National ISDN Switch Types for Basic Rate and Primary Rate Interfaces

Feature Summary

National ISDN Switch Types for Basic Rate and Primary Rate Interfaces introduces changes to ISDN switch types for Primary Rate Interfaces (PRI) and Basic Rate Interfaces (BRI) as follows:

- Adds a new switch type for PRI interfaces (**isdn switch-type primary-ni**).
- Changes the BRI basic-ni1 switch type to basic-ni (**isdn switch-type basic-ni)**.
- Removes the ISDN vn2 switch type (**isdn switch-type vn2**) used in France. The existing vn3 switch type (**isdn switch-type vn3**) supports French vn2 switches.
- Removes the ISDN basic-nwnet3 switch type (**isdn switch-type basic-nwnet3**) used in Norway. The basic-net3 switch type (**isdn switch-type basic-net3)** supports Norway NET3 switches.
- Removes the ISDN basic-nznet3 switch type (**isdn switch-type basic-nznet3**) used by New Zealand NET3 switches. The ISDN basic-net3 switch type (**isdn switch-type basic-net3)** supports New Zealand NET3 switches.
- Adds the ability to configure outgoing PRI B channel selection for the T1 controller in ascending order (channel 1 to channel 23) or descending order (channel 23 to channel 1). Previously, the router selected a B channel for outgoing calls from the highest free channel in descending order. The E1 controller channel selection for ascending order is channel 1 to 31, and 31 to 1 for descending order.

Note The command parser will still accept the following switch types: basic-nwnet3, vn2, and basic-net3; however, when viewing the NVRAM configuration using either the **show running configuration** or **write terminal** command, the basic-net3 or vn3 switch types are displayed respectively.

Benefits

National ISDN Switch Types for Basic Rate and Primary Rate Interfaces provides the following benefits:

- Unlike previous custom implementations, such as basic-5ess, basic-dms100, primary-5ess, and primary-dms100, the National ISDN specification is designed to be switch independent. This increases flexibility in adapting to evolving standards and future enhancements.

- On PRI interfaces, this addition completes Cisco IOS support for the compliment of switch types for ISDN PRI deployed in the United States public switched network.
- The ability to select PRI B channel order election for outgoing calls allows extended flexibility and compatibility with a variety of ISDN switch type service implementations. Additionally, this ability reduces ISDN switch misconfigurations, which can delay initial service activation.
- Adds support for Lucent 5ess and CGCS gtd-5 switches.

List of Terms

Basic Rate Interface (BRI)—An ISDN interface composed of two B channels and one D channel for circuit-switched communication of voice, video, and data.

bearer channel (B Channel)—A channel that carries data on the ISDN interface.

Integrated Services Digital Network (ISDN)—Communication protocols offered by telephone companies that permit telephone networks to carry data, voice, and other source traffic.

non-facility associated signaling (NFAS)—An ISDN service that allows a single D channel to control multiple PRI interfaces. Use of a single D channel to control multiple PRI interfaces can free one B channel on each interface to carry other traffic.

Primary Rate Interface (PRI)—An ISDN interface to primary rate access. Primary rate access consists of a single 64k D channel plus 23 (T1) or 30 (E1) B channels.

signaling channel (D Channel)—A channel used to carry control signals on the ISDN interface.

Restrictions

The following restrictions apply to this feature:

- The basic-ni switch type overrides the existing basic-ni1 switch type and is written to NVRAM; therefore, when viewing the Cisco configuration, the basic-ni switch type is seen.
- The new primary-ni switch type for PRI interfaces is similar to existing switch types; however, it isolates code changes and behaviors that only affect PRI switch types.
- The **isdn switch-type basic-ni** command applies only to BRI interfaces.
- The **isdn switch-type primary-ni** command applies only to PRI interfaces.

Platforms

This feature is supported on these platforms:

- Cisco 1000 series
- Cisco 1600 series
- Cisco 2500 series
- Cisco 3600 series
- Cisco 4000 series (Cisco 4000, 4000-M, 4500, 4500-M, 4700, 4700-M)
- Cisco 5200
- Cisco 5300
- Cisco 7200 series

- Cisco 7500 series

Supported MIBs and RFCs

None

Configuration Tasks

Perform the following tasks to configure an ISDN switch type on an interface level. The first task is required, and the second task is optional.

- Configure the ISDN Switch Type
- Configure B Channel Outgoing Call Order (optional)

Configure the ISDN Switch Type

To configure an ISDN switch type for BRI and PRI interfaces using new switch type keywords, perform the following tasks beginning in global configuration mode. Step 2 is optional.

Task		Command
Step 1	Configure the global ISDN switch type.	**isdn-switch type** *switch-type*
Step 2	Configure the interface level ISDN switch type (optional).	**isdn-switch type** *switch-type*

You must ensure that the global and interface level ISDN switch types are valid for the ISDN interfaces on the router. Table 1 lists valid ISDN switch types for ISDN BRI and PRI interfaces.

Note You may configure a different ISDN switch type for each interface. Configuring a switch type on the interface level overrides the global ISDN switch type. Refer to the Multiple ISDN Switch Types feature in Cisco IOS Release 11.3(3)T for additional details.

Table 1 ISDN Switch Types for BRI and PRI Interfaces

Keyword	Switch Type
ISDN BRI	
basic-1tr6	German 1TR6 ISDN switches
basic-5ess	AT&T basic rate switches
basic-dms100	NT DMS-100 basic rate switches
basic-net3	NET3 ISDN, Norway NET3, and New Zealand NET3 switches (covers the Euro-ISDN E-DSS1 signaling system and is ETSI-compliant)
basic-ni	National ISDN switches
basic-ts013	Australian TS013 switches
ntt	Japanese NTT ISDN switches

Table 1 ISDN Switch Types for BRI and PRI Interfaces

vn3	French VN3 and VN4 ISDN BRI switches
ISDN PRI	
primary-4ess	AT&T 4ESS switch type for the U.S.
primary-5ess	AT&T 5ESS switch type for the U.S.
primary-dms100	NT DMS-100 switch type for the U.S.
primary-net5	European, New Zealand and Asia ISDN PRI switches (covers the Euro-ISDN E-DSS1 signaling system and is ETSI-compliant)
primary-ni	AT&T National ISDN switch type
primary-ntt	Japanese ISDN PRI switches
primary-ts014	Australia PRI switches

Configure B Channel Outgoing Call Order

You can configure the router to select the first available B channel in ascending order (channel B1) or descending order (channel B23 for a T1 and channel B30 for an E1). To configure the optional task of selecting B channel order for outgoing calls for PRI interface types, perform the following task in interface configuration mode:

Task	Command
Enable B channel selection for outgoing calls on a PRI interface (optional).	**isdn bchan-number-order** {**ascending** | **descending**}

Before configuring the ISDN PRI on your router, check with your service vendor to determine if the ISDN trunk call selection is configured for ascending or descending order. If there is a mismatch between the router and switch with regard to channel availability, the switch will send back an error message stating the channel is not available. By default, the router will select outgoing calls in descending order.

Note Configuring an ISDN switch type at the interface level is introduced in the *Multiple ISDN Switch Types* feature in Cisco IOS Release 11.3(3)T. Refer to this feature documentation for additional information on configuring ISDN switch types on BRI and PRI interfaces.

Configuration Examples

This section provides the following ISDN configuration examples:

- BRI Global ISDN Switch Example
- BRI Global and Interface ISDN Switch Example
- PRI Global ISDN Switch Example Using Ascending Call Order

BRI Global ISDN Switch Example

The following example configures the router to use the **isdn switch-type basic-ni** global command, which, by default, will be applied to all BRI interfaces:

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

BRI Global and Interface ISDN Switch Example

The following example configures the router to use the global **isdn switch-type basic-net3**, and applies **isdn switch-type basic-ni** to BRI interface 0:

```
isdn switch-type basic-net3
!
interface bri0
 isdn switch-type basic-ni
```

PRI Global ISDN Switch Example Using Ascending Call Order

The following example configures the router to use global **isdn switch-type primary-ni** and configures the ISDN outgoing call channel selection to be made in ascending order:

```
isdn switch-type primary-ni
!
interface serial0:23
 isdn bchan-number-order ascending
```

Command Reference

This section documents new and modified commands. All other commands used with this feature are documented in Cisco IOS Release 11.3 configuration guides and command references.

- **isdn bchan-number-order**
- **isdn switch-type**

isdn bchan-number-order

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

isdn bchan-number-order {**ascending** | **descending**}
no isdn bchan-number-order

Syntax Description

ascending	Makes the outgoing B channel selection in ascending order as follows: • Channels 1 to 24 for a T1 controller • Channels 1 to 31 for an E1 controller
descending	Makes the outgoing B channel selection in descending order as follows: • Channels 24 to 1 for a T1 controller • Channels 31 to 1 for an E1 controller

Default

Descending

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3 T.

This command instructs 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 B30 for an E1 (descending).

Example

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 B5.

```
interface serial5:10
 isdn bchan-number-order ascending
```

isdn switch-type

To add an ISDN switch type to a BRI or PRI interface, use the **isdn switch-type** interface configuration and global configuration command. To disable the switch on an ISDN interface, use the **no** form of this command.

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

Syntax Description

switch-type	Central office or ISDN service provider switch type. See Table 1 for valid ISDN switch types for BRI and PRI interfaces.

Default

Disabled

Command Mode

Interface configuration and global configuration

Usage Guidelines

This command first appeared as an interface configuration command in Cisco IOS Release 11.3 T.

This command first appeared as a global configuration command in Cisco IOS Release 9.1.

Note Changes to the **isdn switch-type** command are documented in the *Multiple ISDN Switch Types* feature in Cisco IOS Release 11.3(3)T. Refer to this feature document for details about applying ISDN switch types on an interface level.

Example

The following example shows the global ISDN switch type of basic-ni that is applied to BRI interface 0. The PRI interface (T1 controller), is configured for ISDN switch type primary-net5.

```
isdn switch-type basic-ni
!
interface BRI0
!
interface serial0:23
 isdn switch-type primary-net5
```