



# ISDN Network Side for ETSI Net5 PRI

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## Feature History

Release	Modification
12.1(T)	This feature was introduced.
12.1(5)XM2	Support was added for the Cisco AS5350 and Cisco AS5400 universal gateways.

This feature module describes the ISDN Network Side for ETSI Net5 PRI feature. It includes information on the benefits of the new feature, supported platforms, related documents, and so on.

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## Feature Overview

The ISDN Network Side for ETSI Net5 PRI feature enables Cisco IOS to replicate the public switched network interface to a PBX that is compatible with the ETSI Net5 switch type.

Routers and PBXs are both traditionally CPE with respect to the public switched network interfaces. For Voice over IP (VoIP) applications, it is desirable to interface access servers to PBXs with the access server representing the public switched network.

Enterprise organizations use the current VoIP features with Cisco products as a method to reduce long distance costs for phone calls within and outside of their organizations. However, there are times that a call cannot go over VoIP and the call needs to be placed using the PSTN. The customer then must have two devices connected to a PBX to allow some calls to be placed using VoIP and some calls to be placed

over the Public Switched Telephone Network (PSTN). In contrast, this feature allows Cisco access servers to connect directly to user-side CPE devices such as PBXs and allows voice calls and data calls to be placed without requiring two different devices to be connected to the PBXs.

This feature enables the access server to provide a standard ISDN PRI network side interface to the PBXs and to mimic the behavior of legacy phone switches. To a PBX, the access server functions as a Net5 PRI switch. No change in PBX capability or behavior is required.

## Benefits

The ISDN Network Side for ETSI Net5 PRI feature provides the following benefits:

- Allows you to bypass PSTN tariffed services such as trunking and administration, thus extending the cost savings of VoIP.
- Allows your PBXs to be connected directly to a Cisco access server, so PBX station calls can be routed automatically to the IP network without the need for special IP telephones.
- Provides flexibility in network design.

## Restrictions

The ISDN Network Side feature runs on any ISDN-capable platform with PRI interfaces.

## Related Documents

The following online document, *Voice over IP for the Cisco AS5800*, describes VoIP capabilities and the broader configuration context on the Cisco AS5800 network access server:

<http://www.cisco.com/univercd/cc/td/doc/product/access/nubuvoip/voip5800/>

## Supported Platforms

- Cisco 2600
- Cisco 3600 series
- Cisco 4500
- Cisco AS5300
- Cisco AS5350
- Cisco AS5400
- Cisco AS5800
- Cisco 7200
- Cisco 7500

# Supported Standards, MIBs, and RFCs

## Standards

No new or modified standards are supported by this feature.

## MIBs

No new or modified MIBs are supported by this feature.

To obtain lists of MIBs supported by platform and Cisco IOS release and to download MIB modules, go to the Cisco MIB web site on Cisco Connection Online (CCO) at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

## RFCs

No new or modified RFCs are supported by this feature.

# Prerequisites

The Cisco AS5350 and Cisco AS5400 do not support the Mica Modem Card, Microcom Modem Card, or VoIP Feature Card. Voice and modem functions are provided by the Universal Port Dial Feature card running SPE firmware. See the *Cisco AS5350 Universal Gateway Card Installation Guide* and the *Cisco AS5400 Universal Gateway Card Installation Guide* for more information. All references to the Cisco AS5300 in this document apply to the Cisco AS5350 and Cisco AS5400 platforms with the following exceptions:

- Use the Universal Port Dial Feature Card instead of the Mica or Microcom modem cards.
- Use SPE firmware instead of portware version 6.7.7.
- Run Cisco IOS Release 12.1(5)XM2 software for VoIP functionality.

## Other Prerequisites

Before you begin to configure this feature, the following configuration tasks must be completed on the selected access server:

- The router must have the appropriate, operational ISDN PRI interface hardware.
- The E1 controllers must be operational and configured for ISDN PRI.
- The D-channel interfaces must be operational and configured for ISDN PRI.
- Each D-channel interface must be configured with the **isdn incoming-voice modem** command.

For example, the selected D-channel PRI interfaces might have a configuration similar to the following:

```
interface Serial1/0/0:15
 no ip address
 no ip directed-broadcast
 isdn switch-type primary-net5
 isdn protocol-emulate network
 isdn incoming-voice modem
 no cdp enable
```

## Configuration Tasks

See the following section for configuration tasks for the ISDN Network Side for ETSI Net5 PRI feature:

- Configuring ISDN Network Side for ETSI Net5 PRI (required)

### Configuring ISDN Network Side for ETSI Net5 PRI

To configure the access server for ISDN Network Side for ETSI Net5 PRI, you can configure the `primary-net5` switch type globally or you can configure the `primary-net5` switch type on selected PRI interfaces. To configure ISDN Network Side for Net5, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	<code>Router(config)# isdn switch-type primary-net5</code>	Sets the <b>primary-net5</b> global ISDN switch type.
	or <code>Router(config-if)# interface serial0/0/0:15</code>	or Specifies a D-channel interface to configure for ISDN Network Side for ETSI Net5 PRI.
	<code>Router(config-if)# switch-type primary-net5</code>	Sets the <b>primary-net5</b> switch type on the interface.
Step 2	<code>Router(config-if)# isdn protocol-emulate network</code>	Enables network side support on the interface.

Repeat the configuration steps on all the additional PRI D-channel interfaces you want to configure for ISDN Network Side for ETSI Net5 PRI.

### Verifying ISDN Network Side for ETSI Net5 PRI

Enter the `show isdn status` command to learn whether ISDN Network Side for ETSI Net5 PRI is configured successfully:

```
router# show isdn status serial 0:15
Global ISDN Switchtype = primary-5ess
ISDN Serial0:15 interface
***** Network side configuration *****
dsl 0, interface ISDN Switchtype = primary-net5
```

# Monitoring and Maintaining ISDN Network Side for ETSI Net5 PRI

Command	Purpose
Router# <code>show controllers e1 slot/port</code>	Checks Layer 1 (physical layer) of the PRI over E1.
Router# <code>show controllers e1 number call-counters</code>	Displays the number of calls and call durations on an E1 controller.
Router# <code>show interfaces serial slot/port bchannel channel-number</code>	Displays information about the physical attributes of the ISDN PRI over channelized E1 B and D channels.
Router# <code>show isdn {active   history   memory   services   status [dsl   interface-type number]   timers}</code>	Displays information about memory, Layer 2 and Layer 3 timers, and the status of PRI channels.

## Configuration Examples

This section provides the following configuration example:

- ISDN Network Side for ETSI Net5 PRI Configuration on E1

### ISDN Network Side for ETSI Net5 PRI Configuration on E1

The following example enables the ISDN Network Side for ETSI Net5 PRI feature on an access server on which ISDN PRI is already configured and operational. In this example, the Net5 PRI switch type is set on the D-channel interface, and the global interface type is not shown.

```
!
controller e1 0
 pri-group timeslots 1-31
 exit
!
interface serial0:15
 no ip address
 no ip directed-broadcast
 ip mroute-cache
 isdn switch-type primary-net5
 isdn protocol-emulate network
```

## Command Reference

No new or modified commands are required for this feature.

# Debug Commands

No new or modified **debug** commands are required for this feature.

## Glossary

**E1**—Wide-area digital transmission scheme used in Europe. The clock rate of the E1 line (2.048 MHz) allows for 32 64-kbps channels, which include one channel for framing and one channel for D-channel signalling information.

**ISDN**—Integrated Services Digital Network. ISDN is a communications protocol, offered by telephone companies, that permits telephone networks to carry data, voice, and other traffic.

**PBX**—private branch exchange. Privately owned central switching office.

**PRI**—Primary Rate Interface. Primary rate access consists of a single 64-kbps D channel plus 23 T1 or 30 E1 B channels for voice or data.

**POTS**—plain old telephone service. Basic telephone service supplying standard single line telephones, telephone lines, and access to the Public Switched Telephone Network.

**PSTN**—Public Switched Telephone Network. PSTN refers to the local telephone company.

**T1**—Digital WAN carrier facility used in North America. T1 sends DS1 formatted data at 1.544 Mbps through the telephone-switching network, using AMI or B8ZS coding.

**VoIP**—Voice over IP.