **isdn bcac service audit** command in interface configuration mode. To disable service audits, use the **no** form of this command.

**isdn bcac service audit**

**no isdn bcac service audit**

**Syntax Description** This command has no arguments or keywords.

**Defaults** This command is disabled by default.

**Command Modes** Interface configuration

Command History	Release	Modification
	12.3(1)	This command was introduced.

**Usage Guidelines** This commands starts service audits for all triggers. Use the **isdn bcac service audit trigger** command to selectively enable and disable audit triggers.

**Examples** The following example shows how to configure service audits on serial interface 2:23:

```
interface serial 2:23
 isdn bcac service audit
```

Related Commands	Command	Description
	<b>isdn bcac service audit interface</b>	Specifies that the BCAC service audit needs to be triggered on the entire interface.
	<b>isdn bcac service audit trigger</b>	Enables individual BCAC service triggers.
	<b>isdn bcac service retry in-serv-on-fail</b>	Specifies that the BCAC service state of the channel needs to be changed to In Service because no acknowledgment was received.
	<b>isdn bcac service retry max</b>	Specifies the maximum number of times a BCAC service message can be retransmitted when unacknowledged.
	<b>isdn bcac service timer</b>	Changes the value of the BCAC T3M1 or T323 service message timer.
	<b>isdn bcac service update linkup</b>	Triggers updates of the BCAC service states between peer nodes through exchange of SERV and SERV ACK messages.

<b>Command</b>	<b>Description</b>
<b>isdn bcac service update provision</b>	Enables the functionality of service status for provisioning ISDN PRI B channels.
<b>isdn service</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.

# isdn bcac service audit interface

To specify that B-Channel Availability Control (BCAC) service audit needs to be triggered on the entire interface, use the **isdn bcac service audit interface** command in interface configuration mode. To change or remove the specification, use the **no** form of this command.

**isdn bcac service audit interface**

**no isdn bcac service audit interface**

**Syntax Description** This command has no arguments or keywords.

**Defaults** The default can be to trigger audits on a single channel, a group of channels, or the entire interface, depending upon the type of trigger set. See the “Usage Guidelines” section for the **isdn bcac service audit trigger** command for the list of triggers.

**Command Modes** Interface configuration

Command History	Release	Modification
	12.3(1)	This command was introduced.

**Usage Guidelines** Use this command when the service audit needs to be triggered on the entire interface when a condition to trigger the service audit is triggered for any channel.

**Examples** The following example shows how to configure service audits on serial interface 2:23:

```
interface serial 2:23
 isdn bcac service audit interface
```

Related Commands	Command	Description
	<b>isdn bcac service audit</b>	Enables service audits on an interface configured for BCAC.
	<b>isdn bcac service audit trigger</b>	Enables individual BCAC service triggers.
	<b>isdn bcac service retry in-serv-on-fail</b>	Specifies that the BCAC service state of the channel needs to be changed to In Service because no acknowledgment was received.
	<b>isdn bcac service retry max</b>	Specifies the maximum number of times a BCAC service message can be retransmitted when unacknowledged.
	<b>isdn bcac service timer</b>	Changes the value of the BCAC T3M1 or T323 service message timer.
	<b>isdn bcac service update linkup</b>	Triggers updates of the BCAC service states between peer nodes through exchange of SERV and SERV ACK messages.

<b>Command</b>	<b>Description</b>
<b>isdn bcac service update provision</b>	Enables the functionality of service status for provisioning ISDN PRI B channels.
<b>isdn service</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.

# isdn bcac service audit trigger

To re-enable individual B-Channel Availability Control (BCAC) service triggers, use the **isdn bcac service audit trigger** command in interface configuration mode. To disable individual service triggers, use the **no** form of this command.

**isdn bcac service audit trigger** *number*

**no isdn bcac service audit trigger** *number*

## Syntax Description

<i>number</i>	A number from 1 to 6 that disables specific service triggers; see a list of these triggers in the “Usage Guidelines” section.
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## Defaults

All triggers are configured.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.3(1)	This command was introduced.

## Usage Guidelines

The service audit procedure can be used by either the user or network side to bring both ends of the interface into agreement about the service status through an exchange of SERV and SERV ACK messages.

Following is the list of triggers with the conditions that cause them. Triggers 1 through 4 are triggered by single-channel audits. Trigger 5 occurs on the entire interface. Trigger 6 applies to a group of channels, which in some cases may apply to the entire interface.

- Trigger 1: Upon receiving an incoming call indicating a channel that is in the out-of-service (OOS) or Maint (maintenance) state.
- Trigger 2: Upon receiving an unsolicited SERV ACK message when the received service status differs from the current status.
- Trigger 3: Upon receiving an unallowed response to a SERV message. An unallowed response means a SERV ACK message, which indicates a higher availability than was sent in the SERV message.
- Trigger 4: Upon receiving an ISDN call clearing message with cause code 44 (requested channel not available) when this message is not caused by “glare,” which is a SETUP message collision requesting the same channel.
- Trigger 5: Once every 24 hours on all channels.
- Trigger 6: Once every hour on all channels that are in the OOS or Far-end state.

**Examples**

The following example shows how to disable service trigger 4 on serial interface 2:23:

```
interface serial 2:23
 no isdn bcac service audit trigger 4
```

**Related Commands**

Command	Description
<b>isdn bcac service audit</b>	Enables service audits on an interface configured for BCAC.
<b>isdn bcac service audit interface</b>	Specifies that the BCAC service audit needs to be triggered on the entire interface.
<b>isdn bcac service retry in-serv-on-fail</b>	Specifies that the BCAC service state of the channel needs to be changed to In Service because no acknowledgment was received.
<b>isdn bcac service retry max</b>	Specifies the maximum number of times a BCAC service message can be retransmitted when unacknowledged.
<b>isdn bcac service timer</b>	Changes the value of the BCAC T3M1 or T323 service message timer.
<b>isdn bcac service update linkup</b>	Triggers updates of the BCAC service states between peer nodes through exchange of SERV and SERV ACK messages.
<b>isdn bcac service update provision</b>	Enables the functionality of service status for provisioning ISDN PRI B channels.
<b>isdn service</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.

# isdn bcac service retry in-serv-on-fail

To specify that the B-Channel Availability Control (BCAC) service state of the channel needs to be changed to In Service because no acknowledgment was received, use the **isdn bcac service retry in-serv-on-fail** command in interface configuration mode. To change or remove this specification, use the **no** form of this command.

**isdn bcac service retry in-serv-on-fail**

**no isdn bcac service retry in-serv-on-fail**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Original service state is maintained.

**Command Modes** Interface configuration

Command History	Release	Modification
	12.3(1)	This command was introduced.

**Usage Guidelines** Use this command when there is a need to change the service state of a channel to In Service when no acknowledgment is received, even after retransmitting the service message the maximum number of allowed times. If this command is not configured, the original service state is maintained.

**Examples** The following example shows how to configure an option whereby, on service message exchange failure, the service state of the concerned channel or channels will be set to In Service:

```
interface serial 2:23
 isdn bcac service retry in-serv-on-fail
```

Related Commands	Command	Description
	<b>isdn bcac service audit</b>	Enables service audits on an interface configured for BCAC.
	<b>isdn bcac service audit interface</b>	Specifies that the BCAC service audit needs to be triggered on the entire interface.
	<b>isdn bcac service audit trigger</b>	Enables individual BCAC service triggers.
	<b>isdn bcac service retry max</b>	Specifies the maximum number of times a BCAC service message can be retransmitted when unacknowledged.
	<b>isdn bcac service timer</b>	Changes the value of the BCAC T3M1 or T323 service message timer.
	<b>isdn bcac service update linkup</b>	Triggers updates of the BCAC service states between peer nodes through exchange of SERV and SERV ACK messages.

Command	Description
<b>isdn bcac service update provision</b>	Enables the functionality of service status for provisioning ISDN PRI B channels.
<b>isdn service</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.

# isdn bcac service retry max

To specify the maximum number of times a B-Channel Availability Control (BCAC) service message can be retransmitted when unacknowledged, use the **isdn bcac service retry max** command in interface configuration mode. To remove or change the specification, use the **no** form of this command.

**isdn bcac service retry max** *retries*

**no isdn bcac service retry max** *retries*

<b>Syntax Description</b>	<i>retries</i>	A number from 0 to 127 that determines the maximum number of times that a service message can be retransmitted when unacknowledged. Default is 2.
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<b>Defaults</b>	Maximum retransmissions is 2.
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<b>Command Modes</b>	Interface configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.3(1)	This command was introduced.

<b>Usage Guidelines</b>	When a SERV message is sent to the far side, SERV message timer T3M1 or T323 is started. If no SERV ACK message is received before these timers expire, the SERV message is retransmitted. This command determines how many times retransmission occurs.
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<b>Examples</b>	The following example shows how to set the maximum service message retransmissions on serial interface 2:23 to 50:
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```
interface serial 2:23
 isdn bcac service retry max 50
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>isdn bcac service audit</b>	Enables service audits on an interface configured for BCAC.
	<b>isdn bcac service audit interface</b>	Specifies that the BCAC service audit needs to be triggered on the entire interface.
	<b>isdn bcac service audit trigger</b>	Enables individual BCAC service triggers.
	<b>isdn bcac service retry in-serv-on-fail</b>	Specifies that the BCAC service state of the channel needs to be changed to In Service because no acknowledgment was received.
	<b>isdn bcac service timer</b>	Changes the value of the BCAC T3M1 or T323 service message timer.
<b>isdn bcac service update linkup</b>	Triggers updates of the BCAC service states between peer nodes through exchange of SERV and SERV ACK messages.	

<b>Command</b>	<b>Description</b>
<b>isdn bcac service update provision</b>	Enables the functionality of service status for provisioning ISDN PRI B channels.
<b>isdn service</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.

# isdn bcac service timer

To change the value of the B-Channel Availability Control (BCAC) T3M1 or T323 service message timer, use the **isdn bcac service timer** command in interface configuration mode. To change the timer value, use the **no** form of this command.

**isdn bcac service timer** *timer-value*

**no isdn bcac service timer** *timer-value*

<b>Syntax Description</b>	<i>timer-value</i>	Length, in milliseconds (ms), of the T3M1 or T323 service message timer. Valid range is from 500 to 120000 ms; default is 120000 ms.
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**Defaults** The T3M1 or T323 service message timer defaults to 120000 ms.

**Command Modes** Interface configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.3(1)	This command was introduced.

**Usage Guidelines** The T3M1 or T323 service message timer is started when a SERV message is sent to the far side.

**Examples** The following example shows how to change the service timers to 600 ms on serial interface 2:23:

```
interface serial 2:23
 isdn bcac service timer 600
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>isdn bcac service audit</b>	Enables service audits on an interface configured for BCAC.
	<b>isdn bcac service audit interface</b>	Specifies that the BCAC service audit needs to be triggered on the entire interface.
	<b>isdn bcac service audit trigger</b>	Enables individual BCAC service triggers.
	<b>isdn bcac service retry in-serv-on-fail</b>	Specifies that the BCAC service state of the channel needs to be changed to In Service because no acknowledgment was received.
	<b>isdn bcac service retry max</b>	Specifies the maximum number of times a BCAC service message can be retransmitted when unacknowledged.
	<b>isdn bcac service update linkup</b>	Triggers updates of the BCAC service states between peer nodes through exchange of SERV and SERV ACK messages.

<b>Command</b>	<b>Description</b>
<b>isdn bcac service update provision</b>	Enables the functionality of service status for provisioning ISDN PRI B channels.
<b>isdn service</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.

# isdn bcac service update linkup

To trigger updates of the B-Channel Availability Control (BCAC) service states between peer nodes through exchange of SERV and SERV ACK messages, use the **isdn bcac service update linkup** command in interface configuration mode. To disable triggering of updates, use the **no** form of this command.

**isdn bcac service update linkup**

**no isdn bcac service update linkup**

**Syntax Description** This command has no arguments or keywords.

**Defaults** This command is disabled by default.

**Command Modes** Interface configuration

Command History	Release	Modification
	12.3(1)	This command was introduced.

**Usage Guidelines** This command updates the service states of *all* the channels to the far side of the interface by exchanging SERV and SERV ACK messages whenever ISDN Layer 2 comes up.

Use the **isdn bcac service update linkup** command to bring the service state of the channels on the interface in synchronization with its peer through the exchange of SERV messages. This synchronizing of the service states will be triggered whenever ISDN Layer 2 comes up. This command can be used with the **isdn service** command in cases where the service state of the channels needs to be synchronized when the ISDN Layer 2 comes up, and in particular, when the ISDN Layer 2 comes up after the router has reloaded.

**Examples** The following example shows how to trigger service state updates on serial interface 2:23:

```
interface serial 2:23
 isdn bcac service update linkup
```

Related Commands	Command	Description
	<b>isdn bcac service audit</b>	Enables service audits on an interface configured for BCAC.
	<b>isdn bcac service audit interface</b>	Specifies that the BCAC service audit needs to be triggered on the entire interface.
	<b>isdn bcac service audit trigger</b>	Enables individual BCAC service triggers.

<b>Command</b>	<b>Description</b>
<b>isdn bcac service retry in-serv-on-fail</b>	Specifies that the BCAC service state of the channel needs to be changed to In Service because no acknowledgment was received.
<b>isdn bcac service retry max</b>	Specifies the maximum number of times a BCAC service message can be retransmitted when unacknowledged.
<b>isdn bcac service timer</b>	Changes the value of the BCAC T3M1 or T323 service message timer.
<b>isdn bcac service update provision</b>	Enables the functionality of service status for provisioning ISDN PRI B channels.
<b>isdn service</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.

# isdn bcac service update provision

To enable functionality of service status for provisioning the ISDN B channels, use the **isdn bcac service update provision** command in interface configuration mode. To disable provisioning, use the **no** form of this command.

**isdn bcac service update provision**

**no isdn bcac service update provision**

**Syntax Description** This command has no arguments or keywords.

**Defaults** This command is disabled by default.

**Command Modes** Interface configuration

Command History	Release	Modification
	12.3(1)	This command was introduced.

**Usage Guidelines** This command enables functionality of service status for provisioning the B channels, which for the Cisco implementation happens only on reboot.

**Examples** The following example shows how to enable the service service status for provisioning the B channels on serial interface 2:23:

```
interface serial 2:23
 isdn bcac service update provision
```

Related Commands	Command	Description
	<b>isdn bcac service audit</b>	Enables service audits on an interface configured for BCAC.
	<b>isdn bcac service audit interface</b>	Specifies that the BCAC service audit needs to be triggered on the entire interface.
	<b>isdn bcac service audit trigger</b>	Enables individual BCAC service triggers.
	<b>isdn bcac service retry in-serv-on-fail</b>	Specifies that the BCAC service state of the channel needs to be changed to In Service because no acknowledgment was received.
	<b>isdn bcac service retry max</b>	Specifies the maximum number of times a BCAC service message can be retransmitted when unacknowledged.
	<b>isdn bcac service timer</b>	Changes the value of the BCAC T3M1 or T323 service message timer.

Command	Description
<b>isdn bcac service update linkup</b>	Triggers updates of the BCAC service states between peer nodes through exchange of SERV and SERV ACK messages.
<b>isdn service</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.

# isdn bchan-number-order

To configure an ISDN PRI interface to make outgoing call selection in ascending descending, or round-robin order, use the **isdn bchan-number-order** command in interface configuration mode. To restore the default, use the **no** form of this command or reconfigure the interface with the new value.

**isdn bchan-number-order** {**ascending** | **descending**} [**round-robin**]

**no isdn bchan-number-order**

## Syntax Description

<b>ascending</b>	Makes the outgoing B-channel selection in ascending order as follows: <ul style="list-style-type: none"> <li>• Channels 1 to 24 for a T1 controller</li> <li>• Channels 1 to 31 for an E1 controller</li> </ul>
<b>descending</b>	Makes the outgoing B-channel selection in descending order as follows: <ul style="list-style-type: none"> <li>• Channels 24 to 1 for a T1 controller</li> <li>• Channels 31 to 1 for an E1 controller</li> </ul>
<b>round-robin</b>	(Optional) Enables a round-robin B-channel selection scheme.

## Defaults

Selection default is ascending for the network side; descending for the user side.

## Command Modes

Interface configuration

## Command History

Release	Modification
11.3 T	This command was introduced.
12.3(1)	The <b>round-robin</b> keyword was added.

## Usage Guidelines

This command supports ascending, descending, and round-robin B-channel selection schemes. This command is for PRI configuration only.

This command supports ascending and descending B-channel selection by instructing the router to select the lowest or highest available B channel starting at either channel B1 (ascending) or channel B23 for a T1 and channel B31 for an E1 (descending).

In the ascending B-channel selection scheme, for example, if the channel selected for the last call was channel 14, then if channel  $x$ , where  $x$  is any channel number less than or equal to 14, becomes available by the time a channel is selected for the next call, that channel will be selected for the call.

In the round-robin B-channel selection scheme, the next channel selected is the current channel number  $x$  plus 1 for ascending, or current channel number  $x$  minus 1 for descending configuration.

When the channel selection software routine reaches channel 1 (the bottom for descending) or channel 23 for T1 and channel 31 for E1 (the top for ascending), the software routine wraps around. An example for a descending configuration: After reaching channel 1, the routine goes back to channel 31 or 23 and then decrements the count from there.

**Examples**

The following example configures the outgoing B-channel order on a PRI interface to be in ascending order. The router will select the lowest available B channel beginning with channel B1.

```
interface serial 5:10
  isdn bchan-number-order ascending
```

The following example configures the outgoing B-channel order on a PRI interface to be round-robin in ascending order.

```
interface serial 4:23
  isdn bchan-number-order ascending round-robin
```

# isdn busy

To set a false busy signal on an ISDN B channel, use the **isdn busy** command in interface configuration mode. To remove this condition, use the **no** form of this command.

```
isdn busy dsl number b_channel number
```

```
no isdn busy dsl number b_channel number
```

## Syntax Description

<b>dsl</b> <i>number</i>	Digital subscriber loop (DSL) number.
<b>b_channel</b> <i>number</i>	B channel or range of B channels to be set to the false busy signal. B channel numbers range from 1 to 24; 0 indicates the entire interface. The state of the channel, which is obtained using the <b>show isdn</b> command with the <b>status</b> keyword, can also be added to the command.

## Defaults

Disabled

## Command Modes

Interface configuration

## Command History

Release	Modification
12.0	This command was introduced.

## Usage Guidelines

This command gives the impression that a call is active when the channel is actually idle.

Use the **b\_channel 0** keywords to set a false busy signal on the entire interface.

Use the **show isdn** command with the **status** keyword to display the DSL number and channel state.

## Examples

The following example sets the entire PRI interface to a false busy signal; the DSL number was obtained using the **show isdn** command with the **status** keyword, and then used in the command.

```
isdn busy dsl 3 b_channel 0 state 1
```

The following example sets the false busy signal on B channel 11; the DSL number was obtained using the **show isdn** command with the **status** keyword, and then used in the command.

```
isdn busy dsl 3 b_channel 11 state 2
```

## Related Commands

Command	Description
<b>isdn service</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.

# isdn call interface

The **isdn call interface** command is replaced by the **isdn test call interface** command. See the [isdn test call interface](#) command for more information.

# isdn caller

To configure ISDN caller ID screening and optionally to enable ISDN caller ID callback for legacy dial-on-demand routing (DDR), use the **isdn caller** command in interface configuration mode. To disable this feature, use the **no** form of this command.

**isdn caller** *phone-number* [**callback**] [**exact**]

**no isdn caller** *phone-number* [**callback**] [**exact**]

## Syntax Description

<i>phone-number</i>	Remote telephone number for which to screen. Use the letter X to represent a single “don’t care” digit. The maximum length of each number is 25 digits.
<b>callback</b>	(Optional) Enables callback.
<b>exact</b>	(Optional) Performs matching on incoming telephone number exactly as entered.

## Defaults

Disabled

## Command Modes

Interface configuration

## Command History

Release	Modification
10.0	This command was introduced.
11.2 F	This command was implemented on additional Cisco router and access server platforms.
12.1	The <b>exact</b> keyword was added.

## Usage Guidelines

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



### Note

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

When the optional **callback** keyword is used and a call is received from one of the callback numbers, the initial call is rejected (hence, not subject to tolls) and a callback is initiated to that calling number.

When Xs are used in the callback number, dialer caller screening is based on a best match system that uses the *number* of Xs as a criterion. To make callback calls only to specified numbers or ranges of numbers but to accept any other incoming calls, make sure that the number of Xs in any configuration line that uses the **callback** keyword is less than the number of Xs in any configuration line that does not use the keyword.

For example, if you use at most four Xs in the configuration lines with the **callback** keyword, then to accept calls from other numbers use at least five Xs in a configuration line that does not use the keyword.

When a telephone number is entered *without* the **exact** keyword, the software compares each number going from right to left until matching numbers are detected. For example, if the *phone-number* argument is 4085551234, calls from telephone numbers 1234, 51234, 5551234, and 4085551234 would be accepted, but calls from telephone numbers 44 and 4155551234 would be rejected.

If you want to accept a telephone number *exactly* as it is configured, enter it with the **exact** keyword. For example, if the *phone-number* argument is 5551212 and the **exact** keyword is applied, only the telephone number 5551212 is accepted; calls from telephone numbers 408551212 and 51212 would be rejected.

The maximum length of each telephone number is 25 characters. There is no limit on the numbers you can specify per interface.

### Examples

The following example configures the router to accept a call containing the numbers 415 555-1234:

```
isdn caller 4155551234
```

The following example configures the router to accept a call only from telephone number 555-1234:

```
isdn caller 5551234 exact
```

In the above example, a call from telephone number 415 555-1234 would be rejected.

The following example configures the router to accept a call with telephone number containing 415 555-12 and any numbers in the last two positions:

```
isdn caller 41555512xx
```

In the following example, callback calls will be made only to numbers in the 555 and 556 exchanges, but any other telephone number can call in:

```
isdn caller 408555xxxx callback
isdn caller 408556xxxx callback
isdn caller xxxxxx
```

### Related Commands

Command	Description
<b>show dialer</b>	Displays general diagnostic information for interfaces configured for DDR.

# isdn calling-number

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

**isdn calling-number** *calling-number*

**no isdn calling-number**

<b>Syntax Description</b>	<i>calling-number</i> Number of the device making the outgoing call; only one entry is allowed.
---------------------------	---

<b>Defaults</b>	No calling number is presented.
-----------------	---------------------------------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	10.3	This command was introduced.

<b>Usage Guidelines</b>	<p>An interface can have only one ISDN calling-number entry.</p> <p>For ISDN BRI, this command is intended for use when the ISDN network offers TS014 tariffing, in which devices present the calling (billing) number.</p> <p>For ISDN PRI, 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.</p>
-------------------------	--



**Note**

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

<b>Examples</b>	<p>The following example first configures the T1 interface, then configures the D channel interface to present the billing number 4233570925 when it makes outgoing calls:</p>
-----------------	--

```
controller t1 1/1
  framing esf
  linecode b8zs
  pri-group timeslots 1-23
  isdn switchtype primary-4ess
!
interface serial 1/1:23
 ip address 10.1.1.1 255.255.255.0
 encapsulation ppp
 isdn calling-number 4233570925
 dialer map ip 10.1.1.2 name dallas 14193460913
```

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**

<b>Command</b>	<b>Description</b>
<b>interface dialer</b>	Configures a BRI interface and enters interface configuration mode.
<b>interface serial</b>	Specifies a serial interface created on a channelized E1 or channelized T1 controller (for ISDN PRI, CAS, or robbed bit signaling).

# isdn calling-pty

To specify whether the network-provided or user-provided calling party number is selected when two calling party numbers are sent from a primary NET5 switch on ISDN, use the **isdn calling-pty** command in interface configuration mode. To reset the default value, use the **no** form of this command.

**isdn calling-pty** { **network-provided** | **user-provided** }

**no isdn calling-pty**

## Syntax Description

<b>network-provided</b>	Network-provided calling party number.
<b>user-provided</b>	User-provided calling party number.

## Defaults

User-provided calling party number

## Command Modes

Interface configuration

## Command History

Release	Modification
12.2	This command was introduced for the primary ISDN NET5 switch.

## Usage Guidelines

The **isdn calling-pty** command is useful for customers that use network-provided and user-provided calling party numbers for accounting purposes. The selected number will be used by dialer filters such as that configured with the **isdn caller** command.

## Examples

The following example configures the ISDN switch to accept network-provided calling party numbers:

```
interface Serial0:23
  no ip address
  encapsulation ppp
  dialer rotary-group 1
  isdn switch-type primary-net5
  isdn protocol-emulate network
  isdn incoming-voice modem
  isdn calling-number 1111111
  isdn calling-pty network-provided
  isdn T310 40000
  no cdp enable
```

## Related Commands

Command	Description
<b>isdn caller</b>	Configures ISDN caller ID screening and optionally enables ISDN caller ID callback for legacy DDR.
<b>isdn calling-number</b>	Configures an ISDN PRI or BRI interface to present the number of the device making the outgoing call.

# isdn channel-id invert extended-bit

To invert the value of the extend bit (0x80) in the last octet of the channel ID information element, use the **isdn channel-id invert extended-bit** command in interface configuration mode. To restore the default setting, use the **no** form of this command.

**isdn channel-id invert extended-bit**

**no isdn channel-id invert extended-bit**

## Syntax Description

This command has no arguments or keywords.

## Defaults

The last octet of the channel ID information element is not inverted.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.2	This command was introduced.

## Usage Guidelines

Use this command if you use a primary-DMS 100 switch type to ensure compatibility with a Setup or Call Proceeding message containing a channel ID information element. This command can be used only with ISDN PRI.

This command replaces the **isdn-flip-chan-flag** command.

## Examples

The following example configures the router to invert the extended bit in the last octet of the channel ID information element:

```
isdn channel-id invert extended-bit
```

# isdn conference-code

To activate three-way call conferencing, use the **isdn conference-code** command in interface configuration mode. To disable three-way call conferencing, use the **no** form of this command.

**isdn conference-code** *range*

**no isdn conference-code**

---

<b>Syntax Description</b>	<i>range</i> Number from 0 to 999 (ISDN conference code).
---------------------------	---

---



---

<b>Defaults</b>	The default code is 60.
-----------------	-------------------------

---

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

---

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(3)T	This command was introduced.

---



---

<b>Usage Guidelines</b>	Use this command if your ISDN line is connected to an NI1 or a Nortel DMS-100 Custom switch. Your telephone service provider should provide an ISDN conference code when you order three-way call conferencing.
-------------------------	---

---

<b>Examples</b>	The following example specifies 61 as the ISDN conference code:  <code>isdn conference-code 61</code>
-----------------	---

# isdn disconnect-cause

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

**isdn disconnect-cause** { *cause-code-number* | **busy** | **not-available** }

**no isdn disconnect-cause**

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

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

**Command Modes** Interface configuration

Command History	Release	Modification
	12.0(5)T	This command was introduced.

**Usage Guidelines** The **isdn disconnect-cause** command overrides specific cause codes (such as modem availability and resource pooling) that are sent to the switch by ISDN applications. When the **isdn disconnect-cause** command is implemented, 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.

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

```
interface serial10:20
 isdn disconnect-cause not-available
```

Related Commands	Command	Description
	<b>isdn disconnect-cause</b>	Sends a specific ISDN cause code to the switch.

## isdn disconnect interface

The **isdn disconnect interface** command is replaced by the **isdn test disconnect interface** command. See the [isdn test disconnect interface](#) command for more information.

# isdn fast-rollover-delay

To control the timing between successive dial attempts, use the **isdn fast-rollover-delay** command in interface configuration mode. To remove or change a value, use the **no** form of this command.

**isdn fast-rollover-delay** *seconds*

**no isdn fast-rollover-delay**

Syntax Description	<i>seconds</i>	Number of seconds between dial attempts.
--------------------	----------------	--

Defaults	No default timer.
----------	-------------------

Command Modes	Interface configuration
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Command History	Release	Modification
	11.1	This command was introduced.

**Usage Guidelines**

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.

The **isdn fast-rollover-delay** command is necessary on some ISDN switches because the new call may be attempted before the old call is completely torn down, which causes the second call or the callback 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 in to this BRI.
- You have a dialer map or dialer string for each phone number.
- The first call succeeds but the second call continuously fails.

When these conditions occur, set the **isdn fast-rollover-delay** command to 5 seconds and try again. A delay of 5 seconds should cover most cases. Configure sufficient delay to make sure that the ISDN RELEASE\_COMPLETE message has been sent or received before the fast rollover call is made. Use the **debug isdn q931** command to display this information.

When the **isdn fast-rollover-delay** command is configured on a client requesting callback, the callback client first confirms whether the callback server has placed a call back to the callback client before dialing any subsequent numbers.

---

**Examples**

The following partial example sets the fast-rollover delay that is suggested when all the conditions specified in the list in the “Usage Guidelines” are true:

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

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
<b>dialer wait-for-carrier-time (map-class)</b>	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.
<b>ppp callback (DDR)</b>	Enables a dialer interface that is not a DTR interface to function either as a callback client that requests callback or as a callback server that accepts callback requests.

---

## isdn flip-chan-flag

The **isdn flip-chan-flag** command is replaced by the **isdn channel-id invert extended-bit** command. See the [isdn channel-id invert extended-bit](#) command for more information.

# isdn guard-timer

To enable a managed timer for authentication requests, use the **isdn guard-timer** command in interface configuration mode. To reset the timer to its default value, use the **no** form of this command.

**isdn guard-timer** *milliseconds* [**on-expiry** {**accept** | **reject**}]

**no isdn guard-timer**

## Syntax Description

<i>milliseconds</i>	Number of milliseconds that the network access server (NAS) waits for a response from the AAA security server. The valid range is from 1000 through 20,000.
<b>on-expiry</b>	(Optional) Determines whether calls are accepted or rejected after the specified number of milliseconds has expired. If no expiry action is selected, calls are rejected.
<b>accept</b>	(Optional) Calls are accepted if the guard-timer expires before AAA responds.
<b>reject</b>	(Optional) Calls are rejected if the guard-timer expires before AAA responds.

## Defaults

The default timer value is eight (8) seconds and calls are rejected when the timer expires.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.1(3)T	This command was introduced.

## Usage Guidelines

The guard-timer starts when the DNIS number is sent to AAA for authentication. When the timer expires, authentication ends and the call is accepted or rejected based on the configured expiry action.

## Examples

The following example sets the guard-timer to six (6) seconds and specifies that the call should be rejected if AAA does not respond within that interval:

```
interface serial 1/0/0:23
 isdn guard-timer 6000 on-expiry reject
```

## Related Commands

Command	Description
<b>aaa preauth</b>	Enables authentication using DNIS numbers.

# isdn incoming alerting add-PI

To add a Progress Indicator (PI) in an incoming ALERTING messages during ISDN B-channel cut-through, use the **isdn incoming alerting add-PI** command in interface configuration mode. To remove the indicator, use the **no** form of this command.

**isdn incoming alerting add-PI**

**no isdn incoming alerting add-PI**

## Syntax Description

This command has no arguments or keywords.

## Defaults

On North American ISDN switches, the default behavior is to add the PI in incoming ALERTING messages. On ISDN switches compliant with the European Telecommunications Standards Institute (ETSI), the default behavior is to *not* add the PI in incoming ALERTING messages.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.3	This command was introduced for ISDN BRI and PRI interfaces.

## Usage Guidelines

The **isdn incoming alerting add-PI** and **no isdn incoming alerting add-PI** commands provide a way for switch types conforming to different standards to handle B-channel cut-through. These commands apply to both ISDN BRI and PRI connections.

North American switch types such as the 5ESS, 4ESS, DMS, and NI allow cut-through when an ALERTING message is received. ISDN B-channel cut-through for customer premises equipment (CPE) should happen upon receipt of a channel ID Information Element (IE) in the CALL\_PROC message. For this reason, the default on North American ISDN switches is to add the PI in incoming ALERTING message.

On ETSI-compliant ISDN switches, the default behavior is to *not* add the PI in incoming ALERTING messages. But ETSI also specifies that when the remote device is playing tones or announcements, it should also include the PI in the ALERTING message. This is not the default behavior for ETSI-compliant switches, but the **isdn incoming alerting add-PI** command allows Cisco IOS software to support this behavior.

The **isdn incoming alerting add-PI** and **no isdn incoming alerting add-PI** commands can be used on switches that do not want to add the PI in incoming ALERTING messages and on those switches that cannot handle or do not want the PI in incoming ALERTING messages.

**Examples**

Because the the **isdn incoming alerting add-PI** command is the default for a North American ISDN switch, the following example shows that when the interface configuration is displayed, the **isdn incoming alerting add-PI** command is not listed, even if it was explicitly configured:

```
Router(config)# interface BRI1/0
Router(config-if)# no ip address
Router(config-if)# isdn switch-type basic-dms100
Router(config-if)# isdn spid1 40876726760101 5459374
Router(config-if)# isdn spid2 51076726760101 5459375
Router(config-if)# isdn incoming-voice voice
Router(config-if)# isdn incoming alerting add-PI
Router(config-if)# end
Router(config)# end
Router# show running interface BRI1/0
Building configuration...

Current configuration : 167 bytes
!
interface BRI1/0
  no ip address
  isdn switch-type basic-dms100
  isdn spid1 40876726760101 5459374
  isdn spid2 51076726760101 5459375
  isdn incoming-voice voice
end
```

The following example shows that when the the **no isdn incoming alerting add-PI** command is configured on a North American ISDN switch, the command is listed in the interface configuration:

```
Router(config)# interface BRI1/0
Router(config-if)# no isdn incoming alerting add-PI
Router(config-if)# end
Router(config)# end
Router# show running interface BRI1/0
Building configuration...

Current configuration : 201 bytes
!
interface BRI1/0
  no ip address
  isdn switch-type basic-dms100
  isdn spid1 4087672676 5459374
  isdn spid2 51076726760101 5459375
  isdn incoming-voice voice
  no isdn incoming alerting add-PI
end
```

Because the default for ETSI-compliant ISDN switches is **no isdn incoming alerting add-PI**, the following example shows that when the the **isdn incoming alerting add-PI** command is added to the configuration for a NET3 switch, the command is listed in the interface configuration:

```
Router(config-if)# no ip address
Router(config-if)# isdn switch-type basic-net3
Router(config-if)# isdn spid1 40876726760101 5459374
Router(config-if)# isdn spid2 51076726760101 5459375
Router(config-if)# isdn incoming-voice voice
Router(config-if)# isdn incoming alerting add-PI
Router(config-if)# end
Router(config)# end
Router# show running interface BRI1/0
Building configuration...

Current configuration : 165 bytes
```

```
!  
interface BRI1/0  
  no ip address  
  isdn switch-type basic-net3  
  isdn spid1 40876726760101 5459374  
  isdn spid2 51076726760101 5459375  
  isdn incoming-voice voice  
  isdn incoming alerting add-PI  
end
```

If the configuration for the NET3 switch were changed back to contain **no isdn incoming alerting add-PI**, the command would not be listed in the interface configuration, because this is the default behavior for ETSI-compliant switches:

```
Current configuration : 165 bytes  
!  
interface BRI1/0  
  no ip address  
  isdn switch-type basic-net3  
  isdn spid1 40876726760101 5459374  
  isdn spid2 51076726760101 5459375  
  isdn incoming-voice voice  
end
```

## isdn incoming-voice

To route all incoming voice calls to the modem and determine how they will be treated, use the **isdn incoming-voice** command in interface configuration mode. To disable the setting or return to the default, use the **no** form of this command.

```
isdn incoming-voice { voice | data [56 | 64] | modem [56 | 64] }
```

```
no isdn incoming-voice { voice | data [56 | 64] | modem [56 | 64] }
```

### Syntax Description

<b>voice</b>	Incoming voice calls bypass the modems and be handled as a voice call.
<b>data</b>	Incoming voice calls bypass the modems and will be handled as digital data. If the <b>data</b> keyword is selected, you can specify a B-channel bandwidth of either <b>56</b> kbps or <b>64</b> kbps.
<b>modem</b>	Incoming voice calls are passed over to the digital modems, where they negotiate the appropriate modem connection with the far-end modem. If this keyword is selected, you can specify a B-channel bandwidth of either <b>56</b> kbps or <b>64</b> kbps. If no argument is entered, the default value is 64.

### Defaults

If you do not enter the **56** or **64** keywords after the **data** keyword, the default value will be 64 kbps.

### Command Modes

Interface configuration

### Command History

Release	Modification
11.1	This command was introduced for ISDN PRI interfaces.
11.1 AA and 12.0(2)XC	This command was implemented on ISDN BRI interfaces.
11.2	This command was enhanced for channelized T1 and integrated into Cisco IOS Release 11.2.
11.3 NA	This command was implemented on additional Cisco router and access server platforms.
12.0(3)T	This command was implemented on additional Cisco router and access server platforms.

### Usage Guidelines

Unless you specify otherwise, all calls received by the router and characterized as voice calls are treated as normal ISDN calls, which are handled as digital data and not passed over to the modem. 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.

If you use the **voice** keyword, incoming ISDN voice calls will be treated as voice calls and handled by either a modem or a voice DSP as directed by CSM.

If the default value is configured and the bearer capability of the incoming call is the **voice** keyword, the call will be rejected.

To answer incoming voice calls at a configured rate (overriding the incoming data rate in the call), use the **data** keyword.

To establish speedier connections for analog calls to the router, use the **isdn incoming-voice** command with the **modem** keyword to have voice calls routed through digital modems (as pulse-code modulated analog data) instead of being treated as digital data.

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

**Note**

Use the **isdn incoming-voice modem** command only when you are using ISDN. You must use this command to carry voice over a modem when using ISDN PRI.

**Examples**

The following example designates incoming ISDN voice calls to be treated as voice calls:

```
interface 10
 isdn incoming-voice voice
```

The following 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
```

The following example routes all incoming voice calls through the modem as analog data:

```
interface BRI 0/0
 isdn incoming-voice modem
```

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 layer1-emulate

To configure the Layer 1 operation of a BRI voice port as clock master (NT) or slave (TE), use the **isdn layer1-emulate** command in interface configuration mode. To restore the default (user), use the **no** form of this command.

**isdn layer1-emulate** {user | network}

**no isdn layer1-emulate**

## Syntax Description

<b>user</b>	Physical interface operation in clock slave mode (as TE).
<b>network</b>	Physical interface operation in clock master mode (as NT).

## Defaults

Layer 1 port operation is as user (TE functionality as clock slave).

## Command Modes

Interface configuration

## Command History

Release	Modification
12.0(3)XG	This command was introduced on the MC3810.
12.1(3)XI	This command was implemented on the Cisco 2600 and Cisco 3600 series.

## Usage Guidelines

If you use the **no isdn layer1-emulate network** command, the physical layer port operation defaults to user.

## Examples

The following example configures the Layer 1 operation of a BRI voice port as QSIG clock slave (TE):

```
configure terminal
interface bri 1
isdn layer1-emulate user
```

## Related Commands

Command	Description
<b>isdn protocol-emulate (dial)</b>	Configures the Layer 2 and Layer 3 port protocol of a BRI voice port or a PRI interface to emulate NT (network) or TE (user) functionality.
<b>network-clock-priority</b>	Specifies the clock-recovery priority for the BRI voice ports in a BVM.

# isdn leased-line bri

To configure an ISDN BRI for leased-line service, or to configure both 64-kbps leased-line and ISDN service on the same BRI, use the **isdn leased-line bri** command in global configuration mode. To remove or change channel configurations, use the **no** form of this command.

**isdn leased-line bri** *number/number* [**b1** | **b2** | **128** | **144** | *Return-key*]

**no isdn leased-line bri** *number/number* [**b1** | **b2** | **128** | **144** | *Return-key*]

## Syntax Description

<i>number</i>	BRI interface numbers (enter the slash to separate the physical interface numbers).
<b>b1</b>	(Optional) Uses channel B1 as a 64-kbps leased line and channel B2 for ISDN service on a single ETSI NET3 switch on a Cisco 800 series router.
<b>b2</b>	(Optional) Uses channel B2 as a 64-kbps leased line and channel B1 for ISDN service on a single ETSI NET3 switch on a Cisco 800 series router.
<b>128</b>	(Optional) Combines B1 and B2 channels for 128-kbps leased-line service.
<b>144</b>	(Optional) Combines B1 and B2 channels for 144-kbps leased-line service.
<i>Return-key</i>	(Optional) Configures two 64-kbps leased lines instead of two B channels. Press the Return or Enter key at the end of the <b>isdn leased-line bri number/number</b> command instead of entering a keyword.

## Defaults

Disabled

## Command Modes

Global configuration

## Command History

Release	Modification
11.2 F	This command was introduced.
12.2(4)T	The <b>b1</b> and <b>b2</b> keywords were added to allow the BRI channels on an ETSI NET3 switch on a Cisco 800 series router to be split into leased-line and ISDN services.

## Usage Guidelines

Use the **isdn leased-line bri** command to configure an ISDN BRI for leased-line service by aggregating two BRI B channels into a single pipe at a speed of 128 or 144 kbps, or configuring both a 64-kbps leased line and ISDN service on a single European Telecommunications Standards Institute (ETSI) NET3 switch on Cisco 800 series routers.

This command also supports two separate 64-kbps leased lines, where the BRI interface is configured as two separate leased lines instead of two B channels. No keyword is required for this configuration; just press the Return or Enter key at the end of the **isdn leased-line bri number/number** command string. This configuration is different than using the **128** keyword, which configures a single 128-kbps leased line.

When you use the **no isdn leased-line bri** command to change the channel configuration, you must also perform a system reload in order for the change to take effect.

When you use an ISDN BRI interface for access over leased lines, configure the ISDN BRI as a synchronous serial interface and do not configure ISDN calling and called numbers.

---

**Examples**

The following example configures the BRI interface for leased-line access at 128 kbps in Japan:

```
isdn leased-line bri0/0 128
```

Because of the leased-line—not dialed—environment, configuration of ISDN called and calling numbers is not needed and not used. The BRI 0 interface is henceforth treated as a synchronous serial interface, with the default High-Level Data Link Control (HDLC) encapsulation.

The following example configures BRI channel B1 for 64-kbps leased-line service and channel B2 for ISDN service:

```
isdn switch-type basic-net3
isdn leased-line bri0/0 b1
!
interface bri0/0
 ip address 10.1.1.1 255.255.255.0
 no ip address
 dialer pool-member 1

interface bri0/0:1
 ip address 10.1.1.2 255.255.255.0
 encapsulation ppp
 no ip address
```

The following example configures two 64-kbps leased lines:

```
isdn leased-line bri0/0
```

---

**Related Commands**

Command	Description
<b>isdn switch-type (BRI)</b>	Specifies the central office switch type on the ISDN BRI interface.

# isdn logging

To enable logging of ISDN syslog messages, use the **isdn logging** command in global configuration mode. To disable logging, use the **no** form of this command.

**isdn logging**

**no isdn logging**

## Syntax Description

This command has no arguments or keywords.

## Defaults

This command is disabled by default.

## Command Modes

Global configuration

## Command History

Release	Modification
12.3(1)	This command was introduced.

## Usage Guidelines

This command supports syslog logging of the following ISDN events:

- ISDN Layer 2 Up and Down events at severity 3.
- ISDN SERV, SERV ACK, RESTART, RESTART ACK, and STATUS ENQ messages at severity 4.
- ISDN SERV status audit messages for various triggers at different severities.

## Examples

The following example shows how to configure ISDN syslog logging:

```
isdn logging
```

## Related Commands

Command	Description
<b>isdn bchan-number-order</b>	Configures an ISDN PRI interface to make outgoing call selection in ascending, descending, or round-robin order.
<b>isdn protocol-emulate</b>	Configures an ISDN data or voice port to emulate network or user functionality.

# isdn map

To override the default ISDN type and plan generated by the router with custom values, use the **isdn map** command in interface configuration mode. To revert to the default ISDN type and plan, use the **no** form of this command.

```
isdn map {address address | regexp | plan plan | type type}
```

```
no isdn map {address address | regexp | plan plan | type type}
```

## Syntax Description

<b>address</b> <i>address</i>	Address map, which can be to the calling, called, or redirecting number.
<b>regexp</b>	Regular expression for pattern matching.
<b>plan</b> <i>plan</i>	ISDN numbering plan.
<b>type</b> <i>type</i>	ISDN number type.

## Defaults

The default is the ISDN type and plan generated by the router.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.0(6)T	This command was introduced.

## Usage Guidelines

This function can be configured on a per-number basis or on numbers that match regular expression patterns. Keywords and arguments for any or all of the possible parameters can be included.

## Examples

The following example overrides any plan and type used for any ISDN calls with a called or calling number exactly matching 123:

```
int serial1:23
  isdn map address 123 plan isdn type unknown
```

The following example overrides any plan and type used for ISDN calls with a called or calling number that begins with the numerals 12:

```
int serial1:23
  isdn map address 12.* plan data type subscriber
```

The following example matches any number ending with the number 7:

```
int serial1:23
  isdn map address .*7 plan data type subscriber
```

# isdn modem-busy-cause

The **isdn modem-busy-cause** command is replaced by the **isdn disconnect-cause** command. See the [isdn disconnect-cause](#) command for more information.

# isdn negotiate-bchan

To enable the router to accept a B channel that is different from the B channel requested in the outgoing call setup message, use the **isdn negotiate-bchan** command in interface configuration mode. To restore the default condition, use the **no** form of this command.

**isdn negotiate-bchan** [**resend-setup**] [**cause-codes** *cause-code1* [*cause-code2...cause-code16*]]

**no isdn negotiate-bchan** [**resend-setup**] [**cause-codes** *cause-code1* [*cause-code2...cause-code16*]]

## Syntax Description

<b>resend-setup</b>	(Optional) Enables a single reattempt of a setup message if a disconnect message with a cause code of 44 is received before alerting. Supports NET5 and NI2 PRI switches only. (A Code 44 cause code means that the requested circuit or channel is not available. For more information, refer to the International Telecommunications Union [ITU] Q.850 standard.)
<b>cause-codes</b> <i>cause-code</i>	(Optional) Specifies up to 16 cause codes that will alert the gateway to reattempt a call. This reattempt may or may not be on the same B channel as the previous attempt. The value of each <i>cause-code</i> argument is a number from 1 to 127 corresponding to an ISDN cause code number.  If the <b>cause-codes</b> keyword is entered, at least one cause code must be entered or the command will not be accepted. Once the <b>cause-codes</b> keyword is entered, cause code 44 will no longer cause a call reattempt unless 44 is specifically entered as one of the cause codes.  <b>Note</b> The validity of each cause code is not checked by the gateway.

## Defaults

B channel negotiation is not enabled. Most PRI switch types set the default channel ID to Exclusive in the setup message. An exception is the NI2 switch, which sets the default to Preferred.

This command is the default for thunder dial and thunder voice configurations (Cisco SS7 Interconnect for voice and dial).

If the **cause-codes** keyword is not entered, it is assumed that you want ISDN cause code 44.

## Command Modes

Interface configuration

## Command History

Release	Modification
11.3	This command was introduced.
12.2	The <b>resend-setup</b> keyword was implemented for NET5 and NI2 PRI switches.
12.2(15)T	The <b>cause-codes</b> keyword was implemented on the Cisco AS5350 and Cisco AS5400.

**Usage Guidelines**

The **isdn negotiate-bchan** command enables the router to negotiate the B channel by setting the channel ID information element to Preferred in the setup message. If this command is not configured, the channel ID is set to the default of the switch, which is usually Exclusive. Exclusive means that only the requested B channel is accepted. If the requested B channel is not available, the call is cleared.

The **isdn negotiate-bchan** command is supported for all PRI switch types. The **resend-setup** keyword is supported only for NET5 and NI2 switches. This command is not supported for BRI interfaces.

The **cause-codes** keyword allows you to configure the gateway to reattempt a call when a cause code other than 44 is received from the PSTN.

This command is automatically created when the **isdn rlm-group** is configured under D channel.

Refer to the “ISDN Cause Codes” table in the appendix of the [Cisco IOS Debug Command Reference](#) for a list of ISDN cause codes.

**Examples**

The following example enables a call to be reattempted when a disconnect with cause code of 44 is received before alerting:

```
interface serial0:23
 isdn negotiate-bchan resend-setup
```

The following example shows that cause codes 34, 44, and 63 have been configured:

```
interface serial0:23
 isdn negotiate-bchan resend-setup cause-codes 34 44 63
```

**Related Commands**

Command	Description
<b>isdn bchan-number-order</b>	Configures an ISDN PRI interface to make an outgoing call selection in ascending or descending order.
<b>isdn switch-type (PRI)</b>	Specifies the Central Office switch type on the ISDN PRI interface.

## isdn not-end-to-end

To override the speed that the network reports it will use to deliver the call data, use the **isdn not-end-to-end** command in interface configuration mode. To disable the configured end-to-end speed, use the **no** form of this command.

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

**no isdn not-end-to-end**

### Syntax Description

<b>56</b>	Answers all voice calls at 56 kbps.
<b>64</b>	Answers all voice calls at 64 kbps.

### Defaults

The default line speed is 64 kbps.

### Command Modes

Interface configuration

### Command History

Release	Modification
10.3	This command was introduced.

### Usage Guidelines



#### Note

The **isdn not-end-to-end** command is valid only when an incoming Layer 3 Setup message contains a Progress Information Element in the message. The command is validated on a call-by-call basis, depending upon the message.

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.

### Examples

The following example sets the line speed for incoming calls to 56 kbps:

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

# isdn number

To change the maximum number of digits in a called number information element, use the **isdn number** command in interface configuration mode.

**isdn number** [**called enbloc** *limit*]

## Syntax Description

<b>called</b>	Attributes for the ISDN number of the called party.
<b>enbloc</b>	Allows the ISDN terminal to send the ISDN number of the called party in a single SETUP message.
<i>limit</i>	Maximum number of digits allowed in a SETUP message, in the range from 1 to 32.

## Defaults

20 digits

## Command Modes

Interface configuration

## Command History

Release	Modification
12.2	This command was introduced.

## Usage Guidelines

The maximum number of digits sent in the initial call SETUP is defaulted to 20 digits. The default of 20 digits chosen because some switches cannot handle more than 20 digits. Some countries in Europe are changing their calling plans and will require calls to be made using more than 20 digits.

The **isdn number called enbloc** command is used when the maximum number of octets in the called number information element in a SETUP message must be changed from the 20-digit default to the user desired limit. With this command, the user can configure the maximum number from 1 to 32 digits. This command is available for ISDN interfaces and applicable to both BRI and PRI interfaces.



### Note

This command is enabled for only the following switch types:  
 BRI\_NET3\_STYPE  
 PRI\_NET5\_SYTPE

## Examples

The following example configures the called number information element for 32 digits:

```
Router(config-if) isdn number called enbloc 32
```

# isdn nsf-service

To configure Network Specific Facilities (NSF) on an ISDN PRI for outgoing calls configured as voice calls, use the **isdn nsf-service** command in interface configuration mode. To remove NSF on an ISDN PRI, use the **no** form of this command.

```
isdn nsf-service {megacom | sdn}
```

```
no isdn nsf-service {megacom | sdn}
```

## Syntax Description

<b>megacom</b>	Dial voice calls using AT&T Megacom NSF.
<b>sdn</b>	Dial voice calls using AT&T SDN NSF.

## Defaults

Disabled

## Command Modes

Interface configuration

## Command History

Release	Modification
11.3(5)T	This command was introduced.

## Usage Guidelines

This command is used specifically on a PRI (channelized T1) to request NSF services supported on primary AT&T 4ESS (**primary-4ess**) switch types only.

## Examples

The following example sets outgoing voice calls to use AT&T SDN NSF:

```
interface serial 0:23
 isdn-nsf-service sdn
```

## Related Commands

Command	Description
<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
<b>dialer voice-call</b>	Configures the dialer map class for an NSF dialing plan to support outgoing voice calls.
<b>map-class dialer</b>	Defines a class of shared configuration parameters associated with the dialer map command for outgoing calls from an ISDN interface and for PPP callback.

# isdn outgoing ie redirecting-number

To enable passing of the redirect number information element (IE) from the Cisco router to its peer, use the **isdn outgoing ie redirecting-number** command in interface configuration mode. To disable passing of the redirect number IE from the Cisco router to its peer, use the **no** form of this command.

**isdn outgoing ie redirecting-number**

**no isdn outgoing ie redirecting-number**

## Syntax Description

This command has no arguments or keywords.

## Defaults

The redirecting number IE will be passed in the setup message for the following switch types only by default:

- basic-dms100
- basic-ni
- primary-dms100
- primary-4ESS
- primary-5ESS
- primary-ni
- primary-ni2c

For all other switch types, the redirecting number IE will not be passed by default.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.2(15)T5	This command was introduced.
12.3(2.1)	This command was introduced.

## Usage Guidelines

Use the **isdn outgoing ie redirecting-number** command to enable passing of the redirect number IE from the Cisco router to its peer. Some switch types do not support the redirect number IE, so to ensure compatibility with a peer that does support the redirect number IE you may enable the passing of the redirect number IE using the **isdn outgoing ie redirecting-number** command.



### Note

When the **isdn protocol-emulate** command is switched between network and user, this command reverts to its default value. The **isdn outgoing ie redirecting-number** command must be enabled again for switch types that are not enabled by default.

---

**Examples**

The following example enables the passing of the redirect number IE for a NET5 switch on a serial interface:

```
interface Serial 0:15
 isdn outgoing ie redirecting-number
```

---

**Related Commands**

Command	Description
<b>isdn protocol-emulate</b>	Configures an ISDN data or voice port to emulate network or user functionality.

---

# isdn outgoing-voice

To set information transfer capability on outgoing calls for all switch types, use the **isdn outgoing-voice** command in interface configuration mode. To revert to the default state, use the **no** form of this command.

```
isdn outgoing-voice {info-transfer-capability {3.1kHz-audio | speech}}
```

```
no isdn outgoing-voice
```

## Syntax Description

<b>info-transfer-capability</b>	Specifies information transfer capability for voice calls.
<b>3.1kHz-audio</b>	Sets capability to 3.1 kHz audio.
<b>speech</b>	Sets capability to speech.

## Defaults

No information transfer capabilities set.

## Command Modes

Interface configuration

## Command History

Release	Modification
11.3	This command was introduced.

## Usage Guidelines

This command is used on outgoing voice calls only, and sets standard information transfer capability.

## Examples

The following example sets information transfer capability on outgoing voice calls to speech:

```
interface serial 0:23
 isdn outgoing-voice info-transfer-capability speech
```

## Related Commands

Command	Description
<b>isdn incoming-voice</b>	Specifies how to process incoming ISDN voice and data calls.

# isdn overlap-receiving

To enable overlap receiving on an ISDN interface, use the **isdn overlap-receiving** command in interface configuration mode. To disable overlap receiving on an ISDN interface, use the **no** form of this command.

**isdn overlap-receiving** [**T302** *milliseconds*]

**no isdn overlap-receiving**

<b>Syntax Description</b>	<b>T302</b> <i>milliseconds</i>	(Optional) The number of milliseconds that the T302 timer should wait before expiring. Valid values for the <i>milliseconds</i> argument range from 500 to 20000. The default value is 10000 (10 seconds).
---------------------------	---------------------------------	--

<b>Defaults</b>	Overlap receiving is not enabled.
-----------------	-----------------------------------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.1	This command was introduced.

<b>Usage Guidelines</b>	In some situations, the default timer value of the T302 timer is too long. You can shorten the duration of the timer by specifying the <b>T302</b> keyword with the number of milliseconds necessary.
-------------------------	---

When configuring outbound peer matching and overlap receiving, use the **isdn overlap-receiving** command with the **destination-pattern** command. You must configure the commands to allow the router to wait for all the digits to be received before the call is routed. To do this, use the **T** control character after the digits in the destination pattern specified with the **destination-pattern** command. Optionally, you can shorten the duration of the T302 timer when you specify the **isdn overlap-receiving** command.

<b>Examples</b>	The following example shows how to enable overlap receiving on the ISDN interface:
-----------------	--

```
interface serial 0:23
 isdn overlap-receiving
```

The following example shows how to enable overlap receiving on the ISDN interface and set the T302 timer to 2 seconds:

```
interface serial 0:23
 isdn overlap-receiving T302 2000
```

Related Commands	Command	Description
	<b>destination-pattern</b>	Specifies either the prefix or full E.164 telephone number to be used for a dial peer.
	<b>isdn service</b>	Takes an individual B channel or an entire PRI interface out of service or sets it to a different channel service state that is passed in to the switch.

# isdn overlap-receiving calltypes all

To enable overlap receiving for all call types, use the **isdn overlap-receiving calltypes all** command in interface configuration mode. To disable overlap receiving for all call types, use the **no** form of this command.

**isdn overlap-receiving calltypes all**

**no isdn overlap-receiving calltypes all**

**Syntax Description** This commands has no arguments or keywords.

**Defaults** Overlap receiving is not enabled.

**Command Modes** Interface configuration

Command History	Release	Modification
	12.2(13)T	This command was introduced.

**Usage Guidelines** The **isdn overlap-receiving calltypes all** command enables overlap receiving for all nonvoice calls that use data dial peers, and it enables an ISDN interface to proceed with a call when a sufficient number of digits are received. These digits are determined by the **destination-pattern** command under the data dial peer configuration.

This command is supported on the Cisco AS5350, Cisco AS5400, and Cisco AS5850 routers.

**Examples** The following example shows how to enable overlap receiving:

```
interface serial 0:23
 isdn overlap-receiving calltypes all
```

Related Commands	Command	Description
	<b>destination-pattern</b>	Specifies either the prefix or full E.164 telephone number to be used for a dial peer.
	<b>dial-peer no-match disconnect-cause</b>	Disconnects the incoming ISDN or CAS call when no inbound voice or modem dial peer is matched.
	<b>isdn overlap-receiving</b>	Enables overlap receiving on an ISDN interface.

# isdn piafs-enabled

To enable the PRI to take Personal Handyphone Internet Access Forum Standard (PIAFS) calls on MICA technologies modems, use the **isdn piafs-enabled** command in interface configuration mode. To disable the function, use the **no** form of this command.

**isdn piafs-enabled**

**no isdn piafs-enabled**

**Syntax Description** This command has no arguments or keywords.

**Defaults** No default behavior or values.

**Command Modes** Interface configuration

Command History	Release	Modification
	12.1(2)XH	This command was introduced on the Cisco AS5300.
	12.1(3)T	This command was integrated into Cisco IOS Release 12.1(3)T.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T and support was added for the Cisco AS5800.
	12.2(2)XA	Support was added for PIAFS version 2.1 using Cisco MICA 8.2.3.0 was added. <b>Note</b> PIAFS 2.1 is not supported on Cisco AS5800 universal access servers for this release.
	12.2(2)XB1	This command was implemented on the Cisco AS5800 platform.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

**Examples** The following example shows how to enable the PRI to take PIAFS calls:

```
Router(config)# interface serial 0:23
Router(config-if)# isdn piafs-enabled
```

# isdn point-to-point-setup

To configure the ISDN port to send SETUP messages on the static terminal endpoint identifier (TEI), use the **isdn point-to-point-setup** command in interface configuration mode. To restore the default, use the **no** form of this command.

**isdn point-to-point-setup**

**no isdn point-to-point-setup**

**Syntax Description** This command has no arguments or keywords.

**Defaults** The BRI port sends SETUP messages on the static TEI (TEI 127).

**Command Modes** Interface configuration

Command History	Release	Modification
	12.1(3)XI	This command was introduced.

**Usage Guidelines** This command only applies if a static TEI has been activated with the **isdn static-tei command**.

**Examples** The following example configures the BRI port to send SETUP messages on the static TEI:

```
interface bri 1
isdn point-to-point-setup
```

Related Commands	Command	Description
	<b>isdn tei-negotiation (global)</b>	Configures when Layer 2 becomes active and ISDN TEI negotiation occurs.

# isdn protocol-emulate (dial)

To configure the Layer 2 and Layer 3 port protocol of a BRI voice port or a PRI interface to emulate NT (network) or TE (user) functionality, use the **isdn protocol-emulate** command in interface configuration mode. To restore the default (user), use the **no** form of this command.

**isdn protocol-emulate** {user | network}

**no isdn protocol-emulate**

## Syntax Description

<b>user</b>	Specifies Layer 2 and Layer 3 port protocol operation as TE (port functions as QSIG slave).
<b>network</b>	Specifies Layer 2 and Layer 3 port protocol operation as NT (port functions as QSIG master).

## Defaults

The port functions as QSIG slave.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.0(3)XG	This command was introduced on the following platforms: Cisco 2600 series, Cisco 3600 series, and Cisco MC3810 concentrator.
12.3	This command was enhanced to support network emulation capability on the Lucent 4ESS, 5ESS, and Nortel DMS-100 ISDN switch types. These switch types can be configured as network, but no additional changes were made and not all network side features are supported.

## Usage Guidelines

You can use this command to configure the Cisco AS5300 PRI interface to serve as either the primary QSIG slave or the primary QSIG master. To disable QSIG signaling, use the **no** form of this command.

If you use the **no isdn protocol-emulate** command, the Layer 2 and Layer 3 protocol emulation defaults to user.

## Examples

The following example configures the Layer 2 and Layer 3 function of T1 PRI interface 23 to act as the QSIG master (NT):

```
interface serial 1:23
 isdn protocol-emulate network
```

The following example configures the Layer 2 and Layer 3 function of a BRI voice port to operate as QSIG slave (TE):

```
interface bri 1
 isdn protocol-emulate user
```

The following example configures the Layer 2 and Layer 3 function of an E1 PRI interface to operate as QSIG slave (TE):

```
interface serial 4:23
 isdn protocol-emulate user
```

#### Related Commands

Command	Description
<b>isdn</b>	Configures an ISDN PRI interface to make outgoing call selection in ascending, descending, or round-robin order.
<b>bchan-number-order</b>	
<b>isdn logging</b>	Enables logging of ISDN syslog messages.
<b>isdn switch-type (PRI)</b>	Specifies the central office switch type on the ISDN PRI interface.
<b>network-clock-priority</b>	Specifies the clock-recovery priority for the BRI voice ports in a BVM.
<b>pri-group nec-fusion</b>	Configures the NEC PBX to support FCCS.
<b>show cdapi</b>	Displays the CDAPI.
<b>show rawmsg</b>	Displays the raw messages owned by the required component.

# isdn reject

To reject an incoming ISDN BRI or PRI call based on type, use the **isdn reject** command in interface configuration mode. To re-allow the incoming call type, use the **no** form of this command.

```
isdn reject {{cause cause-code} {data [56 | 64]} | piafs | v110 | v120 | vod | {voice [3.1khz | 7khz | speech]}}
```

```
no isdn reject {{cause cause-code} {data [56 | 64]} | piafs | v110 | v120 | vod | {voice [3.1khz | 7khz | speech]}}
```

## Syntax Description

<b>cause</b> <i>cause-code</i>	Rejects call based on cause code value.
<b>data</b> [56   64]	Rejects incoming data call. If the optional <b>56</b> or <b>64</b> keyword is not specified, all data calls, including data over voice, are rejected. Use the optional <b>56</b> keyword to reject data coming in at 56 kbps. Use the optional <b>64</b> keyword to reject data coming in at 64 kbps.
<b>piafs</b>	Rejects incoming Personal Handyphone Internet Access Forum Standard (PIAFS) calls.
<b>v110</b>	Rejects incoming V.110 calls.
<b>v120</b>	Rejects incoming V.120 calls.
<b>vod</b>	Rejects incoming voice-over-data calls, or calls characterized by 64 kbps unrestricted digital data. Although the bearer capability for these calls indicates an incoming data call, the call is treated as voice over data. See the “Usage Guidelines” for more information.
<b>voice</b> [3.1khz   7khz   speech]	Rejects incoming voice and modem calls characterized by one of three information transfer capability types: 3.1 kHz, 7 kHz, and speech, which are defined by using, in corresponding order, the <b>3.1khz</b> , <b>7khz</b> , and <b>speech</b> keywords. If none of the optional keywords is used, all voice calls except voice over data are rejected.

## Defaults

Incoming calls are rejected based on D-channel bearer capability information (cause code 65).

## Command Modes

Interface configuration

## Command History

Release	Modification
12.0	This command was introduced.
12.2	The <b>cause cause-code</b> keyword and argument were added.

## Usage Guidelines

The **isdn reject** command rejects incoming calls based on D-channel bearer capability information. If this command is configured with the **cause cause-code** keyword and argument, it will override the default value and use the configured cause code specified to reject the call. For example, if the **isdn reject data** command is configured so that data calls are rejected with cause code set to 65 (“bearer

capability not implemented” and the default), you can change the cause code to 2, so that data calls will then be rejected with cause code 2. Refer to the *ISDN Switch Types, Codes, and Values* appendix in the *Cisco IOS Debug Command Reference* for a list of ISDN cause code values.

The settings for the **isdn incoming-voice** interface configuration command determine how the call is handled based on bearer capability information, as follows:

- **isdn incoming-voice voice**—Calls bypass the modem and are handled as a voice call.
- **isdn incoming-voice data**—Calls bypass the modem and are handled as digital data.
- **isdn incoming-voice modem**—Calls are passed to a digital modem and the call negotiates the appropriate modem connection with the far-end modem.

When the ISDN interface is configured for incoming voice with the **isdn incoming-voice voice** command and the ISDN bearer capability indicates the call as unrestricted digital data (i = 0x8890), the call is handled as voice over data.

You can assign as many reject incoming call type statements as needed to reject unwanted calls on the ISDN interface.

This command works on any Cisco platform that supports ISDN PRI and BRI interfaces.

## Examples

The following example configuration rejects all incoming data and voice-over-data calls but accepts voice calls:

```
interface serial 2/0:23
  no ip address
  no logging event link-status
  dialer-group 1
  isdn switch-type primary-net5
  isdn incoming-voice voice
  isdn map address 222 plan isdn type national
  isdn T309 80000
  isdn reject data
  isdn reject vod
  isdn reject v120
  isdn reject v110
  isdn reject piafs
```

The following example sets the ISDN interface to reject incoming PIAFS calls:

```
interface serial 2/0:23
  isdn reject piafs
```

The following example sets cause code 21 to reject all incoming data calls:

```
interface serial 2/0:23
  isdn reject data
  isdn reject cause 21
```

## Related Commands

Command	Description
<b>isdn incoming-voice</b>	Specifies how to process incoming ISDN voice and data calls.

# isdn send-alerting

To specify that an Alerting message be sent before a Connect message when making ISDN calls, use the **isdn send-alerting** command in interface configuration mode. To disable the Alerting information element, use the **no** form of this command.

**isdn send-alerting**

**no isdn send-alerting**

**Syntax Description** This command has no arguments or keywords.

**Defaults** This command is disabled by default.

**Command Modes** Interface configuration

Command History	Release	Modification
	11.3	This command was introduced.

**Usage Guidelines** Some switches may want an Alerting message to be sent by the router before sending a Connect message. This is usually seen in a voice and data type of network.

**Examples** In the following example, the **isdn send-alerting** command applies to an ISDN BRI interface:

```
interface BRI0
description connected to PBX 61886
ip address 172.26.1.1 255.255.255.0
encapsulation ppp
isdn send-alerting
isdn sending-complete
dialer idle-timeout 20
dialer map ip 172.26.1.2 name rudder 61884
dialer map ip 172.26.1.3 name bosun 61885
dialer-group 1
ppp authentication chap
```

Related Commands	Command	Description
	<b>isdn sending-complete</b>	Specifies that the Sending Complete IE is included in the outgoing Setup message.

# isdn sending-complete

To specify that the Sending Complete information element (IE) is included in the outgoing Setup message, use the **isdn sending-complete** command in interface configuration mode. To disable the Sending Complete information element, use the **no** form of this command.

**isdn sending-complete**

**no isdn sending-complete**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** This command is disabled by default.

---

**Command Modes** Interface configuration

---

Command History	Release	Modification
	11.2	This command was introduced.

---



---

**Usage Guidelines** The Sending Complete IE tells the switch that all the digits and information necessary for the call are contained in this Setup message.

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.

---

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

```
interface BRI0
  description connected to PBX 61886
  ip address 172.31.1.1 255.255.255.0
  encapsulation ppp
  isdn sending-complete
  dialer idle-timeout 20
  dialer map ip 172.31.1.2 name rudder 61884
  dialer map ip 172.31.1.3 name bosun 61885
  dialer-group 1
  ppp authentication chap
```

The following example enables sending complete IE information on a serial interface:

```
interface serial 0:15
description connected to PBX 61886
ip address 10.1.1.1 255.255.255.0
encapsulation ppp
isdn sending-complete
dialer idle-timeout 20
dialer map ip 10.1.1.2 name rudder 61884
dialer map ip 10.1.1.3 name goodie 61885
dialer-group 1
ppp authentication chap
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>isdn send-alerting</b>	Specifies that an Alerting message be sent before a Complete message when making ISDN calls.

---

## isdn service

To take an individual B channel or an entire PRI interface out of service or set it to a different channel service state that is passed to a time-division multiplexing (TDM) switch at the Public Switched Telephone Network (PSTN), use the **isdn service** command in interface configuration mode. To remove the configuration, use the **no** form of the command.

```
isdn service [dsl number | nfas-int number] b_channel number {state {0 | 1 | 2} [hard | immediate | soft]}
```

```
no isdn service
```

### Syntax Description

<b>dsl</b> <i>number</i>	(Optional) Digital subscriber loop number; displayed with the <b>show isdn status</b> command. DSL numbers range from 0 to 31.
<b>nfas-int</b> <i>number</i>	(Optional) The Non-Facility Associated Signaling (NFAS) member interface number that has a B channel or channels to which you want to do maintenance.
<b>b_channel</b> <i>number</i>	B channel, or a range of B channels separated by a dash, to be set with the passed-in state value. Specifying <i>number</i> as 0 sets the entire PRI interface to a specific state value. B channel numbers range from 0 to 31, or 0 for the complete interface.
<b>state</b> { <b>0</b>   <b>1</b>   <b>2</b> } [ <b>hard</b>   <b>immediate</b>   <b>soft</b> ]	<p>Desired channel service state to be set on the channels. Note that the ISDN service messages are sent only for switch types that support them. A state change from lower availability to higher availability is possible only after a service acknowledgment (SERV ACK) message is received. The following channel service state values are supported:</p> <ul style="list-style-type: none"> <li><b>0</b>—In Service. Restore a channel or channels to service.</li> <li><b>1</b>—Maintenance. An intermediate state between In Service and Out of Service.</li> <li><b>2</b>—Out of Service (OOS). Take a channel or channels out of service. The switch might drop calls on active channels.</li> </ul> <p>Additionally, you can provide one of the following optional keywords to control when to modify the state of the B channel or channels:</p> <ul style="list-style-type: none"> <li>• <b>hard</b>—(Optional) Sends the service (SERV) message immediately, even if the channel is active, and clears the call if there is any. If there is no active call, this keyword has the same effect as using the <b>immediate</b> keyword.</li> <li>• <b>immediate</b>—(Optional) This keyword is the default. It sends the service message, but does not clear the call. The switch might clear the active channels if the state is changed to Maintenance or OOS.</li> <li>• <b>soft</b>—(Optional) Moves the active channel or channels to a pending change state. The service message is sent after the channel becomes idle.</li> </ul>

**Defaults** Disabled

**Command Modes** Interface configuration

Command History	Release	Modification
	11.3	This command was introduced.
	12.2	The <b>dsl</b> keyword was made optional.
	12.3	The <b>hard</b> , <b>immediate</b> , and <b>soft</b> keywords were added as <b>state</b> keyword options.

**Usage Guidelines** Use this command to manage channels on ISDN NFAS and Primary Rate Interfaces (PRI) on Cisco routers.

Use the **b\_channel 0** keywords to set the entire PRI interface to the specified state value.

Use the optional **soft** and **immediate state** keywords to take switches down gracefully, without impacting calls in progress. The **hard** keyword sends an immediate service message to the connected switch that will disconnect active B channels and drop active calls.

To display the digital subscriber loop (DSL) number on NFAS interfaces, use the **show isdn service EXEC** command. To find the NFAS interface value, use the **pri-group T1** controller configuration command.

This command can be used only on North American switch types, because it supports the service message.

**Examples** The following example sets all the PRI B channel on the interface to the maintenance state:

```
isdn service b_channel 0 state 1
```

The following example restores B channels 2 through 4; the DSL number was obtained using the **show isdn** command with the **status** keyword, and the DSL number was then used in the command:

```
isdn service dsl 2 b_channel 2-4 state 0
```

The following example sets B channels 13 to 24 to the OOS state:

```
isdn service nfas-int 3 b_channel 13-24 state 1
```

In the following example, the first statement sets B channels 17 through 20 to the maintenance state and marks any busy B channel (or channels) as pending; the channel will change to the service state only when it becomes idle. The second statement will cause the service message to be sent immediately and will clear the call. If there is no call, the second statement will have the same effect as the **immediate** keyword, that is, it will send the service message, but will not clear the call.

```
isdn service b_channel 17-20 state 1 soft
isdn service b_channel 21 state 1 hard
```

## Related Commands

Command	Description
<b>isdn bcac service audit</b>	Enables service audits on an interface configured for BCAC.
<b>isdn bcac service audit interface</b>	Specifies that the BCAC service audit needs to be triggered on the entire interface.
<b>isdn bcac service audit trigger</b>	Enables individual BCAC service triggers.
<b>isdn bcac service retry in-serv-on-fail</b>	Specifies that the BCAC service state of the channel needs to be changed to In Service because no acknowledgment was received.
<b>isdn bcac service retry max</b>	Specifies the maximum number of times a BCAC service message can be retransmitted when unacknowledged.
<b>isdn bcac service timer</b>	Changes the value of the BCAC T3M1 or T323 service message timer.
<b>isdn bcac service update linkup</b>	Triggers updates of the BCAC service states between peer nodes through exchange of SERV and SERV ACK messages.
<b>isdn bcac service update provision</b>	Enables the functionality of service status for provisioning ISDN PRI B channels.
<b>show isdn</b>	Displays the information about memory, Layer 2 and Layer 3 timers, and the status of PRI channels.

# isdn silent-boot

To prevent the transmission and receipt of ISDN packets by the router during the bootstrap loading process, use the **isdn silent-boot** command in global configuration mode. To allow the transmission and receipt of ISDN packets by the router during the bootstrap loading process, use the **no** form of this command.

**isdn silent-boot**

**no isdn silent-boot**

---

**Syntax Description**

This command has no arguments or keywords.

---

**Defaults**

The transmission and receipt of ISDN packets by the router is allowed during the bootstrap process.

---

**Command Modes**

Global configuration

---

**Command History**

Release	Modification
12.2	This command was introduced.

---

**Usage Guidelines**

ISDN traffic will not be sent from any interfaces on the router (ISDN BRI or PRI) when you use the **isdn silent-boot** command. Disabling the ISDN traffic on the router is appropriate when the router is part of a hunt group that is accepting incoming ISDN calls because you do not want the router to receive calls until after it has reloaded and is ready to accept the incoming calls.

---

**Examples**

The following example disables ISDN traffic:

```
Router(config)# isdn silent-boot
```

# isdn snmp busyout b-channel

To enable PRI B channels to be busyout via SNMP, use the **isdn snmp busyout b-channel** command in interface configuration mode. To prevent B channels from being busyout via SNMP, use the **no** form of this command.

**isdn snmp busyout b-channel**

**no isdn snmp busyout b-channel**

## Syntax Description

This command has no arguments or keywords.

## Defaults

The default value is TRUE; that is, setting busyout using SNMP is allowed.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.1(3)T	This command was introduced.

## Usage Guidelines

To busy out B-channels on a PRI, the ISDN switch must support service messages. The **isdn snmp busyout b-channel** command sets the MIB object, `cpmDS0BusyoutAllow`, indicating whether or not the switch supports service messages, thereby allowing the busyout of B channels. When the network access server receives an SNMP request for a busyout, it checks the value of this object. If the **no isdn snmp busyout b-channel** command is configured, the busyout request fails.

## Examples

The following example allows the busyout of B-channels for serial interface 0:23:

```
configure terminal
interface serial 0:23
isdn snmp busyout b-channel
```

## isdn spid1, isdn spid2

To associate up to three ISDN local directory numbers (LDNs) provided by your telephone service provider to the first service profile identifier (SPID), use the **isdn spid1** command in interface configuration mode. To disable the specified SPID and prevent access to the switch, use the **no** form of this command.

```
isdn spid1 spid-number ldn [ldn] [ldn]
```

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

To associate up to three ISDN LDNs provided by your telephone service provider to the second service SPID, use the **isdn spid2** interface configuration command. To disable the specified SPID and prevent access to the switch, use the **no** form of this command.

```
isdn spid2 spid-number ldn [ldn] [ldn]
```

```
no isdn spid2 spid-number ldn [ldn] [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 additional digits such as 40855522220101.
<i>ldn</i>	(Optional) ISDN LDN, which is a 7-digit number assigned by the service provider. You can optionally specify a second and third LDN.

### Defaults

A default SPID number and ISDN local directory numbers are not defined.

### Command Modes

Interface configuration

### Command History

Release	Modification
10.3	This command was introduced.
12.0(3)T	This command was enhanced with the option of associating the SPID with up to three LDNs.

### Usage Guidelines

This command applies only to North America and is required for DMS-100 and National ISDN switches. Typically, DMS-100 and National ISDN switch implementations using BRI interfaces with SPIDS require two TEIs, two SPIDS, and two phone numbers. If you want to take advantage of both B channels, it is advised you configure the router with the LDN value after the SPID.

**Note**

Some DMS-100 and National ISDN switch installations may be configured as a “hunt group” whereby all calls are initially forwarded to the primary number. Under these circumstances, you should not configure the LDN. You can determine this by enabling the **debug isdn q931** command. If the endpoint identifier (EID) information element is delivered in the incoming setup message, then the switch is addressing the TEIs with the EID, instead of the LDN.

If you want the SPID to be automatically detected, you can specify 0 for the *spid-number* argument.

The ISDN switch checks for the LDN to determine whether both channels can be used to transmit and receive data. If there is not an LDN present, then only the B1 channel can be used for full-duplex communication. However, the B2 channel can still be used to make outgoing calls.

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.

**Examples**

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

```
isdn spid1 41555512130101 5551213
```

The following example shows how to specify that the SPID should be automatically detected, that the primary ISDN local directory number is 4085551111, and that the secondary number is 4085552222:

```
isdn spid1 0 4085551111 4085552222
```

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

```
isdn spid2 41555512140101 5551214
```

The following example specifies that the SPID should be automatically detected, that the primary ISDN local directory number is 4085551111, and that the secondary number is 4085552222:

```
isdn spid2 0 4085551111 4085552222
```

**Related Commands**

Command	Description
<b>isdn autodetect</b>	Enables the automatic detection of ISDN SPIDs and switch type.

# isdn static-tei

To configure a static ISDN Layer 2 terminal endpoint identifier (TEI) over the D channel, use the **isdn static-tei** command in interface configuration mode. To remove a static TEI configuration, use the **no** form of this command.

```
isdn static-tei tei-number
```

```
no isdn static-tei tei-number
```

## Syntax Description

*tei-number* Terminal endpoint identifier, in the range from 0 to 63.

## Defaults

Dynamic TEI (**no isdn static-tei**)

## Command Modes

Interface configuration

## Command History

Release	Modification
11.3	This command was introduced.

## Usage Guidelines

Depending on the telephone company you subscribe to, you may have a dynamically or statically assigned TEI for your ISDN service. The default TEI behavior is dynamic, and the **isdn static-tei** command changes that behavior to static for the specified service.

When you reconfigure a TEI with the **isdn static-tei** command, you must activate the configuration using the **shutdown** and **no shutdown** commands.

## Examples

The following example configures German Anlagenanschluss ISDN lines. These lines are often provided in a group intended to be connected to single ISDN device such as a private branch exchange. To use the Anlagenanschluss ISDN lines on a Cisco router, you must set the TEI to 0, as follows:

```
Router# configure terminal
Router(config)# interface bri 0
Router(config-if)# isdn static-tei 0
Router(config-if)# shutdown
Router(config-if)# no shutdown
```

## Related Commands

Command	Description
<b>interface bri</b>	Configures a BRI interface and enters interface configuration mode.
<b>isdn x25 static-tei</b>	Configure a static TEI for X.25 over the ISDN D channel.
<b>shutdown</b>	Disables an interface.

## isdn switch-type (BRI)

To specify the central office switch type on the ISDN interface, use the **isdn switch-type** command in global or interface configuration mode. To remove an ISDN switch type, use the **no** form of this command.

**isdn switch-type** *switch-type*

**no isdn switch-type** *switch-type*

### Syntax Description

*switch-type* ISDN service provider switch type. [Table 11](#) in the “Usage Guidelines” section lists the supported switch types.

### Defaults

No ISDN switch type is specified.

### Command Modes

Global configuration or interface configuration



#### Note

This command can be entered in either global configuration or interface configuration mode. When entered in global configuration mode, the **basic-qsig** switch type command specifies that the Cisco MC3810 use QSIG signaling on all BRI interfaces; when entered in interface configuration mode, the command specifies that an individual BRI voice interface use QSIG signaling. The interface configuration mode setting overrides the global configuration setting on individual interfaces.

### Command History

Release	Modification
9.21	This command was introduced as a global command.
11.3 T	This command was introduced as an interface command.
12.0(3)XG	The <b>basic-qsig</b> and <b>primary-qsig</b> switch type options were added to support BRI QSIG voice signaling.

### Usage Guidelines

For the Cisco AS5300 access server, you have the choice of configuring the **isdn-switch-type** command to support Q.SIG in either global configuration mode or interface configuration mode. When entered in global configuration mode, the setting applies to the entire Cisco AS5300 access server. When entered in interface configuration mode, the setting applies only to the T1/E1 interface specified. The interface configuration mode setting overrides the global configuration setting.

For example, if you have a Q.SIG connection on one line as well as on the PRI port, you can configure the ISDN switch type in one of the following combinations:

- Set the global **isdn-switch-type** command to support Q.SIG and set the interface **isdn-switch-type** command for **interface serial 0:23** to a PRI setting such as 5ess.
- Set the global **isdn-switch-type** command to support PRI 5ess and set the interface **isdn-switch-type** command for **interface serial 1:23** to support Q.SIG.
- Configure the global **isdn-switch-type** command to another setting (such as switch type VN3), set the interface **isdn-switch-type** command for **interface serial 0:23** to a PRI setting, and set the interface **isdn-switch-type** command for **interface serial 1:23** to support Q.SIG.

For the Cisco MC3810 router, if you are using different Cisco MC3810 BRI port interfaces with different ISDN switch types, you can use global and interface commands in any combination, as long as you remember that interface commands always override a global command.

For example, if you have a BRI QSIG switch interface on BRI voice ports 1, 2, 3 and 4, but a BRI 5ess switch interface on BRI backup port 0, you can configure the ISDN switch types in any of the following combinations:

- Enter the **isdn switch-type basic-qsig global configuration command**, and enter the **isdn switch-type bri-5ess command** on interface 0.
- Enter the **isdn switch-type bri-5ess** global configuration command, and enter the **isdn switch-type basic-qsig command** on interfaces 1, 2, 3, and 4 individually.
- Enter the **isdn switch-type bri-5ess** command on interface 0, and enter the **isdn switch-type basic-qsig command** on interfaces 1, 2, 3, and 4 individually.

If you use the **no isdn switch-type** global configuration command, any switch type that was originally entered in global configuration mode is canceled; however, any switch type originally entered on an interface is not affected. If you use the **no isdn switch-type** interface configuration command, any switch type configuration on the interface is canceled.

**Note**

In the Cisco MC3810, ISDN BRI voice ports support *only* switch type **basic-qsig**; ISDN BRI backup ports support all other listed switch types, but *not* **basic-qsig**.

**Note**

The dial-peer **codec** command must be configured before any calls can be placed over the connection to the PINX. The default codec type is G729a.

If you are using the Multiple ISDN Switch Types feature to apply ISDN switch types to different interfaces, refer to the chapters “Configuring ISDN BRI” and “Configuring ISDN PRI” in the *Cisco IOS Dial Technologies Configuration Guide* for additional details.

The Cisco IOS command parser accepts the following switch types: basic-nwnet3, vn2, and basic-net3; however, when viewing the NVRAM configuration, the basic-net3 or vn3 switch types are displayed, respectively.

To remove an ISDN switch type from an ISDN interface, specify **the no isdn switch-type switch-type command**.

[Table 11](#) lists supported BRI switch types by geographic area.

**Table 11 ISDN Service Provider BRI Switch Types**

Keywords by Area	Switch Type
<b>Voice/PBX Systems</b>	
<b>basic-qsig</b>	PINX (PBX) switches with QSIG signaling per Q.931
<b>Australia , Europe, UK</b>	
<b>basic-1tr6</b>	German 1TR6 ISDN switch
<b>basic-net3</b>	NET3 ISDN BRI for Norway NET3, Australia NET3, and New Zealand NET3switch types; ETSI-compliant switch types for Euro-ISDN E-DSS1 signaling system
<b>vn3</b>	French ISDN BRI switches
<b>Japan</b>	
<b>ntt</b>	Japanese NTT ISDN switches
<b>North America</b>	
<b>basic-5ess</b>	Lucent (AT&T) basic rate 5ESS switch
<b>basic-dms100</b>	Northern Telecom DMS-100 basic rate switch
<b>basic-ni</b>	National ISDN switches
<b>All users</b>	
<b>none</b>	No switch defined

**Examples**

The following example configures the French VN3 ISDN switch type:

```
isdn switch-type vn3
```

The following example uses the Multiple ISDN Switch Types feature and shows use of the global ISDN switch type **basic-ni** keyword (formerly **basic-ni1**) and the **basic-net3** interface-level switch type keyword. ISDN switch type **basic-net3** is applied to BRI interface 0 and overrides the global switch setting.

```
isdn switch-type basic-ni
!
interface BRI0
 isdn switch-type basic-net3
```

The following example configures the Cisco MC3810 router to use BRI QSIG signaling for all of its BRI voice ports:

```
isdn switch-type basic-qsig
```

The following example configures the Cisco MC3810 to use BRI QSIG signaling for BRI voice port 1. On port 1, this setting overrides any different signaling set in the previous example.

```
interface bri 1
 isdn switch-type basic-qsig
```

The following example configures the Cisco AS5300 to support Q.SIG signaling:

```
isdn switch-type primary-qsig
```

# isdn switch-type (PRI)

To specify the central office switch type on the ISDN interface, or to configure the Cisco MC3810 PRI interface to support QSIG signaling, use the **isdn switch-type** command in global or interface configuration mode. To disable the switch or QSIG signaling on the ISDN interface, use the **no** form of this command.

**isdn switch-type** *switch-type*

**no isdn switch-type** *switch-type*

## Syntax Description

*switch-type* Service provider switch type; see [Table 12](#) for a list of supported switches.

## Defaults

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

## Command Modes

Global configuration or interface configuration



### Note

This command can be entered in either global configuration mode or in interface configuration mode. When entered in global configuration mode, the setting applies to the entire Cisco MC3810. When entered in interface configuration mode, the setting applies only to the T1/E1 interface specified. The interface configuration mode setting overrides the global configuration setting.

## Command History

Release	Modification
9.21	This command was introduced as a global command.
11.3 T	This command was introduced as an interface command.
12.0(2)T	The <b>primary-qsig-slave</b> and <b>primary-qsig master</b> switch type options were added to support PRI QSIG signaling.

## Usage Guidelines

You have a choice of configuring the **isdn-switch-type** command to support QSIG at either the global configuration level or at the interface configuration level. For example, if you have a QSIG connection on one line as well as on the BRI port, you can configure the ISDN switch type in one of the following combinations:

- Set the global **isdn-switch-type** command to support QSIG, and set the interface **isdn-switch-type** command for the **interface bri 0** command to a BRI setting such as 5ess.
- Set the global **isdn-switch-type** command to support BRI 5ess, and set the interface **isdn-switch-type** command for the **interface serial 1:23** command to support QSIG.
- Configure the global **isdn-switch-type** command to another setting (such as switch type VN3), and then set the interface **isdn-switch-type** command for the **interface bri 0** command to a BRI setting, and set the interface **isdn-switch-type** command for the **interface serial 1:23** command to support QSIG.

The voice-port **codec** command must be configured before any calls can be placed over the connection to the PINX. The default codec type is G729a.

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

Table 12 lists supported PRI switch types by geographic area.

**Note**

If you are using the Multiple ISDN Switch Types feature to apply the ISDN switch types to different interfaces, refer to the chapter “Setting Up Basic ISDN Service” in the *Cisco IOS Dial Technologies Configuration Guide* for additional details.

**Table 12 ISDN Service Provider PRI Switch Types**

Keywords by Area	Switch Type
<b>Voice/PBX Systems</b>	
<b>primary-qsig</b>	Supports QSIG signaling per Q.931. Network side functionality is assigned with the <b>isdn protocol-emulate</b> command.
<b>Australia and Europe</b>	
<b>primary-net5</b>	NET5 ISDN PRI switch types for Asia, Australia, and New Zealand; ETSI-compliant switches for Euro-ISDN E-DSS1 signaling system.
<b>Japan</b>	
<b>primary-ntt</b>	Japanese ISDN PRI switch.
<b>North America</b>	
<b>primary-4ess</b>	AT&T 4ESS switch type for the United States.
<b>primary-5ess</b>	AT&T 5ESS switch type for the United States.
<b>primary-dms100</b>	NT DMS-100 switch type for the United States.
<b>primary-ni</b>	National ISDN switch type.
<b>All users</b>	
<b>none</b>	No switch defined.

**Examples**

The following example demonstrates the Multiple ISDN Switch Type Feature. The global ISDN switch type setting is basic-net3. The PRI interface (channelized T1 controller), is configured to use the **isdn switch-type primary-net5** command and BRI interface 0 is configured for the **isdn switch-type basic-ni** command (formerly **isdn switch-type basic-ni1**).

```
isdn switch-type basic-net3
!
interface serial0:23
 isdn switch-type primary-net5
 ip address 172.21.24.85 255.255.255.0
!
interface BRI0
 isdn switch-type basic-ni
```

The following example configures T1 interface 23 on the Cisco AS5300 to support Q.SIG signaling:

```
interface serial 1:23
 isdn switch-type primary-qsig
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>isdn protocol-emulate (dial)</b>	Configures the Layer 2 and Layer 3 port protocol of a BRI voice port or a PRI interface to emulate NT (network) or TE (user) functionality.
<b>pri-group nec-fusion</b>	Configures your NEC PBX to support FCCS.
<b>show cdapi</b>	Displays the CDAPI.
<b>show rawmsg</b>	Displays the raw messages owned by the required component.

# isdn t306

To set a timer for disconnect messages received by a router, use the **isdn t306** command in interface configuration mode. To reset to the default, use the **default** or **no** form of this command.

**isdn t306** *milliseconds*

**default isdn t306**

**no isdn t306**

## Syntax Description

<i>milliseconds</i>	Time, in milliseconds, that the router waits before disconnecting a call after it receives a disconnect message with a progress indicator of 8. Range is from 1 to 400000.
---------------------	--

## Defaults

Default depends on the switch, usually from 5000 to 30000 ms.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.1(3)XI	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(2)XA	This command was implemented on the Cisco AS5400 and Cisco AS5350.
12.2(2)XB1	This command was implemented on the Cisco AS5850.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

## Usage Guidelines

The T306 timer is designed for routers that are configured as an ISDN network-side switch. When a router receives a disconnect message with a progress indicator of 8, it disconnects the call after waiting for the specified number of milliseconds (ms) while the in-band announcement or error tone is playing. Be sure to set the timer long enough for the announcement to be heard or the tone to be recognized. This command is used only for disconnect messages with a progress indicator of 8; otherwise, the T305 timer is used. The **disable** and **no** forms of this command have the same result: the timer waits for the default number of ms before disconnecting the call.

## Examples

The following example sets the T306 timer to 60000 ms for serial interface 0:23:

```
interface serial 0:23
  isdn t306 60000
```

Related Commands	Command	Description
	<b>isdn t309</b>	Changes the value of the timer to clear the network connection, and release the B channel and call reference when a data-link disconnection has occurred.
	<b>isdn t310</b>	Changes the value of the T310 timer for Call Proceeding messages.
	<b>isdn timer t321</b>	Changes the value of the T321 timer for D channel switchover when the primary D channel fails.

# isdn t310

To set a timer for the call proceeding state, use the **isdn t310** command in interface configuration mode. To reset to the default, use the **no** form of this command.

**isdn t310** *milliseconds*

**no isdn t310**

<b>Syntax Description</b>	<i>milliseconds</i>	Time, in milliseconds, that the router waits before disconnecting a call after receiving a call proceeding message. Range is from 1 to 400000.
---------------------------	---------------------	--

<b>Defaults</b>	Default depends on the switch; usually from 5000 to 30000 ms.
-----------------	---

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.1(3)XI	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.	
12.2(2)XA	This command was implemented on the Cisco AS5350 and Cisco AS5400.	
12.2(2)XB1	This command was implemented on the Cisco AS5850.	
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.	

<b>Usage Guidelines</b>	The T310 timer starts when a router receives a call proceeding message; it stops when the call exits the call proceeding state, typically when the call moves to the alerting, connect, or progress state. If the timer expires while the call is in the call proceeding state, the router releases the call. Set the timer to match the specific characteristics of your network.
-------------------------	--

<b>Examples</b>	The following example sets the T310 timer to 40,000 ms for serial interface 0:23:
-----------------	---

```
interface serial 0:23
  isdn t310 40000
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
		<b>isdn protocol-emulate</b>
	<b>isdn t306</b>	Changes the value of the T306 timer to disconnect a call after the router sends a disconnect message.

<b>Command</b>	<b>Description</b>
<b>isdn test call interface</b>	Changes the value of the T309 timer to clear the network connection, and to release the B channel and call reference when a data-link disconnection has occurred.
<b>isdn timer t321</b>	Changes the value of the T321 timer for D channel switchover when the primary D channel fails.

# isdn test call interface

To make an ISDN data call, use the **isdn test call interface** command in privileged EXEC mode.

**isdn test call interface** *interface-number dialing-string* [**speed 56** | **64**]

## Syntax Description

<i>interface-number</i>	Interface number.
<i>dialing-string</i>	Telephone number used for making ISDN data call.
<b>speed 56</b>	(Optional) Line speed (56 or 64 kbps) used for making ISDN data call.
<b>speed 64</b>	

## Defaults

The default B-channel speed is 64 kbps.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
12.2	This command was introduced.

## Usage Guidelines

You can use the **isdn test call interface** command to test your DDR configuration. You can also use this command to verify the dialing string and speed without having to know the IP address of the remote router or without configuring a dialer map or string.

The **isdn test call interface** command replaces the **isdn call interface** command.

## Examples

The following example makes an ISDN data call through interface bri 0 to 555-1111 and at a line speed of 56 kbps:

```
isdn test call interface bri 0 5551111 speed 56
```

## Related Commands

Command	Description
<b>isdn caller</b>	Disconnects an ISDN data call without bringing down the interface.

# isdn test disconnect interface

To disconnect an ISDN data call without bringing down the interface, use the **isdn test disconnect interface** command in privileged EXEC mode.

**isdn test disconnect interface** *interface-type interface-number* {**b1** | **b2** | **all**}

## Syntax Description

<i>interface-type</i>	Interface type and number, such as bri 0.
<i>interface-number</i>	
<b>b1</b>	B channel 1.
<b>b2</b>	B channel 2.
<b>all</b>	B channels 1 and 2.

## Defaults

A default interface is not defined.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
12.2	This command was introduced.

## Usage Guidelines

You can use the **isdn test disconnect interface** command to disconnect any ongoing data calls placed manually or caused by DDR.

The **isdn test disconnect interface** command replaces the **isdn disconnect interface** command.

## Examples

The following example disconnects an ISDN data call through interface bri 0 and B channel 1:

```
isdn test disconnect interface bri 0 b1
```

## Related Commands

Command	Description
<b>isdn call interface</b>	Makes an ISDN data call.

# isdn timer t309

To change the value of the T309 timer to clear the network connection and to release the B channel and call reference when a data-link disconnection has occurred, use the **isdn timer t309** command in interface configuration mode. To restore the default value, use the **no** form of this command.

**isdn timer t309** *milliseconds*

**no isdn timer t309**

<b>Syntax Description</b>	<i>milliseconds</i>	Number of milliseconds (ms) that the router waits before clearing the network connection, and releasing the B channel and call reference. Values are from 0 to 86,400,000 ms (0 to 86,400 seconds).
---------------------------	---------------------	---

<b>Command Default</b>	90,000 ms (90 seconds)
------------------------	------------------------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2	This command was introduced.

<b>Usage Guidelines</b>	When a data link layer malfunction occurs, calls that are not in the active state are cleared. For calls that are not in the active state, the T309 timer is started. The timer is stopped when the data link is reconnected. If the T309 timer expires prior to the reestablishment of the data link, the network clears the connection and call to the remote user, sending a disconnect cause of 27 to indicate that the call destination is out of order. The network releases and disconnects the B channel, and releases the call reference, entering the Null state. The T309 timer is mandatory for routers that are configured as an ISDN network-side switch and by default the timer is set to expire after 90,000 ms (90 seconds). The implementation of the T309 timer is optional for the user side of the network. The <b>isdn timer t309</b> command is used for changing the value of the T309 timer.
-------------------------	--



**Note**

Setting the timer to 0 causes the timer expiry to become infinite so that it will never expire.

<b>Examples</b>	The following example sets the T309 timers to 60,000 ms (60 seconds) for serial interface 0:24:
-----------------	---

```
interface serial 0:24
  isdn timer t309 60000
```

Related Commands	Command	Description
	<b>isdn t306</b>	Changes the value of the T306 timer to disconnect a call after the router sends a disconnect message.
	<b>isdn t310</b>	Changes the value of the T310 timer for Call Proceeding messages.
	<b>isdn timer t321</b>	Changes the value of the T321 timer for D channel switchover when the primary D channel fails.

# isdn timer t321

To change the value of the timer for D channel switchover when the primary D channel fails, use the **isdn timer t321** command in interface configuration mode. To restore the default value, use the **no** form of this command.

**isdn timer t321** *milliseconds*

**no isdn timer t321**

## Syntax Description

<i>milliseconds</i>	Number of milliseconds (ms) that the router waits before sending a DL-ESTABLISH request on both D channels to request a switchover. Values are from 0 to 30 ms.
---------------------	---

## Defaults

30 ms

## Command Modes

Interface configuration

## Command History

Release	Modification
12.2	This command was introduced.

## Usage Guidelines

The T321 timer must be implemented when you use the D channel backup procedure involving D channel switchover. The **isdn timer t321** command is used for changing the value of the T321 timer.



### Note

Setting the timer to 0 causes the timer expiry to become infinite so that it will never expire.

## Examples

The following example sets the T321 timers to 25 ms for serial interface 0:23:

```
interface serial 0:23
 isdn timer t321 25
```

## Related Commands

Command	Description
<b>isdn t306</b>	Changes the value of the T306 timer to disconnect a call after the router sends a disconnect message.
<b>isdn timer t309</b>	Changes the value of the T309 timer to clear the network connection, and to release the B channel and call reference when a data-link disconnection has occurred.
<b>isdn t310</b>	Changes the value of the T310 timer for Call Proceeding messages.

## isdn tei-negotiation (global)

To configure when Layer 2 becomes active and ISDN terminal endpoint identifier (TEI) negotiation occurs, use the **isdn tei-negotiation** command in global configuration mode. To remove TEI negotiation configuration, use the **no** form of this command.

**isdn tei-negotiation** [**first-call** | **powerup**]

**no isdn tei-negotiation**

Syntax Description	first-call	(Optional) ISDN TEI negotiation should occur when the first ISDN call is placed or received.
	<b>powerup</b>	(Optional) ISDN TEI negotiation should occur when the router is powered on.

**Defaults** The **powerup** state is the default condition.

**Command Modes** Global configuration

Command History	Release	Modification
	9.21	This command was introduced as a global command.

**Usage Guidelines** This command is for BRI configuration only.

This command is useful for switches that may deactivate Layers 1 and 2 when there are no active calls or primary DMS-100 switches which activate TEI when the first ISDN call is placed or received.

**Examples** The following example applies the **isdn tei negotiation first-call** command to BRI interface 0. BRI interface 1 will use the **isdn tei negotiation powerup command**, which is the default setting. Defaults settings do not appear in the router configuration.

```
isdn switch-type basic-net
!
interface bri0
! Configure the ISDN switch type on this interface and set TEI negotiation to first-call.
  isdn switch-type basic-ni
  isdn tei-negotiation first-call
! BRI interface 1 uses the default TEI negotiation value.
interface bri1
```

## isdn tei-negotiation (interface)

To configure when Layer 2 becomes active and ISDN terminal endpoint identifier (TEI) negotiation occurs, use the **isdn tei-negotiation** command in interface configuration mode. To remove TEI negotiation from an interface, use the **no** form of this command.

```
isdn tei-negotiation {first-call | powerup} {preserve | remove}
```

```
no isdn tei-negotiation {first-call | powerup} {preserve | remove}
```

### Syntax Description

<b>first-call</b>	ISDN TEI negotiation should occur when the first ISDN call is placed or received.
<b>powerup</b>	ISDN TEI negotiation should occur when the router is powered on.
<b>preserve</b>	Preserves dynamic TEI negotiation when ISDN Layer 1 flaps, and when the <b>clear interface</b> or the <b>shut</b> and <b>no shut EXEC</b> commands are executed.
<b>remove</b>	Removes dynamic TEI negotiation when ISDN Layer 1 flaps, and when the <b>clear interface</b> or the <b>shut</b> and <b>no shut EXEC</b> commands are executed.

### Defaults

The **powerup** state is the default condition. Depending upon the ISDN switch type configured, the default will be to preserve or remove the TEI negotiation options. See the “Usage Guidelines” and “Examples” sections for further explanation.

### Command Modes

Interface configuration

### Command History

Release	Modification
11.3 T	This command was introduced as an interface command.
12.2	The <b>preserve</b> and <b>remove</b> keywords were added.

### Usage Guidelines

This command is for BRI configuration only.

The **first-call** and **powerup**, and **preserve** and **remove** command pairs are mutually exclusive, that is, you must choose only one command from either the **first-call** and **powerup** or **preserve** and **remove** command pairs, per command line.

The **no isdn tei-negotiation** command returns the configuration to default to the **powerup** state.

The **preserve** keyword depends on the ISDN switch type configured, that is, the TEI negotiation configured will be preserved during ISN Layer 1 flaps, and when the **clear interface** or the **shut** and **no shut EXEC** commands are executed, on the switch types listed in [Table 13](#).

**Table 13** Switch Types with Preserved TEI Negotiation

Switch Type	Cisco IOS Keyword
French ISDN switch types	<b>vn2, vn3</b>
Lucent (AT&T) basic rate 5ESS switch	<b>basic-5ess</b>

**Table 13** Switch Types with Preserved TEI Negotiation (continued)

Switch Type	Cisco IOS Keyword
Northern Telecom DMS-100 basic rate switch	<b>basic-dms100</b>
National ISDN basic rate switch	<b>basic-ni</b>
PINX (PBX) switches with QSIG signaling per Q.931	<b>basic-qsig</b>

For all other ISDN switch types, the TEI negotiation will be removed during ISDN Layer 1 flaps, and when the **clear interface** or the **shut** and **no shut EXEC** commands are executed. Use the **remove** keyword to specifically set one of the switches listed in [Table 13](#) to the remove state.

### Examples

The following example shows the ISDN TEI negotiation configuration with default settings. (Defaults settings do not appear in the router configuration.)

```
interface BRI0/0
  no ip address
  isdn switch-type basic-ni
  cdapi buffers regular 0
  cdapi buffers raw 0
  cdapi buffers large 0
```

The following example shows how to set TEI negotiation timing to the first call:

```
Router(config-if)# isdn tei-negotiation first-call
Router(config-if)# exit
Router(config)# exit
Router# show startup-config
.
.
.
interface BRI0/0
  no ip address
  isdn switch-type basic-ni
  isdn tei-negotiation first-call
  cdapi buffers regular 0
  cdapi buffers raw 0
  cdapi buffers large 0
```

The following example shows how to change TEI negotiation timing back to the default power-up state:

```
Router(config-if)# no isdn tei-negotiation first-call
Router(config-if)# exit
Router(config)# exit
Router# show startup-config
.
.
.
interface BRI0/0
  no ip address
  isdn switch-type basic-ni
  cdapi buffers regular 0
  cdapi buffers raw 0
  cdapi buffers large 0
```

The following example shows how to remove TEI negotiation when ISDN Layer 1 flaps (the preserve state is the default for the National ISDN basic rate switch):

```
Router(config-if)# isdn tei-negotiation remove
Router(config-if)# exit
```

```
Router(config)# exit
Router# show startup-config
.
.
.
interface BRI0/0
no ip address
isdn switch-type basic-ni
isdn tei-negotiation first-call
isdn tei-negotiation remove
cdapi buffers regular 0
cdapi buffers raw 0
cdapi buffers large 0
```

The following example shows how to return the National ISDN basic rate switch to its default preserve state:

```
Router(config-if)# no isdn tei-negotiation remove
Router(config-if)# exit
Router(config)# exit
Router# show startup-config
.
.
.
interface BRI0/0
no ip address
isdn switch-type basic-ni
isdn tei-negotiation first-call
cdapi buffers regular 0
cdapi buffers raw 0
cdapi buffers large 0
```

# isdn transfer-code

To activate call transferring, use the **isdn transfer-code** command in interface configuration mode. To disable call transferring, use the **no** form of this command.

**isdn transfer-code** *range*

**no isdn transfer-code**

---

<b>Syntax Description</b>	<i>range</i>	Number from 0 to 999 (ISDN transfer code).
---------------------------	--------------	--

---

---

<b>Defaults</b>	The default code is 61.
-----------------	-------------------------

---

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

---

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(3)T	This command was introduced.

---

---

<b>Usage Guidelines</b>	Use this command if your ISDN line is connected to a NI1 or a Nortel DMS-100 Custom switch. Your telephone service provider should issue an ISDN transfer code when you order call transferring.
-------------------------	--

---

<b>Examples</b>	The following example specifies 62 as the ISDN transfer code:
-----------------	---

```
isdn transfer-code 62
```

# isdn twait-disable

To delay a National ISDN BRI switch a random time before activating the Layer 2 interface when the switch starts up, use the **isdn twait-disable** command in interface configuration mode. To remove the delay, use the **no** form of this command.

**isdn twait-disable**

**no isdn twait-disable**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** This command is enabled by default.

---

**Command Modes** Interface configuration

---

Command History	Release	Modification
	11.3	This command was introduced.

---



---

**Usage Guidelines** The random-length delay set by this command 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.

---

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

```
isdn twait-disable
```

## isdn v110 only

To selectively accept incoming V.110 calls based on data bit, parity, and stop bit modem communication settings, use the **isdn v110 only** command in interface configuration mode. To change or disable the expected incoming V.110 modem call configuration, use the **no** form of this command.

```
isdn v110 only [databits {5 | 7 | 8}] [parity {even | mark | none | odd | space}]
[stopbits {1 | 1.5 | 2}]
```

```
no isdn v110 only
```

<b>Syntax Description</b>	<b>databits {5   7   8}</b>	(Optional) Allowed data bits, as follows: <ul style="list-style-type: none"> <li>• <b>5</b>—Allow 5 data bits only.</li> <li>• <b>7</b>—Allow 7 data bits only.</li> <li>• <b>8</b>—Allow 8 data bits only.</li> </ul>
	<b>parity {even   mark   none   odd   space}</b>	(Optional) Allowed parity, as follows: <ul style="list-style-type: none"> <li>• <b>even</b>—Allow even parity only.</li> <li>• <b>mark</b>—Allow mark parity only.</li> <li>• <b>none</b>—Allow no parity only.</li> <li>• <b>odd</b>—Allow odd parity only.</li> <li>• <b>space</b>—Allow space parity only.</li> </ul>
	<b>stopbits {1   1.5   2}</b>	(Optional) Allowed stop bits, as follows: <ul style="list-style-type: none"> <li>• <b>1</b>—Allow 1 stop bit only.</li> <li>• <b>1.5</b>—Allow 1.5 stop bits only.</li> <li>• <b>2</b>—Allow 2 stop bits only.</li> </ul>

**Defaults** No default behavior or values.

**Command Modes** Interface configuration

Command History	Release	Modification
	12.1(4)T	This command was introduced.

**Usage Guidelines** The **isdn v110 only** command provides a way to screen incoming V.110 modem calls and reject any calls that do not have the communication settings configured as the network expects them to be.

---

**Examples**

The following example filters out all V.110 modem calls except those with communication settings of 8 data bits, no parity bit, and 1 stop bit:

```
interface serial 0:23
  isdn v110 only databits 8 parity none stopbits 1
```

# isdn v110 padding

To disable the padded V.110 modem speed report required by the V.110 modem standard, use the **no isdn v110 padding** command in interface configuration mode. To reenable the padded V.110 modem speed report, use the **isdn v110 padding** command.

**no isdn v110 padding**

**isdn v110 padding**

## Syntax Description

This command has no arguments or keywords.

## Defaults

V.110 modem speed padding is enabled.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.2(8)T	This command was introduced.

## Usage Guidelines

The **no isdn v110 padding** command is useful for networks with devices such as terminal adapters (TAs) and global system for mobile communication (GSM) handsets that do not fully conform to the V.110 modem standard. The V.110 modem standard specifies that the incoming asynchronous data must be padded by adding stop elements to fit the nearest channel rate. For example, a 14400 bits per second (bps) user data signaling rate is adapted to a synchronous 19200-bps stream rate. The software reports the adapted rate (19200 bps) to the modem for an incoming V.110 call. However, for those devices that do not fully conform to the V.110 suplications, the software must report the speed as 14400 instead of 19200 to the modem for a successful connection. By setting the modem interface to **no isdn v110 padding**, padding is disabled and the actual bit rate can be reported to the modem.

## Examples

The following example shows how to disable V.110 asynchronous-to-synchronous padding:

```
!  
interface Serial0:23  
  no ip address  
  isdn switch-type primary-ni  
  isdn bchan-number-order ascending  
  no isdn v110 padding  
  no cdp enable
```

# isdn voice-priority

To control the priority of data and voice calls for the telephones, fax machines, and modems connected to the router telephone ports, use the **isdn voice-priority** command in interface configuration mode. To disable a specified ISDN voice priority setting and to use the default setting, use the **no** form of this command.

**isdn voice-priority** *local-directory-number* {**in** | **out**} {**always** | **conditional** | **off**}

**no isdn voice-priority** *local-directory-number*

## Syntax Description

<i>local-directory-number</i>	Local ISDN directory number assigned by your telephone service provider.
<b>in</b>	Incoming voice call.
<b>out</b>	Outgoing voice call.
<b>always</b>	Always bump a data call for a voice call.
<b>conditional</b>	Bump a data call only if there is more than one call to the same destination.
<b>off</b>	Never bump a data call for a voice call.

## Defaults

A data call is never bumped for an incoming or outgoing voice call.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.0(3)T	This command was introduced.

## Usage Guidelines

If an ISDN circuit endpoint is busy with a data call or calls and either a voice call comes in (incoming) or you attempt to place a voice call (outgoing), the data call is handled according to the setting of **isdn voice-priority** command.

If you are in North America and have multiple ISDN directory numbers associated with a SPID, the outgoing voice priority that you set for any of these directory numbers applies to the other directory numbers. For example, if you enter the following commands, the outgoing voice priority for all directory numbers specified in the **isdn spid1** command is set to conditional:

```
isdn spid1 0 4085551111 4085552222 4085553333
isdn voice-priority 5551111 out conditional
```

The setting of the **pots dialing-method** command affects when you hear a busy signal in the following situation:

- A data call cannot be bumped.
- You are trying to make an outgoing call.

If the setting is **overlap**, you hear a busy signal when you pick up the handset. If the setting is **enblock**, you initially hear a dial tone and then a busy signal.

---

**Examples**

The following example specifies that a data call for the specified ISDN directory number never be bumped for an incoming or an outgoing voice call:

```
isdn voice-priority 5551111 in off
isdn voice-priority 5551111 out off
```

---

**Related Commands**

Command	Description
<b>isdn spid1, isdn spid2</b>	Defines the SPID number that has been assigned by the ISDN service provider for the B1 channel.
<b>pots dialing-method</b>	Specifies how the Cisco 800 series router collects and sends digits dialed on your connected telephones, fax machines, or modems.

# isdn x25 dchannel

To create a configurable interface for X.25 traffic over the ISDN D channel, use the **isdn x25 dchannel** command in interface configuration mode. To remove the interface, use the **no** form of this command.

**isdn x25 dchannel**

**no isdn x25 dchannel**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Disabled

**Command Modes** Interface configuration

Command History	Release	Modification
	11.2 F	This command was introduced.

**Usage Guidelines** This command creates a new, configurable interface, which can be specified as **interface bri:x:0** in commands, where *x* is the original BRI interface number. For example, on a Cisco 4500 router with an MBRI, if the **isdn x25 dchannel** command is configured on bri5, the new interface is bri5:0 and can be used for configuring the other parameters for X.25 over the D channel. These parameters include the addresses, the map statements, and others. To display the new interface, use the **more system:running-config** command.

**Examples** The following example creates interface bri 1:0 and configures it for X.25 over the ISDN D channel. This example uses dynamic TEIs, not a static TEI.

```
interface bri1
  isdn x25 dchannel
interface bri1:0
  ip address 10.1.1.2 255.255.255.0
  x25 address 31107000000100
  x25 htc 1
  x25 suppress-calling-address
  x25 facility window-size 2 2
  x25 facility packet-size 256 256
  x25 facility throughput 9600 9600
  x25 map ip 10.1.1.3 31107000000200
  x25 map ip 10.1.1.4 31107000000800
```

Related Commands	Command	Description
	<b>interface bri</b>	Configures a BRI interface and enters interface configuration mode.

# isdn x25 static-tei

To configure a static ISDN Layer 2 terminal endpoint identifier (TEI) for X.25 over the ISDN D channel, use the **isdn x25 static-tei** command in interface configuration mode. Use the **no** form of this command if dynamic TEIs will be used on the interface that is to carry X.25 traffic over the D channel.

```
isdn x25 static-tei tei-number
```

```
no isdn x25 static-tei tei-number
```

<b>Syntax Description</b>	<i>tei-number</i> Terminal endpoint identifier, in the range from 0 to 63.
---------------------------	--

<b>Defaults</b>	Disabled
-----------------	----------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2 F	This command was introduced.

<b>Usage Guidelines</b>	<p>This command applies to ISDN BRI interfaces only. Only one static TEI is allowed per BRI interface. If a second static TEI is configured, the first static TEI is overwritten.</p> <p>Some switches require a static TEI be used for X.25 over the ISDN D channel.</p> <p>When the <b>isdn x25 dchannel</b> command is invoked without the <b>isdn x25 static-tei</b> command, a dynamic TEI is chosen.</p>
-------------------------	--

<b>Examples</b>	The following example creates static TEI 8 on the X.25-over-ISDN-D channel:
-----------------	---

```
interface bri0
  isdn x25 dchannel
  isdn x25 static-tei 8
```

Because the **isdn x25 static-tei** command is missing, the following example configuration sets dynamic TEIs for the ISDN channel:

```
interface bri0
  isdn x25 dchannel
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>interface bri</b>	Configures a BRI interface and enters interface configuration mode.
	<b>isdn x25 dchannel</b>	Creates a configurable interface for X.25 traffic over the ISDN D channel.