

NFAS with D Channel Back Up

Feature Summary

The DMS100 and NI2 switch types have been added to the existing Non-Facility Associated Signaling (NFAS) with D Channel Backup feature.

ISDN NFAS allows a single D channel to control multiple PRI interfaces. A backup D channel can be configured for use when the primary NFAS D channel fails.

Once the channelized T1 controllers are configured for ISDN PRI, only the NFAS primary D channel must be configured; its configuration is distributed to all the members of the associated NFAS group.

Benefits

Use of a single D channel to control multiple PRI interfaces can free one B channel on each interface to carry other traffic.

Any hard failure causes a switchover to the backup D channel and currently connected calls remain connected.

Note On the Nortel dms100 switch, when a single D channel is shared, multiple PRI interfaces may be configured in a single trunk group. The additional use of alternate route indexing, which is a feature of the dms100 switch, provides a rotary from one trunk group to another. This enables the capability of building large trunk groups in a public switched network.

List of Terms

24 B channel interface—A PRI channel group configured to have no NFAS D channel; all its channels are B channels.

NFAS group—A PRI channel group (the group of interfaces) under control of a single D channel. The channel group can include all the ISDN channels on multiple T1 controllers. Cisco IOS supports ten PRI interfaces in an NFAS group with a primary D channel and a backup D channel. Five NFAS groups are supported in a single chassis.

NFAS member—A PRI interface in an NFAS group. For example, an NFAS group might include serial interfaces 1/0:23, 1/1:23, and 2/0:23 if T1 controllers 1/0, 1/1, and 2/0 are configured for NFAS.

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.

Restrictions

The following restrictions apply to this feature:

- NFAS is only supported with a channelized T1 controller and, as a result, be ISDN PRI capable.
- NFAS is supported across multiple T1 controllers installed on different slots only if the DSPs of those slots are of the same type. For example, if T1 controllers on slot 1 and slot 2 are combined to form an NFAS group with the T1 in slot 1 being primary, both slots must have the same type of DSP. If these two slots have different DSP types, only those calls using T1 on slot 1 will connect —all calls through T1 on slot 2 will fail with a disconnect cause of "Resource Unavailable/Unspecified (47)."
- The router must connect to either a 4ess, dms250, dms100, or a National ISDN switch type. Table 1 shows the applicable ISDN switch types and supported NFAS types:

Table 1 ISDN Switch Types and Supported NFAS Types

Switch Type	NFAS Type
Lucent 4ESS	Custom NFAS
Nortel DMS250	Custom NFAS
Nortel DMS100	Custom NFAS
Lucent 5ESS	Custom - Does not support NFAS
Lucent 5ESS	NI-2 NFAS
AGCS GTD5	NI-2 NFAS
Other Switch Types	NI-2 NFAS

Platforms

This feature is supported on these platforms:

- 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

Prerequisites

The router’s channelized T1 controllers must be configured for ISDN, as described in the “Configuring ISDN PRI” section of the “Configuring Channelized E1 and Channelized T1” chapter in the Cisco IOS Release 11.3 *Dial Solutions Configuration Guide*.

Supported MIBs and RFCs

None

Configuration Tasks

To configure NFAS with D channel back up, complete the following task:

- Configure NFAS on PRI Groups

You can also disable a channel or interface, if necessary, and monitor NFAS groups and ISDN service. To do so, complete the tasks in the following sections:

- Disable a Channel or Interface
- Monitor NFAS Groups
- Monitor ISDN Service

Configure NFAS on PRI Groups

This section documents tasks used to configure NFAS with D channel backup. When configuring NFAS, you use an extended version of the ISDN **pri-group** command to specify the following values for the associated channelized T1 controllers configured for ISDN:

- The range of PRI timeslots to be under the control of the D channel (timeslot 24).
- The function to be performed by timeslot 24 (primary D channel, backup, or none); the latter specifies its use as a B channel.
- The group identifier number for the interface under this D channel's control.

To configure ISDN NFAS, complete the following tasks in controller configuration mode:

Task	Command
On one channelized T1 controller, configure the NFAS primary D channel.	pri-group timeslots 1-24 nfas_d primary nfas_interface number nfas_group number
On a different channelized T1 controller, configure the NFAS backup D channel to be used if the primary D channel fails.	pri-group timeslots 1-24 nfas_d backup nfas_interface number nfas_group number
On other channelized T1 controllers, configure a 24 B channel interface, if desired. (Optional)	pri-group timeslots 1-24 nfas_d none nfas_interface number nfas_group number

For an example of configuring three T1 controllers for the NFAS primary D channel, the backup D channel, and 24 B channels, along with the DDR configuration for the PRI interface, see the “NFAS Primary and Backup D Channels Example” section.

When a backup NFAS D channel is configured and the primary NFAS D channel fails, rollover to the backup D channel is automatic and all connected calls stay connected.

If the primary NFAS D channel recovers, the backup NFAS D channel remains active and does not switch over again unless the backup NFAS D channel fails.

Disable a Channel or Interface

You can disable a specified channel or an entire PRI interface, thus taking it out of service or put it into one of the other states that is passed in to the switch. To disable a specific channel or PRI interface, complete one of the following tasks in interface configuration mode:

Task	Command
Take an individual B channel out of service or set it to a different state.	isdn service dsl number b_channel number state state-value
Set the entire PRI interface to the specified state.	isdn service dsl number b_channel 0 state state-value

These are the supported state values:

- 0—In service
- 1—Maintenance
- 2—Out of service

Monitor NFAS Groups

To monitor NFAS groups, complete the following task in EXEC mode:

Task	Command
Display information about members of an NFAS group.	show isdn nfas group number

Monitor ISDN Service

To display information about ISDN channel service states, complete the following task in EXEC mode:

Task	Command
Display information about ISDN channels and the service states.	show isdn service

Configuration Examples

This section provides the following configuration examples:

- NFAS Primary and Backup D Channels Example
- PRI Interface Service State Example

NFAS Primary and Backup D Channels Example

The following example configures ISDN PRI and NFAS on three T1 controllers of a Cisco 7500 series router. The NFAS primary D channel is configured on the 1/0 controller, and the NFAS backup D channel is configured on the 1/1 controller. No NFAS D channel is configured on the 2/0 controller; it is configured for 24 B channels.

Once the NFAS primary D channel is configured, it is the only interface you see and have to configure; DDR configuration for the primary D channel—which is distributed to all B channels—is also included in this example.

```

isdn switch-type primary-dms100
!
! NFAS primary D channel on the channelized T1 controller in 1/0
controller t1 1/0
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 nfas_d primary nfas_interface 0 nfas_group 1
!
! NFAS backup D channel on the channelized T1 controller in 1/1
controller t1 1/1
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 nfas_d backup nfas_interface 1 nfas_group 1
!
! NFAS 24 B channels on the channelized T1 controller in 2/0
controller t1 2/0
    framing esf
    linecode b8zs
    pri-group timeslots 1-24 nfas_d none nfas_interface 2 nfas_group 1
!
! NFAS primary D channel interface configuration for PPP and DDR. This
! configuration is distributed to all the B channels in NFAS group 1 on the
! three channelized T1 controllers.
!
interface Serial 1/0:23
    ip address 1.1.1.2 255.255.255.0
    no ip mroute-cache
    encapsulation ppp
    dialer map ip 1.1.1.1 name flyboy 567898
    dialer map ip 1.1.1.3 name flyboy 101112345678
    dialer map ip 1.1.1.4 name flyboy 01112345678
    dialer-group 1
    no fair-queue
    no cdp enable
    ppp authentication chap

```

PRI Interface Service State Example

The following example reenables the entire PRI interface after it previously had been disabled:

```
isdn service dsl 0 b-channel 0 state 0
```

Command Reference

There are no new or modified commands for this feature. Existing commands used to configure this feature are documented in the Cisco IOS Release 11.3 command references.

