



Configuring ISDN NSF on Cisco 1751 and Cisco 1760 Routers

This document describes support for Integrated Services Digital Network (ISDN) Network Specific Facility (NSF) on Cisco 1751 and Cisco 1760 routers.



Note

Cisco CallManager 3.3(2) is the first Cisco CallManager release that supports this feature.

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Configuring NSF

By configuring a gateway for NSF, you can have the gateway request a particular service from the network or provide an indication of the service being provided. NSF provides *call-by-call* support, meaning that an ISDN B channel can be used for any service; its use is not restricted to a certain preconfigured service, such as incoming 800 calls or outgoing 800 calls.

Cisco CallManager 3.3(2) enables you to configure NSF. Configuring NSF makes it possible to invoke network-specific services or facilities on a call-by-call basis by configuring the fields in the ISDN Network-Specific Facilities Information Element section in the Cisco CallManager Route Pattern Configuration window. Cisco CallManager uses the network-specific services and facilities when the user dials the route pattern.



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**Note**

Cisco CallManager only uses the network-specific information with PRI protocol gateways. H.323 gateways do not support network-specific facilities. Cisco CallManager codes the bearer capability as Speech for the ACCUNET service.

**Note**

For information about configuring ISDN with IOS, refer to the “[Configuring ISDN PRI](#)” chapter in the *Cisco IOS Dial Technologies Configuration Guide, Release 12.2*.

MGCP Gateway Fallback

Media Gateway Control Protocol (MGCP) gateway fallback is designed to improve the reliability of PSTN interfaces on MGCP gateways in a network. Basic call processing support is provided when the gateway loses connectivity to all of the CCM servers. A prioritized list of CCM servers is configured on the gateway, making each CCM server potentially available for use as a backup call agent.

On startup, the MGCP gateway attempts to establish a TCP connection to the highest order CCM server on the configured list. If successful, the gateway registers itself with the primary (highest priority) call agent. If no call agent is accessible, the gateway falls back to the default H.323 session application (Version 2) to perform basic call-handling functions.

ISDN NSF Route Pattern and PRI Backhaul

The ISDN NSF route pattern design has been changed in the Cisco CallManager database to enable invocation of facilities or services on a call-by-call basis. The NSF information is used in ISDN PRI call setup for outgoing calls and includes carrier identification code (CIC) and service parameters. The NSF configuration tasks are done in Cisco CallManager.

The NSF configuration has been added in the route pattern user interface page for MGCP-controlled PRI ports. Without the NSF configuration, users have to configure their associated gateways as stand-alone H.323 gateways for which NSF services are configured locally within the router. With NSF configured, NSF can be used on a call-by-call basis.

ISDN PRI backhaul provides a method for transporting complete IP telephony signaling information from an ISDN PRI interface of an MGCP gateway to Cisco CallManager using a highly reliable TCP connection. A single TCP connection is used by the gateway to backhaul all the ISDN D channels to Cisco CallManager. The “SAP/Channel ID” parameter in the header of each message identifies individual D channels. In addition to carrying the backhaul traffic, the inherent TCP keepalive mechanism is also used to determine MGCP gateway connectivity to an available call agent.

ISDN PRI backhaul terminates all the ISDN PRI Layer 2 (Q.921) signaling functions in the Cisco IOS code on the MGCP gateway while, at the same time, packaging all the ISDN PRI Layer 3 (Q.931) signaling information into packets for transmission to Cisco CallManager through an IP tunnel over a highly reliable TCP connection. This methodology ensures the integrity of the Q.931 signaling information being passed through the network for managing IP telephony devices. A rich set of user-side and network-side ISDN PRI calling functions is supported by ISDN PRI backhaul.

The MGCP gateway also establishes a TCP link to a backup Cisco CallManager server. In the event of Cisco CallManager switchover, the ISDN PRI backhaul functions are assumed by the secondary server.

Understanding Route Plans and Route Patterns

The Route Plan drop-down list on the Cisco CallManager menu bar allows you to configure Cisco CallManager route plans by using route patterns, route filters, route lists, and route groups.

Route patterns, route filters, route lists, and route groups provide flexibility in network design. Route patterns work in conjunction with route filters to direct calls to specific devices and to include or exclude specific digit patterns.



Tip

If a gateway does not have a route pattern, it cannot place calls to the PSTN or to a PBX. To assign a number to an individual port on a gateway, you must assign either a route group or a route pattern to that port.



Note

A gateway port can belong to only one route group; however, a route group can be assigned to multiple route lists.

Cisco CallManager uses route patterns to route or block both internal and external calls. A directory number specifies a type of route pattern that is applied to a Cisco IP Phone. Gateways and Cisco IP Phones can also use more complex route patterns that can contain wildcards.

Updates to route patterns automatically reset the associated gateway and route list.



Caution

If a gateway has no route pattern associated with it, or it does not belong to a route group, it cannot route any calls.

For route pattern configuration instructions, refer to the “[Route Pattern Configuration](#)” chapter in the *Cisco CallManager Administration Guide, Release 3.3(2)*.

Considerations for Using Route Patterns

When using route patterns, take the following considerations into account:

- If the route pattern contains an at symbol (@), the Discard Digits field can specify any discard digits instructions (DDIs).
- When @ is used in a routing pattern, the system recognizes octothorpe (#) automatically as an end-of-dialing character for international calls. For routing patterns that do not use @, you must include the # in the routing pattern to be able to use the # character to signal the end of dialing.



Note

The only Discard Digits instructions that you may use with non-@ patterns comprise <None>, NoDigits, and PreDot.



Note

To set the called party type to international, the dialed number must be prefaced by 011.

Related Documentation

For additional information, refer to the following documentation:

- *Cisco CallManager Administration Guide, Release 3.3(2)*
- *Cisco CallManager System Guide, Release 3.3(2)*
- *Cisco 1751 Router Software Configuration Guide*
- *Cisco IOS Dial Technologies Configuration Guide, Release 12.2*

Obtaining Documentation

The following sections provide sources for obtaining documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following sites:

- <http://www.cisco.com>
- <http://www-china.cisco.com>
- <http://www-europe.cisco.com>

Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or as an annual subscription.

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco Product documentation from the Networking Products MarketPlace:
http://www.cisco.com/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS(6387).

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You can e-mail your comments to bug-doc@cisco.com.

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Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

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Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

<http://www.cisco.com/register/>

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:
http://www.cisco.com/en/US/products/products_catalog_links_launch.html
- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary*, *Internetworking Technology Handbook*, *Internetworking Troubleshooting Guide*, and the *Internetworking Design Guide*. For current Cisco Press titles and other information, go to Cisco Press online at this URL:
<http://www.ciscopress.com>
- *Packet* magazine is the Cisco monthly periodical that provides industry professionals with the latest information about the field of networking. You can access *Packet* magazine at this URL:
http://www.cisco.com/en/US/about/ac123/ac114/about_cisco_packet_magazine.html
- *iQ Magazine* is the Cisco monthly periodical that provides business leaders and decision makers with the latest information about the networking industry. You can access *iQ Magazine* at this URL:
http://business.cisco.com/prod/tree.taf%3fasset_id=44699&public_view=true&kbns=1.html
- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in the design, development, and operation of public and private internets and intranets. You can access the *Internet Protocol Journal* at this URL:
http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html
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http://www.cisco.com/en/US/learning/le31/learning_recommended_training_list.html

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